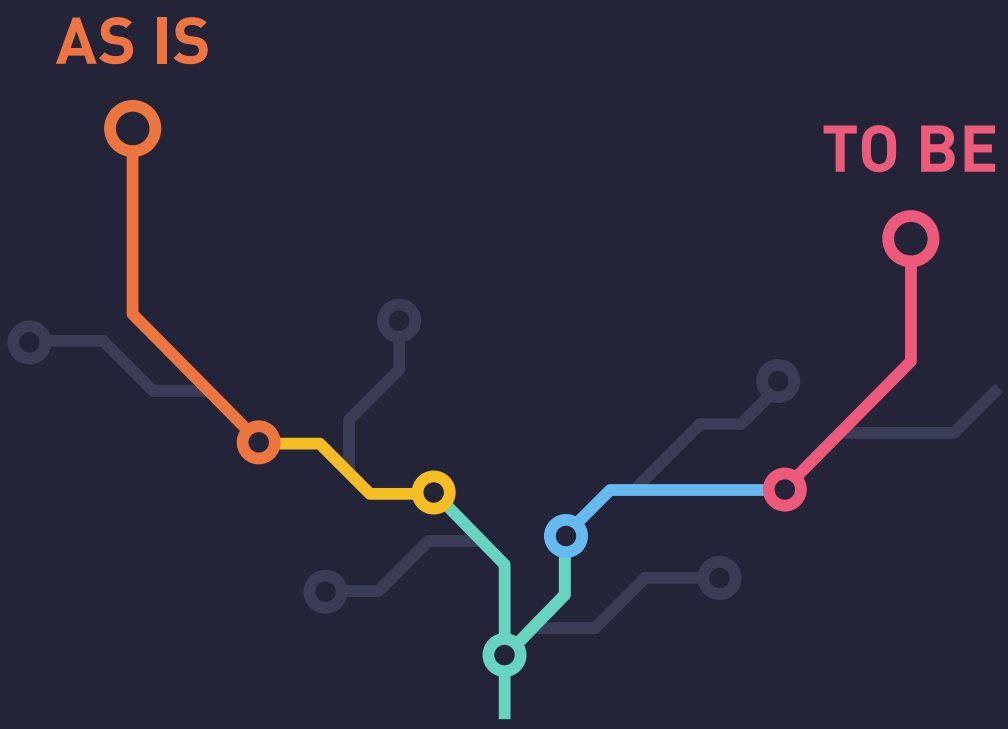
#SkillsBoostWesternCape
Advancing skills for the digital economy_

WESTERN CAPE DIGITAL SKILLS SHARED AGENDA FOR ACTION

Selected research findings on the current "As Is" state of digital skills in the Western Cape and the future "To Be" skills needs for a global digital hub.



Towards digital skills growth

Partners:

Western Cape Government
Economic Development and Tourism

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ACKNOWLEDGEMENTS

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**Radian Consulting

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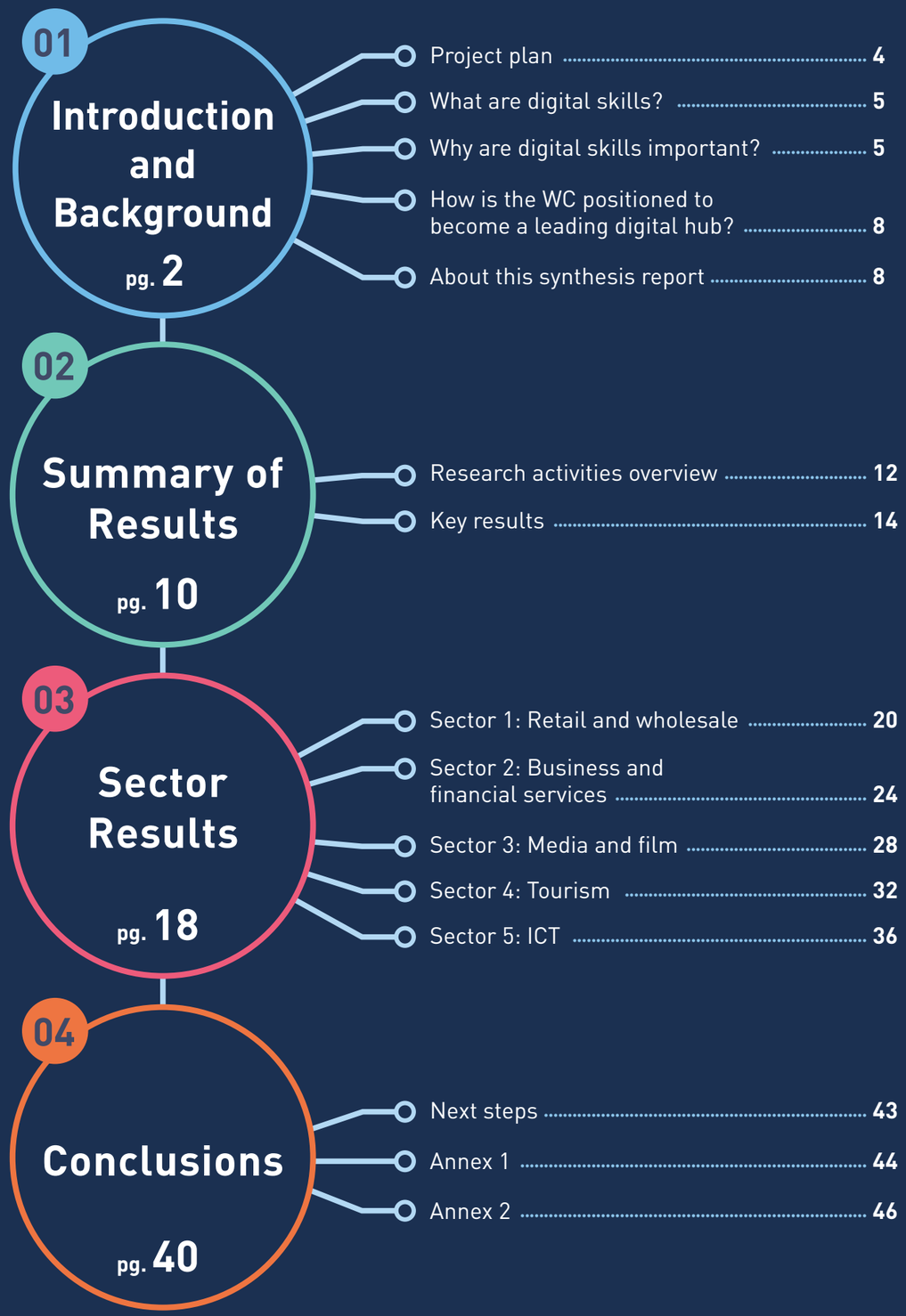
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01

Introduction and Background

INTRODUCTION AND BACKGROUND

The fast pace of technological change, and the ubiquity of digital technologies in all aspects of work and life, are placing new demands on everyone. In recognition of the accelerating technological advances and the requirement to remain responsive to the needs, challenges and opportunities of a hyper-connected global economy, the Western Cape Government (WCG) has set the ambitious goal of positioning the province as a leading digital hub in the global economy by 2030.

The Western Cape Digital Skills Shared Agenda for Action project has been conceptualised with the main objective of supporting the WCG in attaining this vision. The project, also known as #SkillsBoostWesternCape is a research and action project driven by the WCG, the City of Cape Town and partners to help stimulate employment and embed digital skills across all sectors of the Western Cape economy. It aims to help the province achieve its goal by gathering stakeholders across sectors, conducting the right research and catalysing the actions that need to be taken to up-skill the province. In the first phase of the initiative, research, surveys and stakeholder workshops were undertaken to map the current digital skills landscape. In the second phase, the digital skills requirements looking forward to the next five years were investigated via a survey with business leaders and an analysis of global trends.

PROJECT PLAN:

This report outlines the findings of these two research phases, which will be used collectively to inform the development of a "roadmap" for working toward realising the goal of a global digital hub. It looks at the current, "As Is" situation in relation to digitals skills in the Western Cape and explores what will be required for the future "To Be" landscape. For both research phases, there is a particular focus on the sectors that have been identified as strategic growth sectors in the province: Information and communication technology (ICT); business and financial services; retail and wholesale; media and film; and tourism.

Across sectors, the research shows that there is a high demand for digital skills in the Western Cape, especially at the intermediate and high end; and that supply of skills by universities, private companies and training institutions is currently not able to meet the demand. On the other hand, the research shows that the Western Cape has great potential for growth with strong and growing ICT-focused services and industry, and is well positioned to become a leading global digital hub. What is required now is for the Western Cape to find ways of facilitating collaboration among sectors and businesses to address the skills requirements and gaps that have been identified.

What are digital skills?

The Digital Skills Framework One has been developed for South Africa as a locally relevant characterisation of digital skills[1]. The Framework distinguishes between four groups of digital skills, namely:

- Digital literacy as a basic life skill;
- ICT practitioner skills;
- ICT-related skills for sectoral use (such as health, education); and
- Digital leadership skills.

This initiative focuses predominantly on the upper three "stacks" of the framework, namely the intermediate, advanced and specialised digital skills (within user digital skills, ICT practitioner skills and digital leadership skills) and not the foundational or basic digital skills.

Why are digital skills important?

Survival and competitiveness

A World Economic Forum report titled "Readiness for the Future of Production" ranked South Africa 67th out of 100 countries surveyed in terms of human capital, and 94th in the sub-component "Digital skills among population".[2] In the recent Economic Intelligence Unit (EIU) Automation Readiness Index, South Africa ranked 22nd out of 25 included countries.[3] South Africa is therefore not scoring very high when it comes to keeping its workforce digitally skilled.

Digitally capable staff are (or will be) needed by all companies just to survive and compete, let alone thrive in the local as well as global marketplace – and this requirement is only going to grow. In the context of the Western Cape vision, the objective of creating a global digital hub therefore pertains not only to cutting edge or leading industries or highly technical entrants that can leverage new digital technologies. Industry also depends on a broader workforce that are not directly associated with the "in vogue" technologies and innovations. Upskilling, re-skilling and "right skilling" of the broader workforce is therefore of key importance. Many jobs will be significantly affected by automation, with a high possibility of significant changes in the way the jobs are being performed in the presence of some level of automation. This has implications for the skills requirements for these jobs and also affects the risk of job-less and job-loss growth.

[1] - Claassen, W.T. 2017. Digital Skills Framework One – A comprehensive digital skills framework (Version 1.1). Pre-publication draft
[2] - WEF. (2018a). Readiness for the Future of Production Report 2018. Geneva
[3] - EIU. (2018). The Automation Readiness Index: Who is ready for the coming wave of automation? London

What are digital skills?

The *Digital Skills Framework One* has been developed as a locally relevant digital skills framework as part of a comprehensive perspective on the skills required for South Africa to productively benefit from, participate in and contribute towards the digital world.

SECTOR USER SKILLS

The digital skills for work in a specific sector, type of organisation or profession. These skills can be:

- of a generic nature (e.g. a generic digital skills-set for office use or business); or
- a specific skills-set applicable to that sector (e.g. the graphics industry, or health), or to a profession; or
- both of the above.

DIGITAL LEADERSHIP SKILLS

The capabilities needed to exploit opportunities provided by ICTs to:

- ensure more efficient and effective performance of different types of organisations;
- explore possibilities for new ways of conducting business and organisational processes;
- establish new businesses, organisations, platforms, applications or interventions; and
- accomplish goals that rely on ICT through the direction of human resources and uses of ICT, and effect innovation through digital means.

ICT PRACTITIONER SKILLS

The skills/capabilities required for:

- the researching, developing and designing, managing;
- the producing, consulting, marketing and selling;
- the integrating, installing and administrating; and
- the maintaining, supporting and servicing of ICT systems.

