# Digital Innovation Profile
# South Africa

*ICT-centric innovation ecosystem snapshot*

*Version 1.1 for comment*

# Digital Innovation Profile
# South Africa

*ICT-centric innovation ecosystem snapshot*

Version 1.1 for comment

Digital Innovation Profiles are an important element in the ITU series of snapshots of countries' ICT centric innovation ecosystems. Each Profile assesses and summarizes the opportunities and challenges facing the country's ICT ecosystem. The at-a-glance format enables international comparisons and meaningful measurement of a country's capacity to accelerate digital transformation and of its innovative ICT capability.

Digital Innovation Profiles offer a rapid and straightforward means of analyzing and optimizing your ICT ecosystem. This analysis then helps navigate through a country's fast-moving ICT/ telecommunication landscape with a view to building a competitive, sustainable, ICT-enabled economy. Further collaboration with ITU can go on to target specific engagements, including the implementation of co-developed bankable projects which are appropriate to and of high value in the national context.

All Digital Innovation Profiles are developed by experts specially trained in ITU's Digital Innovation Framework process. This features highly structured workshops and facilitated assessments, designed to build national capacity, enhance on-the-ground skills and powerfully accelerate digital transformation. The Framework process equips ITU Members with the tools for ongoing assessment and monitoring of their own ICT innovation ecosystems.

The analysis and the positions expressed in this initial high-level assessment, reflect opinions and research of the national expert, working within ITU's Digital Innovation Framework process and with guidance from ITU Innovation.

# Contents

# Background & Context


## Key Indicators: South Africa

| | |
|---|---|
| Population: | **56,71** million |
| Population density: | **46.7** |
| GNI per capita: | **5,430** |
| Region: | **Africa, Developing** |

| | |
|---|---|
| ITU Global ICT Dev. Index 2017: | rank **92** /176, score **4.96** /10 |
| Global Innovation Index 2018: | rank **58** /126 |
| Innovation Efficiency Ratio: | ratio **0.5**; rank **83** /126 |
| Global Competitiveness Index 2017: | rank **61** /137 |
| Business Sophistication & Innovation: | rank **38 & 39** /137 |

South Africa is a middle-income country with an average GDP growth rate of 2.82 percent between 1994 and 2018. South Africa is one of the most competitive countries in sub-Saharan Africa, and among the region's most innovative countries. It has long served as the "gateway to Africa", and while its economy has experienced relatively slow expansion in recent years, it remains one of the most accessible and dynamic entry points to the continent's roughly 1bn consumers. It serves as home to the headquarters of a number of major multinational players, particularly in the fields of industry, energy and financial services.

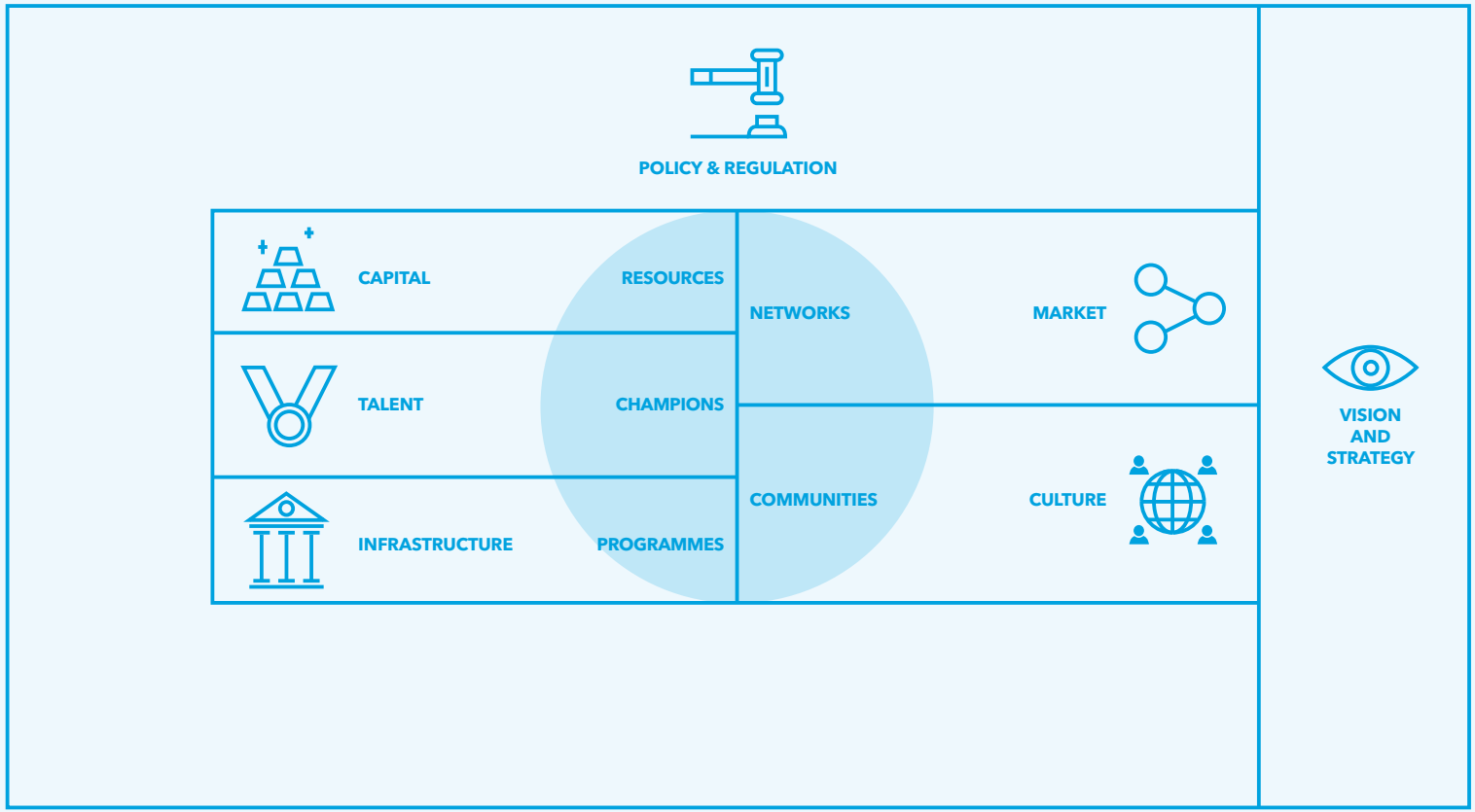
High levels of unemployment (26.6% in in the first quarter of 2018) and inequality (GNI: 5,430) are amongst the largest challenges facing South Africa. However, over the last two decades, South Africa has accomplished extensive social progress by making key public services like education, health, housing and electricity accessible to millions of citizens. More recently, actions (in line with the National Development Plan) are being taken to refuel the economy.

