



SA *it* IS

SOUTH AFRICAN  
ICT SECTOR DEVELOPMENT FRAMEWORK

*Summary*

NOVEMBER 2000



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“History proves that trying to evolve through a discontinuity is like walking across a chasm: leaping may seem risky but it’s our only chance.”

*Charles E Lucier and Janet D Torsilien – TRILLION DOLLAR RACE TO E.*

## Introduction

The South African Information Technology Industry Strategy (SAITIS) project was conceived during the emergence of the new democratic order in South Africa in 1994. This period of transition required the dismantling of Apartheid structures and their replacement with processes which would empower and enfranchise all South Africans. The then Minister of Posts and Telecommunications, Mr. Jay Naidoo, supported by the then Deputy President, Mr. Thabo Mbeki, initiated the SAITIS project – the aim of which was to bridge the global and local development gaps in the use and application of Information and Communications Technologies. The SAITIS project encompassed the challenge to build a robust, growing and sustainable South African Information and Communications Technology Sector (see appendix for definition of the ICT Sector) that would directly support and contribute to the challenges of sustainable economic growth, social upliftment and empowerment.

The Government of South Africa received support for the SAITIS project from the Canadian International Development Agency (CIDA), under CIDA’s Country Development program for South Africa.

Government, as well as other stakeholders, recognised the need for a coherent national ICT Sector strategy that would increase South Africa’s economic strength and ensure the involvement of the wider population in the development of this sector. Close to 1,000 representatives of the key stakeholder groups including government, industry, labour, academia and civil society took an active role in the development of strategies through a series of Working Groups, Workshops and Fora (see appendix for the Strategy Development Methodology).

The result is a national ICT Sector Development Framework, together with associated strategies, actions and a “Going Forward Plan” for rapid economic development of the sector. It is expected that implementation of these strategies will continue in the spirit of cooperation and partnership engendered through the strategy development process.

The purpose of this Framework is to further the development of the ICT Sector in South Africa. The Framework is intended to be complementary to and supportive of broader socio-economic development goals of the government of South Africa, particularly with respect to its emphasis on social upliftment and empowerment.



A process will be established to review, refine and prioritise existing initiatives over time.

The full ICT Sector Development Framework is presented in three volumes. The first volume comprises a summary of the ICT Sector Development Framework (this document). The second volume comprises the strategies, actions and “Going Forward Plan” for development for the South African ICT Sector. A third volume includes supporting appendices. All three volumes are published on the SAITIS website at [www.saitis.co.za](http://www.saitis.co.za).



## Background

The ICT Sector is seen as providing the potential for economic growth and substantial job creation in both developed and developing countries. This is supported by the size and sustained growth of the global sector. The worldwide market for ICT goods and services for the year 2001 is estimated to be in excess of \$US 2 trillion. Although South Africa's share of the global ICT market is small at approximately \$US 10 billion, the sector holds promise of being a significant and growing contributor to economic growth in domestic and export markets. Furthermore, the sector has the unique opportunity, both directly and as an enabler for other sectors, to contribute in a substantial manner to sustainable economic development, social upliftment, and empowerment.

There are several key trends that capture the transformative effects of ICTs in the emergence of the Information Age. These ICT trends are:

- The rapid evolution of the Internet – the Internet (and the World Wide Web) has become the backbone of the knowledge-based economy and information society and the platform for new applications including hardware, software and services in areas such as knowledge management and dissemination, entertainment and the arts, science, medicine, finance, government and education, as well as electronic business applications in many traditional sectors.
- Growth in infrastructure and applications – increased bandwidth and improved connectivity make new and improved applications possible, which in turn stimulates the need for more bandwidth and better connectivity, as well as content.
- Globalisation and deregulation – have transformed the workforce and shifted business investment from bricks and mortar to ICT applications and infrastructure.
- The evolution of business models in the private and public sectors – the emergence of the digital economy and the e-business revolution are redefining business models, particularly with lesser emphasis on physical capital and more emphasis on human capital focused on customers and leveraged more effectively to drive growth.
- The linkage of ICT and social infrastructure – the ICT revolution has changed the nature and level of interaction between citizens and community development organisations, public institutions and government; equitable and affordable access to ICTs has the capability to empower citizens to solve common problems and to form new relationships for idea generation, artistic expression and enterprise development.

South Africa already has an established ICT Sector comprising:

- A small number of thriving large indigenous companies, some of which have achieved multi-national status.



- Several State Owned Enterprises (SOEs) that are major players in the ICT Sector (most notably Telkom SA).
- A growing base of ICT SMMEs.
- A number of foreign-owned multinational enterprises (MNEs) that have established a presence and business relationships in South Africa.

In addition, several ICT clusters, still in the early stages of development, have been established, particularly in Gauteng and Cape Town, which can be the focus of further growth for the sector. The sector has a small but growing presence in local and export markets.

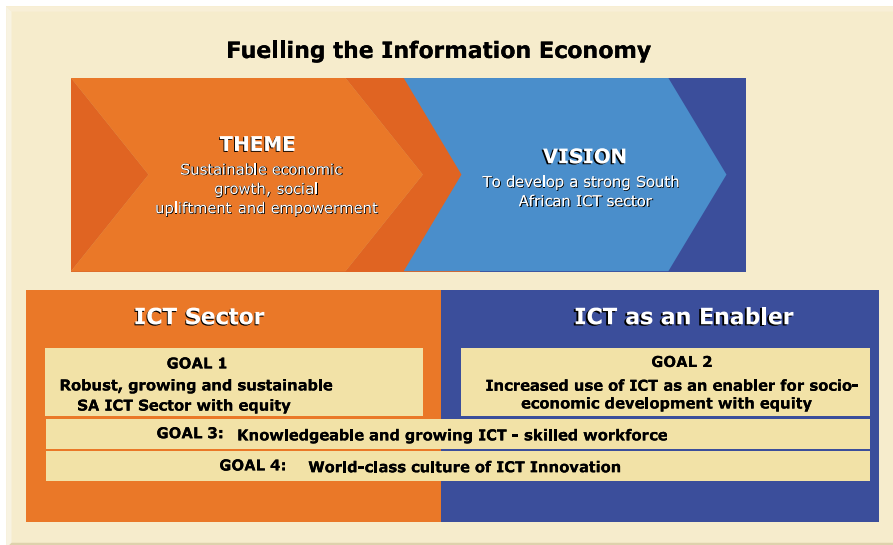
It is recognised that a powerful stimulus to sector development could be achieved through stimulation of the local market for ICT products, services and applications. Furthermore, such stimulation could have substantial socio-economic benefits to other sectors of the South African society through the enabling impacts of ICT adoption, particularly new and innovative applications that lead the way towards realisation of an information society.

Human resources development is the most critical area that South Africa faces in the development of its ICT Sector and in stimulating ICT usage in other sectors of the South African society. In one respect, South Africa is no different from other countries that have to deal with the global shortage of ICT workers and, in particular, the global migration of skilled workers. South Africa, however, faces a much more profound challenge of educating, training and integrating a large proportion of its population previously denied the opportunity to move into the emerging information society.

It is recognised that innovation is the lifeblood of developing a sustainable approach to ICT development in South Africa, whether related to the development of products and services by the ICT Sector or the adoption of ICTs in other sectors of the economy. There is clearly a need to build a culture of innovation, and to create the need for innovation to happen. Furthermore, innovation must be translated into commercial success for it to have the desired impact in South Africa.



