

Shaping the Future of Work Technology's Role in Employment

A report by: The Economist Corporate Network



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Acknowledgements

Shaping the Future of Work: Technology's Role in Employment is a study by The Economist Corporate Network (ECN), and sponsored by SAP. The report seeks to present foresight on how technology can play a proactive role in addressing some of today's challenges faced by the government, workforce and employers.

This study draws on the expertise of academics and experts from a range of fields that will, collectively, shape the future of work. We would like to thank the interviewees for their invaluable insights and participation.

The interviewees (listed alphabetically) were as follows:

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Introduction

Digitisation has fundamentally altered the way we live, businesses operate, governance is undertaken, and has enabled the state of hyperconnectivity that binds us together. Technological advancements within the digital space have rendered big data as the pivotal element that will continue to transform how business is conducted in many industries, including government. Government data generation and digital archiving rates are on the rise, as smart solutions are demanded to keep abreast with the pace of change. The government market is at a tipping point, realizing that information is a strategic asset, and that governments need to protect, leverage, and analyse both structured and unstructured information to render a more vigilant decision-making process that enables effective governance.

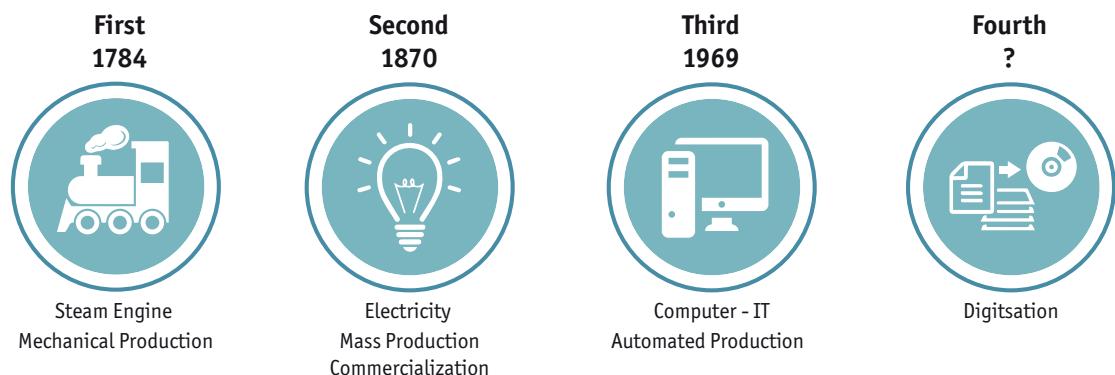
As government leaders strive to evolve data-driven organizations to improve governance, they are laying the groundwork to correlate dependencies across events, people, processes, and information. This ultimately improves policy-making decisions. To date, numerous government bodies have realized the potential of the big data that rests in their possession. However, very few governments have heeded to the potential that big data has to solving one of the key challenges; unemployment. Big data can be utilized to not only match future economic needs with the appropriate human capital caliber, it can also address pressing short-term needs, by bridging the gap between the employers and employees and assist in job-matching. This paper hopes to present a plausible case for governments to embrace an initiative that digitises and utilises the big data reservoir at their disposal to match the growing needs of entrepreneurs with the existing and future workforce. Governments can capitalize on our state of hyperconnectivity to facilitate and moderate a discussion among key stakeholders, which would inevitably bring down unemployment, upskill the existing workforce, and foster economic development.



The Digitisation Revolution

The First Industrial Revolution used water and steam power to enable mechanical production. The Second and Third introduced mass production and then the automation of this mass production, giving birth to commercialization. Now digitisation was dubbed the Fourth Industrial Revolution, at the World Economic Forum this year, as its scale, scope, and complexity will continue to fundamentally alter the way we operate and connect. The evolution of digitisation has been exponential, grandiose, and has affected every industry. Moreover, the depth of the change heralds the transformation of production, management, and governance.

Industrial revolutions



The digitisation revolution has the potential to raise global income levels and improve the quality of life for populations around the world, similar to those that preceded it. To date, the primary beneficiaries have been those that either have the skill set to invent and produce these technologies or those that have the financial means to afford access to the digital world. Ordering a cab, booking a flight, buying a product, making a payment, listening to music, watching a film, or playing a game—any of these can now be done remotely. In the future, technological innovation will also lead to a supply-side miracle, with long-term gains in efficiency and productivity. Transportation and communication costs will drop, logistics and global supply chains will become more effective, and the cost of trade will diminish, all of which will open new markets and drive economic growth.



The digitisation revolution will force businesses and governments to redefine their models of interaction with customers. Governments will be compelled to adopt a higher level of collaboration with businesses and individuals and assume the role of an economic and social enabler. Governments will need to reimagine processes. The need for frictionless, integrated and real-time processes will continue to grow. As such, governments will need to develop a digital plan and architecture to facilitate services to match the demand by the hyperconnected customers.

Digitisation in the workplace

Digitisation has prompted an unprecedented level of fluidity that has impacted business models across every sector. These disruptive changes will continue to have a profound impact on the employment landscape over the foreseeable future. Past waves of technological advancement have been a major contributor to increased prosperity, productivity and job creation. One cannot deny that each industrial transformation gave rise to custom-made challenges. Therefore, it becomes imperative to anticipate and prepare for the current transition.

Digitisation, mobility, big data, cloud computing, and analytics, and other drivers of transformation are expected to have a significant impact on jobs, ranging from significant job creation to job displacement, and from heightened labour productivity to widening skills gaps. Today, in many industries worldwide, the most in-demand occupations or specialties did not exist 10 or even five years ago, and the velocity of change is forecast to only quicken. By one popular estimate, presented at the World Economic Forum, 65% of children entering primary school today will ultimately end up working in completely new job types that do not yet exist. In such a rapidly evolving employment landscape, the ability to anticipate and prepare for future skills requirements, job content and the aggregate effect on employment is increasingly critical for businesses, governments and individuals in order to fully seize the opportunities presented by these trends—and to mitigate undesirable outcomes.

Digitisation's demands from the workforce

The growing gulf between the knowledge, skills and abilities of young people entering the workforce and the knowledge, skills, and abilities that employers are seeking will undoubtedly be the biggest deterrent to growth. The Economist Intelligence Unit's *Closing the skills gap* report shows an overwhelming consensus among US employers that too many graduates lack critical-thinking skills and the ability to communicate effectively, solve problems creatively, work collaboratively and adapt to changing priorities. In addition to these 'soft skills' deficit, employers have also reported an increasing lack of 'hard skills' associated with specific, growing jobs.

The current mismatch between business needs in the US and what the national education system offers stems from the fundamental restructuring of the economy since the 1970s. Technological advances have revolutionised industries, changing the nature of the tasks and the kind of activities employees engage in. Manufacturing, once focused on the mass production of standardised goods, has now evolved to depend on variety and constant innovation. In many cases, the actual manufacture of goods, the one-time bedrock of the US economy, now represents only a fraction of the cost of an item and is often outsourced abroad. This paradigm shift paved the way for an increasingly service-based economy. As such, working environments require more and more collaboration rather than



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the performance of repetitive tasks or the operation of machinery. Although hard to predict over the long-term, but the immediate and medium-term give rise to the importance of “soft” skills—critical thinking and problem solving, collaboration and teamwork, and effective and timely communication. At all career levels, employees are increasingly required to integrate knowledge from a number of areas and work in teams to find innovative solutions to problems. There is also growing discussion of the competencies required for middle-skills jobs. Often found in fields such as information technology, healthcare, high-skilled manufacturing and the service industry, these jobs require some postsecondary training. These kinds of jobs comprise the largest segment of the US labour force, and many experts believe that shortages of workers prepared for them are undermining US competitiveness.