On the ICT development index of ITU, South Africa scores 4.96 out of 10, ranking at 92 out of 176. The South African ICT sector has a 2.7 percentage of contribution to the economic activity, placing it just above the agriculture sector (2.4%). However, the trade deficit for ICT has grown since 2011, as South Africa has consistently imported more ICT products than it has exported. South Africa has acknowledged the need for a stronger promotion of digital technologies in business by rising recogniton of ICT's importance to inclusive economic growth.

Affordable and accessible high speed broadband is an important enabler for competitiveness across many areas; while the government has made gradual efforts to provide support for nationwide development of internet connectivity through the National Broadband Plan, further infrastructure investment and development is needed to meet the market demand.

SMEs contribute to 32% of GDP, 59% of employment and 19% of exports. While small businesses and entrepreneurs face barriers such as bureaucratic procedures and licensing, efforts are being made to provide financial and non-financial assistance through national and sub-national support programmes – some of which target sub-groups such as youth or previously disadvantaged groups. Some of these include business training, business development services, seed capital and other forms of funding. Public procurement regulations are also being used to support SMEs, but so far its net effect on them is not clear.

# Ecosystem Assessment Canvas




*The Ecosystem Assessment Canvas offers at-a-glance an overview of the components that make up the innovation ecosystem. It helps assess both the challenges and opportunities for those components essential to building a digital ecosystem that is vibrant and innovative.*

# Current Landscape

## VISION AND STRATEGY

- **Strong strategic vision that needs to be more comprehensive and inclusive**
- **Need for support mechanisms to build a shared vision**
- **Lack of alignment on ecosystem issues including policies and their perceived rigidness**
- **Implementation issues due to limited stakeholders collaboration**

South Africa has a strong vision and long term strategic plans, complemented by robust policies and political will. However, this vision is not necessarily shared by all stakeholders, and needs to be communicated more clearly. As a result there is a lack of clarity on (i) what innovation might mean for the ecosystem and what the fourth industrial revolution entails for all the stakeholders; (ii) who should be innovating; (iii) how governmental policies can adapt to a future shared vision; (iv) and how synergies can be creating without reinventing the wheel.

The political will and commitment is not currently being fully translated into implementation as there are limited mechanisms to nurture stakeholder collaborations to work together. As a result, innovators may not be engaged in solving and addressing the right problems, and many stakeholders have been working in silos. The misalignment of important issues also come down to a discussion on accountability – whose job is it to create this alignment? Ultimately, the opportunity is for both policy-makers and the ecosystem stakeholders themselves to take responsibility and actions, such as through increasing public sector leadership in championing digital transformation, putting emphasis on whole ecosystem needs, and improving the agility of policy making.

## INFRASTRUCTURE AND PROGRAMS

- **Growing infrastructure, but limited access to hard infrastructure due to cost and broadband development**
- **Great programs supporting soft infrastructure but inadequate for talent pool**
- **Need to scale up and increase quality of programs that nurture innovations**
- **Weak distribution of connectivity and infrastructure that would unlock socio-economic potential**

There is growth in infrastructure, along with high mobile penetration, but simultaneously there is also a perceived high cost and monopolies. For example, a large proportion of the population is still on 2G, while the cost of broadband and other infrastructure such as electricity remain too high. This offer investment opportunities to position South Africa as a leading nation in bridging the digital divide and in the fourth industrial revolution; opportunities are particularly salient in – in focus areas such as ICT infrastructure, multi-technology space, drones and artificial intelligence, automation and digitization of processes, digital manufacturers' "clouds", and distributed manufacturing driven by 3D printing.

Existing supporting soft infrastructure in the ICT/Telecommunication sector are limited, despite investment from State Development Agencies. The quality and quantity of this infrastructure is not adequate in mentoring, skills-training, and other services. Efforts are underway to improve quality with certification and quality standard for innovation hubs. However, many challenges remain unaddressed, such as the inadequate support and commercialization of innovations, high cost and low access, silos between public and private soft infrastructure, and very limited private sector investment in these infrastructure beyond compliance requirements.

A growing pipe-line of ICT graduates and talented youths are hungry for opportunities. In contrast to innovators in urban areas, those in rural areas do not have the same access to the ecosystem's key resources. Furthermore, South Africa's low density provinces are suffering from limited connectivity, limited soft infrastructure and unaffordable access to means of communication. This limitation is preventing the development of appropriate services (such as health and government services) to meet social needs and inclusion objectives.

