

# **SOUTH AFRICA** **in the** **DIGITAL AGE**

## Digital readiness assessment

---

FOR SOUTH AFRICA TO TAKE UP ECONOMIC OPPORTUNITIES  
IN THE DIGITAL AGE

A report by Genesis Analytics in partnership with the Gordon  
Institute of Business Science and the Pathways for Prosperity  
Commission on Technology and Inclusive Development

# Table of Contents

Table of Contents.....	1
Introduction.....	2
Opportunity Assessment Overview .....	4
Readiness Assessment .....	6
Universal Digital Access .....	9
Infrastructure .....	10
Affordability.....	12
Telco regulation.....	13
Summary of gap analysis.....	14
Human Capital.....	16
Foundations.....	17
Demand-driven educational pathways .....	18
Skills Gap.....	21
Summary of gap analysis.....	21
Government Support .....	24
Government as the provider of digital business foundations.....	26
Government as a purchaser of business services .....	27
Government as an enabler of business.....	28
Government as a regulator of markets.....	30
Summary of gap analysis.....	32
Innovative Business.....	35
Innovation Finance .....	37
Non-financial innovation support .....	39
Innovation Culture.....	40
Attitudes to technology.....	41
Summary of gap analysis.....	43
Constructing Ecosystems .....	46
Summary of gap analysis.....	49
Cross-Pillar Conclusion.....	51

# Introduction

**South Africa cannot lose any more time in preparing for the extraordinary opportunities and risks presented by the digital age.** While digital and other technological innovation brings significant risk, particularly in displacing labour in traditional sources of employment, it also offers new opportunities for creating work at scale in a digital economy.

**Whether and how these new opportunities play out in South Africa will increasingly determine the country's collective prosperity as a nation.** As traditional work opportunities start to taper off, South Africa's ability to create new forms of work in a digital economy will determine the country's future economic trajectory. In addition to creating new forms of work, having these work opportunities open to as many South Africans as possible will be critical to this trajectory creating inclusive outcomes.

**Developing South Africa's readiness to seize these opportunities when they arise is therefore a cornerstone of the country's economic strategy.** Identifying what South Africa should be ready for to create these opportunities is not straightforward, especially as the pace of disruptive innovation increases. But since decisions made now will determine South Africa's economic future, it is important to identify the right combination of conditions which enable these opportunities, whatever they may be, to scale significantly.

**This report diagnoses the state of these enabling conditions in South Africa to contribute a baseline of knowledge for government and private sector growth initiatives.** It measures where South Africa is ready for these future economic opportunities, and where gaps remain which need to be closed. Public initiatives such as the PPGI and the 4IR Commission are a means to coordinate the efforts of the public and private sector and inform national strategy. The SADA initiative and this report contributes to these processes.

**This report approaches the assessment of these enabling conditions through an opportunity-focused lens.** While most readiness assessments provide measures of readiness from the perspective of macro-systems or enablers in the digital economy, this report takes an opportunities first approach – readiness is measured from the bottom-up for conditions that are directly relevant to unlocking inclusive growth opportunities.

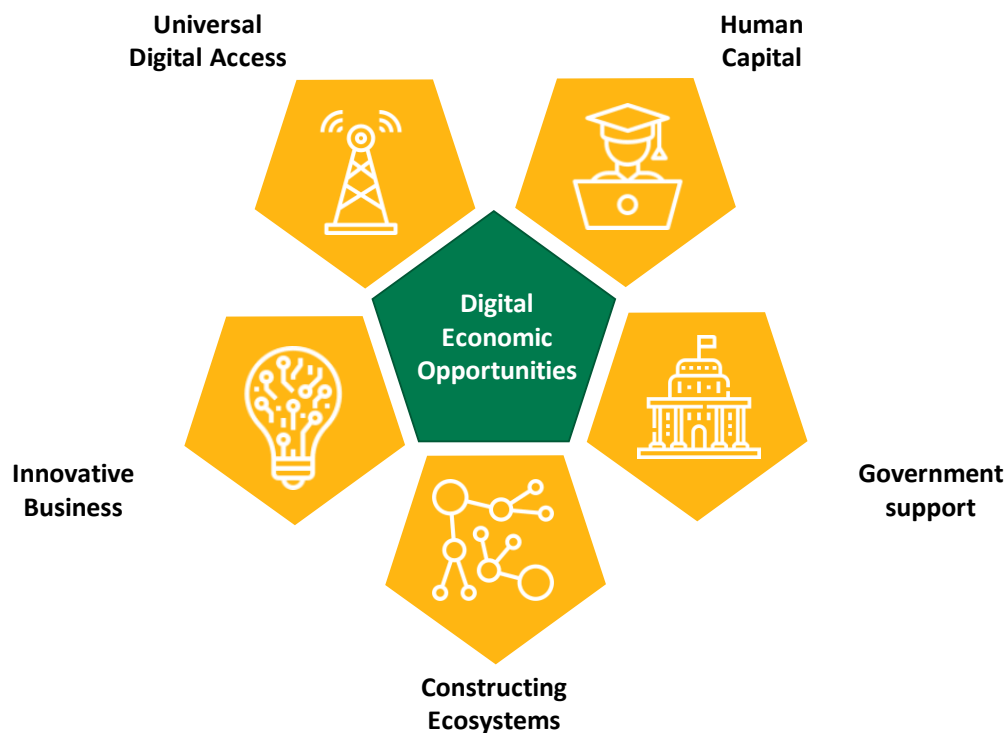
**It does this by first identifying concrete economic opportunities that South Africa has the potential to take up in the next ten years.** The report initially summarises some of the tangible economic opportunities that South Africa might realistically take up. These are discussed in more detail in the SADA Strategy Primer - the sister document of this report. While these may not be the exact opportunities posed to South Africa over the next decade, identifying what these opportunities might look like, and the conditions required for these opportunities to scale, provides useful context to the general concept of digital readiness.

**In doing so, the report considers which readiness conditions to measure by first identifying the factors that really matter for the opportunities to be realised and scaled.** This bottom-up approach allows for the measurement of more nuanced and meaningful conditions compared to typical macro readiness assessments. Following the overview of the opportunity

assessment, the set of readiness conditions that together create an enabling environment for taking up the economic opportunities in the digital age are identified.

**Once these readiness conditions have been identified, the report then measures the state of these conditions in South Africa now**, with a view on whether they are sufficiently ready to enable whatever new economic opportunities are presented to South Africa. The appendix to the report provides the complete future-oriented assessment of the state of the readiness conditions to identify where there is readiness, and where gaps remain. A summary of this measurement is provided in the body of this report.

**The report identifies three opportunity zones and a number of enabling conditions across five readiness categories.** The opportunity zones identified are sets of related opportunities, grouped together to represent areas where any number of future economic opportunities are likely to arise. The enabling conditions for these opportunity zones are identified and measured across five readiness categories, as shown in the diagram below.



**Lastly, the role these readiness categories play in driving inclusivity of opportunities is assessed.** Inclusiveness of economic opportunity is defined along two dimensions. Firstly, inclusive opportunities have fewer barriers to access for individuals. These barriers may relate to finance, geography, demographics, educational attainment or others. Secondly, the benefits primarily accrue to those that access them and are not concentrated in a single group such as asset owners or business owners. Each readiness category is assessed in terms of its importance for inclusivity, and current gaps in supporting inclusivity are noted.

# OPPORTUNITY ASSESSMENT OVERVIEW

**The SADA opportunity assessment provided an indication of the types of economic opportunities that South Africa may feasibly realise and scale over the next ten years.** In order to do that, it is important to define up front what constitutes an opportunity. Technology innovation has application to so many economic outcomes – GDP growth, exports and the balance of trade, market efficiency and competitiveness, and many others – so it is important to be specific. This report defines digital economic opportunities as the application of technology and other kinds of innovation in markets where significant income-generating work is created, and where better access to these income-generating opportunities is enabled. A high-level feasibility proviso was included so that unrealistic opportunities that South Africa could not access were not considered.

**To identify these opportunities, three bottom-up methodologies were used.** The methodologies are bottom up because they look for specific examples of economic opportunities rather than thinking about how technology can be applied to broad sectors or industries. The *fast follower* approach looked at what work-creating innovation is occurring in other parts of the world, and whether South Africa could replicate this. The *fixing what is broken* approach identified systems, processes or markets that are not functioning in South Africa, and assessed whether technology could fix them to unlock latent demand for work. The *global opportunities* approach considered the sources of increasing demand for globally-traded goods and services, and whether South African entities could capture this demand.

**The identified opportunities were grouped into three opportunity zones to describe broad areas where opportunities are likely to arise.** The opportunity zones describe a broad variety of income-generating opportunities across a number of sectors, skill levels, and educational requirements. The three opportunity zones and the methodology that led to their identification are described in brief on the next page, but are elaborated on fully in the SADA Strategy Primer. Opportunities that were identified but not explicitly contained in the zones are detailed in the appendix.



## Capturing an increasing share of the demand for globally-traded services



Global Opportunities

Developments in ICT are allowing new kinds of work to be conducted anywhere in the world. This is opening-up services that have traditionally been proximity-based but are starting to be provided using digital technologies. This is creating work opportunities in the South African global business services sector and for individuals who work as independent freelancers. These opportunities could scale significantly if South African individuals leverage the rising appetite for freelance work among global businesses and businesses tap into new sources of global demand in sectors such as education and health-care where services are increasingly being provided virtually.



## Unlocking local demand for low-skilled labour through digital platforms



Fixing What is Broken



Global Opportunities

Digital platforms that aggregate and match demand and supply for low-skilled labour or sell goods online with delivery services, are creating income-generating opportunities for low-skilled South Africans across a number of sectors. Platform cost reductions and efficiency gains for consumers are unlocking latent demand for low-skilled services and products. As similar platforms expand to and scale in other sectors, there is a large opportunity for the same cost and efficiency effects to unlock latent demand for a range of low-skill and blue-collar services and emerging businesses.



## Establishing South Africa as a regional hub for frontier technology



Fast Follower



Global Opportunities

Frontier technologies such as the internet-of-things, drones, robotics and AI are transforming the way organisations operate, interact and create value. The rising adoption of these frontier technologies has the potential to create additional work opportunities in a number of areas. First and most importantly, the application of frontier technology will reshape how sectors like agriculture, mining and many others operate. This will unlock new forms of production, and subsequently new job opportunities. Secondly, complementary high-tech skills such as AI, data science, and software engineering are all required to develop and deploy these innovations locally. Finally, the deployment and maintenance of frontier technology solutions will drive the demand for more common tech skills such as IT sales and support, cloud computing and information security.

# READINESS ASSESSMENT

**This readiness assessment identifies the conditions required for digital economic opportunities to be realised and scaled.** Having defined three broad areas of opportunity that South Africa could realistically pursue, it is important to then identify what it would take to ensure these opportunities could materialize. This section details the readiness conditions that need to be in place for South Africa to take up digital economic opportunities in the future, and for these opportunities to be meaningfully inclusive.

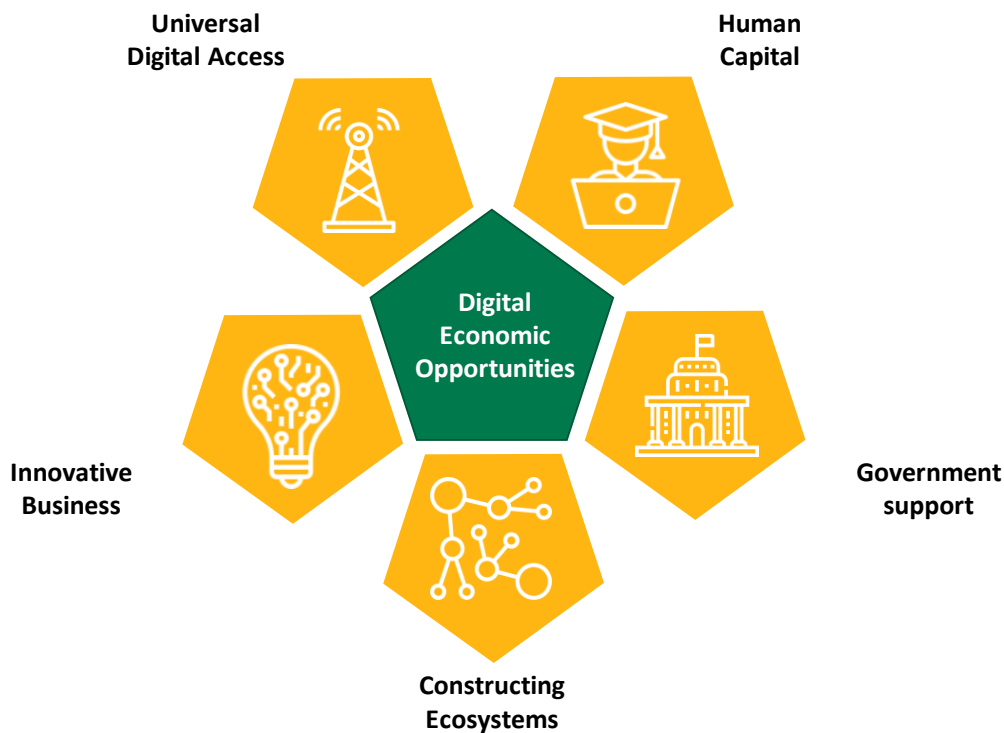
**These readiness conditions are synthesized into five broad pillars.** The identified readiness conditions were grouped together into the pillars of Universal Digital Access; Human Capital; Government Support; Innovative Business; and Constructing Ecosystems. These five pillars constitute the main areas of readiness that South Africa will have to get in order to scale digital economic opportunities and ensure inclusion.

**The assessment analyses the current state of play of the readiness conditions within each of the five pillars.** This is done through a future-oriented lens. Rather than speculating on how the conditions will play out over the next ten years, the assessment considers whether current conditions are on track to support future economic opportunities, and where gaps remain.

**This includes a consideration of the drivers of change for each condition and the extent to which gaps are being closed.** Where significant gaps exist, part of South Africa's readiness for future economic opportunities is defined by whether there is momentum to close these gaps going forward. As such, the readiness measurement includes a consideration of both the size of the gap and the dynamics that are leading to the gap shrinking or growing over time.

**Each pillar is summarised from the perspective of inclusivity.** This summary evaluates the importance of the pillar in ensuring emerging economic opportunities are inclusive, and measures the pillars's gap in achieving this.

The five readiness pillars are described in brief below and elaborated on in this section:



The **Universal Digital Access** pillar considers whether all South Africans have access to the digital economy in order to take advantage of digital economic opportunities. It considers the state of the country's digital infrastructure, of ICT regulation, and of device and data affordability across various geographies and demographics.

The **Human Capital** pillar considers whether South Africa's education ecosystem is sufficiently preparing individuals with the skills and talent that will be demanded by private sector and other organisations as digital economic opportunities are scaled. It includes considerations of the state of basic and secondary schooling, and the flexibility and relevance of tertiary education pathways.

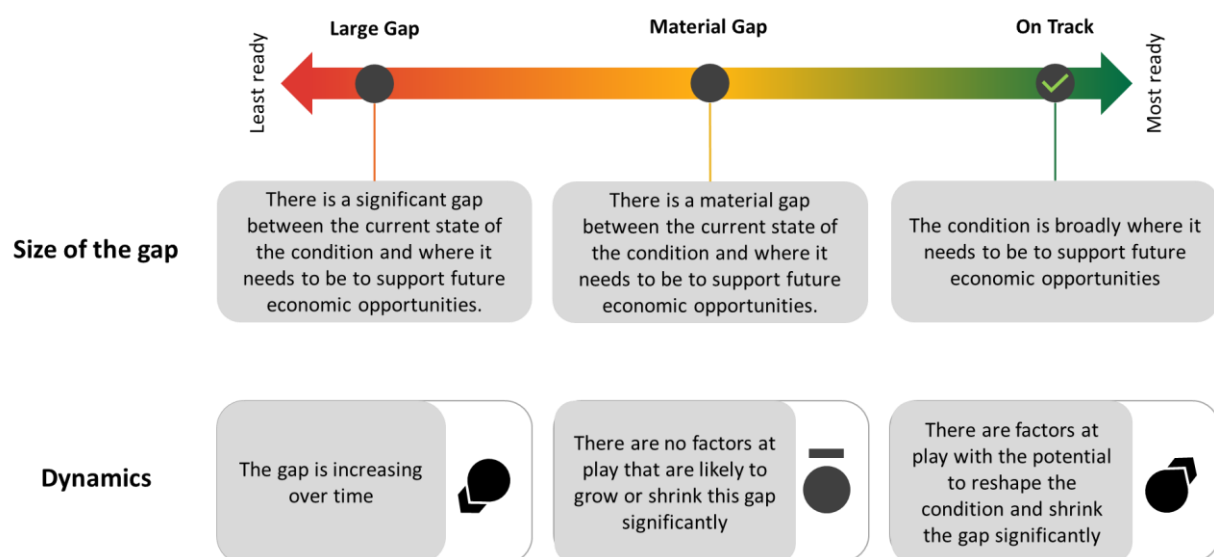
The **Government Support** pillar considers whether the public sector in South Africa is adequately prepared to support the new types of opportunities that may emerge. It includes the role of government as a regulator of business, as a manager of fiscal tools, as a bridge for the poor to access digital opportunities, and as a regulator of labour markets.

