WORLD ECONOMIC FORUM

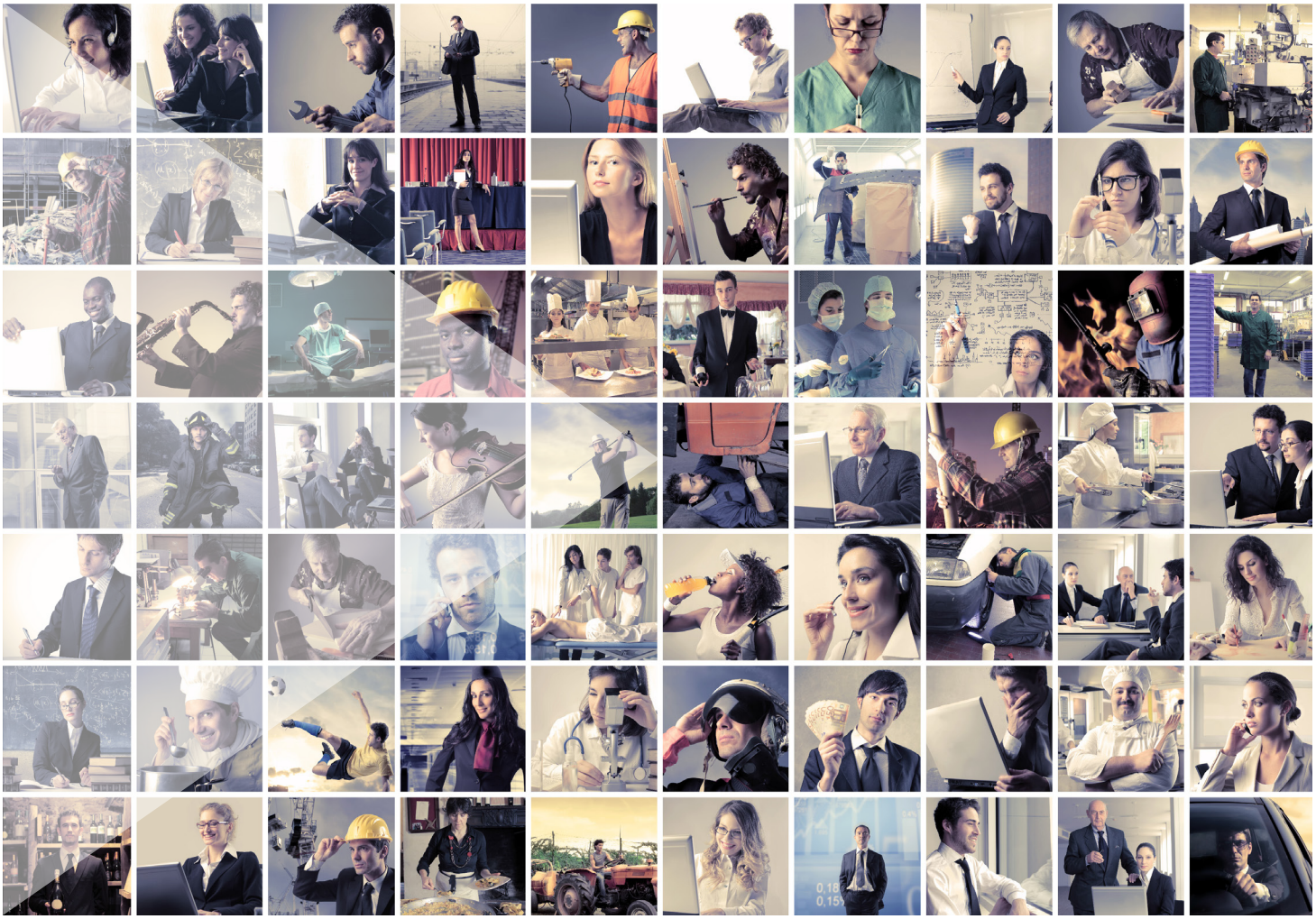
COMMITTED TO IMPROVING THE STATE OF THE WORLD

Global Challenge Insight Report

The Future of Jobs

Employment, Skills and Workforce Strategy for the Fourth Industrial Revolution

January 2016



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REF 010116

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Preface

KLAUS SCHWAB
Founder and Executive Chairman

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Member of the Managing Board

Today, we are at the beginning of a Fourth Industrial Revolution. Developments in genetics, artificial intelligence, robotics, nanotechnology, 3D printing and biotechnology, to name just a few, are all building on and amplifying one another. This will lay the foundation for a revolution more comprehensive and all-encompassing than anything we have ever seen. Smart systems—homes, factories, farms, grids or cities—will help tackle problems ranging from supply chain management to climate change. The rise of the sharing economy will allow people to monetize everything from their empty house to their car.

While the impending change holds great promise, the patterns of consumption, production and employment created by it also pose major challenges requiring proactive adaptation by corporations, governments and individuals. Concurrent to the technological revolution are a set of broader socio-economic, geopolitical and demographic drivers of change, each interacting in multiple directions and intensifying one another. As entire industries adjust, most occupations are undergoing a fundamental transformation. While some jobs are threatened by redundancy and others grow rapidly, existing jobs are also going through a change in the skill sets required to do them. The debate on these transformations is often polarized between those who foresee limitless new opportunities and those that foresee massive dislocation of jobs. In fact, the reality is highly specific to the industry, region and occupation in question as well as the ability of various stakeholders to manage change.

