INSPIRE

PROVINCIAL INFORMATION SOCIETY STRATEGY PROGRAMME IN THE REPUBLIC OF SOUTH AFRICA (INSPIRE)

NORTHERN CAPE INFORMATION SOCIETY STRATEGY

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Province of the
Northern Cape
REPUBLIC OF SOUTH AFRICA

Inspire
PROVINCIAL INFORMATION SOCIETY
STRATEGY PROGRAMME
IN THE REPUBLIC OF SOUTH AFRICA

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ACRONYMS

ALL:	Women, Children, Disabled, Elderly, Rural, Rich, Poor
INSPIRE:	Provincial Information Society Strategy Programme in the Republic of South Africa
NCISS:	Northern Cape Information Society Strategy
CTA:	Chief Technical Advisor
JPO:	Junior Programme Officer
PM:	Programme Manager
WSIS:	World Summit on the Information Society
MDG:	Millennium Development Goals
PNC:	Presidential National Commission
ISAD:	Information Society and Development
PGDS:	Provincial Growth and Development Strategy
SMME:	Small Medium Micro Enterprises
ICT:	Information and Communication Technology
eris@:	European Regional Information Society Association
BUG-C:	Business, University, Government, Citizen
DEDaT:	Department of Economic Development and Tourism
NCISTC:	Northern Cape Information Society Technical Committee
SVB:	Supervisory Board
IGRF:	Inter-Governmental Relations Forum
MEC:	Member of the Executive Council
NIHE:	National Institute for Higher Education
OSS:	Open Source Software
NCIS:	Northern Cape Information Society
HR:	Human Resource
COFISA:	Cooperation Framework on Innovation Systems between Finland and South Africa
DOI:	Digital Opportunity Initiative
GDP:	Gross Domestic Product
DST:	Department of Science and Technology
NC:	Northern Cape
OECD:	Organisation for Economic Co-operation and Development
ITU:	International Telecommunications Union

ICASA: Independent Communications Authority of South Africa

1 EXECUTIVE SUMMARY

Since 2007 the Northern Cape Provincial Government (NCPG), with technical and financial support from the Ministry of Foreign Affairs, Finland, set-out a programme to develop a Northern Cape Information Society Strategy. The NCPG as early as 2004, had already identified weaknesses in the Provincial Growth and Development Strategy (PGDS) uptake of technology and particularly Information and Communications Technology (ICT).

To address this limitation, the “Provincial Information Society Strategy in the Republic of South Africa” (INSPIRE), was established under the Cooperation Agreement between the Republic of Finland and Republic of South Africa. INSPIRE, in the Northern Cape Province prepared a “user-centric” approach to Information Society and Development (ISAD) via a process comprising five components. The five components where: (1)Technical Assistance; (2)Strategy Process; (3)Capacity Building; (4)Strategy Induced Initiatives; and (5)Technical Infrastructure.

Under a governance structure represented by: the Embassy of Finland, Ministry of Foreign Affairs, Finland; Department of Communications, South Africa; Presidential National Commission on Information Society and Development; Office of the Premier, Province of Limpopo; Office of the Premier, Northern Cape Province; and the INSPIRE programme management. Several e-working groups: e-Education; e-Government; e-Health; e-Infrastructure; Local Content Development; e-SMME; e-Agriculture and e-Tourism were established to develop the Provinces Information Society Strategy. These e-working groups were led by the associated Provincial Department and were instrumental in ensuring contributions to the strategy development process be in-line with Provincial and Departmental strategies and needs. The working groups also included business, academia and civil society, in a relationship model that became known as the BUG-C (Business, University, Government – Citizen) model.

The NCPG knowing that a paradigm shift would be required to transition its resource rich industrial and agricultural economy to a Knowledge-Based Information economy, pursued a Foresight methodology to drive the development of the Northern Cape Information Society Strategy. The foresight methodology was chosen to develop the Strategy because, it offered a process that took the participants out of the normal linear trajectory for strategic planning and placed them in a context, where they could imagine beyond their constraints and think innovatively about the future. Three workshops where hosted in the Province, accumulating in a draft Northern Cape Information Society Strategy, which was submitted to the University of Turku for critical review and input. By the last of the three workshops, the resulting Northern Cape Information Society Strategy has emerged with seven pillars for immediate action: (1) Example Setting, (2) Broadband infrastructure, (3) Culture of Innovation (4) Skills, (5) Content, (6) Diversifying the Economy, and Poverty Alleviation, Job Creation and Growth.

1.1 Example Setting to Signal Culture of Innovation

The Provincial Government through its positional authority is preparing to be the catalyst in stimulating a culture of innovation, by leading by example. The actions and practices of the Provincial Government Departments, individual government representatives and more broadly all civil servants, in their uptake and use of ICTs, are expected to set the example for innovation. Exemplary innovative actions by Provincial Government are expected to raise awareness that fundamental change is occurring in the way the Provincial Government meets the needs of the people. Specific actions, such as:

- electronic document management;
- electronic commerce;
- video conferencing;
- mobile telephone engagement;
- public access terminals to Government services; and
- inter-active devices for timely communications with provincial government and local government.

The above sample of actions, are expected to produce efficiencies in government processes and in the methods that provincial government uses to meet the needs of its people and organisations.

Innovative actions by the Provincial Government will set the example for other civil servants, other citizens, SMMEs, other businesses, and NGO representatives to follow. Through the innovative application of ICTs, the NCPG intends to stimulate and create strong social and economic networks to improve communication and the exchange of information and knowledge for the social and economic development of the province.

1.2 Broadband

Broadband connectivity underpins the growth of the Information Society and serves as the basis for transition to a Knowledge-Based Economy. Broadband connectivity is the electronic frequency transport carrier for, the electronic packages of data, images, information, knowledge, marketing, sales, logistics, audio, voice, surveying instruments, etc., that arrive on a myriad of electronic devices. From televisions, handheld mobile devices to microchips embedded in materials. Broadband connectivity facilitates instantaneous communication dependent on bandwidth availability, affordability and ultimately the skills of the individuals and users.

ICT devices in a broadband architecture stimulate an environment for the exchange of ideas, information and knowledge to stimulate learning, monitoring and evaluation, the exchange of goods and services, innovation and change in daily workflow processes. Uptake and usage of ICTs in daily practices, within a broadband connected infrastructure, is a cornerstone from which the development of the Information Society and Knowledge-Based Economy materialises. Broadband will encourage change in the way people work, organisations operate, information is delivered and responded to, and fundamentally, the kinds of uses, practices and operations that can be then carried out in the Province.

The geographic spread and low population density of the Province presents a particular challenge for the Province, analogous to the province being a last-mile connection and essentially an under serviced area by the major telecommunications operators. Conversely however, ICTs can be recognised as an opportunity to close the distances between people and organisations in the Province, by connecting them for instantaneous, simultaneous communication. The challenge however, is essentially the cost of infrastructure measured against the return-on-investment (ROI), is a difficult business case to present to investors and operators. Businesses appear to be reluctant to consider extending their time frames for accruing the returns on their investments beyond a "normal" ROI window.

Given this challenge, the Province is pursuing a "user-centric" approach to the development of a broadband infrastructure. The user-centric approach is predicted to stimulate uptake and usage, consequently creating a market for connectivity services. Proper planning is a requisite to ensuring the success of the user-centric approach and it is premeditated by what people do on a daily basis, thus informing the architectural design of the broadband networks. Accordingly, the development and implementation of the broadband infrastructure requires appropriate relevant content that will contribute to producing efficiencies in what people and organisations do on a daily basis and create an opportunity for the development of the new skills necessary for the Province's Information Society and Knowledge-Based Economy.

The DEDaT has already initiated intensive collaboration with ELISA Corporation to provide the opportunities that broadband connectivity can accrue for the Province. The user-centric approach has resulted in the development of a road-map, which will define the Provinces broadband requirements through "service delivery improvement platforms" for each of Government's service delivery requirements: e-Education; e-Health; e-Government; e-Tourism; e-Heritage; e-Agriculture; e-SMME; etc.

1.3 Culture of Innovation

The combination of Provincial Government leading by example and the user-centric approach to broadband infrastructure development is expected to stimulate awareness, about the dynamic shift the province is initiating towards an Information Society and Knowledge-Based Economy. The combined analysis and intuitive[1] reasoning of the people of the province about this shift, is anticipated to provoke the emergence of creative thinking. This model on the combination of analysis and intuition is anticipated to spark creative new ideas, and is illustrated in the work of Nobel Prize Laurent, Eric Kandel, in "Cognitive Neurosicience and the Study of Memory" (Journal: *Neuron.* 1998).

To support this dynamic shift, capturing, mapping and promoting the Northern Cape innovation achievements and solutions will be key in engendering a culture of innovation. Concrete actions to increase awareness of Northern

[1] William Duggan (2010), How Aha! Really Works. Strategy & Business, Issue 61, November 2010

Cape innovations, through evidenced based promotions, will contribute to promoting and increasing awareness and potential investments in the factors that contribute to an innovative milieu. Incorporating ICTs into education, government, health, business, and social services, in-themselves present a significant opportunity for innovation. Innovation in how information and knowledge is processed, retrieved, accessed, shared, generated and exploited for the benefit of ALL.

The National Institute for Higher Education (NIHE) with the Department of Science and Technology have initiated a process to prepare a Provincial Innovation System. An Innovation Forum has been established to drive the processes for a provincial system of innovation to emerge. The ideas in the forum and the emerging system of innovation are expected to stimulate a discourse between the social needs and economic drivers, within the Province. The discussions between business, academia, government and civil society, within the forum, are expected to formalise relationships and linkages towards the development of a proficient system of innovation that defines the trajectory for skills and sustainable livelihoods for transition to the Information Society and Knowledge-Based Economy. The mix of business, academia, government and civil society is intended to stimulate a culture of innovation and contribute to informing "combinations of the elements of intelligent memory that will lead to the production of new creative ideas[2]".

1.4 Skills

The success of the Northern Cape Information Society and transition to a Knowledge-Based Economy rests upon the development of corresponding skills. The innovation forum will contribute to accessing the trajectory range of skills required for the development and growth of the Northern Cape society and economy, as well as assist in preparing necessary skills and training interventions. The potential range of skills required, expand from the basic abilities to access correct information and manipulate basic machinery, to the expert ability to transform ideas into products and services and implement globally competitive locally based beneficiation processes for mining, agriculture, tourism, as well as emerging renewable energy fields. The benefit

[2] William Duggan (2010), How Aha! Really Works. Strategy & Business, Issue 61, November 2010

of investing in human resources is confirmed in the success of countries such as Singapore, Finland, Korea, Taiwan, Japan...

An essential ingredient for the improvement of the skills base for the Northern Cape Information Society and Knowledge-Based Economy is the establishment of reputable tertiary learning environments. The presence of a University in Northern Cape or similarly articulated institutional arrangement (centre of excellence, innovation hub, innovation cluster, science park), will dramatically serve to raise the aspiration of learners in the Northern Cape and significantly contribute to an innovative milieu. The processes surrounding the National Institute for Higher Education activities towards the establishment of a University should be supported, in order to introduce and contextualise innovative approaches to tertiary learning environments, along with sector specific research and development environments. The combination of the existing University model with the elements of Innovation Hubs, Technology Stations, Centres of Excellence, Science Parks and Clusters could serve to result in new creative environments, such as:

- LearningLab: linked to a faculty of education.
- Expanding the Fablab to provide computer aided research experiments.
- Developing a MiningLab that services the Northern Cape mining sector, while introducing topics such as “data mining” to pioneer new technology related subjects.
- Twinning partnerships with established innovation environments. e.g. Malaysia Super Corridor; Canadian Clusters; Taiwan Science Parks; noted Universities; etc.

