

# VEDP

Virginia  
Economic  
Development  
Partnership



## Industry Report Africa - ICT Industry

**Prepared by: Alinafe Malonje**

**Zurcom International (Pty) Ltd**  
Ground Floor, Block 2  
Kingfisher Office Park  
28 Siphosethu Road  
Mount Edgecombe, KwaZulu-Natal  
South Africa  
Tel: +27 12 993 0159  
Email: zurcom@zurcom.net

Date: July 2019

# Contents

<b>Contents</b>	<b>2</b>
<b>Executive Summary</b>	<b>4</b>
<b>Introduction</b>	<b>5</b>
<b>Economic Overview – South Africa and Tanzania</b>	<b>5</b>
<b>Why South Africa?</b>	<b>5</b>
<b>Why Tanzania?</b>	<b>5</b>
<b>African Outlook Present and Post Covid-19</b>	<b>7</b>
<b>Key Findings</b>	<b>9</b>
<b>Current Trends Summary</b>	<b>10</b>
<b>Africa’s ICT Sector</b>	<b>10</b>
<b>Current Status of ICT Sector in Africa</b>	<b>11</b>
<b>Recent Developments – South Africa</b>	<b>12</b>
South Africa’s National E-Strategy	12
Government Funding & Planned Initiatives	13
<b>Recent Developments – Tanzania</b>	<b>14</b>
National ICT Policy	14
Government Funding & Planned Initiatives	14
<b>Industry Opportunities – South Africa</b>	<b>15</b>
Infrastructure	15
Mobile Services	15
Smart Technology in Industry	16
<b>Industry Opportunities – Tanzania</b>	<b>16</b>
eHealth	16
Infrastructure	17
Mobile Services	17
Smart Farming	18
<b>Key Players</b>	<b>19</b>
<b>Ict Companies</b>	<b>19</b>
<b>Government Agencies &amp; Networks – South Africa</b>	<b>20</b>
South Africa Agency for Science and Technology Advancement (SAASTA)	20
State Information Technology Agency (SITA)	20
Technology Innovation Agency (TIA)	20
<b>Government Agencies &amp; Networks - Tanzania</b>	<b>21</b>
Cyber Tanzania National Research and Education Network (TERNET)	21
Tanzania Commission for Science and Technology	21
<b>Industry Associations – South Africa</b>	<b>21</b>
South African Council for Automation and Control (SACAC)	22

<b>Industry Associations – Tanzania</b>	<b>22</b>
Tanzania Free and Open Source Software Association	22
<b>Market Entry Strategy</b>	<b>23</b>
<b>Recommendations</b>	<b>23</b>
The Current State of each Sub-Sector	23
Suitable Local Partners	23
<b>Industry Publications</b>	<b>25</b>
Brainstorm	25
Dataweek	25
EngineerIT	25
Gadget	26
Hi-Tech Security Solutions	26
Instrumentation and Control	26
IT News Africa Magazine	27
Motion Control	27
Stuff	27
Technews	28
TechSmart	28
<b>Industry Events – South Africa</b>	<b>29</b>
Africa Aerospace and Defence 2020	29
Africom	29
rAge Expo	29
Securex	29
<b>Industry Events - Tanzania</b>	<b>30</b>
Tanzania Trade Show	30
East Africa International Trade Exhibition (EAITE)	30
<b>Sources</b>	<b>31</b>

# EXECUTIVE SUMMARY

As the Sub-Saharan African Consultant to the Virginia Economic Development Partnership (VEDP), Zurcom International was commissioned to prepare an in-depth industry report on the **ICT Sector in South Africa and Tanzania**.

This report is intended to provide Virginian exporters with a general overview of the ICT sector in both South Africa and Tanzania, as well as offer specific insights into the opportunities available in the sector and how the sector intersects with other industries.

We have structured this report into the following sections:

- **Overview & Current Status of South African and Tanzanian ICT Sectors** (which includes Recent Developments & Industry Opportunities);
- **Key Players**; and
- **Market Entry Options**

This report also provides information regarding:

- **Industry Publications**; and
- **Industry Events**

We encourage any Virginian companies with questions or enquiries to contact VEDP for further information.

We look forward to continuing to assist VEDP and Virginian exporters in the South African and Tanzanian markets.

*June 2020*

# INTRODUCTION

## ECONOMIC OVERVIEW – SOUTH AFRICA AND TANZANIA

South Africa has often been a promising option for investment for many countries outside of Africa. In 2019 the country had a GDP of approximately USD380 billion, a population 58 million people of an unemployment rate of 29.1% and an inflation rate of 4.6%. Foreign trade contributes to 59.8% of South Africa's GDP with China, Germany, the United States, the United Kingdom, Japan and India being some of the country's biggest trading partners.

Tanzania is less economically developed than South Africa, in 2019 it had a GDP of around USD59 billion, a population of 55.9 million people, an unemployment rate of 9.7% and an inflation rate of 3.6%. The country's inflation rate has fluctuated over the years, but the unemployment rate has been declining steadily. Foreign trade contributes to 32% of Tanzania's GDP with China, Rwanda, India, Kenya, South Africa and the United States being some of its main trading partners.

## WHY SOUTH AFRICA?

South Africa is a good country to invest in and trade with in terms of ICT for a number of reasons, including:

- ✓ Efficient financial markets;
- ✓ Links to Sub-Saharan Africa
- ✓ Links to BRICS countries

South Africa ranks high globally in terms of investor protection, this is one of the benefits of the country's efficient financial market and one of the reasons why, according to Forbes Magazine, international companies should look into trading with the company. The continent of Africa's GDP is projected to reach USD2.6 Trillion by the end of 2020 with research showing that South Africa will contribute greatly to this growth, these numbers show that international companies would benefit from growth in the country and on the continent.

Moreover, South Africa has often been seen as a hub that connects the rest of the world to Sub-Saharan Africa, in addition to this South Africa also has links to the BRICS countries, this makes the country strategically linked to different blocs of countries, providing opportunities for companies within South Africa.

## WHY TANZANIA?

Tanzania has a promising economic environment as well as a promising ICT sector investment, the following are some of the opportunities available for investors.

- ✓ The country has experienced economic growth that averages 6% to 7% every year over the past 10 years
- ✓ Creation of the National ICT Backbone (NICTBB)
- ✓ Gateway to Eastern, Southern and Central Africa

Tanzania's economy has experienced a lot of growth over the last decade, the stable economic environment has led to growth throughout the sectors including the ICT Sector. One of the big investments made by the government in the country's ICT sector is the creation of

the NICTBB, this is a network which links all the government's district and regional headquarters. The development of the NICTBB led to an 80% drop in bandwidth costs. There has also been some expansion of towers which has increased mobile usage, research suggests that Tanzania's mobile usage could reach that of Kenya's within the next seven years. Despite these strides, the ICT sector remains largely untapped. Another benefit of investing in Tanzania comes from its strategic geographic location which would give investors access to trade with countries in Eastern, Southern and Central Africa.

# AFRICAN OUTLOOK PRESENT AND POST COVID-19

Africa will emerge out of the Covid-19 pandemic relatively stronger. The continent has been on an ascendant rise in the past two decades, but trending better with several national economies in the 6 – 9 % growth range prior to the pandemic: Cote d'Ivoire, Ghana Kenya, Rwanda, Tanzania and others. Demographics, business culture, competition among other powers for market share and a generally buoyant economy are key to Covid-19 recovery and future trends. Businesses in sectors such as healthcare and life sciences, information technologies, manufacturing technologies as well as mining and agriculture will be able to find immediate interest in some specific instances and an expanded general interest once the pandemic passes.