## Vision and Goals



It is expected that within 5 years, South Africa will have a strong vibrant knowledge-based economy that is creating new jobs, generating wealth, and improving quality of life through the development of the ICT Sector itself and in its enabling role in other sectors. South Africa's significant and growing ICT Sector will also act as an enabler of sustainable economic growth, social upliftment and empowerment.

There are two main concepts embodied in this approach, namely the development of the ICT Sector and its important role in the development of other sectors of the economy (which in turn will also drive the demand for ICT within South Africa). Within each of these main concepts, specific goals have been identified.

### GOAL 1: Robust, growing and sustainable ICT Sector, with equity

The intent is to create a cohesive, clearly delineated, and vibrant ICT Sector with strong leadership, and commitment from all participants and stakeholders. The growth of the sector is expected to substantially outpace the South African economy as a whole and be comparable in growth with the ICT Sectors in more advanced information economies. Sustainability of the sector will be achieved through continuing profitability, global competitiveness and increased participation by disadvantaged individuals. In addition, the intent is to develop a sector that is adaptable to changing social, economic and technological circumstances.



## **GOAL 2: Increase use of ICT as an enabler for socio-economic development, with equity**

The intent is to stimulate ICT-enabled growth of business across the economy. In this regard, the adoption of ICT in enabled sectors will help to increase overall employment through the use of ICT, not only increased numbers of ICT jobs at the expense of jobs in other areas of the economy. In this regard, the intent is to specifically address equity issues with regard to gender, disadvantaged groups and those in rural and under-served communities.

## **GOAL 3: Knowledgeable and growing ICT-skilled workforce**

A key underpinning of information age success is world-class products and infrastructure developed by a highly skilled workforce. The intent of this goal is to substantively increase the pool of highly skilled individuals in the ICT Sector in order to create a growing base of world leading ICT products, and in other sectors to stimulate the adoption of ICT in those sectors.

## **GOAL 4: World-class culture of ICT innovation**

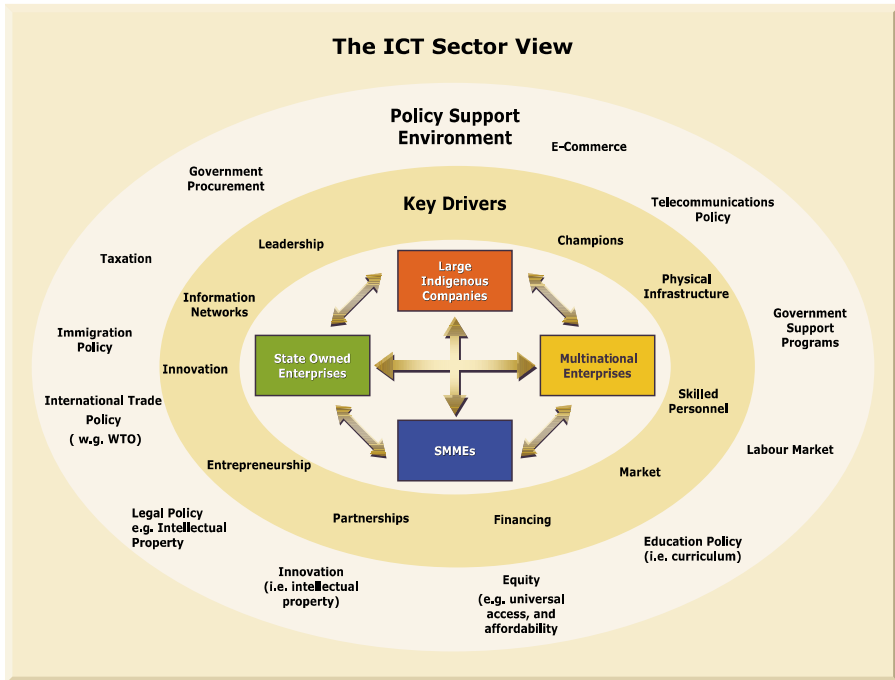
Developing a strong culture of innovation and entrepreneurship will be essential to the growth and success of the ICT Sector. The intent is to actively encourage the process of innovation from the basic ICT research and development through to diffusion of ICT into the economy as a whole.

Within each goal a series of objectives and related strategies have been defined. As well, a set of actions have been identified and these actions are intended to serve as a guide for subsequent implementation planning. The suggested actions, and the specific initiatives flowing from them are expected to evolve over time.



## ICT Sector Development

### GOAL 1: Robust, growing and sustainable South African ICT Sector, with Equity



This aspect of strategy development pertains to the goal of creating a robust, growing and sustainable South Africa ICT Sector, with equity. The intent is to create a cohesive, clearly delineated, and vibrant ICT Sector with strong leadership and commitment from all participants and stakeholders. The growth of the sector is expected to substantially outpace the South African economy as a whole and be comparable in growth with the ICT sectors in more advanced information economies. Sustainability of the sector will be achieved through an emphasis on continuing profitability and global competitiveness. The commitment to sector development with equity will mean increased participation by disadvantaged individuals and organisations than has previously been the case.

In terms of the ICT Sector view, the strategies are intended to develop the capacity to achieve sector growth, including developing and strengthening the linkages represented; influence change in areas of policy and program support to improve the operating environment; and strengthen the support infrastructure upon which the sector relies.



## **OBJECTIVE 1.1: Build Local ICT Sector Capacity**

This objective seeks to build ICT Sector capacity, unique to South Africa, that leads the world in supporting sustainable economic growth, social upliftment and empowerment. The strategies and actions to achieve this objective deal with the sector structures and processes to be instituted that will enable the sector to increase sector revenues; increase the sector's contribution to GDP; increase sector exports; increase employment in the sector; and maintain or increase sector profitability. It deals with developing the four major types of organisations depicted in the centre oval in of the ICT Sector View, and strengthening the linkages between these organisations. Special emphasis is placed on creating and supporting new entrants in the ICT Sector, particularly SMMEs.

### ***Strategy 1.1.1: Sustain Action Through Leadership and Inclusivity***

Establish the governance structure that will successfully take the strategy into implementation. In particular, the strategy is intended to provide the organisational framework for the articulation of a national vision, for leadership in executing the strategy, and for the participation of all stakeholders.

### ***Strategy 1.1.2: Establish a Framework for a Sustainable ICT Sector***

Establish a sustainable South African ICT Sector, based on an approach that combines broad sectoral development with the development of critical mass geographical clusters of companies.

### ***Strategy 1.1.3: Foster ICT Sector Linkages***

Build and/or strengthen linkages amongst sector participants to assist in establishing credibility, coherence and convergence between all the involved parties. The intent is to enable companies in the sector to expand their range of successful business activities.

### ***Strategy 1.1.4: Accelerate Successful Entry***

Accelerate new entry into the sector and improve the success rate of new entrants. The promotion and support of new entrepreneurial entrants will provide a major impetus for increased employment opportunities within the ICT Sector.

## **OBJECTIVE 1.2: Establish the Enabling Policy/Support Environment that makes South Africa an Attractive Place for ICT Development**

The intent of this Objective is to engage government in a comprehensive and systematic way to review existing policies and create the policy and program environment in South Africa



that will permit the ICT Sector to take full advantage of the opportunities possible with evolving technologies and markets.

### ***Strategy 1.2.1: Create Dynamic Policies and Programs for the ICT Sector***

There are many government policies and programs operating within, and impacting on, the South African business environment. In the transformation from the industrial paradigm to the information paradigm, it is necessary to revisit these policies and programs, with specific attention to transforming them to better support the ICT Sector.