## TALENT AND CHAMPIONS

**Big talent pool in need of adequate skills**

**Significant effort to train talent but curriculums need alignment to market and trends**

**Talent retention issues linked to fragmentation of ecosystem and lack of championing**

**Lack of 21st century knowledge and engagement by key stakeholders**

South Africa has a big pool of talent that is suffering from unemployment; in order for the country's ecosystem to mature, this talent needs to be developed and equipped with the adequate skills. Soft skills such as project management, collaboration, mentoring, and business skills that are particularly important in creating innovation. The talent pool is also lacking high end technical skills such as data science and high end coding. In addition, vocational training is not producing enough artisans for low-level skills and thus creating a talent trap – an hourglass that does not enable talent to meet all of the ecosystem's demand.

Public sector policies have been heavily driven to upskill talent, but yet, efforts are falling short of the ecosystem's need to leverage available opportunities. To address these challenges, a few universities have been adapting their curriculums to include new digital skills, and to enable development of entrepreneurial communities. However, their impact need scale and they lack engagement from the private sector who consumes the talent. Narratives shows again that private sector engagement in curriculum and talent has been driven by compliance to laws, rather than seen as an opportunity for their businesses.

In addition, South Africa is also facing the issue of talent retention – because of limited championing, success stories, and opportunities, a large proportion of South Africans are looking for opportunities elsewhere. There is a need to connect the talent network and to ensure that it does not stay fragmented and silo-ed.

Thus, the talent is at a crossroad. As a result, existing skills are not up to date with the 21st century skills requirements, and there is in particular a lack of 4IR tech knowledge and deep skills. More needs to be done in innovation-related skills development, and in convincing stakeholders that talent training is a business opportunity for the country.

**Available but insufficient capital from a risk-averse finance sector**

**Opportunities in growing demand-side investment, and alternative forms of financing**

**Some government funding available, but limited impact and synergies**

**Limited resources from both public, private and foreign direct investment into ecosystem**

Capital for innovation does exist in South Africa but is currently insufficient to drive innovation to market; furthermore, there is a lack of investment in truly innovative ideas. There is particularly high demand for risk capital (especially for high tech ideas) but the finance sector has little appetite for unproven ideas. There is a need to develop venture capital and to nurture alternative forms of funding such as crowdfunding.

The private sector is failing to take an active role in creating demand investment to meet this gap, especially in the technology sector. South Africa is an attractive destination for investment, and so more needs to be done to unlock this potential. This includes improving the flexibility of governmental legislation, and developing the appropriate policies and incentives aimed at financing innovative ICT infrastructure. This infrastructure will go on to support key sectors such as industrial farming, mining, and tourism, to cite a few.

Currently South Africa's net import in technology, a situation that is compounding the exodus of forex, signals for the need to attract more FDI funding for the ecosystem. The start-up community is receiving a substantial proportion within what is available from governmental funding programs. But the private sector (multinational corporations especially) are failing to invest in opportunities to develop the value chains of the ICT sector, and in that sense also hindering the ecosystem's growth. Such a lack of demand-side investment is not just about access to capital – it also prevents SMMEs to grow and create jobs, since this resource brings with it demand and growth knowledge.

## NETWORKS AND MARKETS

**Considerable efforts to promote SMMEs and start-up access, but limited impact on their growth**

**Opportunities in the domestic and regional markets but untapped by local innovators**

**Market unawareness and access difficulties leave undeveloped value chains**

**Silo-ed formal networks with insufficient engagement to develop and grow markets**

Government programs such as the supplier development programs have provided some access for SMMEs, but their effects have been low in growing value chains. SMMEs are perceived as unable to create innovations. Many of them are unable to be scaled, or run into issues with commercial expertise and availability. Very few B2B platforms exist to help grow non-technologies businesses, and existing start-ups do not have access to the right resources to create such platforms.

There are ample opportunities to leverage the domestic markets in industries like agriculture, mining, tourism, and supply-side automation from established manufacturers. However, there are very few success stories of tapping into these markets or the regional markets in SADC and sub-Saharan countries.

Market awareness and access is a particular challenge currently; often, ideas are not always addressing the right societal problems. In addition, the rate of tech transfer and adoption in the market is very low, and research and new products are taking too long to reach the market. Simultaneously, the domestic market is already concentrated (and with a duopoly in place), with high barriers to entry compounding the problem for small firms' growth.

To access markets, there is a need to strengthen the potential to export, and to focus support in developing specific clusters. Some business associations are helping to bridge this gap of limited services; however, more can be done in network collaborations and geographical inclusion, such as mapping existing networks and resources and identifying sectorial opportunities.

## CULTURE AND COMMUNITIES

**Entrepreneurial interest driven by need for jobs instead of real growth and innovation**

**Some attitudes toward risk taking but the mentality of ownership inhibits success**

### Development of entrepreneurial culture fueled by numerous events but facing societal barriers

### Many efforts at inclusion with perceived challenges which can be turned into opportunities

South Africa has seen a growth in entrepreneurial interest driven by needs-based entrepreneurship and the various programs funding enterprise development. However, the motivation is often misplaced as some entrepreneurs feel entitled to the resources, and yet lack the entrepreneurial drive to solve problems with a real growth mindset. One potential opportunity is in changing the attitude perception and showcasing success stories of the ecosystem.

Currently, there is much competition between players in different parts of the ecosystem, which has led to a tendency for individualistic and self-centered approaches to innovation. Without team collaboration, knowledge and expertise flow has been inhibited significantly, preventing key innovations to reach market.

South Africa has strong start-up communities that host an abundance of events – from start-up factories to more experienced accelerators. This has been driven by a favorable environment and climate for innovation. However, the ecosystem is lacking role models, mentors and success stories that can help nurture communities that are globally competitive and supportive of a shared vision.

Efforts for diversity and inclusion have been seen as social redress activities instead of business opportunities, thus impacting innovation. The opportunity here is in tackling perceived transparency issues and transforming compliance requirement into business opportunities and partnership with diverse groups.