The US is not alone in this challenge, many countries across numerous regions such as Spain, Italy, South Africa, Saudi Arabia, and China lack the talent needed for economic development. So far, the largest beneficiaries of innovation have been the providers of intellectual and physical capital—the innovators, shareholders, and investors—which explains the rising gap in wealth between those dependent on capital versus labour. Technology is therefore one of the main reasons why incomes have stagnated, or even decreased, for a majority of the population in high-income countries, such as some of the aforementioned. The demand for highly skilled workers has increased while the demand for workers with less education and lower skills has decreased. It is worth noting that tertiary education no longer suffices employers’ needs; they require talent. The result is a job market with a strong demand at the high and low ends, but a hollowing out of the middle. This trend is likely to continue, which makes the challenge grave. Without talent economic development will stagnate. And, with global unemployment reaching a high of nearly 200 million, the majority of which are below the age of 30, it is time for a response. “The response to it must be integrated and comprehensive, involving all stakeholders of the global polity, from the public and private sectors to academia and civil society,” says Rainer Binder, Accenture’s Global Employment Lead.



Big Data

Big data, refers to the massive amounts of raw, structured, and unstructured digital data that can be derived from any digital source. As data has always been around, the question arises why is big data the new buzzword? Volume. Variety. Velocity. The sheer volume and variety of data, which can be sourced from any digital platform, and the speed at which data is exchanged has converted data into big data. To extract value from big data in-memory technology is used, as it is an overwhelming task for traditional database technologies. In-memory technology employs sophisticated algorithms to store data "in-memory" to allow for real time processing with practically no time lag. And our state of "hyperconnectivity," which refers to the multiple forms of digital communication we are engaged in, has exponentially increased the volume, variety, and velocity of data, thus making data more valuable.

"More than just a platform for economic activity, hyperconnectivity is a new cultural environment for all human behaviour. Its impact on that behaviour is still unfolding, and governments as much as businesses must be sensitive to shifting social values and citizens expectations as it continues to evolve," as defined by the EIU. As such, the use of big data, with the help of technology breakthroughs in artificial intelligence, robotics, the Internet of Things, and quantum computing, will continue to evolve and impact our way of life as well as conducting business and interacting with government. So far, big data has helped us in many ways, some obvious like aiding research and producing more efficient health care products and others not as much as predicting behaviour. Moreover, it has helped drive efficiency in processes, decision-making, and value creation.

Artificial intelligence is all around us, from self-driving cars and drones to virtual assistants and software that translate or invest. Artificial intelligence, driven by the use of big data, has generated higher quality algorithms to better understand customers, their behaviour, and their choices. Big data is applied heavily in improving security and enabling law enforcement, such as foiling terrorist plots or detecting and preventing cyber attacks. Smart cities deploy the use of big data to improve many aspects of our daily lives such as optimizing traffic flows based on real time traffic information. A number of cities, such as Dubai, are currently piloting big data analytics with the aim of turning themselves into Smart Cities, where the transport infrastructure and utility processes are all joined up.

Big Data in Government

The use of laptops, smartphones, and tablets in government continues to grow. Mobile computing enables effective telework and supports continuity of operations and worker productivity in disaster recovery. The communication technologies of social media business technologies are enabling citizens to take a proactive role in government. As social media skills are increasingly well honed, the value of this collaborative technology is maturing, especially when used to enable open, transparent government and to facilitate government service delivery. Big Data is one of the intelligent industry solutions and allows government to make better decisions by taking action based on patterns revealed by analysing large volumes of data — related and unrelated, structured and unstructured. Ultimately, the dissemination of information can render better governance. But, what is key is agile governance. Governments themselves to enable regulation must adapt to these changes and take initiatives to support innovation and technological development to create an environment conducive to generating the talent needed for economic development. Moreover, governments can showcase their agility in policy-making, especially in areas that help solve national chronic challenges, such as unemployment. The possibility that big data can reduce unemployment while improving the talent pool is an element that has thus far been overlooked by many, but not all, governments.

Government, Big Data, and the Workforce

How the government can use Big Data to reduce unemployment and promote talent competitiveness

The phenomenon of digitisation and the use of Big Data alongside other technology applications to solve challenges are reaching an inflection point. There is an innovative concept being discussed in technology circles by global ICT powerhouses such as SAP and Accenture whereby the applications of Big Data can be a game-changer in the employment space, helping solve this generation's most threatening economic, social, and political challenge; unemployment and limited talent availability.

The idea entails developing the architecture of a platform that leverages big data, mobility, and cloud computing to first, "turn big data into actionable data, the ultimate game-changer in the analysis-paralysis syndrome," says Mr Edde. This translates to supporting job placement, vocational training, upskilling, and building the foundation of competitive talent. This concept would involve a polity of stakeholders including the government, business community, academia, and the national workforce. The initiative is to be undertaken by the government, as it possesses a plethora of information on the national workforce, and in most cases the wealth of information in the government's arsenal goes untapped. The information ranges from the hard skills that each individual has to professional experience. The premise of the concept lies in its data exchange between the stakeholders to address current and long-term needs. On the other side of the equation would be information from employers of the skill sets and qualifications needed for their current operations and for strategic expansions. The scope and scale of this platform, with its tiered information can support constructing long-term economic development programs that are cohesive as many stakeholders would be engaged in a horizontal governance policy-making process.

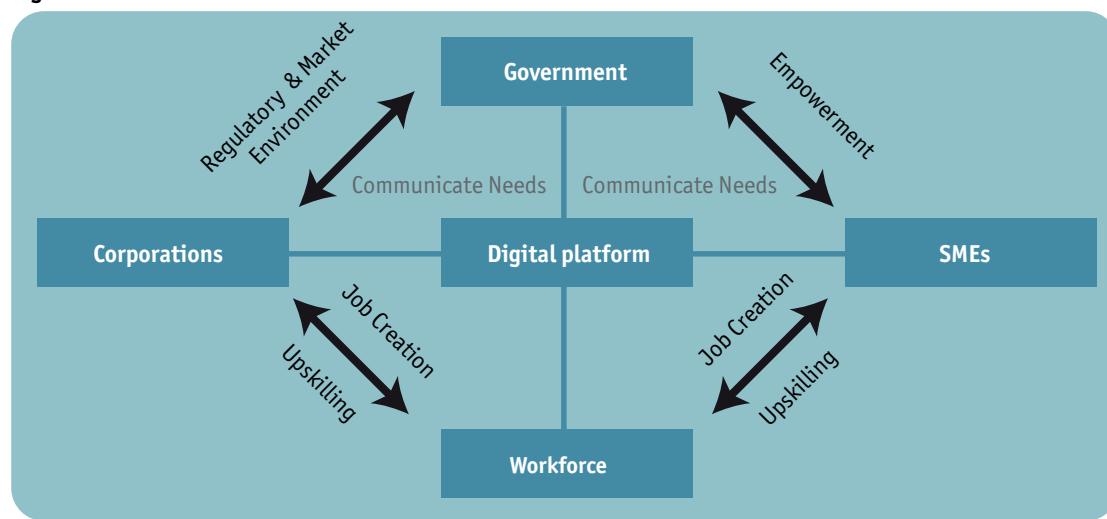
Referring to Ronald Coase's, a Nobel laureate, work on the need to bring transaction costs to zero to unlock economic growth and prosperity, Selim Edde adds "the role of government today is to facilitate



a job market where its transaction cost that is near zero vis-à-vis digitisation of the labour market. By leveraging mobility, cloud computing, and “amazing” citizen-centric applications the power of the data can be unlocked. One can argue that the likes of monster.com and LinkedIn have been successful in driving costs to near zero. But, the government’s wealth of data surpasses these corporate entities, which can drive the cost even lower.” By introducing such a platform not only are there quick wins for the government of reducing unemployment, it is unleashing a wealth of data whose potential to create value and growth is unmatched by any corporate initiative.