## **OBJECTIVE 1.3: Build a World-Class ICT Sector Support Infrastructure**

In order for local organisations to compete globally on a more equal basis, it is necessary that South Africa build a world-class ICT Sector support infrastructure. This will allow South African ICT Sector organisations to share information more easily, thereby providing for more effective growth within the ICT Sector. Specific strategies are outlined below to deal with those sector support infrastructure elements not covered elsewhere in this Framework.

### ***Strategy 1.3.1: Provide Leadership and Foster Champions***

Complementary to Strategy 1.1.1: Sustain Action through Leadership and Inclusivity, this strategy extends the processes of providing leadership and fostering champions widely throughout the country. The strategy contemplates involving stakeholders to ensure that leaders and champions are identified and engaged throughout stakeholder groups, particularly in building the sector support infrastructure.

### ***Strategy 1.3.2: Develop Information Networks***

Encourage, facilitate and establish the mechanisms for information and knowledge sharing among sector participants.

### ***Strategy 1.3.3: Increase the Financing of Sector Development***

Encourage an increase in available financing for the ICT Sector development, particularly early-stage financing of “high-risk” start-ups. This strategy specifically addresses inadequate information on available, accessible financing; lack of the local support infrastructure to facilitate the partnering of capital lenders/investors and borrowers/firms; inadequate information on government incentives and support programs; and inadequate incentives for foreign investment.



## **OBJECTIVE 1.4: Stimulate Export Penetration to Capture a Growing Portion of the Global ICT Market**

The growth of the local ICT Sector cannot be promoted through addressing the local market alone. The export market is recognised as very important to the growth of the ICT Sector in South Africa. The focus here is on the strategies that South Africa can adopt to increase its penetration of the global ICT market. A potential initial approach is to leverage the unique relationships that South Africa has with the rest of Africa to increase its penetration of the African regional market. Subsequently, this can be leveraged into the global marketplace.

### ***Strategy 1.4.1: Communicate Market Trends and Opportunities***

Establish the capacity to track trends, determine opportunities and disseminate information on an ongoing basis.

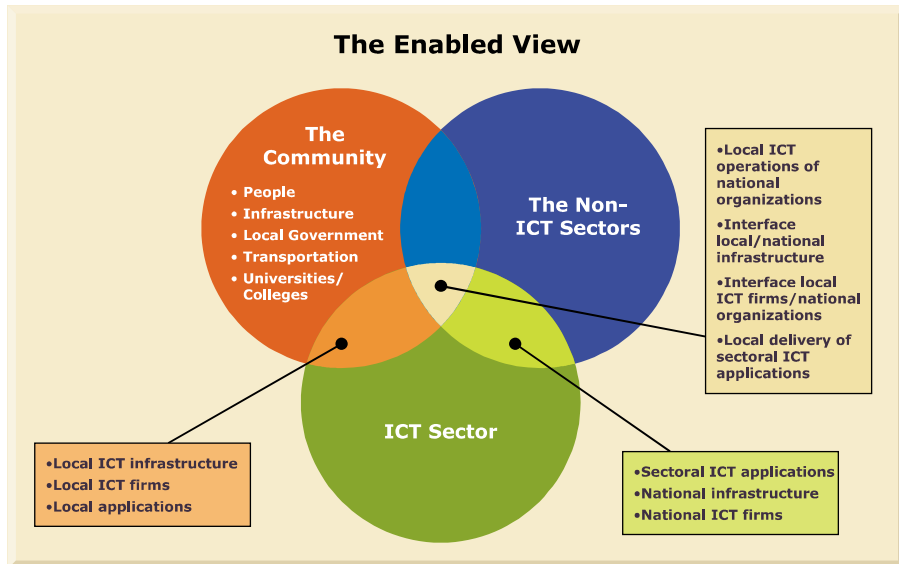
### ***Strategy 1.4.2: Market South Africa's ICT Products and Services***

In order to stimulate further the growth of the ICT Sector, it is imperative that South Africa achieves a greater awareness in foreign markets on its product and service offerings, which in turn will stimulate exports. In particular, South Africa should strive to market its innovative capabilities into both Africa and the rest of the world.



## ICT Usage Stimulation

### GOAL 2: Increase the Use of ICT as an Enabler for Socio-Economic Development, with Equity



This goal is designed to encourage the use of ICT as an enabler of socio-economic development with equity, by stimulating ICT-enabled growth of business across the economy. The adoption and use of ICT in more traditional sectors will help to increase overall employment through the use of ICT, not just increased numbers of ICT jobs at the expense of jobs in other areas of the economy.

The increased use of ICT will help improve competitiveness and stimulate jobs and wealth creation across other economic sectors. In the early stages of ICT adoption, decreases in employment will result, because of increased efficiencies enabled by ICT adoption. In many instances, ICT will be a transparent element of new ICT-enabled jobs, creating employment for those not skilled in IT. The primary focus of this component of the Framework is on developing new ICT applications for ICT adoption.

There are three potential approaches to identify target applications development areas:

- Stimulating current large users of ICT to increase use and develop new approaches to ICT adoption.



- Assisting newly emerging industry sectors to expand and/or adopt ICT.
- Assisting traditional industry sectors to expand and/or adopt ICT.

In terms of this enabled view, the strategies are designed to:

- Interact with other sectors of the economy to stimulate the deployment of ICT;
- Work with communities, on a cross-sectoral basis to stimulate community development through the use of ICT; and
- Address equity issues with regard to gender, disadvantaged groups and those in rural and under-served communities.

### **OBJECTIVE 2.1: Stimulate ICT Adoption Through Partnerships**

The purpose of this objective is to grow the demand for ICT products and services through partnerships between the ICT Sector and all socio-economic sectors. Users need to be familiar with the use and benefits of ICT to themselves in both the work and home environment. An underlying theme of these strategies is to increase the awareness and to encourage government to raise the profile of the benefits and use of ICT.

#### ***Strategy 2.1.1: Forge Cross-Sectoral Linkages***

A significant way to promote ICT Sector growth is to increase the demand for ICT products and services through establishing cross-sectoral linkages. A cross-sectoral linkage connects the ICT Sector and other sectors of the economy to stimulate greater awareness and adoption of ICT across the non-ICT Sectors of the economy, and to stimulate the development of sectoral ICT applications. Particular focus areas include forging linkages with current large users of ICT, newly emerging industry sectors, and traditional industry sectors.

#### ***Strategy 2.1.2: Engage Communities***

This strategy deals with the deployment of ICT at the community level and to leverage community strengths for socio-economic development. This strategy seeks to dramatically increase ICT awareness, access and usage at the community level, to stimulate greater demand for ICT products and services, including supporting current community-level socio-economic development initiatives (e.g. SDIs).

### **OBJECTIVE 2.2: Make a Modern Information Infrastructure Available to all South Africans**

This objective involves accelerating the development of the information infrastructure that South Africa will need to stimulate ICT applications development nationally. The underly-



ing ICT infrastructure is essential to the development of modern, network-centric applications. It was made very clear by stakeholders that the current information infrastructure is inadequate to meet anticipated ICT demand and to further stimulate such demand, in particular. Stakeholders also voiced strong support that substantial entrepreneurial activity to meet these challenges would be unleashed by the establishment of an open, competitive telecommunications environment.

### ***Strategy 2.2.1: National Information Infrastructure Initiative***

A national information infrastructure initiative would propose a national vision for information infrastructure development to achieve widespread national access to broadband infrastructure, for example. Implementation of this initiative would not only have significant job creation impacts within the ICT Sector, but would also stimulate ICT adoption throughout the country, particularly in communities. There is a need to develop the business case for such an infrastructure initiative including necessary policy, regulatory and legislative changes required. More immediate action would be the removal of the monopoly within the fixed-line telecommunications arena, to stimulate competition and reduce usage costs.