1.5 Content and Applications

The combination of Provincial Government leading by example, a broadband infrastructure to increase connectivity and productivity, an innovative environment and the proliferation of new skills and tertiary learning environments, are expected to strengthen the Province’s innovative milieu. ALL citizens of the Northern Cape’s are likely to recognise, appreciate, be more aware and supportive of the Provinces ambition to become an Information Society and Knowledge-Based Economy.

However, for the dynamic shift the province is initiating to have meaning to ALL citizens and organisations, it must provide relevant, appropriate content and e-applications that support the individual or organisation's respective ambitions. Governmental incentives, corporate social responsibility, award systems, social energy could all contribute to creating an environment for content and applications development. The production of content and e-applications is inexplicably linked to the context of the respective beneficiary i.e. the community and environment within which they live, work or operate. Processes and facilities to ensure ALL citizens and organisations have available the correct information, to progress their social and economic well being, while driving the growth of the Information Society and Knowledge-Based Economy, will require the establishment of localised content development centres.

These centres will produce the products and e-based services for government, education, health, business and civil society to become active participants in the Information Society and Knowledge-Based Economy.

1.6 Diversifying the Economy

The Northern Cape Information Society Strategy (NCISS) recognises that the process towards diversifying the provincial economy and moving towards a knowledge-based economy is not a short term goal. However, the Information Society Strategy contribution to growth and development lies in stimulating the diffusion and use of ICTs across all sectors, to create the skills, opportunities and innovative milieu that will allow the Information Society and Knowledge-Based Economy to take root.

The opportunity is to align and commit the Provinces resources towards building the capacity and strength of its current sectors, to create opportunities for the Information Society development and Knowledge-Based Economy interaction in new growth areas. Current new grow opportunities in the Province appear as simple opportunities, but by the nature of their complexity, offer incredible opportunities to begin to diversify the Provincial economy. Such opportunities include:

- Establishing a multi-stakeholder Information Society and Knowledge-Based Economy Technical Committee to drive ICT integration into socio-economic objectives;

- Building service delivery improvement platforms across all sectors to stimulate the implementation of a broadband e-Infrastructure that is accessible by ALL;
- Capturing and detailing the provinces innovations for publication in printed, digital and online media formats;
- Building innovative higher learning and research and development institutions in the Provinces areas of competitive and comparative advantage;
- Establishing the processes and facilities to produce locally relevant content for ALL;
- Leveraging new “green” energy opportunities in solar and wind farming, as well as potential bio-mass opportunities;
- Localising the value chain inputs and knowledge production in satellite radio telescopie and astronomy;
- Growing innovative new social and economic value chains on the back of the introduction of ICTs.

1.7 Poverty Alleviation, Job Creation and Growth

A significant challenge in accelerating development in the Northern cape is the large number of unemployed people, which is aggravating the levels of poverty and inequality. The widespread levels of unemployment and income poverty, low human development and high social and economic inequality represent a critical area for positive action.

Number of people living in poverty in the Northern Cape

Area	Total 1996	Percentage	Total 2009	Percentage
Northern Cape province	429712		483526	
John Taolo Gaetsewe	119190	27,7%	110252	22,9%
Namakwa	35120	8,2%	51935	10.7%
Pixley Ka Seme	84464	19,7%	81095	16,8%
Siyanda	79202	18,4%	93460	19,3%
Frances Baard	111736	26%	146783	30,3%

Source: Global Insight

The NCISS strategic interventions, seek to empower and enable ALL people to take control of their own destiny through affordable access, to relevant, appropriate information and knowledge. A prerequisite for the NCISS is that the context of the information and knowledge, must be attuned to the needs and opportunities that exist in the local environment, where people are seeking to create their sustainable livelihoods.

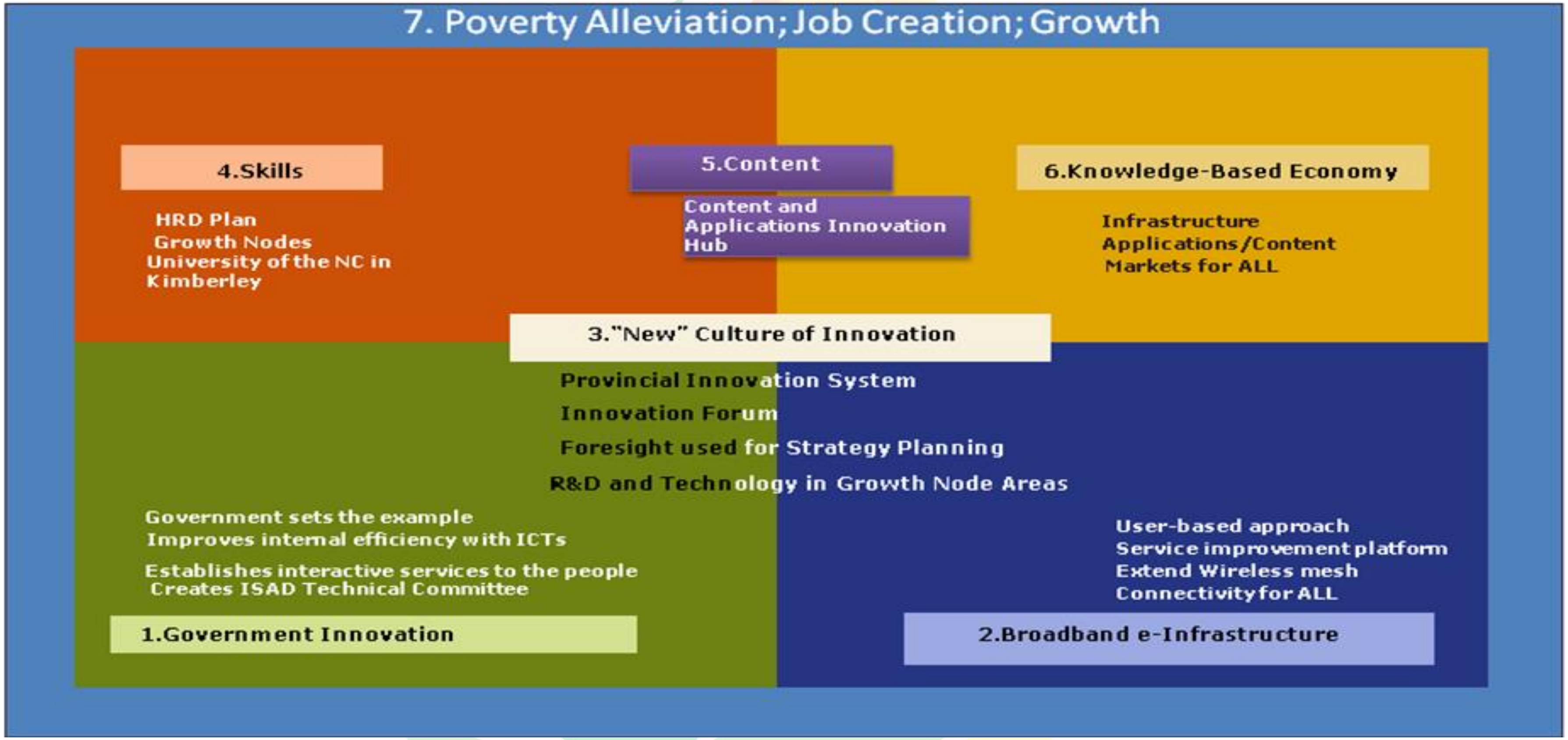
The NCISS proposes that innovative initiatives, designed in consultation with local communities, businesses, civil society and institutions of learning, seek to stimulate the transfer of technology, capital and human resources to assist development, through the deployment of relevant technologies and training. The strategic intent of the NCISS, is to stimulate a positive spiral of development, which facilitates local capacities to beneficiate local competitive and comparative advantages.

The potential NCISS interventions, through access to skills and technologies, for arts, crafts, agriculture, mining, renewable energies, environment, tourism, mariculture, etc, will depend on the circumstances of the local comparative and competitive advantages.

1.8 Summary

The seven priority areas emerging for the Northern Cape Information Society Strategy are presented in the framework below. The framework has arisen from a top-down / bottom-up approach through the Provincial Information Society Strategy Programme in the Republic of South Africa (INSPIRE).

NORTHERN CAPE INFORMATION SOCIETY STRATEGY FRAMEWORK



2 INTRODUCTION

Change is the mother of both opportunity and calamity – opportunity for those who are as fleet of foot as change itself and calamity for those with an inappropriate affection for the past[3].

The Information Society Strategy for the Northern Cape Province is born out of an ambition to accelerate sustainable social development and economic growth for the people of the Province. As early as 1994, South Africa recognised the emerging impact of information and communication technology (ICT) on society and its under-pinning role in creating the powerful social and economic networks, to improve communication and the exchange of information and knowledge across the globe. The Information Society Strategy for the Northern Cape Province emerges from the Development Cooperation Agreement between the Government of the Republic of South Africa and the Government of the Republic of Finland, under the Provincial Information Society Strategy Programme in the Republic of South Africa (INSPIRE). INSPIRE is implemented under the authority of the Minister of Communications with the Presidential National Commission on Information Society and Development (PNC on ISAD) through the Province of the Northern Cape and Province of Limpopo, Office of the Premier. The PNC on ISAD identified the Northern Cape and Limpopo Provinces' as forerunners towards the establishment of the Information Society in their respective Provinces. The Northern Cape noting the lack of ICTs in their Provincial Growth and Development Strategy established relationships with the Government of Finland for an information society strategy in the Northern Cape.

Negotiation between the office of the Premier of the Northern Cape Province and the Finnish Government began in 2004. Finland is one of the most technologically advanced countries in the world. Finland still continues to hold top spots in various Information Society indexes, including the International Telecommunication Union ICT Development Index (ITU IDI). Finland has managed to combine the information society with the welfare state and in fifty years transformed its agrarian / industrial economy to a leading information

[3] Hamel Gary (2002). *Leading the Revolution.* Boston: Harvard Business School Publishing

society model. Finland represents a model for building a successful competitive information society.

Finland promotes information society development and the utilization of new technologies globally and in its partner countries. Principles of the Finnish Information Society development policy are based on Finland's own development policy, the UN Millennium Development Goals and declarations adopted by WSIS in Geneva and Tunis.[4] The principles are:

- Reduction of poverty by making use of ICT.
- Improvement of access to education and training for all through ICT, and upgrading of overall information society literacy.
- Development of an information society that is inclusive and democratic and promotes human rights.
- Development of an information society based on law.
- Prediction of environmental threats, prevention of serious illnesses and promotion of healthy lifestyles.
- Creation of the preconditions necessary for information society development[5].

Development however, is always based on sovereign needs. The developmental needs of a specific country are a complex myriad of issues related to their political, economic, societal, cultural, technological, available resources, environment, educational levels, skills availability, health status, regulatory and legislative environments, amongst other matters. As such, Finnish solutions cannot be transferred elsewhere, and particularly not to developing countries. Nonetheless, the history of the Finnish provides a good starting point for sharing experiences with other countries.