DIGITAL LITERACY

Ability of individuals to use digital tools and facilities in all aspects of life and work to:

- perform tasks
- solve problems
- communicate
- manage information
- collaborate
- create and share content
- build knowledge

Terminology

Fourth Industrial Revolution (4IR) - This term is used as a designation of the "era" that is characterised by certain megatrends and disruptive technologies. It builds on the third industrial revolution, the digital revolution that has been occurring since the middle of the last century, and is characterised by a fusion of technologies that is blurring the lines between the physical, digital, and biological spheres.[4]

Digital transformation - Digital transformation is the process of shifting an organisation from a legacy approach (i.e. a decrease in the application of old technology) to new ways of working and thinking using digital, social, mobile and emerging technologies. It involves a change in leadership, different thinking, the encouragement of innovation and new business models, incorporating digitisation of assets and an increased use of technology to improve the experience of an organisation's employees, customers, suppliers, partners and stakeholders.[5]

Digital disruption - Digital disruption is caused by emerging digital technologies and business models. These innovative new technologies and models can impact the value of existing products and services offered in the industry. This is why the term 'disruption' is used, as the emergence of these new digital products/services/businesses disrupts the current market and causes the need for re-evaluation.[6]

Transformative digital technologies (TDTs) - technologies that enable digital transformation. The term encompasses various other designations, many of which can refer to digital or non-digital technologies, including "4IR technologies", "game changing technologies", "transformative technologies" and "emerging" or "new" technologies.[7] For a full list of some of the TDTs that are expected to impact various sectors in the Western Cape, see Annex 1.

[4] - https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/
[5] - http://www.theagileelephant.com/what-is-digital-transformation/
[6] - https://blog.oxfordcollegeofmarketing.com/2016/02/22/what-is-digital-disruption/
[7] - Capacity Building Programme for Employment Promotion To-Be Report: Digital Skills for the Future - Western Cape Digital Skills Shared Agenda for Action (2019) p.7

Opportunities for growth

Digital disruption is both a threat and an opportunity to individual businesses, cities and regions and will have an impact on every sector. Digital disruption of the Western Cape economy is already occurring as businesses are challenged to reconsider/reinvent their business models due to the impact of digital technologies, new (digital) entrants, platform businesses and out-the-box business innovations. The adoption of transformative digital technologies offers new opportunities that will allow businesses to become more efficient and reduce costs, as well as allow for increased growth through innovation, new business models or new market entry.

How is the Western Cape positioned to become a leading digital hub?

There are a number of key driving forces that suggest that the Western Cape is leading South Africa from a 4IR perspective. First, is the strength of the services, trade and tourism sectors. For example, some of South Africa's biggest e-commerce platforms, such as online shopping giants Spree, Gumtree and Zando, are based in the Western Cape. These sectors are all highly digitalised, which has the potential to positively influence other sectors.

The City of Cape Town is an important economic hub within the Western Cape and rates highly on global indexes, such as the Pricewaterhouse-Coopers ranking of cities of opportunity. The city is considered a continental leader in start-ups (with three times the amount of start-up companies compared to Johannesburg) and financial services, and rates highly in terms of liveability and ease of doing business.

Investment, skilled labour and partnerships are drawn to cities that perform well on global indexes.

Overall, the Western Cape has made great strides in the development of digital partnership institutions such as the Cape Innovation and Technology Initiative (CiTi) and the successful rollout of broadband, all contributing to the fact that digital literacy in the Western Cape is significantly higher than in other provinces.[8] The province has also performed exceptionally well in relation to knowledge and innovation infrastructure and performance, with Cape Town the national leader in the number of patents registered.[9]

A challenge that remains is for stakeholders across the private sector, government, and academia and training institutions to find ways of collaborating to address the skills requirements for realising the province's potential as a leader in the global digital economy.

About this synthesis report

This synthesis report provides a summary of the results of a number of research activities conducted so far to inform the #SkillsBoost-WesternCape initiative. The full results are discussed in detail in the following two reports:

- Western Cape Digital Skills Shared Agenda for Action-As-Is Landscape: A Macro-level Descriptive Study of the Projected Demand-and-Supply Interaction Between ICT Skills Supply and Selected Growth Areas in Response to the Accelerating Technological Advances (2018) - This report maps the current digital skills landscape in the Western Cape with the aim of providing a descriptive overview of the current awareness of the potentially disruptive impact of technological advances on skills requirements and digital skills demand-and-supply patterns.

- To-Be Report: Digital Skills for the Future - Western Cape Digital Skills Shared Agenda for Action (2019) - This report looks to the future, what digital transformation may mean for industry, and the skills that will be required to achieve the WCG vision of a global digital hub.

The research outlined in the two reports, and explained in summary in this document, involved the following:

Current "As Is" landscape

- Desktop research to identify and provide a descriptive overview of digital skills related research as it relates to user digital skills, digital leadership skills and ICT practitioner skills within the province's strategic growth sectors that are ICT intensive.

- A supply-side analysis of digital skills initiatives within higher education institutions (universities, TVET colleges, selective accredited and/or industry-specific service providers), focusing on ICT-practitioner skills and skills sets. The overview was based on audited data from the Classification of Educational Subject Matter Category 06 (CESM 06), as provided by the Department of Higher Education and Training (DHET), for 2012, 2014 and 2016.

- A once-off demand-side analysis which considered the current demand for digital skills in the Western Cape, based on an analysis of selected social media platforms such as LinkedIn job search data (the study was conducted for a one-month time period and cannot be generalised).

Future "To Be" landscape

- An online survey of business and industry role-players (n=385) was conducted to give insight into the views of business representatives. about the digital technologies and skills considered important to the Western Cape economy. Respondents were asked for their views of technologies most likely to impact companies, and which skills were most likely to be required by companies in the Western Cape in the next five years.

- A review of global studies and initiatives on the future of digital skills.

This report outlines some of the findings of this research, providing a general overview and then a section for each of the five sectors that were identified as strategic growth sectors that are ICT intensive:

- Retail and wholesale sector
- Business and financial services sector
- Media and film sector
- Tourism sector
- ICT sector

For each sector the report includes:

1) a definition and key characteristics for that sector;

2) major current digital trends and dynamics within that sector;

3) business perspectives on the skills landscape looking into the future, including skills needs and challenges and how those needs could be met; and

4) an outlook on what technologies will be impacting that sector in the future (not available for the ICT sector).

The report concludes with an overview of the digital skills environment, identifying some key issues to consider going forward as well as some of the characteristics or must-have requirements of a globally competitive digital hub.

[8] - Research ICT Africa (RIA). 2015. Western Cape Digital Readiness Assessment 2015. [Online] https://www.westerncape.gov.za/assets/departments/economic-development-tourism/digital_readiness_full_report.pdf
[9] - PWC Africa. 2018. Cape Town: African City of Opportunity. [Online] https://www.pwc.co.za/en/assets/pdf/cape-town-african-city-of-opportunity.pdf

SECTION

02

Summary of Results

RESEARCH ACTIVITIES OVERVIEW

01 AS IS:

The aim of this research was to provide a descriptive overview of the current impact of technological advances on skills requirements and digital skills demand-and-supply patterns.

Desktop research

A descriptive overview of user digital skills, digital leadership skills and ICT practitioner skills within the province's strategic growth sectors that are ICT intensive.

Notes on methodology

- Secondary research by means of external desk research and a consistently applied data extraction guideline.
- Validity of findings was established through cross verification from multiple sources.
- Value was added via Interviews with selected industry practitioners.

Demand-side analysis

An analysis of LinkedIn, PNet and Google Trends to consider current demand for digital skills in the Western Cape for a single one-month period.

- Data were categorised according to academic qualification, gender and employment equity requirements.
- For TVET colleges, data were extracted from Higher Education Management Information System for 2015-2017 and categorised by number of graduates, gender and EE imperatives.

Supply-side analysis

Analysis of digital skills initiatives within higher education institutions, focusing on ICT-practitioner skills and skills sets. Based on audited data from the Classification of Educational Subject Matter Category 06 for 2012, 2014 and 2016.

- Data were freely available and obtained from LinkedIN and Google job and keyword searches, respectively.
- Data were limited to the Western Cape, although for LinkedIn only Cape Town data were available.

02 TO BE:

This report looks to the future, what digital transformation may mean for industry, and the skills that will be required to achieve the WCG vision of a global digital hub.

Industry survey

An online survey of business and industry role-players (n=385) to give insight into views on the digital technologies and skills considered important to the WC economy.

- Survey was conducted via SurveyMonkey.
- It was distributed to stakeholder databases of DEDAT, Accelerate Cape Town and the Cape IT Initiative.
- The survey was designed to enable field driven analysis, and was trust based (i.e. anonymous and non-verifiable).

Global analysis

A review of global studies and initiatives on the future of digital skills.

03 NEXT STEPS: ROADMAP

These activities will allow DEDAT and partners to create an action plan for getting from the current state of digital skills to the desired future state of a globally competitive digital hub, based on the findings of both research processes. This will be a collaborative process, involving stakeholder engagements to identify and shape the recommendations and action points for all sectors going forward.

AS IS: KEY RESULTS

DESKTOP RESEARCH AND SUPPLY-SIDE ANALYSIS

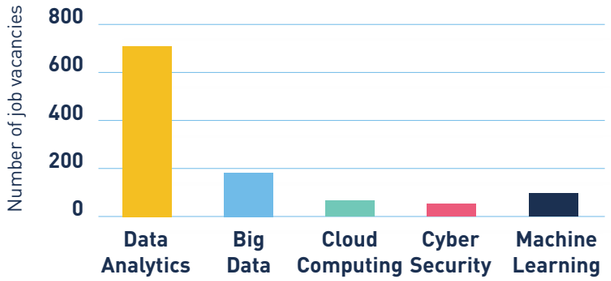
These studies within the As Is process identified the following industry-wide trends and requirements for catalysing digital skills growth.

DEMAND-SIDE ANALYSIS

This analysis used LinkedIn job search results for a one-month period to show once-off employer demand for ICT and related skills. It also assessed changes in Google Trends keyword searches for programming skills and information systems skills from 2014-2018.

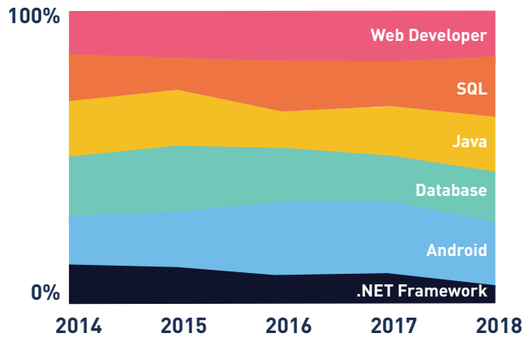
INFORMATION SYSTEMS SKILLS VACANCIES IN THE WESTERN CAPE, SEPT. 2018

Results represent a one-month period and cannot be generalised.

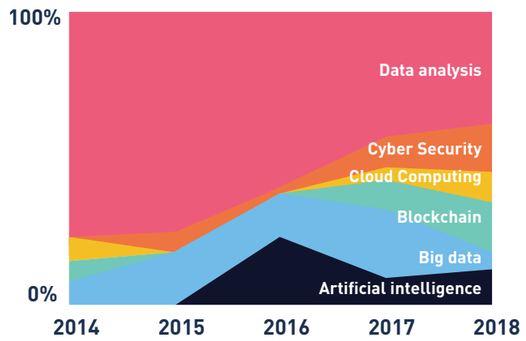


GOOGLE KEYWORD SEARCH TRENDS IN THE WESTERN CAPE

Programming skills



Information systems skills



INDUSTRY-WIDE TRENDS

A differentiated approach for identifying sector-specific digital skills

A more incorporated digital skills development approach is needed. Each sector should identify and develop its own digital competency profile for capabilities not typically provided by ICT practitioner skills.

