



CREATING SOUTH AFRICA'S FUTURE WORKFORCE

DIGITAL PUTS ONE IN THREE JOBS AT RISK

EXECUTIVE SUMMARY

Digital technology brings efficiencies but it also brings disruption and radically new ways of engaging and doing business. For countries and organisations that are ready for digital and have a workforce that is geared to ‘run with the machine’, digital has the potential to uncover new value, create and redesign more jobs than those being lost and boost growth significantly. However, for countries like South Africa that are less prepared, digital may bring more job losses than gains—which will negatively impact the socio-economic wellbeing of individuals and the economy.

Specially commissioned research from Accenture indicates that 35 percent of all jobs in South Africa—almost 5.7 million jobs—are currently at risk of total automation. With a fragile economy and growing unemployment, especially youth unemployment, further job losses in South Africa could have a crippling effect.

The challenge we face? Until now, digital technology adoption has overwhelmingly been used by organisations to drive cost reduction, automate and increase efficiencies, displacing human workers. The value of human-machine collaboration has become increasingly apparent, however,

making it clear that realising the full promise of digital technologies and truly boosting economic growth depends on humans and machines working together to develop differentiated customer experiences, and create new products and services for new markets.

Our research shows that if South Africa can double the pace at which its workforce acquires skills relevant for human-machine collaboration, it can reduce the number of jobs at risk from 20 percent (3.5 million jobs) in 2025 to just 14 percent (2.5 million jobs).

But for such an intervention to be effective, we must start now.

As digital continues to dominate, South Africa’s ability to secure economic access for all its people—giving its workforce the skills to participate in the digital economy and earn—will determine its future trajectory.

In this report, Accenture Research identifies:

- The new skills needed to unlock advantages in the digital economy.
- The actions needed by South African leaders across business, government and industry to shape and prepare the workforce to ‘run with the machine’.

PANDORA'S BOX

**"A great deal more of the world emerges from its technologies than from its wars and treaties."
- W. Brian Arthur¹**

The best thing the cave people did was leave the cave. Technology helped them take that step. Today the possibilities created by technology continue to be felt in every sphere of business and life. Its artefacts, from fire to forks to Facebook and machine learning algorithms, have catapulted humanity from Stone Age to phone age to drone age. We can now solve some of the world's most intractable problems and finally make significant progress in reducing our usage of our planet's capital for our living expenses, as economists encouraged us to do over 100 years ago. But technology's ability to release humans from much physical drudgery is also the source of much fear and anxiety.

John Maynard Keynes predicted this day would come in his 1930 lecture "Economic possibilities for our grandchildren".² He suggested then that mankind will solve its most pressing economic problem, one that we have been steadily solving since we walked this planet, namely 'the struggle for subsistence'.

Machines will help us produce enough for our needs. But we open Pandora's box because, as Keynes argued then, solving the economic problem is coupled to a second problem, namely 'technological unemployment'— 'unemployment due to our discovery of means of economising the use of labour outrunning the pace at which we can find new uses for labour'. We are producing more and more (products and services) with less and less need for intervention.

What options are open to us?

Job transition is not new. In the pursuit of higher productivity at lower cost options, jobs have for many years been shed. In recent times, many manufacturing and standard business process intensive jobs were outsourced to countries where labour was cheaper. Those jobs rarely made it back to home soil but at least labour in outsource recipient countries benefitted from the employment opportunities created there. Today, the same phenomenon occurs. But now, the search for labour arbitrage is no longer between physical geographies; today, jobs are lost to the digital world and will, in all probability, never to be done by humans again.

The loss of jobs creates an even bigger problem. Machines do not consume things. Machines do not buy things. So, while machines can replace human work, they do not drive purchasing power and consumption or GDP as humans do. Humans work. Humans get paid. Humans spend. Humans consume. Society progresses. Humans don't work. Don't get paid, can't spend or consume (much). Society regresses.³

While the steady march of progress inevitably spells more and more machine augmentation, allowing humans to use their time, energy and creativity differently, we are ill prepared for its consequences. Labour is still a major economic growth driver. Jobs remain the primary mechanism of distributing income and providing humans with access to the economy. This is especially true in emerging markets—like South Africa—where poverty remains a problem, rates of unemployment are high and the social security blanket is thin.

There is an answer

Instead of being replaced by machines, humans must learn to collaborate with machines to enhance their own productivity and ingenuity. We must learn to 'run with the machine'.

JOBS AT RISK IN SOUTH AFRICA

“The primary will of the world is no longer about peace or freedom or even democracy; it is not about having a family, and it is neither about God nor about owning a home or land. The will of the world is first and foremost to have a good job. Everything else comes after that.”
- Jim Clifton, *The Coming Jobs War*

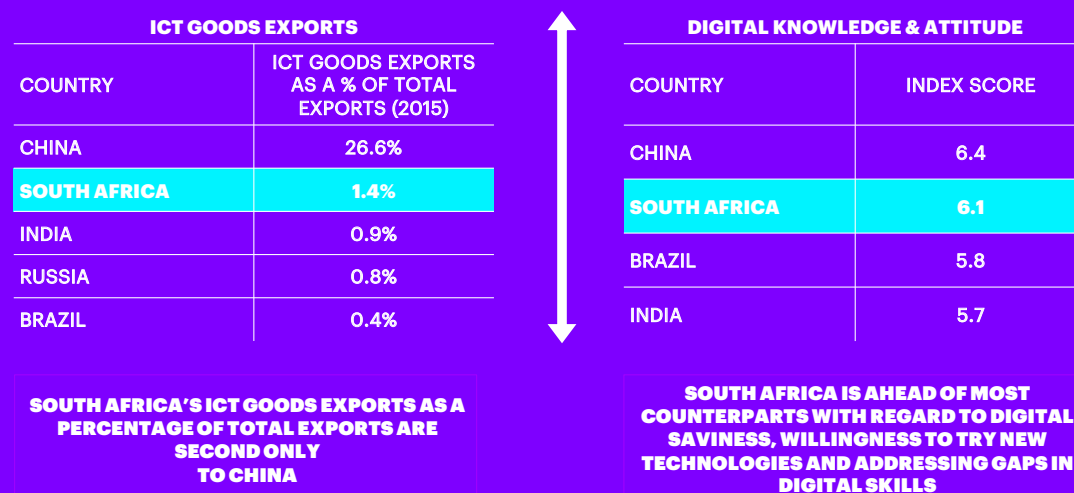
South Africa has made good headway in terms of adopting digital, however, the growing maturity of its digital economy has yet to translate into significant growth, especially for labour.