Covid-19 risk load in Africa as of June 2020 appears relatively low against other global regions. This may be due to several factors including relative isolation from air traffic coming from previously infected regions. Most of South Africa's early infections were from Europe for example, so the travel patterns and infection timing mitigated the virus hitting most parts of Africa. Secondly, the amount of people traveling relative to population was lower than other regions' air traffic to key infected zones – a case where less development may be considered a good thing. Thirdly, and importantly, lock-downs and airport closures were done very early – many countries closing their borders with no known Covid cases. Lock-downs, where they happened, were done concurrently with most of the rest of the world meaning that Africa had a lower base-load of infections prior to the lock-down and hence lower transmissions afterward. Africa, though, seems to be facing an increasing wave as cases continue to peak while other regions of the world are decreasing their daily newly reported rates and lock-downs are lifted.

Demographics figure importantly in how Africa will rebound from the pandemic. With an average age of just less than 20 years old, Africa is the youngest large global region. Of its total population of approximately 1.3 billion, only 43 million are 65 years and older. Covid-19 puts those with co-morbidities and elderly, particularly those over 75, at the very highest risk. Seeing this, very few will be affected by the pandemic directly. Africa does have several co-morbidity issues such as HIV/AIDS and Tuberculosis and non-communicable diseases are on the ascendency. These will not outweigh the demographic differences in term of Covid deaths. One estimate puts Covid-19 maximum deaths at 83,000 to 190,000 if no precautions are taken ("Covid-19 in Africa: The long game", Economist May 16, 2020). Given the knowledge about Covid-19 at present, the absolute number of deaths will be relatively low compared to other regions such as North America, Europe and/or parts of Asia. These deaths also represent a small ratio due to other causes.

As of writing this in late June 2020, enforced isolations are being lessened around the world. In Africa, this is likewise happening. Absolute morbidity from Covid will be lower than other diseases. In fact, one South Africa study created by a group of actuaries indicated that deaths relating to lock-down that were not Covid related would be 29 times more deadly than Covid itself ("Lockdown disaster dwarfs Covid-19, say SA actuaries" [www.businesslive.co.za](http://www.businesslive.co.za) 5 May 2020) making the medicine possibly worse than the cure. African countries will open up eagerly once it becomes the accepted norm in the rest of the world. Countries will deal with the Covid response as they will with the larger threats from other diseases in the background ecology.

Africa's entrepreneurial business culture is critically important to resilience in the pandemic era. While most of the developed world are several generations removed from high childhood morbidity rates, Africa is only now coming to a point where people can easily expect to live to old age. Culture can only be measured indirectly in economics but it remains possibly the key ingredient to what a response will look like. African culture is very family-based, very stoic and resilient to hardship. The youth culture is dynamically entrepreneurial, and tends toward merit over the collectivist thinking of previous generations, while retaining a very strong linkage to family and faith communities. All this to say that many in Africa have come to look at any new situation as an opportunity through the recent decades of radical change.

Sectors hit by Covid-19 include energy, particularly crude oil production as global demand has decreased. African countries that have oil based revenues, such as Nigeria, Angola and Gabon, will have harder hills to climb in recovery. Countries such as Kenya, Rwanda, South Africa, Tanzania and Cote d'Ivoire are net energy importers and will benefit from lower fuel prices. Mining remains relatively strong as metals prices have remained high although logistics have created issues for output to reach markets. Agriculture, food processing, and healthcare will remain strong sectors due to the impressive middle class growth demand that is occurring across the continent. The healthcare economy tracks roughly double the GDP growth in many African countries indicating that life sciences will remain robust during and after the Covid event.

Competition amongst powers over Africa's resources will likely benefit economic growth. China, having reached a high point after becoming Africa's largest trading and investment partner may be on the relative decline. Other powers, particularly the USA, India, UK, EU, Japan and Korea all see Africa as a natural partner in trade and are eager to compete for a share of the market in the region. More competition will allow for greater choices and optimal outcomes in some ways. African economies will have more suitors as the curtain rises in a post-Covid world although we are already seeing a geo-strategic realignment in recent months that will benefit Africa.

Overall, Africa will come out of the pandemic not unscarred but resilient and resume a good economic growth pattern. Africa's growth will depend on an energetic youthful business culture which is and will be looking for new business opportunities.

## KEY FINDINGS

- ✓ The trends that impact the global ICT market the most are: mobile apps, cloud computing, big data analytics, social media technologies, internet of things, customer experience IT and cyber security.
- ✓ In 2014, the telecommunications services sub-sector contributed to 60% of the ICT sector's GDP in South Africa.
- ✓ In 2018, South Africa had the second highest level of telecommunication development in Africa.
- ✓ A GSMA report published in 2016 stated that gross mobile money settlements grow at an annual rate of over 30%.
- ✓ The adoption rate of mobile phones throughout Africa in relation to the population was 46% in 2015 and this number was projected to increase by 6% every year.
- ✓ The main acts and policies governing the ICT Sector in Tanzania are the:
  - Tanzania's National ICT Policy (2016)
  - The Communications Act (1993)
  - The National Telecommunications Policy (1997)
- ✓ There are 8 telecommunications providers in Tanzania: Airtel, Smart, Smile, Halotel, Tigo, TTCL, Vodacom, and Zantel, with the biggest operators being Airtel, Tigo and Vodacom.
- ✓ Tanzania's eHealth Strategy outlines a number of ways in which ICT can be used to improve the health sector. The sector encourages ICT companies to get involved in the development of the health sector.
- ✓ This report will further assist Virginian companies to develop a suitable **market entry strategy** for the South African and Tanzanian markets to align with their overall objectives

# CURRENT TRENDS SUMMARY

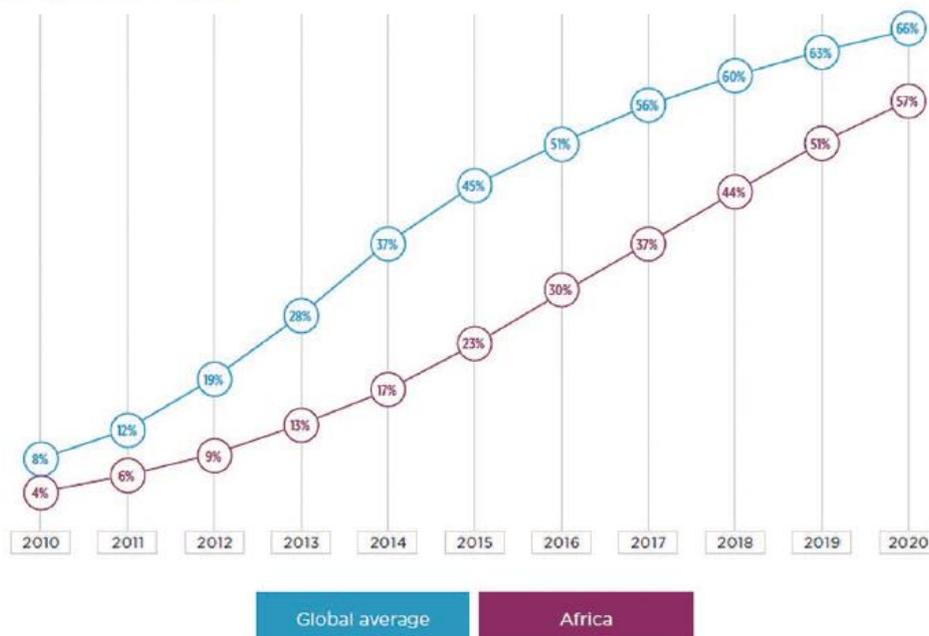
## AFRICA'S ICT SECTOR

The ICT sector comprises four major sub-sectors: hardware manufacturing, software and computer services, communications services, and ICT wholesaling. Out of these four sub sectors, the communications services sector is the most thriving in Africa. [According to a report by JICA](#), the adoption rate of mobile phones throughout the continent in relation to the population was 46% in 2015 and this number was projected to increase by 6% every year. In 2015 the increase in mobile phone use and the increase in the use of mobile money accounted for 6.7% of the overall GDP of Africa, which was equal to USD153 billion of economic value. These numbers are expected to reach 7.6% and USD214 billion by 2020.