With this background, on the one hand, the Information Society Strategy for the Northern Cape Province illustrates the position of the Northern Cape Province in a dynamically changing world. On the other hand, the strategy is an implementation process for the Province to initiate activities that will accelerate development. It presents options for the Province to consider in consultation

[4] See e.g. Klein, H. (2004), Understanding WSIS: an institutional analysis of the UN World Summit on the Information Society, *Information Technologies and International Development* (The Massachusetts Institute of Technology), 1(3–4): 3–13

and collaborative partnership with business, academia and civil society to build upon its core competencies (what people in Northern Cape collectively know) and its strategic assets (what they own), as a platform towards new information and knowledge based activities. The strategic framework presents seven pillars from which the Northern Cape Information Society and Knowledge-Based Economy will be born:

(1) Government setting the example;
(2) Broadband Infrastructure;
(3) Culture of Innovation;
(4) Skills;
(5) Content and Applications;
(6) New provincial economy; and
(7) Poverty alleviation, Job creation and Growth.

The implementation of the strategy requires that the Provincial Government lead by example and presents an opportunity for the Provincial Government to demonstrate a "new" ecosystem for Government communications, relations and partnerships with all citizens and stakeholders, and represents processes towards improved service delivery.

The strategy is informed by the experiences of:

a) the Finnish Consulting Group;
b) the Presidential National Commission on Information Society and Development, ISAD Plan;
c) Learning North Karelia project in Finland;
d) the Digital Opportunity Index Report (i.e. *Creating a Development Dynamic*);
e) the eris@ e-Adoption Ladder;
f) the Bamako Information Society Principles;
g) INSPIRE International Study missions;
h) INSPIRE e-Working Groups;
i) strategy induced pilot projects in the province; and
j) a Foresight approach to strategy development.

[5] Finnish IS Policy *(check the ref)*

Furthermore, the emerging strategic pillars are designed to contribute to transformation within the Provinces existing sectors of Mining, Finances, Government (education, health, SMME development, culture and heritage), Wholesale and Retail and Agriculture. The strategy intends to stimulate local human and social capacity to create new industries, while growing the current economic drivers through the uptake and usage of ICTs. As emerging broad macroeconomic data from the World Bank Group indicates, as well as growth, accounting analyses of the impact of ICTs, reflects: Across the world, per capita economic growth is driven by three factors: (1) investment in equipment and infrastructure; (2) investment in human capital; and (3) efficient use of labour and capital, which increase total factor productivity.

The Strategies strategic intent is to provide actionable ideas for the Northern Cape Information Society and Knowledge-Based Economy. The Strategy epitomizes the challenges and the dynamism of the changes required, for provincial strategy, structure, culture and systems. Fundamental to the strategy is upgrading organisations, people and communities to become active co-creators, participants and innovators in the use and application of the tools of the Information Society – Information and Communications Technologies (ICTs) – to accelerate development through innovation.

The NCISS represents the Province’s first conceptual orientation, towards creating an environment, for the preconditions required to facilitate societal and economic progression towards the information based knowledge economy.

.

3 BACKGROUND

In 2001 the development cooperation agreement between the Government of the Republic of South Africa and the Government of the Republic of Finland was established. During the same year the President’s State of the Nation Address formed the Presidential National Commission on Information Society and Development (PNC on ISAD). The first World Summit on Information Society (WSIS) was hosted in Geneva, Switzerland in 2003 and the second WSIS was hosted in Tunis, Tunisia in 2005. The PNC on ISAD led a national process to develop an Information Society and Development (ISAD) plan for

South Africa. The ISAD Plan was approved by Cabinet in February 2007 as a framework for the development of a nationally *inclusive* Information Society and globally competitive Knowledge Society. The ISAD Plan amounts to a framework to guide the Nation and Provinces in developing their respective information society strategies and development models.

Through the PNC on ISAD, the Provinces of Limpopo and Northern-Cape were selected as early adopters of Information Society Development. The Northern Cape was selected for its early engagement with the Government of the Republic of Finland, while the Province of Limpopo was selected due to their significant ICT experiences emanating from their participation in Presidential International Advisory Council on ICTs.

The Finnish Government committed itself to assist Limpopo and Northern Cape provinces with the development and implementation of the Provincial Information Society Strategies including the introduction of the concept of the Knowledge-Based Economy. The commitment by the Finnish Government was translated into the Provincial Information Society Strategy in the Republic of South Africa (INSPIRE).

INSPIRE is as a mechanism, designed to be auxiliary to ISAD and assist and contribute to the attainment of the objectives of the respective Provinces Provincial Growth and Development Strategies as aligned to the Medium Term Strategic Framework and twelve key outcomes of the National Government:

1. Improved quality of basic education.
2. A long and healthy life for all South Africans
3. All people in South Africa are and feel safe.
4. Decent employment through inclusive economic growth.
5. A skilled and capable workforce to support an inclusive growth path.
6. An efficient, competitive and responsive economic infrastructure network.
7. Vibrant, equitable and sustainable rural communities with food security for all.
8. Sustainable human settlements rural communities and improved quality of household life.
9. A responsive, accountable, effective and efficient local government system.

10. Environmental assets and natural resources that are well protected and continually enhanced.
11. Create a better South Africa and contribute to a better and safer Africa and World.
12. An efficient, effective and development orientated public service and an empowered, fair and inclusive citizenship.

The Northern Cape Information Society Strategy (NCISS) seeks to contribute to these outcomes using the Information Society model as a catalyst for accelerated social development and economic growth, and ultimately a transition to a Knowledge-Based Economy.

4 DEFINING THE INFORMATION SOCIETY

The IBM Community development foundation in their 1997 report, "The Net Result – Report of the National Working Party for Social Inclusion" elaborates:

> Information Society: A society characterised by a high level of information intensity in the everyday life of most citizens, in most organisations and workplaces; by the use of common or compatible technology for a wide range of personal, social, educational and business activities, and by the ability to transmit, receive and exchange digital data rapidly between places irrespective of distance.

Building upon the IBM vision, the World Summit on Information Society (WSIS) agreed that the Information Society amounts to a worldwide technological and social infrastructure in which, every human individual, *"can* ***create, utilise and share information and knowledge****, enabling individuals, communities and people* [at large] *to achieve their full potential in promoting sustainable development and improving their quality of life".*

In the case of the Northern Cape Information Society Strategy, our pragmatic interpretation of the Information Society translates into:

(A) "**digital-ICT and** (B) **social infrastructure that can carry information, video, graphics, text and voice to and from ALL the people, thereby creating powerful new knowledge, and social and economic networks for the Northern Cape Province**".

The NCISS reflects that this infrastructure does not yet fully exist, but in large part must be built. Once implemented, the infrastructure will enable:

- Capacity and capabilities for instant communication by voice, computer, mobile phones and video so that there is information sharing across all sectors of the society for improved education, health, government, and enhanced quality of life;
- Improved accessibility to critical information resources and support for localized social development and economic growth;
- Capacity and capabilities for sharing electronically, information on Government activities, results of research and processes of development across individuals, communities, businesses and organizations so that there is information sharing across all sectors of the economy for knowledge production and higher efficiency and effectiveness in society and the economy; and
- Stimulation of new innovative social and economic activity, generation of employment, as well as identification and pursuit of new business opportunities.

It needs to be emphasized that the value of such infrastructure is contingent on mutually connected and networked communities that can put to use such infrastructure in a meaningful way. To realize the Information Society (including the Knowledge-Based Economy) requires vision, leadership, skills and work practices and opportunities that understand and can leverage the set of key tools of the Information Society – that is, ICTs – for accelerated innovative social development and economic growth.

4.1 Sample of Information Society Models

The current discourse on the Information Society appears to suggest that there is no universal definition of "Information Society". However, the Information Society takes forms that are locally particular. It is multifaceted and requires a serious consideration of not only commonalities, but also differences in culture, social structure, economic productivity, political powers, human and natural resource endowments, urban / rural spaces, innovation, level of development, all which contributes to a specific model of the information society, relative to the context of the local environment. These interdependent considerations are exemplified in such sample models of the Information Society, as those to be found in:

(1) the Silicon Valley,
(2) Singapore, and
(3) Finland.

In terms of the terminology of economic sociology, these three models are interesting in that they reflect three key institutional pillars of how to organize society and the economy: "exchange", "redistribution", and "reciprocity".[6] The three models in themselves do not account for similarities or differences, or reflect on what may be attested to predominant models. More current Information Society and Knowledge-Based Economy models emerging, include Japan, Sweden, and South Korea, who now have top-positions on current ITU Information Society indices.

4.1.1 Silicon Valley Model

It is in the Silicon Valley that the American neo-liberalist model – the global model[7] - is perhaps technologically and economically more dynamic than anywhere else. The pillar of social organization and industrial organization in the Silicon Valley is "exchange". Local success stories, often based on venture capital, are models for subsequent success stories and for industrial organization.

While an engine of economic growth, this model has tended to amount to a persistent existence of a social divide in local society. A case example of this in the Silicon Valley is that the town of Palo Alto is home to global success stories such as Hewlett-Packard and is one of the more affluent towns in all of California. At the same time, East Palo Alto, the neighbouring town, has long struggled with a lack of social order and plenitude of violence and other forms of crime.

[6] Karl Polanyi in R. Swedberg (2003), *Principles of Economic Sociology*. Princeton University Press.
[7] Pekka Himanen (2004), *Challenges of the Global Information Society*, Committee for the Future, Parliament of Finland

In Silicon Valley, one's opportunities depend on social networks, thus creating a marginalised group who don't have the access and opportunities created by education, social capital, and an established base of appropriate experience.

In one of the INSPIRE workshops, the Silicon Valley neo-liberalist model was identified with a scenario of *"leaving the weak behind".* Extreme social divides, such as the one between Palo Alto and East Palo Alto have recently been treated with philanthropy and capitalistic self-interest. This philanthropy tends to maintain the social divide between the rich and the poor, but this solution is not transferable to locales that are pursuing an *inclusive* Information Society.

4.1.2 Singapore Model

The Asian state-run model is one in which the objective of the local government is to attract multinational companies to the region. This kind of a model – in its emergent form – can be found also in countries such as China and India[8]. The model has also been dynamic and based on tax competition. While an engine of economic growth, this model has tended to amount to a persistent failure to develop a fully working democracy. A case example of this is that there is little modern three-partite distinctions made between law enforcement, writing of laws, and governance of the system of laws. Instead, federal government makes and governs all three pillars of society with a monopoly. Thus, there is little creative destruction in the capitalistic sense. Rather, the central governments, using monopoly rights, "redistributes" resources in the economy for purposes of building a Knowledge Economy, while denying citizens a right to an Information Society.

In Singapore, one's opportunities depend on nurturing relations with foreign investors, on the one hand, and the government, on the other. Of the two, the latter is more important than the first.

The challenge of the Singapore model is that as other countries reduce their corporate taxes or improve incentives to investors, multinational companies move to where the attraction is better. In one of the INSPIRE workshops, the Singapore model was referred to as *"a race to the bottom"*.

[8] Ibid.

4.1.3 Finnish Model

The European model that combines the Information Society and the Knowledge Society with the development of a welfare state is represented in its most advanced form in the case of Finland.[9] In this model, important decisions are made through the state and its national government, but large corporations actively lobby the government at both the national and local levels.[10] The logic of decision making is consensual. The Information Society and the Knowledge Economy exist in "reciprocity", feeding each other. The welfare model is the third leg in this model.

The downside of the Finnish model is that the industrial era structures of the welfare state are difficult to adapt quickly. Democratic decision making, makes aglint and smart advances difficult to negotiate through successfully. Hence, democratic governance tends to result in a welfare state that may be somewhat outdated and protected, contributing to a state of passivity among the unemployed, for example.

In one of the INSPIRE workshops, the Finnish model was referred to as the scenario of the *"the dead hand of passivity"*. Participants in that workshop realised that if the welfare state is not reformed with the same innovation that was applied in the information society and the economy, passivity may lead to a situation where the dynamics of the economy may fade over time. The welfare state may then need to be cut back as unemployment levels rise to a level where the welfare state is really needed[11].