5.7
MILLION

jobs currently
at risk in South
Africa

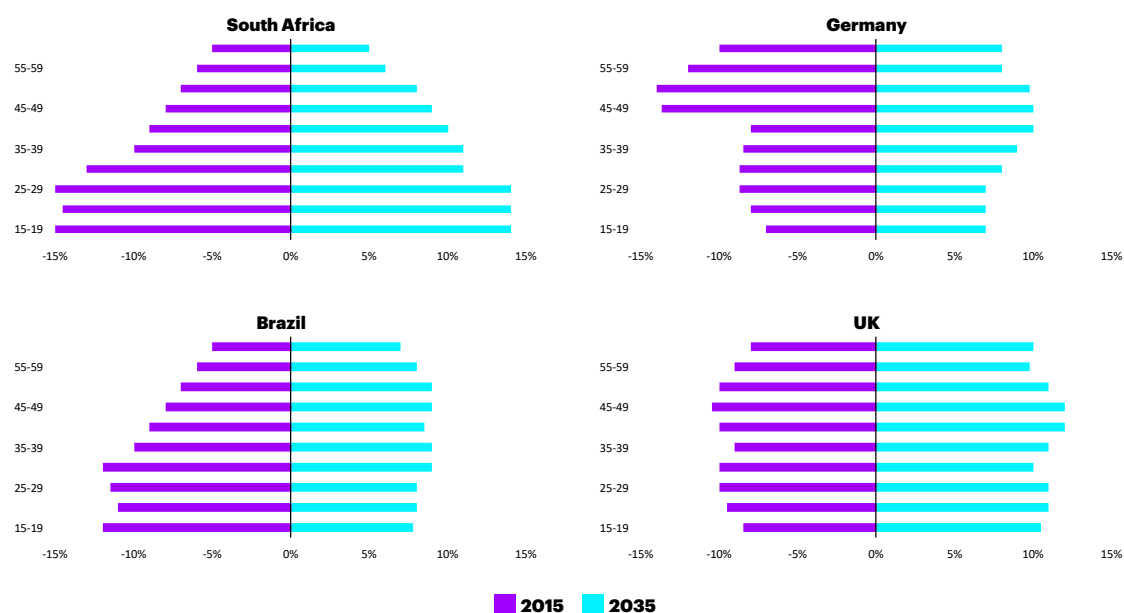
While it scores well in terms of digital competitiveness compared to its emerging market peers (Figure 1) and its demographics—50 percent of the population is under 30 years old—are well suited to the demands of a digitally-driven economy (Figure 2), South Africa's economy remains weak. Population growth has overtaken GDP growth (Figure 3). Labour and income growth are declining (Figure 4) while unemployment (now at 28 percent), and especially youth unemployment (at 36%), is high. Jobless youth make up 75 percent of the unemployed.

Figure 1: South Africa is ahead in terms of adopting digital



Source: IMD World Digital Rankings, IMD (2017)

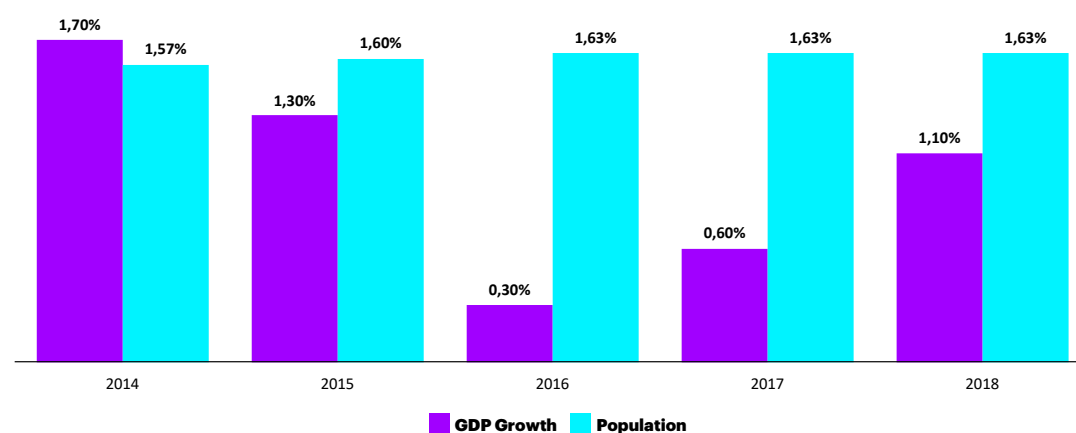
Figure 2: Almost 50 percent of the population is under 30 years old



Source: Oxford Economics

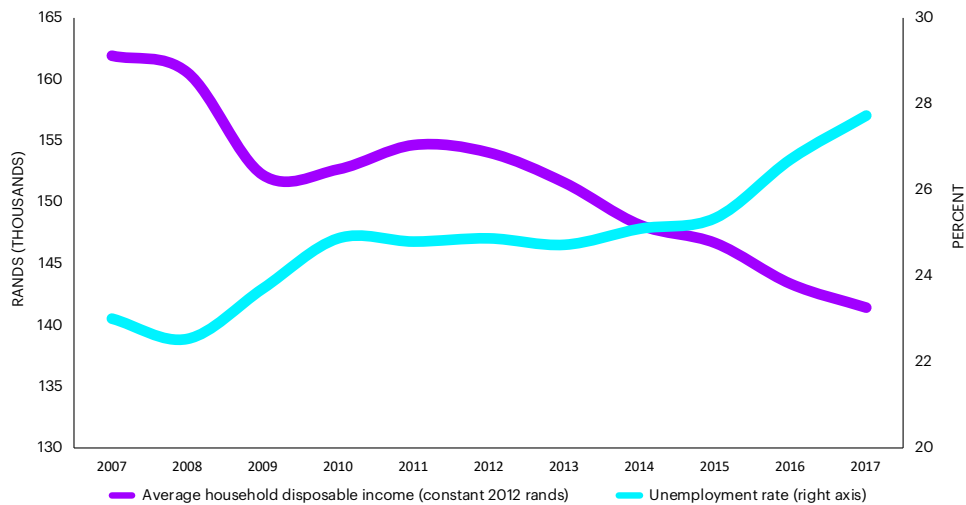
Figure 3: Population growth has overtaken GDP growth

Unemployment reached a 14-year peak of **27.7%** in 2017



Source: Accenture Research, IMF

Figure 4: South Africa - household disposable income and unemployment rate



Source: Accenture Research, Statistics South Africa, Oxford Economics

Until now, digital technologies have been deployed to work alongside people and automation has occurred only in isolated cases. Now, as digital technologies advance, the threat of automation grows. It will eliminate a broad swath of jobs across the economy, aggravating the risk of unemployment. And, as digital technologies become ever more sophisticated, more waves of job displacement will almost certainly occur. It is a distressing picture.

To quantify the size of the challenge, Accenture commissioned South Africa-specific research. The result: 35 percent of all jobs in South Africa are currently at risk of total automation—i.e. machines can perform 75 percent of the activities that make up these jobs. The threat is significantly higher in South Africa than in more advanced economies such as Germany (24 percent), and second only to Brazil (46 percent) in this study (Figure 5).