In the short-term this platform, “by leveraging data, can help reduce unemployment by making a databank of qualified workers accessible to employers to facilitate effective job-matching,” explains Mr Edde. It would also help facilitate labour mobility, as pointed out by Dr. Omar AlNuami. The Global Talent Competitive Index ranks the UAE as the 24th worldwide and the first in the MENA region primarily on the back of the country’s high quality of governance and strength in attracting talent. “The UAE economy can benefit from such a platform by enabling internal labour mobility, especially among the low-skilled workforce, where local recruitment is low and turnover is high. Having access to such a database would enable construction companies, for example, to recruit locally and save associated costs, such as training workers with UAE construction codes,” Dr. AlNuaimi explains. Another short-term benefit would be identifying those that can be upskilled to fill an employment gap that hinges on specific, but easy to attain skills. This is particularly applicable to middle-level jobs, such as technicians or nurses.

Digitisation of the Labour Market



Actionable Data

By having the corporate perspective of what kind of soft skills and technical skills that are needed for businesses in the medium-term, it can assist educators in honing existing curricula. Professor Lanvin recommends that this dimension of structural development would also require the engagement of civil society in the policy-making process, vis-à-vis a national dialogue, so as to mitigate resistance



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from specific groups. Professor Lanvin gives the example of how it has become evident that sophisticated technology concepts need to be introduced in education systems, as a means to satisfy economic development. As such, it becomes imperative to involve both educators and families, when discussing the notion of introducing coding at the primary education level. By engaging educators in the policy-making process they automatically have ownership to the project, in addition to the invaluable input they would have on how to introduce the concept to students. However, Professor Lanvin stresses “the importance of flexibility and to refrain from typology when introducing new concepts or solutions.” Policy-makers need exhibit agility and flexibility in that their solutions need be broad-stroked, and not precise, to allow room for organic development and to accommodate for the velocity of change around us.

Policymakers can harness these efforts to establish the cornerstone of a new e-system for all government practices that could pave the way for smart solutions, all around. First, policies should outline a national digitisation plan that encompasses areas and sectors that are not currently on a digital platform. Second, to support this initiative with infrastructure capabilities and enablers. And, thirdly policymakers should work with all stakeholders to establish an inclusive information and communication technologies (ICT) ecosystem that encourages greater uptake and usage of digital services. Dr. Omar Al Nuaimi added that this precise plan invigorated a national plan to implement e-government across the board by using the latest technology in back office processes to applying client-facing smart solutions, delivering efficacy across the entire system.

Applied research in computer science alone has yielded tremendous benefits for businesses and consumers, and through such a project, it has potential to help nations develop and solve endemic issues, such as reducing unemployment or as importantly promoting homegrown talent. The development of this platform, will not only make more functions digitised, but can also encourage further development in converting fully to e-government practices and paving the way for integrated smart solutions, nationwide.



Labour Market Dynamics

Demographic, socio-economic, policy and—increasingly—technological trends and disruptions to the business and operating models of global companies have had a profound impact on the dynamics of the global employment landscape,” Professor Lanvin states. The outlook over the medium term is polarized. There are those who foresee limitless opportunities in newly emerging job categories and prospects that improve workers’ productivity and liberate them from routine work, and those that foresee massive labour substitution and displacement of jobs. Academics, chief executives and labour leaders hold strong and diverse views on the debate, as do policymakers.

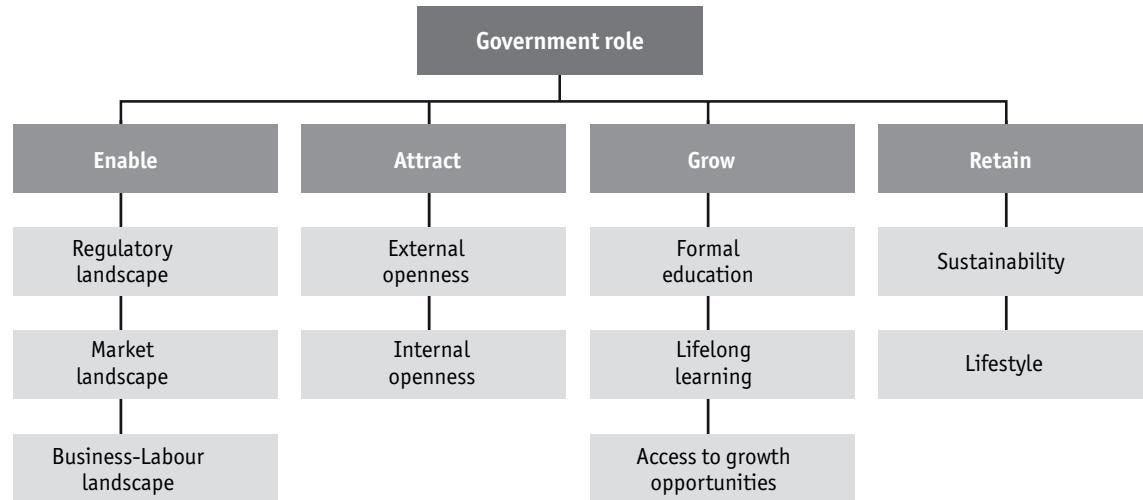
While forecasts vary by industry and region, the trend across the board points to a momentous change that is underway. Professor Lanvin foresees “talent and not capital as being the key factor linking innovation, competitiveness and growth.” And ultimately, actionable policies today will determine whether a country goes down the path of massive displacement of workers or supports an environment that is conducive to generating opportunities. Without urgent and targeted action today to manage the near-term transition and build a workforce with future proof skills, governments will have to cope with ever-growing unemployment and inequality, which would inevitably lead to value destruction.

Professors Lanvin and Evans debuted a Global Talent Competitive Index (GTCI) three years ago that is a composite index of input and output parameters that measures the ability of countries to compete for talent. Input components of the GTCI are based on the Attract-Grow-Retain framework used by corporations to steer talent management, whereas output factors measure the economic impact of mid-level and high-level skilled workforce. The 2015/16 rankings place Switzerland, Singapore, Luxembourg, USA, and Denmark in the top 5 positions. It comes as no surprise that high-income countries have better education systems and greater ability to attract foreign talent through better quality of life and higher remuneration. But beyond this macro-level correlation that are other underlying factors that make countries more competitive for talent than others, each of which ties back to policies and central role government’s play. The UAE ranks highest in the MENAT region at 23, followed by Qatar at 24, and Saudi Arabia at 42.