The **Innovative Business** category considers whether private sector stakeholders and support systems are adequately prepared to respond to and scale economic opportunities presented by the digital age. It considers the processes required for new business models to be developed and scaled, and whether there are adequate inputs into those processes (such as entrepreneurship, innovation financing, and the diffusion of technology across markets).



The **Constructing Ecosystems** category considers whether there are sufficient organisations and processes that link up and co-ordinate stakeholders that usually operate in silos. Co-ordinating different stakeholders around a specific opportunity is critical to the opportunity's ability to be scaled. This includes considerations of business-to-business co-ordination, public private solutioning, the presence of market facilitators, and access to global markets and ideas.

Collectively these pillars constitute the framework for assessing South Africa's readiness to take up future economic opportunities. Readiness is categorised based on the size of readiness gaps, and considerations of dynamics (whether the gap is likely to shrink or grow). As shown in the diagram below, the degrees of readiness are placed on a spectrum from least ready to most ready. A description of each readiness degree is provided.



# Universal Digital Access



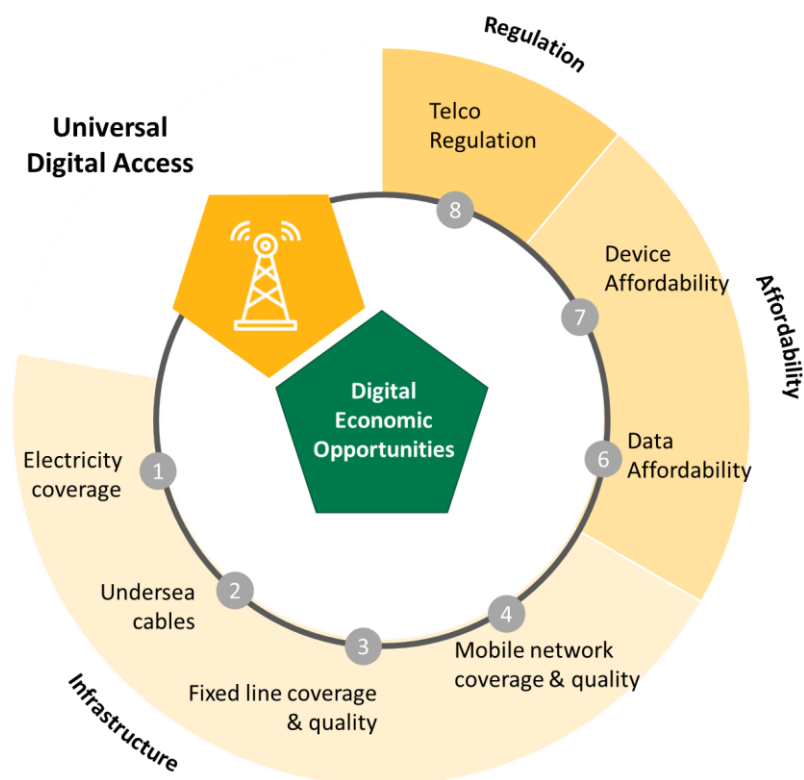
**Universal access to the digital economy is a basic prerequisite for leveraging digital economic opportunities.** Location and affordability should not prohibit access to digital opportunities if these are to be accessible to all South Africans. This access is predicated on the coverage and quality of infrastructure, reliable internet connections, fit-for-purpose telco regulation, and the affordability of data and devices. These are the key areas measured in this pillar.

**All digitally-enabled opportunities are reliant on a well-developed and high quality network of digital infrastructure.** This includes the coverage and quality of fixed line and mobile connections, and the electricity and undersea cable infrastructure that supports South Africans being able to access and transfer data with global markets. While these cut across all opportunities, the scale and sophistication of the infrastructure that is required varies. Digital business models unlocked through frontier technologies as well as globally traded services require the reliable and fast transfer of high volumes of data mostly provided by fixed line connections. These connections are typically cheaper than mobile connections for transmitting large amounts of data. Digital platforms that absorb low-skilled labour, however, often rely on good mobile network coverage as participants typically connect through a mobile device. Poor quality connections with frequent downtime can prevent people from carrying out income-generating work on these platforms.

**Affordable internet connections and hardware is a critical requirement for individuals and businesses.** Affordable internet connectivity and hardware is required for all opportunities, but each opportunity has slightly different requirements. Low-income individuals participating in digital platforms need to be able to purchase relatively small amounts of data at affordable rates. Having data is a prerequisite to earning income from the platform which may only be aggregated and paid at weekly or monthly intervals. For the South African globally traded services sector to transition towards a larger share of the global market, a key consideration is the cost of fixed line connectivity.

**The regulation of telecommunication infrastructure and services has a direct impact on the coverage and quality of digital connectivity.** This includes considerations of competition amongst telecommunication providers, as well as regulatory issues such as spectrum allocation and mobile termination rates. Telecommunication regulation informs the competitive environment of service providers and the way they service customers.

The specific readiness conditions to be measured are listed in the diagram below, and a summary of the measurement for each condition follows thereafter. The full detail of the condition measurement is available in Appendix I.



## Infrastructure

### 1 Extensive coverage of electricity is required as a basic enabler of digital participation.

There is a **large and worsening gap** in South Africa's electricity coverage. Although only 15% of the population is permanently unable to access electricity, load-shedding has been ongoing for the last 10 years<sup>1</sup>. South Africa ranks below BRIC nations and the global median in the quality of electricity supply<sup>2</sup>. The ailing public power utility creates financial duress for consumers and business with the real price of energy rising substantially since 2007. The duress this places on the economy is compounded by the continued financial support needed from and provided by the fiscus – anticipated at R70bn a year for the next 3 years<sup>3</sup>. Although investment in renewables that reduces reliance on the grid is growing, historical corrective actions for the utility have been unsuccessful and demand growth will likely continue to outpace the grid's supply.

Select Measurements from Appendix	Score	Source
Electricity Access (% of population)	84.2%	World Bank
Electricity Access (% of rural population)	67%	World Bank
Quality of Electricity Supply (country rank)	97/137 (1 is best)	WEF Global Competitiveness Index
Quality of Electricity Infrastructure (country rank)	98/ 140 (1 is best)	WEF Global Competitiveness Index
Real Electricity Price Rise (07/08 – 15/16) (%)	147%	Deloitte

2 The presence of high-quality undersea cables is necessary to support the transport of South African and global broadband. Undersea cables in South Africa are **on track**. South Africa is ranked 18 of 139 countries in terms of bandwidth per user and is well placed to compete in the global digital market<sup>4</sup>. Six undersea cables connect South Africa to the rest of

the world, and the open access models of undersea operators will motivate continued investment through competition.

Select Measurements from Appendix	Score	Source
Number of undersea cable connections	6	TeleGeography
International Internet Bandwidth per user ( <i>kb/s</i> )	149.5 kb/s	WEF Global IT Report
International Internet Bandwidth per user ( <i>country rank</i> )	18/139 (1 is best)	WEF Global IT Report

**3 Well-developed and high-quality coverage of fixed line connections provide businesses and individuals with connectivity and a means of digital participation.** There is a **large and improving gap** in fixed line coverage and quality in South Africa. South Africa ranks 139 of 190 countries in fixed broad-band penetration<sup>5</sup>. Fixed line and fibre networks are most prominent in high-income metropolitan areas with Fiber-To-The-House (FTTH) servicing only 2% of internet connected households, and urban areas 15 times more likely to have fixed line coverage than rural areas<sup>6</sup>. Fixed line speeds are more than 50% below the global average placing South Africa at an unfavourable position compared to competitors such as China, Brazil and USA<sup>7</sup>. Furthermore, South African businesses far exceed the global average in reporting slow or challenging internet activity<sup>8</sup>. However, these speeds are rising while the National Treasury has allocated R1.9 billion to South Africa Connect to invest in high-speed internet connection. Disparities in access between rural and urban populations are large, however far smaller than other African markets<sup>9</sup>. The lack of rural fixed line infrastructure and high costs make fixed line connections inaccessible for low income and rural businesses who must rely on less stable mobile networks and the purchase of costly data bundles as an alternative. s

Select Measurements from Appendix	Score	Source
Fixed-broadband subscription per 100 inhabitants ( <i>country rank</i> )	139/190	ITU
Household Access to Fibre (%)	2%	RIA After Access Survey
Household access to fixed line ( <i>Rural</i> , %)	0.7%	RIA After Access Survey
Household access to fixed line ( <i>Urban</i> , %)	11%	RIA After Access Survey
SMMEs without fixed line access (%)	46%	SME South Africa Landscape Survey
Fixed line internet download speed ( <i>country rank</i> )	99/179 (1 is best)	Ookla Global Index
Small businesses experiencing slow internet connectivity (%)	41%	Xero & World Wide Worx Technology Reshaping SA's Small Business

**4 Extensive coverage of high-quality mobile networks are an important means of connectivity, particularly for individuals and micro-entrepreneurs.** Mobile network coverage and quality in South Africa is **on-track**. Approximately 99.9% of South Africa's population have access to mobile networks, 99% have access to 3G and more than 80% access to 4G – up from 53% in 2015<sup>1011</sup>. While 3G networks are inferior in speed to 4G networks, 4G access is expanding as mobile operators continue to make large investments aimed at improving next-generation networks. The gap in 4G access will be outstripped by the gap in 5G networks once the anticipated launch of 5G occurs in late 2019. Mobile network connection speeds are of a high quality and exceed global averages<sup>12</sup>.

Select Measurements from Appendix	Score	Source
Mobile network coverage (% of population)	99.9%	WEF Global IT Report
3G network coverage (% of population)	99%	ICASA ICT Sector Report
4G/LTE network coverage (% of population)	77%	ICASA ICT Sector Report
Phone as internet device used by households (% of households)	43%	RIA After Access Survey
Mobile internet download speed (country rank)	54/138 (1 is best)	Ookla Global Index

## Affordability

**5 Mobile data, even in small packages, should be affordable across income groups.** There is a **large and persistent gap** in the affordability of mobile data. Data prices are 134% higher than BRICS nations and the most expensive across 13 African comparators<sup>1314</sup>. Declines in prices have flattened with South Africa's cheapest prepaid mobile 1GB still 166% more expensive than the second highest priced African comparator, Nigeria. This has disproportionate effects on low income consumers who are charged higher rates per MB when buying smaller bundles and businesses that are forced to rely on mobile networks which are almost twice as costly per GB as ADSL networks<sup>15</sup>. The racial disparities in internet usage are partly attributable to the high costs of data and racial disparities in income<sup>1</sup>. While MNOs are facing increasing scrutiny and pressure, data prices continue to be buoyed by market structure and the existence of a large captive consumer market without access to an alternative.

Select Measurements from Appendix	Score	Source
ICT Affordability Index (country rank)	74/178 (1 is best)	WEF Global IT Report
Cost of 1GB Bundle basket (country rank – African Comparators)	1/14 (1 is worst)	RIA After Access Survey
Share individuals reporting cost as primary barrier to internet usage (%)	15%	RIA After Access Survey

**6 The cost of hardware and devices must be accessible to South Africans across income groups.** There is a **small and improving gap** in this measure. Mobile devices are the most common means of accessing the internet at 72% of internet users<sup>16</sup>. High device costs are therefore a direct impediment to access. These costs have fallen approximately 41% since 2012<sup>17</sup>. Smartphones are often needed to access digital platforms. While simple smartphones are largely affordable at approximately R250, these may lack the functionality needed to access digital opportunities through apps. Smartphone ownership is rising, with 54% of the urban population owning smartphones versus 33% of those in rural areas<sup>18</sup>. The total remains short of OECD averages of 70% to 80%<sup>19</sup>. Device affordability should improve through time as innovation reduces production costs and focus in distribution moves away from branding.

Select Measurements from Appendix	Score	Source
Share of individuals using mobile phone as primary source of internet access (%)	72%	RIA After Access Survey

<sup>1</sup> Online Media (2014) - Internet Usage in South Africa – Magooze

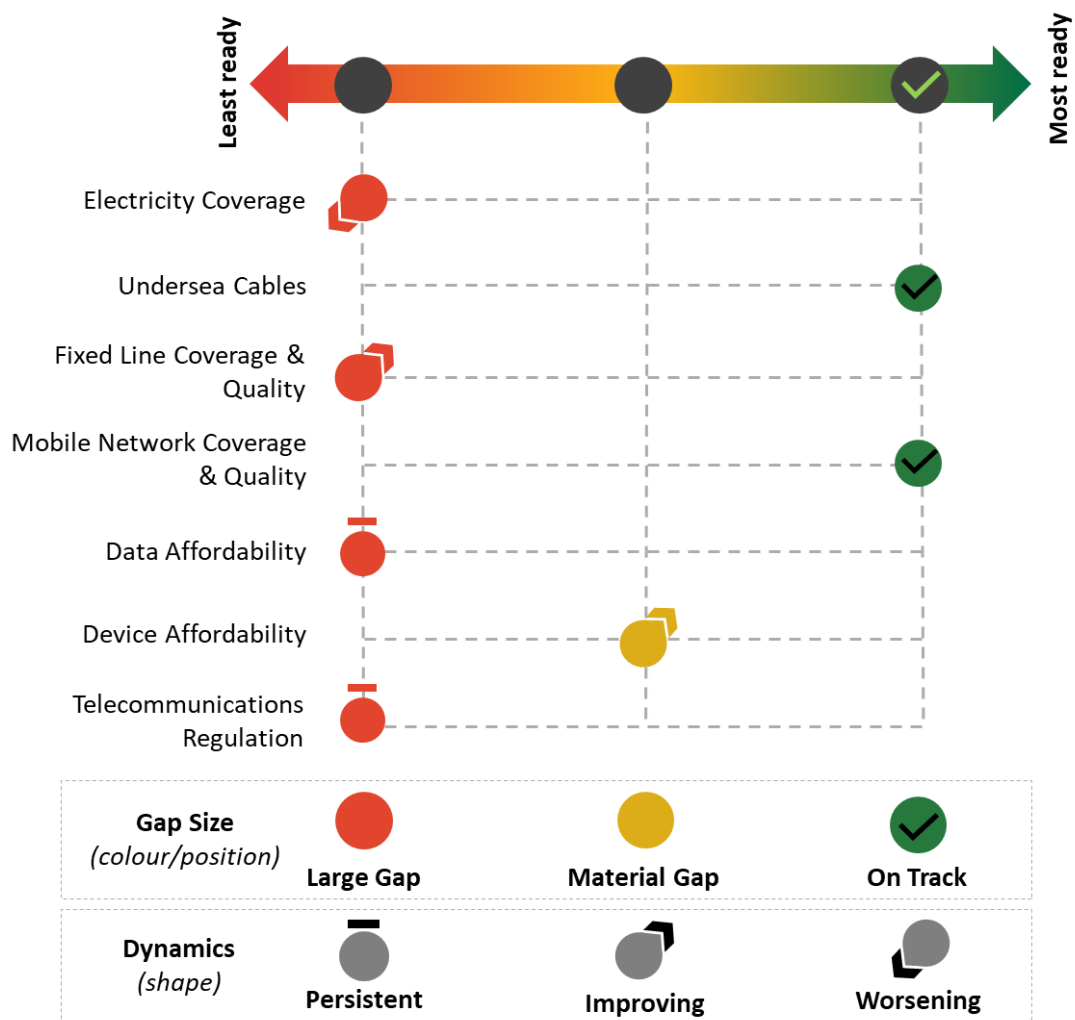
Share individuals reporting device access as primary barrier to internet usage (%)	36%	RIA After Access Survey
Smartphone ownership (% <i>rural</i> )	33%	RIA After Access Survey
Smartphone ownership (% <i>urban</i> )	54%	RIA After Access Survey

## Telco regulation

**7 Telecommunication regulation can play an important role in enabling competitive ICT markets and affordable electronic communication services.** There is a **large and persistent gap** in telecommunication regulation. There are a number of regulatory bottlenecks and competition issues that are hindering affordable access to electronic communication services: firstly, a lack of spectrum and cost-based facilities access is driving high mobile service provision costs; secondly competition could be improved - particularly in the case of mobile markets - by regulating wholesale access. There have been a number of indications that the sector regulator is seeking to address the identified regulatory bottlenecks, however past experience and current regulatory and policy uncertainty suggests that change is unlikely to be forthcoming.

Telco regulation was analysed by an expert team of competition economists experienced in telco regulation and relies both on nuanced insight and interpretation of regulation.

## Summary of gap analysis



**The universal digital access pillar directly enables workers and business to engage with emerging economic opportunities by facilitating access to the digital economy.** Digital access allows lower-skill individuals and those in the informal sector to search for and access new opportunities and enables higher skilled individuals to access job opportunities outside of their proximity. Local businesses can scale through access to international markets, rural businesses may access markets previously serviced by urban businesses while emerging businesses are provided with a way of accessing similar scales of consumers as established businesses.