In June 2016, 4G level telecommunications networks were operating in 32 African countries. The most potential in the ICT sector has been shown in the development of the mobile economy, ICT related business activity has not shown much growth in areas other than the mobile economy, especially manufacturing. Mobile money has been on the rise in Africa, and as generated many sales throughout different countries, M-Pesa, developed in Kenya, is an example of these mobile money services. A [GSMA report published in 2016](#) stated that gross mobile money settlements grow at an annual rate of over 30%.

### Smartphone Adoption Rates in Africa (2010 – 2020), JICA

■ Figure 2: Smartphone adoption rates in Africa  
Percentage of connections



In terms of ICT infrastructure throughout Africa, there are a number of undersea network cables in place along the coasts of the African continent. Some of the cables cross the Indian Ocean, and connect East Africa with South Africa and the Middle-East region, while the other cables connect African countries with Western Europe (U.K., France, Spain, etc.).

## CURRENT STATUS OF ICT SECTOR IN AFRICA

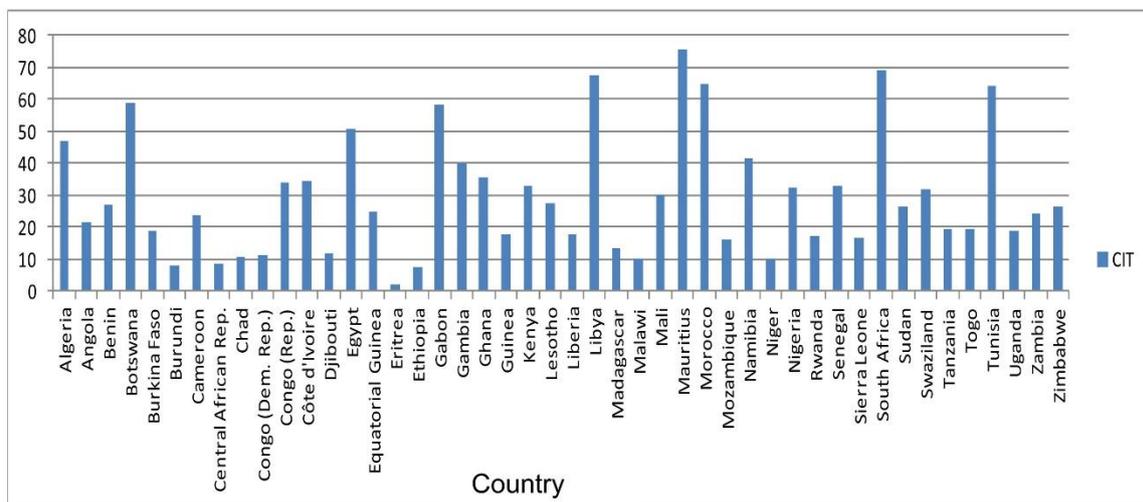
There are a number of gaps in Africa's ICT sector, gaps that create opportunities for companies wishing to invest in the continent, these gaps include:

- ✓ Not enough domestic communications networks that are able to provide adequate services at competitive prices, this results in a few companies monopolizing sub-sectors of the industry making the services inaccessible for poor Africans;
- ✓ Insufficient domestic core networks. Although there are a number of international undersea networks that connect Africa to Europe and Asia, there aren't many internal networks within the continent that can connect countries to the international lines that arrive at the coasts;
- ✓ Less bandwidth available for rural areas which make up the majority of the continent. The available bandwidth is concentrated on major urban areas;

A [study published by Taylor & Francis](#) measured the levels of telecommunication development on the continent by analysing ICT penetration on the continent, in conjunction with the percentage of each country's population that has access to internet as well as how connected mobile lines are in each country. The level of telecommunication development is depicted by the Composite Index of Telecommunication (CIT).

The following image shows the results of the report, these show that in 2018 Mauritius had the highest average CIT with 75.81, followed by South Africa, Libya, Morocco and Tunisia. These countries have the highest levels of telecommunication development in Africa.

Composite Index of Telecommunication in African Countries in 2018, Taylor & Francis Online



Some of the common procedures that companies have taken on to cut costs in the ICT sector have included:

- ✓ Network outsourcing: A number of network operators have developed partnerships with network operating companies to outsource their call centres, IT systems, networks as well as other functions. For example, MTN sold some of their towers in Rwanda and Zambia to IHS Holdings. It is envisaged that in total MTN will sell 1228 mobile network towers to IHS's subsidiaries in Rwanda and Zambia comprising 524 and 704 towers respectively.

- ✓ Infrastructure sharing: This is when companies share some of their infrastructure with each other in order to cut costs, this includes sharing towers, air-conditioning equipment, diesel generators, electric power supply, antennas, microwave radio equipment and more. An example of infrastructure sharing in Africa is the recent collaboration between some of the biggest multinational mobile operators in Africa and the Middle East. The deal is meant to bring these companies together in a partnership that will allow them to share their collective 79 mobile networks which are held in 47 different countries. Some of the operators involved in the deal are MTN, Orange and Vodacom.

## RECENT DEVELOPMENTS – SOUTH AFRICA

### South Africa's National E-Strategy

South Africa's E-Strategy was developed in 2017 with the aim of developing ICT in the country and increasing the use of ICT in other sectors. The strategy focuses on two pillars:

- ✓ Opening the sector, encouraging competition and lowering the costs of different technologies.
- ✓ Making technology relevant and accessible to different social and economic sectors.

#### **Pillar 1: Opening the Sector**

According to a report by Accenture Technology Vision the trends that impact the global ICT market the most are: mobile apps, cloud computing, big data analytics, social media technologies, internet of things, customer experience IT and cyber security. Successes in these different areas lead to overall growth in the sector. In 2014, the telecommunications services sub-sector contributed to 60% of the ICT sector's GDP in South Africa, related industries contributed 16% to the sector's GDP, computer services and activities contributed 10% and manufacturing, content and media contributed the least with 6.6% each.