5 EXAMPLE SETTING TO SIGNAL CULTURE OF INNOVATION

Since the end of *apartheid* in 1992, in a way that resembles more the Finnish model than the Silicon Valley or Singapore models, South Africa's new democratic government has stressed participation, consensus building, collaboration, partnerships, equality and reconstruction and development as important components of transformation.

[9] Ibid.
[10] Spencer, J., T Murtha and S Lenway (2005), How governments matter, *Academy of Management Review*, 30 (2): 321–337.
[11] Pekka Himanen (2004), *Challenges of the Global Information Society*, Committee for the Future, Parliament of Finland

The Northern Cape Information Society Strategy (NCISS) is built on the premise that a broad range of stakeholder input is key. Practices, infrastructure and processes ensured representations from all significant constituencies and they had an opportunity to contribute to the formulation of the strategy. In particular, the model of “BUG-C” (Business, University, Government – Citizens) was used to ensure the strategy has been designed for all constituencies.

Participation, consensus building, reconstruction and development all require involvement and contribution. Provincial Government can set the example of a connected government i.e. intra-and-inter connected, for information society development, through the efficient and effective use of ICTs. The demonstration of what the Northern Cape Information Society and Knowledge-Based Economy means, rests with the key provincial departments:

- Office of the Premier;
- Department of Economic Development and Tourism;
- Cooperative Governance, Human Settlement and Traditional Affairs;
- Department of Education;
- Department of Health;
- Department of Arts and Culture;
- Department of Rural Development;
- Department of Social Development and
- Department of Agriculture and Land Reform.

Provincial Government leadership in collaboration with private sector ICT service providers is a catalyst for the accelerated development of the Information Society. In principle, the opportunities to exploit the tools of the Information Society, ICTs, are provided primarily from the private sector. Government’s strength lies in its ability to leverage its legislative mechanisms and incentives, as well as its purchasing power, to create the means for the private sector to make ICTs more widely available to individuals and organisations, including in rural areas. However, this leverage depends increasingly on Government taking responsibility for releasing and promoting the use of ICTs to meet development goals. Conversely, development occurs essentially at the local level. This presents a paradox in the South African context, where nationally designed projects need to be generic enough to meet the diverse conditions, capabilities, cultures, resources and contexts of the local environments.

While the local government explores opportunities to address their local challenges and release their local competitive advantages, it must maintain an alignment to provincial and national goals and objectives. The establishment of a Northern Cape Information Society Technical Committee (NCISTC) is intended to explore, align and streamline the congruency between National Spatial Development Plan (NSDP), Provincial Growth and Development Strategy (PGDS), District Growth and Development Strategy (DGDS) and Integrated Development Plans (IDP), along with sector specific plans emerging from the Departments' of Trade & Industry, Communication, Science & Technology, Arts & Culture, Education, Health, Agriculture, Land Reform and Social Development.

A challenge in ensuring the success of a NCISTC is the need to include private sector participation, without marginalising the developmental needs of the Province. Private sector participation and contribution in the construction of the infrastructure, ICTs and devices along with content is essential for the emergence and sustained growth of the Information Society and Knowledge-Based Economy.

The Departments noted above, will need to make some hard choices about how the Northern Cape Information Society considers the national-government parameters in the province, i.e. as:[12]

a. rules of the game that determine for everybody (i.e. for each department, for each organization, and for each individual) 'to the letter' (i.e. to the finest detail) what can happen in Northern Cape; that is, the extent to which national-government considers the special circumstances, and comparative and competitive advantages of the province;

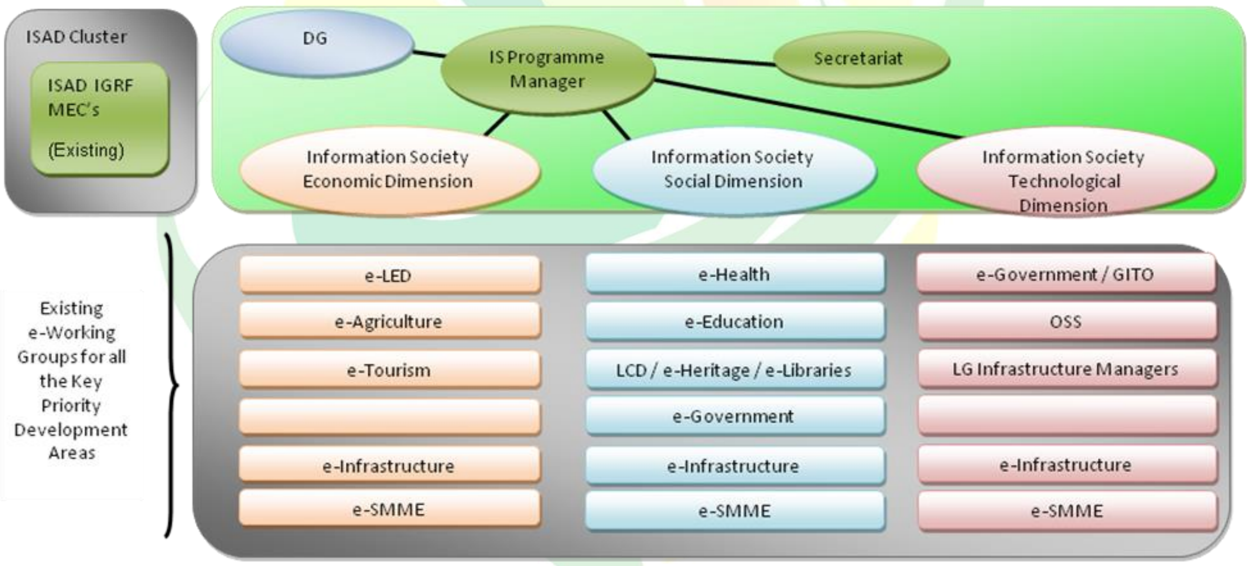
b. the distribution and allocation of administrative resources for promoting a culture of innovation that allows the province considerable interpretation, flexibility, and adaptation of resources; and/or

[12] Professor Antti Ainamo (2010), *Roll-Out of Information Society and Ramp-Up of Knowledge Based Economy: Notes on Progress of 'Inspire' in Northern Cape* ,November 2010

c. legislative means that everybody in Northern Cape ought to comply with and not oppose, for implementation of the Northern Cape Information Society.

The NCISS proposes an institutional matrix for engaging the key Departments through a Northern Cape Information Society Technical Committee (NCISTC). The NCISTC will include working groups that represent civil society, business and academia, to ensure the strategy implementation processes are relevant to the majority of citizens and sectors, and accordingly embody the needs of women, children, youth, elderly and disabled. The institutional matrix suggested for the NCISTC, must provide the opportunities for existing and new businesses and organisations to come into existence. These existing and new businesses and organisations are anticipated to reflect the opportunities instigated, from the NCISTC, to engage in "new" productive activities[13], which will spur the development of the Northern Cape Information Society and Knowledge-Based Economy.

The NCISTC institutional matrix, supposes that the lead departments will implement modern systems that take advantage of ICTs, to demonstrate the information society and stimulate a culture of innovation. The NCISTC is illustrated as follows:



[13] Douglas C. North, (1994). *Economic Performance Through Time*, American Economic Review, June 1994

Hosted by the Office of the Premier and reporting to the Director-General, the institutional matrix, reporting relationships, funding, multi-stakeholder partnerships, inter-governmental relations and regulatory frameworks, across government, business, labour, academia and civil society for the integrative coordination and implementation of the NCISS, will be provided through "dimension" based working groups. The NCISTC represents a platform from which government has the opportunity to set the example for collaborative interdependent planning and a formula for new collaborative approaches to the uptake and use of ICTs. The establishment of the NCISTC establishes a common platform from which to agree procedures, policies and priorities for igniting the dynamism of the Information Society into the local Knowledge-Based Economy context(s).

The NCISTC will leverage the advances in ICTs to demonstrate increased integration in planning and coordination to improve service delivery and accelerate development. The opportunity to strengthen linkages between departments and facilitate communication with citizens, via interactive ICT devices and applications, presents a move from being system-oriented to value-chain-oriented with respect to structure, functioning, skills and capabilities, content and culture and management.

This joined-up government concept is derived from a whole-of-government approach which increasingly looks towards technology as a strategic tool and as an enabler for public service innovation and productivity growth. ICT's are the vehicle for connected governance and are aimed at:

- Facilitating improved cooperation between governmental agencies,
- Allowing enhanced, active and effective consultation and engagement with citizens, and
- Greater involvement with multi-stakeholders locally, regionally and internationally.

Strengthening joined-up governance is an important step towards improving the coordination of processes and systems within and across, government departments, agencies, organizations and requires fundamental changes in the way that government works. The effective and efficient use of ICTs provides an opportunity to harness the benefits of technology to achieve developmental goals. Their potential provides significant opportunities to reduce organisational costs, increase information services delivery, expand market access, better serve rural areas and provide tools for citizen involvement and feed-back.

The opportunity for the Provincial Government is in ensuring the value-chain for the development of the Information Society serves to provide the policy environment and connectivity infrastructure and access points, which will enable citizen inputs to government and release local competitive advantages to compete in the global arena. The speed of economic change is a function of the rate of learning, but the direction of that change is a function of the expected payoffs to acquiring different, new kinds of knowledge[14].

STRATEGY 1
Establish Action Through Leadership and Inclusivity.
ACTION(S)
▪ **1.1 Establish Northern Cape Information Society Technical Committee.**
▪ **1.2 Operationalise "dimension" based working groups using the clusters model.**
▪ **1.3 Connect the Technical Committee to the industrial and social mechanisms that will drive Information Society and Knowledge-Based Economy development.**

6 BROADBAND INFRASTRUCTURE

Broadband connectivity as researched by the World Bank Group, across 27 developed countries and 66 developing countries, found that a 1-percentage point increase in the number of Internet users correlated with a boost in exports of 4.3-percentage points. Accordingly an econometrics analysis of 120 countries by the World Bank Group found, for every 10-percentage point increase in the penetration of broadband services, there is an increase in economic growth of 1.3-percentage points[15]. For the Information Society and Knowledge-Based Economy, the foundation infrastructure is the telecommunications system[16], enhanced by broadband. The broadband

[14] Douglas C. North, (1994). *Economic Performance Through Time*, American Economic Review, June 1994
[15] World Bank Group (2009), 2009 Information and Communications for Development: Extending Reach and Increasing Impact, The World Bank Group
[16] William H. Melody (1996), Toward a Framework for Designing Information Society Policies, Elsevier Science Ltd, Great Britain