**The pillar has a wide range of indirect effects and is core to enabling the mechanisms for three other pillars.** For the human capital pillar, universal digital access provides a broader range of individuals with a means to access digital educational content which could be used to either supplement traditional education or serve as a substitute for traditional educational pathways. For the innovative business pillar, it provides businesses of all sizes and maturities with the means to create new forms of digitally-enabled business models, the opportunity to leverage digital goods and services as inputs, and to cooperate with other businesses

regardless of geography. High quality and affordable internet access furthermore impacts the government pillar by improving the operating environment for local businesses.

**While there is evidence of readiness, there are also notable gaps in the digital access pillar.** Analysis of the pillar suggests that access to the digital world is improving for individuals and businesses – in South Africa, an estimated 52% of people actively use the internet<sup>20</sup>. However key gaps create barriers to opportunity. Firstly, electricity access remains skewed towards urban centres leaving those without access primarily lower income individuals. This is coupled with low though improving fixed lined coverage. Geographic disparities in fixed line coverage and cost related barriers inhibit full participation outside of urban enclaves Secondly, inflated data costs may deter complete and effective participation in digital labour and product markets. These weaknesses exist despite strengths in mobile internet infrastructure that provide the vast majority of the population with access to high quality mobile networks and an availability of undersea cables that facilitates fast connectivity with international markets.

**The most significant gaps are due to poor competitive forces, regulatory oversight and infrastructural challenges.** The regulatory environment determines the competitive environment wherein ICT firms operate. High data costs – partly attributable to a concentrated ICT market – are yet to be corrected through an appropriate regulatory response. The poor performance in fixed line access is additionally a function of market forces as businesses will need to onboard the capital costs required to extend coverage to areas outside of urban enclaves. The gap in the regulatory oversight reflects weaknesses in government response – overshadowed by the challenges government has faced in supporting universal and reliable access to electricity.

.

---

<sup>1</sup> World Bank (2018)

<sup>2</sup> WEF (2018). Global Competitiveness Index

<sup>3</sup> Omarjee (2019) – *Eskom gets R69bn in financial support over 3 years* – Online Media - Fin24

<sup>4</sup> WEF (2018). Global IT Report

<sup>5</sup> ITU (2019). Fixed Broadband Access data

<sup>6</sup> RIA. (2017). The State of ICT in South Africa

<sup>7</sup> Ookla (2019). Speedtest Global Index

<sup>8</sup> Xerox & World Wide Worx (2018) - How technology is reshaping South Africa's small business economy

<sup>9</sup> RIA. (2017). The State of ICT in South Africa

<sup>10</sup> WEF (2017). Global IT Report

<sup>11</sup> ICASA (2018). 3rd Report on the State of the ICT Sector in South Africa

<sup>12</sup> Ookla (2019). Speedtest Global Index

<sup>13</sup> RIA. (2017). The State of ICT in South Africa

<sup>14</sup> Seeth (2018) - *High Data Costs Challenged – Low Income Households Hit the Hardest* – Online Media - CityPress

<sup>15</sup> MyBroadband, (2018) - *MWEB to charge R49 for 1GB of ADSL data* – Online Media - MyBroadband,

<sup>16</sup> RIA. (2017). The State of ICT in South Africa

<sup>17</sup> GSMA (2018) The Mobile Economy – Sub-Saharan Africa

<sup>18</sup> RIA. (2017). The State of ICT in South Africa

<sup>19</sup> RIA. (2017). The State of ICT in South Africa

<sup>20</sup> RIA. (2017). The State of ICT in South Africa



# Human Capital



**South Africa's education ecosystem will have to supply a steady pipeline of candidates with skills that allow them to develop, utilize and complement technology in order for digital economic opportunities to scale.** The specific skills required range by opportunity – some are technology skills while others simply relate to digital literacy or the ability to work digitally. The Human Capital pillar considers these skill requirements, and the resulting demand on educational institutions. This is assessed in terms of foundations (throughput from basic and secondary schooling into post-school educational pathways), the availability of demand driven educational pathways (relating to access and funding, the quality and relevance of providers, accreditation of qualifications and business involvement in the sector), and attracting and retaining critical skills.

**Creating a steady supply of quality digital skills will requires high quality foundational educational systems that effectively prepares students for tertiary education.** Basic and secondary education requires both high quality teaching of STEM subjects and a high throughput of students matriculating with these subjects. Emerging opportunities also requires a strong pipeline of raw talent.

**Post-school educational pathways need to be accessible to provide equal opportunity to develop the skills needed for the digital age.** These pathways might require students pay for tuition, material and related expenses. High costs that create barriers to entry could limit who has access to the skills necessary to participate in the digital age.

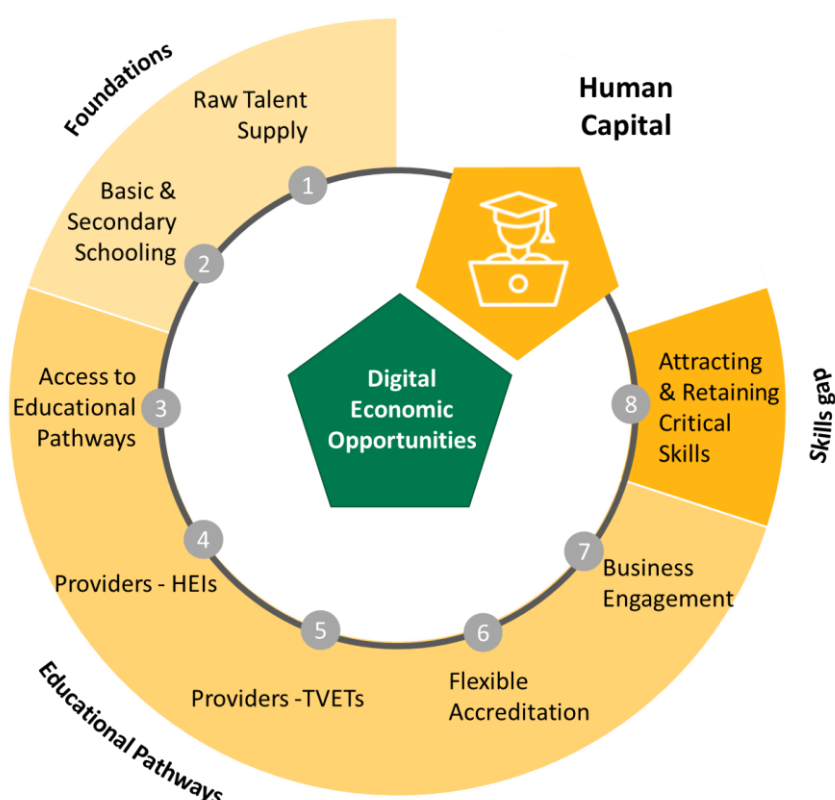
**The quality and output of post-school education pathways, particularly STEM graduates, will need to be scaled.** This requires an improvement in the institutional capacity, of universities and TVETs, to supply both STEM degree graduates and more specialized degrees in specific frontier technologies such as, AI, data analytics and robotics. Furthermore, traditional tertiary institutions need to be flexible enough to adapt to further, rapid developments in tech innovation, keeping curriculum design up to date with the pace of innovation and responsive to the needs of local industry. In addition to traditional tertiary institutions, alternative education providers - some of which provide training online – have a role to play in creating the skills needed for the digital age.

**A sophisticated and flexible accreditation framework that provides clarity on the value of qualifications and recognises low cost alternatives can accelerate skills development.** Frameworks such as the NQF and SETA help individuals move between pathways and support businesses in investment in skills development. Clarity and consistency on the value of traditional and non-traditional qualifications may unlock low cost pathways to skills development. Supporting the emergence of alternative education providers, for example through flexible accreditation standards, will be important for the skills supply chain in South Africa to scale.

**Businesses can contribute to human capital development by supporting students during studies, offering students experience through internships and investing in continued learning of staff.** Business is a key benefactor of the skills pipeline and therefore a key player in the education ecosystem. Financial support of students through bursaries can help scale the skills pipeline in areas business considers valuable. Creating programs of continued learning furthermore help to ensure staff skills remain relevant and reflect the needs of the digital age.

**All opportunities will benefit from strategies that retain and attract critical skills and close the critical skills gap.** This can include processes supported by migration policy that reflects the demand for specific opportunities, and strategies that seek to prevent emigration of local skills.

The specific readiness conditions to be measured are listed in the diagram below, and a summary of the measurement for each condition follows thereafter. The full detail of the condition measurement is available in Appendix II.



## Foundations

**1 A supply of raw talent ensures there is a large input to tertiary educational pathways that can be leveraged to unlock current and future economic opportunities.** Raw talent is on track. With approximately 10.3 million youth either unemployed or enrolled in educational institutions, there is a large pool of raw talent that can be leveraged to scale the supply of skills necessary for leveraging economic opportunity.<sup>21,22,23</sup> The Oxford School of Economics consider South Africa among the 10 countries expected to produce the largest skills supply by

2021.<sup>24</sup> Whereas nations such as Japan and Canada suffer from an aging population, South Africa is unlikely to be in shortage of raw talent and is at a demographic advantage.

Select Measurements from Appendix	Score	Source
Students in public, private, TVET and CET ( <i>no.</i> )	2.3 million	DHET
Students in SETA programs ( <i>no.</i> )	249,000	DHET
Youth not in employment, education or training ( <i>no.</i> )	7.8 million	DHET
Strongest talent surplus ( <i>county rank</i> )	4/46 (1 is best)	Oxford Global Talent Rank

**2 Basic and secondary schooling is necessary to ensure the South African population can pursue higher education and gain more complex digital skills.** There is a **large and persistent gap** in this measure. As of 2016, 16% of children aged 5-14 were not enrolled in any form of basic or secondary schooling, leading to South Africa ranking last amongst 43 OECD partner countries.<sup>25</sup> Worryingly, only 30% of students who enrol in grade one actually make it to and pass matric<sup>26</sup>. The shortfalls of inadequate enrolment are compounded by poor educational outcomes across both basic and secondary schools: as of 2016, 78% of grade 4 learners were classified as illiterate by The Progress in International Reading Literacy Study; and in 47% of high schools, no pupil performed at the intermediate international mathematics benchmark.

27

Select Measurements from Appendix	Score	Source
Schooling enrolment, 5-14 years ( <i>% of population</i> )	84%	OECD
Students completing Gr. 9 after completing Gr. 3 ( <i>%</i> ):		
<i>White</i>	98%	StatsSA Education Series
<i>Coloured</i>	87%	
<i>Indian</i>	97%	
<i>Black</i>	54%	
Student dropout during Gr. 11 & Gr 12 ( <i>%</i> ):		
<i>Male</i>	29%	StatsSA Education Series
<i>Female</i>	13%	
Population 25-64 with no attainment beyond Gr. 7 ( <i>%</i> )	19%	StatsSA Education Series
Grade 4 student achievement in reading ( <i>country rank</i> )	50/50 (1 is best)	PIRLS Literacy Study
Grade 4 student achievement in maths ( <i>country rank</i> )	48/49 (1 is best)	TIMS-N Maths Study
Perceived quality of science and maths education ( <i>country rank</i> )	128/137 (1 is best)	WEF Global Competitiveness Report
Matric candidates qualifying for university ( <i>%</i> )	29%	StatsSA
Private Institution attendance ( <i>% of students</i> )	10%	StatsSA
Private Institution matric pass rate ( <i>% of students</i> )	98%	Online Reporting

## Demand-driven educational pathways

**3 Translating this raw talent pool into tertiary education pathways requires barriers to access being addressed.** There is a **large though improving gap** in this measure. There are significant financial barriers for students seeking to enter educational pathways with HEI costs rising at an average of 2% above inflation between 2008 and 2015 and nearly 51% of youth aged 18 to 24 not having the funds to pay their tuition.<sup>28,29</sup> However, there has been significant progress in increasing access, with government committing to increase its contribution to HEIs by R17.6 billion over three years from 2016 and adjusting the criteria for students that qualify for NSFAS grants – improving access for lower income individuals and a driver of economic inclusivity.

Select Measurements from Appendix	Score	Source
Annual tertiary education fee growth ('08–'15) (%)	8.8%	StatsSA
'No money for fees' as reason for not attending educational institution (%):		
<i>Total</i>	51%	StatsSA
<i>White</i>	28%	
<i>Not-white</i>	53%	
NSFAS rejection rates (% of applicants)	25%	NSFAS
TVET students supported by NSFAS (no.)	255,557	NSFAS
Government spending on tertiary institutions as % of GDP ( <i>country rank</i> )	62/94 (1 is highest)	UNESCO

**4 Higher Education Institutions (HEIs) need to be accessible and produce high quality expertise relevant to the digital age.** Higher education institutions in South Africa have a small and persistent gap. South Africa has a traditional strength in the quality of its universities - in the Times Higher Education (THE) World Universities Rankings in 2019, four of the top five universities in Africa are South African.<sup>30</sup> These institutions are producing a range of expertise with a rising output of STEM degrees at 29.1% of all graduates.<sup>31</sup> However, access remains constrained to 10% of youth, while there is evidence of poor performance and failure rates.<sup>3233</sup> In addition, these institutions are institutionally rigid leading to curricula that is outdated and does not accurately reflect the requirements of business.<sup>34</sup>

Select Measurements from Appendix	Score	Source
Ranking of top South African University ( <i>rank</i> )	156/1250 (1 is best)	Times Higher Education
Ranking of top South African University ( <i>rank</i> )	241/2500 (1 is best)	URAP
Increased likelihood of employment holding university qualification over matric (%)	36%	Hofmeyr <i>et. Al</i>
Share of graduates in STEM ( <i>country ranking</i> )	60/93 (1 is most)	UNESCO
Share of youth in university (%)	10.3%	DHET; StatsSA
Student enrolment in HEI ( <i>no. of students</i> )	1,200,000	DHET
Course success rates (% of students)	78%	CHE

**5 Technical and vocational educational training (TVET) programs need to provide practical and relevant qualifications and training at scale.** The TVET system in South Africa suffers from a large and persistent readiness gap. Studies into the sector suggest that TVET programs have significant curriculum challenges and are not adequately preparing students for work – curriculums are largely out-dated, lecturers are often out of touch with industry or have no industry experience whatsoever while programs are infrequently paired with practical experience.<sup>35</sup> This is a significant impediment as students with practical experience have 82% better odds of finding work.<sup>36</sup> Negative perceptions of the quality of these qualifications by both the private sector and other educational pathways create barriers to employment and accessing HEIs.<sup>37</sup> This disadvantages TVET graduates who may come from largely lower income backgrounds given the greater availability of subsidy and lower financial barriers to access. While a ministerial task-team has been established to oversee the overhaul of the system, this is yet to be embarked upon.

Select Measurements from Appendix	Score	Source
Student enrolment in TVET colleges ( <i>no. of students</i> )	705,000	DHET
TVET completion rate – Report 191 (N6) (%)	64.8%	Stats SA

TVET assessment combines expert insights from research conducted by the Council on Higher Education and interviews with key stakeholders along the TVET value chain.

**6 Flexible accreditation frameworks which recognise micro-credentialing institutions and clarify articulate movements between pathways are key in scaling the skills pipeline.** There is a large and persistent gap in this measure. The NQF sets the articulation between different qualifications while SETA defines funding allowances for sector-specific continued learning. The transition from TVETs to universities is constrained by a lack of cooperation between these institutions which creates challenges for students seeking to further studies in HEIs. Furthermore, most micro-credentialing institutions struggle for recognition under the national qualification framework (NQF) or Sector Education & Training Authority (SETA).<sup>38</sup> It appears that there is no clear plan to integrate emerging micro-credentialing programmes into the SETA accreditation standards. Without this accreditation, businesses find it difficult to access SETA funding to scale training partnerships with these micro-credentialing institutions.<sup>39</sup> This places the acceptance of these programs in South Africa behind global trends.

Conclusions are drawn from interviews with key stakeholders from micro-credentialing institutions and published academic articles. The conclusion and ranking is derived from an interpretation and synthesis of available information.

**7 Business can contribute to the scale and quality of skills by supporting students during studies, by providing students with experience through internships, and developing continued learning programs for current staff.** There is a material and persistent gap in this measure. As of 2013, a representative sample of corporates disbursed nearly ZAR 500 million to more than 100,000 students.<sup>2</sup> Regardless of scale, lack of coordination between corporate funders and between corporates and educational institutions often sees high performing, qualifying students being awarded multiple bursaries.<sup>3</sup> While internships are not uncommon in South Africa and have been shown to provide students with support in the development of their career paths.<sup>4</sup>, business tends to view them as transient and cost-effective sources of labour - 42% of graduates that completed internships remained unemployed following completion.<sup>5</sup> In another study, only 8% of newly employed graduates attributed their job to a previous internship.<sup>6</sup> In terms of on the job learning, South African enterprise is aware of the need for programs that keep staff skills relevant, improve their ability to pivot to new tasks, and embed a staff-wide innovation mindset – in 2017, 83% of executives considered the concept of continued learning and career development as important or very important.<sup>7,8</sup>

Data regarding the effectiveness and scale of business involvement with academia is limited. Conclusions rely on interviews with academic coordinators. The impact and effectiveness of internships and on the job-learning is also little documented with insights drawn from a narrow survey and findings from established research bodies.