## POLICY AND REGULATION

### Strong policies and regulation, but weaker implementation

### Policies need updating and more agility, especially to support small firms and high growth start-ups

### Opportunities to enhance ecosystem engagement through e-government and applied research

### Restrictive access for innovators to IP framework

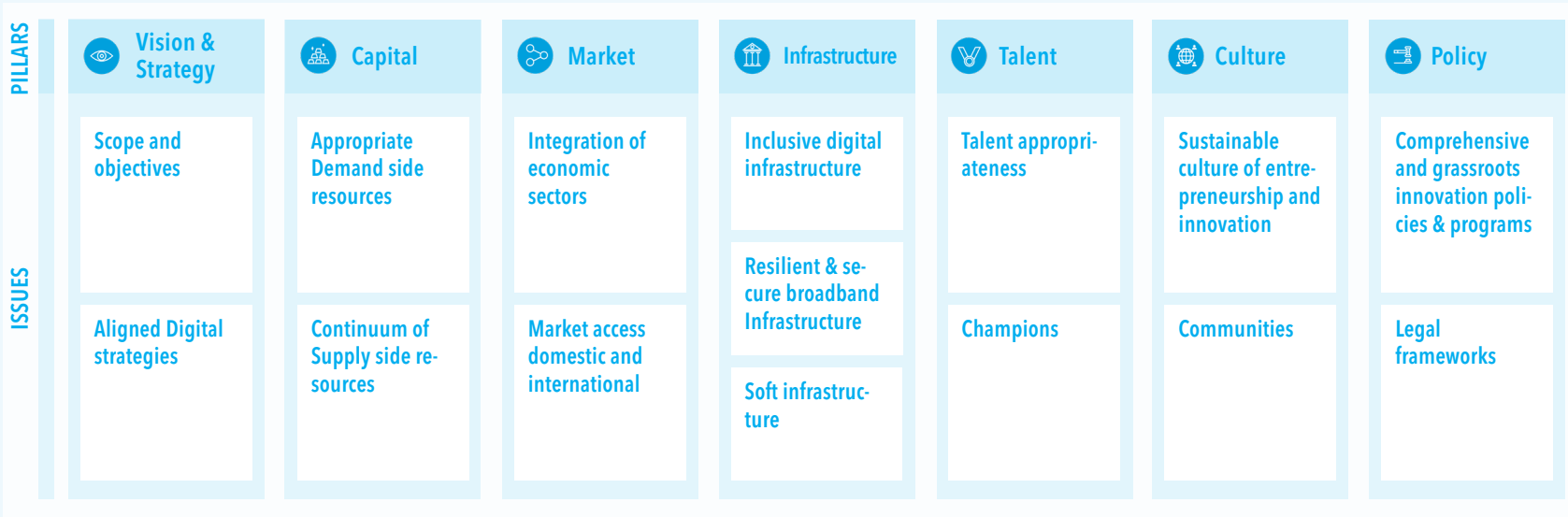
The public sector has strong policies aimed at building skills, promoting enterprise development, supporting SMMEs, and funding basic research. However, the implementation of these policies – through specific strategies, tactics and monitoring – needs improvement. The public sector has been strong in its support for SMMEs; however, start-ups are perceived to receive less support. Regulatory constraints for SMMEs, from procurement systems to internal systems, and to public finance management, have hindered their growth.

There is opportunity for the public sector to upgrade its policies and provide legislative support in key areas. This is particularly the case for tax incentives: for example, to incentivize companies to fund innovation centers or to enable crowdfunding platforms. One perceived reason is the lack of policy agility: due to red tape, lengthy processes and limited e-services from the government. Some policies are seen as lagging, such as those that build future talent, that align curriculum changes to the vision of 4IR, and that promote fair and inclusive secure data policies, technology transfer, and risk capital formation.

E-government is seen as an opportunity to address bureaucratic challenges, to provide much-needed awareness about policies or programs, and to improve collaboration with the ecosystem. In addition, very limited applied research is visible for the ecosystem. This, coupled to the low efficiency ratio of the innovation system (50% per Global Innovation Index), is wasting resources and preventing South African from benefiting from commercialization.

To make matters worse, the existing intellectual property framework is perceived as inaccessible to innovators due to prohibitive costs. There is a need to ensure that the ideas being funded have programs and resources to aid commercialization, and are protected in order to be competitive.

# Understanding Digital Transformation Capabilities




*The image above sets out the major elements, which are key to understanding the country's digital transformation capability.*

Digital transformation is what happens when innovation is applied to solve problems through the use of ICT/Telecommunication. The benefits to a country and its people are immense – significantly increased productivity, economic growth and increased employment opportunity. The degree to which these benefits are within reach depends on the vibrancy of the ICT-centric ecosystem and a corresponding, long-term vision and strategy that supports it.

All stakeholders in the ecosystem need to understand their potential for making a difference, as well as their very real capabilities – as they engage in transformation. The ITU Digital Innovation Framework not only helps transfer this understanding but also clearly sets out what enablers can achieve – as well as identifying the barriers they will encounter along the journey of change. Key factors and components that enhance, foster and facilitate digital transformation are clearly clustered and helpfully organized in the diagram above.

# Key points

## *CHALLENGES & OPPORTUNITIES IN THE ECOSYSTEM*

The three main ecosystems fundamental to South Africa's digital transformation journey are the (i) national innovation ecosystem; (ii) entrepreneur ecosystem; and the (iii) technology ecosystem. These three ecosystems interlink closely to form South Africa's innovation landscape, from ideation to market. There are challenges and also opportunities that each ecosystem is currently facing, but also ones that impact all three. The following section contains a snapshot analysis of each ecosystem, and concludes with a macro snapshot of the challenges and opportunities that face all three ecosystems.

## 1. NATIONAL INNOVATION ECOSYSTEM

The national innovation ecosystem – including research institutions, academia, and public sector entities such as national innovation agencies and public sector financing – serves an invaluable role in the national innovation journey, particularly in kick starting innovation.