## **OBJECTIVE 2.3: Stimulate ICT Adoption Through Government as a Model User**

Government can stimulate the adoption of ICT by becoming a model user of ICT. The national government should take the lead in this respect and co-ordinate their actions with other levels of government in strategic areas to increase leverage and extend the impact throughout the country.

### ***Strategy 2.3.1: Encourage Collaborative Development of Electronic Delivery of Government Services***

Electronic delivery of government services is currently a priority with many governments worldwide. One of the intents with such strategy is to stimulate the growth of the ICT Sector. This strategy is similarly intended to increase the use of ICT by the broad population, stimulating awareness, and further stimulating ICT Sector development through increased demand.

### ***Strategy 2.3.2: Direct Strategic Use of Government Procurement***

Governments at all levels can use government procurement in a strategic manner to stimulate ICT adoption and, indirectly, ICT Sector growth. This would include the strategic purchase of ICT products and services, and the development of ICT applications and the use of industrial development credits from major government procurement to stimulate ICT product, service and applications development.



## **OBJECTIVE 2.4: Bring Disadvantaged Communities into the Main Stream of ICT Development and Use**

This objective is designed to help ensure that disadvantaged communities are included in the benefits accruing from the development of the ICT Sector and ICT-enabled sectors. The challenge facing South Africa is significant – ICT is considered to be a predominantly white male domain; the required education and training are not accessible to disadvantaged communities; business funding for black schools is considerably less than that for white schools; and women are not encouraged to participate in ICT activities. All these factors have marginalised the disadvantaged communities and women from ICT development.

South Africa must ensure that all South Africans have access to the lifelong learning opportunities made possible through ICTs. Making high-speed Internet connections widely available will open up learning opportunities for all South Africans. It will also create the opportunity for South Africa to become a world leader in systems and applications for connectivity, Internet-based learning and electronic commerce.

### ***Strategy 2.4.1: Information and Learning for all South Africans***

To encourage a greater portion of the population to more actively take part in the South African economy, it is critical that wider and affordable access to information and education be provided to all South Africans. This will require the continuing development of the skills and knowledge of all South Africans, at home, through educational institutions, and working in the environment.

### ***Strategy 2.4.2: Improve Opportunities for Disadvantaged Individuals***

With the growth of the ICT Sector, new and additional skills will be required to support this growth. This presents an opportunity for disadvantaged communities, including women, to enter the ICT Sector workforce. To achieve this, it is necessary to improve access, make communication easier, and improve access to information across all sectors, for the development of skills and knowledge within disadvantaged communities.

### ***Strategy 2.4.3: Improve Opportunities for Disadvantaged Areas***

For this national set of strategies to succeed, it is imperative that communities in disadvantaged areas are encouraged to participate in the ICT developmental process. This strategy helps to improve opportunities for disadvantaged areas to contribute to the development and growth of the ICT Sector, through the development of disadvantaged areas.



## Human Resources Development

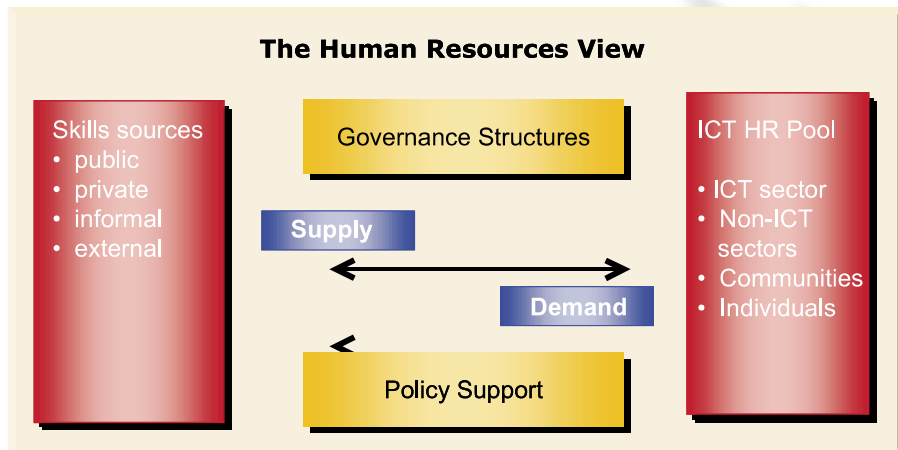
### GOAL 3: Knowledgeable and Growing ICT-Skilled Workforce

A key underpinning of success in the information age is a highly skilled workforce. The strategies in the Framework are designed to provide four essential elements:

- Improved labour market information for planning and decision-making.
- Retaining the highly skilled intellectual capital that has been developed in South Africa.
- Substantially increase the pool of highly skilled individuals needed in the ICT and non-ICT sectors.
- Provide the leadership necessary to keep ICT human resource issues near the forefront of ICT sector development.

Historically, educators collectively tried to meet the needs of children and young adults, with some small amount of attention paid to immigrants, disadvantaged groups and the incumbent work force. Education was delivered mostly at public cost and at specific times and locations – irrespective of the needs of the learners. In South Africa, the educational system was further crippled by the huge discrepancy in availability of teaching skills and job opportunities for the Black, Coloured and Asian communities.

In the knowledge economy, the “learning market” and learning systems are as important as the business sector and labour market. The responsibilities for delivering education and training at all levels (formal, informal and on-the-job) are shared among government, business, labour and education and training providers.





The current supply and the shortage of ICT skills, redressing equity and empowerment issues, and the brain drain are significant human resource issues being faced by South Africa.

The Human Resources View presents the essential factors needed to develop an effective ICT human resource environment. This Human Resources View requires:

- Effective governance structures to guide and direct the implementation of activities necessary to provide trained ICT workers.
- The “supply” of learning must be continuously available, easily accessible and adaptive to the changing requirements of the ICT Sector and ICT-enabled sectors.
- The demand for learning will be generated by the ICT and non-ICT sectors, individuals and communities.
- The “policy” support must be flexible in the delivery of learning, so that a variety of modes and at times and locations that are convenient to learners, firms and other organisations can be used.

### **OBJECTIVE 3.1: Develop a Comprehensive Understanding of the South African ICT Labour Market to Support Effective ICT Human Resources Development**

Strategies relating to this objective are designed to provide a comprehensive understanding of the South African ICT labour market to support effective ICT human resource development.

Current occupational classification systems are too slow in capturing and describing new occupations, many of which are connected to emerging technologies in new sectors. In addition, the duties and skills required of individuals in these occupations are changing continuously. The current statistics on these occupations may not capture very important skill changes.

#### ***Strategy 3.1.1: Strengthen the Capacity to Understand Labour Markets***

Develop the scope and use of labour market information to support the identification of the requirements for, and current status of, human resources in the ICT Sector.

#### ***Strategy 3.1.2: Make Better Use of Labour Market Information***

Enable a comprehensive understanding of ICT labour market statistics, to develop appropriate and effective skills in and for the ICT Sector, particularly as a means to provide accurate, timely information on trends and conditions in the labour market.

#### ***Strategy 3.1.3: Improve the Ability to Compete for Highly Skilled Workers from Abroad***

Improve South Africa’s ability to compete for highly skilled workers from abroad in order to speed up the wider diffusion of ICT skills into the labour force. Making the latest skills available in the international market more readily available in South Africa for technology transfer and diffusion into the local environs will substantially increase our competitive posture.



### **OBJECTIVE 3.2 Establish Employment Environment to Retain Skilled Workers**

Strategies related to this objective are designed to establish a more favourable employment environment to retain skilled workers.