<sup>2</sup> HRDC (2013), Status of the Bursary/Scholarship Funding Landscape in South Africa.

<sup>3</sup> Genesis analytics interview

<sup>4</sup> SAGDA (2013) Final Report on the Internship Baseline Study

<sup>5</sup> SAGDA (2013) Final Report on the Internship Baseline Study

<sup>6</sup> CHEC (2013) Pathways from University to Work

<sup>7</sup> BCG (2017). Human Capital Trends South Africa

<sup>8</sup> *Ibid.*

## Skills Gap

**8 Creating an attractive environment that retains critical skills and prevents widening of the critical skills gap can aid in scaling the skills supply.** There is a **large and persistent gap** in the country's ability to retain and attract critical skills. Mismatches in labour have created a critical skills gap that will be challenging to close in the short term. The skills gap is significant with 76% of businesses finding the recruitment of critical skills a challenge.<sup>40</sup> This gap is at risk of widening as 50% of a select sample of to-be graduates plan to work overseas while established professionals seek new opportunity abroad.<sup>41</sup> The 'brain drain' is extensive with South Africa ranking 75 of 125 countries in ability to retain talent.<sup>42</sup> In response, business has come to partially rely on foreign talent which may crowd out local job seekers. South Africa's attractiveness to foreign talent is depressed by poor local conditions and an antiquated and ineffective migration policy.<sup>43,44</sup> Whereas Vietnam, India and China are actively seeking to recruit people from their diasporas, strategies that create incentives for South Africa expatriates and graduates to return home from overseas are not in place. Business is furthermore exploring flexible work arrangements as a solution to the skills gap.

Select Measurements from Appendix	Score	Source
Extent to which companies find people with the skills needed to fill vacancies ( <i>country rank</i> )	77/140 (1 is best)	WEF Global Competitiveness Index
Share of business experiencing difficulty recruiting critically skilled staff (%)	77%	XPatWeb
Share of business confident international search would assist in closing skills gap (%)	76%	XPatWeb
Share of professionals emigrated (1989 – 2003) (%)	7%	DHA
Ratio of skilled emigrants to immigrants (1989 – 2003)	8.2	Stats SA
Anticipated net-loss of skilled labour in South Africa given global freedom to immigrate (%)	16%	Gallup World Poll
Country retention of talented skills ( <i>country rank</i> )	78/137 (1 is best)	WEF Global Competitiveness Index
To-be university graduate intention to work overseas following graduation (%)	54%	PPS Student Confidence Index

## Summary of gap analysis



**The human capital pillar determines who has access to skills and capacity building programs required for emerging digital opportunities.** Access to foundational schooling and higher educational pathways is fundamental as it broadens the pool of people who can create new opportunities, and who access new opportunities. This system is key in addressing disparities in human capital created by historically institutionalised inequalities. Financial barriers to educational pathways means lower income individuals are less able to access economic opportunities requiring more sophisticated skills, while traditional educational systems that require on-site attendance create barriers for prospective students who are not within reach of a physical institution. Flexible accreditation frameworks can help overcome these challenges by recognising lower-cost, digitally accessible micro-credentials, while business can onboard responsibility for supporting students and staff in skills and career development.

**The pillar has a wide range of indirect effects through its impact on three other pillars.** Firstly, human capital strengthens the capacity of entrepreneurs and is key in driving innovative entrepreneurial activity detailed in the innovative business pillar. Established businesses are furthermore presented with domestic talent and can avoid reliance on foreign talent. In the case of universal digital access, a baseline of human capital in reading and writing enables an individual to access and digest digital content effectively. Finally, the

human capital pillar impacts the government support pillar by informing the geo-spatial distribution of skills and abilities for individuals to participate in the digital economy.

**There are significant gaps in the human capital pillar and little evidence of improving conditions.** Shortcomings in the pillar begin at foundational education where poor performance of public sector schools translates into low levels of education for labour market entrants and aspiring post-school students. A large share of these school leavers attend under-performing TVETs where curriculum challenges are vast and practical skills limited. Many youth are left with little choice to attend these institutions due to financial barriers to accessing HEIs which – although of a high quality – also suffer from a shortage of demand driven curriculum design. The shortfalls of traditional post-school institutions is compounded by a lack of flexibility in accreditation frameworks which are needed to support the scaling of micro-credentialing institutions.

**Gaps in the human capital pillar are largely attributable to institutional weaknesses and compounded by budgetary constraints.** Government is deepening what is already significant spend in the sector. While this can improve barriers to access for post-school institutions it has yet to materialise in improving the performance of these institutions in preparing students for the digital age. Despite this spend, low performance in public education providers – in schooling and post-school pathways alike – reflects institutional challenges in the delivery of educational content and skills. This contrasts measures with higher performance such as business involvement and HEIs where these players arguably have greater autonomy and private sector involvement.

---

<sup>21</sup> Spaull (2019) Priorities for Education Reform (Background note for Minister of Finance 19/01/2019)

<sup>22</sup> DHET (2016). Statistics on Post-school education and Training in South Africa

<sup>23</sup> DHET (2018). Fact Sheet on “NEETs”

<sup>24</sup> Oxford Economics (2012) Global talent 2021-How the new geography of talent will transform human resource strategies.

<sup>25</sup> OECD (2018) Education GPS South Africa

<sup>26</sup> StatsSA (2016). Education Series Vol III

<sup>27</sup> PIRLS (2016) International Results in Reading

<sup>28</sup> StatsSA (2019) Higher Education and Skills in South Africa

<sup>29</sup> StatsSA (2016) Tertiary Education Inflation Index

<sup>30</sup> Times Higher Education (2019) Times Higher Education’s World University Rankings

<sup>31</sup> DHET (2016)-Statistics on Post-school education and Training in South Africa

<sup>32</sup> Stats SA (2017) Education Series Volume V

<sup>33</sup> Council on Higher Education (2016) Vital Stats Public Higher Education 2014

<sup>34</sup> Council for Higher Education (2013). A Proposal for Undergraduate Curriculum Reform in South Africa

<sup>35</sup> DHE (2018) TVET Sub-Sector Report for the 2019/2020 Sector Skills Plan

<sup>36</sup> DHE (2018) TVET Sub-Sector Report for the 2019/2020 Sector Skills Plan

<sup>37</sup> Interviews with Stakeholders conducted by Genesis Analytics, February-March 2019.

<sup>38</sup> Makura & Nkonki (2017)-Constraints and enablers of articulation from further education and training colleges to Universities: Perceptions from South Africa

<sup>39</sup> Interviews with Stakeholders conducted by Genesis Analytics, February-March 2019.

<sup>40</sup> XPateWeb (2017). Critical Skills Survey

<sup>41</sup> PPS (2016) Student Confidence Index

<sup>42</sup> WEF (2018). Global Competitiveness Index

<sup>43</sup> Owusu-Sekyere *et.al.* (2016) A critical skills attraction index for South Africa, Human Sciences Research Council

<sup>44</sup> Owusu-Sekyere *et.al.* (2016) A critical skills attraction index for South Africa, Human Sciences Research Council



# Government Support



**Policymakers, regulators and other government agencies have a critical role to play in creating an enabling environment for digital economic opportunities to scale.** This pillar considers four important roles government plays in this regard. First, ***government as the provider of foundations*** assesses, government's ability to tax digital firms, the quality of guardianship of intellectual property and the enforcement of data regulation. The second role, ***government as a purchaser of business services***, assesses government's ability to drive business growth through the purchase of IT services. ***Government as an enabler*** is the third role which measures local government ability to enable local business, and the quality and effectiveness of financial and non-financial incentives. The final measure, ***government as a regulator***, assesses labour regulation's ability to cater for emerging forms of work, the relevance and effectiveness of competition policy for the digital age and the responsiveness of sector specific regulation to emerging digital firms.

**Disruptive business can create challenges for intellectual property, and consumer data protection policy and regulation.** Data is a cornerstone of the digital age – it provides the rails upon which globally traded businesses operate, the source of content for frontier technology and the means of connection that enables labour absorbing digital platforms. Data protection and cyber security policy should aim to protect participants in the digital economy without being overly restrictive of business operations.

**Digital firms and innovative disruptors are changing the way consumers and business interact which creates complexities for taxation policy.** Digital businesses are developing innovative operating and ownership models to offset their tax burden and impact markets in ways previously unknown. For example, Uber is domiciled in San Francisco and all trip fares paid directly to a subsidiary in the Netherlands. Taxation policymakers are grappling with how to account for these complexities to ensure the rightful share of profits are taxed.

**The digitisation of government can improve the efficiency, effectiveness and transparency of government services while stimulating business growth by procuring business services.** These processes can motivate the emergence and support the scaling of ICT providers. Effective and large-scale procurement of these services can therefore improve government performance and contribute to job creation in businesses supplying digital skills.

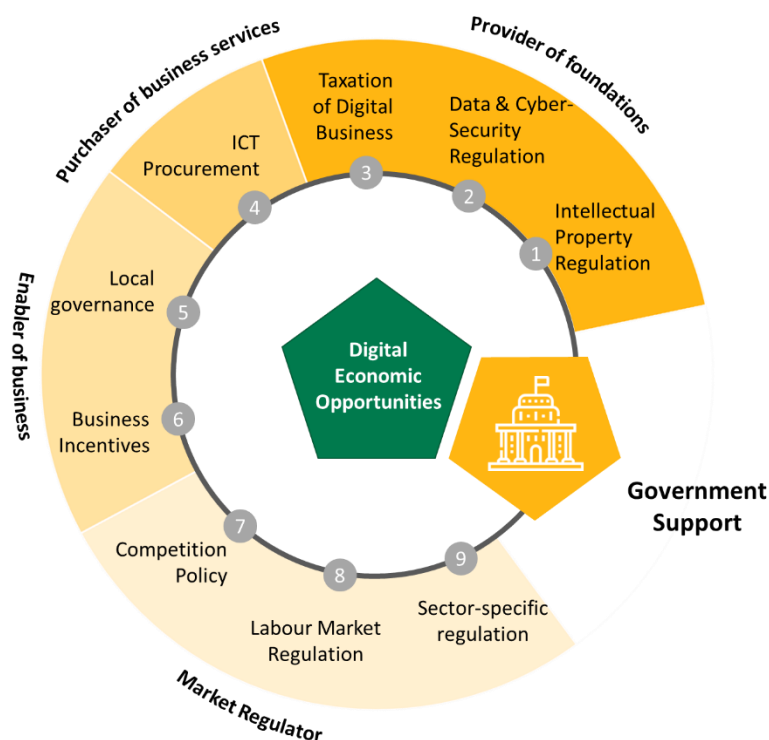
**Financial and non-financial incentives attract business to South Africa and help established and emerging digital businesses to scale.** These incentives promote skills development, drive innovation and investment, and assist in redistribution. This can offset the costs foreign firms face in establishing operation in South Africa and provide the capital needed by emerging digital firms. For the globally traded business opportunity this might play out in terms of support for skills development while for digital platforms this might unlock venture capital finance.

**An enabling business environment requires appropriate sector-specific policy and local government support of business operation.** Sectoral specific regulation and local government efficiency is instrumental in enabling or blocking the scaling of digital opportunities. Low-skilled labour platforms are often reliant on city level regulation. For example: drivers on e-hailing apps might be required to obtain taxi permits which are administered by local government; home-owners making use of Airbnb might need to comply with standards enforced by the hospitality industry. This regulation and enforcement at local municipality level can support or deter the growth of these businesses.

**Competition policy is grappling with how to regulate digital businesses that deploy innovative business models and can scale exponentially.** Disruptive innovators can have drastic impacts on the distribution of market power in a very short period due to extreme returns to scale and network externalities which entrench early-adopting digital firms. Competition regulators are still determining how best to respond and adapt to these new forms of business to safeguard consumers. Intellectual property regulation balances consumer welfare against incentives for business innovation. Regulation should therefore consider the appropriate conditions under which this right is granted to ensure that digital platforms and frontier technology firms alike are motivated to innovate while avoiding any detrimental impact on consumers.

**New forms of work require new approaches to labour regulation to ensure that labour protection is appropriately extended to digital workers.** Unlocking demand for low skilled labour and across flexible work platforms has also unlocked new forms of income-generating work. These challenge conventional views of employment, and the labour market regulation that governs fair pay and work conditions. South African regulators will have to consider how minimum and other wage regulations should apply to platform work in the gig economy. This choice determines which aspects of labour market regulation should apply to platform participants. These may include considerations of whether platform participants are exposed to a fair number of opportunities and whether issues of market concentration lead to a race to the bottom in fees. Regulators will furthermore have to determine how digital platform participants are able to bargain with platform developers and how unionisation should be engaged with.

The specific readiness conditions to be measured are listed in the diagram that follows, and a summary of the measurement for each condition follows thereafter. The full detail of the condition measurement is available in Appendix III.



## Government as the provider of digital business foundations

**1 Businesses need to be confident that they have adequate rights to the returns of their innovation and that these rights are adequately enforced.** There is a **material and improving gap** in the measure of intellectual property (IP) rights. IP is perceived by business to be well protected in South Africa, ranking far above global averages and BRICS comparators.<sup>45</sup> South Africa's IP regulation is in the process of overhaul, replacing the 'depository' IP system with a 'substantive' system. The depository system is believed to undermine genuine innovation as patents are granted when meeting thin formal requirements and only ever examined if challenged in litigation.<sup>46</sup> This system provided market exclusivity regardless of patent quality. Input from UNCTAD and the UN has seen Phase 1 of the Intellectual Property Policy of RSA completed. This recommends transition to a substantive system that uses expert examiners to judge whether patent applications warrant the grant of IP. This system is used in innovative BRICS comparators such as China, India and Brazil.<sup>47</sup>

Select Measurements from Appendix	Score	Source
Perceived extent of intellectual property protection (country rank)	24/139 (1 is best)	WEF Global IT Report
Assessment of the condition relies on findings of expert researchers and analysis of the incentives and dynamics of IP systems to conclude the likely impacts of regulatory reforms. Conclusions are in accordance with the IP Unit (UCT). Empirical measurement of IP policy effectiveness has been noted by the IP Unit as challenging given data availability.		

**2 Data and cyber-security regulation should protect consumers and meet international expectations without creating undue pressure on business.** This is a **material and improving gap** in this measure. The unenforced Protection of Personal Information Act (POPI) is generally on par with the international benchmark of the EU's General Data Protection

Regulation (GDPR). There is a gap in enterprise readiness as many businesses require process and procedure overhauls, financing and expertise to comply - a survey of enterprise found that 8% will probably not be ready and 3% will definitely not be ready to comply.<sup>48,49</sup> While small, this gap is paralleled by uncertainty regarding the government's likely effectiveness in enforcement. South Africa ranks 4th on the continent and 56th of 156 countries in the ITU cyber-security index.<sup>50</sup> South Africa's cyber-security regulatory framework is in the process of overhaul, however impending legislation prioritises punitive measures without enforcing preventative action.

Select Measurements from Appendix	Score	Source
Cyber-security composite index ( <i>country rank</i> )	56/156 (1 is best)	ITU
POPI level of priority for organisation (%):		
High	62.3%	Sophos POPI Survey
Low	21.4%	
Organisation readiness for POPI compliance (%):		
Will definitely be ready	34%	Sophos POPI Survey
Will probably be ready	33.3%	
Unknown	11.3%	
Already Compliant	10.7%	
Probably not be ready	8.2%	
Will definitely not be ready	3.5%	
SMME POPI Compliance (%):		
Compliant	16.35%	Botha et. Al.
Non-compliant	16.35%	
In the process of complying	11.54%	
Unknown	55.77%	

**3 Taxation policy will have to provide the means to tax digital firms which often have complex operating and ownership models.** There is a **large and improving gap** in this measure. The general effectiveness of the South African Revenue Service has been called into question given the loss of expertise, closure of various investigative divisions and poor management under the former SARS commissioner. Despite these shortfalls, taxation policy is at least partially adapting to the peculiarities of digital firms with the existence of a digital tax - multi-nationals providing e-services in South Africa with operations domiciled overseas are required to register with SARS and pay 15% of revenues in VAT. Foreign digital firms operating in South Africa are however not subject to any form of corporate tax. The Davis Tax Committee has advised South Africa follow the lead of regulation developed in the OECD in this regard.<sup>51</sup> Taxation of robots that replace labour has drawn little attention locally.

This evaluation of readiness to tax digital firms overlays current policy changes with global trends and best practices. Given the susceptibility of the tax base to economic conditions, traditional metrics focusing on collection targets are inappropriate for measuring the effectiveness of SARS.