Technical and digital skills are not the only requirements

Skills such as problem solving, complexity thinking, computational thinking, design thinking skills, ability to innovate, and the ability to work across functional or disciplinary boundaries and team work all seem to be important.

Pro-active skilling (or upskilling) of first-time job entrants

It is evident that competency in the Microsoft Office Suite (often referred to as digital work-readiness competency) is not sufficient anymore. Competencies such as media literacy and data literacy are increasingly regarded as essential components of digital literacy.

Combining efforts for high impact

The efforts of the National Research Foundation and various universities to address the national data analytics skills shortage serve as an excellent example of how stakeholders can collaborate to address skills demands in a coordinated manner for impact.

Upskilling and re-skilling of people already in employment

Technological advances and disruption are already affecting the work force. To facilitate sustained competitiveness in the digital economy, it will be necessary to develop and implement focused sector-specific interventions.

Acknowledging the human dimension, combating ignorance and fear

Cognisance needs to be taken of the potential ignorance and even fear of particular target audiences to engage with ICTs and the digital economy. People-friendly approaches and the inclusion of behavioural economic principles should be considered to facilitate change.

New and innovative models and approaches for skills acquisition

The accelerated digital skills demand outpaces the current traditional model of skills acquisition practices. Skilling and re-skilling will require a rethink of the current skills development and skills funding models and approaches.

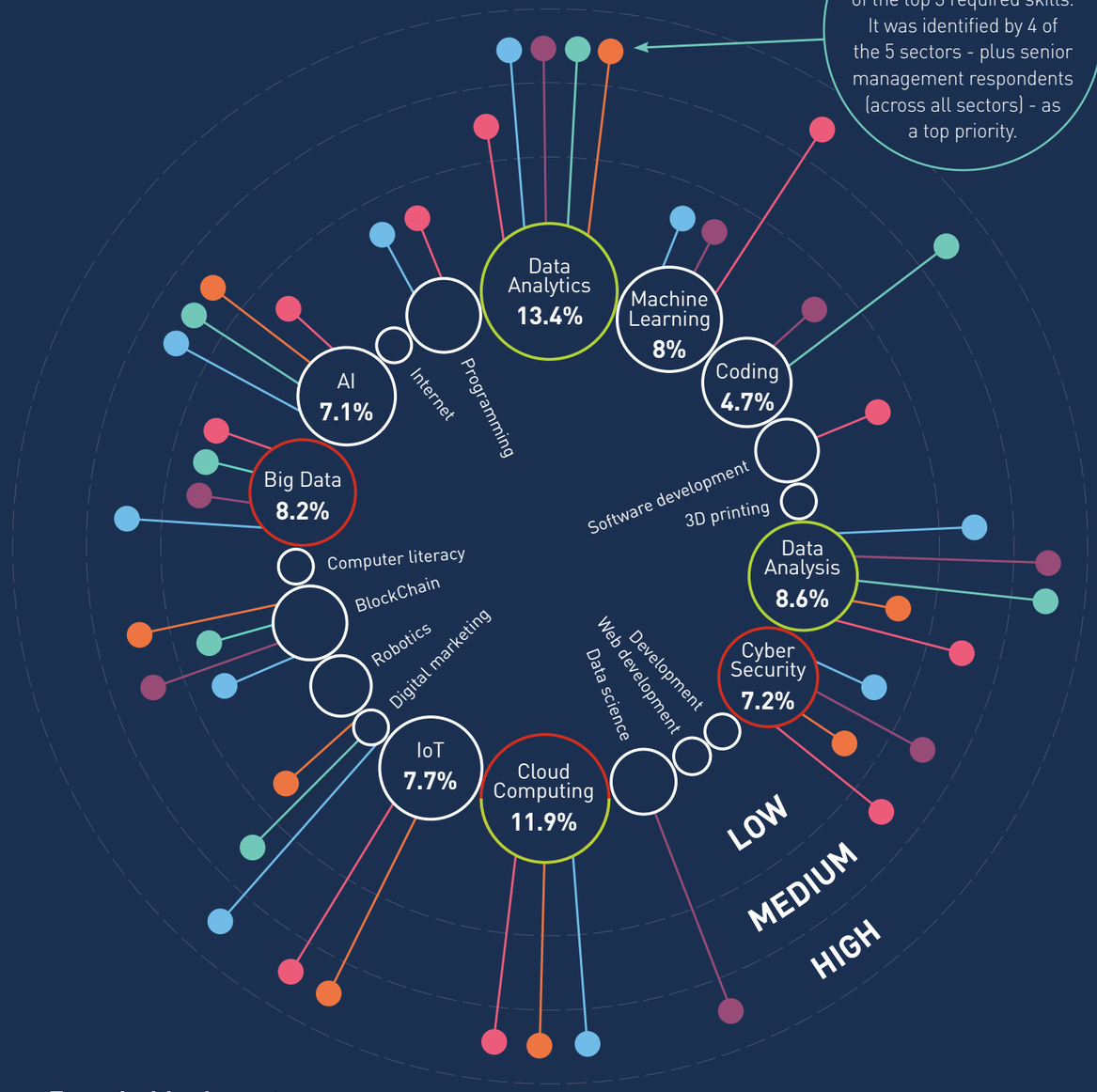
Digital transformation leadership skills

Skills level requirements have moved from the very technical to the higher levels of digital architecture, integration and digital transformation leadership skills. Investment in the digital leadership capabilities of medium to senior managers across sectors should be considered as a way of fast-tracking digital transformation.

TO BE:

Which skills are most likely to be required by companies in the Western Cape in the next 5 years? (n=385)

13.4% of respondents listed data analytics as one of the top 3 required skills. It was identified by 4 of the 5 sectors - plus senior management respondents (across all sectors) - as a top priority.



Top priorities by sector

- Retail (n=39)
- Business and financial services (n=35)
- Media and Film (n=19)
- Tourism (n=16)
- ICT (n=205)

Top priorities by role

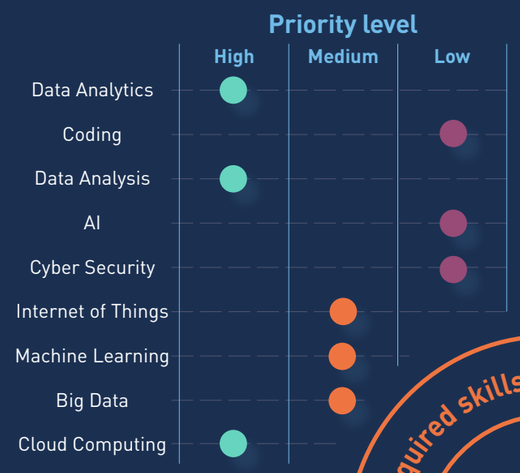
- ICT personnel
- Senior management

Bubble size indicates the proportion of mentions of each skill across all respondents

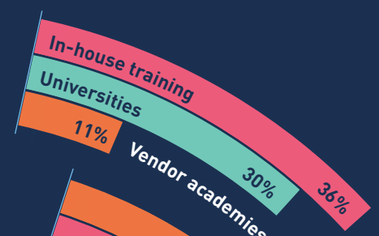
Industry views: What will the digital skills landscape look like in 5 years?

Based on a survey of business representatives across the 5 priority sectors (n=385). Full survey questions listed in Annex 2, and full survey results are available in the To Be Report: Digital Skills for the Future (2019).

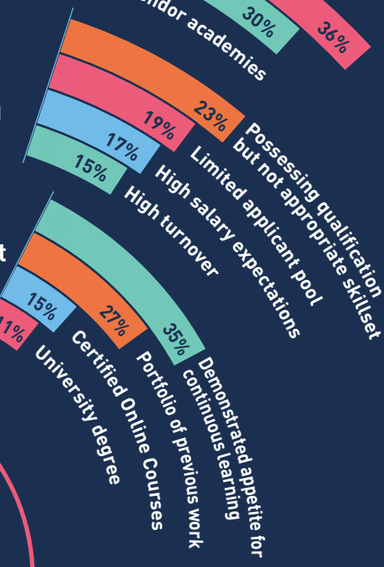
Most required digital skills in the next 5 years



Most likely source of skills

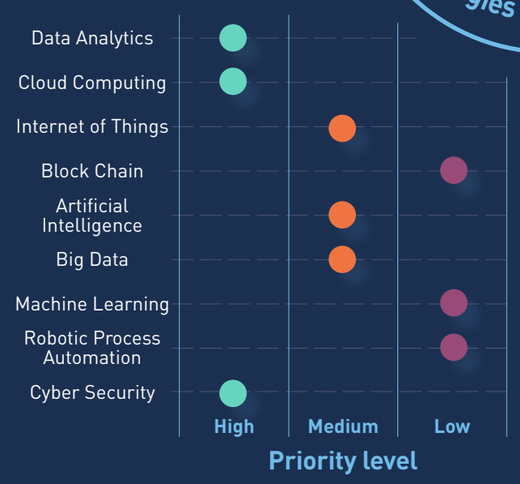


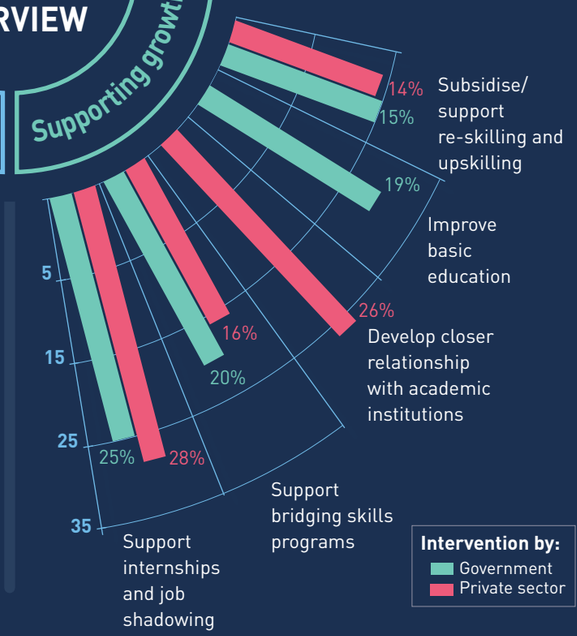
Major challenge in finding and keeping skilled staff



Most important requirement for new hires

Technology areas with the biggest impact, next 5 years





SECTION

03

Sector Results

SECTION 1: RETAIL AND WHOLESALE SECTOR

What is the retail and wholesale sector?

#2 contributor to the WC economy

Contributing **13%** to provincial GDP

The retail and wholesale sector is at the core of the Western Cape economy in terms of its overall contribution, its critical connection to other major sectors, and its contribution to growth and employment. The sector was the second largest contributor to the Western Cape economy in 2016, valued at R59 billion and contributing 13% to provincial GDP. It grew by an average annual rate of 2.6% between 2007 and 2016.

The retail sector involves the sale and exchange of goods directly to consumers, whereas wholesale involves sales to retailers. General dealers dominate the sector, making up 42% of all retail enterprises. This is followed by textiles, clothing, footwear and leather goods retailers that comprise 20% of the retail sector. In wholesale, dealers of solid, liquid and gaseous fuels and related products dominate the sector followed by food, beverages and tobacco, then machinery and equipment wholesalers.