South Africa produces some of the most talented and sought-after graduates in the world. Unfortunately, many firms, especially SMMEs, have difficulty absorbing highly educated graduates, particularly in science and technology and the amounts spent on R&D are small compared with most other nations. This has resulted in a shortage of opportunities for highly skilled R&D workers in South Africa, leading some of the most highly qualified people to seek employment elsewhere.

#### ***Strategy 3.2.1: Increase the Capacity of South Africa's Universities and Technikon to do High Quality Basic and Applied Research***

Increase the capacity of universities and technikons to do high quality basic and applied research, in order to succeed in generating innovations for the sustainable growth of the sector and retaining the high-skilled human resources, with special instructions for research that addresses and benefits the South African environment.

#### ***Strategy 3.2.2: Improve the Return on Investment in Science and Technology***

Improve the return on public and private sector investments in science and technology, by providing a platform for the knowledge, skills, and values for innovation and growth to be identified, captured and disseminated into the country, particularly as a stimulus for future growth and development of appropriate science and technology for the country. Consideration should be given to how the current universities funding formula may be used to emphasise the necessity for ICT training across all disciplines.

#### ***Strategy 3.2.3: Stimulate Growth among Small Knowledge-Intensive Firms***

Stimulate growth among small knowledge-intensive firms to gain new knowledge, not only in the use of ICT, but also to see it's relevance and potential in management, productivity, efficiency and contribution towards new development processes.

### **OBJECTIVE 3.3: Establish the Human Resources Development Infrastructure to Provide the Pool of ICT Skills to Support the Development of ICT and ICT-Enabled Industries**

Strategies related to this objective are designed to help establish the human resource development infrastructure needed to provide the substantial pool of ICT skills to support the development of ICT sector and ICT-enabled industries.



In the knowledge economy, the speed of economic and technological change demands increasingly higher technical and scientific competence, combined with a broad and evolving set of management skills, often called “soft skills”.

The education and training systems are showing unmistakable signs of stress. Many high school, technical and university graduates lack the essential technical and management skills that most employers seek.

The impact that HIV/AIDS will have on the supply of ICT skills availability in the country could be substantial. To date little research has been done on the economic impact the HIV/AIDS situation will have in this regard.

### ***Strategy 3.3.1: Develop the Skills for a Knowledge-Based Economy***

Develop ICT literacy and ICT skills across all levels of primary, secondary and tertiary institutions;

### ***Strategy 3.3.2: Improve the Capacity of Tertiary Institutions***

Improve the capacity of tertiary institutions to co-operate with the public/private sectors to generate and meet the skill needs of students and employers required.

### ***Strategy 3.3.3: Upgrade the Skills of the Existing Work Force***

Transform the role education and learning to allow for upgrading the skills of the existing work force and make lifelong learning desirable and accessible.

### ***Strategy 3.3.4: Upgrade the Skills of Retrenched Workers to Enable them to Participate in the Knowledge Economy***

Establish programs and initiatives to re-skill retrenched workers for the ICT or ICT-enabled sectors, or to assist them to become economically productive.

## **Objective 3.4: Make Human Resources Development an Integral part of ICT Development in South Africa**

Strategies related to this objective are designed to make human resource development an integral part of ICT development in South Africa.

New structures are required that both respect market forces and the democratic institutions, and provide the means for making country-level decisions quickly and effectively on issues connected with skills and enterprise development.



### ***Strategy 3.4.1: Create Decision-Making Structures for a Knowledge-Based Economy***

Build the decision-making structures best suited to establish the knowledge-based economy that will evolve the South African economy into a regionally and globally competitive knowledge-based economy.

### ***Strategy 3.4.2: Keep Skills and Enterprise Development Front and Centre***

Keep skills and enterprise development priorities front and centre on the agenda of South Africans and the government.



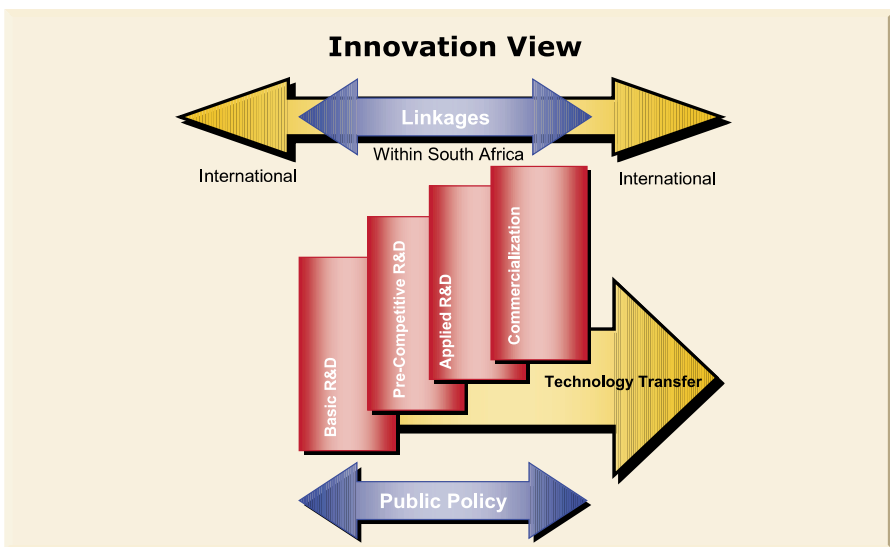
## ICT Innovation

### GOAL 4: World-Class Culture of ICT Innovation

The intent of Goal 4 is to build an exceptional culture of innovation and entrepreneurship in South Africa – to create the mechanisms within industry, academia, government, labour and civil society for fostering, encouraging and supporting innovative and entrepreneurial behaviour.

Developing a strong culture of innovation and entrepreneurship will be essential to the growth and success of the sector. Innovation in this context can apply to the development of innovative approaches to developing the products and services that the sector will require, and to the development of new and innovative ICT applications in enabled sectors. Thus it is necessary to foster, encourage and support innovative behaviour.

As a result of globalisation and rapid technological change, markets are placing a growing premium on innovation, entrepreneurship, risk taking, marketing prowess and commercialisation. By and large, however, these characteristics are hard to come by. Many people see themselves as being more concerned with fairness and equity than competitiveness and wealth creation. Many in South Africa view these value sets as mutually exclusive. To prosper in the knowledge-based economy, it is necessary to recognise that “being successful” and “being fair” are not incompatible. There is a need to take charge and change this thinking about risk and innovation in order to create wealth and protect the values that South Africans hold dear.





This Framework takes a comprehensive view of innovation and is built around the innovation Framework articulated in the following.

### **OBJECTIVE 4.1: Establish an ICT Innovation, Entrepreneurship and Risk Management Culture Throughout South Africa**

Companies are increasingly recognising that conducting ICT R&D is essential to survival, often spending significant percentages of annual revenues on their R&D activities. Many governments have also recognised that it is in the public interest to devote substantial funds to R&D in support of their industries, providing program support for R&D, or sharing the risks and rewards of investing in R&D. To develop a strong culture of innovation and entrepreneurship, it is necessary to foster, encourage and support innovative behaviour.

This objective seeks to stimulate ICT innovation by significantly increasing the awareness of ICT Innovation activities taking place in South Africa, provide increased intelligence on ICT Innovations occurring elsewhere in the world and encourage collaborative ICT Innovation activities in South Africa.

#### ***Strategy 4.1.1: Create ICT Innovation Awareness***

Creating the mind-sets required to investigate and build the future technologies that South Africa needs in order to remain competitive begins with becoming aware of what is possible with ICTs, and in particular what is happening elsewhere in South Africa. Thus this strategy deals with generating ICT innovation awareness within South Africa.