The *Future of Jobs Report* is a first step in becoming specific about the changes at hand. It taps into the knowledge of those who are best placed to observe the dynamics of workforces—Chief Human Resources and Strategy Officers—by asking them what the current shifts mean, specifically for employment, skills and recruitment across industries and geographies. In particular, we have introduced a new measure—skills stability—to quantify the degree of skills disruption within an occupation, a job family or an entire industry. We have also been able to provide an outlook on the gender dynamics of the changes underway, a key element in understanding how the benefits and burdens of the Fourth Industrial Revolution will be distributed.

Overall, there is a modestly positive outlook for employment across most industries, with jobs growth expected in several sectors. However, it is also clear that this need for more talent in certain job categories is accompanied by high skills instability across all job categories. Combined together, net job growth and skills instability result in most businesses currently facing major recruitment challenges and talent shortages, a pattern already evident in the results and set to get worse over the next five years.

The question, then, is how business, government and individuals will react to these developments. To prevent a worst-case scenario—technological change accompanied by talent shortages, mass unemployment and growing inequality—reskilling and upskilling of today's workers will be critical. While much has been said about the need for reform in basic education, it is simply not possible to weather the current technological revolution by waiting for the next generation's workforce to become better prepared. Instead it is critical that businesses take an active role in supporting their current workforces through re-training, that individuals take a proactive approach to their own lifelong learning and that governments create the enabling environment, rapidly and creatively, to assist these efforts. In particular, business collaboration within industries to create larger pools of skilled talent will become indispensable, as will multi-sector skilling partnerships that leverage the very same collaborative models that underpin many of the technology-driven business changes underway today. Additionally, better data and planning metrics, such as those in this *Report,* are critical in helping to anticipate and proactively manage the current transition in labour markets.

We are grateful for the leadership of Jeffrey Joerres, Executive Chairman Emeritus, ManpowerGroup and Chair of the Global Agenda Council on the Future of Jobs; Jamie McAuliffe, President and CEO, Education for Employment and Vice-Chair of the Global Agenda Council on the Future of Jobs; J. Frank Brown, Managing Director and Chief Operating Officer, General Atlantic LLC and Chair of the Global Agenda Council on Gender Parity and Mara Swan, Executive Vice-President, Global Strategy and Talent, ManpowerGroup and Vice-Chair of the Global Agenda Council on Gender Parity.

We would also like to express our appreciation to Till Leopold, Project Lead, Employment, Skills and Human Capital Initiative; Vesselina Ratcheva, Data Analyst, Employment and Gender Initiatives; and Saadia Zahidi, Head of Employment and Gender Initiatives, for their dedication to this *Report.* We would like to thank Yasmina Bekhouche, Kristin Keveloh, Paulina Padilla Ugarte, Valerie Peyre, Pearl Samandari and Susan Wilkinson for their support of this project at the World Economic Forum. Finally, we welcome the untiring commitment of the Partners of the Global Challenge Initiative on Employment, Skills and Human Capital and the Global Challenge Initiative on

Gender Parity, who have each been instrumental in shaping this combined *Report* of the two Global Challenge Initiatives.

The current technological revolution need not become a race between humans and machines but rather an opportunity for work to truly become a channel through which people recognize their full potential. To ensure that we achieve this vision, we must become more specific and much faster in understanding the changes underway and cognizant of our collective responsibility to lead our businesses and communities through this transformative moment.

Part 1

Preparing for the Workforce of the Fourth Industrial Revolution

Chapter 1:
The Future of Jobs and Skills

INTRODUCTION

Disruptive changes to business models will have a profound impact on the employment landscape over the coming years. Many of the major drivers of transformation currently affecting global industries 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. In many industries and countries, the most in-demand occupations or specialties did not exist 10 or even five years ago, and the pace of change is set to accelerate. By one popular estimate, 65% of children entering primary school today will ultimately end up working in completely new job types that don't yet exist.[1] 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.

Past waves of technological advancement and demographic change have led to increased prosperity, productivity and job creation. This does not mean, however, that these transitions were free of risk or difficulty. Anticipating and preparing for the current transition is therefore critical. As a core component of the World Economic Forum's Global Challenge Initiative on Employment, Skills and Human Capital, the *Future of Jobs* project aims to bring specificity to the upcoming disruptions to the employment and skills landscape in industries and regions—and to stimulate deeper thinking about how business and governments can manage this change. The industry analysis presented in this *Report* will form the basis of dialogue with industry leaders to address industry-specific talent challenges, while the country and regional analysis presented in this *Report* will be integrated into national and regional public-private collaborations to promote employment and skills.

The *Report's* research framework has been shaped and developed in collaboration with the Global Agenda Council on the Future of Jobs and the Global Agenda Council on Gender Parity, including leading experts from academia, international organizations, professional service firms and the heads of human resources of major organizations. The employer survey at the heart of this Report was conducted through the World Economic Forum's membership and with the particular support of three Employment, Skills and Human Capital Global Challenge Partners: Adecco Group, ManpowerGroup and Mercer.

This *Report* seeks to understand the current and future impact of key disruptions on employment levels, skill sets and recruitment patterns in different industries and countries. It does so by asking the Chief Human Resources Officers (CHROs) of today's largest employers to imagine how jobs in their industry will change up to the year 2020—far enough into the future for many of today's expected trends and disruptions to have begun taking hold, yet close enough to consider adaptive action today, rather than merely speculate on future risks and opportunities.

While only a minority of the world's global workforce of more than three billion people is directly employed by large and emerging multinational employers, these companies often act as anchors for smaller firms and local entrepreneurship ecosystems. Therefore, in addition to their own significant share of employment, workforce-planning decisions by these firms have the potential to transform local labour markets through indirect employment and by setting the pace for changing skills and occupational requirements.