The E-Strategy works hand in hand with South Africa's ICT Policy White Paper and the first pillar is dependent on the implementation of the white paper's objectives. Specific activities put in place to facilitate the opening of the sector and overall growth of ICT use in the country include:

- ✓ Legislative changes: The strategy outlines that there will be legal changes put in place to assure that a more conducive and competitive environment is created within the sector.
- ✓ Introduction of an ICT Development Fund: A fund dedicated to the development of the sector will be created with a designated regulator.
- ✓ Rollout of Broadband: The South African government plans to connect 40,000 government offices to fast internet networks
- ✓ Small, Medium and Micro Enterprise Development: SMMEs will be developed in line with the SMME Strategy that has yet to be implemented
- ✓ Introduction of cyber security initiatives: The strategy will develop the already existing cyber security hub

## Pillar 2: Making ICT Relevant Amongst Social and Economic Sectors

This pillar focuses on establishing the use of ICT amongst other sectors. The South African Government put in place a nine-point plan that aims to bring about the success of this pillar. The nine points are:

1. **Revitalizing the agriculture industry:** this point involves identifying 'smart farming' projects, these are farming projects that integrate the use of ICT in the value chain.
2. **Integrating ICT in the Engineering value chain:** this involves using smart technologies in industries such as mining and manufacturing
3. **Improving the management of utilities:** Using smart solutions to improve the delivery of utilities (energy, water and transport)
4. **Introducing Operation Phakisa:** Operation Phakisa is a government initiative that was put in place to speed up the implementation of development issues that were outlined in the National Development Plan.
5. **Implement the Industrial Policy Action Plan more effectively:** Encouraging the use of ICT in the implementation of the action plan
6. **SMME Development:** The second pillar also emphasizes the development of small, medium and micro enterprises.
7. **Increasing private sector investment:** Increasing investment in the private sector is meant to drive the growth of employment in the sector
8. **Reducing conflict in the workplace:** The increased use of ICT can lead to the loss of jobs so the strategy puts in place mechanisms to mitigate conflict in the workplace and introduce online jobs.
9. **State reform:** This point involves increasing the role of government owned companies as well as the use ICT within these companies.

## Government Funding & Planned Initiatives

South Africa has a number of different initiatives in place in order to develop the ICT Sector, these include:

- ✓ **Integrated ICT Policy White Paper (2016):** The White Paper has three strategies that were put in place by the Department of Telecommunications and Postal Services, these are:
- ✓ **SA Connect Broadband rollout:** The aim of this policy is to deliver broadband access to 90% of the country and to 100% of the country by 2030.
- ✓ **The Digital Terrestrial Television Migration (DTT):** In 2006, the International Telecommunications Union (ITU) passed a resolution that countries should migrate from analogue to digital broadcasting services, South Africa was meant to meet this deadline by 2018 but missed the deadline.
  - The ICT SMME Support Strategy
  - The National E-Government Strategy and Roadmap
  - The National E-Strategy
- ✓ **The South African National Research Network (SANREN):** The Network is funded by the Department of Science and Technology (DST) and was implemented in 2009. SANREN provides internet connectivity with a minimum speed of 1 Gigabyte per second and a maximum speed of 10 Gigabytes per second to all South African public universities, some science councils and other entities, as of March 2017 the network was connected to 227 sites
- ✓ **The Square Kilometer Array:** This is an initiative between a number of different countries including South Africa, to build an array of telescopes. The core will be built in the Northern Cape, South Africa.

## RECENT DEVELOPMENTS – TANZANIA

### National ICT Policy

Tanzania's National ICT Policy was written in 2003 and updated in 2016, it works hand in hand with their Communications Act of 1993 and their National Telecommunications Policy of 1997. Other relevant acts and policies include the Broadcasting Services Act of 1993, the National Science and Technology Policy of 1996 and the Tanzania Development Vision 2025. The main goals of the policy are:

- ✓ To provide a national ICT framework that will contribute to the country's development
- ✓ To increase knowledge and information sharing through ICT.

### Government Funding & Planned Initiatives

- ✓ **Connectivity Arrangement:** The connectivity arrangement was funded by the World Bank and is an arrangement that links a number of higher education institutions in Tanzania together on the HERI Core Network.
- ✓ **Digital Tanzania Program:** The program has two phases:
  - Phase 1 (2018 – 2022): This phase will focus on increasing market competitiveness and investment in order to strengthen ICT processes and services in the country.
  - Phase 2 (2021 – 2026): This phase will focus on encouraging both the public and private sectors to make use of technology in their everyday processes in order to grow the country's digital economy.
- ✓ **ICT Infrastructure:** The Ministry of Works, Communication and Transport set up the National ICT Optic Fibre Cable Infrastructure Back Bone (NICTBB) in 2009, this links the government's district and regional offices in the country.
- ✓ **Tanzania ICT Technology Park:** This is a project that is due to be run as a partnership between the government and a company known as SEACOM. The park will be a space that [will host multiple multinational companies](#) as well as start-ups, housing them in the same space is meant to encourage interaction between them. SEACOM will be responsible for providing bandwidth to the area.
- ✓ **Tanzania National Research and Education Network (TERNET):** TERNET was set up under the Science Technology and Higher Education Program. The network was set up by the government to manage the increasing number of students and to facilitate data and information sharing. The goal was to eventually link tertiary education institutions to each other and to the internet in order to facilitate data sharing amongst them.

## INDUSTRY OPPORTUNITIES – SOUTH AFRICA

### Infrastructure

ICT infrastructure is one of the areas in the ICT sector with a lot of potential in South Africa. As afore-mentioned, Africa as a whole is lacking in critical infrastructure that can progress the sector. Some innovation that South Africa needs in ICT at the moment includes:

- ✓ Investment in broadband roll-out
- ✓ Development of data centres
- ✓ Development of cloud services

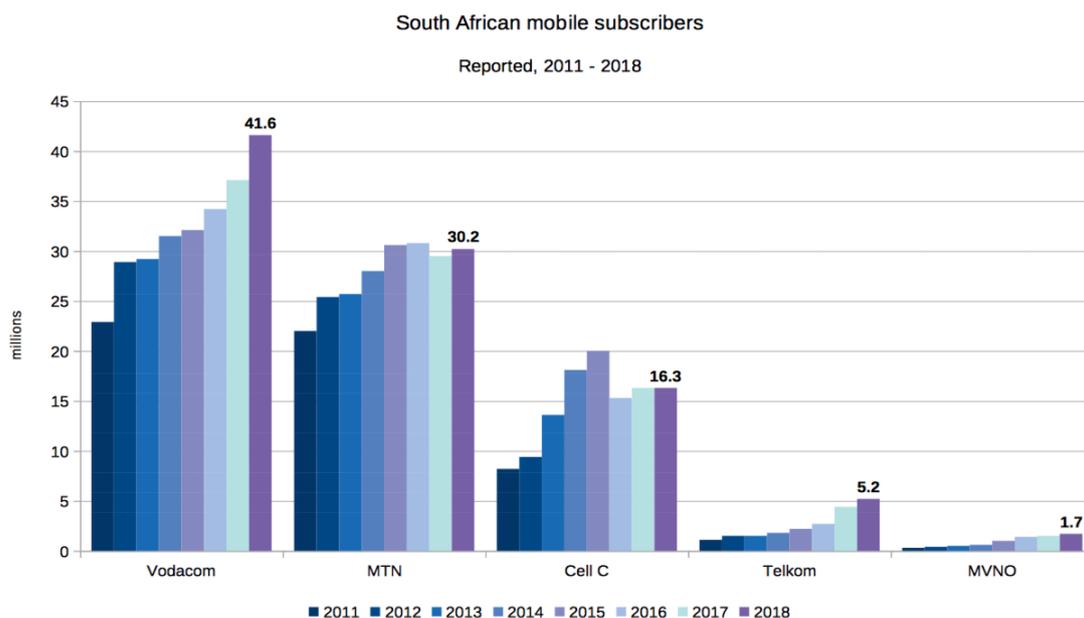
Investing in this kind of infrastructure is something that the government has noted and planned for through the creation of national projects such as the development of Safe Cities and the introduction of a policy framework on ICT development. There has also been the introduction of an 'Internet for All' program which aims to give more South Africans internet access.