#### ***Strategy 4.1.2: Create ICT Innovation Listening Posts***

Part of innovation awareness is in knowing what is happening with respect to ICT innovations elsewhere in the world. This strategy sets out to establish mechanisms for identifying and disseminating information on international ICT innovation activities.

#### ***Strategy 4.1.3: Forge Linkages with Other Innovation Initiatives***

Technological innovations from the ICT Sector can be a main driver of change. The innovative initiatives necessary to drive this change will be secured by collaborative efforts from South Africa's lead role players and economic engines.

### **OBJECTIVE 4.2: Stimulate ICT Research and Development of World-Class Products, Services and Applications for Local and Global Markets**

The South African ICT Sector is in a unique position to grow its expertise base as a provider of ICT-based solutions. The first and third world environments that exist in South Africa



provide a ready made arena for the research and development of ICT based products and services that directly address the needs of the developed world as well as those that address the digital gaps between these two worlds.

#### ***Strategy 4.2.1: Develop an ICT R&D Strategy***

In general terms, there is a need to articulate a national vision that demonstrates the compatibility of risk, wealth creation and competitiveness with the values of fairness and equity and alternative innovation strategies for the African environment.

The DACST Foresight Study sets out possible technology futures for the country and provides a good foundation for such a vision. This strategy sets out to determine and prioritise plausible areas for further investigation and investment for ICT R&D into the future.

#### ***Strategy 4.2.2: Support ICT R&D in Universities and Research Laboratories***

Universities and research laboratories are the power sources for new developments. The growth of new knowledge arising from new developments is the catalyst for higher levels of social and economic development. This strategy sets out to expand on mechanisms for supporting R&D in universities and research laboratories.

#### ***Strategy 4.2.3: Harness R&D Capabilities through ICT Centres of Excellence***

Centres of Excellence have been successful vehicles for breaking down barriers between individual organisations engaged in pre-competitive research in particular areas and encouraging collaboration between such organisations. This strategy will seek to harness ICT R&D activities through centres of excellence focused on specific areas of ICT innovation.

#### ***Strategy 4.2.4: Support Private Sector R&D***

Supporting research and development in the private sector will create an attractive environment for local companies and international MNEs to establish their research facilities.

### **OBJECTIVE 4.3: Increase ICT Technology Transfer from Basic Research and Development through to Commercialisation**

The continuum from basic research to commercialisation has not been fully understood or exploited in the South African research environment. The following strategies set out to address this gap in the continuum and increase the extent of technology transfer that takes place with respect to ICT innovation.



### ***Strategy 4.3.1: Technology Transfer from Universities and Government Research Establishments***

The focus of this strategy is on ICT research and development within universities and government research establishments. It is intended to create the mechanisms required to increase the flow of ideas out of such organisations.

### ***Strategy 4.3.2: Encourage Commercialisation of Private Sector ICT Applications***

Investigate government incentive packages that will enable more commercialisation of ICT applications. These incentives will alleviate some of the risks in the commercialisation process.

## **OBJECTIVE 4.4: Ensure Intellectual Property Protection in South Africa**

For South Africa to effectively compete on the global stage, understanding and compliance with global intellectual property rules is important. More and more, governments and organisations are withdrawing their participation in countries that do not uphold Intellectual Property laws.

### ***Strategy 4.4.1: Develop an Intellectual Property Regime for Global/Local Markets***

Understanding and compliance with Intellectual Property protection/development for local and global markets should ensure easier and quicker start-ups, and acceptance into the Global market.



## Going Forward Plan

The previous sections of this document provided clear strategic directions for developing the ICT Sector in South Africa. An overall vision, goals and objectives were stated, along with specific strategies for achieving these objectives. Furthermore, for each strategy, particular actions were identified (see main document for details). From these suggested actions a series of key initiatives has been developed in order to provide clear direction to the ongoing implementation planning process. The intent is to build on and leverage existing initiatives where possible

### ***Implementation Initiatives***

Three priorities of initiatives have been identified:

***Immediate initiatives*** that will commence immediately following the launch of the strategy. In general terms, these initiatives are viewed as:

- Having relatively high impact on sector development.
- Being clearly within the domain of the stakeholder responsible for implementation.
- Having well-understood, and affordable, implementation costs.
- Capable of being moved forward quickly within existing budgets.
- Building on existing initiatives where possible.

***Short-term initiatives*** that will commence within 12-18 months of strategy launch. These are initiatives that require more discussion and development before they can be initiated but, nevertheless, are viewed as being of high priority relative to sector development.

***Other initiatives*** that have not yet been defined but will address all other strategies/ actions not covered by the Immediate or Short-term initiatives. The intent is to define such initiatives shortly after strategy launch and commence them within 3 years, subject to funding availability.

A process will be established to review, refine and prioritise initiatives over time.



## ICT SECTOR DEVELOPMENT INITIATIVES

## STRATEGIES SUPPORTED

### ■ Establish Governance and Organisational Approach (Immediate)

This initiative will investigate and establish an appropriate governance and organisational approach for implementation of the ICT Sector Development Framework. This will involve establishing the appropriate governance structure to guide implementation of the Framework, including the respective roles of stakeholders from industry, government, labour and academia. The initiative also includes the establishment of an implementation entity that will undertake day-to-day strategy implementation activities.

1.1.1: Sustain Action Through Leadership and Inclusivity

### ■ Conduct an Impact Analysis of Current ICT Initiatives (Immediate)

This initiative will analyse, and assess the impact of, other ICT initiatives currently underway in South Africa relevant to ICT Sector development. The intent is to identify the potential synergies that may be created by leveraging current initiatives.

1.1.2: Establish a Framework for a Sustainable ICT Sector

### ■ Accelerate ICT Cluster Development (Immediate)

This initiative will select and implement major ICT projects in Gauteng and Cape Town, respectively, as a means to accelerate ICT development. The intent is to strengthen the capabilities of Gauteng and Cape Town and to assist them in becoming centres (or clusters) of ICT growth.

1.1.2: Establish a Framework for a Sustainable ICT Sector

### ■ Undertake Satellite Cluster Pilot

This initiative will determine whether ICT capabilities can be successfully built up outside the main urban centres by linking existing capabilities in Gauteng and/or Cape Town to emerging ones in smaller centres (i.e. satellites).

1.1.2: Establish a Framework for a Sustainable ICT Sector



| <b>Support Information Exchange Within the ICT Sector</b>  |   |
|--|---|
| <p>This initiative will seek out and support a sector organisation, such as IISA, to take a lead role in developing, promoting and hosting an ongoing program of sector events for the exchange of information on technical, market, management, human resources, and other matters of importance to the ICT Sector. This initiative will also assist in developing an ICT innovation culture within the sector.</p> | <p>1.1.3: Foster ICT Sector Linkages<br/>4.1.1: Create ICT Innovation Awareness</p>   |
| <b>Review of Policies Affecting the ICT Sector</b>   |   |
| <p>This initiative will conduct a review of the policy environment of South Africa's ICT Sector. The intent is to prepare to engage government in a comprehensive and systematic way to create the policy environment in South Africa that will permit the ICT Sector to take full advantage of the opportunities possible with evolving technologies and markets.</p>   | <p>1.2.1: Create Dynamic Policies and Programs for the ICT Sector</p>   |
| <b>Develop an ICT Sector Portal (Immediate)</b>  |   |
| <p>This initiative will support the development of an ICT Sector Portal to provide Internet-based information, services and applications for ICT companies to assist the growth of the ICT Sector. The portal will be available to all companies in the ICT Sector.</p>  | <p>1.1.3: Foster ICT Sector Linkages<br/>1.3.2: Develop Information Networks<br/>1.4.1: Communicate Market Trends and Opportunities<br/>1.4.2: Market South Africa's ICT Products and Services<br/>4.1.1: Create ICT Innovation Awareness</p> |



## ICT USAGE STIMULATION INITIATIVES

## STRATEGIES SUPPORTED

### ■ Conduct an ICT Awareness Program

This initiative will develop and deliver an awareness program directed at individuals, businesses, government at all levels and other organisations on the enabling impacts of ICTs.