This *Report* aims to serve as a call to action. While the implications of current disruptions to business models for jobs are far-reaching, even daunting, rapid adjustment to the new reality and its opportunities is possible, provided there is concerted effort by all stakeholders. By evaluating the future labour market from the perspective of some of the world's largest employers we hope to improve the current stock of knowledge around anticipated skills needs, recruitment patterns and occupational requirements. Furthermore, it is our hope that this knowledge can incentivize and enhance partnerships between governments, educators, training providers, workers and employers in order to better manage the transformative impact of the Fourth Industrial Revolution on employment, skills and education.

Survey and Research Design

The dataset that forms the basis of this *Report* is the result of an extensive survey of CHROs and other senior talent and strategy executives of leading global employers, representing more than 13 million employees across 9 broad industry sectors in 15 major developed and emerging economies and regional economic areas. Our target pool of respondents comprised, as the primary selection criterion, the 100 largest global employers in each of our target industry sectors (as classified by the World Economic Forum; see Appendix B, Table B1). A total of 371 individual companies from these industries and regions responded to the survey over the first half of 2015, providing us with 1,346 detailed occupation-level data points on mass employment,

Figure 1A: Sample overview by number of employees

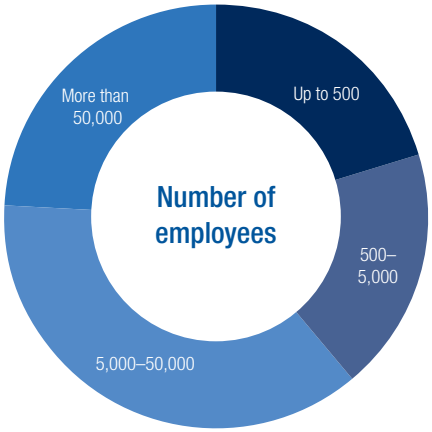


Figure 1B: Sample overview by respondent job titles

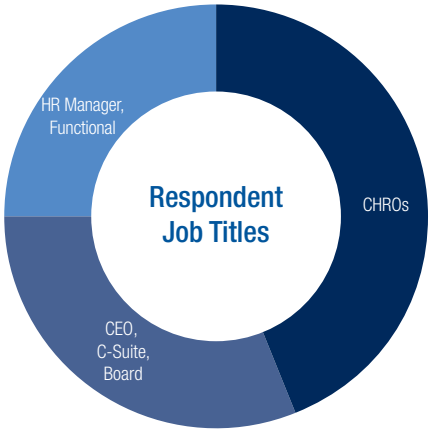


Table 1: Employees represented by companies surveyed

Industry group	Number of employees
Basic and Infrastructure	**1,486,000**
Chemicals	
Infrastructure and Urban Development	
Mining and Metals	
Consumer	**1,672,000**
Agriculture, Food and Beverage	
Retail, Consumer Goods and Lifestyle	
Energy	**1,506,000**
Energy Utilities and Technology	
Oil and Gas	
Renewable Energy	
Financial Services & Investors	**1,050,000**
Banking and Capital Markets	
Insurance and Asset Management	
Private Investors	
Institutional Investors, Sovereign Funds, Family Offices	
Healthcare	**821,000**
Global Health and Healthcare	
Information and Communication Technology	**2,447,000**
Information Technology	
Telecommunications	
Media, Entertainment and Information	**358,000**
Media, Entertainment and Information	
Mobility	**2,602,000**
Aviation and Travel	
Automotive	
Supply Chain and Transportation	
Professional Services	**1,607,000**
Professional Services	
Industries Overall	**13,549,000**

specialist and newly emerging occupations based in specific geographic locations across these companies' global operations.[2]

A quarter of the companies surveyed employ more than 50,000 people globally; another 40% have between 5,000 and 50,000 employees; the remaining third is equally split between employers with 500 to 5,000 staff and high-growth companies with currently up to 500 employees.