## Government as a purchaser of business services

**4 Government procurement of private sector ICT services is an important source of business demand and can support government in the effective and efficient digitisation of government services.** There is a **large and persistent gap** in this measure. South Africa is considered a regional leader in e-Government development and falls slightly short of the

continental leader of Mauritius in the UN e-Government Development Index<sup>52</sup>. Approximately 17% of national GDP is spent on procurement - generous relative to benchmarks at 4% higher than a select sample of 2015 OECD averages and 10% higher than Mexico<sup>53</sup>. Approximately ZAR 14 billion was spent on ICT services. While the scale of spending is significant, its effectiveness is questionable: firstly, nearly 50% of government procurement does not follow proper regulatory processes and is at risk of loss to corruption; secondly, there are 36 supply chain management systems in government which are poorly integrated and poorly automated – this fragmentation remains despite efforts towards digitisation through an e-tender application portal and centralised database where tenders from all spheres of government are published; finally, obscure, onerous and poor procurement processes and repayment timelines and deter participation from the majority of SMMEs.

Select Measurements from Appendix	Score	Source
eGovernment Global Ranking (Top in Africa) <i>Mauritius</i> <i>South Africa</i> <i>Tunisia</i> <i>Seychelles</i>	66/193 (1 is best) 68/193 (1 is best) 80/193 (1 is best) 83/193 (1 is best)	UN eGovernment Survey
Government Procurement as a share of GDP (%) <i>South Africa (est.)</i> <i>Netherlands</i> <i>Canada</i> <i>Mexico (2013)</i>	17% 19.9% 13.4% 5.1%	Our World in Data (OECD report visualisation)
Distribution of SMMEs by share of income generated by contracts with government (%) <i>0% of revenue generated by government</i> <i>1% to 10% of revenue generated by government</i>	~81% ~8%	Online Media

The evaluation makes use of multiple sources to infer likely government impact on ICT businesses through procurement – at present there is no clear data to determine whether government has fostered the growth of ICT businesses through purchases of services. The assessment therefore overlays the scale of the spend with its likely effectiveness as proxied for general effectiveness of government spending.

## Government as an enabler of business

**5 Local government operation can support digital businesses to scale efficiently and expand employment opportunity.** There is a **large and persistent gap** in this measure. Local governments have not been particularly effective at enabling business operation or establishing strong public-private relationships. An IUDF assessment observed that many municipalities do not meaningfully engage with local business or other economic stakeholders.<sup>54</sup> Moreover, some municipalities have an adversarial relationship with business as they do not pay suppliers on time or at all<sup>55</sup>. The Cities Support Program (CSP) seeks to unlock growth in cities and create positive business environments and was formulated in consultation with the World Bank and with recognized industry experts embedded in business. This indicate that government is investing in and committed to improving government-business interaction and local government responsiveness. This program is yet to move from planning to implementation.

City Ranked	Getting electricity (1 is best)	Dealing with Construction Permits (1 is best)	Source
-------------	------------------------------------	--	--------

Buffalo City	5/9	6/9	World Bank Doing Business
Cape Town	1/9	1/9	
Ekurhuleni	6/9	4/9	
eThekweni	2/9	2/9	
Johannesburg	3/9	8/9	
Mangaung	4/9	7/9	
Msunduzi	8/9	3/9	
Nelson Mandela Bay	9/9	5/9	
Tshwane	7/9	9/9	
South Africa ( <i>country rank</i> )	109/190	96/190	World Bank Doing Business
Variation in local government capability is proxied through measures from the World Bank Doing Business Report with conclusions as to business-local government engagement validated against observer opinion and government-led research.			

**6 Government delivered incentives are important sources of support for emerging and established digital businesses.** There is a **large but improving gap** in this measure. The South African government has an estimated 244 business incentives in the form of direct and indirect grants and subsidies which equated 3% of national budget in 2019<sup>56</sup>. These incentives are considered competitive, attractive and well aligned with national objectives.<sup>57,58</sup> However, there is concern that these programmes are inadequately coordinated and less effective than comparator countries, that they tend to prioritise established business as opposed to emerging business and do not systemically complement each-other<sup>59</sup>. In addition there is a lack of business awareness of incentives, underperformance in approval and application processes, and a lack of evidence led design.<sup>60</sup> Four examples of incentives are detailed below while educational incentives are discussed in the Human Capital pillar and export incentives in the Constructing Ecosystems pillar.

- Firstly, *broad-based black economic empowerment (BBBEE)* seeks to redress apartheid induced inequalities. Business 'scorecards' determine access to government contracts through the Preferential Procurement Policy Framework Act. While it is challenging to quantify the social effect of the policy, anecdotal evidence reveals that there are significantly more previously disadvantaged business owners. The policy has been criticised for potentially creating a new elite as opposed to achieving broader economic transformation.
- Secondly, *the Foreign Investment Grant (FIG)* supports international manufacturing firms seeking to operate in South Africa. The FIG offers a cash grant which is the lesser of 15% of the value of new capital and equipment or the total relocation costs incurred by moving capital and equipment to a maximum of ZAR 10 million.
- Thirdly, *the Section 11D R&D tax incentive* allows a 150% tax deduction on expenditure on research on an invention, or on new or improved product designs. This is a competitive policy when benchmarked to innovation leaders. The incentive has been effective in driving product innovation in business. Despite this severe backlogs in the approval process are significantly limiting uptake.
- Finally, *the section 12J venture capital fund* incentive is funnelling investment towards employment creating SMMEs. The incentive is rapidly growing in popularity and scale, and allows individuals, corporates and funds investing in qualifying venture capital companies

(VCCs) to offset their income tax burden by 45% of the investment. A forthcoming review of the fund will determine whether the economic benefits outweigh foregone tax revenues and understand the degree to which funding is diversified.

Select Measurements from Appendix	Score	Source
Share of national budget allocated to incentives (%)	3%	UN eGovernment Survey
Maximum R&D Tax Deduction (% of investment)		
<i>South Africa</i>	150%	
<i>Brazil</i>	200%	Deloitte
<i>China</i>	75%	
<i>Russia</i>	150%	
<i>India</i>	15%	
11D fund applications adjudicated (number)		
2014	97	Standing Committee of Finance
2012	218	
Share of companies attributing new products to the 11D tax incentive (%)	75%	National Advisory Council on Innovation
Value of 12J tax relief (% of investment)	45%	
Estimated number of 12J funds:		
2015	30	SAVCA; Online Media
2018	>100	
Estimated value under 12J management (ZAR)	ZAR 3.6 billion	SAVCA; Online Media; Genesis Analytics

## Government as a regulator of markets

**7 Competition policy will have to reflect the drastic impact digital firms and disruptors have on market competition and structure.** There is a **material and improving gap** in this measure. South African competition policy and its enforcement is of a high quality and has contributed to an environment that promotes innovation.<sup>61</sup> With the emergence of powerful digital firms and disruptors, OECD research advises competition commissions to play an increasingly active role by conducting more frequent market inquiries and shift the burden-of-proof onto digital incumbents who must demonstrate that their actions are pro-competitive - even in the absence of confirmed consumer welfare losses.<sup>62</sup> The Competition Amendment Bill strengthens the Competition Commission of South Africa's (CCSA) powers to conduct independent market inquiries and shifts the burden-of-proof to dominant firms that must demonstrate that pricing is not anti-competitive.

The assessment of this condition relies on interpretation of policy changes relative to emerging best practice. The quality and effect of South African competition policy and oversight draws from general sentiments and an innovative empirical study. A small set of indicators of the competition environment are available for international comparison, however these are aggregated indexes and open to interpretation.

**8 Labour market regulation should be dynamic and provide adequate rights to emerging and non-traditional forms of labour.** There is a **large but improving gap** in labour market regulation. Impending and established labour market legislation such as the national

Labour market composition is available annually and is robust. Labour union effectiveness however requires deeper research to unpack its economic impact while enforcement data tends to be dated. Assessing labour regulation dynamism relies on interpretation of case law while pressure to cater for non-traditional forms of labour is proxied for by rising intensity in public debate and academic research into the topic.



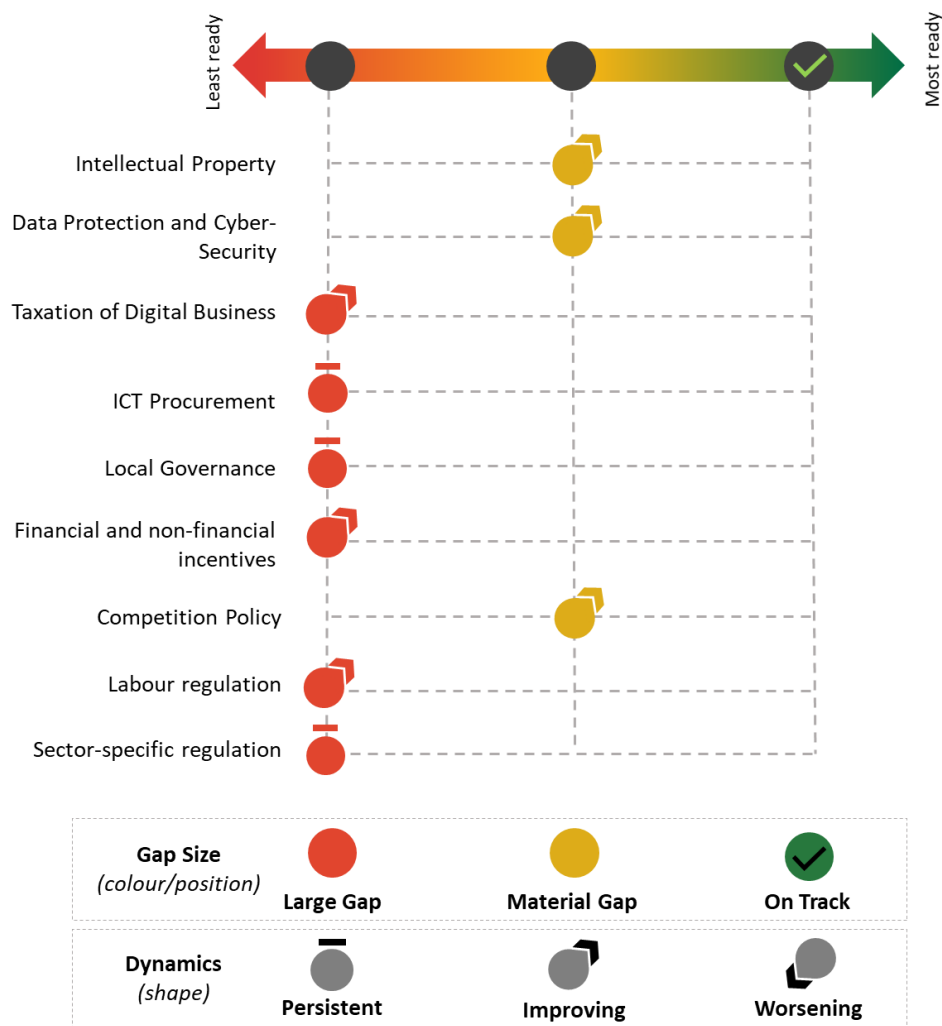
Minimum Wages Act, R204, and the Labour Regulations Act all demonstrate the capacity for labour regulation to adapt to changing conditions and cater for non-traditional workers. This is coupled with the protection of collective action which disciplines business to operate in the interests of workers. Regardless of this dynamism, gig-economy workers remain excluded from the ambit of labour protection provided to 'employees'. Furthermore, compliance to regulation is imperfect due to a lack of capacity in monitoring and enforcement<sup>63,64</sup>.

**9 Sector specific regulation needs to cater for disruptive and innovative business models while guarding the wellbeing of consumers.** There is a large and persistent gap in this measure as regulation in a representative sample of 3 sectors either disadvantages digital firms, creates unrealistic expectations for firms or outright prevents them from operation. In the *transport sector*, the National Land Transport Amendment Bill places the job security of drivers of e-hailing services such as Uber at risk by requiring all drivers obtain an operating license. The decision appears agnostic of local government ability to implement - drivers currently seeking to obtain permits from local authorities are often unable to do so with backlogs extending as far as 18 months while temporary licenses are not provided during the application process. In the *hospitality industry* the Tourism Amendment Bill will extend regulation to Airbnb by including short term home rentals. This will empower the minister of tourism to establish regulatory requirements for platform participants including inspections and audits, licenses, insurance and certificates, limits on the number of nights a guest may stay and what business hours they may operate, how much a home-owner may earn and what zones home-owners may operate in. The regulation has come under criticism for placing significant compliance pressures on home-renters and follows lobbying by the Federated Hospitality Association of South Africa (Fedhasa) and the Tourism Business Council of South Africa (TBCSA). Finally, in the *financial services sector*, regulators have adopted a cautious approach to regulating emerging digital firms. South African regulators frequently engage with emerging digital firms, have established an Inter-Governmental Fintech Working Group, and are investigating a potential sandbox for experimentation. These all allow assessment of the regulatory and market impact of potential innovators. While promising, the stringency of financial services regulation and the lack of bespoke regulation for innovative firms limits innovation in socially beneficial areas such as crowdfunding and P2P lending.

The assessment recognises the broad range of sector specific regulations and the nuances of competitive and innovative forces of specific markets. The representative sample was elected as it reflects areas wherein there are instances of innovation. The assessment furthermore recognises the vital role regulators have in guarding consumer wellbeing, however balances this against being open to and realistic in regulating digital firms.



## Summary of gap analysis



**The government category directly affects access to economic opportunity for businesses, consumers and workers.** Government sits at the intersection of business, labour and civil society. Enabling access to opportunity is therefore core to government's objective of redressing past inequalities and achieving equity and prosperity moving forward. The pillar can incentivise the emergence and scaling of digital firms, improve the competitive landscape for emerging firms through competition policy and local government and assist in the scaling of digital businesses through procurement. For consumers, competition policy can inhibit exploitation while regulation around data and cyber-security protect consumers who might be unaware of the relevance of their digital footprints. Sector-specific regulation achieves similar outcomes by requiring digital firms operate with the same responsibility to its customers as traditional firms. Government also has a vital role in impacting access to opportunity for labour by empowering and guarding emerging forms of workers.

**The government pillar indirectly affects access to opportunity by enabling mechanisms along all other pillars.** Government entities define the nature and extent of taxation which

can be used to finance activities that support national objectives. For the innovative business pillar, this may play out in terms of government funding for start-ups, tax incentives to direct early stage funding to start-ups and incentives that direct funding towards innovation and R&D. For the human capital pillar, funding can be used to reduce financial barriers to educational pathways for key groups. Competition policy comes to impact the universal digital access pillar by preventing anti-competitive behaviour and predatory pricing. This and financial incentives support the emergence of new businesses that improve access to digital economic opportunities. Finally, in the constructing ecosystems pillar, government is a key participant.

**Although there are numerous large gaps with little evidence of improvement, there are no measures deteriorating and the majority of measures are improving.** Large gaps in the pillar range from a national to a local level. Of concern are gaps in government internal capabilities which reduce the effectiveness of procurement, local government engagement with business and taxation. These factors are important touch-points between government and business. While financial incentives are wide-ranging, they are not systematically structured and often have uncertain impact as they lack evidence led design. Elements key to a knowledge economy such as IP regulation, data and cyber-security laws and competition policy are areas of high performance illustrating South Africa's ability to cater for emerging trends and innovations. However, performance in these areas is at odds with sector-specific and labour regulation which have struggled to adapt to emerging forms of work and business.

**Government suffers from weaknesses in its ability to execute upon policy and comply with internally developed processes.** Assessment of the pillar suggests government is aspirational as reflected in the high quality of policy and targets. The efficient and effective execution on policy is arguably a significant stumbling block. Government suffers from a lack of compliance with internally developed processes which impacts its ability to engage with business at a national and local level. In addition, gaps in the government pillar are partly driven by a lack of coordination, and cautious or heavy-handed responses to digital firms which can rely on the logic of pre-existing regulation and overlook the economic peculiarities of these firms.

.

---

<sup>45</sup> WEF (2017). Global Information Technology Report

<sup>46</sup> IP Unit (2017). Innovation and Intellectual Property in South Africa: The Case for Reform

<sup>47</sup> IP Unit (2017). Innovation and Intellectual Property in South Africa: The Case for Reform

<sup>48</sup> Sophos (2018). POPI Survey Report

<sup>49</sup> Botha et. Al. (2015). The Effects of the POPI Act on Small and Medium Enterprises in South Africa

<sup>50</sup> ITU (2018). Global Cyber-Security Index.

<sup>51</sup> Online Media (NY)– *Tech Giants Tax Avoidance hurts South Africa's Media* – Tax Consulting

<sup>52</sup> UN (2018) e-Government Development Index

<sup>53</sup> OurWorld in Data (2019)

<sup>54</sup> Department of Cooperative Governance and Traditional Affairs (2016). Integrated Urban Development Framework.