Fully understanding the risk

For the study, Accenture Research developed an econometric model using labour data from Statistics South Africa (Stats SA)⁴ to gain insights beyond just the job categories at risk.

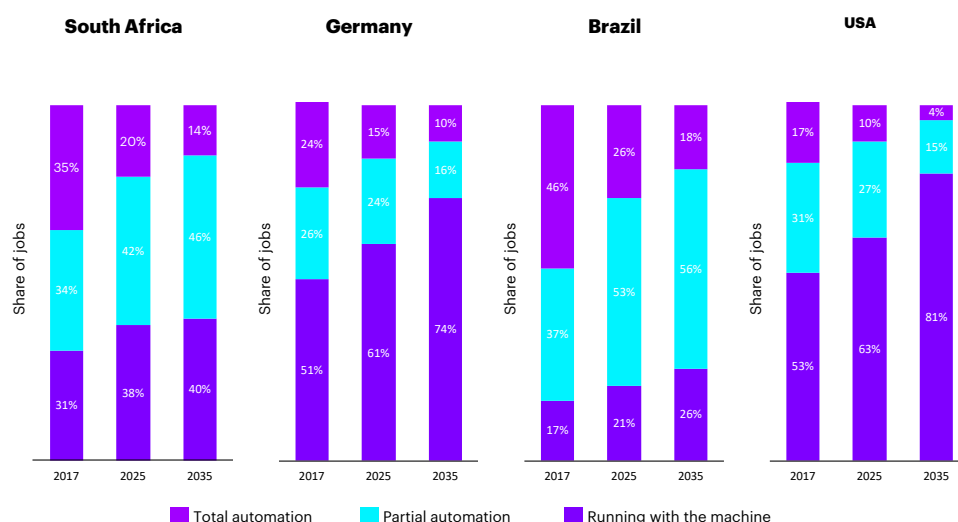
To fully understand the risk, it identified the share of job activities in each category that can be automated.

Human-like (analytical, leadership, social intelligence, creativity) and machine-like activities (routine work, transactions, manual work) were allocated across professions and adjusted based on local South African statistics, including type of work, skills and tasks, the recent skills evolution in jobs, degree of work automation, work supply demographics and productive structure.

The results clearly show that occupations that allocate more time to human-like activities have a lower probability of automation, while workers involved in occupations such as production, office administration, farming, food preparation, construction, mining, transportation, installation and maintenance are at highest risk.

For South Africa, initial findings show that 35 percent of all jobs in South Africa are currently at risk of total automation. By 2025, this will reduce to 20 percent as workforces evolve with new digital demands across occupations.

Figure 5: Jobs with risk of automation by country



Source: Accenture Research, OECD, Stats SA, Osborne & Frey (2013), US Bureau of Labor Statistics

Which jobs are at risk?

Both white - and blue-collar jobs are at risk (Figure 6).

The more predictable and repetitive the activities that make up the task, the more likely it is to be replicated by machines ... and automated. The jobs of clerks, cashiers, tellers, construction-, mining- and maintenance workers all fall into this category.

The more intensive the use of human-like skills to perform a task, the less likely it is to be automated. Jobs with less than 25 percent of risk of automation will comfortably 'run with the machine'. Hard-to-automate jobs include tasks like influencing people, teaching people, programming, real-time discussions, advising people, negotiating and cooperating with co-workers.

Figure 6: Top 10 jobs at risk in South Africa

South Africa					
Rank of automation risk	Occupation	Industry	No. of jobs	Time spent on tasks	
				Human-like	Machine-like
1st	Bookkeeping, Accounting, and Auditing Clerks	Office and Administrative Support	99,190	43%	57%
2nd	Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic	Production	18,031	44%	56%
3rd	Furnace, Kiln, Oven, Drier, and Kettle Operators and Tenders	Production	6,945	43%	57%
4th	Laborers and Freight, Stock, and Material Movers, Hand	Transportation and Material Moving	94,439	43%	57%
5th	Insurance Claims and Policy Processing Clerks	Office and Administrative Support	68,633	46%	54%
6th	Electrical and Electronics Installers and Repairers, Transportation Equipment	Installation, Maintenance, and Repair	28,111	46%	54%
7th	Bill and Account Collectors	Office and Administrative Support	20,283	43%	57%
8th	Team Assemblers	Production	37,656	39%	61%
9th	Heat Treating Equipment Setters, Operators, and Tenders, Metal and Plastic	Production	1,656	49%	51%
10th	Farm Equipment Mechanics and Service Technicians	Installation, Maintenance, and Repair	96,756	46%	54%
Total			471,700		
Key: Time spent on task:		0 (never)	➔	1 (full time)	

Source: Accenture Research, OECD, Stats SA, Osborne & Frey (2013), US Bureau of Labor Statistics

Clearly, the threat that automation and the growing sophistication of digital technology (e.g., AI) poses to jobs in South Africa will add considerable stress on an already pressured economy.

But there are also answers and a significant incentive to act now.

Digital—a growth multiplier

Digital technologies will usher in a new economic era—they overcome the physical limitations of capital and labour, exposing new sources of value and growth, increasing efficiency and driving competitiveness. Without these technologies, companies will lose market share and be left behind, and economies will stagnate. The opportunity for South Africa is considerable.

Accenture Research shows that one major digital technology, artificial intelligence (AI), has the potential to boost labour productivity in countries by up to 40 percent by 2035 as innovative technologies enable people to make

better use of their time. By embedding AI and making it a factor of production, this research indicates that South Africa could potentially double the size of its economy five years earlier.

To rise to this challenge, South Africa will need to recalibrate its economy and its workforce for digital, developing an environment in which humans and machines work together to engage with customers, and create entirely new products, services and markets. This will drive demand and consumption within the economy, boosting growth.

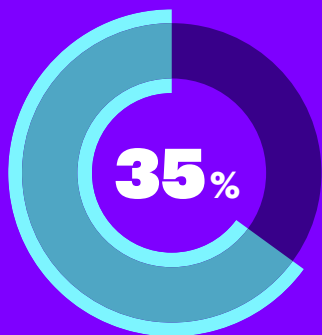
The foundations are in place. With a strong digital economy in the making and the right demographics, South Africa has the tools to stimulate economic growth and reduce the number of jobs at risk. But, to be effective, the key intervention—increasing the pace at which the workforce acquires the skills essential to maximise the benefits of human-machine collaboration—must start now.

To stimulate economic growth and reduce the number of jobs at risk, the key intervention—increasing the pace at which the workforce acquires the skills essential to maximise the benefits of human-machine collaboration—must start now.