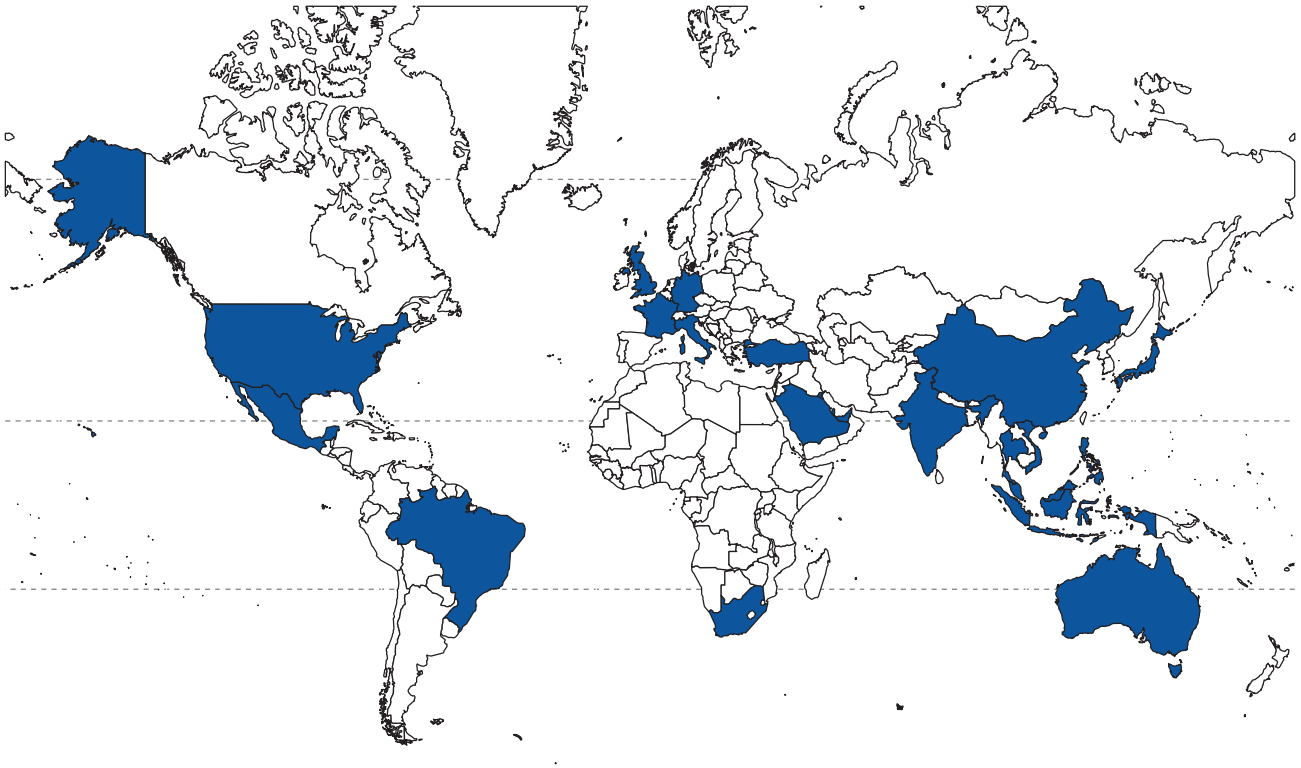
Nearly half of our respondents identified themselves as the Chief Human Resources Officers (CHROs) for their companies at the global level; another third identified as C-suite or board level representatives of their organizations; and the rest identified as strategy officers or human resources line managers, country directors or functional leads.

While the majority of the large employers in our sample have worldwide operations and employee bases, including in several or all of the focus countries of our survey, they are typically headquartered in a more limited number of these countries. To ensure geographical balance, our sample pool included at least 50 companies each from our list of target geographies. We only report country-level findings when we have at least 30 unique data points on local employees in that country. Accordingly, the countries and economic areas covered in-depth by the *Report* are: the Association of Southeast Asian Nations (ASEAN), Australia, Brazil, China, France, Germany, the Gulf Cooperation Council (GCC), India, Italy, Japan, Mexico, South Africa, Turkey, the United Kingdom and the United States (Figure 1C).

In addition, our survey sample was constructed on the basis of nine broad industry sectors as defined by the Wold Economic Forum, with a view to balanced industry results in terms of number of companies and employees represented. For each sector, our target list of respondents identified the leading large and emerging employers in that industry (see *Appendix A: Report Methodology* for details).

Our analysis groups job functions into specific occupations and broader job families, based on a streamlined version of the O*NET labour market information system widely used by the US Department of Labor and labour market researchers worldwide.[3] In addition, we asked respondents to provide a gender breakdown for the employee functions they listed. The geographic balance of our sample enables a nuanced view on the outlook for job functions in different countries and industries, covering both

Figure 1C: Sample overview by geographic coverage



white-collar and blue-collar workers, and both high-income and low-income countries.

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. In addition to asking respondents to provide details on the geographical spread of their workforce, we asked them to distinguish between *mass employment* jobs (i.e. job functions that are significant to the company's operations in terms of the absolute number of employees since they form the bulk of its workforce) and *specialist* jobs (i.e. job categories, such as design and R&D, that are significant to the company's operations—not necessarily in terms of the absolute number of employees but because they provide specialist skills crucial to its value proposition). Following this task approach to the global labour market, we found that—depending on the nature of their business—our respondents often locate these functions in different geographic locations.[4]

Demographic, socio-economic and—increasingly—technological trends and disruptions to the business and operating models of global companies have the potential to rapidly change the dynamics of the global employment landscape. In addition to the outlook for existing roles, we asked respondents to tell us about wholly *new occupations* and fields of specialization they expect to emerge in their industries as well as those they foresee to be made obsolete over the coming years until 2020.

Structure of the *Report*

This *Report* consists of two parts. Part I explores the future of jobs and the pace of change to the global employment landscape up until the year 2020, as anticipated by the CHROs of some of the world's largest employers. It touches, first, on the expected trends, disruptions and drivers of change transforming business models in every industry, with far-reaching implications for skills, jobs and the nature of work. It then reviews the expected effects on employment levels and skills profiles in different job families, industries and geographies. It discusses consequences of these changes for the adequacy of existing talent and workforce strategies. Finally, in a dedicated chapter, it explores the implications of today's transformations on the future of women's workforce participation.

Part II of the *Report* presents our findings through an industry, regional and industry gender gap lens—highlighting key industry-by-industry and region-specific trends—and provides a wealth of industry-specific and country-specific practical information to senior decision-makers and experts through dedicated Industry Profiles, Country and Regional Profiles and Industry Gender Gap Profiles.

Finally, a detailed Methodological Appendix provides further information on our survey design, sample selection criteria and research methodology.