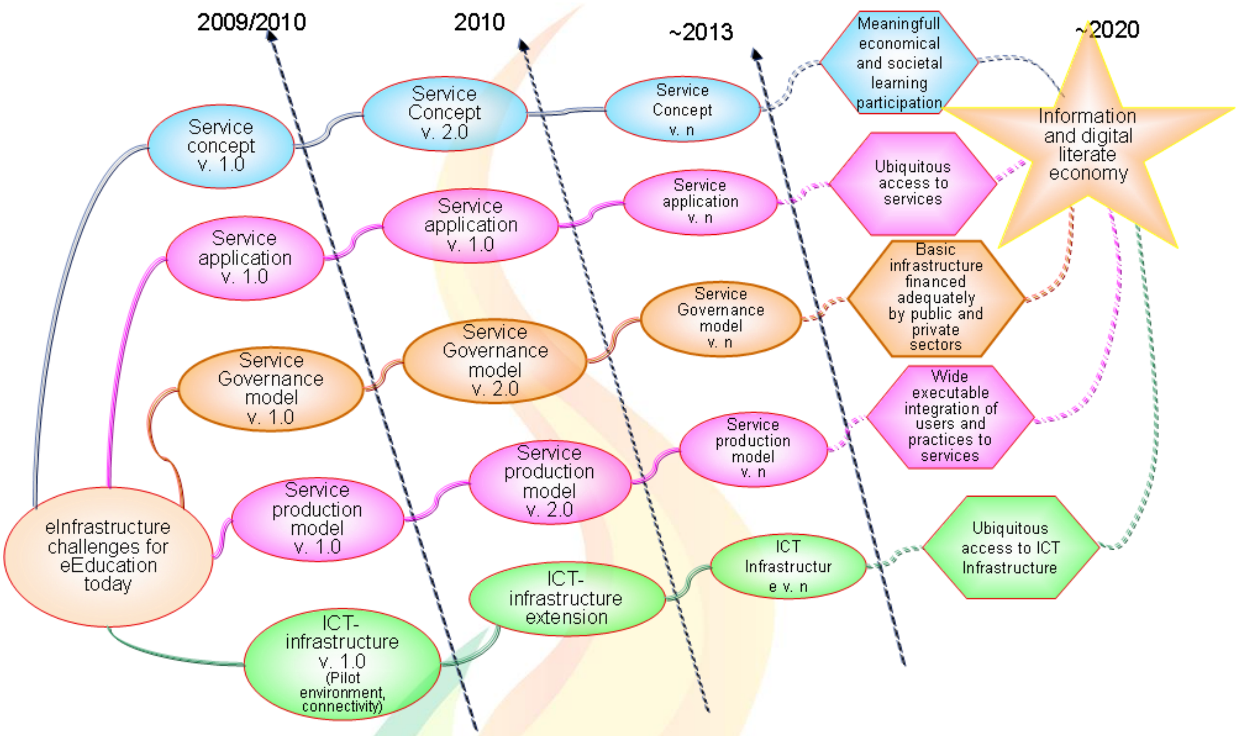
telecommunications infrastructure includes: content; new value added communication services suppliers; infrastructure equipment (hardware and software); communications networks; applications developers; training and development; affordable accessibility options; skills through all sectors and coordinated policies[17].

Building a Northern Cape broadband e-infrastructure for ALL is perplexed by the large geographic spread and the low population densities in the province. The current ratio of geographic spread and population density translates into three (3) people per square kilometre. Unfortunately, the costs of providing broadband to ALL in the Northern Cape, does not present a viable business model. To address this challenge and ensure the province does not lose out on the economic potential of broadband connectivity. The province has embarked upon a "user-centric" approach to the development of e-Infrastructure.

The usual approach to developing infrastructure is typically systems centric. That is the deployment of technologies to establish connectivity and networks. The user-centric approach means that peoples needs' will define the requirements for technological intervention. This user-centric approach creates a basis for uptake and usage, which will then create a market for broadband requirements.

The Department of Economic Development and Tourism in collaboration with Elisa Corporation, Finland, have already executed significant work in pursuing a developmental (user-centric) approach to the building of an e-Infrastructure for the Province. The collaboration has prepared the below road-map for e-Infrastructure in the Province.

[17] William H. Melody (1996), Toward a Framework for Designing Information Society Policies, Elsevier Science Ltd, Great Britain



This collaboration has realised a content and technology based e-Infrastructure programme, which is systematically developing a user orientated service delivery platform. The resulting product, the service delivery improvement platform, is being prepared for each sector using a cyclic developmental approach. The current work is focused on the education sector and has completed a service delivery improvement platform for administrators and educators in schools. The architectural framework defined by the education environment will serve as a basis for introducing a platform as a service approach to the health sector next, and to be followed by government, SMME, heritage, etc.

Subsequently, the Northern Cape Information Society strategy builds upon the current user-centric approach towards the implementation of a broadband infrastructure for the Province. With the creation of a critical mass of content to meet and support user needs, options to leverage existing telecommunications operators collaboration in rolling-out broadband for the Province becomes more plausible. The costs of building the e-infrastructure are subsequently off-set by the size of the market base and its frequency of use.

An alternate option is for the Provincial Government to secure a public service communications license and partner with existing operators to then build the broadband network.

Either option requires sufficient support with requisite significant financial resources to ensure affordable access and use of the infrastructure by ALL. Thus, financial institutions such as National Treasury, the World Bank, African Development Bank, European Investment Bank, Development Bank of Southern Africa, all become critical potential funding partners for the e-Infrastructure requirements of the Province.

STRATEGY 2
Provincial Broadband Infrastructure Initiative.
ACTION(S)
▪ **2.1 Expand the service delivery improvement platform across all sectors.**
▪ **2.2. Apply for a telecommunications under-serviced areas operator license for the province.**
▪ **2.3 Formulate strategic partnerships with current telecommunications operators for back-haul connectivity.**
▪ **2.4 Investigate options and processes to establish a submarine telecommunications cable landing point on the Province's coast.**
▪ **2.5 Pursue funding support from the World Bank Group, National Treasury, Provincial Treasury, Universal Service and Access Agency South Africa (USAASA,) Development Bank of Southern Africa (DBSA), Africa Development Bank and European Union Infrastructure Trust Fund.**

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7 CULTURE OF INNOVATION

Innovation is crucial to the development of the Northern Cape Information Society (NCIS). Innovation implies a new way of doing something or "new stuff that is made useful"[18]. It may refer to incremental and emergent or

[18] McKeown, Max (2008). *The Truth About Innovation*. London, UK: Prentice Hall.

radical and revolutionary changes in thinking, products, processes, or organizations. The Northern Cape Information Society Strategy (NCISS) sets-out on the premise that innovation will be central to the NCIS success across ALL sectors i.e. Public, Private, Academic and Civil Society.

The entire realm of human progress depends on the power of innovation, in a sequence that accelerates its pace by month. For example, genetic engineering is benefiting from a wealth of innovation through information processing capacity, provided by ICTs, resulting in extraordinary potential consequences. Software development is making possible user-friendly computing, so that millions of children, when provided with adequate education, can progress in their knowledge, and in their ability to create wealth and enjoy it wisely, much faster than any previous generation. Society is being impacted by the Internet, which today is used by about 100 million people and doubling every year[19].

The Northern Cape Information Society Strategy (NCISS) was developed using a "Foresight" approach to strategy development. Foresight is one approach to strategic development amongst a host of strategy development methodologies. For the Northern Cape, the Foresight methodology provided a platform for consultative discourse and consensus on themes for the NCISS within a short period of time. Three multi-stakeholder workshops, using tools that included "Futures-Wheels" and "ACTVOD" tables, resulted in future "scenarios" that informed the vision and actions needed to build a Northern Cape Information Society. **ACTVOD** is an acronym which stands for:

- **A**ctors / Roles players participating in realising the provincial information society vision for the year 2030;
- **C**ustomers / Services to be produced in the short, medium and long term;
- **T**argets – milestones to be realised in the short, medium and long term;
- **V**alues to be embraced by the role players in order to realise the 2030 provincial information future;
- **O**bstacles / risks / key uncertainties likely to encountered in realising the strategic futures. The identification of obstacles and risks is carried out primarily to find ways of bypassing the identified obstacles;

[19] Manual Castells (1999), Information Technology, Globalization and Social Development. United Nations Institute for Social Development

- **D**rivers are present or emerging driving forces likely to have an impact on the strategy implementation plan.

Foresight refers to methods and a technique used to develop viable and sustainable futures for communities and focuses on “what can be” and then directs efforts towards systematically developing the desired futures. The strength of foresighting over short term development strategies is in its proactive development approach towards desired futures. It is a departure from short term incremental planning, which typically focuses on *how to* solve present problems. Foresighting on the other hand focuses on what *can be* and then directing efforts towards systematically developing the desired futures (COFISA 2007).

The Province’s ability to transition to an Information Society will depend on the its ability to innovate and whether it can accelerate the development of innovative approaches to meeting its challenges and seizing its opportunities. Foresight is one approach to developing a culture of innovation in the Province and is essential to the growth and success of the Northern Cape Information Society. Globalisation and rapid technological change are causing markets to place a premium on innovation. ICTs appropriately applied, present an opportunity for the Province, to stimulate increased collaboration between institutions and organisations and encourage intellectual and technology transfer across the Province and the world. Connecting the Province to the world through information based networks, websites, portals, etc, furthermore, increases the innovative milieu.

The Department of the Science and Technology (DST) developed a draft Regional Innovation Systems Strategy, which presents a framework for Regional Innovation Systems Development. The National Institute for Higher Education (NIHE), Kimberley is currently enagaged with DST to faciliate processes, by which the province can formualte the Provincial Innovation System. The NCISS, supports the establishment of a Northern Cape Innovation Forum (NCIF) and furthermore, proposes the Province invest in stimulating creativity in existing industries, as well as in cultural industries.

The culture of innovative thinking is expected to be sparked by provincial government setting-the-example through the creation of the province’s broadband infrastructure and development of a Provincial Innovation System. The system for innovation is a neccessary ingredient for broader thinking on innovation and serves as a model for interdependency across sectors and industries. It is anticipated that the formalisation of the NCIF will accelerate the development of the Provincial Innovation System by creating a space for stimulating creative ideas based on the innovative firsts of the Northern Cape Province.

STRATEGY 3
Culture of Innovation
ACTION(S)
▪ **3.1 Establish the Northern Cape e-Innovation working group.**
▪ **3.2 Introduce Foresighting Tools in the Provinces Strategy Development Processes.**
▪ **3.3 Develop and Implement the Provincial Innovation System.**
▪ **3.4 Implement Research and Development and Technology Facilities in Areas of competitive and comparative advantage.**

8 SKILLS

Many firm-level studies confirm the complementarities between technology and skills. A study in Canada in 2004, for example, found that a management team with a focus on improving the quality of its products by adopting an aggressive human-resource strategy – by continuously improving the skill of its workforce through training and recruitment – was associated with higher productivity growth. A similar study in Australia, also in 2004, found that the positive benefits of ICT use on growth were typically linked to the level of human capital and the skills base within firms, as well as firms' experience in innovation, their application of advanced business practices and the intensity of organisational change within firms. The data for Australia also showed that the earliest and most intensive users of ICTs and the Internet tended to be large firms with skilled managers and workers. Similar studies exist for European economies[20].

In further studies by the OECD and the World Bank Group, in countries that have invested heavily in human resources and systems, like Singapore and Taiwan, show they produce far more output per person and have experienced higher growth rates than countries like Venezuela and Saudi Arabia, whom relied on their physical resources.

The Northern Cape Province is faced by a choice on where it focuses its financial resources, while maintaining its obligations to social development and economic growth. In order to excel in the development of the Information Society and its economic counterpart, the Knowledge-based Economy, skills and knowledge for the sustained growth are a strategic imperative for long-term success. Creating the balance between skills for the current economy and skills for the future economy are not mutually exclusive, but a clear provincial human resource development strategy must balance the complexity of needs.

The NCISS, through the foresight process proposed the following strategic interventions to raise the human capacity of the Province:

1. Develop and establish a “free” mixed residential and virtual online learning university.
2. Develop and establish “best-in-class” Centres of Excellence in key drivers of the Northern Cape economy.
3. Promote tools and methodologies for continuous learning that support the transition from an agricultural-mining economy to a knowledge based economy.
4. Create supplementary, technology enhanced learning environments, for learners and citizens to choose subject areas they wish to excel in, or need further education and skills on – linked to opportunities that expose the learner or citizen to live work situations.