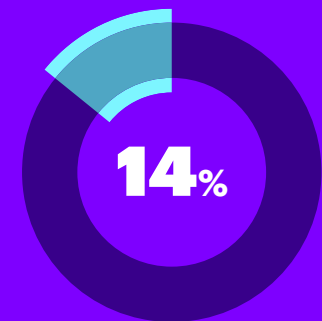
Our research factored into the analysis the fact that the adoption of new technologies is a slow process (although it's becoming increasingly shorter) and workers are able to adjust by learning skills and switching tasks, preventing unemployment. This returned very useful data. The model indicates that fewer jobs will be lost to automation if:

- People are able to reallocate their skills to tasks that require more “human skills”, such as complex analysis and social/emotional intelligence.
- People can increase the pace at which they embrace digital technologies to become more knowledgeable, connected and effective.

By doubling the pace at which its workforce acquires relevant skills, South Africa can reduce the share of jobs at risk from



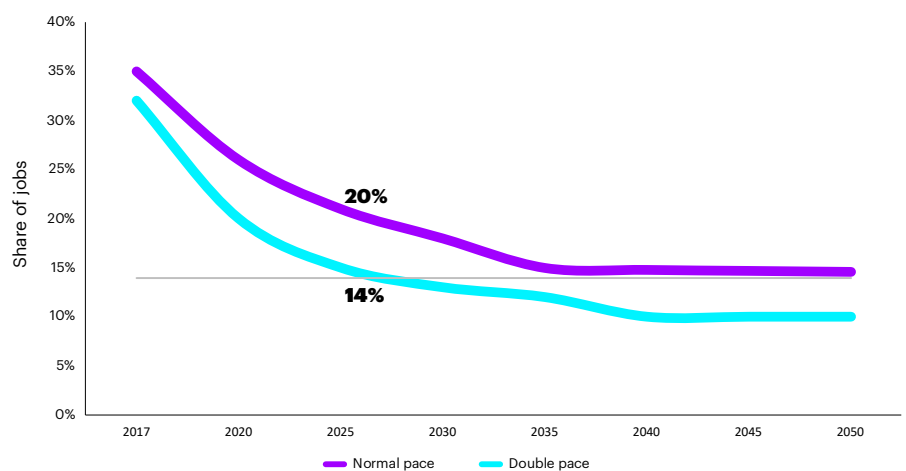
5.7 million jobs



to 2.5 million jobs by 2025.

The research indicates that at its current rate of learning, South Africa will shift to 'running-with-the-machine' activities (those that require more human-like skills) slower than other developed countries. However, by reallocating skills and doubling the pace at which its workforce acquires relevant skills, South Africa can reshape work and activities such that the share of jobs at risk of being fully automated reduce from 35 percent (5.7 million jobs) to 14 percent (2.5 million jobs) by 2025 (Figure 5). This intervention equates to reducing the risk of automation for an additional one million jobs.

Figure 7: Doubling the pace of learning will reduce jobs at risk of automation in South Africa from 35 percent to 14 percent by 2025.

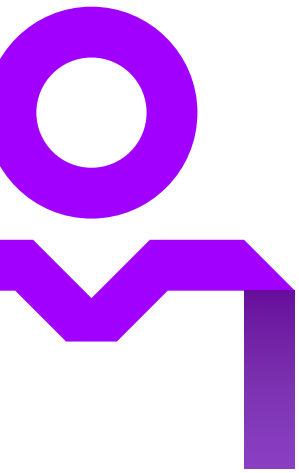


Source: Accenture Research, OECD, Stats SA, Osborne & Frey (2013), US Bureau of Labor Statistics

How are digital technologies practically impacting jobs and what will it take for workers to shift to 'running with the machine'?

JOB TRANS- FORMATION - A NEW ORDER IS RISING

To understand the evolution of jobs and the skills shifts that will be required over the next five to 10 years, we created four personas: a sales person, customer services person, machine operator and HR business practitioner.



SALES PERSON

DEREK

Country: South Africa

Age: 29

Derek is a sales agent for a large African financial services institution. He manages a small team of junior sales staff. Currently, agents review clients' portfolios and schedule consultations, and follow up on leads generated by the company system. Derek draws reports to direct his team, project profitability and help the company set pricing. This is about to change. As the company invests in omni-channel sales and service platforms, customers will turn to self-service. With their tasks augmented or automated by technology, Derek and his sales team will need to reskill, learning to using complex data to deliver improved outputs if they are not redeployed.

ANTICIPATED TASK AND SKILLS SHIFTS

Today

- Engage directly with customers to sell products and resolve queries
- Direct and coordinate sales activities
- Review operational reports to project sales and determine profitability

Tomorrow

- Use analytical software fed by data from BI, ERP and CRM tools to determine trends, predict sales and personalise customer engagement
- Shift from managing people to managing problems

CUSTOMER SERVICE PERSON

FATIMA

Country: South Africa

Age: 25

Fatima works in a contact centre for a large multi-national African insurer. She is allocated customer service related calls by an automated system that measures all aspects of her call handling and issue resolution. However, omni-channel self-service facilities are being introduced. Technology will change the way Fatima and her colleagues work. AI, chatbots and automated self-service technologies will free up their time so they can focus on more complex tasks. This will require deeper product and backend knowledge and skills.

ANTICIPATED TASK AND SKILLS SHIFTS

Today

- Provide customers with information about products and services, enter orders, cancel accounts and deal with queries
- Keep records of customer interactions or transactions

Tomorrow

- Use analytics and other tools to gain a deeper understanding of customer behaviours and needs, and match them to products and services



MACHINE OPERATOR

JOHANNES

Country: South Africa

Age: 46

In Johannes' world industrial robots are already automated, programmable and capable of movement. Their functionality will only increase in future. Co-bots and Johannes will work together to increase productivity. Co-bots will perform the physical tasks of production and track performance, while Johannes will set, train and maintain the machine workers. In addition, Johannes will supervise and optimise the production process through sensor data and analytics.

ANTICIPATED TASK AND SKILLS SHIFTS

Today

- Set up machines using blueprints, adjust settings (speed, temperature), monitor machines for unusual sound or vibration, and maintain machines
- Insert material into machines and remove finished products
- Test finished workpieces

Tomorrow

- Set up robotic machine workers, with the appropriate settings
- Supervise robotic production process, supported by sensor data from the whole production line
- Train, maintain and repair robots to ensure steady quality and productivity

HR BUSINESS PRACTITIONER

MAPULE

Country: South Africa

Age: 42

Technology, digitisation, operating model redesigns and changes in the ways that employees want to work and engage with HR are making a significant impact on the way Mapule and her team need to work. HR chat bots, emerging crowd sourcing models, multi-generational liquid workforces and advancements in learning are only some of the changes impacting this team. Mapule and her team will need to improve their data and analytical skills to develop and support a new agile workforce capable of digital-speed adaptation.