DRIVERS OF CHANGE

According to many industry observers, we are today on the cusp of a Fourth Industrial Revolution. Developments in previously disjointed fields such as artificial intelligence and machine learning, robotics, nanotechnology, 3D printing and genetics and biotechnology are all building on and

Table 2: Significance, timeframe and definition of drivers of change

DEMOGRAPHIC AND SOCIO-ECONOMIC DRIVERS OF CHANGE

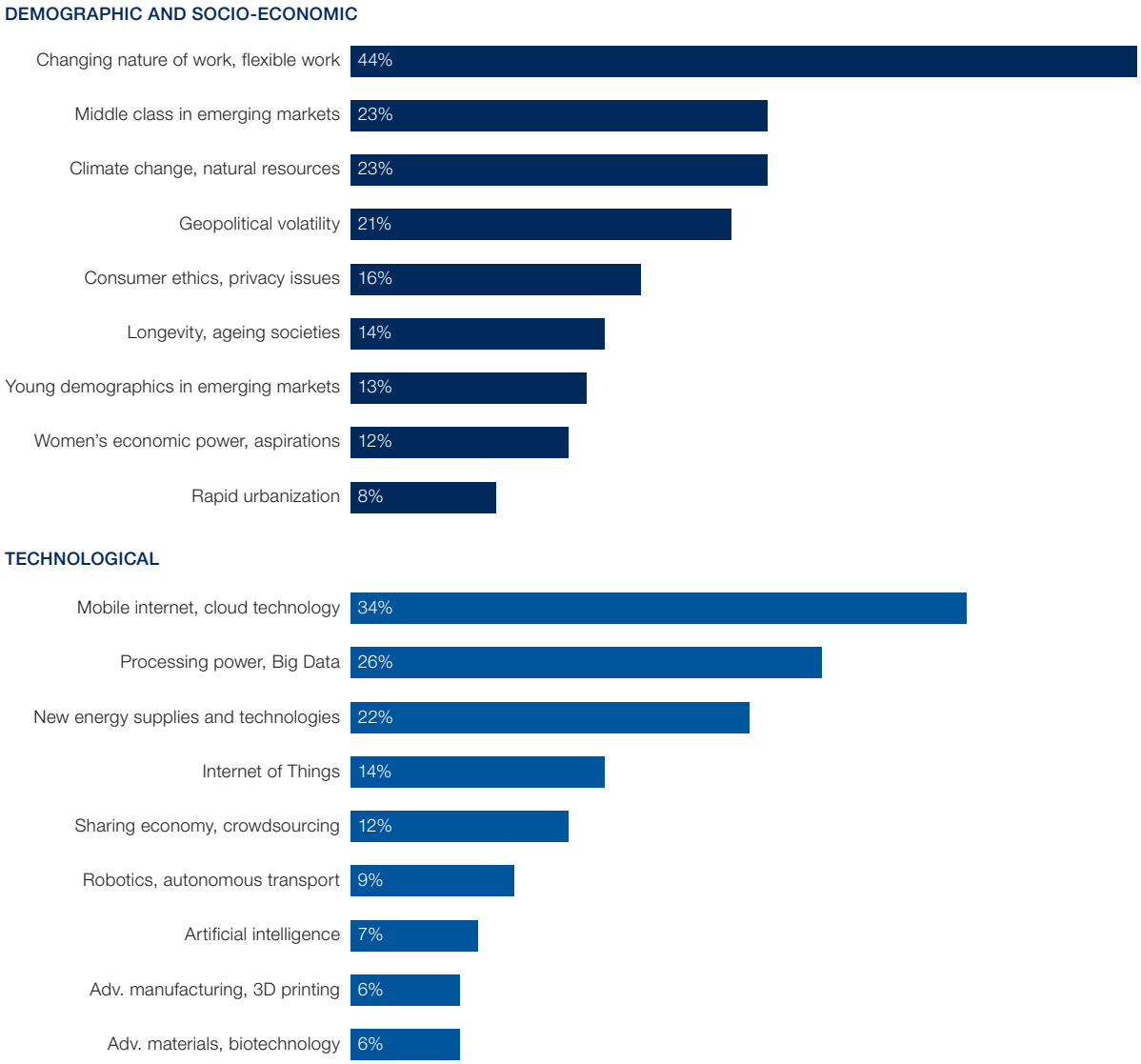
Driver of change	Rated as top trend	Expected timeframe	Definition
Changing work environments and flexible working arrangements	**44%**	Impact felt already	New technologies are enabling workplace innovations such as remote working, co-working spaces and teleconferencing. Organizations are likely to have an ever-smaller pool of core full-time employees for fixed functions, backed up by colleagues in other countries and external consultants and contractors for specific projects.
Rise of the middle class in emerging markets	**23%**	Impact felt already	The world's economic centre of gravity is shifting towards the emerging world. By 2030, Asia is projected to account for 66% of the global middle-class and for 59% of middle-class consumption.
Climate change, natural resource constraints and the transition to a greener economy	**23%**	Impact felt already	Climate change is a major driver of innovation, as organizations search for measures to mitigate or help adjust to its effects. Yet as global economic growth continues to lead to demand for natural resources and raw materials, over-exploitation implies higher extraction costs and degradation of ecosystems.
Rising geopolitical volatility	**21%**	Impact felt already	The geopolitical landscape is constantly changing, with far-reaching implications for global trade and talent mobility, requiring industries such as Oil and Gas or Aviation and Tourism to react and adapt faster than ever before.
New consumer concerns about ethical and privacy issues	**16%**	2015–2017	In many economies consumers are increasingly concerned about a range of issues related to their purchasing decisions: carbon footprint; impact on the environment; food safety; labour standards; animal welfare; and a company's record on ethical trade. Additionally, internet users have increasingly become aware of issues around data security and online privacy.
Longevity and ageing societies	**14%**	2015–2017	Over the next decade, advanced economies will see the effects of an ageing population. Increasingly, people will work past age 65 to secure adequate resources for retirement. At the same time, serving the needs of an older society will create opportunities for new products, services and business models.
Young demographics in emerging markets	**13%**	Impact felt already	Much of the developing world is experiencing rapid population growth and faces a very different demographic challenge than advanced economies: devising appropriate education and training systems to prepare an overwhelmingly young population for the workplace. Leading emerging nations continue to move up the skills ladder and improve access to high-quality education, contributing to a dramatic rise in the number of the college-educated and a shift in the global distribution of talent.
Women's rising aspirations and economic power	**12%**	2015–2017	Women have made significant gains in labour force participation and educational attainment, resulting in an increasingly important role in the economy as both consumers and employees. As a market, women will account for US$ 5 trillion additional consumer spending and more than two thirds of global disposable income over the next decade.
Rapid urbanization	**8%**	Impact felt already	The world's urban population is set to double between 2010 and 2050, from 2.6 billion to 5.2 billion. This rapid and unprecedented pace of urbanization, especially in markets such as China and Sub-Saharan Africa, brings with it many opportunities as well as challenges.