South Africa's national ecosystem is facing numerous challenges. Research is currently too slow to market, there is a low success rate in tech transfer, and there is an ongoing exodus of Forex. Basic infrastructure, such as transport, electricity, and ICT, are lacking and limiting the extent of innovation in the country. Youth unemployment rates are high, and the large talented pool of youths are lacking in the appropriate innovation-relevant skills despite numerous programs from public sector initiatives.

The ecosystem is lacking communication and collaboration, and suffering from inclusion and diversity issues. Furthermore, the supply side investors (such as traditional banks) are overly risk-averse. In terms of public sector engagement, the ecosystem requires more flexible legislations and more agility from the government.

Geographically, the South Africa is in an advantageous position – especially taking into account of regional economic zones and the potential to export in sub-Saharan African markets. South Africa also has strong international relations, and has already proven itself to be attractive for investment. Nationally, numerous strong universities are present in the ecosystem, and will play an important role in improving the education system to build the talent of the future for South Africa.

## 2. ENTREPRENEUR ECOSYSTEM

The entrepreneurial ecosystem includes the entrepreneurs, their support systems and the organizations that initially nurture the formation of enterprises through the "valley of death", and subsequently nurture their growth as SMMEs.

Entrepreneurs and innovators in South Africa are talented and motivated, but facing difficulties in their innovation journey. Access to support systems for entrepreneurs is limited, and there is a shortage of platforms for innovation (especially B2B platforms for SMMEs). Difficult access to the market is also impeding entrepreneurship. Moreover, there is not enough hunger for high growth innovation in the ecosystem, and attitudes for innovative thinking need to be further fostered. Efforts are underway with various actors to provide the needed support, but are likewise lacking in collaboration and services and lacking in training of high quality.

Opportunities are plentiful for the entrepreneurial ecosystem in South Africa. Market-wise, there are opportunities for entrepreneurs to bring services to the population in rural areas, as well as opportunities to leverage technologies such as artificial intelligence and robotics to create the jobs of the future in South Africa. There is opportunity for both private and public engagement to make a positive impact on the entrepreneurial ecosystem – including increased amounts of venture capitalist and angel investment funding, as well as policies to support them accordingly.

# 3. TECHNOLOGY ECOSYSTEM

The technology ecosystem includes high growth technology companies and the ecosystems supporting them that are integrated into local or global value chains. These include high tech companies, their OEMs, system integrators, firms in ICT sectors, B2B technology platforms supporting SMEs, among others. Its development is critical to a country's ability to leverage technological innovation and to create high growth industries and jobs.

South Africa is facing significant challenges in leveraging new technological solutions. As noted previously, there is a monopoly of value chains by some large enterprises that has negatively impacted new entrants and entrepreneurs. There is also a lack of motivation for the private sector to invest in skills and training; currently, activities in these areas are viewed as more of a compliance requirement.

There is an opportunity to review policies and programs that can nurture the formation of a technology ecosystem from the commercialization of innovation, to the development of appropriate skills, and the improvement of public private partnership. There is scope for large returns of investment with the development and improved distribution of technology absorption capacity if South Africa wants to lead in the fourth industrial revolution.

# 4. MACRO CHALLENGES AND OPPORTUNITIES

At a macro level, there are challenges that are facing all three individual ecosystems.

- First, there is a general misunderstanding and lack of awareness on the fourth industrial revolution (4IR) technologies and the opportunities that it could afford

- Second, public sector efficiency is currently hindering progress for national innovation – in public service delivery, domestic markets, and resource sharing, as well as in policies that support SMMEs and facilitate alternative forms of funding

- Third, insufficient resources and funding is an important challenge for South Africa. Basic infrastructure being costly and inaccessible to a large proportion of the population stifles grassroots innovation, while a shortage of risk capital and VC funding is hindering high growth ideas and innovation

Agriculture, tourism and mining have also been identified as particularly strong industries to capitalize on. Programs, policies, and regulations can be developed to support more and better funding for entrepreneurs and SMMEs. Newer forms of business models such as the shared economy can also be leveraged to further amplify South Africa's strengths.

# Relevant Practices

*The following practices were identified during the assessment process as noteworthy and potentially positive activities for the ecosystem. As a next step in this process and with further engagement, an in-depth collaborative analysis could identify champions and good practices throughout the ecosystem.*

## Small Enterprise Development Agency (SEDA)

SEDA promotes entrepreneurship and the development of SMMEs and cooperatives by providing customized, non-financial business support services. It was established in December 2004 as an agency under the Department of Trade and Industry. By assisting entrepreneurs with a constant modernization and fine-tuning of its services, SEDA has directly impacted the creation of job opportunities. Some of its main services are: business plan assistance, training and capacity development, mentorship, opportunities for networking and partnership creation, assistance with link to finance providers and preparation for loan applications. SEDA also provides technology transfer, business and technology incubation services, as well as incentives for management systems implementation, product testing and certification. Specifically, the SEDA Technology Programme has provided a range of interventions to assist businesses in improving efficiency and production. The service delivery network of SEDA consists of delivery points located throughout the country. As of the end of September 2015, SEDA had an established network of 58 branches, 19 mobile units, 53 electronic information kiosks, 15 satellite offices, 48 incubation centers and 46 access points where SEDA co-locates.