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Government's Role in Enabling Talent and Attracting Business



Source: GTCI 2015/16 Report, ECN.

Government's Role in Enabling Talent and Attracting Businesses

Many of the countries that rank highly on the index were small economies that embraced national strategies of openness to achieve competitiveness. Agile governance through providing incentives for establishing businesses and promoting labour mobility gave many of these countries a competitive advantage in their respective regions, such as Singapore in Asia and the UAE in the Middle East. What impedes investors from committing to certain geographies, despite the multitude of opportunities ranges from the time it takes to set up a business to legal frameworks that do not protect investors. As such, “the government’s role is central and essential in creating the right environment that is conducive to attracting businesses, domestic and foreign, as a pre-requisite to attracting talent,” says Mr Edde. Based on studies conducted by the EIU, SMEs in both developed and developing nations face numerous barriers such as access to financing, professional advisory services, and red tape. In this context, the government can support the development of SME’s, which are the backbone of economies such as the US. Tailored digital solutions can address these obstacles and facilitate the growth of this segment of the private sector, which is anticipated to be tomorrow’s engine of job creation.

The foundation of breeding talent is a process that requires cultivating and starts during formal education years. It is important for education systems to churn out students that have fundamental skills. Mr. Upadhyay adds that as technology progresses it is difficult to anticipate all the skills one may need 15 years from now, but what is crucial “is teaching students how to learn,” he says. The technical skills needed today may not be in line with what is needed in 15 to 20 years, but cognitive skills are timeless. But at the same time, not encouraging certain technical skills may prove more costly in the long run. In the current era of global value chains, many companies are locating different job functions and categories in different geographic locations to take advantage of the specific strengths of particular local labour markets. A prime example of this trend was US companies outsourcing IT functions to companies in India where there is an oversupply of skilled IT workforce. In light of



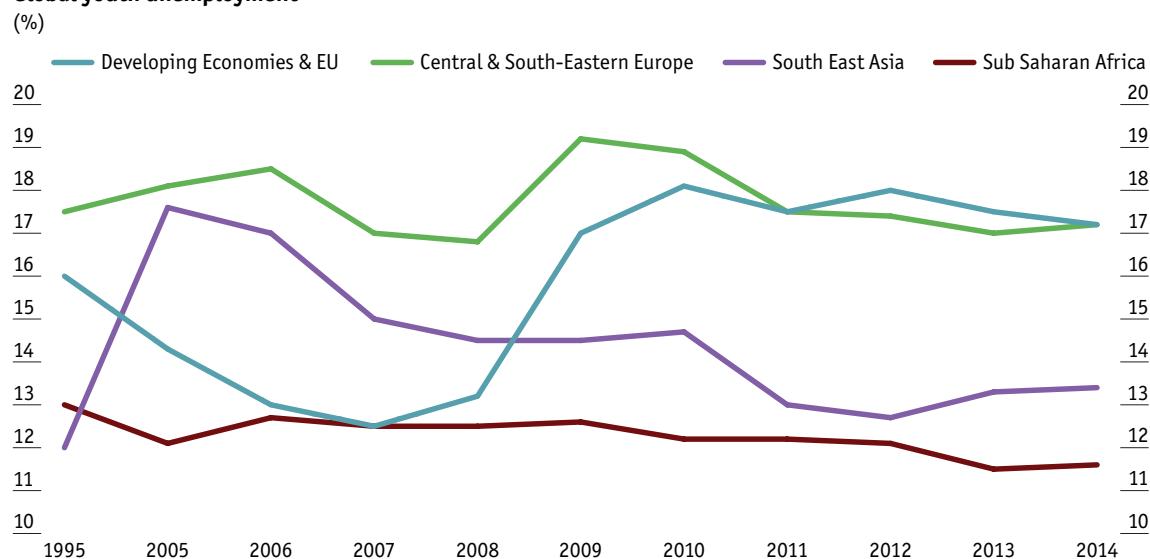
that, the US today faces a deficit in highly-skilled IT professionals. Therefore, it is necessary for the government to take the lead on centralizing the decision-making process vis-à-vis engaging the various stakeholders with a vested interest in the value chain, and to start with "making the right investments in technology applications to eradicate inefficiencies in the job market and create a platform where people connect, meet, communicate, collaborate, and co-innovate to create the jobs of the future," Mr Edde explains.



Employment Landscape

The International Labour Organization estimates that unemployment has reached an all-time high of nearly 200 million individuals, underneath which, youth unemployment has reached staggering highs, such as 48% in Greece. But, unemployment figures do not paint the whole picture. McKinsey estimates that between 30%-40% of the global working population is underutilized, which broadens the definition to include the unemployed, part-time employees, and inactive participants in the labour market. This underutilization obviously has a profound impact on value-creation, be it in curbing synergies between industries and stifling innovation or simply protracting investments in much-needed brick-and-mortar. What is even more alarming, the ILO estimates that global vulnerable employment could be as high as 60% of the global workforce, meaning that 1.7 billion people in vulnerable positions.

Global youth unemployment (%)



Source: The Economist Intelligence Unit.



While much of the Eurozone suffers from relatively higher unemployment is due to cyclical reasons, other countries, including Southern Europe nations and much of the Middle East and Africa have underlying structural deficiencies that must be addressed. The usual suspects that have attributed to this pressing challenge are the economies not creating enough jobs, the misalignment between the current jobs and the workforce's skillsets, and poor education. On top of these there is what Mr Edde refers to as the 'silent job killer.' The ineffective and failed labour market mechanism is what exacerbates the situation, especially at times of crises. The time lag associated between employers posting job vacancies and the actual hiring is the silent killer in itself. Simply put "unfilled jobs result in growth impediments, which results in less job creation, and more job seekers drawing out a country's resources," explains Edde. He gives an analogy of inventory glut that resulted from excess manufacturing in the 70s soon reversed into shortages of resources, as manufacturers curbed production that precipitated an economic crisis. Smart inventory management systems and ERPs turned around the value chain allowing for an economic boom to ensue. This can be applicable to today's unemployment challenge, with the help of technology solutions that apply big data, computing, the IoT and amazing solutions, to both lower unemployment and ensure a system that synchronizes produced talent with business needs. As this an on-going mechanism, it will expedite the response time to changes that are anticipated in talent competitiveness.

There are three trends that will impact employment and in turn talent competitiveness, according to Professor Lavin:

- **Technology:** Automation will continue and algorithms are expected to replace professions such as accountants, and bankers. In fact, most European banks today have replaced a teller with an ATM. The "uberization" of economies will have an impact on sectors. For example uber has adversely impacted local taxi industries worldwide. Air-b-n-b has taken away market share from conventional hotels. As such it is expected that the digitisation of platforms will continue to displace some jobs that we know of today, but will also create jobs that do not exist today.
- **Regional Integration:** The European Union is the first model for a full-fledged regional integration. We have seen through the EU experience that the integration of the labour market resulted in waves of migration, and much of it has been economically beneficial. ASEAN is looking to introduce an integration mechanism that facilitates talent migration. Going forward, we can expect to see more labour mobility within regions. The GCC for example has a limited model where the national talent of the GCC countries enjoy mobility, but perhaps there is room for broadening it.
- **Policies:** Government policies will ultimately determine which countries gain competitiveness and those will be the laggards. As mentioned earlier in the previous section, talent will be the key driver for growth and policy-makers need to be more cognisant of that so as to push for reforms and the application of technological solutions to help gain attractiveness.
In the next section, we will analyse the employment landscape of select geographies to determine in which areas technological solutions can aid in creating talent and/or addressing unemployment.