None of the above skills building initiatives are easy. The costs, relationships, networks, content, hardware, software, physical infrastructures, cultural identities, relevant appropriate opportunities, interdependent planning requirements, social and economic value chains, determination, perseverance, trust, mind-shift, control, etc., are incredible challenges to coordinate and bring to fruition. Creating the context from which skills can be built for an inclusive Information Society and Knowledge-Based Economy, will demand serious choices and commensurate commitment. The options are not static and continue to evolve. All of Provincial Government and the citizens of the

[20] i2010 High Level Group (2006). The economic impact of ICT: evidence and questions. European Union i2010

province bear parallel responsibility in choosing the most suitable, inspiring entry point towards the building of skills for the envisioned future.

"In a nutshell, cultural and educational development conditions technological development, which conditions economic development, which conditions social development, and this stimulates cultural and educational development once more. This can be a virtuous circle of development or a downward spiral of underdevelopment. And the direction of the process will not be decided by technology but by society, through its conflictive dynamics."[21]

Creating the institutions that will effect skills development for the Information Society and Knowledge-Based Economy is a complex process, because it not only entails the creation of the institutions for learning and skills development that is aligned to social development and economic growth within the needs and competitive and comparative advantages of the Province, but also requires that they be undergirded by appropriate political and economic resolve.

Buildings upon the pillars of the NCISS, a series of skills development opportunities emerge that include consideration of emerging "new" areas, such as alternative energies and radio telescopy in astronomy. Potential streams for skills development emerging in the NCISS include:

1. Hardware, software and connectivity in deploying innovative ICTs in Government.
2. Hardware, software and connectivity for expansion of the service delivery improvement platform and implementation of the e-Infrastructure.
3. Digital content development skills.
4. Technology and ICT interventions in existing areas of competitive and comparative advantage, mining, agriculture, tourism, SMMEs.
5. Research and development and "new" technologies in existing and emerging areas of competitive and comparative advantage.

STRATEGY 4
Grow Skills

[21] Manual Castells (1999), Information Technology, Globalization and Social Development. United Nations Institute for Social Development

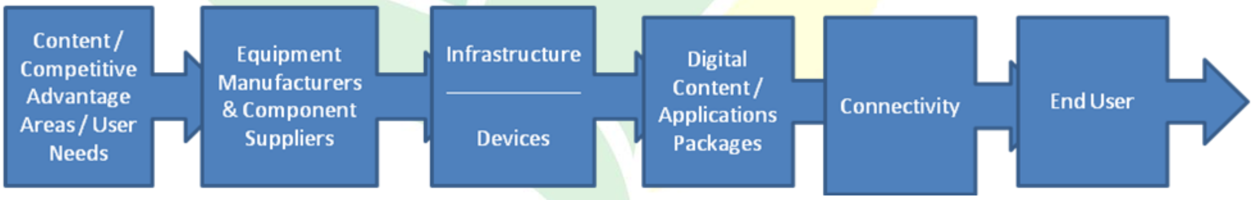
ACTION(S)
▪ **4.1 Establish an e-Skills Institute Connected to the Public, Private and Civil Society drivers of the Province.**
▪ **4.2 Establish Institutional Partnerships with Selected Leading Global Expertise and Institutions.**
▪ **4.3 Create e-Learning environments online and off-line for ALL.**
▪ **4.4 Accelerate the Establishment of an Innovative Model of a "New" Tertiary Level Institution in Northern Cape.**
▪ **4.5 Proposition Leading Academic Research and Development (R&D) Institutions to Partner the Province in Establishing Local R&D Facilities in the Provinces Areas of Competitive and Comparative Advantage**

9 CONTENT AND APPLICATIONS

Content appears to be inexplicably linked to context. Who, what, where, culture, language, level of education, sector, industry, profession, etc. Valuable content must be generated on a continuing basis for the beneficiaries' contexts. There must also be a commensurate amount of sufficiently skilled people, to not only generate the supply of information content, but also with the abilities to transform the information into digital formats that can be accessible by ALL. Most importantly, the information must meet actual needs and be presentable on devices that allow effective participation in the Information Society and Knowledge-Based Economy.

The priorities for choosing which content to develop will depend on achieving a balance between the needs of society and the needs of the economy, within the applicable context.

The value chain for content and applications development and production can be represented as:



Building a Provincial digital content production facility will address the need for locally relevant content and provide an opportunity to stimulate local content production competencies. The challenge is ensuring the right mixes of context-relevant experts are available to work with software experts in developing the digital content.

The NCISS proposes the development of information society based products and services for government services, education and health services, and potentially culture and heritage, to be delivered though broadband communications for use in homes and accessed through the Internet to the world-wide-web. The fundamental challenge is the difficulty of coordination towards a common objective and focused purpose, which requires the orchestrated allocation of resources in space and time[22], across multiple stakeholders.

The option of a content development cluster or an Innovation Hub for content and e-applications production, presents an opportunity for new skills and jobs in the Province. The content and e-applications hub could be in geographic proximity to an Institution of advanced learning and set-about to invite suitable companies and associated institutions in particular fields, to be linked by commonalities and complementarities[23], thus presenting an opportunity for Information Society and Knowledge-Based Economy spin-offs.

STRATEGY 5
Content and Applications
ACTION(S)
▪ **5.1 Develop and Establish Content and Applications Innovation Hub / Cluster**
▪ **5.2 Link Hub / Cluster to Advanced Content and Application Development Institution(s)**
▪ **5.3 Incentivise Related Software, Hardware, Content and Packaging Companies to Locate in the Hub / Cluster.**

[22]Manual Castells (1999), Information Technology, Globalization and Social Development. United Nations Institute for Social Development
[23] Michael E. Porter (1998), On Competition, Harvard Business School Review Book, USA

10 NEW ECONOMY

"A vibrant Northern Cape information based knowledge economy, driven by innovative small to medium enterprises operating within a just, transparent, democratic, information society. A society built on a solid base of highly skilled citizens who have embraced smart green living as a way of life. This is a society no longer dependent on beneficiated mineral resources. GDP growth in the Province is driven by the export of renewable energy sources and technologies. This is a Smart Province where knowledge work is the predominant work ethic that is transforming society where high social capital is the norm."[24]

One of the overarching ambitions of the Northern Cape Information Society Strategy (NCISS) is to stimulate provincial growth and development by introducing innovation through ICTs in the Provincial Growth and Development Strategy. Not through a traditional approach to strategy that looks at the current conditions and plots a path along existing sectors to close gaps and achieve growth and development. But, rather a foresight approach that says what growth and development do we need to achieve, where, for the Province to grow and develop. Building upon the foresight mantra, the NCISS deliberately sets out on an endogenous developmental approach towards growth and development.

Endogenous growth implies that social and economic growth will be created from within the Province by direct result of internal processes. i.e. enhancing the Province's human capital pool to take advantage of the new forms of technology and ICTs for sustained efficient and effective productivity. This view contrasts with neoclassical economics, which contends that technological progression and other external factors are the main sources of economic growth[25].

The originality in the approach is in its strategic intent to shift the Province towards changes in the behaviours, relationships, actions and activities[26] in the people, groups and organisations responsible for building an inclusive Information Society and Knowledge-Based Economy. Essentially the strategic

[24] Ontolligent Services (2010). Foresight Northern Cape Information Society Vision Workshop, Kimberley
[25] http://wiki.answers.com
[26] S. Earl, F. Carden & T. Smutylo (2001), Outcome Mapping: Building Learning and Reflection into Development Programs, International Development Research Centre, Ottawa, Canada

intent is more than just ambition, but encompasses active management processes that include:

- focusing attention on the multi-faceted components necessary for success;
- motivating people by transparent open communications that stress the value of the targets;
- leaving room for individuals, communities and organisations to determine their contributions to the targets;
- sustaining the enthusiasm by providing new resources and incentives as circumstances change; and
- consistently using the strategic intent to monitor and guide resource allocations[27].

The NCISS recognises that growth and development depends more on the inventive capacity and skills of individuals and small teams[28], than on Governments plans or strategy documents intent. There is however, an exceptional misfit between the Provinces natural and financial resources, business and human resources and the penultimate goal – a Northern Cape Information Society and Knowledge-Based Economy.

The essence of the NCISS contribution to growth and development lies in stimulating the diffusion and use of innovative thinking and ICTs to create the institutions, facilities, infrastructure, skills, content and opportunities for the Information Society and Knowledge-Based Economy to emerge. The challenge is to align and commit the provincial resources towards meeting the challenges and creating the opportunities for the Information Society and Knowledge-based Economy to effectively deliver upon social and economic needs in the Province.

The Province has sufficient potential “new” economic drivers that can facilitate the transition to an Information Society and Knowledge-Based Economy. These include:

- Southern Africa’s Largest Telescope (SALT).
- Square Kilometre Array (SKA).
- Solar Energy.

[27] Harvard Business Review (1994), Global Strategies, Harvard Business School Publishing, Boston, USA

- Bio-tech in the aquamarine and agricultural environments.

The opportunity is to combine the traditional economic drivers, mining and agriculture, with the potential "new" economic drivers. The complex inter-play between institutions, companies, technology, time and demography in the overall process of economic change, is a function of the nature of the political markets and, underlying that, the belief systems of the actors[29]. The NCISS attempts through its proposed strategies, to create conditions for the emergence of the Northern Cape Information Society and Knowledge-Based Economy.

STRATEGY 6
New Economy
ACTION(S)
▪ **6.1 Raise Provincial World-Class Expertise in Existing Economic Drivers.**
▪ **6.2 Explore Developing Provincial Expertise in Emerging Potential Economic drivers.**
▪ **6.3 Encourage the Diffusion of ICTs across ALL Sectors.**
▪ **6.4 Transition Traditional Economic Sectors into New Sources of the Economic Growth through ICT based New Ideas and Ventures.**

11 POVERTY ALLEVIATION, JOB CREATION AND GROWTH

The socio-economic indicators of the province appear to indicate that the most significant challenge faced by Provincial Government and its partners in growing and developing the Province is the reduction of poverty[30]. Poverty as defined by the Oxford dictionary, "is the state of lacking adequate means to live comfortably and (attain the) things or needs indispensible to life". The societal challenges faced by the Province emanate from poverty and potentially a lack of access to information that will allow poor people, to tap into their innate creative abilities and become aware of tools that will accelerate their development and local competitive and comparative advantages.

As C.K Prahalad says in his book, The Fortune at the Bottom of the Pyramid: "If we stop thinking of the poor as victims or as a burden and start recognizing

[28] Harvard Business Review (1994), Global Strategies, Harvard Business School Publishing, Boston, USA
[29] Douglas C. North, (1994). *Economic Performance Through Time*, American Economic Review, June 1994

them as resilient and creative entrepreneurs and value-conscious consumers, a whole new world of opportunity will open up" for them.

However, poverty alleviation cannot be addressed without taking into account peoples need for: housing; water; sanitation; access to health, education and social services; decreasing the prevalence of HIV/AIDS; creating employment; reducing crime; assisting vulnerable groups; creating access to the means to transform their lives and empowering them to break the cycle of poverty, to create productive futures.

The Information Society has further aggravated the plight of the poor by creating a digital divide. The digital divide relates to the access divide which considers the gap between those with and those without access; the usage divide concentrating on those who have access, but are non-users; the divide stemming from the quality of use; the geographical digital divide; digital literacy; e-Accessibility; availability of online public services[31]; and the gender and rural-urban divide. In many ways, this digital divide(s) parallel similar disparities in access to and use of other development "goods" – (health, education, water, sanitation etc) – which are more readily available to rich than poor[32].