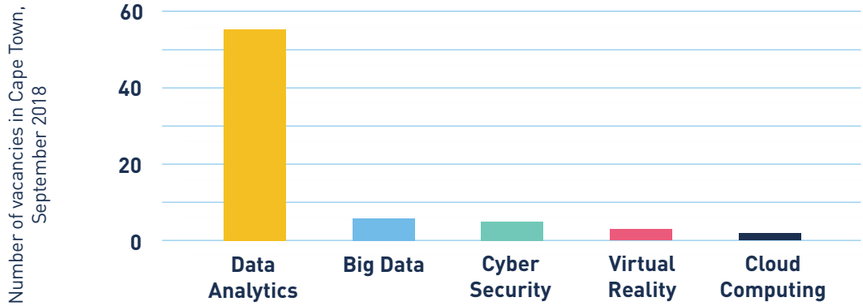
AS IS: 2019

Major trends: What characterises the sector and how is that changing?

The formal retail sector in the Western Cape has been transformed by digital technologies over the last decade and the rise of digital services and online-only retailers follows global trends. Digital is having an impact on every part of the value chain, creating opportunities for new market creation, market entry and innovation. It is driving new capabilities and ways of operating, challenging traditional business models and transforming the traditional competitive landscape.

- Omni-channel marketing is now the norm through integrated web, social, email, mobile and brick-and-mortar platforms;
- Digitalisation and mobile technology are giving customers the power to influence the industry – social platforms and loyalty programmes are vital;
- Big firms lead digitalisation; and
- Digital capabilities are empowering small businesses to compete with larger firms.

Vacancies for digital skills in the retail sector



This information is from LinkedIn results for a one-month period and does not portray a trend.

Current Digital Skills Needs

- Data skills to support everything from better brand management (by harnessing social media) to loyalty programmes to increased sophistication of supply chains;
- Mobile-based digital entrepreneurship skills as more buying and selling happens on digital platforms;
- Up-skilling of leadership skills combining management, innovation and digital savvy; and
- High-level sales skills as large amounts of product information are readily available on mobile platforms.

TO BE:

The priority skills requirement for the future in this industry is data analytics. However, since this industry is competing for the same pool of individuals with sectors such as ICT and financial services, it is seemingly experiencing a high turnover of skilled individuals, having identified "high skill individuals moving jobs regularly" as a major challenge. This is possibly due to sectors such as ICT and financial services being able to afford higher salaries for skilled talent.

Suggested actions for government and the private sector

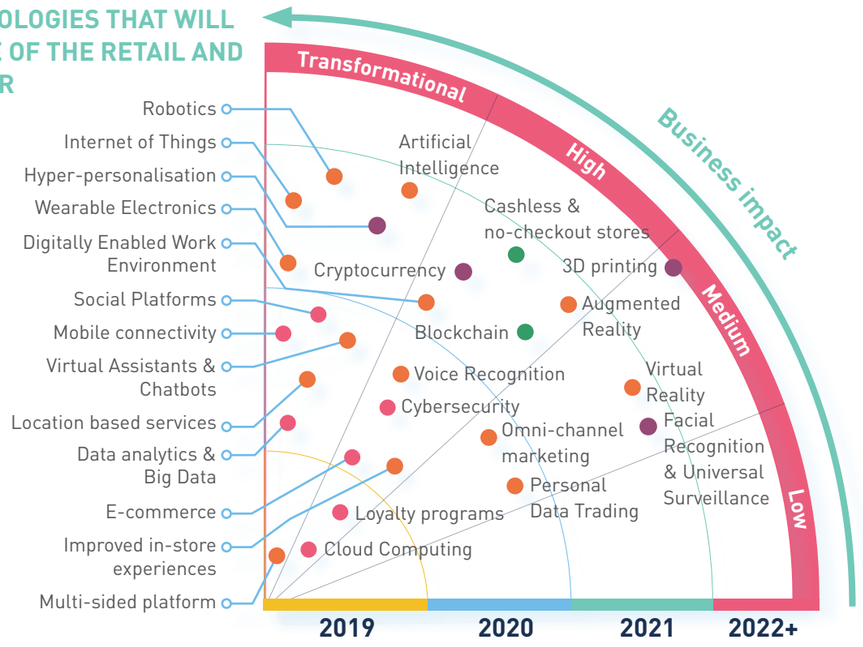
In order to meet their future skills demands, respondents from this sector indicated that they are willing to develop a closer relationship with academic institutions to ensure graduates are work-ready. The most important intervention by the government, as viewed by the retail sector, is that of providing internships and job-shadowing programmes.

DISRUPTIVE TECHNOLOGIES THAT WILL SHAPE THE FUTURE OF THE RETAIL AND WHOLESALE SECTOR

Maturity level

- Mainstream
- Early adoption
- Adolescent
- Emerging

Business impact predictions were based on data gathered in the As-Is phase, including interviews with sector players and research on sector trends.

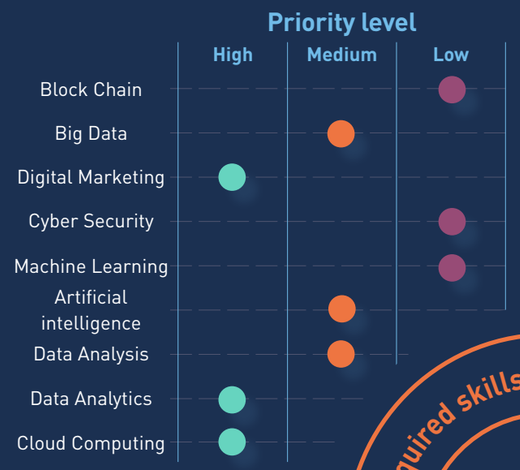


Derived from: Atos. (2018). Look Out 2020+ Tech Trends. Which technologies will power your business tomorrow? Bezons, France

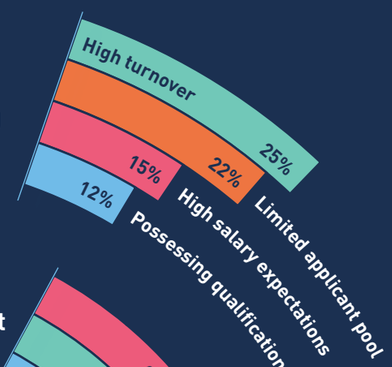
Industry views: What will the digital skills landscape look like in 5 years?

Based on results from 39 retail and wholesale sector representatives. Full survey questions listed in Annex 2, and full survey results are available in the To Be Report: Digital Skills for the Future (2019).

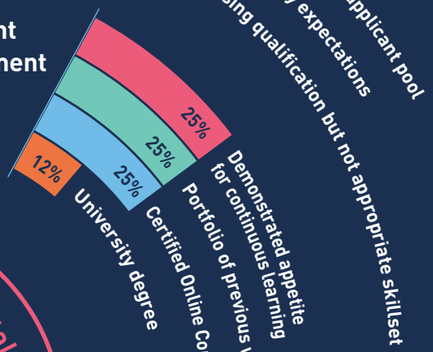
Most required digital skills in the next 5 years



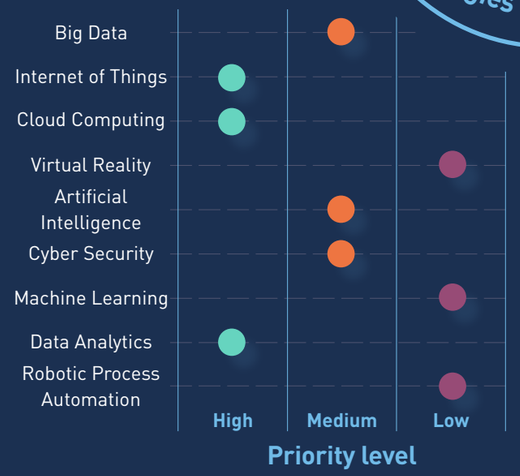
Major challenge in finding and keeping skilled staff

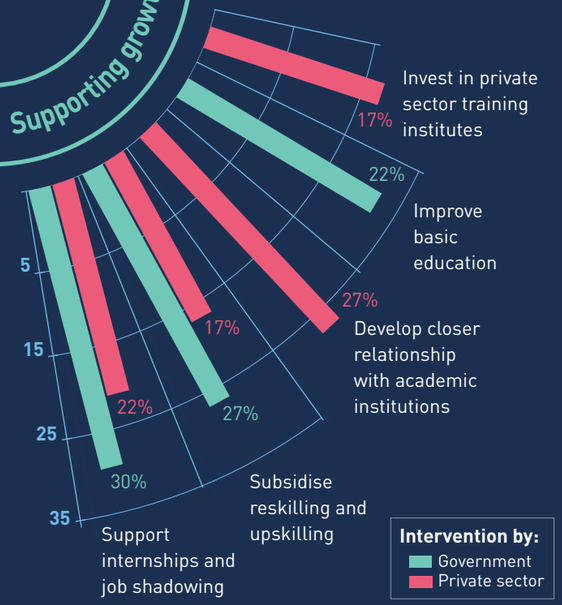


Most important requirement for new hires

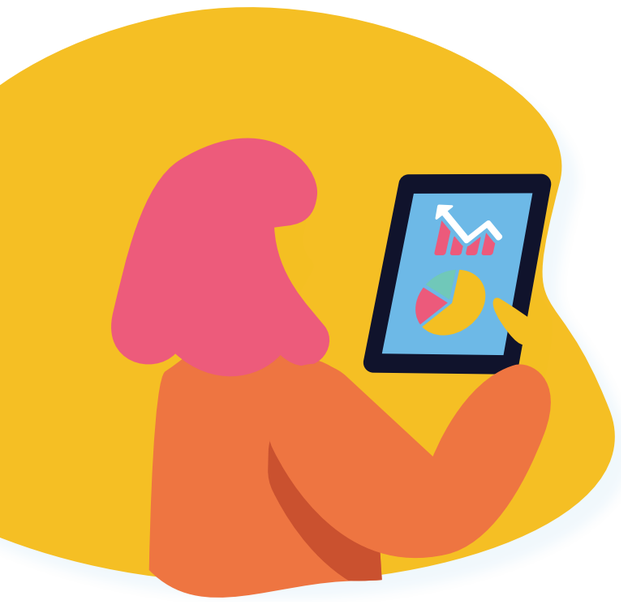


Technology areas with the biggest impact, next 5 years





SECTION 2: BUSINESS AND FINANCIAL SERVICES SECTORS

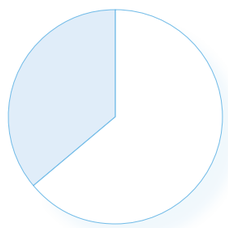


AS IS: 2019

This sector is the Western Cape's biggest employer. It is fully integrated into the global economy and is playing a leading role in sub-Saharan Africa as a financial centre and services export hub.

What is the business and financial services sector?

"Business services" is a general term that describes work that supports a business but does not produce a tangible commodity. The scope of business and financial services is vast, and includes Business Process Outsourcing services, consulting services, customer services, human resources services, cleaning, patronage, repair and maintenance services, dispute resolution and prevention services, IT services, security services and financial services. Financial services include accountancy, banks and building societies, real estate, stock brokerages, tax services, valuation, risk management and insurance.



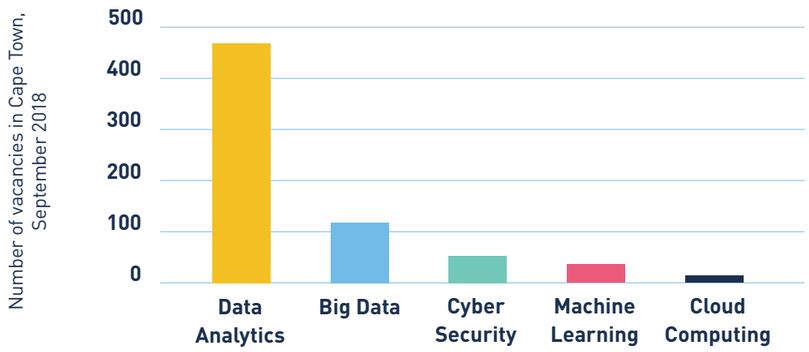
64% of the jobs added in the province in 2011 were in this sector

Major trends: What characterises the sector and how is that changing?