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USA

The US economy is once again at crossroad after a stellar recovery post-global financial crisis. Monetary policy supported the rebound in economic growth as corporate and household deleveraging paved the way for structural fiscal reform. However, given the recent strength in the US dollar, wage growth deceleration, and manufacturing beginning to tail off, it could very well be that US monetary tightening may have been premature. Perhaps the main indicator used to exhibit the strength of the US economy and justified the recent interest rate hike is the unemployment rate. At first glance it appears to denote a healthy economic stance, where the number of jobs created have managed to bring it down to 5%, as of Jan 2016, from 10% in 2008. Recent discussions have pointed out that real unemployment may be higher as the current definition is too narrow. Those working part-time or not actively seeking employment are not included in the computation. Depending on how you calculate these two groups, real unemployment can be anywhere between 7% and 9%.

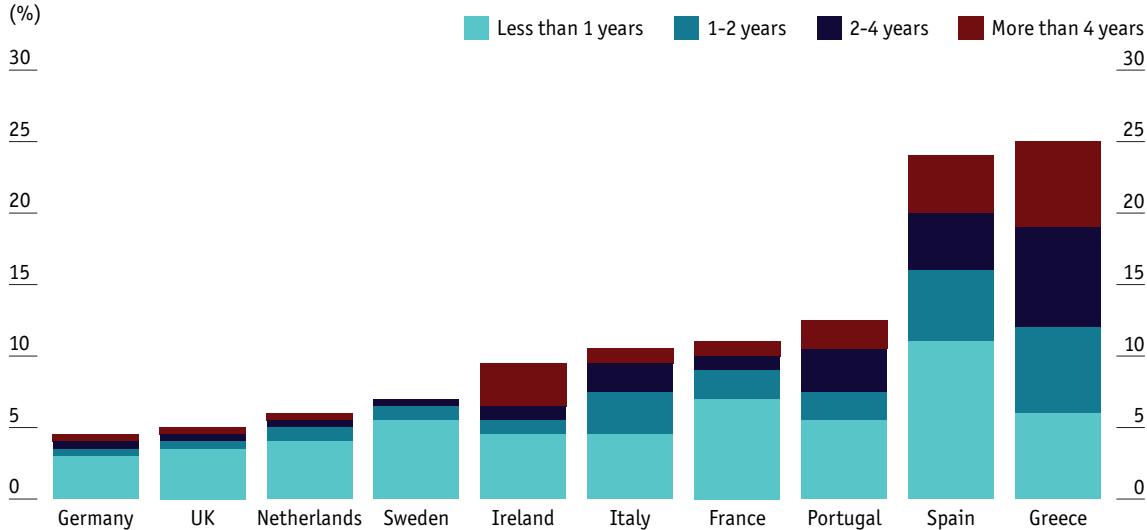
The US ranks 4th in the Global Talent Competitive Index and its strongest subset ranking was the country's ability to grow talent, vis-à-vis formal education, lifetime long learning, and growth opportunities. In spite of this high ranking, the private sector is calling on the government for more actionable policies in this sphere to improve talent. Some US corporations have partnered up with education institutions to ensure that graduates have the prerequisites for their business needs. Whereas these individual initiatives have fulfilled specific industry jobs, there is a need for a nationwide enterprise to tackle what seems to be a growing need. The White House's former CIO, under the Obama Administration alludes to companies such as LinkedIn and Monster.com was holding vast amounts of information on people's professional lives, but there is one organization that surpasses them all: the US federal government. Government labour data is rich and comprehensive, and although hard to access as it is bound by red tape, but "with today's technologies, we can do a lot more to build open data sets for skills," says Aneesh Chopra the White House's first chief technology. Sushant Upadhyay, Partner Aon Hewitt, believes that the more information available, the higher the success of this platform for job placement and aligned skill sets with industry needs. And, as such, the US is a candidate for a successful implementation of this platform.

Spain & Italy

The euro area has been plagued by economic stagnation, making the past decade practically a lost one. At the forefront of the meek growth has been high unemployment, especially among the youth. They show the overall unemployment rate has crept down to 10.5%, still way above where it needs to be. Despite the good news, there are two challenges that the euro workforce faces; long-term unemployment and high unemployment among the youth. Long-term unemployment is defined as being out of work for 12 months. Of the 18m jobless Europeans, more than half have not worked for the last year. And over 15% have not had a job for more than four years. Unsurprisingly, the problem is most severe in southern Europe where a protracted crisis pushed up overall unemployment, and with it long-term joblessness. Moreover, unemployment among the youth in Europe has reached staggering highs in Greece, currently at 47.9%. Despite Spain making economic headlines with a modest economic recovery, employers continue to prefer experienced workers versus inexperienced youth, leaving



Unemployment by duration



Source: The Economist Intelligence Unit.

47.7% of the below 25 year olds out of work. Italy ranks fourth in terms of highest unemployment, more than half of which is long-term unemployment.

Part of the reason why unemployment has been so sticky is due to labour mobility, or immobility in this case. Despite the EU spanning 28 countries, a mere 2.8% of Europeans have moved to a different country in the EU, as language barriers, cultural differences and non-transferable qualifications stifle their mobility. Generous unemployment benefits in Europe also tie would-be workers to one place for one year, in many EU countries. Moreover, the longer someone is out of work, the less employable they become. There are a few bright spots in the EU, including Denmark, The Netherlands, and Germany. These countries have managed to keep long-term and overall unemployment low through job training programmes, flexible labour laws and education.

In order for Spain to realize the potential of applying big data and other technological applications to address its unemployment, it is necessary for fundamental structural change. Unlike the US or many MENA countries, Spain does not have centralized labour data. Each province is privy to data within its jurisdiction. Moreover, Spain lacks an empowered central authority to undertake such a project. Even though it is a daunting and long process, the political will to act should be there because the ramifications of not addressing unemployment could have serious political consequences. The lack of opportunity among young voters has resulted in two political trends, which could seriously threaten the institution of democracy. The young have either joined the camp of political apathy or are flocking towards populist parties, such as Syriza in Greece, or rallying support for Marine Le Pen and the National Front.