## Technology Information Agency (TIA)

TIA's role as South Africa's innovation agency is to use South Africa's science and technology base to develop new industries, create sustainable jobs and help diversify the economy towards knowledge-based industries to address modern global challenges. TIA is a statutory body and its mandate derives from the provisions of the Technology Innovation Act (Act 26 of 2008), which tasked TIA with the promotion, development and exploitation of discoveries, inventions, innovations. The agency provides support for the stimulation of innovation in the ecosystem, through partnership initiatives that enhance technological innovation – locally, regionally and globally. The agency catalyzes partnerships between SMMEs, industries, universities and science councils. Through its Technology Innovation Program, TIA has successfully launched four collaborative innovation partnerships in animal health, electric vehicle mobility, beef and dairy genomics – all of which have seen new technology initiatives being supported. Through its Technology Stations and Technology Platforms services, TIA enables access to high-end skills and equipment for innovators and provides risk funding for innovators wishing to evolve towards market entry and commercialization.

## IBM Research Lab

IBM researchers in South Africa with backgrounds in machine learning, mathematics, computer science, robotics, genomics and computational biology, are exploring the use of cognitive computing, the internet of things, and big data to support the country's national priorities, drive skills development and to foster innovation-based economic growth. This Research Lab seeks to boost new business opportunities and ensure the bankability and commercialization of its solutions and services by actively engaging with South Africa's innovation ecosystem. Entrepreneurs, developers and business partners are a key part of IBM's research programs and go-to-market strategy. IBM Research's second Africa lab in Johannesburg was launched in February 2015 and it is based at the University of the Witwatersrand (Wits). The lab has the support of a 10-year investment program through the Department of Trade & Industry of South Africa and works closely with the Department of Science & Technology.

## Tshimologong Digital Innovation Precinct

Tshimologong is a digital innovation hub and incubator addressing the skills shortage in tech and digital by fostering expertise exchange and enabling skills transfer and business opportunities. An example of this is the recent creation of a digital content incubator, in partnership with Agence Française de Développement (AFD) and the French Institute of South Africa (IFAS), that will expand their activities to audio-visual content creation (animation, virtual and augmented reality, video games, applications, etc.) thus enabling key collaborations with the cultural and creative industries in France.

# Relevant Stakeholders

**ENTREPRENEURIAL SUPPORT NETWORKS**

*Selected stakeholders:* Innovation centers and tech hubs, such as Softstart BTI, The Innovation Hub, the French South African Tech Labs and SmartXchange; associations and support service providers such as the ICT Chamber and the Black Business Council.

**PRIVATE SECTOR**

*Selected stakeholders:* CISCO, Sentech, SAP, IBM, Ericsson, Huawei, Telkom, Vodacom, Screamer Telecoms, MTN, Urban Zulu Creative

**ACADEMIA**

*Selected stakeholders:* University of Cape Town, University of Witwatersrand - Johannesburg Centre of Software Engineering, University of Stellenbosch - Centre for Research on Evaluation, Science and Technology, University of Pretoria

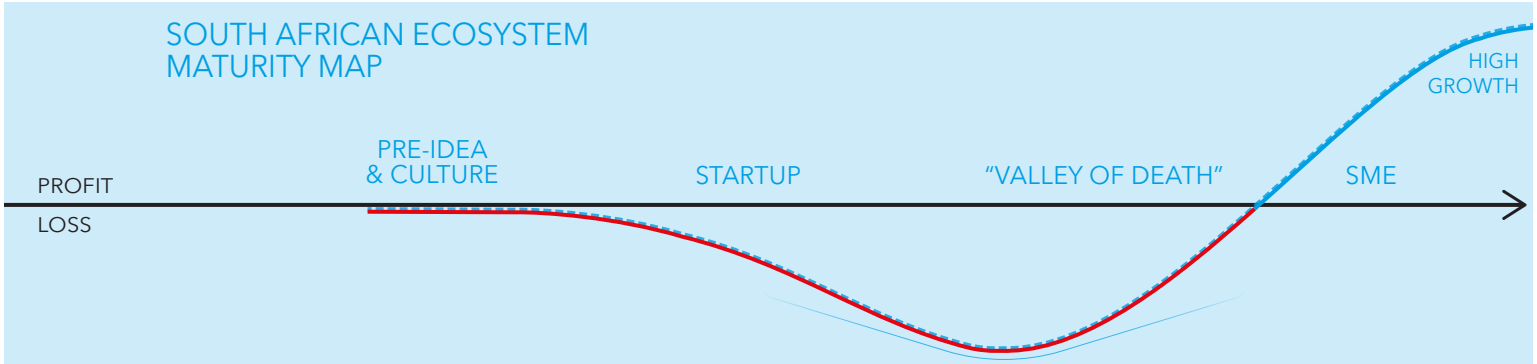
**PUBLIC SECTOR**

*Selected stakeholders:* Council for Scientific and Industrial Research (CSIR); Economic Development Department, Department of Communications and Postal Services, Department of Small Business Development, Department of Trade and Industry, Department of Science and Technology, the Technology Innovation Agency (TIA), Small Enterprise Development Agency (SEDA), Independent Communications Authority of South Africa (ICASA), .ZA Domain Name Authority (.ZADNA)

**FINANCE**

*Selected stakeholders:* Development Bank of Southern Africa, Standard Bank South Africa

# Ecosystem Maturity Map - South Africa




| ENTREPREN. PHASE | PRE-IDEA | IDEATION | STARTUP | THE "VALLEY OF DEATH" | SME |
|---|---|---|---|---|---|
| ENTREPRE-NEURS | ENTREPRENEURIAL INTEREST | ENGAGE WITH PROBLEMS | DEVELOP BUSINESS MODELS | BUILD COLLABORATION | EXPAND |
| FINANCE | RESEARCH FUNDING | SEED FUNDING | ANGEL INVESTMENT | VENTURE CAPITAL | BUSINESS FINANCE & LOANS |
| ENTREPRE-NEURIAL SUPPORT | ENTREPRENEURIAL EVENTS | HACKATHONS & COMPETITIONS | CO-WORKING & SUPPORT | INCUBATORS & ACCELERATORS | BUSINESS ASSOCIATION |
| PRIVATE SECTOR | SUCCESS STORIES | RESEARCH PROGRAMS | LABPROGRAMS | B2B & SUPPORT SERVICES | SKILL TRAINING PROGRAMS |
| ACADEMIA | ENTREPRENEUR COMMUNITY | BASIC RESEARCH | SPIN OFFS | SOFT SKILL TRAININGS | HUMAN CAPITAL |
| PUBLIC SECTOR | VISION & STRATEGY | IP & R&D SUPPORT | TAX SUPPORT | PUBLIC PROCUREMENT | TRADE POLICY |