- Cape Town is a start-up hotspot, with triple the number of start-up companies as Johannesburg;
- The Business Processing Industry is converging back office administrative services (for example, call centres) to achieve economies and efficiencies of scale;
- Global Multi-Sided Platforms such as LinkedIn, Salesforce, Google, MasterCard and even Facebook are converging matchmaking and financial services at low cost that connects service providers, consumers, advertisers and value added services to facilitate growth of the Gig Economy; and
- Shared Services Centres are converging all business services under one roof for large enterprises.

Vacancies for digital skills in the financial services sector

Results represent a one-month period and cannot be generalised.



The demand for ICT-related jobs in this sector is strong, and a close second to the ICT sector itself.

Current Digital Skills Needs

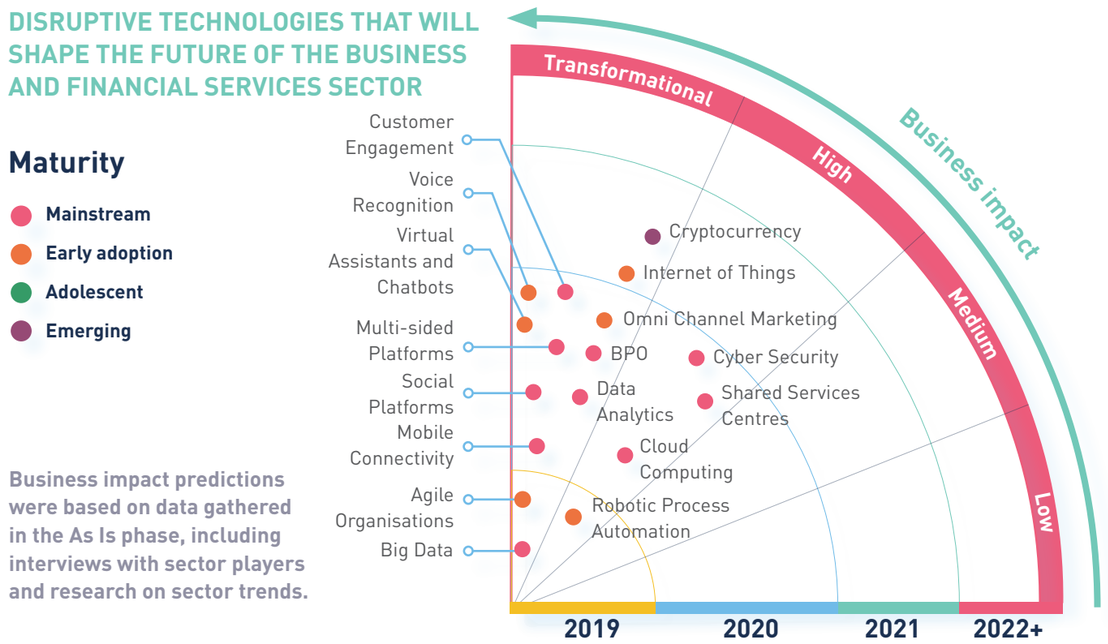
- Brand management, graphic design, digital sales, marketing and social media skills for those working with web-based product information;
- Higher level analytical skills for Big Data; and
- Up-skilling of call-centre agents to adapt to omni-channel business models.

TO BE:

The local financial services sector faces a number of technology-driven challenges. Modern financial products and services are primarily digital in nature, technical innovation is rapid, and consequently digital transformation is imperative. The rise of new 'fintech' services means that this sector is also facing disruption to its business models.

A lack of skilled staff is a debilitating feature of the financial sector. Key skills required in this industry (such as data science) are highly specialised; however, the available skills pool is limited. Due to the 3–4 year timeframe for training graduates in a formal University programme, firms in this sector evidently prefer candidates with the aptitude to be up-skilled through on-the-job training and continuous learning. Respondents from this industry indicated that they are willing to support internship or job shadowing programmes to increase the pool of skilled labour and expect to receive assistance from the Government in the form of subsidies for re-skilling and up-skilling of their existing workforce.

DISRUPTIVE TECHNOLOGIES THAT WILL SHAPE THE FUTURE OF THE BUSINESS AND FINANCIAL SERVICES SECTOR

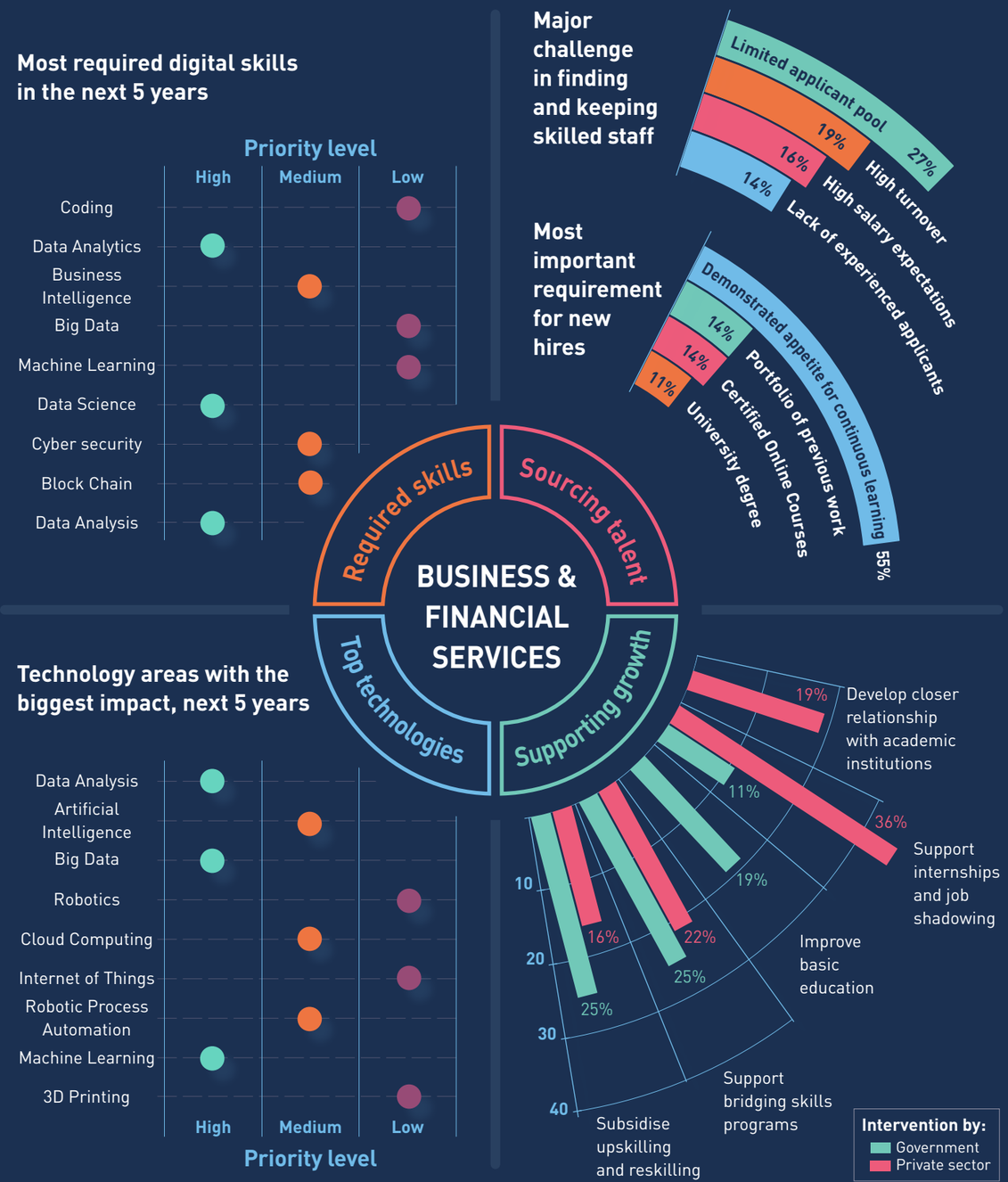


Business impact predictions were based on data gathered in the As Is phase, including interviews with sector players and research on sector trends.

Derived from: Atos. (2018). Look Out 2020+ Tech Trends. Which technologies will power your business tomorrow? Bezons, France

Industry views: What will the digital skills landscape look like in 5 years?

Based on results from 35 business and financial services sector representatives. Full survey questions listed in Annex 2, and full survey results are available in the To Be Report: Digital Skills for the Future (2019).



SECTOR 3: MEDIA AND FILM SECTOR

AS IS: 2019

What is the media and film sector?

The film and media industry is a significant contributor to the Western Cape and national economy, and an important job creator.

The media sector has been using various forms of digital technology for decades (think Internet radio, online publications and video streaming). The boom in new digital media (social media, online news and web streaming services) and the slow death of traditional media has dramatically changed the nature of work in this sector. Over the last decade, the advent of affordable computers, online software, and 'broadband' internet access has pushed the sector into a "gig economy" mode, in which pieces of work are often contracted out to a pool of individual professionals or small, specialised firms.

The concept of media is vast and includes (inter alia) TV, print, radio, blogs, email newsletters, social media, tweets, online sources, websites, app alerts, text messages, gaming, animation and advertising.

Major trends: What characterises the sector and how is that changing?

Virtual and augmented reality technology is growing in influence and popularity within the sector; and

Visual effects technology and software continue to evolve rapidly in the global film and media industry, requiring more global exposure to keep up with the change.

Supply-side insights: Where do digital skills come from?

It appears that limited training opportunities are available for the skilling of first-time job entrants or upskilling of people already employed in this sector. Limited (if any) training and development opportunities are available for staff at middle management roles or those wishing to further their careers to potentially become industry leaders.

ICT Practitioner Skills are pervasive in the film, media and new media (gaming and animation) industries where specialist skills are required. In general, it appears that there is a gap in both sector-specific digital skills for the film and media sector in addition to the ICT practitioner skills.

Current Digital Skills Needs

- Artistic skills including media production, cinematography and editing;
- Game development/programming, graphic design;
- Multi-media and visual effects expertise;
- Direct marketing; and
- Soft skills: Social intelligence, ability to collaborate virtually, novel forms of thinking, higher order cognitive skills, computational thinking.

TO BE:

ICT practitioner skills are pervasive in the film, media, gaming and animation industries where specialist skills are required. In general, it appears that there is a gap in sector specific digital skills for the film and media sector in addition to the ICT practitioner skills. The need for development opportunities to grow the required digital leadership skills was also highlighted.

The media sector identified a limited pool of skilled applicants as its primary skills-related issue. In the context of the sector, this implies that there is a shortage of individuals that can produce high quality work. This is corroborated in that the sector considers experience and a portfolio of work done previously as the most important requirement for new hires.