ANTICIPATED TASK AND SKILLS SHIFTS

Today

- Prepare and maintain records related to the employee lifecycle, from hiring to termination
- Find and hire employees
- Engage with employees on job responsibilities, HR policies, learning
- Handle complaints and queries

Tomorrow

- Use applicant tracking software and HR information systems to streamline HR processes
- Apply analytics to available company and external data to develop insights on hiring trends
- Use analytics to match available skills to tasks and projects
- Increase focus on finding and hiring the right recruits and developing current employee skills

WORK SPACES, PLACES AND FACES

Accenture's 2017 Technology Vision research identified four dominant features of work in the digital economy:

- **Digital and Human**
- **Cooperative and Collaborative**
- **Knowledge and Task-Based**
- **Flexible and Fluid**

While each feature represents an individual dynamic, they overlap and intertwine. The combination and the weighting of these characteristics will vary depending on organisations, sectors, geographies and timeframes, but all are fundamental to how the workforce is evolving—particularly for low- and middle-skilled work.

Understanding this new reality will help prepare the workforce for in-demand jobs. But it also helps prepare individuals to thrive throughout their lifetime, beyond the work and jobs we can envision today.

Digital and Human

Humans and machines will increasingly work together to drive productivity. Accenture's recent global survey of more than 1,000 companies to understand how they use or plan to use AI, identified three new types of employment that require collaboration between humans and machines:

- Explainers understand and interpret the output of AI algorithms
- Sustainers optimise the effectiveness of AI systems
- Trainers feed AI systems' capacity for language, empathy and judgment

Consider the example of Samasource, a non-profit organisation working to reduce unemployment through digital work. Its service offerings have evolved to meet the latest market demands in Silicon Valley and to support machine learning and computer vision applications. Samasource trains individuals in Kenya, Uganda and India to annotate photographs and video stills, creating a database of digital images that can help machines recognise and interpret our world. The collection of annotated images enables machines to create algorithms for AI. Over the last decade, Samasource has trained and hired over 9,000 workers. It has impacted the lives of more than 35,000 people, raising workers' average daily income by nearly 400 percent and increasing access to better housing, education and healthcare.

Mercedes-Benz, a first mover in automating assembly lines, automated 90 percent of production in its E-Class factory. However, the robots couldn't keep up with the demand for hyper-personalisation of vehicles, which required rapid change and complex customisation.

While skilled humans can change a production line in a couple of days, robots take weeks to realign. As a result, the company is giving people a greater role in industrialisation again, reducing automation from 90 percent to 50 percent, and introducing robots better able to collaborate with human workers. Human-machine collaboration gave the company the flexibility it needed to improve their response to consumer demand for hyper-personalisation while also halving the time taken to produce a car from 2005's benchmark of 61 hours to 30 hours.

Cooperative and Collaborative

Cooperation is defined as working with others for mutual benefit while collaboration is a deeper communal effort toward a shared goal. New digital technologies are changing how people do both. Tools such as interactive portals and social networking are common features of work, and their use is set to increase. Companies are leveraging open-source collaboration to solve problems and engage customers.

Knowledge and Task-based

Work will increasingly be broken into tasks that utilise the individual's unique skills and knowledge. Accenture's 2016 Technology Vision report found that 79 percent of business leaders across industries believe that the future workforce will be structured more by project than by job function. Organisations are outsourcing projects and tasks to individuals or teams with

specialised knowledge and skills relevant to a specific industry and timeframe.

The pathways into work are also changing. Task platforms are, for example, connecting people with specialised skills to a global marketplace. The emergence of platforms and the rise of the gig economy are expanding the marketplace. For example, platforms like Upwork and Thumbtack and, in South Africa, Call a Maid and RecruitMyMom.co.za, connect employers to skilled workers (e.g., domestic workers, web developers, electricians, white-collar workers) to complete knowledge and task-based work.

Flexible and Fluid

Work used to be a place to go to. Today it is a place to which we connect. Technology is uncoupling work from finite hours and locations. Stephane Kasriel, CEO of Upwork, indicates that the majority of the US workforce will freelance by 2027 with younger workers leading the way. Almost half of millennials in that country are already freelancing. As the nature of work evolves, individuals are expanding their professional networks by leveraging platforms to access work.

This flexibility is enabling people to increase their income, work part-time, rejoin the workforce or assume new roles. By eliminating geographic and time constraints, flexible and fluid work arrangements will allow new talent pools to enter the workforce. A talent oversupply in countries like South Africa can support talent demands in other countries, if the right skills are developed.

INTRODUCING NEW SKILLS NOW

“The illiterate of the future will not be those who cannot read and write, but those who cannot learn, unlearn and relearn.”

- Alvin Toffler (1928 – 2016), author of Future Shock

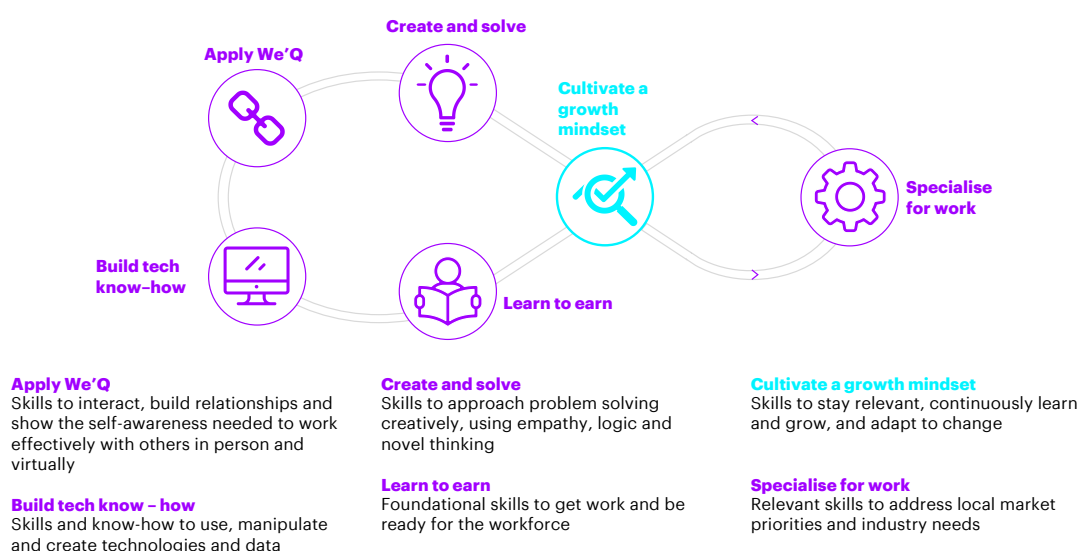
Human beings have an amazing capacity to learn new skills and adapt to new environments. This is true not only in early life, but throughout our lives. As the nature of work evolves—i.e., becoming more digital and human, cooperative and collaborative, knowledge and task-based, flexible and fluid—employees and entrepreneurs will need to adapt their mix of skills and knowledge to embrace new challenges and stay relevant.