*The Ecosystem Maturity Map, also known as the Innovation Journey Map, sets out at-a-glance the work that needs to be done within the ecosystem to harness innovation on a trans-formative journey from pre-ideation to high growth. It describes each stakeholder's roles in support of entrepreneurs and innovators at each stage of the lifecycle. The colour-coding identifies areas which are well-supported (green), inadequate (yellow) and missing / weak (red).*

# Innovation Journey Map

## *PROFILING KEY STAKEHOLDER ACTIONS NEEDED TO ACCELERATE DIGITAL TRANSFORMATION*

### ENTREPRENEURS

There is entrepreneurial interest in South Africa, particularly driven by the investment that the government has made in SMMEs and entrepreneurs. However, many are not able to develop their ideas into solid businesses that create innovative products/services offering appropriate solutions to the market. This is the result of numerous factors; first, there are not enough success stories to inspire truly entrepreneurial interest. Second, motivated entrepreneurs are having trouble finding access to the right problems, and even when they have found a societal problem, resources and skills are available to them are inadequate for turning it into an innovative business. In general, entrepreneurs are finding it difficult to collaborate with other firms – especially the OEMs – in order to grow and gain access to the appropriate markets. For those who are successful, they face issues of limited availability of capital for them to expand into high-growth firms, and also the possibility of their solutions not being innovative enough for the growth market.

### FINANCE

The existing funding in South Africa is not yet sufficient to drive the development of frontier technologies, and the limited funding received by the ecosystem is not achieving maximum impact because of the inefficiency of the innovation system. High-growth innovators are lacking start-up capital and risk capital, and for existing businesses, access to business loans in the technology sector is very limited.

### ENTREPRENEURIAL SUPPORT NETWORKS

The growing numbers of innovation hubs have contributed to an increasing support network in South Africa, which would host events such as competitions as well as provide coaching and mentoring schemes for entrepreneurs. However, the distribution of these support organization is limited – currently mostly in urban areas. Despite the presence of many business associations, there is a perceived lack of support by some associations to nurture entrepreneurship in digital innovation.

### PRIVATE SECTOR

The private sector is perceived to be dominating the value-chains of industries, and also not to be providing adequate lab and research programs to support innovation in the country. Currently, the private sector perceives their investment in skills training as more of a compliance requirement rather than an investment opportunity. As a result, many of the solutions in the technology circle are imported, and small businesses cannot grow because of the lack of enabling B2B platforms. Policies have played a key role in improving the skills-training support offered in the ecosystem, but this area is still not strong enough for a mature ecosystem.

### PUBLIC SECTOR

The public sector has strong policies and strategies in place, but implementation is perceived as lacking by the ecosystem. Areas that are perceived to be lacking support from the public sector include IP commercialization, tax support, incentives for creating new funding mechanisms, and incentives for companies to invest in innovation. In addition, public procurement is perceived to be not supporting SMMEs adequately. On the positive side, trade policies are perceived as favorable in South Africa.

### ACADEMIA

South Africa has a few flagship universities that are able to develop entrepreneurial communities, and provide support to entrepreneurs. However, basic research is limited and applied research is perceived to be quite insufficient. As a result, very few spin-offs are being created. Education in general is not providing adequate soft-skills training, and a combination of other factors have led to innovation talent not making its way into the market – talent is creating business opportunities, but these opportunities are currently not creating innovation.

# Perspective on Priorities

*The high-priority objectives for the ICT-centric innovation ecosystem, formulated through the workshop and by DTPS with key ecosystem stakeholders, are set out below.*

At the highest level, the president of South Africa has a made call during his state of Union Address in 2018 for the "establishment of that a Digital Revolution Commission which is inclusive of the private sector and civil society to ensure that SA is in a position to seize the opportunities and manage the challenges of rapid advances in information and communication technologies". This places ICT and stakeholders in a key role, front and center, and follows on the recommendation which called for the establishing of the Fourth Industrial Revolution Commission (FIRC), with an advisory role to help South Africa chart the way to navigate this industrial revolution.

These recommendations also included strategies such as undertaking research in the area, benchmarking South Africa at a regional and global level, in order to foster engagement of cross-cutting stakeholders and partnership with international relevant organization in the matter.

At DTPS, additional consultation led to the following highlights based on what the department can do to play its role, alongside other stakeholders. Based on the requirement of the fourth industrial revolution, the following key priorities were established for consideration:

- New comprehensive and agile policy frameworks
- Empowering SMMEs and start-ups
- Preventing job losses and disruption
- Addressing inequality
- New partnerships

To deliver these priorities, the department has also articulated new approaches that need particular attention, such as having stakeholders take an ecosystem approach and a platform approach to enable South African to navigate the fourth industrial revolution. In order to achieve these goals, one of the key projects is the innovation center to accelerate digital transformation towards 4IR, in partnership with all relevant stakeholders and members of the Fourth Industrial Revolution Commission.