Germany

The German employment and labour market narrative is worth learning from. Today, Germany's unemployment rate is at the lowest level since German reunification, at 4.5%. Despite, tepid global growth, which the German economy depends on for exports, resilience and domestic growth have

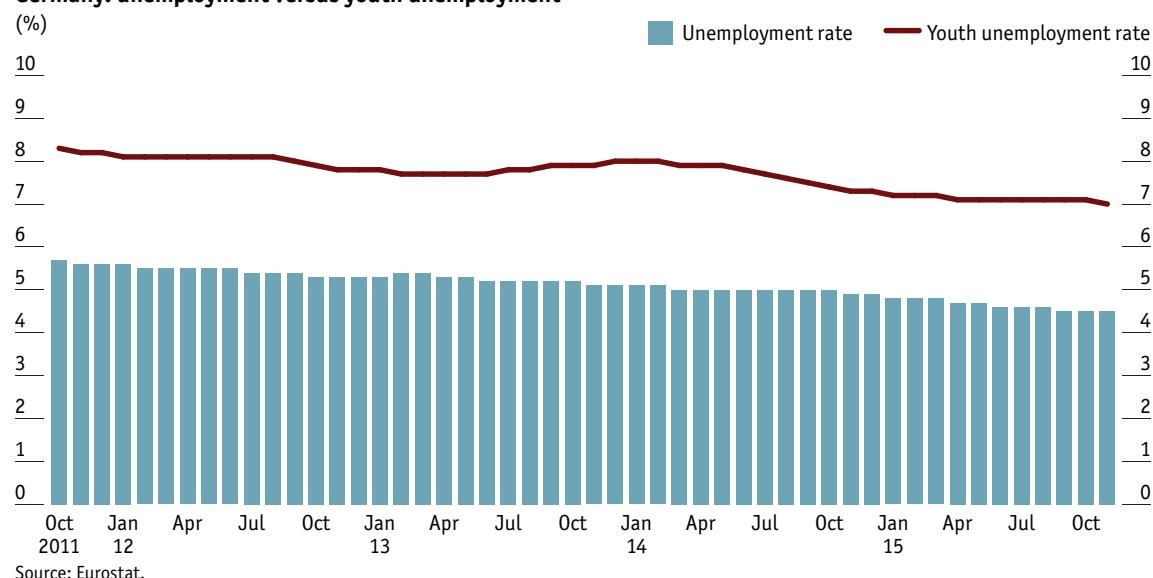


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proven to be stouter. Consumer and investor confidence, in turn, continue to boost the momentum in the labour market.

A closer look at the dynamics of the labour market explain exactly why Germany has succeeded in keeping both overall and youth unemployment lower than its European peers.

Germany: unemployment versus youth unemployment



Source: Eurostat.

The success is largely imbedded in the system that starts during the formal education years. For example, Germany uses a dual system of vocational education and training. The system is referred to as "dual" because the knowledge and skills required for each specific profession are conveyed in two different learning-locations: a classroom and a work place, making them more fit for the workplace. Vocational training in Germany covers a wide range of professions; some 350 certified occupations, ranging from technical, commercial and industrial sectors to public sector administration and health and social services.

"Collaborative governance is the essence of Germany's labour market ecosystem. Germany's education policies are rooted in a collaborative approach to labour markets, a key feature, which requires continuous employer involvement to enable the on-going development of required skills," says Mr Binder. German companies are required to train employees based on a system of nationally-established and portable certifications, defined by government in collaboration with employers—elements for example that do not exist in Spain, where responsibility for both education and the regulation are not centralized or are the responsibility of one authority, explains Mr Binder. Working alongside government and employers, labour unions in Germany also play a more active and engaged role in apprenticeship.

Germany is a prime example how the use of Big Data, cloud computing, the IoT, and other technological features have enabled the efficacy of the system and produced excellent results.

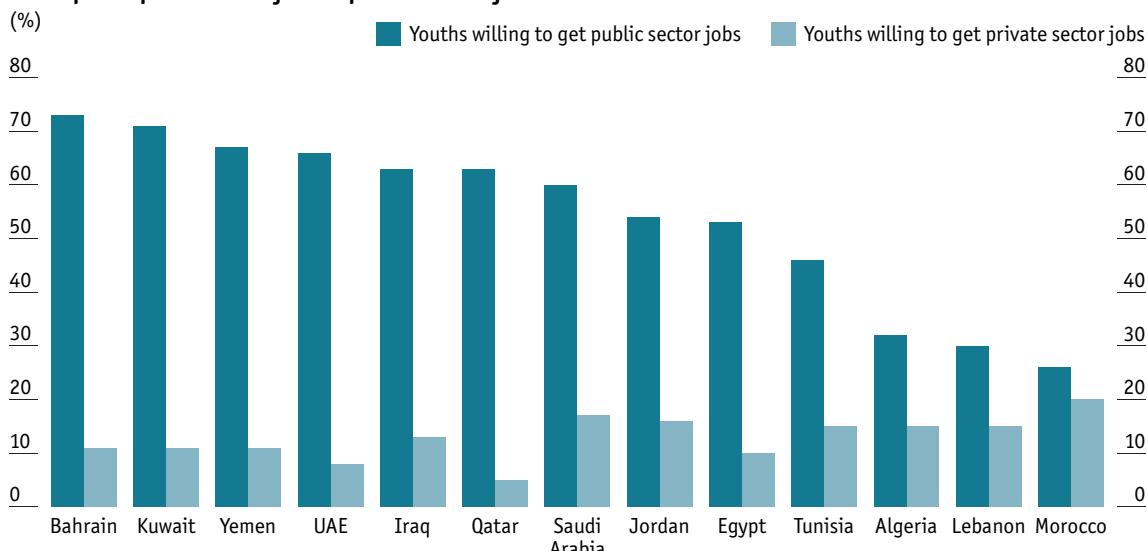


Collaboration is the cornerstone of Germany's policy-making process, but was further enabled by technology that precipitated the economy's development that is intrinsic of competitive talent.

The MENA Region

The employment landscape in MENA region differs from all other regions. Most of the region's challenges today are deep-rooted in its "social contract" with its populations. In the GCC, the unwritten covenant dictated distributing the spoils of oil through social provisions. In other MENAT countries, the doctrine between the leaderships and their nations was loyalty for benefits. Today, as a result of these policies the region suffers from endemic unemployment, especially among the youth, bloated public sector employment, and an environment that does not support talent or entrepreneurship. The UAE and Qatar are exceptions in the region, while Saudi Arabia's recent reforms are bound to make strides. Nevertheless, the region is in dire need of fundamental change that spans fiscal, economic, legal, social, and business reforms.

Youth prefer public sector jobs to private sector jobs



Source: Gallup survey, 2010.

Youth unemployment was the prompter of the Arab Spring due to protracted periods of low development that curbed growth to times below half of its economic potential. There are a slew of factors that have culminated in this pervasive challenge that the MENA Region faces, that at first appearance not all seem related, but on one level they are concomitant. Mr. Jafar highlights four major economic and operational impediments that have attributed to today's employment landscape and have stifled growth, all around.

- 1- *Mismatch between workforce skills and those required by businesses.* Throughout the MENA region, education systems churn out students that lack employable skills. On paper, many have completed their tertiary education, but even these technical skills attained are not on par with global standards. "Critical-thinking, problem-solving, and effective communication are pre-requisites for many of today's high-skilled jobs," says Mr. Jafar. The quality of the soft skills that students in MENA

education systems acquire does not suffice many of the private sector job requirements. In short, the public education system has generated a prototype that fits the public sector employee mould.