International companies have begun investing in the growth of the country's ICT infrastructure, with Huawei signing a partnership with South Africa's electricity provider, Eskom. The partnership details a plan to build a 'smart grid' which will allow for more reliable electricity access. Huawei has also partnered with South Africa's rail network 'PRASA' to improve the efficiency of trains. There are many gaps in the development of infrastructure that provide opportunities for companies wishing to penetrate the market.

### Mobile Services

South Africa's Telecommunications market is made up of [four major companies](#) and a few smaller companies. The largest companies in the telecommunications sub-sector are Vodacom, which had 41.6 million mobile subscribers in 2018, MTN, which had 30.2 million subscribers in 2018, Cell C, which had 16.3 million subscribers, Telkom had 5.2 million subscribers and the smaller telecommunications companies had 1.7 million subscribers.

#### Mobile Subscribers in South Africa (2011 – 2018), *Businessstech*



Opportunities in the sector come from the challenges faced, throughout Sub-Saharan Africa the main challenges that plague the telecommunications sector are:

- ✓ Lack of infrastructure
- ✓ Intermittent Electricity
- ✓ High prices

These are the main reasons why the industry struggles to grow but they also provide gaps for companies to fill. Vodacom announced that it would [rollout a 5G network](#) in 2020, they partnered with a company known as Liquid Telecom who have been building a wholesale 5G network in the country. Partnerships like these are examples of the ways in which companies can take advantage of the market.

## Smart Technology in Industry

Other opportunities in the ICT sector present themselves in the intersections between ICT and other sectors, one of these being mining. [Enterprise Resource Planning](#) (ERP) is a type of software that helps to coordinate the mining value chain from the beginning to the end, this would help mining companies throughout the entire mining and value addition process. Other mining technologies include Radio Frequency Identification (RFID), Ultra-deep Water Drilling technologies, Teleoperations/Telerobotics and Global Positioning Systems (GPS). Investment in these technologies would make South Africa's mining industry more efficient and safe.

One company that has invested in these innovative methods is Penguin ASI, they have created wireless technology which allows mining companies to communicate with their robotic equipment underwater.<sup>1</sup> The benefits of investing in mining technologies is that a lot of the technology created for mining can also be used in the manufacturing and in some cases the agriculture industry, in this way investing the mining sector is investing in the ICT sector as a whole.

## INDUSTRY OPPORTUNITIES – TANZANIA

### eHealth

Tanzania's government has seen the need for the integration of ICT in their health sector. There have been multiple international examples of the use of ICT in the health industry that helped to inspire Tanzania's [eHealth strategy](#). Some of these examples include:

- ✓ Tracking epidemics through USSD and internet based apps on phones
- ✓ Use of telehealth to extend access to specialty health care through two-way communication and image sharing
- ✓ Taking pictures of blood samples with mobile phones
- ✓ Using mobile phones to determine drug resistance
- ✓ Use of online learning for the development of health professionals

These are some of the ways in which ICT has been used to develop the health sector around the world. Tanzania's eHealth strategy lists out a number of strategic goals for the integration of ICT in the health sector, these goals are also ways in which international companies can get involved. Some of these goals are to:

- ✓ Improve information management by reducing the use of paper;

---

1

- ✓ Use ICT to increase the safety of patients and deliver patient information effectively;
- ✓ Connect patients in remote, rural, and disadvantaged communities to appropriate healthcare;
- ✓ Improve communication between clinicians, patients, and caregivers across the sector;

## Infrastructure

Tanzania's ICT infrastructure is even less developed than that of South Africa, however the country does have a few main interventions in place to support the sector, this includes the National ICT Optic Fibre Cable Infrastructure Backbone (NICTBB) which was set up in 2009 and connects all the district and regional headquarters in Tanzania.

A study carried out by the Economic and Social Research Foundation (ESRF) showed that the technologies commonly used in rural Tanzania are radio, mobile phone, landlines and television, with few people using internet, email and fax.

The study also showed that the major ways ICT contributed to rural areas in Tanzania are through:

- ✓ Business improvements
- ✓ Increased access to education
- ✓ Improved communication
- ✓ Increased access to important information

With these being the biggest ways in which ICT currently contributes to the majority of poor rural communities, the sector could benefit from the following developments: improvements in communications services, use of technology in education and incentives that integrate the use of technology in entrepreneurship.

Airtel Tanzania has been [granted 4G high speed internet licence](#) by the Tanzania Communications Regulatory Authority. This is a provisional licence which will be valid for eight months, after which the company will begin to expand the coverage of their network throughout the country. This is one of the ways in which an international company is taking advantage of the need for more communications services in the country.

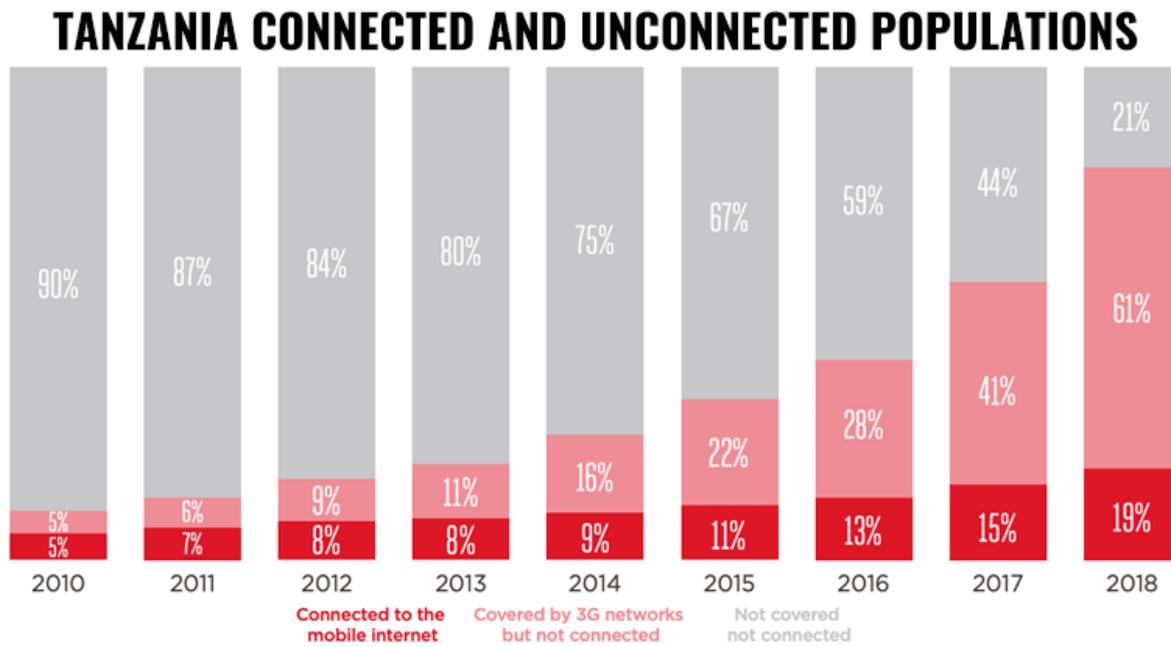
## Mobile Services

There are 8 telecommunications providers in Tanzania: Airtel, Smart, Smile, Halotel, Tigo, TTCL, Vodacom, and Zantel, with the biggest operators being Airtel, Tigo and Vodacom.