Table 2: Significance, timeframe and definition of drivers of change *(cont'd.)*

TECHNOLOGICAL DRIVERS OF CHANGE

Driver of change	Rated as top trend	Expected timeframe	Definition
Mobile internet and cloud technology	**34%**	2015–2017	The mobile internet has applications across business and the public sector, enabling more efficient delivery of services and opportunities to increase workforce productivity. With cloud technology, applications can be delivered with minimal or no local software or processing power, enabling the rapid spread of internet-based service models.
Advances in computing power and Big Data	**26%**	2015–2017	Realizing the full potential of technological advances will require having in place the systems and capabilities to make sense of the unprecedented flood of data these innovations will generate.
New energy supplies and technologies	**22%**	2015–2017	New energy supplies and technologies, such as renewables and hydraulic fracturing (fracking), are shaking up the global energy landscape and disrupting powerful players at least as much as yesterday's oil price crises did, with profound and complicated geopolitical and environmental repercussions.
The Internet of Things	**14%**	2015–2017	The use of remote sensors, communications, and processing power in industrial equipment and everyday objects will unleash an enormous amount of data and the opportunity to see patterns and design systems on a scale never before possible.
Crowdsourcing, the sharing economy and peer-to-peer platforms	**12%**	Impact felt already	With peer-to-peer platforms, companies and individuals can do things that previously required large-scale organizations. In some cases the talent and resources that companies can connect to, through activities such as crowdsourcing, may become more important than the in-house resources they own.
Advanced robotics and autonomous transport	**9%**	2018–2020	Advanced robots with enhanced senses, dexterity, and intelligence can be more practical than human labour in manufacturing, as well as in a growing number of service jobs, such as cleaning and maintenance. Moreover, it is now possible to create cars, trucks, aircraft, and boats that are completely or partly autonomous, which could revolutionize transportation, if regulations allow, as early as 2020.
Artificial intelligence and machine learning	**7%**	2018–2020	Advances in artificial intelligence, machine learning, and natural user interfaces (e.g. voice recognition) are making it possible to automate knowledge-worker tasks that have long been regarded as impossible or impractical for machines to perform.
Advanced manufacturing and 3D printing	**6%**	2015–2017	A range of technological advances in manufacturing technology promises a new wave of productivity. For example, 3D printing (building objects layer-by-layer from a digital master design file) allows on-demand production, which has far-ranging implications for global supply chains and production networks.
Advanced materials, biotechnology and genomics	**6%**	2018–2020	Technological advances in material and life sciences have many innovative industry applications. Recent breakthroughs in genetics could have profound impacts on medicine and agriculture. Similarly, the manufacture of synthetic molecules via bio-process engineering will be critical to pharmaceuticals, plastics and polymers, biofuels, and other new materials and industrial processes.

Figure 2: Drivers of change, industries overall
Share of respondents rating driver as top trend, %



Source: Future of Jobs Survey, World Economic Forum.
Note: Names of drivers have been abbreviated to ensure legibility.

amplifying one another. Smart systems—homes, factories, farms, grids or entire cities—will help tackle problems ranging from supply chain management to climate change. Concurrent to this technological revolution are a set of broader socio-economic, geopolitical and demographic developments, each interacting in multiple directions and intensifying each another.

While these impending changes hold great promise for future prosperity and job creation, many of them also pose major challenges requiring proactive adaptation by corporations, governments, societies and individuals. As whole industries adjust and new ones are born, many occupations will undergo a fundamental transformation. Together, technological, socio-economic, geopolitical and demographic developments and the interactions between them will generate new categories of jobs and occupations while partly or wholly displacing others. They will change the skill sets required in both old and new occupations in most industries and transform how and where people work, leading to new management and regulatory challenges.

Given the rapid pace of change, business model disruptions are resulting in a near-simultaneous impact on employment and need for new skill sets, requiring an urgent and concerted effort for adjustment.

So far, the debate on these transformations has been sharply polarized between those who foresee limitless new opportunities and those that foresee a massive dislocation of jobs. In fact, the reality is likely to be highly specific to the industry, region and occupation in question and the ability of various stakeholders to successfully manage change. A major goal of this *Report* is to unpack the relative impact of key drivers of change and provide specific information on the relative magnitude of these expected changes by industry and geography, and the expected time horizon for their impact to be felt on job functions, employment levels and skills.