- 2- *Regulatory Environment:* Actionable policy reforms are needed to produce an environment conducive to attract business, vis-à-vis reducing red tape and bureaucracy, reforming the legal framework under which investors can operate, and providing incentives. “For example, the lack of bankruptcy laws impedes many investors, especially in the SME space, which is vital for economic growth,” explains Mr. Jafar.
- 3- *Chronic Underinvestment:* Prior to the Arab Spring and since, investments throughout the region were meagre, and especially in infrastructure and other added-value industries. Many government budgets were burdened by wages, subsidies, and debt servicing costs, leaving close to nothing for long-term investments that are vital for sustainable productivity and growth. The MENA region is also laggard in innovation as many government development programs failed to allot sizable investments in research and development.

- 4- *Labour Market Rigidity:* Labour market reforms are needed across the region to tackle a large array of issues. For example, labour laws in Egypt make it difficult for businesses to make employees redundant, despite poor performance. While in the GCC, policy-makers need to pave way for labour mobility, especially among the low-skilled workforce.

There are other employment challenges that are unique to the region, one of which is the “mindset” of the youth. An overwhelming majority of Arab youth want and even feel entitled to a public sector job, which defines stability and benefits, and in the GCC countries is regarded as more financially rewarding than private sector jobs. Moreover, cultural and traditional factors underpin the divergence of employment among males and females. These range from prohibition of females to work in certain areas in Saudi Arabia to social dissent for women to take on certain jobs. The only country that bucks this trend is Lebanon where female unemployment is on par with their male counterparts. Youth unemployment is currently around 29% for the region but it is worth noting that like many developing economies, the North African economies’ informal sectors absorb much of the workforce, whose jobs go unaccounted for.

Saudi Arabia

Saudi Arabia’s population are, today, the most wired, most connected, and best-educated in Saudi history. But, unemployment in Saudi Arabia hovers 11.5%, while youth unemployment in the Kingdom is in the vicinity of 30% making job creation a policy challenge of the highest order. Combined estimates in the Saudi working age population by 2025 forecasts 226,000 new entrants into the labour market per annum and expected to reach 17.9 million. What further impairs the situation in the Kingdom is the high public sector absorption of nationals and the associated wage bill that is weighing on fiscal coffers. Despite reforms and vigilant application of systems like Nitaqat, the public sector continues to employ 78% of the Saudi workforce. Indeed the Saudi leadership’s commitment to tackling unemployment, diversifying its economy, attracting investments, and supporting talent competitiveness is ubiquitous in official communiqué.



One of King Salman's first decrees was the establishment of the Council on Economic and Development Affairs (CEDA) whose mission is to oversee a comprehensive and cohesive development plan for the Kingdom. "Centralizing the program while engaging horizontal governments to be equal stakeholders in the construction of the plan, displays a flair of agility in the approach but assertiveness in the undertaking," states Ms. Maha Taibah. The Commission for Job Generation and Anti-Unemployment, linked directly to the federal body, CEDA, is in itself a product of this holistic approach to addressing the structural reforms that Saudi Arabia needs.

This empowered entity is tasked with creating sustainable jobs, which centres on entrepreneurship, innovation and SME's, concomitant to a job-creating ecosystem. However, Ms. Taibah argues that government efforts need be propelled in multiple directions, with labour market regulation at the forefront and encouraging migration of Saudi nationals from the public to private sector. It is worth noting that a summer internship program was launched by the Saudi government to help instil a different mind set among the youth.

Quasi-state enterprises have played a decisive and central role in fostering the development of skilled national workforces, such as ARAMCO, SABIC, and several state banks. In fact, Saudi ARAMCO is the gold standard in staff training, spending around US\$ 1 million a day on executive and staff training. As such, tapping into the expertise of ARAMCO to share its training strategy is an exemplary form of collaboration among stakeholders in delivering national goals.

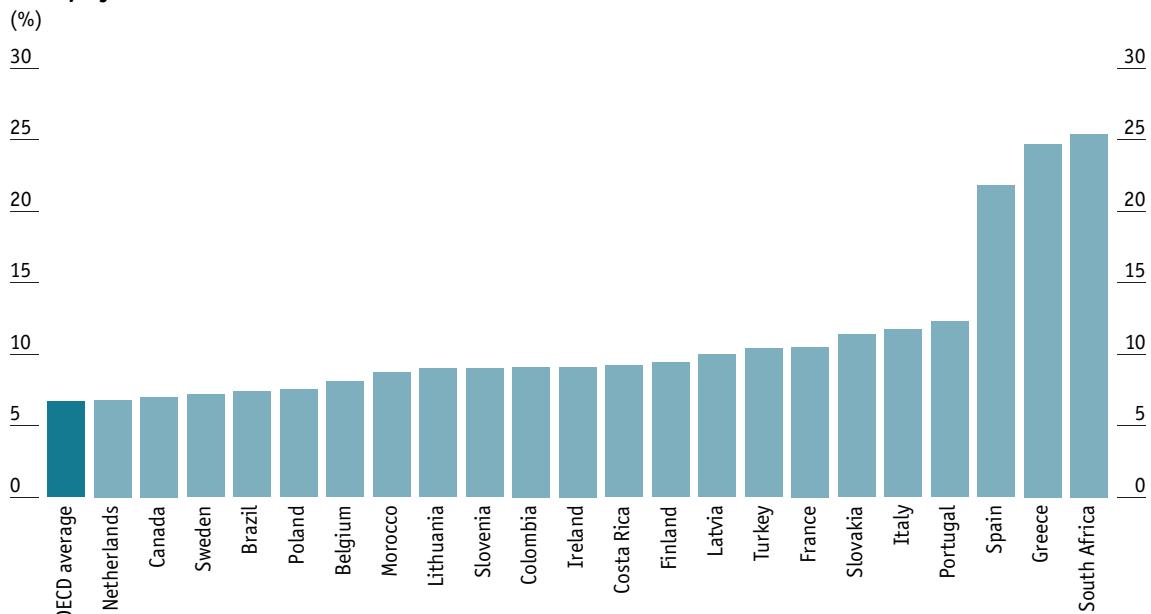
As previously discussed in the report, growing talent requires cultivation that starts during formal education. Hard skills are part of the equation, but soft skills are of equal weight. "The government is reassessing the entire policy reform spectrum in order to enhance entrepreneurial mindsets, and encourage the adoption of 21st century skills that support the successful transition from education to employment," adds Ms Taibah. Services such as career counsellors, coaching, and mentoring helps students hone their talents and solidify more soft-skills.

We have seen a plethora of investment reforms launched in Saudi over the past couple years that all point to more openness and diversification of its economy, which will help both the large quasi-state entities as well as the SMEs to innovate and create much needed jobs. What makes Saudi Arabia ideal for using technology applications to help drive its strategy and goals is having a centralized empowered entity (CEDA) to carry out the initiative. The political will and economic situation have made this matter urgent. So, if there is a time to apply smart solutions that can accelerate the results, it is now. Moreover, Saudi Arabia is adamant about diversifying its economy and developing a knowledge-based economy, which will rely greatly on digitisation. Saudi Arabia can benefit in numerous ways, especially in helping female job placements as technology now supports mobile workstations.

South Africa

Over the past 20 years, South Africa's unemployment has doubled and is currently the highest in the world. Youth unemployment in particular has skyrocketed and within that segment school leavers face the toughest challenge. The impact of the apartheid regime policies of marginalization continues to impact the employment landscape today. The variance in school quality largely is a function of the

Unemployment rates



Source: OECD.

neighbourhood as there is no national standard to which all schools must adhere. Moreover, labour market rigidity also contributes to this problem. The procedure and cost associated with dismissing a worker for instance is both difficult and costly, for example.