Info Box

## Flagship Projects

Decisive, active intervention can help transform an ICT ecosystem, making it more innovative and a real engine for accelerated digital expansion into every aspect of society – with real gains in public, business and personal life. ITU innovation research has shown that three key pillars are of immense importance in exploring and addressing opportunity for digital transformation. These pillars align with Sustainable Development Goal 9 which calls for the building of resilient infrastructure, the promotion of inclusive, sustainable industrialization and the fostering of innovation. These three pillars are as follows:

| | |
|---|---|
| **Guiding innovation activity** | Is innovation 'on the map'? How supportive of innovation is the general environment? A dynamic innovation environment demands regulatory organizational settings which are coherent and which guide, facilitate and promote innovation culture, mind-set, projects and programmes. |
| **Building Innovation Capacity** | Is there an innovation infrastructure? Is that infrastructure sufficiently well developed? Is it the right infrastructure to enable the ecosystem to grow sustainably? Does the infrastructure support, encourage and inspire innovation? |
| **Key sector development** | Is innovation integrated? Is ICT innovation integrated across key sectors? Innovative entrepreneurial ICT ventures realize their full potential only if they scale up well beyond their niche, enabling transformation across other industries. |

# Next Steps

*Next steps for the ecosystem, the process for further engagement and collaboration with ITU Innovation.*

This Digital Innovation Profile provides an initial, high-value overview both of the ecosystem and of existing practices. The Profile is designed to raise awareness and generate commitment from all stakeholders to implement flagship projects – which in turn will foster an enabling environment for the ICT-centric innovation ecosystem, helping unleash its full potential and ultimately to help bridge the innovation divide.

The value of this assessment – which clearly identifies key barriers and enablers already existing in the ecosystem – is that it constitutes the perfect platform for the launch and development of high impact flagship projects. Each would help accelerate digital transformation and each would be designed to be of unique relevance to South Africa.

Building on this platform, and as a next step, further commitment is needed to generate a more in-depth assessment, detailed strategy and thoroughly planned flagship projects designed to help transform the ecosystem – all within the tried and tested ITU Digital Innovation Framework.

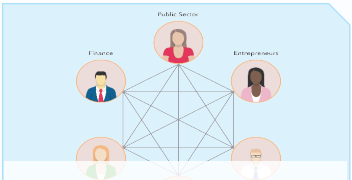
# ITU's Comprehensive Approach & Digital Innovation Framework

ITU's Digital Innovation Framework is a scalable approach. It is based on a multi-stakeholder, cross sectoral, high-value analysis which maps both enablers and blockers in potentially vibrant ICT centric ecosystems. It assesses a country's capabilities in progressing towards an accelerated digital transformation.

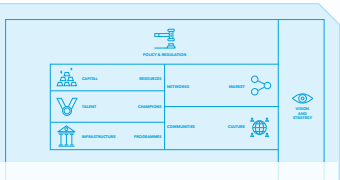
Through expert assessment, the identification of good practice, capacity-building, tools and knowledge-sharing, ITU enables and empowers stakeholders to transform their own ecosystem.

The Framework's aim is to help countries fully realize their innovation potential and benefit from the enormous advantages this will bring. It first raises awareness of how innovation can address national challenges and subsequently creates sustainable, scalable projects designed to build environments that enable innovative digital ecosystems to flourish.

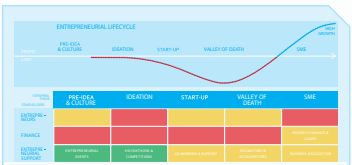
## DIGITAL INNOVATION FRAMEWORK – ASSESS REALITY




Multi stakeholder and cross sectoral approach



Nurturing policy & good practices along the ecosystem's key enablers




Mapping key barriers in the ecosystem to assist stakeholders through their innovation journey

Tools, policy & project recommendations tailored to your context

Global Good Practices

## CO-DESIGN & IMPLEMENT

Flagship projects, develop & facilitate implementation

Knowledge Sharing & Innovation Capacity Development

BUILD CAPACITY & NETWORK

## ITU Innovation Platform

*'How do we get started, and how do we know we are heading in the right direction?*

These are the questions ITU Members often ask as they embark on a programme to transform their ICT infrastructure into the innovative powerhouse it could be and indeed should be – one that will drive outstanding economic growth and place them squarely at the centre of the 21st century digital opportunity. While the questions can appear daunting, there is a solution – and a step-by-step process that leads the way.

Through its range of powerful products, services and tools that make up the ITU Innovation Platform, ITU supports its members in fostering vibrant innovation ecosystems and in accelerating digital transformation for sustainable growth in the digital economy. The goal is to place ICT innovation front and centre in a country's national development planning.

The ITU Innovation Platform offers four powerful elements:

- Digital Innovation Framework: a scalable approach mapping enablers and blockers in potentially vibrant ICT centric ecosystems and assessing a country's capabilities in progressing towards an accelerated digital transformation.
- Digital Innovation Profile: a powerful, at-a-glance and high-value analysis of a country's digital ecosystems and its potential for digital transformation.
- Co-development of country-level bankable projects.
- Knowledge-sharing and capacity building: including dialogues on innovation at regional and global level – and scaling of work through national and regional capacity building.

*For more information visit* ***innovation.itu.int*** *– or contact* ***innovation@itu.int***

# Acknowledgements

The Digital Innovation Profile for South Africa has been prepared collaboratively, with contributions from DTPS and the Innovation Division, Innovation and Partnership Department, of the ITU Telecommunication Development Bureau. The information was gathered at a national stakeholders' workshop, held on 14-15 August 2018 in Pretoria with active engagement and content from 75 experts from across the ecosystems – including entrepreneurs, academia, public sector, private sector, financiers, entrepreneurial support organizations, and civil society.

The report was undertaken to set the context for the development of an innovation center to accelerate digital transformation towards the 4IR, formally known as the African Digital Transformation Center.

International
Telecommunication
Union
Place des Nations
CH-1211 Geneva 20
Switzerland

Geneva, 2018
Photo credits: Shutterstock