Table 3: Significance of drivers of change, by industry
Share of respondents rating driver as top trend, %

Driver of change	BAS	CON	EN	FS	HE	ICT	MEI	MOB	PS	OVERALL
Changing nature of work, flexible work	46	42	46	26	20	36	36	35	63	**44**
Mobile internet, cloud technology	8	17	0	41	50	69	57	16	38	**34**
Processing power, Big Data	5	8	4	44	20	44	36	6	40	**26**
Middle class in emerging markets	15	42	0	41	40	8	21	39	13	**23**
New energy supplies and technologies	38	21	71	3	10	17	0	26	5	**22**
Climate change, natural resources	49	21	50	3	0	8	7	32	8	**23**
Geopolitical volatility	28	25	29	26	0	3	14	16	10	**21**
Consumer ethics, privacy issues	3	21	8	18	20	31	21	10	20	**16**
Internet of Things	8	13	4	12	10	33	14	6	15	**14**
Longevity, ageing societies	13	17	13	9	40	14	14	3	13	**14**
Young demographics in emerging markets	10	17	17	24	10	3	21	13	8	**13**
Sharing economy, crowdsourcing	3	4	4	18	10	11	21	6	25	**12**
Women's economic power, aspirations	10	21	13	9	10	3	7	6	15	**12**
Robotics, autonomous transport	15	8	4	3	0	0	7	29	5	**9**
Rapid urbanization	13	4	13	3	0	6	14	10	8	**8**
Adv. manufacturing, 3D printing	10	4	8	0	0	6	0	16	3	**6**
Artificial intelligence	5	0	8	3	0	6	7	16	5	**7**
Adv. materials, biotechnology	8	4	0	3	30	0	0	13	0	**6**

Source: Future of Jobs Survey, World Economic Forum.
Note: Names of drivers have been abbreviated to ensure legibility.

Technological, Demographic and Socio-Economic Trends Affecting Business Models

Figure 2 lists the major industry drivers of change and disruptions to business models identified by the senior executives in our survey, ranked according to the share of respondents who expected each trend to be among the top trends impacting their industry by the year 2020. Table 2 provides a short description of each trend and the median time horizon by which it is expected to start impacting the respondent's industry.

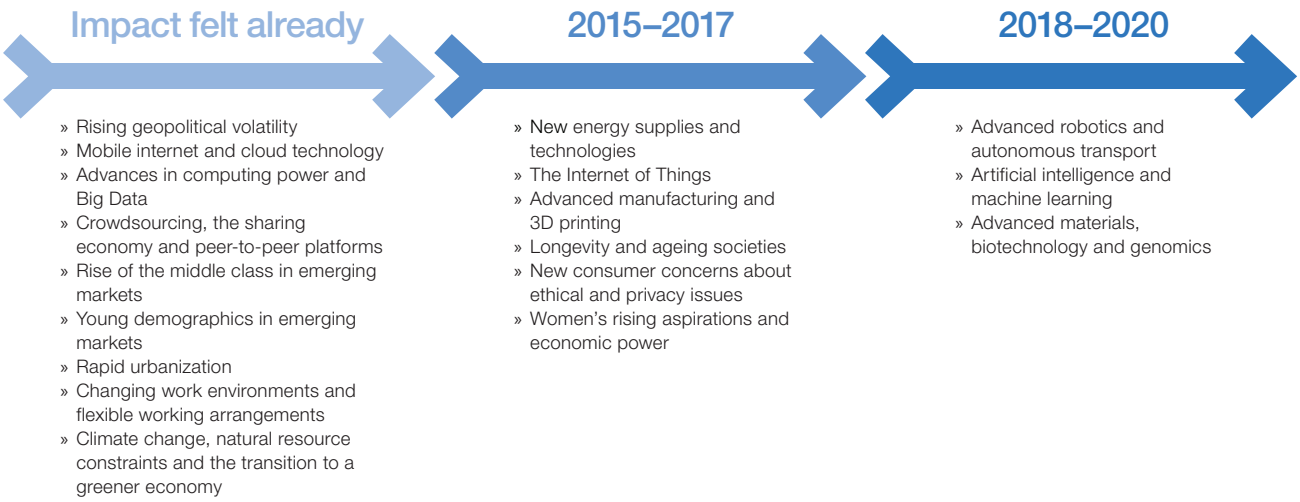
Collectively, technological disruptions are seen as very significant drivers of industrial change by the respondents. Among these, growth in cheap computing power and the ubiquity of the mobile internet have already had widespread impact on existing business models. Additionally, even technological trends whose potentially far-ranging implications have not yet fully materialized—such as 3D printing, artificial intelligence and the Internet of Things—are expected to be well underway in specific industries in the years leading up to 2020.

Industry codes

Code	Industry
BAS	Basic and Infrastructure
CON	Consumer
EN	Energy
FS	Financial Services & Investors
HE	Healthcare
ICT	Information and Communication Technology
MEI	Media, Entertainment and Information
MOB	Mobility
PS	Professional Services

Demographic and socio-economic shifts are expected to have nearly as strong an impact on business models and organizational structures as technological change. Application of technology has already changed when and where work is done in practically every industry as workplaces of the industrial age give way to work practices of the digital age, including remote work, flexible work and

Figure 3: Timeframe to impact industries, business models



on-demand work. The rising middle class in emerging markets, the need to transition towards an environmentally sustainable economy and increased geopolitical volatility are all seen as major organizational drivers of change. Changing values and the growing ability of consumers to express these values are also transforming business models and employment. The rising role and importance of women in the economy is transforming not only the composition of the talent pool but also the nature of products catering to them specifically—and by extension the skills profiles of the jobs required. Longevity and population ageing in advanced economies—and the opportunities and challenges it presents—are also expected to have an impact on business models, and by extension talent needs, in addition to changing the composition of the talent pool in most developed economies in particular.