2.1.1: Forge Cross-Sectoral Linkages  
2.1.2: Engage Communities  
2.3.1: Encourage Collaborative Development of Electronic Delivery of Government Services

### ■ Conduct a Cross-Sectoral Pilot

This initiative will showcase a successful innovative ICT application that can be used as a role model for other sectors. The intent is to demonstrate the potential for ICT in another sector of the economy of strategic importance to South Africa, particularly with respect to partnering with the ICT Sector.

2.1.1: Forge Cross-Sectoral Linkages  
4.1.1: Create ICT Innovation Awareness

### ■ Conduct a Smart Community Pilot

This initiative will demonstrate the potential for ICT to support socio-economic development at the community level in South Africa. The intent is to develop and showcase a community that has successfully integrated ICT into its overall economic development plans and can demonstrate the broad application of ICT to community advantage. The selected community will be used as a role model for other communities.

2.1.2: Engage Communities  
2.2.1: National Information Infrastructure Initiative  
2.4.1: Information and Learning for all South Africans  
2.4.2: Improve Opportunities for Disadvantaged Individuals  
2.4.3: Improve Opportunities for Disadvantaged Areas



### Participate in Planning a National Information Infrastructure Initiative

This initiative involves contributing to planning the accelerated deployment of the information infrastructure that South Africa will need for ICT applications and content development throughout the country. It focuses primarily on the underlying (telecommunications) infrastructure that is essential to modern, network-centric applications, but also includes the IT infrastructure (e.g. computers, software and related components) that will also be required.

2.2.1: National Information Infrastructure Initiative



### Establish Cooperative Mechanisms Between the ICT Sector and Government

This initiative will establish the mechanisms whereby cooperation between government and industry can lead to stimulation of growth in the ICT Sector through increased use of ICT in government. Such cooperation will be achieved by creating a regular dialogue between the ICT Sector and senior officials in the various government departments engaged in ICT planning and procurement within the national government (e.g. the government CIO committee currently being established).

2.3.2: Direct Strategic Use of Government Procurement



## HUMAN RESOURCES DEVELOPMENT INITIATIVES

## STRATEGIES SUPPORTED

### ■ Improve the Collection of ICT Labour Market Statistics (Immediate)

This initiative will improve the collection of information on the current ICT labour market to assist in the development of a long-term Human Resources Development Plan.

3.1.1: Strengthen the Capacity to Understand Labour Markets  
3.1.2: Make Better Use of Labour Market Information

### ■ Phase 1: Re-skill Retrenched Workers

The first phase of this initiative is designed to identify initiatives that selected other countries have undertaken to upgrade the skills of retrenched workers to enable them to participate in the knowledge economy, and provide an analysis of the relevance of these initiatives to South Africa.

3.3.4: Upgrade the Skills of Retrenched Workers to Enable them to Participate in the Knowledge Economy

### ■ Establish an ICT Youth Internship Program (Immediate)

This initiative will create a program to help graduates from tertiary education institutions, with non ICT-related degrees, but some ICT skills, and who are having difficulty finding employment, to find employment in the ICT Sector or ICT jobs in ICT-enabled sectors.

2.4.2: Improve Opportunities for Disadvantaged Individuals  
3.3.1: Strengthen the Capacity to Understand Labour Markets

### ■ Establish an ICT Co-operative Work Experience/Education Program

This initiative will provide a means for students from secondary and tertiary education institutions to gain work experience in the ICT Sector. This will be done by providing them with work-term experience that allows them to translate the ICT knowledge gained from their courses in school into practical work-term experience.

2.4.2: Improve Opportunities for Disadvantaged Individuals  
3.3.1: Strengthen the Capacity to Understand Labour Markets  
3.3.2: Improve the Capacity of Tertiary Institutions



### Black ICT SMME Skills Development (Immediate)

This initiative will provide direct assistance to Black ICT SMMEs to bid on and win work, and manage the project(s) once awarded.

2.4.2: Improve Opportunities for Disadvantaged Individuals  
3.3.3: Upgrade the Skills of the Existing Work Force



### Change Management Training for Disadvantaged Individuals

This initiative will assist disadvantaged individuals in managing and reporting on the results of resources donated by NGOs, ICT companies and International Financial Institutions for ICT-related initiatives. The intent is to increase the capacity to manage the resources donated and report on the results of these resources in a way that the donors can justify their contribution.

2.4.2: Improve Opportunities for Disadvantaged Individuals  
3.3.3: Upgrade the Skills of the Existing Work Force



## ICT INNOVATION INITIATIVES

## STRATEGIES SUPPORTED

### ■ Establish ICT Innovation Awards

An awards program will be established that recognises the successes of ICT innovators and entrepreneurs. The intent is to encourage ICT innovation by recognising innovation achievements, particularly with regards to innovative applications of ICT in other sectors. The award winners must have a viable commercialisation plan and the award money must be spent on commercialisation.

2.4.2: Improve Opportunities for Disadvantaged Individuals  
4.4.1: Create ICT Innovation Awareness

### ■ Establish ICT Innovation Listening Post

A listening post will be established within CSIR in order to gather ICT innovation intelligence from around the world and disseminate it to firms and R&D organisations in South Africa. A priority for this unit will be to gather intelligence related to the projects proposed in this ICT implementation plan.

4.1.2: Create ICT Innovation Listening Posts

### ■ Establish an ICT Innovation Fund

This initiative will expand the DACST Innovation Fund to give it a dimension that specifically focuses on supporting the development of new ICT products, services and applications. The DACST Innovation Fund is a general fund that supports technology development broadly. Given the potential offered by ICT, the fund would have a particular ICT dimension with its own funds.

4.1.3: Forge Linkages with Other Innovation Initiatives

### ■ Establish an ICT Co-operative Work Experience/Education Program

Develop and Implement a Network of Centres of Excellence Program in ICT Innovation. This initiative will develop and implement a proactive public-private Networks of Centres of Excellence program in ICT innovation, building upon existing Centres and innovation programs where appropriate.

4.2.3: Harness R&D Capabilities through ICT Centres of Excellence



ICT SECTOR & USAGE  
MEASUREMENT INITIATIVES

STRATEGIES  
SUPPORTED



Conduct an ICT Measurement Pilot

This initiative will collect accurate and reliable information about the ICT Sector in South Africa. The focus will be on information pertaining to key indicators required to measure the progress of ICT Sector development in South Africa.