Suggested actions for government and the private sector

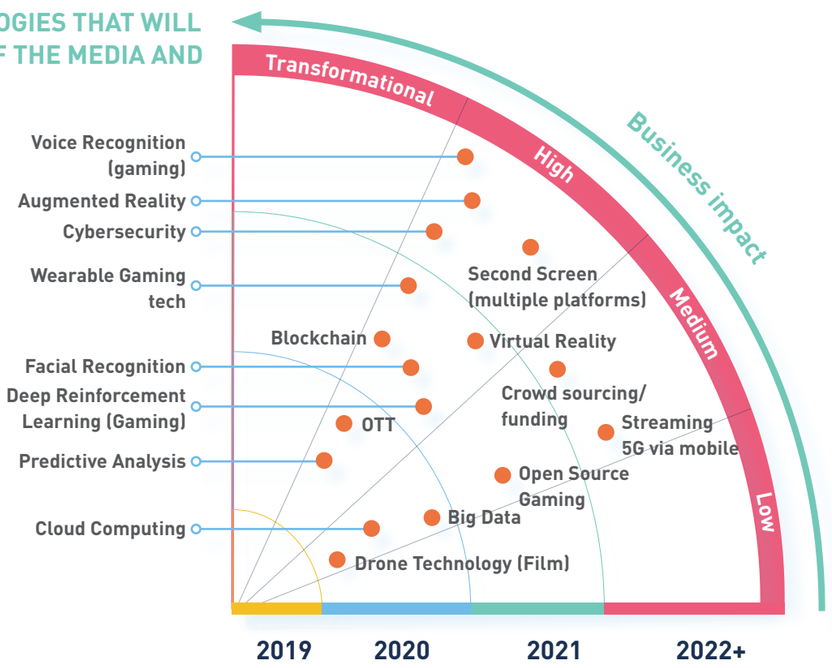
Respondents from this sector noted that the private sector can support internship and job shadowing programmes to provide job experience, whereas the government could support bridging skills programmes to enable graduates to become work-ready.

DISRUPTIVE TECHNOLOGIES THAT WILL SHAPE THE FUTURE OF THE MEDIA AND FILM SECTOR

Maturity level

- Mainstream
- Early adoption
- Adolescent
- Emerging

Business impact predictions were based on data gathered in the As Is phase, including interviews with sector players and research on sector trends.

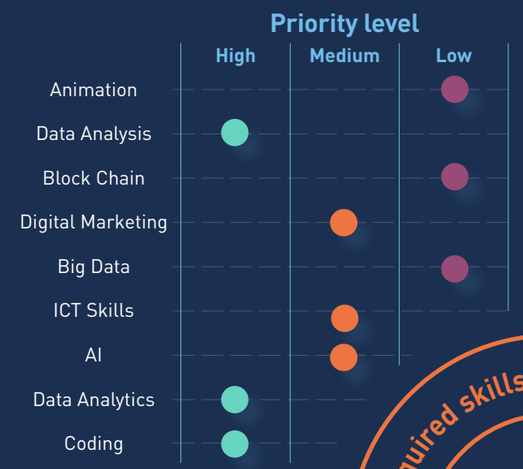


Derived from: Atos. (2018). Look Out 2020+ Tech Trends. Which technologies will power your business tomorrow? Bezons, France

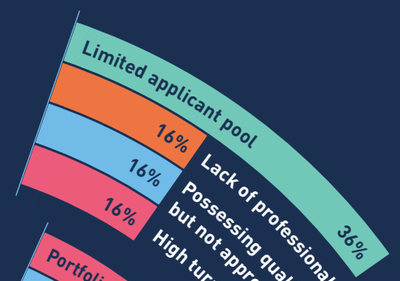
Industry views: What will the digital skills landscape look like in 5 years?

Based on results from Film and Media sector representatives. Note that response from this sector was low (n=19) and should therefore be treated cautiously. Full survey questions listed in Annex 2, and full results are available in the To Be Report: Digital Skills for the Future (2019).

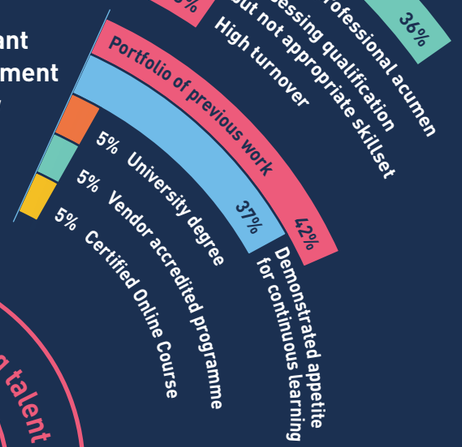
Most required digital skills in the next 5 years

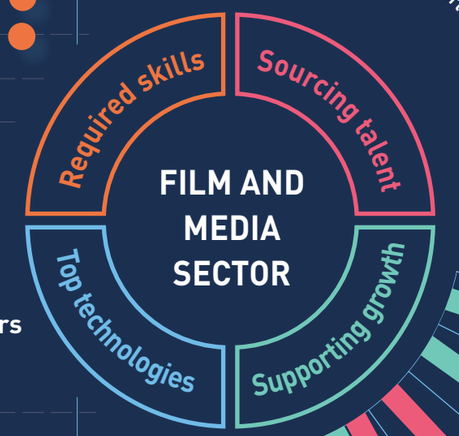


Major challenge in finding and keeping skilled staff

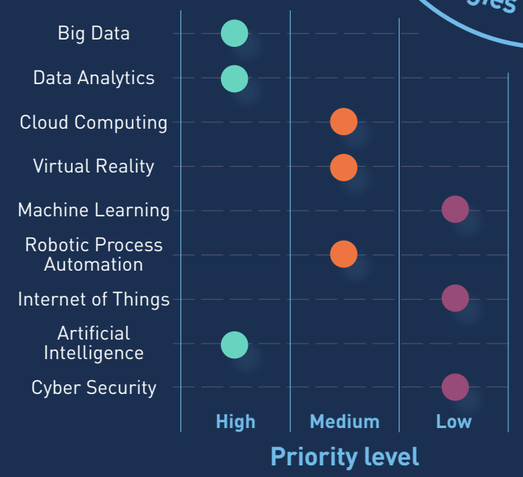


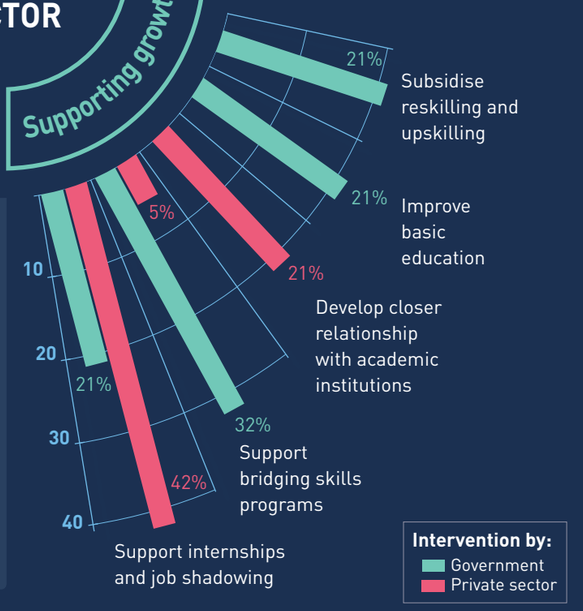
Most important requirement for new hires





Technology areas with the biggest impact, next 5 years





SECTOR 4: TOURISM SECTOR

AS IS: 2019

The tourism sector is highly digitalised and a key contributor to the Western Cape economy. The sector is at the leading edge of digital innovation and disruption and is obliged to be globally competitive. However, there are few tourism-specific digital skills development initiatives in the Western Cape to support growth.

What is the tourism industry?

The UNWTO57 defines tourism as "...the activities of persons traveling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business and other purposes."[10] The value chain in the Western Cape includes the accommodation industry, which piggy-backs on international digital agencies such as booking.com and Airbnb; the travel industry, with digital travel platforms like Travelstart; and attractions, some of which are run by the public sector (e.g. parks, monuments, beaches). Online guides such as *Eat Out* and *The Inside Guide* are important sources of information and bookings. From an economic perspective we can also talk about tourism as the intersection of the visitor economy and the leisure economy.

[10] - UNWTO (World Tourism Organization). Tourism Highlights 2018 Edition. 2018

Major trends: What characterises the sector and how is that changing?

Multi-sided platforms that integrate all aspects of the value chain are the key driver of change;

Digitalisation of the whole value chain has supported fundamental changes to business models and product platforms; and

Mobile technology has given rise to self-service and personalised tourism experiences.

The following transitions are underway in the tourism industry:

From	To
Mass markets	Niche markets
One-size-fits-all	Personalisation*
Vacation packages	Self-service
Brochures and websites	Video and virtual experience
Expert and media review	Social media review
Selling of products (outbound marketing)	Two-way engagement (inbound marketing)
Traditional products	Digitalised products
A tourism value chain	An experience value chain**
Booking engines and websites	Multi-sided platforms
Desktop interfaces	Mobile interfaces

Social media skills are a critical requirement across the tourism value chain.

* Facilitated by accurate understanding through customer analytics and engagement
** That is more complex, orchestrated, personalised and diverse

Current Digital Skills Needs

- Social media skills across all platforms
- Advanced internet research
- Rich media presentation and marketing
- Digital fluidity: the ability to manoeuvre between types of platforms
- Data analytics

TO BE:

There is little formal education for digital skills in the tourism sector. The industry in general has a low level of computer literacy. According to respondents of the survey, even when applicants have qualifications, they do not necessarily have an appropriate skills-set required by the company.

Suggested actions for government and the private sector

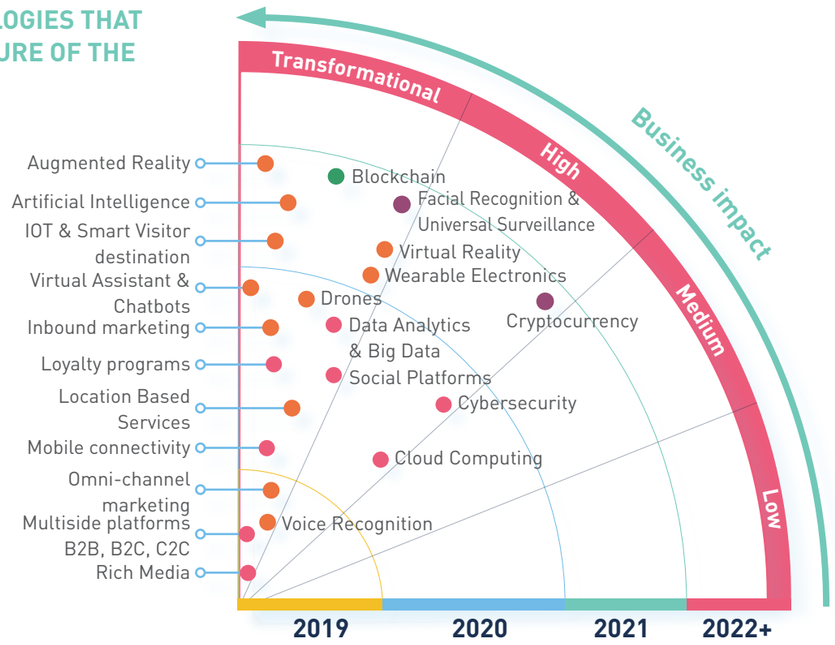
In order to improve the digital skills of the workforce in the tourism industry, respondents noted that they believe the government should improve basic education and training at school level, whereas the private sector sees its role as providing job experience through internship and job-shadowing programmes.

DISRUPTIVE TECHNOLOGIES THAT WILL SHAPE THE FUTURE OF THE TOURISM SECTOR

Maturity level

- Mainstream
- Early adoption
- Adolescent
- Emerging

Business impact predictions were based on data gathered in the As Is phase, including interviews with sector players and research on sector trends.

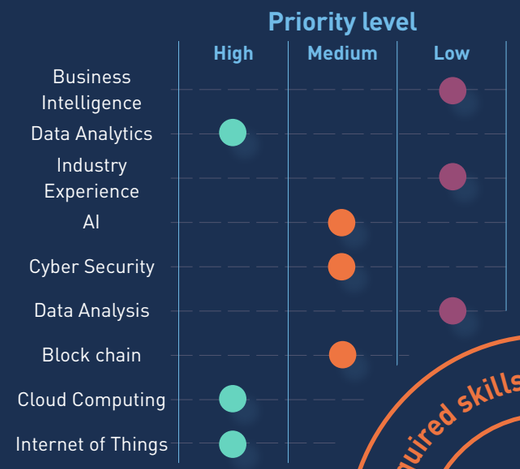


Derived from: Atos. (2018). Look Out 2020+ Tech Trends.