The government needs to undertake structural reform of the education sector. Policies in the US calling for affirmative action helped integrate African Americans and women in the education system. Perhaps policy-makers in South Africa need to approach the education and employment challenge in a similar fashion.

A broad overhaul of South Africa's labour law is overdue. In the meantime, the country is in dire need for pragmatic policy action. A recommendation put forth by Oxford University includes a targeted wage subsidy to facilitate school to work transition. This subsidy is somewhat of a tax break to encourage employers to hire and by extension discouraging informal sector jobs. A wage subsidy or tax break, can also apply to hiring a disadvantaged group, such as those that have been out of work for an extended period.

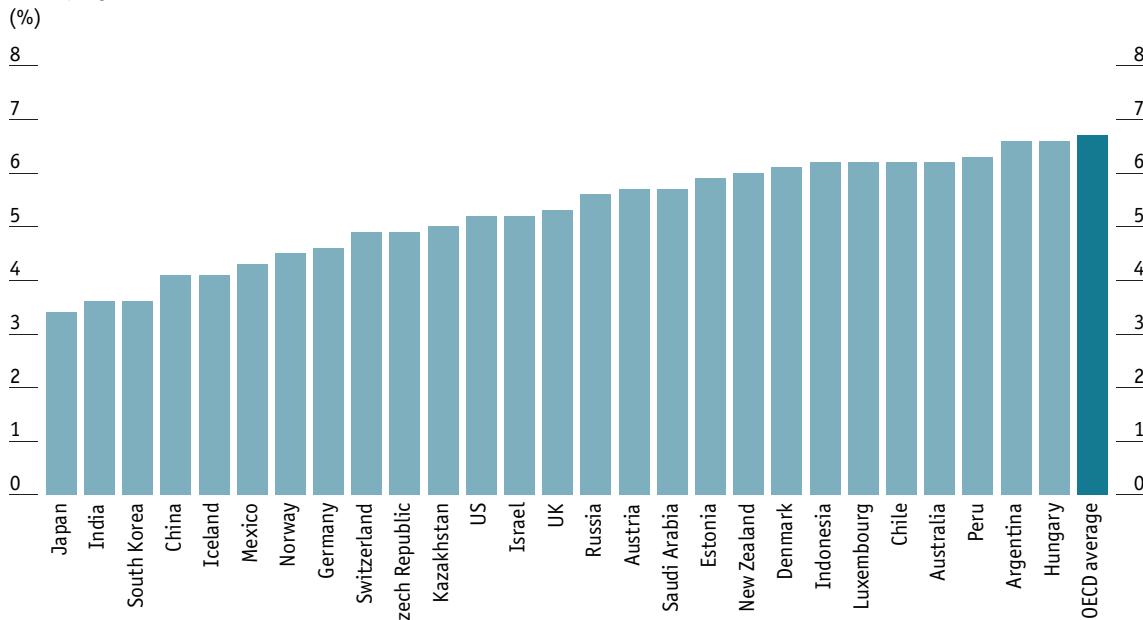
Given the gravity of the unemployment and continuous displacement of workers, it is crucial for South Africa to supplement structural reform with IT applications such as the platform we are presenting.



Asia

The economies of East and South Asia are facing some serious headwinds from within the region as well as from the global economy. Asian economies will have to adjust to slower demand from China as its rebalancing transition takes time. Tighter US monetary policy as well as rising imports costs resulting from weaker regional currencies will also pressure Asian economies. Perhaps the highest risk the region faces now is how high leverage is through the region, especially Chinese debt. This macro backdrop will most likely weigh on job growth. However, the employment landscape differs greatly from one Asian economy to the other.

Unemployment rates (%)



Source: OECD.

Japan unemployment dips to a 20 year low and is on record to have the lowest number of jobless workers worldwide. Economists are suggesting that at 3.1% unemployment, Japan is regarded as close to full employment. This signals a move away from deflation, as long as labour market remains tight, which has stifled economic growth for 20 years. Any drop below this level will have inflationary pressure on wages, something Japanese corporates have been trying to avoid. For example, Japanese employers have been offering overtime as opposed to raising wages.

Other parts of Asia like South Korea have also had low unemployment while some countries face higher rates, such as Indonesia and the Philippines, around 6%. Employment challenges in Asia include disparity between female and male labour participation, particularly in Southern Asia. The female labour force participation rate in Southern Asia in 2015 is estimated at 28.2 per cent. This is far lower than the participation rate of 61.9 per cent in Eastern Asia and 58.8 per cent in South-Eastern Asia and the Pacific.



Shaping the Future of Work: Technology's Role in Employment

What has been iterated for most geographies is also applicable to Asia, a mismatch in skills of the workforce versus needs in the economy. Many initiatives have been launched in Asia, but not all have been successful. Some programs have focused on churning out skills that are fit for a sector where the economy has a key advantage e.g. IT skills in India. And while that has delivered the numbers, the program was independent of a strategy to enable and grow talent across the board. As a partner at Aon Hewitt, previously based across many countries in Asia, Mr. Upadhyay advised many Asian governments on initiatives that bring the skills of the new age workforce in alignment with industry needs. "What distinguishes a successful model is the strategic planning that encompasses a holistic approach to invoke structural change. Centralizing the data and responsibility within the jurisdiction of a single dedicated and empowered agency that is accountable for the follow-through of the project is key," he points out. The most successful initiatives require at least four years of consistent follow-through. As Asia has been home to several successful stories, the implementation of technology applications to mimic these successes across economic sectors would help Asia weather the storm of a slowdown in the region, while putting in place tools to help some of the world's largest economies place its workforce in suitable jobs, while increasing its talent competitiveness.



Conclusion

Economic, political, and social trends have impacted global investment opportunities. More recently technology has had a disruptive impact on businesses that have amplified value creation, but while has altered the employment landscape. Meanwhile, the growing gulf between the skill set of the global workforce and the needs of economic growth today will undoubtedly be the biggest deterrent to growth. Talent and not capital will differentiate one economic narrative against the other. Nevertheless, it is important to stress the role of the private sector, and especially SMEs, in its job-creating role. The private sector is the driver of value, jobs, and economic growth when given the right environment to grow. As such, it is vital for all stakeholders-government, private sector, workforce-to collaborate to ensure economic potential is realized. A part of effective government solutions is enabling a labour market ecosystem that functions properly and empowering a private sector, vis-à-vis effective governance, to create jobs. Technological applications, such as big data, cloud computing, IoT, and "amazing" tailored customer solutions can facilitate this daunting task. The government's role is integral and a leading one among stakeholders, powered by the state of "hyperconnectivity" and evolving customer demands. Digitisation is a unique opportunity from which governments can reimagine the labour market model to effectively address the challenges of tomorrow. The innovative concept of developing the architecture of a highly collaborative industry-grade platform that leverages big data, mobility, and cloud computing to turn big data into actionable data is compelling. This would translate into supporting job placement, vocational training, upskilling, empowering entrepreneurs, and building the foundation of competitive talent that meets future economic needs. The development of this platform will also encourage the development of next generation personalised e-government services and paving the way for the economic and social development of communities, regions, and countries, thus shaping the future of work.

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