The optimistic perspective of the NCISS is that the digital divide(s) can be bridged through innovative initiatives to stimulate the transfer of technology, capital and human resources to under developed regions. Investigating and investing in people and technology options that are relevant and appropriate for their respective contexts, with ICTs that are relevant, affordable and accessible.

Mobile and fixed digital technologies and equipments appear to present the greatest opportunity to enhance access to relevant, appropriate information and bridge the digital divide. The opportunities provided through mobile technologies are still relatively untapped and present a significant "new" technology and content developmental area. Opportunities to grow mobile penetration and relevant products, content and services to meet the needs of the poor require further exploration.

[30] Northern Cape Economic Roundtables (2009), Pre-Summit Roundtables 22-23 October, 2009, CRC Kimberley
[31] Commission of the European Communities (2007), i2010 – Annual Information Society Report 2007. Brussels.
[32]Development Co-Operation Directorate, Development Assistance Committee, Network on Poverty Reduction (2004), ICTs and Economic Growth in Developing Countries, OECD

STRATEGY 7
Poverty Alleviation, Job Creation and Growth
ACTION(S)
▪ **7.1 Establish Baseline of Current State of Information Poverty.**
▪ **7.2 Engage poor communities participation in identifying, developing and implementing ICT based interventions.**
▪ **7.3 Align skills development to local competitive and comparative advantages.**
▪ **7.3 Establish Subsidised Internet Access Points in Rural Areas (with appropriate training and relevant content).**

12 PRIORITY STRATEGIC INTERVENTIONS

12.1.1 Provincial Government Sets the Example

Actions:

- Establish the Northern Cape Information Society Technical Committee.

12.1.2 Establish the Broadband Infrastructure

Actions:

- Expand the development and implementation of the service delivery improvement platform

12.1.3 Create a Culture of Innovation

Actions:

- Develop the Provincial Innovation System.

12.1.4 Skills

Actions:

- Establish the Provinces e-Skills Institute.

12.1.5 Content and e-Applications

Actions:

- Develop the Provincial content and e-applications innovation hub / cluster.

12.1.6 Diversify and Grow the Provincial Economy

Actions:

- Encourage the adoption of innovative technologies and ICTs across ALL sectors.

12.1.7 Poverty Alleviation, Jobs Creation and Growth

Actions:

- Co-create and establish information and knowledge access points for poor communities.

13 CRITICAL SUCCESS FACTORS

The areas that require priority attention for the Northern Cape Information Society are:

- Political support for longer-term planning horizons (10 – 20 years).
- Establishment of Northern Cape Information Society Technical Committee.
- Establishment of Information Society multi-stakeholder forums.
- Planning and Implementation of a broadband communications infrastructure.
- Stimulating a culture of innovation.
- The development of a skilled workforce relevant to the context of the opportunities emerging based on use of the tools of the Information Society i.e. ICTs.
- Enhanced linkages between educational and R&D institutions for endogenous growth and development of local competitive advantages.
- Appropriate relevant content and e-applications.
- Access to development information.
- Inclusion of ALL (women, children, youth, disabled, rural).

14 IMPLEMENTATION PLAN

The concept of Strategy Maps has evolved from the work of Robert Kaplan and David Norton and serves as a framework from which the implementation of the Northern Cape Information Society Strategy can be implemented and measured. Building on the study of their experiences of companies that have successfully implemented the Balanced Score Card, there are two important factors that enabled successful implementation – **focus** and **alignment.** Kaplan and Norton's work on the balanced scorecard has evolved from a performance management tool to a comprehensive management tool. The formulation of the Strategy Map, provides a visual framework for integrating organisational objectives in the four perspectives of the balanced scorecard:

1. Financial perspective: describes the tangible outcomes of the strategy in traditional financial terms.
2. Customer perspective: defines the value proposition for targeted customers. This proposition provides the context for how intangible assets, such as human resources and ICT, create value.
3. Internal perspective: identifies the critical few processes that are expected to have the greatest impact on the strategy.
4. Learning and growth perspective: identifies the intangible assets that are most important to the strategy.

Alignment of each of the four perspectives is critical to value creation and hence, to a focused and internally consistent strategy.

The context and the environment of the Northern Cape Province indicates that the most influential area for the Province to initially focus its resource, is on the intangible assets within the learning and growth perspective – Human capital; Information capital; and Organizational capital. However, given the criteria for alignment across the four perspectives, the strategy map is presented from the top down. The Provincial needs are paramount and worked downwards towards what is needed at the level of (1) human, (2) information and (3) organizational capital.

(1) Human capital: Employees' skills, talent and knowledge.

(2) Information capital: Databases, information systems, networks and technology infrastructure.

(3) Organizational capital: Culture, leadership, employee alignment, teamwork and knowledge management.

14.1 Strategy Map

The top-level tier of the strategy map represents the Provinces aspirations to transition to an Information Society and Knowledge-Based Economy through:

- the diversification of the Provincial Economy;
- transition to a Knowledge-Based Economy;
- expanded plus new skills and employment opportunities; and
- enhanced information content and service delivery to the people of the Province.

This transition is planned to arise from a coordinated and integrated combination of the economic, technical and social development strategies of the Province. Through the Northern Cape Information Society Technical Committee, it is anticipated that the related private and civil society organisations will participate in the Economic, Technological and Social dimensions. These dimensions will be integrated to ensure a whole-systems approach for the stimulation of capacity, creation of new industries and delivery on social needs, while leveraging resources to create a tipping-point for a paradigm shift to an Information Society and Knowledge-Based Economy.

The next level of the strategy map captures the set of drivers (projects) for progress towards the Provincial Information Society and Knowledge-Based Economy. These drivers are measured by:

- the product / service benefits to the people;
- the number of new “networked” relationships; and
- the wellness of the image of the Information Society processes as perceived by the public at large.

This level provides the context for the intangible assets to create value and the tangible projects that serve to stimulate and drive the transition to an Information Society and Knowledge-Based Economy. Each project is dependent on the other, subsequently creating a value-chain of interdependencies essential for the success of the Northern Cape Information Society and transition to a Knowledge-Based Economy.

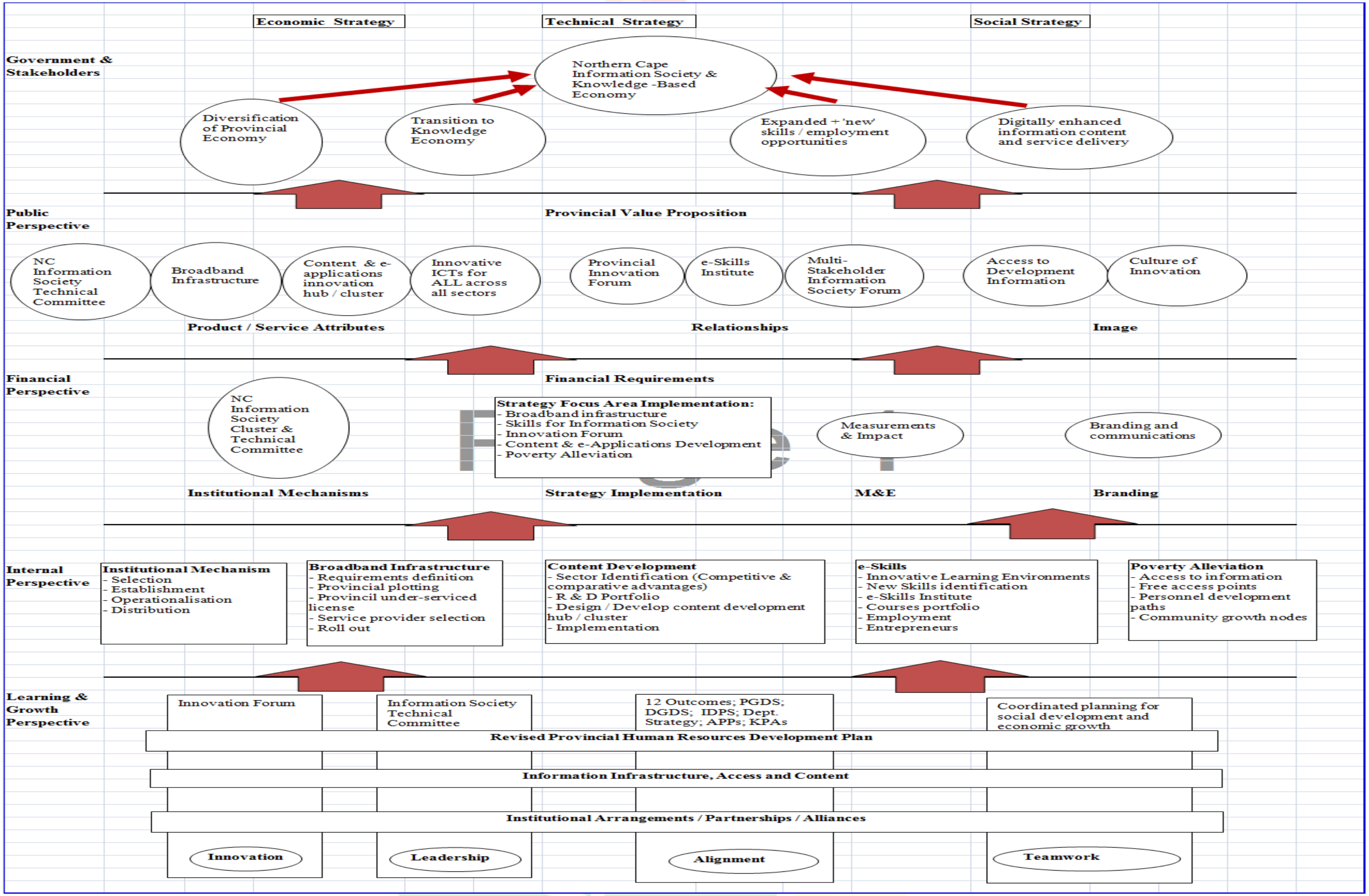
The financial perspectives level identifies the key cost drivers for the implementation of the NCISS:

- the Institutional Mechanism;
- the implementation of the strategy;
- monitoring and evaluation; and
- the brand identity and communications mechanisms.

Measurement against this level shows whether the Strategy is succeeding or failing. This level represents the management control layer of the Northern Cape Information Society Strategy (NCISS) and is essential for review and strategic alignment of the anticipated outcomes. Where necessary, revision of strategic projects will be presented from this level through the Northern Cape Information Society Technical Committee.

The internal perspective level identifies the critical few processes that must be implemented to nurture the NCISS, and are expected to have the greatest impact on the strategy. They accomplish two vital components: (1) they produce and deliver the value proposition for the NCISS, and (2) they improve processes for the productivity and efficiency of the NCISS. These processes represent the foundational building blocks of the Northern Cape Information Society and Knowledge-Based Economy.

The learning and growth perspective level is the contextual relationships upon which the Northern Cape Information Society and Knowledge-Based Economy must be built. The foundational building blocks of the NCISS cannot be affected if the innovative thinking, visionary leadership and integrated alignment between policies, legislation, regulations and strategic planning are not coordinated as a team. The opportunity for the strategy is to ensure that the team of officials assembled to address the intangible assets - Human Capital; Information Capital; Organizational Capital – are aligned and focused on the specific capabilities, attributes, needs and competitive and comparative advantages within the Province that can catalyse the required critical processes for the transition to an Information Society and Knowledge-Based Economy.