<sup>55</sup> Tshwane (2019) - *Fraud, poor governance' cause municipal crisis* – Online Media - Mail and Guardian

<sup>56</sup> Department of Planning, Monitoring and Evaluation (2018). Report on the Evaluation of Government Business Incentives.

<sup>57</sup> Barbour (2005). An Assessment of South Africa's Investment Incentive Regime with a Focus on the Manufacturing Sector

<sup>58</sup> Department of Planning, Monitoring and Evaluation (2018). Report on the Evaluation of Government Business Incentives.

<sup>59</sup> Department of Planning, Monitoring and Evaluation (2018). Report on the Evaluation of Government Business Incentives.

<sup>60</sup> Department of Planning, Monitoring and Evaluation (2018). Report on the Evaluation of Government Business Incentives.

<sup>61</sup> Truen & Rateiwa (2017) Competition Policy and Innovation: What does evidence in South Africa Show?

<sup>62</sup> OECD (2019). Competition Policy for the Digital Age

<sup>63</sup> Murahwa (2016). Monitoring and enforcement: strategies to ensure an effective national minimum wage in South Africa

---

<sup>64</sup> Chayya (2018). Towards the creation a fair ride-hailing industry: Should South African labour law regulate the Uber relationship?

# Innovative Business



For innovation to occur and digital opportunities to be realized, South Africa's private sector must be well positioned to create and apply innovation processes and technologies. The Innovative Business category firstly looks at the availability of **innovation finance**. It thereafter reviews three areas that make innovation finance effective: firstly, **non-financial innovation support** assesses the effectiveness of the start-up ecosystem and business appetite for open architecture; secondly, **innovation culture** assesses the innovative capabilities of entrepreneurs and corporates; finally, **attitudes to technology** investigates business access to and willingness to deploy technology.

**To create and scale digital opportunities, businesses of all maturities require access to capital and incentives to invest in R&D.** This financing may come from several sources. Firstly, start-ups require early stage and seed funding. This may include venture-capital and private-equity, angel investors or alternative sources such as crowdfunding. Secondly, established firms require access to functional debt markets and the means to raise funds through capital markets. Thirdly, businesses and government are independent sources of R&D investment by committing their own funds to innovation. In leading innovative nations, the business sector tends to be the champion source of investment in R&D. Direct investment needs to be of a sufficient scale and be targeted to maximize pay off in areas where South Africa has a competitive advantage and where there are social development prospects.

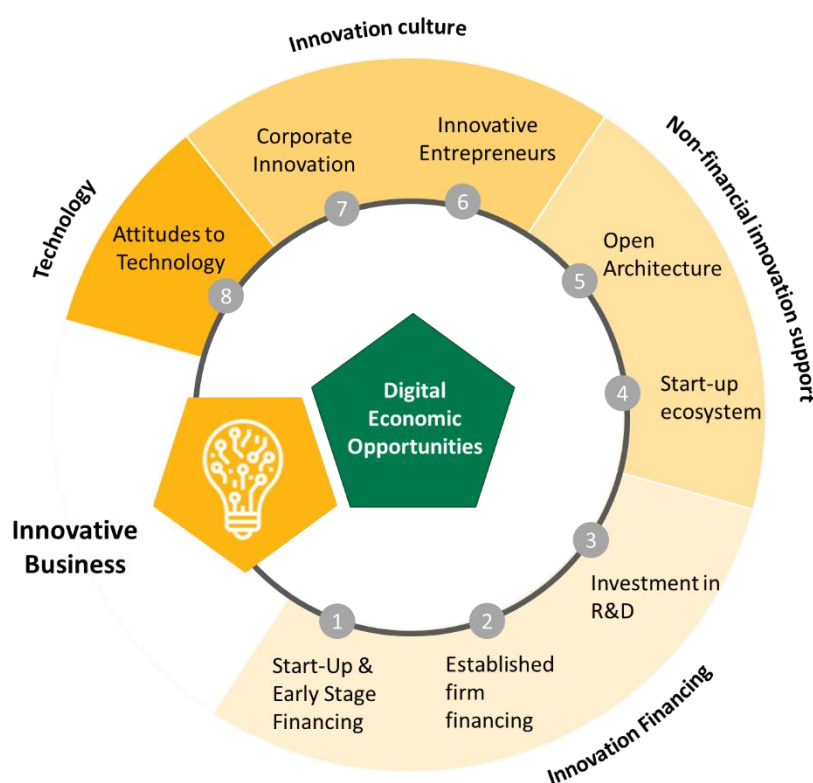
**A well-functioning start-up ecosystem and appetite for open architecture are key to scaling new business models, services and products.** These two forms of non-financial innovation support are important for both emerging and established businesses. A start-up ecosystem which can provide mentoring, networks and business model refinement can lead to the scaling of profitable disruptive and tech businesses. A major challenge for digital platforms is developing revenue models which are sustainable and commercially viable. Some of the best-known examples of digital platforms, such as Uber, are still unprofitable and require massive capital investments to continue operating. There are many trade-offs that these platforms need to manage such as subsidizing the cost of services to win customers while managing the demand for platform participants to receive a fair portion of fees and the need to deliver returns for investors. A well-functioning start-up ecosystem can support start-ups in solving these challenges. In contrast to servicing consumers directly, start-ups can provide established businesses with innovative products, services and processes. Open architectures which enable Between business collaboration provides corporate firms with new innovations and ideas and start-ups with access to large consumer markets, capital and mentorship. Collaboration not only occurs between businesses but can also occur between business lines in a single entity, and between business, academia and service providers.

**A business culture of innovation can lead to the emergence, execution and scaling of new digital opportunities.** The digital age provides entrepreneurs with access to previously inaccessible markets and the means to scale businesses rapidly. Some of the most successful

exponential businesses are execution on individuals' ideas and not designed by incumbent corporate firms. Entrepreneurs with positive attitudes, a willingness to embrace risks and an eye for opportunity can leverage the tools offered by the digital age and become sources of employment. Likewise, corporates require innovation processes that align with business objectives which enable agile development and the scaling of new products and processes. This requires institutional flexibility, digital maturity and a 'fail fast' mindset. Corporate leadership that recognise the value of innovation, and its limits and opportunities are better positioned to unlock resources and avoid wastage.

**Businesses of all sizes and maturities require positive attitudes to digital technologies and a willingness to deploy them when appropriate.** Accessing and leveraging the opportunities of the digital age often requires technology and the ability to tap into digital networks. These technologies may help firms better service their customers, reduce the costs of operation or assist business expansion. Emerging and established firms both require access foundational technologies such as payments integration and cloud computing to frontier technologies such as IOT or AI. The availability of technology needs to be matched with an appetite for their deployment. The effective deployment of technology is depressed by risk adversity, a lack of understanding of the value technology can provide and the absence of deployment skills or service providers.

The specific readiness conditions to be measured are listed in the diagram below, and a summary of the measurement for each condition follows thereafter. The full detail of the condition measurement is available in Appendix IV.



## Innovation Finance

**1 Start-up and early-stage finance provide emerging firms that have high growth potential with the means to scale newly developed products and processes.** There is a **large but improving gap** in this measure. South African start-ups have access to local capital offered by an emerging venture capital (VC) and private equity (PE) sector and growing angel investor network. This is complemented by growing interest from international investors<sup>65</sup>. Despite this, seed and early-stage financing is in shortage in the USD 50k to USD 500k range<sup>66</sup>. The PE and VC sectors are well run and expanding, have a good history of performance and exits with access to VC capital considered above global averages.<sup>67,68</sup> The Section 12J tax incentive has been key in the growth of VC funding, providing an attractive tax deduction that motivates investment in VC firms targeting employment creating SMMEs. The incentive has grown rapidly in use - the estimated 30 12J funds in 2015 accelerated to over 100 in 2018, becoming a non-negligible source of finance at approximately R1.5 billion under management.<sup>69,70</sup> On the demand side, there is a gap in entrepreneur ability to secure funding due to unrealistic valuations and insufficiently developed strategies.<sup>71</sup> In terms of alternative finance, the most common crowdfunding models are in direct infringement of multiple financial services regulations. Subsequently only a handful of innovative crowdfunding models have emerged.

Select Measurements from Appendix	Score	Source
Share of firms receiving VC funding (%)	49%	VC4A
Average VC funding value (USD)	USD 253,488	VC4A
Number of direct funders (No.)	71	ANDE
Share of direct funders that are foreign (%)	30%	ANDE
Share of start-ups receiving local funding (%)	41%	VC4A
Share of start-ups receiving international funding (%)	14%	VC4A
Share of start-ups receiving combined funding from local and international funders (%)	45%	VC4A
Venture Capital Availability (country rank)	47/139 (1 is best)	WEF Global IT Report
VC investments made (2017) (ZAR)	R1,160 million	SAVCA
PE Growth rate (1994 – 2017) (CAGR)	9.4%	SAVCA
PE funds under management (2017) (ZAR)	R158.6 million	SAVCA
Value of 12J tax relief (% of investment)	45%	

**2 Established firms seeking to expand operations or develop new products and business lines have access to a high-quality banking sector and mature capital markets.** This measure is **on track**. South Africa has a world-class financial system which ranks 18 of 140 markets in its efficiency, trustworthiness and confidence.<sup>72</sup> There is a deep availability of credit, with domestic credit provided to the private sector estimated at 144% of GDP - in line with OECD averages<sup>73</sup>. South Africa's banking sector is a key financier of this credit at 66% of GDP and nearly 10% above global averages<sup>74</sup>. The banking sector is robust given its strong regulatory and legal framework and is competitive with a host of well-established and emerging institutions. South Africa's capital markets are significant relative to global benchmarks with listed domestic companies' market capitalisation second only to Hong Kong<sup>75</sup>. South Africa subsequently ranks 25<sup>th</sup> globally in ease of raising capital through the public sale of shares.<sup>76</sup> Alternatives to the incumbent JSE such as ZAR X and 4 Africa Exchange are gaining traction.<sup>77</sup>

Select Measurements from Appendix	Score	Source
Financial System Index ( <i>country ranking</i> )	18/140 (1 is best)	WEF Global Competitiveness Index
Domestic credit to private sector as share of GDP (%)	144%	World Bank
Domestic credit to private sector as share of GDP ( <i>country rank</i> )	10/??	WEF Global Innovation Index
Bank credit to private sector (% of GDP)	66%	World Bank
Bank credit to private sector – Global average (% of GDP)	53%	World Bank
Lafferty Ranking of South African ( <i>country ranking</i> )	6/38 (1 is best)	Lafferty
Soundness of banks ( <i>country rank</i> )	37/137 (1 is best)	WEF Global Competitiveness Index
Listed domestic companies market capitalisation (% of GDP)	321%	World Bank
Integrated Reporting Quality Ranking ( <i>Country rank</i> )	1/10	International Integrated Reporting Council
Ease of raising capital through issuing shares on the stock market ( <i>country rank</i> )	25/137	WEF Global Competitiveness Index

### 3 Investment in R&D and innovation can unlock new forms of value and employment.

There is a **small and deteriorating gap** in investment in R&D. As of 2017, GERD was 0.77% of GDP – akin to global and Indian averages however substantially far below top performing BRICS nations and the OECD average of 2.5%<sup>78</sup>. Government have set ambitious targets for GERD, seeking to double spend to 1.5% of GDP by 2020.<sup>79</sup> Government accounted for 44% of gross expenditure on R&D in 2015 – nearly 10% higher than a sample of 36 countries including OECD benchmarks.<sup>80</sup> The business sector contributed 38.9% to gross expenditure on R&D in 2016, placing South Africa at 37 of 63 countries in business share of government expenditure on R&D (GERD) and slightly below sample averages.<sup>81,82</sup> Business' share of R&D has slid by 3% since 2012.<sup>83</sup> In high performing innovative nations, R&D is driven by the business sector with business share in GERD generally far higher than in South Africa. With local returns to R&D exceeding those in France the USA and OECD averages, South African firms appear risk averse.<sup>84,85</sup> This risk adversity may be a function of declining business confidence which depresses business investment<sup>86</sup>.

Select Measurements from Appendix	Score	Source
GERD (% of GDP; 2015):		
South Africa	0.77%	UNESCO
Brazil	1.34%	
Russia	1.09%	
India	0.61%	
China	2.05%	
OECD Average	2.5%	
Government share of GERD (%)		
South Africa	44.6%	UNESO
Brazil	33.56%	
Russia	68.17%	
China	20.03%	
Sample Average (68 markets)	45.62%	
Business share of GERD (%; 2016):		
South Africa	38.9%	UNESO, DTI
Brazil	45.04%	
Russia	28.1%	
China	76.05%	
Sample average (63 countries)	38.44%	

Business returns to R&D (%): <i>South Africa</i> <i>France &amp; United States</i> <i>Taiwan</i>	118% - 294% 28% - 78% 8% - 35%	World Bank
Business Confidence Index ( <i>Index</i> ) <i>South Africa</i> 2012 ( <i>June</i> ) 2018 ( <i>June</i> )	109.9 93.7	SACCI BCI

## Non-financial innovation support

**4 A start-up eco-system that provides non-financial capacity development is required to support the sustainability of start-ups and translate ideas into tangible proofs of concept.** There is a **small and improving gap** in this measure. South Africa has the most mature and robust start-up ecosystem on the continent comprised of nearly 100 providers of capacity building and support across the lifecycle of business.<sup>87,88</sup> The community of incubators, accelerators and shared working space collectively meet five key criteria for this system to be effective: there is access regardless of industry; support spans the start-up lifecycle and range of start-up requirements; there are efforts to broaden access beyond urban centres; support provided by the ecosystem is of a high quality, and; the ecosystem facilitates access to capital with ecosystems participants more likely to access funding and generally receiving 3 times the value of funding than their non-participant counterparts.<sup>89</sup> Access to networks, mentoring, marketing, and business strategy/planning are the most common forms of capacity development provided to emerging business while investor matchmaking and showcasing are uncommon.<sup>90</sup> The performance of the ecosystem may be improved through an ecosystem coordinator, skills and capacity training for ecosystem service providers and a focus on internationalisation.<sup>91,92</sup>

The assessment drew on industry reports and research conducted by a renowned multi-national entity that conducts research on and advocates for entrepreneurs. Findings are a strongly guided interpretation of available anecdotal evidence regarding the scale and perceived quality of the ecosystem.

**5 Business adoption of open architectures that facilitate collaboration with other enterprises and access to support networks are important sources of new ideas and capabilities.** There is a **small and improving gap** in business open architecture. At nearly 90% of surveyed business, South African corporates rank above global averages in the desire to collaborate with emerging business, are intent on learning from competing firms, service providers and academic institutions and rank 59 of 126 countries in innovation linkages and business willingness to collaborate for ideas and research.<sup>93,94,95</sup> This has seen the emergence of open innovation platforms and recognition by innovation leaders that these are key sources of co-creation and ideation. This has been coupled with opening institution data architectures. South African enterprise scores far above global averages in knowledge sharing within business and between business functions.<sup>96</sup>

Select Measurements from Appendix	Score	Source
Share of business actively engaging with external sources for new ideas – RSA; Global Avg. (%)	66%; 59%	PWC Global Digital IQ Survey
Innovation Linkages ( <i>country rank</i> )	59/126 (1 is best)	WEF Global Innovation Index
Business University collaboration ( <i>country rank</i> )	28/126 (1 is best)	WEF Global Innovation Index



Share of large firms affirming importance of collaboration (%)	89%	Accenture Open Innovation & Digital Collaboration Report
--	-----	--

## Innovation Culture

**6 Innovative entrepreneurs are a key source of new products, services and business models and can create significant employment opportunities if given the opportunity to scale.** There is a **small and improving gap** in the innovation culture of South African entrepreneurs. South African entrepreneurs are innovative with 48% believing they produce products that are new to some or all customers and 43% believing their products differ from those offered by other businesses. This is above continental averages.<sup>97</sup> The GEDI assessment of the South African ecosystem suggests there are no gaps in entrepreneurial capacity for product and process innovation.<sup>98</sup> South African entrepreneurs are primarily opportunity motivated and therefore interested in the creation of value and the pursuit of growth. These innovative entrepreneurs have positive attitudes, and rank second on the continent and 55<sup>th</sup> of 137 countries in their attitudes, aspirations and abilities.<sup>99</sup> These capabilities have translated into an emerging ICT start-up community<sup>100</sup>. Despite these innovative qualities and an emerging digital orientation, the scale of South African entrepreneurial activity ranks poorly relative to competitors while shortfalls in entrepreneur skills persist.