In addition to a big data analysis of in-demand skill trends, a review of skill frameworks and a landscape scan of 1,000 workforce development

programmes, Accenture interviewed experts from a wide variety of fields, from neuroscience and corporate learning to education and workforce development. We then used these insights to help identify and categorise both the universal skill families and the underlying cognitive capabilities needed for inclusion in the digital economy.⁵

We call the resulting taxonomy ‘New Skills Now,’ and the six skills families that underpin it are: Learn to Earn, Build Tech Know-How, Apply We’Q, Create and Solve, Cultivate a Growth Mindset and Specialise for Work (Figure 8).

Figure 8: The New Skills Now Taxonomy, Accenture



The six New Skills Now families comprise the cognitive abilities, aptitudes and dispositions needed to stay relevant and thrive in the fast-evolving digital economy, as well as specialised knowledge or craft skills for a specific market, industry or setting. These are capabilities that individuals can learn at any age and hone over time.

A dynamic mix of all six skills families is critical to securing a first job or starting a business, and will remain critical to retaining that job, growing that business or navigating to the next opportunity. Cultivate a Growth Mindset is the linchpin that connects all six skills families—it provides the agility, resilience, curiosity and love of learning required to stay relevant, adapt, specialise and transition in the new economy.

Learn to Earn

Foundational skills remain critical to learning and earning. Learn to Earn skills include: literacy, numeracy and digital literacy—the minimum competencies required to locate, evaluate, create, transact and share content digitally. It also includes basic employability skills, such as conduct and work protocols (e.g., learning to maintain eye contact in an interview, listening and time management), and entrepreneurship.

Build Tech Know-How

Technology and data skills are no longer solely the purview of experts; jobs requiring these skills will grow by 30 percent in the next seven years.⁷ Build Tech Know-How skills include the ability to use digital devices and platforms to analyse, explore and share data, and to work effectively alongside machine intelligence. This requires an understanding of how technology and data can be built, manipulated and applied.

Apply We'Q

As work becomes increasingly collaborative and task-based, social and relationship-building skills are gaining importance. Apply We'Q skills

include teamwork, collaboration, communication, social and emotional intelligence, and the ability to manage others. It also includes cognitive functions such as self-regulation, which allows individuals to understand, control and adapt their emotions and behaviours in a team environment.

Create and Solve

As work boundaries become more fluid and challenges more complex, the concept of problem solving is changing. It requires thinking unconventionally, gathering ideas from diverse sources and applying design thinking. Create and Solve skills include creative problem solving, critical thinking, reason and logic to assess and analyse problems, and an entrepreneurial mindset. This skills family also includes cognitive functions such as decision-making and the ability to plan and execute a goal.

Cultivate a Growth Mindset

In the digital economy, work will no longer be restricted to one employer, job or team. People will need to constantly learn new skills to remain relevant in the workforce of the future, and a growth mindset will be critical to success. Cultivate a Growth Mindset skills include the ability to cultivate curiosity, openness, a growth mindset and the capacity for lifelong learning. Underpinned by the cognitive function of flexibility, these skills are building blocks for personal resilience and the ability to cope with and adapt to change.

Specialise for Work

The need for specialised, timely and market-relevant skills is essential for any type of work or entrepreneurial venture. However, as jobs and opportunities continue to shift in the digital economy, the specialised skills required to get ahead in those areas will continue to change. Specialise for Work skills are not static or fixed and will need to continuously change based on context, industry, market demand and type of work.

WHAT LEADERS NEED TO DO FOR TOMORROW, TODAY

“Instead of teaching students to answer questions, we should teach them to ask them. Beyond creating better employees, we must aim to create better leaders and innovators.”

- Raya Bidshahri, Singularity University

A picture is emerging of the actions needed to shape and prepare the workforce along the entire talent value chain.

Leaders need to:

- Accelerate reskilling people
- Pivot the workforce to areas that create new forms of value
- Strengthen the talent pipeline from its source

The good news: these actions will enable leaders to build a workforce that is highly engaged with digital and to reshape their organisations and society at large in a way that drives real business value—labour productivity, talent acquisition and retention, as well as innovation and creativity. To achieve this, leaders need to be responsive, responsible and response-abled.

The bad news: the clock is ticking. The time to act is now.

Accelerate reskilling people

Companies need to increase the speed at which they reskill their workforce. This will position the organisation and its people to win in this newest revolution.

- **Prioritise skills for development.** Selecting skills training will depend on the type of machine intelligence and automation being used, as well as the size, sector and existing skills levels of an organisation. See See Accenture's New Skills Now taxonomy (p20) for guidance.
- **Reskill at the top of the house.** Preparing the workforce for digital doesn't exclude the higher echelons of the organisation. Businesses need new leadership skills to lead in an era of technology disruption.
 - In South Africa, large companies are already doing this. Diligent Corporation, a software-as-a-service (SaaS) company, enables board members of organisations to share information and collaborate. Its clients include National Treasury, Nedbank, Naspers, MTN, Barloworld and MultiChoice.⁸
 - Sasol's Board of Directors adapted how it advised and provided leadership to the company's Executive Management Committee with regards to turning Sasol into a digital organisation. It started by engaging experts to help build the Board's understanding of what digital means for the oil and gas industry, and for Sasol's future.
- **Keep building on what you have.** As digital changes the way companies operate, businesses need to become more agile, identifying and closing the skills gap through rapid reskilling.
 - To rapidly pivot over 160,000 of its employees to be conversant in new IT skills and help more than 100,000 be job-ready in less than two years, Accenture developed a 'new skilling' framework based on a progression of skills from awareness to expert to guide its ambition. It also relied on a suite of innovative learning methods grounded in neuroscience research.
 - When mobile transactions across Standard Bank's domestic, personal and business banking unit rose 55 percent to almost 500 million transactions over the first half of 2017, the bank took action. It is currently enhancing its digital capabilities, reskilling staff and revising its branch formats to meet changing client expectations and improve the client experience.
- **Change the mindset to "learning as a way of life".** This shift in behaviour from point-specific training to lifelong learning makes workers and organisations nimbler, and businesses more readily adaptable to volatile markets.
 - Organisations like WeThinkCode, where students can study for free, are helping to show the way. WeThinkCode aims to address the scarcity of developers in South Africa by enabling qualifying applicants to learn how to use coding as a tool to solve problems in a peer-to-peer environment, partnering with industry.⁹

- **Use digital to learn digital.** Digital learning methods, such as virtual reality and augmented reality technologies can provide realistic simulations to help workers master new manual tasks so they can work with smart machinery. The same technologies can help reinforce correct procedures on the shop floor, monitoring how employees execute tasks and coaching them to do it the best way.
 - Thyssenkrupp is overcoming skill mismatches through AI. The industrial services giant equips its elevator technicians to consult subject matter experts through Hololens, a holographic computer and head-mounted display.
 - At Walmart, US employees are being trained at the retailers' training academies, using Oculus Rift virtual reality headsets. This technology allows trainees to experience and practice responding to real-world scenarios, like a spill in aisle three, with the instructor and trainee peer group able to provide performance feedback as they watch remotely through the employees' eyes.