Economic Strategy
Technical Strategy
Social Strategy
Government & Stakeholders
Northern Cape Information Society & Knowledge -Based Economy
Diversification of Provincial Economy
Transition to Knowledge Economy
Expanded + 'new' skills / employment opportunities
Digitally enhanced information content and service delivery
Public Perspective
Provincial Value Proposition
NC Information Society Technical Committee
Broadband Infrastructure
Content & e-applications innovation hub / cluster
Innovative ICTs for ALL across all sectors
Provincial Innovation Forum
e-Skills Institute
Multi-Stakeholder Information Society Forum
Access to Development Information
Culture of Innovation
Product / Service Attributes
Relationships
Image
Financial Perspective
Financial Requirements
NC Information Society Cluster & Technical Committee
Strategy Focus Area Implementation:
- Broadband infrastructure
- Skills for Information Society
- Innovation Forum
- Content & e-Applications Development
- Poverty Alleviation
Measurements & Impact
Branding and communications
Institutional Mechanisms
Strategy Implementation
M&E
Branding
Internal Perspective
Institutional Mechanism
- Selection
- Establishment
- Operationalisation
- Distribution
Broadband Infrastructure
- Requirements definition
- Provincial plotting
- Provincil under-serviced license
- Service provider selection
- Roll out
Content Development
- Sector Identification (Competitive & comparative advantages)
- R & D Portfolio
- Design / Develop content development hub / cluster
- Implementation
e-Skills
- Innovative Learning Environments
- New Skills identification
- e-Skills Institute
- Courses portfolio
- Employment
- Entrepreneurs
Poverty Alleviation
- Access to information
- Free access points
- Personnel development paths
- Community growth nodes
Learning & Growth Perspective
Innovation Forum
Information Society Technical Committee
12 Outcomes; PGDS; DGDS; IDPS; Dept. Strategy; APPs; KPAs
Coordinated planning for social development and economic growth
Revised Provincial Human Resources Development Plan
Information Infrastructure, Access and Content
Institutional Arrangements / Partnerships / Alliances
Innovation
Leadership
Alignment
Teamwork

15 MONITORING AND EVALUATION

The importance of monitoring and evaluation (M&E) is increasingly being recognised as absolutely necessary to track the intended inputs; outputs; outcomes; and impacts of a strategy. M&E consists of two basic components: performance monitoring and evaluation:

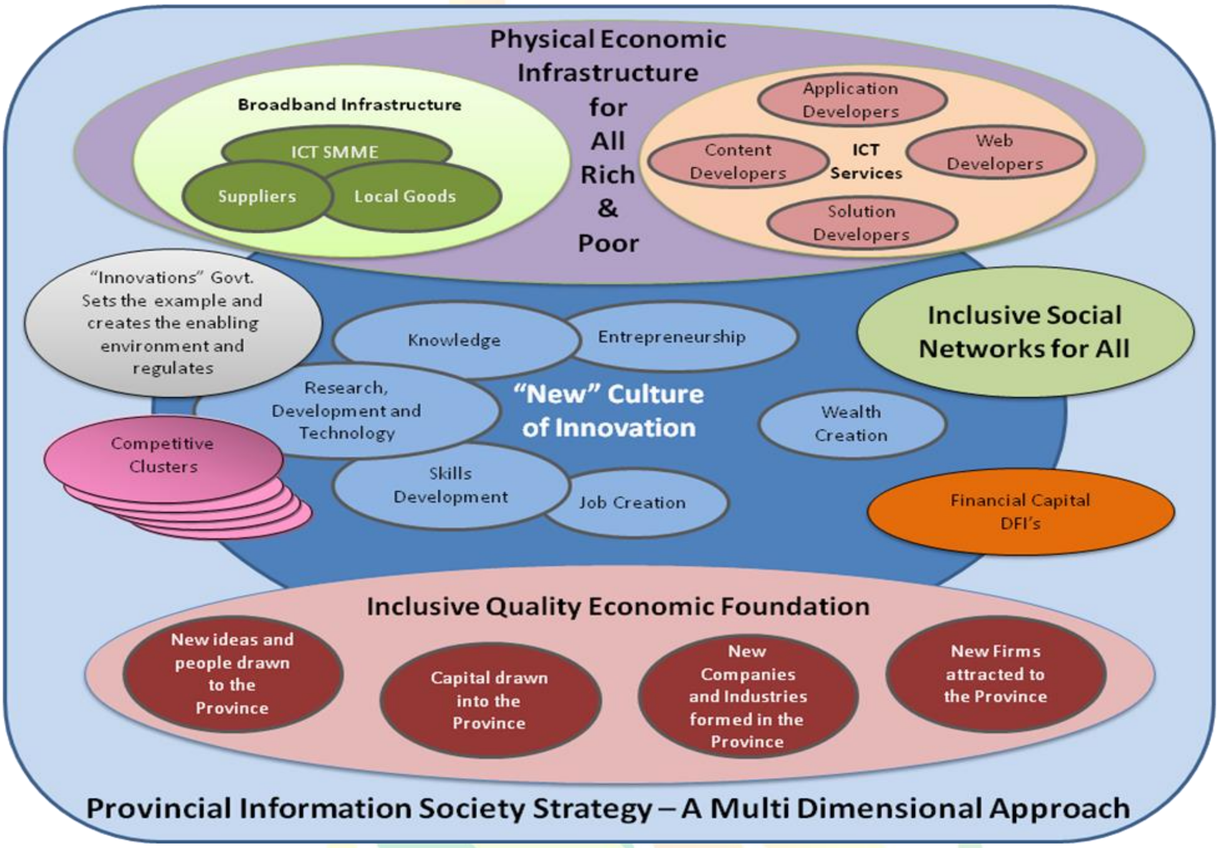
- Performance monitoring is the process by which data is systematically and regularly collected about the strategy(s) over time.
- Evaluation is the process by which the strategy(s) is studied and assessed in depth.

Across the continuum for M&E, the expected inputs; outputs, outcomes and impacts, of the strategy(s), serve as the indicators from which information is collated indicating whether the strategy is on the right road towards its intended destination and, if not, how to get it back on the right road.

- Inputs are the resources that are invested in the strategy(s) in order to encourage results through the relevant activities.
- Outputs are the directly achievable and observable products of the strategy.
- Outcomes are the changes in behaviour, relationships, activities, and/or actions of the partners that can be logically linked to the strategy.
- Impact generally means significant and lasting changes in the well-being of large numbers of intended beneficiaries[33].

The M&E framework for the NCIS will thus be informed by the vision, mission, partners, goals, objectives and strategic interventions presented in the NCISS, and will be confirmed by the NCISTC as the priority activities are selected. The basic units of analysis will be informed by the strategic priorities as aligned from the citizen to communities, government, business, academia, civil society and networks. The M&E system that evolves will ultimately be cyclical in-order to assess and adapt to any changes, in areas of positive performance and in areas that need improvement.

A challenge for the NCISS M&E system is to recognise that the Information Society evolves across a multiple of environments and sectors, and its events are typically non-linear. This dynamism could be represented as follows:



Developing an M&E framework to measure progress towards the Information Society is complicated. However, the common catalysts, across various global models, appear to be:

- Infrastructure;
- Connectivity;
- Access and equity of access;
- Skills; and
- Content.

An M&E framework could then be presented as follows:

[33] Sarah Earl, Fred Carden & Terry Smutylo (2001). *Outcome Mapping: Building learning an reflection into development programs.* International Development Research Centre, Canada

Aligning the Strategy Map for Monitoring and Evaluation

	Economic Dimension	Indicators	Technology Dimension	Indicators	Social Dimensions	Indicators
Impact	Diversified Provincial economy. Knowledge Economy formations.		Provincial broadband networks with content repositories online.		Poverty alleviated. New e-skills integrated.	
Outcomes	New relationships and networks for growth and development. New multimedia content businesses and broadband infrastructure companies.		Broadband infrastructure with improved services delivery options.		Improved abilities to access information and knowledge.	
Outputs	• NCISTC. • Content Hub / Cluster.		• Connectivity. • Access Points. • Bandwidth availability		• Content appropriation. • Tertiary learning environments • Information availability. • New skills development.	
Process / Activities	• Multi-stakeholder Institutional Arrangements. • Content Development Hub / Cluster		e-Infrastructure design and deployment.		• e-Human Resource Development Plan. • Innovation Forum.	
Inputs	• Partnerships. • Resources.		• Processes. • Workflow.		People.	

It is anticipated that once the priorities are selected the indicators will be confirmed. The indicators will be presented to the respective associated departments' M&E units for inclusion in their M&E processes.

16 THE *INCLUSIVE* NORTHERN CAPE INFORMATION SOCIETY

“The biggest problem is how to engage a wide range of actors in a large region, with a fragmented institutional structure, to be interested in an issue which is not at the top of their agenda, using an organisation which has no position power and limited resources. Apart from that, it’s easy!”[34]

The Northern Cape Information Society Strategy is the result of a provincial effort to transition the Northern Cape into an Information Society and Knowledge-Based Economy. The Northern Cape has historically relied on its natural resources for its social and economic development. The advent of ICTs and their impact in stimulating globalisation has led to technological advances across almost all domains and sectors of human endeavour. The chief catalyst in advancing ICTs, Globalisation, Information Societies and the Knowledge-Based Economies has however been collaborative networks of people, creating integrated networks of information and knowledge for innovative new creations.

The paramount driver for the development and growth of the Northern Cape Information Society and Knowledge-Based Economy is skills. The human talent pool in the Province must be developed in close alignment to the local and provincial competitive and comparative advantages and needs. Through a multi-stakeholder partnerships comprising Government, leading companies, industry and civil associations and academia. So that the skills competencies will be aligned with the social development and economic growth needs of the people and industries of the province.

The Northern Cape Information Society Strategy seeks a common alignment between the stakeholders and presents a series of goals, objectives and strategies intended to accelerate the development of the Northern Cape. In effect, the strategy pursues a comprehensive process towards learning and change that is essential for the Province to create its future. The strategy links economic, social and technological drivers, from the bottom-up and top-down, in-order to inform possible policy challenges and facilitate institutional arrangements for a common vision, that has the shared commitment of all stakeholders, to work together to achieve the Northern Cape Information Society and Knowledge-Based Economy for ALL.

[34] Prof. Gareth Huges, *A Concise Guide to Developing Regional Information Society Initiatives,* Technopolis Ltd. UK

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18 ATTACHMENTS

18.1 Northern Cape Environment

18.2 World Summit on Information Society

18.2.1 Declaration of Principles

18.2.2 WSIS Action Lines

18.2.3 Tunis Commitment

18.2.4 Tunis Agenda for the Information Society

18.2.5 Internet Governance Forum

18.3 United Nations Millennium Development Goals

18.3.1 South Africa Millennium Development Goals Progress Report 2005

18.3.2 South Africa Millennium Development Goals Mid-Term Progress Report 2007

18.4 Presidential National Commission Information Society and Development Plan

18.5 Northern Cape Provincial Growth and Development Strategy

18.6 Provincial Information Society Strategy in the Republic of South Africa Programme Agreement

18.7 Learning North Karelia

18.8 Digital Opportunity Initiative Final Report: Creating a Development Dynamic

18.9 Elements and Principals of the Information Society

18.10 South African Broadband Policy

18.11 First Foresight Workshop Report

18.12 Second Foresight Workshop Report

18.13 Third Foresight Workshop: INSPIRE Summit

18.14 Roll-Out of Information Society and Ramp-Up of Knowledge Based Economy: Notes on Progress of ‘INSPIRE’ in the Northern Cape