Between 2010 and 2018 the amount of mobile internet subscribers in Tanzania grew from 5% to reach 18.5%, with over 8 million subscribers added during that time. In June 2019 there were a total of 43,670,675 mobile subscriptions in Tanzania. The majority of the country's population is still not connected to the internet, with a large amount of the unconnected demographic being women and low income classes.

Tanzania's low mobile tariffs don't do much to increase the amount of subscribers as income levels are low and telecommunications services prove to be expensive for citizens. Despite the increase in subscribers over the years, the large amount of the population that remain uncovered opens up opportunities for companies.

Tanzania Connected and Unconnected Populations (2010 – 2018), *Tanzaniainvest*



The above graph shows the percentage of the population in Tanzania that is connected to mobile internet, the percentage of the population connected to 3G mobile networks but not connected to the internet as well as the percentage of the population that not connected to any networks at all

### Smart Farming

The agriculture industry provides many opportunities for the growth of the ICT sector. There are already a number of companies that have taken advantage of the gaps in the market. One company that has found ways to integrate ICT into agriculture is Agrimark, a Tanzanian company founded in 2015. They introduced an input verification service which farmers use to verify whether or not the fertilizer they purchased is genuine through SMS.

Another company making use of smart farming techniques is Sibesonke, this is a Finnish company that established [an mFarming service in 2013](#). Sibesonke partnered with local mobile service providers to develop a platform that uses both USSD and SMS. The service provides 3,000 to 4,000 users a day with access to agronomic and farm input information.

With strides like these being made in agriculture, research has shown that telecommunications company would rather invest in technologies that benefit the health and nutrition sectors. Companies feel that health services benefit everyone, whereas farming services only benefit farmers. Although there may be some truth to this, it is important to note that even though farmers would be the primary users of agricultural technologies, increased efficiency and effectiveness in agriculture through ICT benefits the whole country and this is particularly true for countries like Tanzania which rely heavily on agriculture.

# KEY PLAYERS

## ICT COMPANIES

There are a number of ICT companies stationed in South Africa, both international and local. Companies in the ICT sector can be divided into the sub-sectors: hardware, software, telecom and IT services. Hardware companies manufacture the physical parts of technology whereas software companies focus on the creation of the technology and applications needed to run the products, IT solutions companies specialize in IT support and sometimes outsource IT Services to small and medium enterprises and telecom companies focus on communication software and hardware services. For a lot of companies, these sub-sectors are beginning to merge.

Examples of companies in South Africa in the ICT sector include Cisco, Psybergate, Uber, Apple, IBM, MTEC, Datacentrix, Telkom, Vodacom, MTN, Cell C and more:

:



Examples of companies in Tanzania in the ICT Sector include Smart, Halotel, Tigo, IctPack, Airtel, Kuare Solutions, Empire, DevelopICT, ITL and more:



## GOVERNMENT AGENCIES & NETWORKS – SOUTH AFRICA

### South Africa Agency for Science and Technology Advancement (SAASTA)

[www.saasta.ac.za](http://www.saasta.ac.za)



The South Africa Agency for Science and Technology Advancement (SAASTA) is a South African agency that works to advance public awareness of science, engineering, innovation and technology in South Africa.

The agency aims to get more and more South Africans engaging with science and research. The agency also promotes the use of science and technology in ways that work with the South African context, this way technology can be appropriately applied to entrepreneurship in a sustainable way. SAASTA also promotes the use of science and technology to inform policies and research in the country.

### State Information Technology Agency (SITA)

[www.sita.co.za](http://www.sita.co.za)



SITA was established in 1999 as a body that coordinates the ICT resources in the country. SITA promotes the increased and efficient use of ICT in the government throughout the different ministries and agencies, it does this by managing the IT procurement and delivery process and by using ICT throughout various governmental processes.

### Technology Innovation Agency (TIA)

[www.tia.org.za](http://www.tia.org.za)



TIA is an agency that aims to connect higher education institutions, science councils, public entities, and the private sector. The agency works to coordinate technology information between all of these entities in a way that encourages information sharing and facilitates overall technology innovation. The agency has created a number of funds in order to assist these body with innovative projects, these include the Seed Fund, the Technology Development Fund, and the Commercialisation Support Fund.

## GOVERNMENT AGENCIES & NETWORKS - TANZANIA

### Cyber Tanzania National Research and Education Network (TERNET)



TERNET was established in 2008 as way to manage the increasing numbers of students in institutions, to encourage information sharing, to improve class participation; and to improve research in education institutions. The aim was to eventually connect the higher education institutions in the network to the internet along with the other entities in the network, this would allow information to be shared between institutions.

### Tanzania Commission for Science and Technology

The Tanzania Commission for Science and Technology (COSTECH) was established in 1988 as a governmental organization responsible for coordinating and promoting research and technology in the country. It advises the Government on all matters pertaining to science and technology and how they apply to the development of the country. It is also entrusted with the responsibility of coordinating and promoting science and technology development activities in the country.

## INDUSTRY ASSOCIATIONS – SOUTH AFRICA

### Institute of Information Technology Professionals South Africa (IITPSA)

[www.iitpsa.org.za](http://www.iitpsa.org.za)



The Institute of Information Technology Professionals South Africa (IITPSA) was established in 1957, it was originally called the Computer Society South Africa (CSSA).

The IITPSA aims to further the study, science and application of Information and Communications Technologies in South Africa. Other aims of the IITPSA are as follows:

- ✓ To maintain and promote Codes of Conduct and Ethics for our members;
- ✓ To define and promote standards of ICT knowledge;
- ✓ To promote the formulation of effective policies on ICT and related matters;
- ✓ To extend the knowledge and understanding and usage of ICTs in the community.

The institute achieves its goals by engaging players in the ICT Industry and the Government on ICT policy, regulations and professional activities. Some of the initiatives the institute has put in place include:

- ✓ The International Computer Driving License (ICDL), a non-profit organisation founded by the IITPSA in 1999 to promote digital literacy in the country.
- ✓ A Students Special Interest Group (SIG) at the Vaal University of Technology where ICT students are mentored and guided, by members of the IITPSA.
- ✓ The institute created multiple Special Interest Groups in various ICT fields like Software Testing, Business and Systems Analysis, Green IT, Enterprise Architecture, Data Storage and Recovery and Digital Forensics.

## Information Technology Association of South Africa (ITA)

[www.ita.org.za](http://www.ita.org.za)



The Information Technology Association (ITA) was founded in 1934 as the official trade and employer body of the Information Technology Industry in South Africa. The ITA has consists of the following divisions:

- ✓ Recruitment Consultancy Services Group: This division was set up to address recruitment and contracting issues within the IT industry.
- ✓ Producer Environmental Group: The forum's objective is to explore, review and implement compliance mechanisms for the management of Waste of Electrical and Electronic Equipment.
- ✓ The Information Technology Users Council: The council works as an external examinations body that deals specifically with examinations in Common Business Oriented Language (COBOL).

## Society for Automation, Instrumentation, Measurement and Control (SAIMC)

[www.saimc.org.za](http://www.saimc.org.za)



The Society for Automation, Instrumentation, Measurement and Control (SAIMC) was originally founded in 1957 as the Instrument and Control Society of Southern Africa. The name was changed to the SAIMC in 2009 to incorporate developments in the industry.

The goals of the SAIMC are:

- ✓ Education and Training
- ✓ Automation Thought Leadership

## South African Council for Automation and Control (SACAC)

[www.sacac.org.za](http://www.sacac.org.za)



SOUTH AFRICAN  
COUNCIL FOR AUTOMATION  
AND CONTROL

The South African Council for Automation and Control was formed in 1961 with the goal of promoting computation, automation and control and how they apply to industry in Southern Africa. SACAC facilitates the dissemination of information about technologies and how they can be used locally and internationally. This is done through organising symposia, workshops and other regular events.