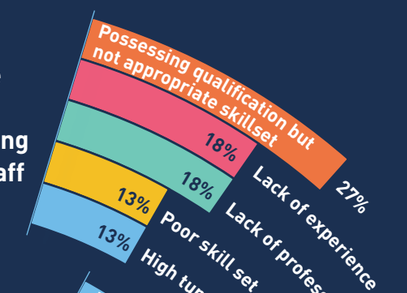
Industry views: What will the digital skills landscape look like in 5 years?

Based on results from tourism sector representatives. Note that response from this sector was low (n=16) and should therefore be treated cautiously. Full survey questions listed in Annex 2, and full results are available in the To Be Report: Digital Skills for the Future (2019).

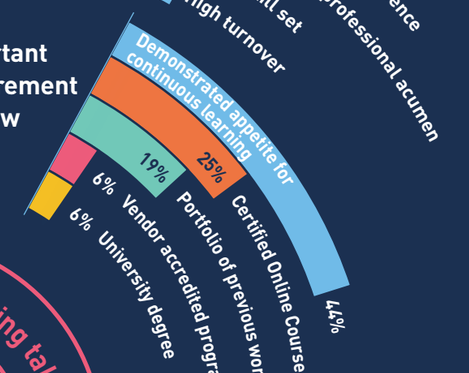
Most required digital skills in the next 5 years



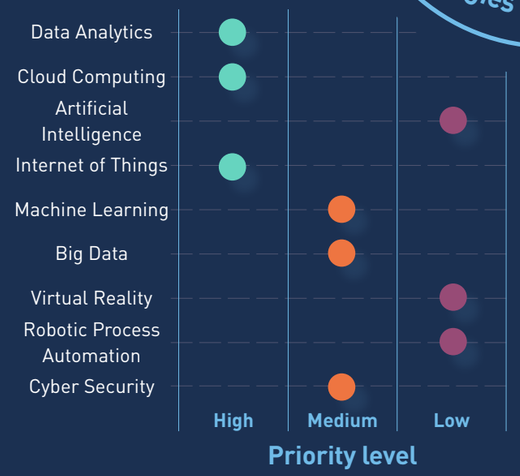
Major challenge in finding and keeping skilled staff

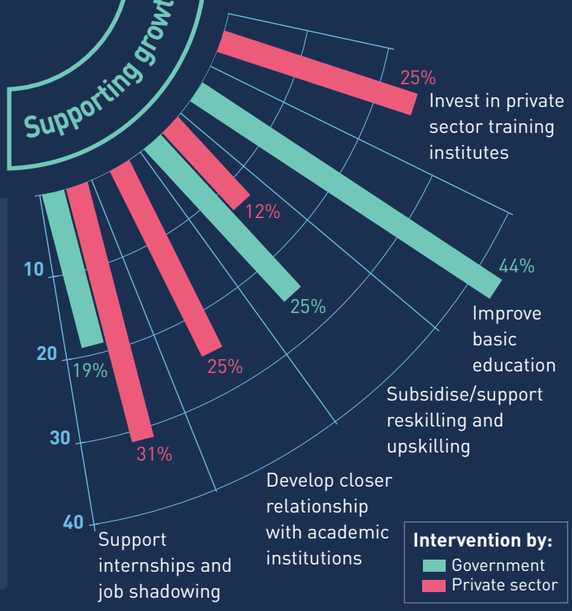


Most important requirement for new hires

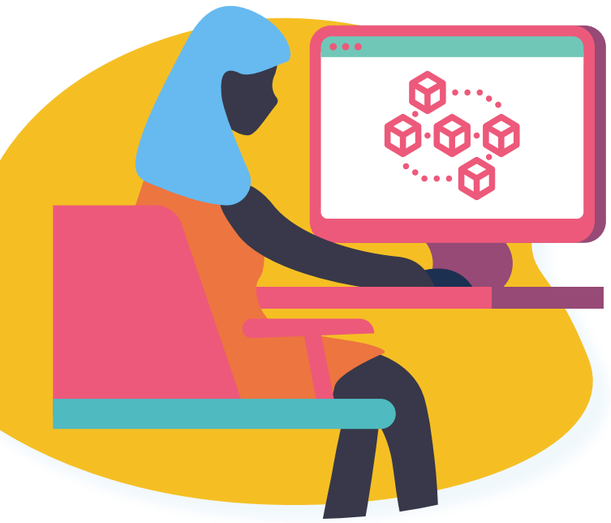


Technology areas with the biggest impact, next 5 years





SECTION 5: INFORMATION, COMMUNICATION AND TECHNOLOGY SECTOR



What is the ICT sector?

The South African ICT sector is well established and is the largest in Africa, contributing approximately 8,2% of the national GDP. ICT is also a major priority for the Western Cape, employing 30,000 people and contributing over R3 billion to the provincial GDP.

The ICT sector has grown into an enormous ecosystem with many sub-ecosystems interlinking, overlapping and some functioning on their own. The Western Cape is committed to becoming a leading ICT player.

30 000
people employed in the WC in ICT

Zia, Ilahi and Khan define information and communication technology (ICT) as "a diverse set of technological tools and resources used to communicate and to create, disseminate, store and manage information," and this is the definition used in these studies[2].

The included workforce comprises management-level skills, core practitioner skills, and other ICT technical skills. The use of the term ICT practitioners does not include ICT mechanics, manual workers and non-ICT professionals working in the industry.

[2] - Zia, N., Ilahi, M., Khan, N.A. 2018. The Role of ICT. Multidisciplinary Higher Education, Research, Dynamics & Concepts. Faculty of Commerce SV PG College, Aligarh, India.

AS IS: 2019

Major trends: What characterises the sector and how is that changing?

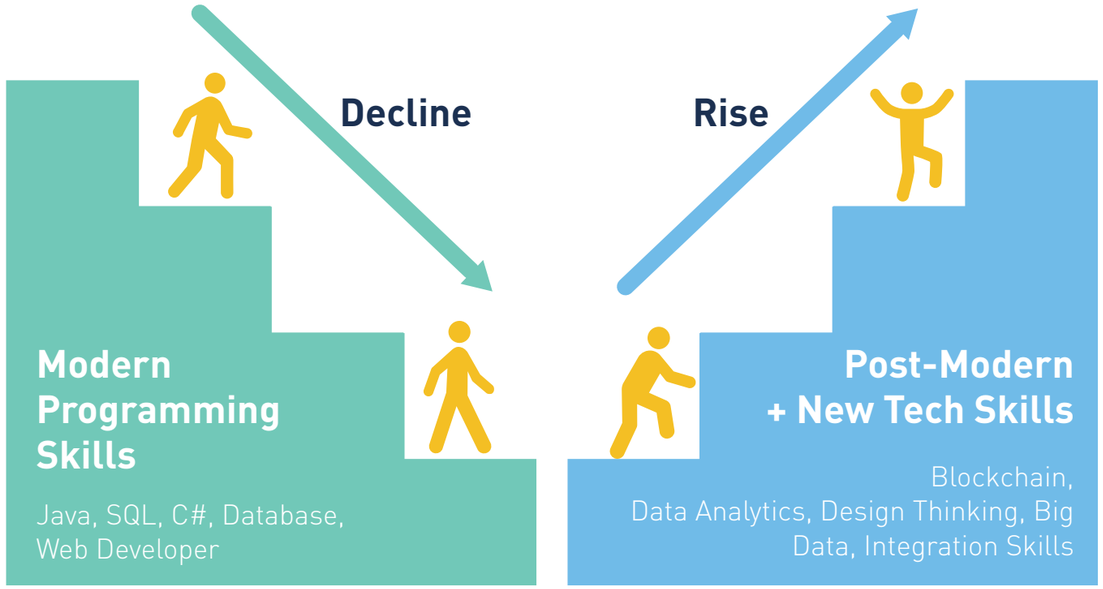
Nano technology, Blockchain, digital transformation and the cloud are all changing the ICT sector

A shift is evident away from websites toward platforms

Artificial intelligence and data analytics are changing quickly and will dominate the ICT landscape in the coming years

Focus is growing on self-service and end-user technology

The decline in legacy technology



Current Digital Skills Needs

- Systems thinking and design thinking skills with the ability to see the bigger picture
- Building artificial intelligence and analytical skills is paramount
- In general, skills needs are moving from very technical to higher-level integration and digital transformation skills

TO BE:

There is a realisation within the industry that new skills are needed to develop, support, maintain, implement and grow new technology. Skills such as Java and SQl, and others associated with Legacy Technologies are slowly becoming obsolete and need to be replaced with new skills such as platform development, Blockchain, and design thinking.

Suggested actions for government and the private sector

In order to support digital skills growth, the ICT sector believes that government should support internships or job- shadowing programmes to provide job experience. This sector also suggests that the private sector should develop a closer relationship with academic institutions to match future demands.

The demand for cyber security

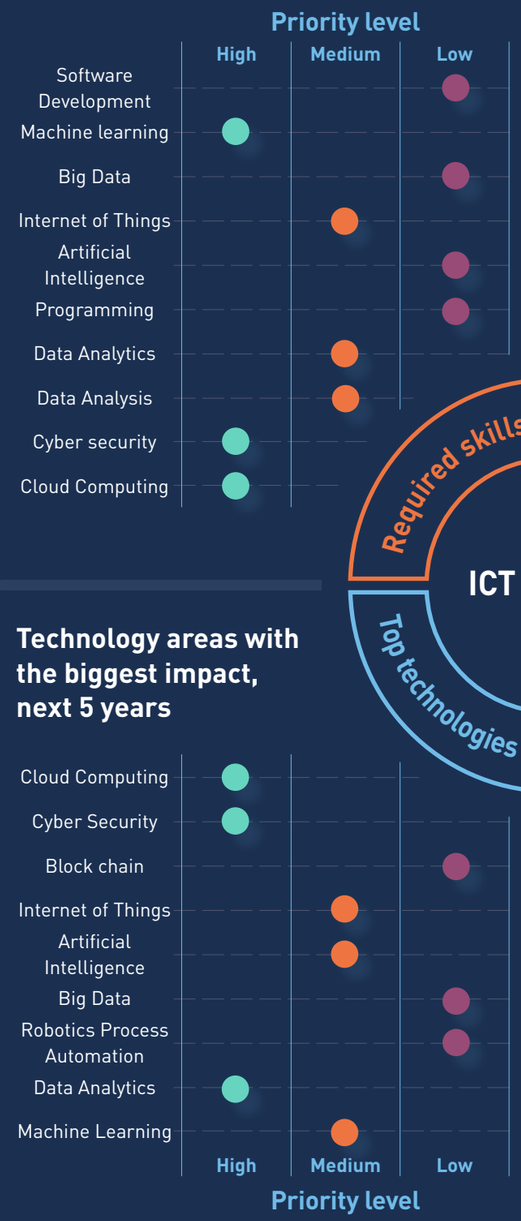
It is interesting to note that IT practitioners and the ICT sector shows a strong concern for cyber security skills, which is a highly technical, complex, and hard-to-find skill set. Cyber security requirements are normally fulfilled by a small number of people with highly specialised and scarce skills. Whilst this is a very niche focal area, the impact of becoming a region known as a "global leader" in cyber security skills must not be underestimated – data breaches cost South African companies alone more than R30 million per incident and affected millions of users in 2018 across all sectors.*

* "Five massive data breaches affecting South Africans", Fin24, https://www.fin24.com/Companies/ICT/five- massive-data-breaches-affecting-south-africans-20180619-2

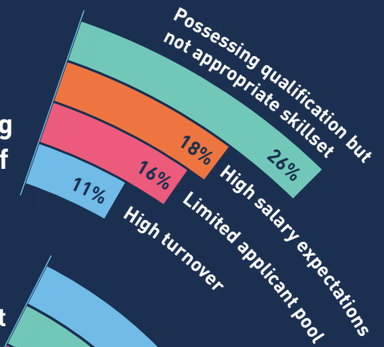
Industry views: What will the digital skills landscape look like in 5 years?