Walmart's approach to New Skilling

"Our customers are changing and so are their expectations. They expect simpler, faster, frictionless experiences both in our stores and online. To meet those needs, we are constantly evolving our use of technology to empower our associates and provide them with new skills at a rapid scale to better serve our customers. Our Academies combine classroom learning with hands-on experience delivered through technology, such as virtual reality, to create immersive and adaptive learning experiences. We have seen that department managers who complete Academies have higher retention rates, as do associates who report to them. These training investments are providing our associates with the skills they need to succeed today and in the future, driving positive business outcomes, and keeping us competitive in our rapidly evolving retail environment."

- Jacqui Canney, Executive Vice President of Global People for Walmart.

- Digital technology also helps to democratise learning. Accenture's 3,000 Pinterest-like digital learning boards are curated by approximately 900 experts and give 435,000 employees access to more than 300 content categories, with topics ranging from technical skills, such as blockchain, to softer skills such as coaching.
- **Tap into boomers for a knowledge boost.** Tap current wisdom workers and recently retired executives to coach new talent coming up through the ranks. They still know more about many parts of your business than anyone. This will help create a culture that respects and even celebrates different contributions from different generations.

Pivot the workforce to areas that create new forms of value

Today, AI and human-machine collaboration is beginning to have a significant impact on how enterprises conduct business. But it has yet to transform what business enterprises choose to pursue.

- **Use automation to fuel growth by reinvesting savings in the workforce.** Don't simply bank efficiencies to benefit the bottom line. Turn the savings into investments for the future workforce that will propel new business models.

- One Accenture client, a leader in the high-tech industry, has produced a human-AI hybrid workforce where algorithms predict which orders have issues, such as a risk of cancellation or payment disputes. Employees can therefore spend more time paying attention to high-risk situations and be more proactive in mitigating negative outcomes. This approach has required training people to help them develop a range of expertise and capabilities—from industry sector knowledge to analytics and data interpretation, to the soft skills required to work with customers in new ways. The investment is paying off, with a potential of delivering cashflow improvements of over \$50 million along with increased working capital and a bottom line profit of more than \$10 million in the first year of implementation.
- **Create a more flexible workforce model.** Rigid, formal job structures do not support the speed and agility demands needed in the face of digital innovation. Redefining and co-creating employment opportunities through more responsive role-based and gig-like work is a reality. These opportunities need to be available to both full-timers and freelancers.

Strengthen the talent pipeline from its source

Businesses may not be the cause of the talent pipeline problem, but they experience the brunt of its effects. While reskilling within their own organisations and ecosystems is critical, leaders need to do more to influence change at the source.

- **Foster national and cross-border programmes.** In South Africa, the Ekurhuleni Artisans and Skills Training Centre (EASTC) focuses on skills development and training for unskilled labourers or labourers looking to expand their skills and knowledge base. Their courses last 15 days or less, so students are not away from work for prolonged periods of time. In addition, as soon as the course is completed students can commence work.¹⁰
- **Bring personal influence to bear on industry groups.** By banding together, companies can wield greater influence. NASSCOM, India's engineering industry group is, for example, helping the public sector create new courses on data science and analytics, automation and internet of things (IoT) in academics.
- **Collaborate with academia.** Influence the academic agenda from the beginning—and not just in engineering programmes. That includes higher education, community colleges as well as non-degree programmes. The Nedbank Stellenbosch University LaunchLab is a start-up incubator that aims to build a thriving ecosystem for entrepreneurs in Africa. Its focus is on the entrepreneurs themselves, and helping them build a viable business through coaching and mentorship programmes.¹¹

LEADER OR LAGGARD?

ANSWER THESE 10 QUESTIONS

It's time for businesses leaders to reimagine the work their people do in partnership with machines. Ten defining questions separate the winners from the losers, the leaders from the laggards, the disruptors from the disrupted:



From 'Workforce' Planning to 'Work' Planning:

1. Do we have a clear understanding today of how work in our organisation will be reconfigured by intelligent machines?
2. Which of our core activities will be automated, which will see human-machine collaboration elevate our workers, and which will remain the preserve of workers only?
3. What will this mean for our operating model?
4. Are we prepared for the enormous changes ahead as the nature of work is reimagined—starting now?



'New Skilling' the future workforce:

1. Do we have a clear view today of the knowledge, skills and mindsets required to work with intelligent machines in a way that creates real value?
2. Where are our people against that benchmark?
3. Is 'New Skilling' already being integrated into our leadership development, learning and recruitment programmes?



Positioning for the full value of digital technologies and automation:

1. Do we have a clear understanding as a leadership team of how AI will be disruptive—not just with regards to efficiency and productivity gains in our existing business model, but in creating entirely new markets, products, services and customer experiences?
2. What new jobs will this create in our organisation?
3. Are we organised and do we have the talent to take advantage of both the top line and bottom line opportunity as human-machine collaboration reshapes the nature of competition?

Source: Reworking the Revolution: Are you ready to compete as intelligent technology meets human ingenuity to create the future workforce? An Accenture Report¹²

RESPONSIVE, RESPONSIBLE AND RESPONSE-ABLED LEADERSHIP IS CRUCIAL

**“If we stop thinking of the poor as victims or as a burden and start recognising them as resilient and creative entrepreneurs and value conscious consumers, a whole new world of opportunity will open up.”
– CK Prahalad**

If our challenge is securing economic growth for South Africans through the provision of access to, and participation in the economy without compromising global competitiveness and the productivity that comes from digital technologies, multi-stakeholder leadership and collaboration is our collective crisis.

To avoid any stakeholder feeling coerced into investing into longer-term shared economic growth while potentially compromising short-term efficiency gains, a new model of co-operation is needed. Such a model will involve multiple ecosystem stakeholders and will shift the current paradigm from doing well or doing good to doing well and doing good.

A clear collaborative multi-stakeholder approach is needed.

Government

Government needs to be at the forefront of creating opportunities for its citizens to access digital technologies across areas such as infrastructure, connectivity, skills, incentives, policy frameworks and regulation. It must also set policy to regulate action across areas where the digital revolution is likely to have the most impact. Key areas will include eCommerce, cybersecurity, digital healthcare, the creation of a digital society (e.g., regulate more stringently the cost of data, which is an enabler), driving the acquisition of digital skills, and service provision.

South Africa talked about The Social Plan¹⁴ in the late nineties and early 2000s when retrenchments were rife. Attempts to implement it were not very successful. Today an opportunity exists to revisit the concept of a Social Plan and re-design it to take advantage of technology advances, as well as expand it to reach across more than one generation in a family or community.