## INDUSTRY ASSOCIATIONS – TANZANIA

### Tanzania Free and Open Source Software Association

[www.ict-innovation.fossfa.net](http://www.ict-innovation.fossfa.net)

The Tanzania Free and Open Source Software Association (TAFOSSA) was established in 2004 with the goal of becoming an umbrella organization that uses free and open source software to support the developmental goals outlined in Tanzania's National Vision 2025 and reiterated in the ICT Policy of 2003.

# MARKET ENTRY STRATEGY

## RECOMMENDATIONS

Virginian companies interested in entering the South African and Tanzanian ICT sectors should take note of the following:

- ✓ **The demands of each sub-sector**
- ✓ **The suitable local companies with whom they can partner**

### The Current State of each Sub-Sector

As afore-mentioned the main sub-sectors of the ICT sector are: hardware, software, telecommunications and IT services. Each of these sectors affect the entire sector differently and come with their own demands.

The hardware market in South Africa is currently under some pressure as a result of a decline in PC units and storage, the sector currently requires more investment from other IT companies specializing in hardware. The software sub sector on the other hand is doing quite well, with the packaged software market growing by 10% in 2017, the sub-sector as a whole is projected to reach [R36.8 billion by 2021](#). When it comes to the IT Services sub-sector, Businesstech forecasts that the biggest attributors to the subsectors growth in the coming years will be application development and managed services. The telecommunications sector offers the most promise for investment with much space for growth in internet users and mobile subscribers.

The ICT Sector in Tanzania is a lot smaller but shares a lot of the same characteristics as South Africa's ICT Sector. [Over 80% of the companies are small to medium sized](#) and operating in the sub-sectors of: Information Technology and Services, Computer Software, Computer Hardware, Computer and Network Security and Online Learning. The other 20% pf the sector consists of telecommunications companies, despite the fact that this sub sector makes up only 20% of the full sector, telecom companies are generally larger companies which have been in business longer and employ more people. The sizes of telecommunications companies are likely to increase along with improvements in mobile networks, increases in internet users and increases in mobile subscribers.

### Suitable Local Partners

Choosing the right local partner is a big determinant of whether or not a company will be successful when it enters the market. Some examples of partnerships between local and international companies in the ICT sector in South Africa include:

- ✓ Vodacom's partnership with Liquid Telecom in order to build a wholesale 5G network in the country.
- ✓ MTN selling and outsourcing some of their towers to IHS Holdings
- ✓ Partnership between some of the biggest multinational mobile operators in Africa and the Middle East to share their collective 79 mobile networks which are held in 47 different countries. Some of the operators involved include MTN, Orange and Vodacom.

Some of the partnerships between local and international companies in Tanzania include:

- ✓ Airtel Tanzania partnered with the Tanzanian government in order to gain a 4G high speed internet licence which allows them to expand the coverage of their network throughout the country.
- ✓ The ICT Technology Park is a partnership between the government and a company known as SEACOM. The park will be a space that will host multiple multinational companies as well as start-ups, housing them in the same space is meant to encourage interaction between them.

All these different partnerships show how companies can take advantage of the networks and the infrastructure that existing companies have already set up. Suitable partners to partner with in South Africa and Tanzania would be companies with a large consumer base as well as entities within the government. After analyzing the current state of each subsector as well as which companies are most appropriate to partner with, a company could also study what has made other companies who have attempted to enter the market in the past fail. There is also the option of setting up one's own office in the country instead of partnering with a local company.

# INDUSTRY PUBLICATIONS

## Brainstorm

[www.brainstormmag.co.za](http://www.brainstormmag.co.za)

**Editor:** Adrian Hinchcliffe  
**Tel:** +27 11 807 3294  
**Email:** [adrian@itweb.co.za](mailto:adrian@itweb.co.za)



Brainstorm is a monthly trade publication, founded in 2001, published by technology media house ITWeb. The magazine covers all issues technology related, this includes financial technology (fintech), the internet of things, security, the cloud, telecommunications and more.

## Dataweek

[www.dataweek.co.za](http://www.dataweek.co.za)

**Editor:** Brett van den Bosch  
**Tel:** +27 11 543 5800  
**Email:** [brett@technews.co.za](mailto:brett@technews.co.za)



Dataweek is an electronics & communications publication that provides insights into analog, mixed signal, circuit & system protection, computer/embedded technology, design automation, industrial electronics, optoelectronics, power electronics / management, programmable logic, switches & relays and more. The publication is owned and managed by Technews.

## EngineerIT

[www.ee.co.za](http://www.ee.co.za)

**Managing Editor:** Chris Yelland  
**Tel:** +27 11 543 7000  
**Email:** [chris.yelland@ee.co.za](mailto:chris.yelland@ee.co.za)



EngineerIT is a business-to-business magazine, published by EE Publishers, in print and online, the publication focuses on science, engineering and related technologies. The magazine acts as a voice for a number of institutions including: The Institute of Information Technology Professionals South Africa (ITTPSA), Wireless Access Providers Association (WAPA), the Information Technology Association (ITA) and more.

## Gadget

[www.gadget.co.za](http://www.gadget.co.za)



**Editor-in-Chief:** Arthur Goldstuck

**Tel:** +27 11 782 7003

**Email:** [news@itnewsafrika.com](mailto:news@itnewsafrika.com)

Gadget is an online magazine on consumer technology. The magazine reviews everyday technology of all types. The publication also aims to become an educational environment on technology. The most popular sections of Gadget are coverage of Mobile technology, hi-tech issues and the World Wide Web.

## Hi-Tech Security Solutions

[www.securitysa.com](http://www.securitysa.com)



**Editor:** Andrew Seldon

**Tel:** +27 11 543 5800

**Email:** [news@itnewsafrika.com](mailto:news@itnewsafrika.com)

Hi-Tech Security Solutions is a technical publication for security and risk professionals owned by Technews. The magazine provides insights into major security issues. Hi-Tech Security Solutions covers the key areas of security and risk management: access control, alarm and intrusion detection, building management, cyber security, fire technology, identity management, it infrastructure for security, perimeter security, surveillance, system integration and more.

## Instrumentation and Control

[www.instrumentation.co.za](http://www.instrumentation.co.za)



**Editor:** Steven Meyer

**Tel:** +27 11 543 5800

**Email:** [steven@technews.co.za](mailto:steven@technews.co.za)

SA Instrumentation and Control magazine is a technical publication for industry professionals across southern Africa. The magazine covers the key areas in the instrumentation and control sector these include: laboratory and analytical, measurement: pressure, level, flow, temperature, mass, enclosures, cabling and accessories, electrical power and energy efficient systems, it in manufacturing, control valves, actuators and pumps, robotics and mechatronics, wireless and telemetry, data logging and recording and more.

## IT News Africa Magazine

[www.itnewsafrika.com](http://www.itnewsafrika.com)



**Consumer Tech Editor:** Charlie Fripp

**Tel:** +27 11 026 0982

**Email:** [news@itnewsafrika.com](mailto:news@itnewsafrika.com)

IT News Africa is a Johannesburg-based technology news website. It focuses on news surrounding information and telecommunications, broadband, IT security, software, gadgets and gaming, and mobile operators from across Africa.