Based on results from 205 ICT/tech sector representatives. Full survey questions listed in Annex 2, and full survey results are available in the To Be Report: Digital Skills for the Future (2019).

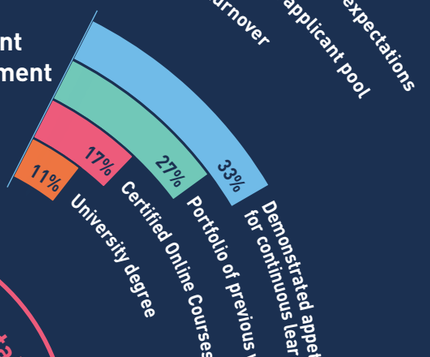
Most required digital skills in the next 5 years

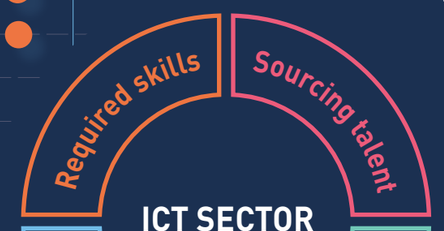


Major challenge in finding and keeping skilled staff

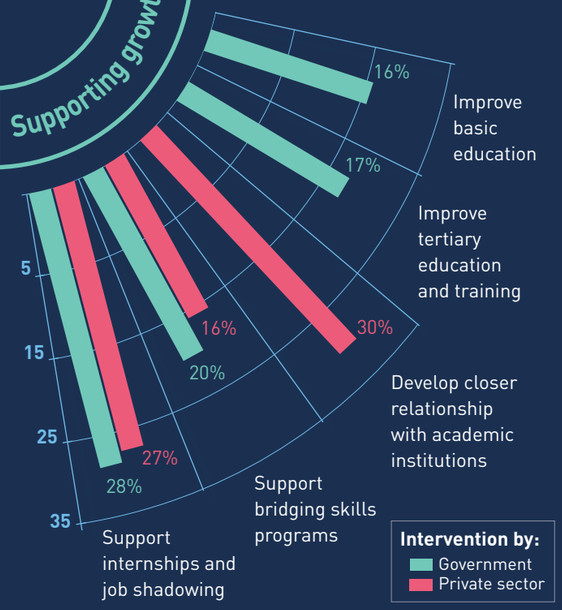


Most important requirement for new hires





Technology areas with the biggest impact, next 5 years



SECTION

04

Conclusions

CONCLUSIONS

This combined synthesis of the As Is and To Be analyses present an overview of the digital skills environment characterized by the following:

01 The need for digital skills merely to participate in the economy, and to be employable:

Staff need to continually learn and develop new skills as business and society is engulfed by the 4IR. The kinds of jobs available for people to pursue, and the very nature of work, are headed into unchartered directions.

02 A current requirement by businesses to hire or develop staff with appropriate digital skills with demand currently not being met:

Digitally capable staff are (or will be) needed by all companies just to survive and compete, let alone thrive in the local as well as global marketplace. This requirement is only going to grow.

03 A constantly shifting skills landscape:

The specific skills that are in demand at any time are continuously evolving to keep up with new technologies, business models, and business methods. These skill-sets are characterised by a continual drift towards ever more advanced and developed skills.

04 A global marketplace for people with more advanced digital skills:

Just as locally developed talent may leave, so the Western Cape must position itself to attract talent as well.

05 A complex skills development ecosystem with multiple actors:

These include schools, institutes of higher education, SETA learnerships, Massive Open Online Courses (MOOCs), personal learning, professional development, and on-the-job training, among others. Many of these have a long "lead-time" to produce qualified individuals with specific digital skills, but those individuals with a sufficient foundation can pivot towards new opportunities by acquiring further skills in a much more agile way.

06 Many parts of the skills development ecosystem are sub-optimal:

This leaves large numbers of working-age local people out of the digital work environment (which means out of almost any formal employment).

Moving Forward

A globally competitive digital hub must have access to:

At any given time, the overall result should be a close match between the supply (and availability) of digital skills, and the local demand for them, even as this demand grows in size and velocity, and in directions that are inevitably uncertain.

01 Skills pool:

A pool of people that collectively has the wide range of digital skills required by business, whether as specialist ICT skills or as broader digital user skills.

02 Flexible skills supply:

A continual supply of digitally-skilled employees (whether produced by the formal education sector, through self-development, or by migration), that is sufficient in volume and quality to ensure that the "skills demand gap" is first reduced and then remains narrow, without any reduction in demand (i.e. the skills gap is not reduced because businesses fail or move away).

03 Dynamic labour market

A dynamic employment environment allowing and encouraging people to move jobs, roles, and employers easily, including encouraging people to move into the region, accepting that people will also move in the other direction as well.

04 Supportive skills ecosystem:

The supporting structures, institutions, services, and social culture that encourage and enable individuals to continually learn, grow their skills and capabilities, and act entrepreneurially on a lifelong basis, so that as some move "up" and eventually "out", others can easily move "in" and then "up".

Next Steps

The next step towards positioning the province as a leading digital hub in the global economy by 2030 is to develop a shared agenda and sector-specific "roadmaps". This process will be informed by the research findings outlined in this report, as well as consultative meetings across the priority sectors, academia and training institutions, SETAs and government entities. The aim is for DEDAT and partners to identify ways of facilitating upskilling, re-skilling and "right skilling" initiatives of already-employed workers as well as to work toward closing the gap between supply and demand.

ANNEX 1: DEFINING TRANSFORMATIVE DIGITAL TECHNOLOGIES

What are transformative digital technologies?

Some of the Transformative Digital Technologies (TDTs) that are expected to impact various sectors in the Western Cape.

1. Data analytics

- Data analytics proper
- Data modelling and predictive analytics
- Data modelling and predictive analytics

2. Hyper-connectivity of devices amongst themselves and with human users

- Internet of things (IoT)
- Industrial Internet of things (IIoT)
- Mobility: increasing broadband speeds and mobile applications drive consumer interactions

3. Cognitive technologies

- Artificial intelligence in general, including machine learning and deep learning
- Robotic process automation (RPA)
- Digital twins
- Image recognition (including personal identification and authentication)
- Human language recognition, understanding and production/ generation (incl. "chatbots", "virtual assistants", both of which make use of AI)

4. Robotics

- Internet of things (IoT)
- Industrial Internet of things (IIoT)
- Mobility: increasing broadband speeds and mobile applications drive consumer interactions.

5. Sensor

6. Location technologies

7. Cloud computing

8. Immersive technologies

- Augmented Reality (AR)
- Virtual Reality (VR)
- Mixed Reality (MR)

9. Blockchains

10. Digital ecosystems and platform technologies

11. App-and web-enabled markets

12. Social media

13. Cybersecurity / digital security

14. 5G networks

15. Wearable electronics

16. Additive manufacturing (in certain contexts also called 3D printing)

17. Drones (remotely piloted flying devices, or in advanced instances, aerial robots)

18. Digitally-supported learning environments (amongst others, "micro learning" and "learning in the flow of work")

19. Programming/coding/digital system development in all its different manifestations, as well as the various related skills and competencies required to create, implement and maintain computers and other digital devices

20. Technologies for human talent management (identification, optimisation, personal development pathways, etc.)

ANNEX 2: TO BE SURVEY QUESTIONS

For full survey results, please see the *To Be: Digital skills of the future* full report

Q1. Which of the following sectors best describes your primary field of business?

a. Retail
b. Tourism
c. ICT Services
d. Financial Services
e. Media Services
f. Other
(please specify)

Q2. Which of the following options best describes your role in your company?

a. Senior Management
b. Human Resources
c. Operations
d. IT
e. Other
(please specify)

Q3. Do you have plans to expand your ICT operations (by increasing ICT budgets, implementing major technological changes, or adding more ICT practitioners) with in the next two (2)years?

a. Yes
b. No

Q4. Are you planning any significant (digital skills) upskilling or re-skilling of your workforce, or employees, in the next 12 months?

a. Yes
b. No

Q5. What do you believe are the top five (5) Technology/ICT areas that will have a significant impact on your company in the next five (5) years?

a. Virtual Reality
b. Big Data
c. CyberSecurity
d. Augmented Reality
e. Data Analytics
f. Machine Learning
g. Cloud Computing
h. Internet of Things
i. Blockchain
j. Artificial Intelligence
k. 3D Printing
l. Robotic Process Automation
m. Quantum Computing
n. Robotics
o. Other
(please specify)

Q6. From the Technology/ICT areas selected in the previous question, what is the single most important Technology/ICT area that will have the most impact on your company in the next five (5) years?

Choice dependent on options selected in Q5.

Q7. Based on the previous answers, what do you anticipate to be the top three (3) most important Technology/ICT skills/Digital Skills for your company in the next five (5) years?

a. Skill 1
b. Skill 2
c. Skill 3

Q8. What is the most likely talent source of the Technology/ICT/Digital Skills identified in the previous question?

a. Universities
b. Labour brokers
c. Immigration
d. TVETs
e. Vendor Academies
f. Other companies
(please specify)

Q9. Which of the following will be the most important for new hires in ICT roles in the next five (5) years?

a. University Degree
b. Demonstrated appetite for continuous learning
c. Certified Online Courses
d. Vendor Accredited Program
e. Portfolio of work done previously
f. Other

(please specify)

Q10. What do you anticipate will be the major challenge faced by your company in acquiring and keeping the appropriate Technology/ICT/ Digital practitioners (select one)?

a. Limited pool of skilled applicants
b. High skill individuals moving jobs regularly
c. High salary expectations
d. Lack of experience of applicants
e. Applicants having qualifications but not possessing the appropriate skill set required by the Company
f. Poor skills set of applicants
g. Lack of business/professional acumen
h. Other

(please specify)

Q11. Select One (1) governmental intervention that, in your opinion, could assist in supporting the growth of digital skills in the region?

a. Subsidise reskilling and upskilling of the existing workforce
b. Improve Tertiary education and training (University and TVET colleges)
c. Improve basic education and training (school level)
d. Ease immigration requirements to attract skills
e. Support bridging skills programmes, to enable graduates to become workready
f. Support Internships or job-shadowing programmes to provide job experience
g. Other

(please specify)

Q12. Select One (1) intervention by the private sector that, in your opinion, could assist in supporting the growth of digital skills in the region?

a. Develop a closer relationship with academic institutions to match future demands
b. Support bridging skills programmes, to enable graduates to become workready
c. Support reskilling and upskilling of the existing workforce
d. Invest in developing private sector skills training institutes
e. Support Internships or job-shadowing programmes to provide job experience
f. Other

(please specify)

Q13. Please provide any additional comments/suggestions you would like to add.

Comments:

NOTES:

Western Cape
Government
Economic Development
and Tourism

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

GTAC
Analyse
Assess
Activate
Strategic & Technical Advisory
National Treasury
REPUBLIC OF SOUTH AFRICA

cbpep
CAPACITY BUILDING PROGRAMME
FOR EMPLOYMENT PROMOTION