Corporate South Africa

Large corporates have pivotal roles to play in attaining South Africa's shared economic future. In addition to preparing their organisations to take advantage of the benefits of digital technologies, businesses should also work at using technology to enhance growth beyond achieving efficiencies. Corporates can allay fears of job losses by committing to:

- Creating job alternatives through re-skilling initiatives
- Communicating transparently and honestly and engaging with employees and other stakeholders
- Taking all impacted parties along on the journey

Organised Labour

Organised labour needs to accept that digital technologies bring the potential for economic growth and global competitiveness. The course of the digital revolution cannot be changed but it can be smartly managed.

The United Association of South Africa (UASA) talks about South Africa's future workforce needing to align its skillset to keep pace with developments. Organised labour plays an important role in preparing the next generation of workers to contribute meaningfully to inclusive growth and economic transformation.

Institutions of Learning

Institutions of learning have to pivot too.

According to Edgar Morin, the French philosopher and sociologist¹⁵, we need new systems of learning for both what and how we learn across organisations, governments, non-governmental organisations and institutions of research and education. Morin argues that the education of the future should be such that ‘we are better able to grasp realities and problems which are ever more global, transversal, poly-disciplinary and planetary’.

Tshilidzi Marwala, Vice-Chancellor and Principal of the University of Johannesburg talks about multidisciplinary education being the way to go in preparing for the workforce of the future. He states that we will need graduates who are innovative, internationally oriented and have strong problem solving capabilities. Scientists need to have soft skills and social science and humanities students will need to have technical skills.¹⁶

“In my tenure as Vice Chancellor, I plan to take the university into the Fourth Industrial Revolution. The world of work is changing. This means that engineers in South Africa will need to understand social sciences and humanities, like I was trained to do in the US. Conversely, students studying humanities and social sciences should also study technology. I plan to take UJ [The University of Johannesburg] to industry and bring Industry to UJ, and am well poised to do so because I started my career in industry. Our students are going to be in the front of the queue when it comes to preference of employment. Already about 25 percent of black chartered accountants are being trained at UJ. We are also one of the biggest producers of high quality engineers. We now need to orient a significant number of our graduates to have a mind-set of not having to look for jobs but creating jobs for others.”¹⁷
- Tshilidzi Marwala, Vice-Chancellor and Principal of the University of Johannesburg

Industry Associations

Industry associations need to lead the discussions, keep abreast of research, do research of their own and continue to drive engagement and conversation on matters of change.

CONCLUSION

Advances in technology have changed the nature of work since time immemorial. In the times of the first Industrial Revolution, things got worse before they got better. In Britain, the Luddites, a group of skilled artisans (textile workers and weavers) destroyed machinery in textile mills as a form of protest against machines taking their jobs. Out of that era came secondary and tertiary education, the minimum wage, bans on child labour and major public health advances, from vaccinations to sanitation. It was both the best of times and the worst of times as Dickens wrote. It's time to change again.

The adjustments we require in this era will be equally large and will additionally require both economic focus and political attention. We've seen the harsh beginnings of this in the United States, with Brexit in Europe, with the 'Arab Spring' and, in South Africa, with Marikana and the "fees must fall" protests. Anger about inequality and social and economic exclusion is brewing under the surface.

While Luddites still live among us, we have to resolve the jobs debate in a way that does not impact our competitiveness. Keeping machines at bay would, as University of Oxford professor Luciano Floridi indicates, "damage technological innovation and fail to improve the human condition".

This period of 'maladjustment', where new uses for labour are still somewhat illusory, is temporary. There are many questions. Will

there be enough jobs to fill our time? Will working for money be replaced by working for meaning? In the future, will jobs be fewer and work weeks shorter, and will jobs be shared? The answers are already apparent. We will find new jobs. We will not only do things differently, we will do different things. New industries will emerge. But the future trajectory of countries will, by and large, be determined by how they ensure economic access for all to build a consumer class with the purchasing power to spend on the goods and services that businesses produce with the aid of machines.

Countries that have never prized inclusive socio-economic growth over economic efficiency will find it difficult. South Africa should find it easier. Our culture and philosophy of Ubuntu aim to leave no person behind. However, to drive change, we must start now.

APPENDIX

¹ 'How Growth Builds upon Growth in High-Technology', Annual Sir Charles Carter Lecture 2001, Belfast: Northern Ireland Economic Council, 1-14 WB Arthur - International Library of ..., 2007 - Edward Elgar Publishing Ltd

² John Maynard Keynes, *Essays in Persuasion*, New York: W.W.Norton & Co., 1963, pp. 358-373

³ "The Rise of the Robots – Technology and the Threat of Mass Unemployment", Martin Ford, accessed online 10 January, 2018, https://www.uc.pt/feuc/citcoimbra/Martin_Ford-Rise_of_the_Robots.

⁴ National statistics on employment at the occupation level obtained from Stats SA Quarterly Labour Force Survey 2017 Q2 (S. Africa) and BLS (US)

⁵ Accenture's Corporate Citizenship team interviewed more than 40 practitioners and thought leaders from a wide range of fields spanning neuroscience, workforce development, corporate learning and talent development, education, sociology and cognitive psychology; analysed over 130 million job postings; reviewed 1,000 workforce development programmes; established a Learning Circle made up of experts from around the world; and assessed more than 25 of the leading frameworks on the future of work and skills.

⁶ Accenture Corporate Citizenship, *New Skills Now Survey*, 2017

⁷ 7 Critical Skills for the Jobs of the Future, Raya Bidshahri, Singularity University, accessed online at <https://singularityhub.com>, Jul 04, 2017

⁸ <https://techcentral.co.za/digital-banking-fast-gaining-traction-sa/77425/>, accessed January 10, 2018

⁹ <https://www.wethinkcode.co.za/>

¹⁰ <http://eastc.co.za/about/>

¹¹ <https://launchlab.co.za/about/>

¹² <http://www.accenture.com/futureworkforce>

¹³ Diamandis, PH and Kotler, S. (2012). *Abundance. The future is better than you think*. Free Press. New York. London. Toronto. Sydney. New Delhi. ISBN 978-1-4516-1684-2 (eBook).

¹⁴ Morin, E. (2014). Complex thinking for a complex world – About reductionism, disjunction and systemism. *Systema* 2 (1): 14-22

¹⁵ Tshilidzi Marwala: SA must connect to the fourth industrial revolution, December 12, 2017. Accessed 10 January, 2018 at www.thenewage.co.za/sa-must-connect-to-the-fourth-industrial-revolution

¹⁶ <https://www.news24.com/SouthAfrica/News/newsmaker-forging-a-new-academic-path-20170702-2>

¹⁷ Technological Unemployment, Leisure Occupation, and the Human Project, Floridi, L. *Philos. Technol.* (2014) 27: 143. Accessed 10 January 2018, <https://doi.org/10.1007/s13347-014-0166-7>

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