Select Measurements from Appendix	Score	Source
Total early stage entrepreneurial activity (TEA) (% of adult population)	6.9%	GEM
TEA (country rank)	52/65 (1 is best)	GEM
Share of TEA that are opportunity motivated (%)	74.4%	GEM
Share of TEA that believe that their product is new to some or all customers (%)	47.9%	GEM
Share of TEA that believe that product is new to some or all customers – African Average (%)	42.6%	GEM
Global Entrepreneurship Index (Attitudes, Abilities, Aspirations) (country rank)	55/137 (1 is best)	GEDI Entrepreneurship Ecosystem of South Africa

**7 South African corporates require a sophisticated approach to innovation that aligns with business objectives and makes necessary resources available.** There is a **small and improving gap** in corporate innovation culture. South African corporates are in the early to middle stages of the innovation process maturity cycle.<sup>101</sup> These stages reflect a growing entrenchment and genuine institutional vision for innovation and an innovation strategy that aligns with and supports broader business strategy.<sup>102,103</sup> This processes is in evolution - 85% of Accenture surveyed firms are deploying dedicated innovation teams while the majority of business consider innovation a strategic imperative and have innovation targets appear in business plans.<sup>104,105</sup> The bulk of local firms are in the middle stages of digital maturity - generally higher than global averages – and are therefore well positioned to pursue and leverage digital innovations.<sup>106</sup> These firms have leaders who are enabling innovation and are a strength in established business' innovation landscape<sup>107,108</sup> Leadership commitment to innovation is supporting business competitiveness, however surveyed business suggests the innovation competencies of leaders are sometimes inadequate and can create obstacles.<sup>109</sup> South

African CIOs and CEOs are also believed to score below continental and global averages in their perceived ability to assimilate new technologies into an organisation<sup>110</sup>. South African enterprise recognise the role an agile workforce plays in enabling innovation and are in the early stages of embracing flexible work arrangements and on the job learning<sup>111</sup>.

Select Measurements from Appendix	Score	Source
Share of businesses in stage of innovation maturity (%)		
<i>Ad Hoc</i>	14%	CLC South Africa Innovation Capabilities Report
<i>Emerging</i>	44%	
<i>Define</i>	34%	
<i>Integrated</i>	8%	
<i>Optimised</i>	0%	
Business Innovation Capabilities Index (Index):		
<i>Innovation Strategy</i>	4.04 (6 is best)	CLC South Africa Innovation Capabilities Report
<i>Linkages</i>	3.97 (6 is best)	
<i>Innovation Process</i>	3.81 (6 is best)	
<i>Organisation</i>	3.79 (6 is best)	
<i>Innovation Learning</i>	3.78 (6 is best)	
Share of businesses in stage of digital maturity - RSA; Global Avg. (%):		
<i>Digital Laggards</i>	6%; 9%	Dell Digital Transformation Index
<i>Digital Followers</i>	24%; 30%	
<i>Digital Evaluators</i>	39%; 33%	
<i>Digital Adopters</i>	23%; 23%	
<i>Digital Leaders</i>	5%; 8%	
Share of managers considering innovation a business opportunity (%)	96.6%	Steyn & Bell, Univ. of Stellenbosch
Share of managers the perceive innovation as a strategic business priority (%)	78.9%	Steyn & Bell, Univ. of Stellenbosch
Share of businesses that have innovation objectives appear in business plans (%)	52.9%	Steyn & Bell, Univ. of Stellenbosch
Share of businesses considering a fluid workforce a means to improve innovation performance (%)	76%	Accenture

## Attitudes to technology

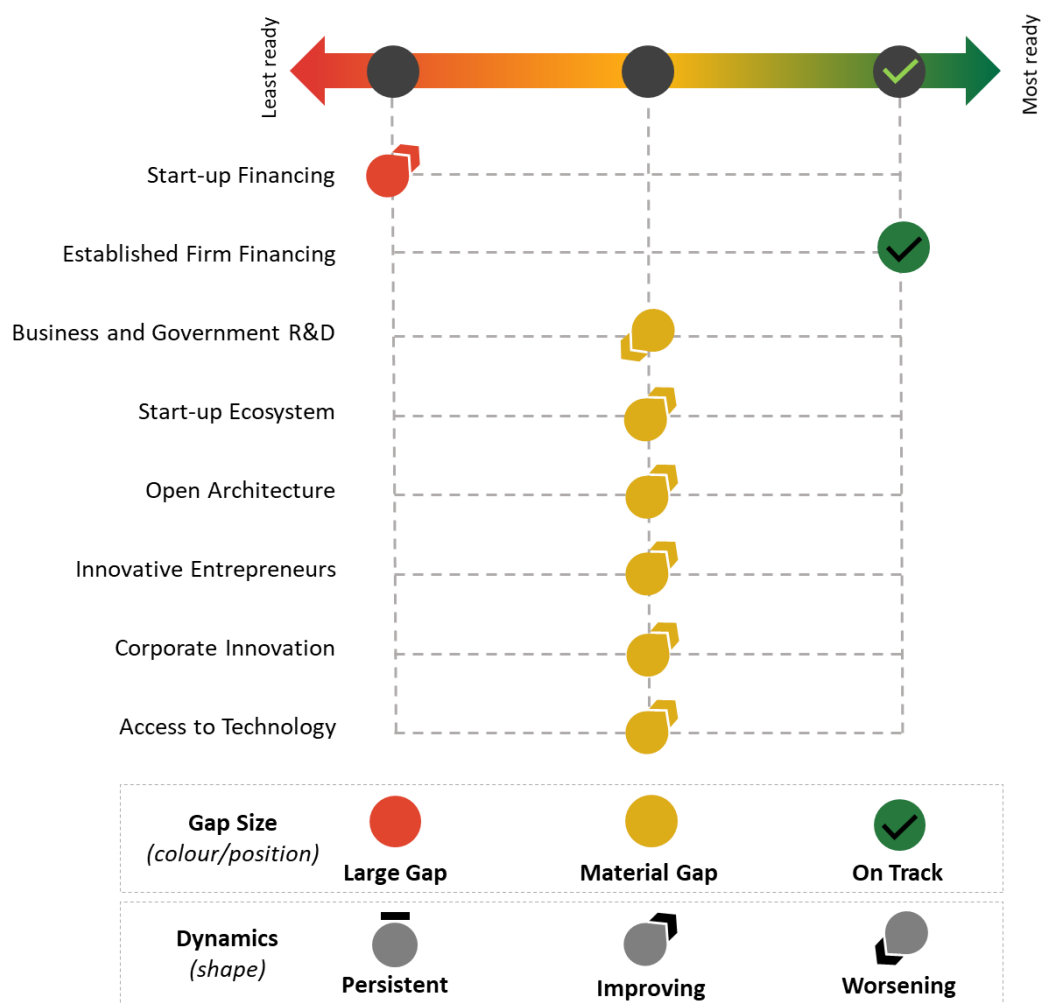
**8 South African businesses need to have ready access to and positive attitudes towards technology so that it can be effectively used to improve productivity and competitiveness.**

There is a small and improving gap in this measure. The Global Innovation Index suggests South African firms are above global medians in access to the latest technology.<sup>112</sup> Local firms are believed to adopt new technologies more extensively than continental competitors and global averages. Despite this, many businesses seem to approach new technology cautiously and adopt a 'wait-and-see' attitude.<sup>113,114,115</sup> Frontier technologies have healthy adoption in a handful of cutting-edge South African firms while corporate attitudes to AI have improved drastically in the last 2 years<sup>116</sup>. Across all frontier technologies (with the exception of robotics) cost was not the most common impediment to adoption. This implies that deeper factors such as attitudes to innovation, institutional culture and skills are key in unlocking the effective use of technology. Laggard adopters struggle to see the broader benefits these technologies bring such as fundamentally changing production processes or accessing consumer insights. The majority of South African SMMEs have at least basic access to technology with 97% using a smart-phone and 94% access to LTE networks.<sup>117</sup> Technology

enabled SMMEs are well positioned to compete in the digital age and recognise the need to remain technologically relevant with almost 25% making use of the latest technology.<sup>118</sup> However nearly 50% of emerging businesses have little to no new technology orientation and consider technology access a challenge to growth.<sup>119,120</sup> Costs and education are barriers to adoption.

Select Measurements from Appendix	Score	Source
Availability of the latest technology ( <i>country rank</i> )	41/139 (1 is best)	WEF Global IT Report
Firm adoption of the latest technology ( <i>country rank</i> )	28/126 (1 is best)	WEF Global IT Report
SMMEs with no access to smartphones (%)	3%	SME South Africa Landscape Survey
SMMEs with no access to LTE networks (%)	6%	SME South Africa Landscape Survey
Share of SMMEs considering technology access a barrier to growth (%)	50%	SME South Africa Landscape Survey
Share of SMMEs using latest technology – RSA; African Avg. (%)	26%; 26%	GEM
Share of SMMEs using new technology – RSA; African Avg. (%)	29.2%; 19.5%	GEM
Share of SMMEs using no new technology – RSA; Africa Avg. (%)	44.9%; 54.4%	GEM
Share of established business using frontier tech. (%):		
<i>IOT</i>	66.1%	World Wide Worx, Syspro – The Mobile Corporation in South Africa
<i>VR/AR</i>	13.6%	
<i>Big Data &amp; Machine Learning</i>	13.4%	
<i>Robotics</i>	6.2%	
<i>Blockchain</i>	3.2%	
Share of business citing cost is the primary inhibitor to frontier tech adoption (%; <i>average across tech.</i> )	31%	World Wide Worx, Syspro – The Mobile Corporation in South Africa

## Summary of gap analysis



**The innovative business category determines business access to opportunity, creates opportunities for workers when businesses scale and defines the nature of employment created through choices around technology.** The elements that enable emerging businesses to scale are not necessarily in equal supply or equally accessible: incubators and accelerators tend to be concentrated in metros; access to technology which provides access to new markets may be out of reach due to cost, geography or education; the skills necessary to develop innovative business models or products may be in short supply; while finance may be in shortage or directed to a narrow set of firms. Established businesses may face similar challenges in terms of finance. These businesses are sources of employment when developing and deploying innovations and assist emerging firms scale through collaboration. Depending on how these businesses decide to use technology also impacts the way emerging opportunities create employment - technology can substitute low-skill labour for digital processes that are generally developed, deployed and managed by a group of skilled individuals.

**The pillar indirectly effects access to opportunity through its impact on three other pillars.** Enabling the emergence of innovative businesses can improve competition and benefit consumers and workers. In the Universal Digital Access category, geographic barriers to accessing fixed line networks and the high costs of data are partly attributable to poor competitive forces. The innovative business pillar's mechanisms enable the emergence of disruptors such as Rain. These mechanisms can also lead to the emergence of new service providers that improve business and individual access to ICT products and services. The Innovative Business pillar impacts the Human Capital pillar as it is a direct participant. Furthermore, business determines the nature of skills demanded which should inform curriculum design while business hiring norms define who may access work opportunity and reflect perceptions of accreditation quality. Finally, organised business is a key participant in the Constructing Ecosystems pillar.

**The pillar is high performing - the majority of measures are improving and tend to suffer from material as opposed to large gaps.** This reflects the traditional strengths of the South Africa private sector. The private sector appears well positioned to leverage the opportunities of the digital age given the internal capabilities and processes of established and emerging businesses, attitudes to innovation and technology and the existence of well-functioning ecosystems. Subsequently, many businesses in South Africa operate on the cutting edge and are globally competitive. With the exception of investment in R&D, all measures are improving. This measure is deteriorating due to the falling contribution of the business sector.

**Gaps in the pillar are driven by business norms and economic conditions.** Business sentiment has deteriorated significantly over the past decade depressing willingness to engage in risky activity. This is especially reflected in falling business contribution to R&D, and a large share of firms taking a wait and see approach to new technologies. Although business approaches to innovation and the digital age are likely to mature moving forward, risk adversity will slow the process.

---

<sup>65</sup> VC4A (2018) Startup Ecosystem Analysis South Africa

<sup>66</sup> VC4A (2018) Startup Ecosystem Analysis South Africa

<sup>67</sup> VC4A (2018) Startup Ecosystem Analysis South Africa

<sup>68</sup> WEF (2017). Global Information Technology Report

<sup>69</sup> SAVCA (2018). Venture Capital Industry Survey

<sup>70</sup> Buckland (2018) - *Section 12J incentive good start but government can do more* – Online Media - Venture Burn

<sup>71</sup> VC4A (2018) Startup Ecosystem Analysis South Africa

<sup>72</sup> WEF (2018) Global Competitiveness Index

<sup>73</sup> World Bank (2018)

<sup>74</sup> World Bank (2018)

<sup>75</sup> World Bank (2018)

<sup>76</sup> WEF (2018) Global Competitiveness Index

<sup>77</sup> COEFS (2017) The Impact of the 4<sup>th</sup> Industrial Revolution on the South African Financial Services Market

<sup>78</sup> UNESCO (2018). Institute for Statistics

<sup>79</sup> Makoni (2017). – *Government Aims to Double R&D Spend by 2020* – Online Media - University World News

<sup>80</sup> UNESCO (2018). Institute for Statistics

<sup>81</sup> UNESCO (2019). Research & Development Spending

<sup>82</sup> UNESCO (2018). Institute for Statistics

<sup>83</sup> HSRC (2016) South African National Survey of Research and Experimental Development

<sup>84</sup> World Bank (2017). South African Economic Update: Innovation for Productivity and Inclusiveness

<sup>85</sup> World Bank (2018). Innovation activity in South Africa: Measuring the Returns to R&D

- 
- <sup>86</sup> Jongh & Mncayi (2018). An Econometric Analysis on the Impact of Business Confidence and Investment on Economic Growth in Post-Apartheid South Africa
- <sup>87</sup> VC4A (2018) Startup Ecosystem Analysis South Africa
- <sup>88</sup> ANDE (2018). South Africa's Entrepreneurial Ecosystem
- <sup>89</sup> VC4A (2018) Startup Ecosystem Analysis South Africa
- <sup>90</sup> ANDE (2018). South Africa's Entrepreneurial Ecosystem
- <sup>91</sup> ANDE (2018). Gauteng Entrepreneurial Ecosystem Snapshot
- <sup>92</sup> VC4A (2018) Startup Ecosystem Analysis South Africa
- <sup>93</sup> PWC (2017). Global Digital IQ Survey.
- <sup>94</sup> Accenture. (2016). Harnessing the Power of Open Innovation through Digital Collaboration – a \$12 billion Opportunity for South Africa.
- <sup>95</sup> WEF (2018) Global Competitiveness Index
- <sup>96</sup> Dell (2018). Digital Transformation Index.
- <sup>97</sup> GEM (2017). South Africa Report
- <sup>98</sup> GEDI (2017) The Entrepreneurial Ecosystem of South Africa: A Strategy for Global Leadership
- <sup>99</sup> GEDI (2017) The Entrepreneurial Ecosystem of South Africa: A Strategy for Global Leadership
- <sup>100</sup> World Bank (2017) South African Economic Update: Innovation for Productivity and Inclusiveness
- <sup>101</sup> CLC Africa (2018). The State of Innovation Capabilities Report.
- <sup>102</sup> CLC Africa (2018). The State of Innovation Capabilities Report.
- <sup>103</sup> Accenture (2016). *SA Companies slow to innovate, Shows Accenture Innovation Index* – Online report
- <sup>104</sup> Steyn & Bell - USB (2016). South African Management Index Report
- <sup>105</sup> Accenture (2016). *SA Companies slow to innovate, Shows Accenture Innovation Index* – Online report
- <sup>106</sup> Dell (2018). Digital Transformation Index
- <sup>107</sup> CLC Africa (2018). The State of Innovation Capabilities Report.
- <sup>108</sup> PWC (2017). Global Digital IQ Survey.
- <sup>109</sup> CLC Africa (2018). The State of Innovation Capabilities Report.
- <sup>110</sup> PWC (2017). Global Digital IQ Survey
- <sup>111</sup> Accenture (2016). *SA Companies slow to innovate, Shows Accenture Innovation Index* – Online report
- <sup>112</sup> WEF (2018). Global Competitiveness Index
- <sup>113</sup> IT-Online (2018). Citrix Survey - 'Digital Adoption Key for SA Business' – Online Media – IT-Online
- <sup>114</sup> WEF (2018). Global Information Technology Report.
- <sup>115</sup> Online Media (2019) - Accenture & GIBS report of digital competitiveness
- <sup>116</sup> **EY (2018). Growth Ambitions of middle market companies in South Africa rebound on a wave of political optimism**
- <sup>117</sup> SME South Africa (2018). An Assessment of South Africa's SME Landscape
- <sup>118</sup> GEM (2017). A South African Perspective on Entrepreneurship.
- <sup>119</sup> SME South Africa (2018). An Assessment of South Africa's SME Landscape
- <sup>120</sup> GEM (2017). A South African Perspective on Entrepreneurship

# Constructing Ecosystems



Central to the scalability of emerging economic opportunities is the presence of an affordable and high-quality network of support service providers and ecosystem co-ordinations. The Constructing Ecosystems category considers this in terms of the presence of organisations and structures that act as ecosystem stewards and improve South Africa's capabilities to market to global demand.

**Business-to-business coordination can improve the visibility of industry value propositions and help direct efforts at deepening and marketing these to global markets.** Business associations, support organisations and councils provide platforms for businesses to collectively identify and respond to industry weaknesses and opportunities and communicate strengths and capabilities. This private sector coordination helps industry curate, develop and market industry-level value propositions which assist in leveraging emerging global opportunities. This would require market intelligence on South Africa's specific competitive advantage which is more effectively developed at an industry level. For the GBS and frontier technology opportunities, this is particularly important given intense international competition and the need to differentiate South African capabilities.