ICT Sector Development strategies  
ICT Usage Stimulation strategies



## APPENDIX: ICT Sector Definition and Strategy Development Methodology

### ICT Sector Definition

For the purpose of this Framework, the following OECD definition of the ICT Sector has been used:

*“The industries that produce the products (goods and services) that support the electronic display, processing, storage, and transmission of information.”*

The major industries comprising the ICT Sector are generally acknowledged as including:

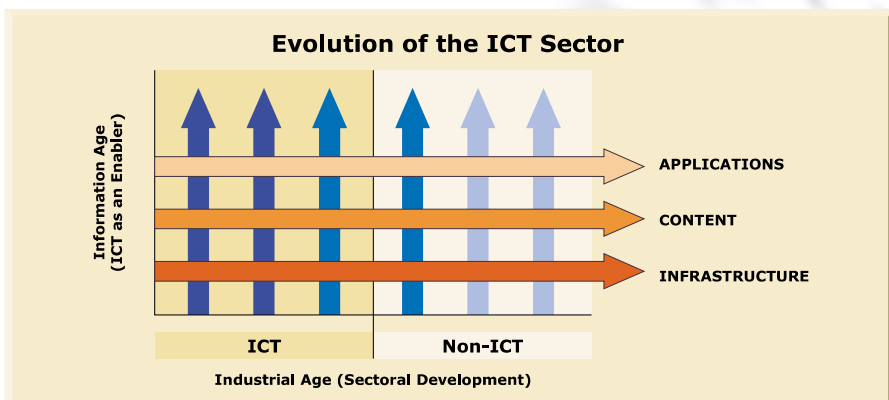
#### Manufacturing

- Computer Hardware
- Telecommunications Equipment

#### Services

- IT Professional Services (including custom software application development and maintenance)
- Computer Software (packaged software products – cross industry and vertical market applications)
- Telecommunications Service

In the Information Age, ICT as an enabler of overall socio-economic development is becoming more important than the development of ICT along strictly sectoral lines.





The key elements of an Information Age model are:

### *Infrastructure*

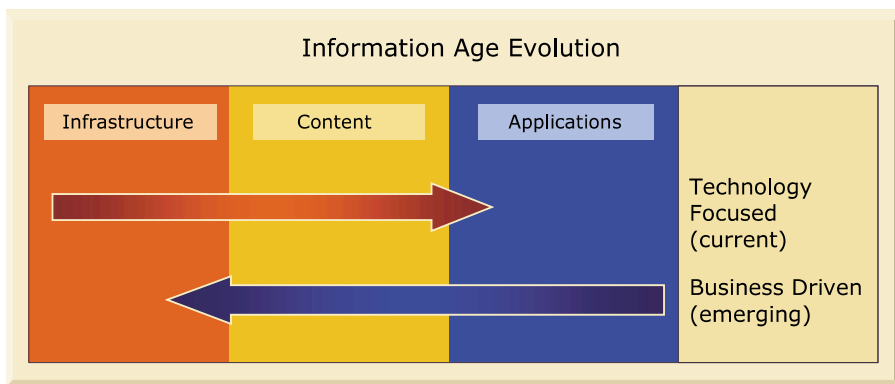
This is the communications, largely Internet based, underpinning of the Information Age. It is predicated on the notion that the communications network linking individuals, government and corporations is a commonly accessible shared resource managed for the benefit of all users. In order to seek clarity of definition of what is meant by Infrastructure, the OECD has developed a definition, and indicators, based on the industries (manufacturing and services) considered part of the ICT Sector. This common base of reference is intended to allow measurement of the production and use of ICT in a meaningful and consistent manner.

### *Content*

This is the information that is published and disseminated on the infrastructure. This information was initially largely undifferentiated and disaggregated thereby limiting its usefulness. It is the recognition of the importance of content that has led to the term Information Society and content aggregation has been proceeding apace for the last several years. As bandwidth increases and technology evolves, the nature and the range of content have evolved and increased rapidly. The intersection with cultural, and other, industries has again created a need for clarity of definition and the OECD is in the process of defining a Content Sector.

### *Applications*

Until now, applications have been little more than tools for manipulating available information. The real information age applications have not yet started to emerge, although they will inevitably result in the dramatic restructuring of Industrial Age, or “old economy” industries, as they are often referred to. However, this area is where explosive growth is starting to occur

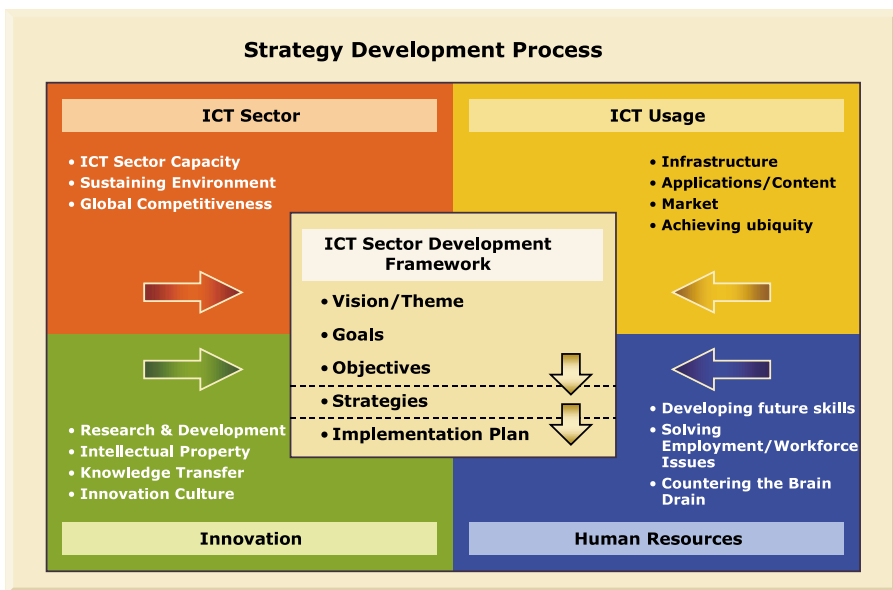




particularly with respect to e-business/e-government. It is these business-driven applications, and associated content, that are expected to provide wide-ranging and lasting socio-economic impact. The underpinning of the information age applications is the enabling environment of e-commerce. At this time, the OECD definition activities are focusing on the e-commerce application-enabling environment.

This then provides the definitional underpinnings for the analysis of the sector and the development of the ICT Sector development Framework.

## Strategy Development Methodology



The Framework was developed in a top-down and bottom-up manner using a formal strategy development process.

A key step in the process was completing a Situation Analysis of the current situation with regards to the ICT Sector in South Africa, including the international context in which it operates. This was a bottom-up process involving a series of Working Groups created to identify issues and opportunities pertaining to discrete aspects of ICT in South Africa.

The four Working Groups created for this purpose were:

- ICT Industry Working Group
- ICT Usage Working Group



- Human Resources Working Group
- Innovation Working Group

A separate Indicators Working Group was established and charged with considering potential tangible objectives of the strategies and issues regarding measurement of progress against the project's objectives.

In addition to the Working Groups, a series of thematic workshops and Executive Fora were conducted, also with the purpose of identifying issues and opportunities. The issues raised by these activities were referred to the appropriate Working Group for summarisation.

The specific SAITIS thematic workshops conducted were

- Capital Mobilisation
- Infrastructure
- International Markets
- Women in ICT
- SMMEs
- Management Skills
- Provincial workshops

Other sources of issues/opportunities for the Situation Analysis were the Baseline Studies, the Kimberley Workshop conducted by the Department of Trade and Industry (DTI) and the Executive Fora comprising government, business, labour and academia representatives.

In parallel with the Situation Analysis, an initial Framework was developed from the top down using the SAITIS Project Design Document as a starting point. The purpose of the initial Framework was to provide overall guidance to the Framework development activities.

A Strategy Development Forum that included both the Project Steering Committee and the Working Group Chairs as well as interested observers completed the process of rationalising the bottom-up and top-down approaches resulting in the ICT Sector Development Framework.