## Motion Control

[www.motioncontrol.co.za](http://www.motioncontrol.co.za)



**Consumer Tech Editor:** Kim Roberts

**Tel:** +27 11 543 5800

**Email:** [kimroberts@technews.co.za](mailto:kimroberts@technews.co.za)

Motion Control is a publication that covers issues concerning controlled mechanical power, the magazine provides solutions that address today's engineering challenges, covering the key areas of major spending in the industry which are: electricity, drives and controls, hydraulics, pneumatics.

## Stuff

[www.stuff.co.za](http://www.stuff.co.za)



**Consumer Tech Editor:** Kim Roberts

**Tel:** +27 11 889 0600

**Email:** [stuff@stuff.co.za](mailto:stuff@stuff.co.za)

Stuff Magazine is a gadget & technology magazine. The magazine reviews modern and innovative technology in the form of digital cameras, cell-phones, computers, games, wheels, lifestyle products, and more.

## Technews

[www.technews.co.za](http://www.technews.co.za)



**Managing Director:** Malckey Tehini

**Tel:** +27 11 543 5800

**Email:** [malckey@technews.co.za](mailto:malckey@technews.co.za)

Technews is a technical publisher for solutions marketing in the technology sector, they specialize in a number of print magazines, handbooks, buyers' guides and online content. Their magazines focus on electronic engineering, process control and factory automation, engineering or business risk and security. Technews covers the industry news and reports on ICT trends with their following magazines: Dataweek, SA Instrumentation and Control, Motion Control and Hi-Tech Security Solutions. All 4 titles are published in print magazine, online and digital formats supported by bi-weekly electronic newsletters.

## TechSmart

[www.techsmart.co.za](http://www.techsmart.co.za)



**Managing Editor:** Ryan Noik

**Tel:** +27 +27 83 290 2889

**Email:** [ryan@technews.co.za](mailto:ryan@technews.co.za)

TechSmart is a South African technology website and magazine that was founded in 2003. The magazine covers daily news and reviews on the latest science, technology and telecommunications stories.

# INDUSTRY EVENTS – SOUTH AFRICA

## Africa Aerospace and Defence 2020

[www.aadexpo.co.za](http://www.aadexpo.co.za)

Dates: 16 – 20 September, 2020

Location: Africa Aerospace and Defence, Air Force Base Waterkloof, Centurion, City of Tshwane



The AAD Expo is a trade exhibition which showcases air, sea and land defence technologies. It is rated amongst the top six exhibitions in the world and usually has more than 450 participating companies in the defence and aerospace industries, from over 30 countries.

## Africom

[www.tmt.knect365.com/africom](http://www.tmt.knect365.com/africom)

Dates: 10 – 12 November, 2020

Location: Cape Town International Convention Centre, Cape Town



AfricaCom is one of Africa's largest tech and telecoms event attended by over 15,000 qualified industry professionals. The show includes a zoned exhibition dedicated to Artificial Intelligence, the Internet of Things, blockchain, fintech, cloud, data centres and cyber-security.

## rAge Expo

[www.rageexpo.co.za](http://www.rageexpo.co.za)

Dates: 04 – 06 September, 2020

Location: Ticketpro Dome in Northgate, Johannesburg



rAge Expo is South Africa's biggest annual video gaming, computer, technology and geek culture exhibition.

## Securex

[www.securex.co.za](http://www.securex.co.za)

Dates: 01 – 03 June 2021

Location: Gallagher Convention Centre, Midrand, Johannesburg



Securex is a security and fire protection trade show that usually has over 190 exhibitors in attendance.

# INDUSTRY EVENTS - TANZANIA

## Tanzania Trade Show

[www.growexh.com/tanzaniatradeshow](http://www.growexh.com/tanzaniatradeshow)

Dates: 26 – 28 February, 2021

Location: Diamond Jubilee Hall, Dar es Salaam, Tanzania



The Tanzania Trade Show is a trade show for all trades. The event showcases new products & technology to Tanzania as well as to surrounding countries. Companies that exhibit at the show come from the following industries: Automotive, IT, Construction, Medical and Pharmaceutical Supplies, Food, Industrial Machinery, Safety, Security, Printing, Packaging

## East Africa International Trade Exhibition (EAITE)

[www.expogr.com/tanzania/general](http://www.expogr.com/tanzania/general)

Dates: 9 – 11 September, 2020

Location: Diamond Jubilee Hall, Dar es Salaam, Tanzania



The East Africa International Trade Exhibition (EAITE) is an exhibition that invites companies from different sectors throughout the East African market. The exhibition attracts exhibitors from more than 30 countries and visitors from all over East & Central Africa, thus giving exhibitors an excellent opportunity to explore several countries at one time.

# SOURCES

- ✓ African Telecom News: [www.africatelecomsnews.com](http://www.africatelecomsnews.com)
- ✓ Afriten: [www.afriten.co.za](http://www.afriten.co.za)
- ✓ Brainstorm Magazine: [www.brainstormmag.co.za](http://www.brainstormmag.co.za)
- ✓ Budde: [www.budde.com.au](http://www.budde.com.au)
- ✓ Business Tech: [www.businessstech.co.za](http://www.businessstech.co.za)
- ✓ Crunchbase: [www.crunchbase.com](http://www.crunchbase.com)
- ✓ Dataweek: [www.dataweek.co.za](http://www.dataweek.co.za)
- ✓ Financier Worldwide: [www.financierworldwide.com](http://www.financierworldwide.com)
- ✓ Gartner: [www.gartner.com](http://www.gartner.com)
- ✓ IITPSA: [www.iitpsa.org.za](http://www.iitpsa.org.za)
- ✓ Infodev: [www.infodev.org](http://www.infodev.org)
- ✓ Investing in Africa: [www.investinginafrica.net](http://www.investinginafrica.net)
- ✓ IT News Africa: [www.itnewsafrika.com](http://www.itnewsafrika.com)
- ✓ ITU: [www.itu.int](http://www.itu.int)
- ✓ Nordea Trade: [www.nordeatrade.com](http://www.nordeatrade.com)
- ✓ Oxford Business Group: [www.oxfordbusinessgroup.com](http://www.oxfordbusinessgroup.com)
- ✓ Quartz: [www.qz.com](http://www.qz.com)
- ✓ Semantic Scholar: [www.pdf.semanticscholar.org](http://www.pdf.semanticscholar.org)
- ✓ Society for Automation, Instrumentation, Measurement and Control: [www.saimc.co.za](http://www.saimc.co.za)
- ✓ South African Council for Automation and Control: [www.sacac.org.za](http://www.sacac.org.za)
- ✓ Statista: [www.statista.com](http://www.statista.com)
- ✓ Stuff: [www.stuff.co.za](http://www.stuff.co.za)
- ✓ Tanzania Invest: [www.tanzaniainvest.com](http://www.tanzaniainvest.com)
- ✓ Taylor and Francis Online: [www.tandfonline.com](http://www.tandfonline.com)
- ✓ Technews: [www.technews.co.za](http://www.technews.co.za)
- ✓ Web Africa: [www.webafrica.co.za](http://www.webafrica.co.za)
- ✓ World Bank: [www.worldbank.org](http://www.worldbank.org)
- ✓ World's Top Exports: [www.worldstopexports.com](http://www.worldstopexports.com)
- ✓ Zinio: [www.zinio.com](http://www.zinio.com)
- ✓ Research ICT Africa: [www.researchictafrica.net](http://www.researchictafrica.net)
- ✓ Mining Review Africa: [www.miningreview.com](http://www.miningreview.com)
- ✓ CABI: [www.cabi.org](http://www.cabi.org)