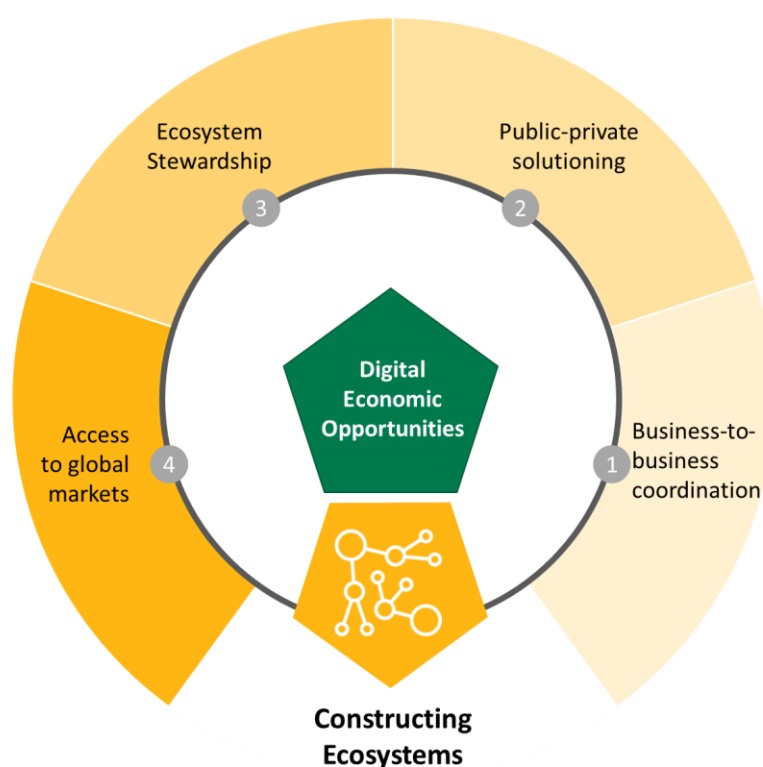
**Public-private solutioning allow public and private sector stakeholders to co-develop industry strategies and solutions to problems constraining inclusive growth.** Channels for cooperation and communication between government and business are important means of aligning efforts and effectively directing them towards emerging high growth and employment opportunities. Business is positioned to understand and communicate private-sector barriers to opportunity and government made aware of what bottlenecks need to be alleviated and what the outcomes of this alleviation are. This is important across all opportunities and a national imperative.

**Ecosystem stewards that observe and communicate market signals between stakeholders can help align interests and lead to collective problem solving.** These intermediary organisations may be private or public sector led, may be social enterprises and may include researchers, consultancy service providers, and partnership brokers. These entities are important means of unlocking funding and resources, creating common agendas, coordinating efforts and negotiations and providing common understanding between stakeholders. Ecosystem facilitators play different roles within different opportunities. For GBS, for example, an ecosystem coordinator would also be critical in creating an efficient skills matching system between business and talent development agencies while for frontier technology they are vital in identifying business skills demand and creating pipelines of talent that meet these requirements.

**For South Africa to tap into the global market it requires effective marketing of national and industry level value propositions.** BrandSA and Invest SA are examples of government-led marketing vehicles that communicate South African industry's value proposition. Private

sector-led, public sector-led or public-private-partnership led vehicles may be equally or more effective. Marketing business capabilities to the global market would typically take the form of an in-country visit such as presenting at a tech expo or leveraging an in-country partnership. For example, for GBS it may be necessary to leverage an in-country partnership through a broker that has a good knowledge of local GBS capabilities. This would require access to funding requirements and the ability to leverage broker relationships, particularly for emerging providers. There is also a need to create direct relationships with the offshoring companies that use major international BPOs to decide on offshore destinations. This requires South African industry representatives that can create those relationships and maintain them for a longer-term positioning of South Africa as a desirable offshoring destination.

The specific readiness conditions to be measured are listed in the diagram below, and a summary of the measurement for each condition follows thereafter. The full detail of the condition measurement is available in Appendix IV.



**1 Having a cooperative and well-organized private sector allows industries to gather market intelligence and craft a competitive and specific value proposition.** Industry coordination in South Africa suffers from a **large and persistent gap**. There is a relatively well-developed organized business community with a large presence of industry and apex business associations. However, it is not clear whether these associations have taken the responsibility to coordinate businesses to market to the global market.<sup>121</sup> The BPS association BPESA provides an example of high performance by sourcing market intelligence and crafting a value proposition that can be marketed to global players. The apparent lack of industry



coordination is evident in the fact that most market intelligence practices are at a firm level.<sup>122</sup> There is little progress being made to close this significant gap.

The measure relies on a base of anecdotal evidence and academic publication, both validated against stakeholder insights. The assessment acknowledges that BPESA may not be the sole entity successfully playing a coordinating and intelligence sourcing role. However, in the absence of visible alternatives, it is feasible to conclude that entities playing similar roles are scarce.

**2 Effective co-ordination between the public and private sector assist in identifying and removing policy and regulatory blockages to take up economic opportunities.** Public private solutioning in South Africa has a large though improving gap. South Africa has a number of institutions and ad-hoc structures designed to facilitate public private engagement, such as the National Economic Development and Labour Council (NEDLAC) and its recent Presidential Jobs Summit. However, these institutions and structures are often not effective at arriving at solutions for specific areas of opportunity given the nature of nationally-representative consultation.<sup>123</sup> A recent development in South Africa is aiming to address this issue directly. The Public Private Growth Initiative (PPGI) brings together business and government leaders in specific sectors to design 5 year growth strategies in each sector by identifying specific projects and the public sector enablers required for them to scale. This provides a more effective means to unlock specific opportunity as opposed to instituting broad developmental processes.

The measure captures the complexities of decision making within multi-agent systems through readings of regulation and observation of developments in the market. The nature of the measurement means data related evidence would need a highly accurate focus to be meaningful.

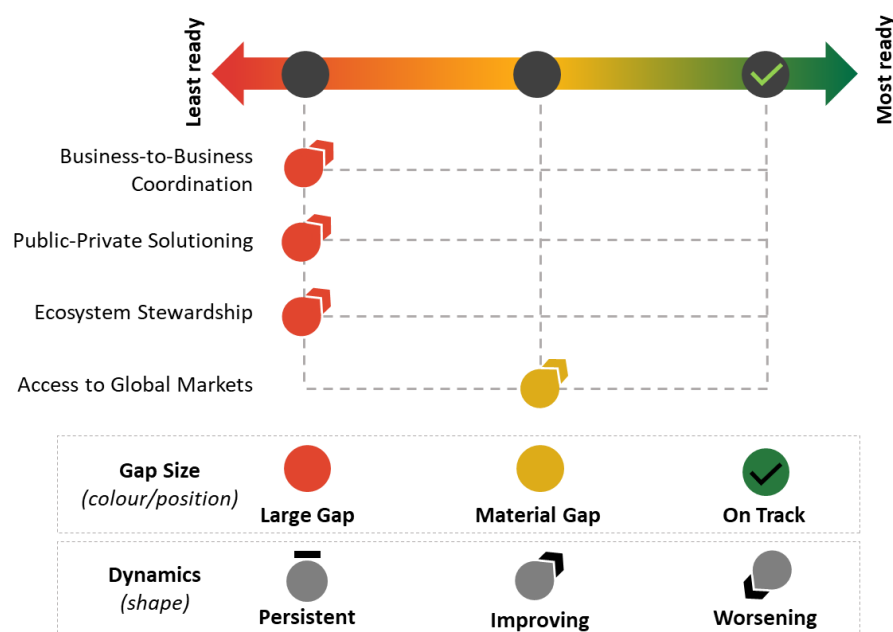
**3 Organisations that can catalyze cross-sectoral partnerships and develop common agendas for change play an important role in realizing economic opportunities.** Ecosystem stewardship in South Africa has a large though improving gap. South Africa has a number of organisations playing this ecosystem stewardship role across a number of areas and with a mix of models.<sup>124,125</sup> However, these organisations are not widespread and could be replicated across a number of sectors with emerging opportunity, particularly if there is additional research on understanding where these models work best. Ecosystem stewards with strong private sector involvement may provide an added advantage because they bring the necessary expertise and social capital to provide sector-specific strategies and can enlist support from public intermediaries as needed. The Harambee Youth Employment Accelerator illustrates the potential of ecosystem stewards. The firm sources, screens and upskills young South Africans to take up jobs among Harambee's partner companies.

Ecosystem stewards are an emerging organisational form. Measuring the impact of these organisations is simpler when their effects are direct (as with Harambee) though more complex if effects are indirect and less visible (as with the successful coordination of entities). The condition therefore considers the prevalence, importance and trajectory of stewards in key systems.

**4** In order to access and compete in the global market, business will likely require the aid of effective export promotion incentives and vehicles. In addition, brokers are needed to facilitate international connections and relationships. There is a small and improving gap in the ability for South African businesses to access global markets. There are incentives and support structures that are crucial for export promotion: InvestSA is the award-winning official investment promotion agency which offers a ‘One Stop Shop’ detailing sector specific value propositions<sup>126</sup>; through the Export Marketing & Investment Assistance Scheme (EMIA), the DTI assists with the identification of new export markets through market research and helps companies strengthen their competitive advantage by supporting patent registrations, quality marks and product marks.<sup>127</sup> There are also marketing channels through which South African capabilities can be marketed to the global market such as BrandSA. However, there remains a gap in expanding these channels to growing industries. Access to these marketing channels is limited for smaller players who lack awareness of these services or the capital to pay for such connections. The DTI aims to correct this by compensating businesses for costs incurred recruiting in new FDI into South Africa.<sup>128</sup>

Access to global markets is evaluated in terms of the presence and perceived effectiveness of coordinating and dedicated entities. The direct economic impact of export and investment promotion is difficult to estimate and divorce from trends.

## Summary of gap analysis



**The constructing ecosystems pillar directly impacts access to opportunity in any systems where businesses, consumers or workers operate.** Coordinators and stewards can emerge in any system where there are avenues for achieving mutually beneficial cooperation. Their role in the creation of ecosystems is invaluable as ecosystems are fundamental to unlocking and scaling opportunity – interests are aligned, uncertainty is reduced, and resources are unlocked. Businesses are offered new avenues to craft value propositions and market

themselves to international demand, government and business can complement each-other in efforts at scaling industry, while work seeking youth are provided with programs that offer new job opportunities in roles businesses have been struggling to fill.

**The pillar indirectly impacts access to economic opportunity through the mechanisms of all other pillars.** In the human capital pillar, alignment of business needs with educational institution curricula can better ensure graduates are positioned for accessing opportunity. An intermediary such as Harambee can serve to close this gap outside of the established education ecosystem. For the innovative business pillar it improves coordination within the start-up ecosystem and for businesses looking to collaborate. Within the government pillar, coordination and alignment between business and local government can unlock opportunity for emerging firms. This is achieved through improved communication between government and businesses. Finally, in the universal digital access pillar, an ecosystem steward may assist service providers in identifying and executing on extending access to unconnected communities and draw government into alignment with these strategies.

**The pillar has enabled access to opportunity however large gaps remain in supporting the emergence of ecosystems and coordinators.** Export promotion systems are effectively structured and perform well, however the degree to which they support previously disadvantaged firms and broadened employment opportunity is uncertain. Similarly, the outcomes of the PPGI are yet to be seen however the proactivity of the private sector in the process has been promising. The value of coordination and ecosystem stewards is becoming increasingly recognised. The champion example of an ecosystem steward – Harambee - has been successful in channelling employment opportunities to disempowered youth, however this is a single instance of scaled success that signals the potential the model has. Finally, between business coordination remains less common than optimal and limits industry ability to curate value propositions. These processes require champions and trust between players.

---

<sup>121</sup> Genesis Analytics Team Analysis 2019

<sup>122</sup> Du Toit & Sewdass (2015) Competitive intelligence in emerging economies: A comparative study between Brazil and South Africa

<sup>123</sup> Genesis Analytics Team Analysis 2019

<sup>124</sup>Peterson, Kruss, McGrath, & Gastrow (2016). Bridging skills demand and supply in South Africa: The role of public and private intermediaries

<sup>125</sup> Sondag (2014). Towards value generating capabilities for collaborative intermediary organisations

<sup>126</sup> South African Government (2019). – *Trade and Industry on Investment Promotion Award* – Online Media - South African Government

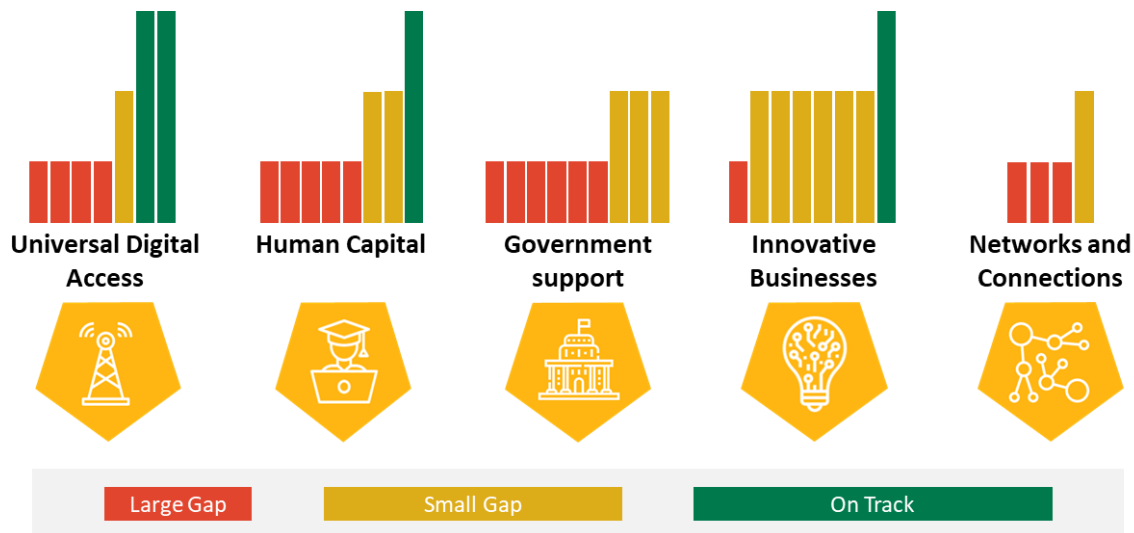
<sup>127</sup> DTI (2019) Trade, Exports & Investment

<sup>128</sup> DTI (2019) Export Marketing and Investment Assistance

## Cross-Pillar Conclusion

**South Africa exhibits a few pockets of readiness and numerous outstanding gaps in conditions necessary for taking up the economic opportunities presented by the digital age.**

As with South Africa's foundational economic structure, dualism in readiness conditions exist – there are instances of world class sophistication and instances of significant shortfall. These shortfalls can disadvantage select communities, workers and businesses as access to the 'world-class' may be barred by educational, income, geographic or some other requirements.



The **Universal Digital Access** pillar provides businesses, individuals and workers with the fundamental means of accessing the digital world. The conditions that are 'on track' are infrastructure based and provide a solid foundation for competing in the global world and leveraging the local digital market. Despite this, high data costs and the distribution of access remain a concern which are partly underpinned by market structure, sub-optimal competitive forces, and regulatory lethargy.

Readiness in the **Human Capital** pillar is concerning given its foundational role in individual and business capacity, and long lead times in transformation. Micro-credentialing is an alternative, short-term solution to the significant gaps observed in the traditional foundational and higher education system. This is yet to scale and faces cost and accreditation-related barriers to broadening usage. The key strength – access to raw talent – is demographic in nature. This illustrates how the most significant gaps are institutional leading to a shortage of skills and weak capacity to rapidly produce these skills.

The **Government Support** pillar suffers from numerous large gaps. These exist at both the national and sub-national level which reflects inherited distributional inequalities. Analysis of the pillar suggests government is aspirational and capable of defining world-class and comprehensive policy however execution on this policy is inadequate. Developments in local government policy are promising although yet to demonstrate tangible outcomes.

Conditions in the **Innovative Business** pillar mostly suffer from small gaps with relatively few instances of large gaps. These findings illustrate the strength of the South African private

sector and the availability of world-class financial and business capabilities. While the internal innovative capabilities of established business are maturing, support for start-ups access to international markets and partnerships with South African corporates can ignite growth.

The **Constructing Ecosystems** pillar helps businesses and communities to co-ordinate activities, align incentives and unlock resources. Coordination and support in accessing markets are key means for scaling opportunities. While the bulk of conditions exhibit large gaps, there are examples of high performance and successful ecosystem constructing entities. Successes such as Harambee as an ecosystem steward and BPESA as an industry coordinator offer the opportunity for replication while the emergence of the PPGI signals a maturing approach to public private solutioning in the pursuit of economic growth.