Industry- and Country-Level Change

A number of drivers of change will have an acute impact within specific industries. At the industry level, for example, new energy supplies and technologies will have a particular impact on the Energy, Basic and Infrastructure and Mobility industries. Processing power and Big Data will have an especially strong impact on Information and Communication Technology, Financial Services and Professional Services. The rising middle class in emerging markets will have the largest effect on Consumer, Financial Services and Mobility. Consumer ethics and privacy issues will have a significant impact on the Consumer, Financial Services and Information and Communication Technology sector (see Table 3).

At the country level, expectations regarding the nature of upcoming disruptions are shaped by the demographic, economic and technological development of the country in question. Overall, changing and flexible work is seen as the most significant driver of change in advanced economies, whereas the rising middle class takes this role in emerging markets. New energy supplies and technologies are expected to play the largest role in the countries of the Gulf Cooperation Council, while climate change adaptation is seen as a particularly major driver in Germany. A number of developing countries expect particularly large impact from the mobile internet given that the technology has the potential to bring millions of formerly unconnected workers and consumers into the formal economy for the first time. For further details, please also refer to the Country Profiles in Part 2 of this *Report.*

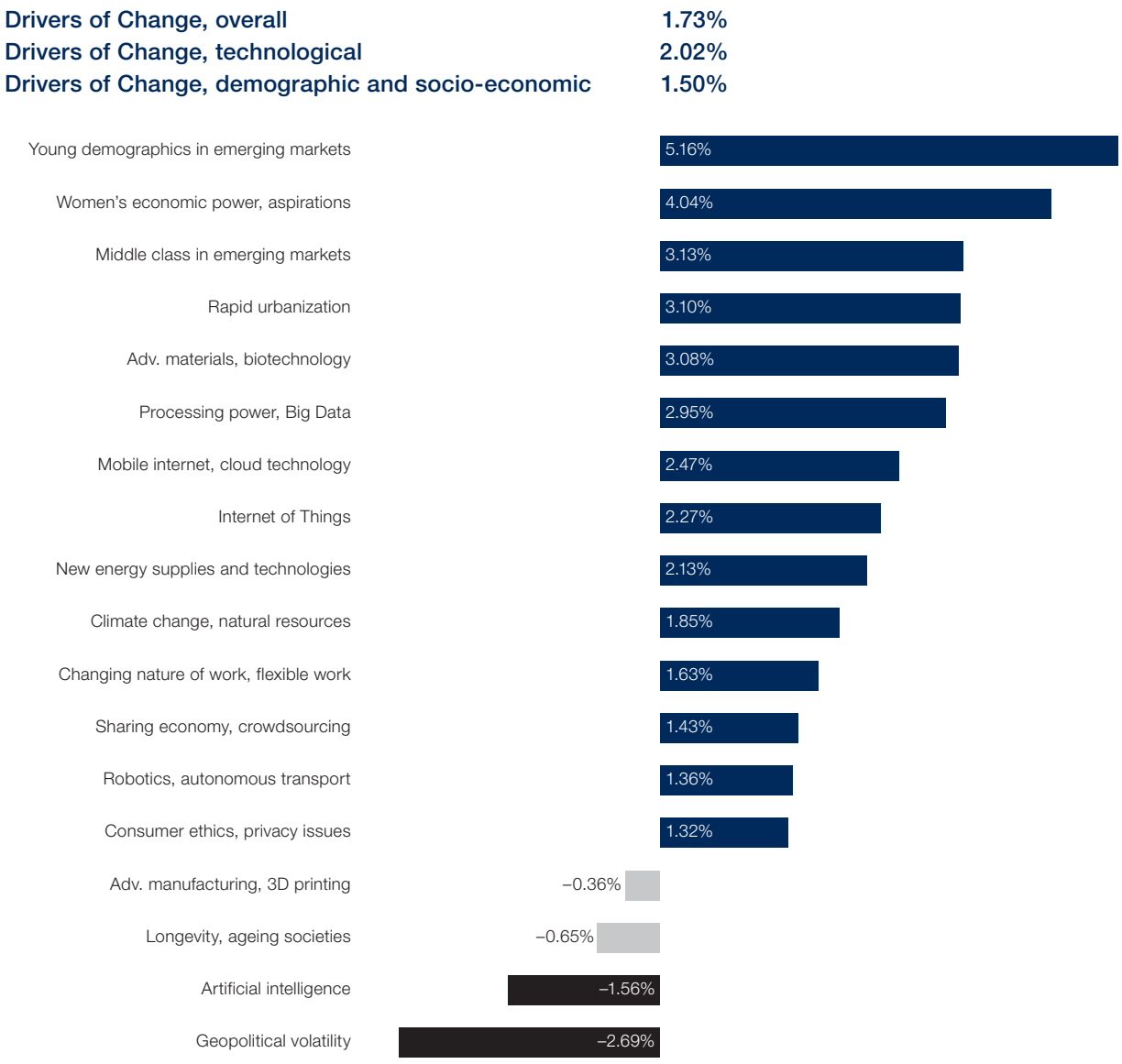
Expected Timeframe

The time-to-impact trajectory of certain drivers of change differs between industries and is shaped by the specific nature of each sector's current business model. For example, there is a wide variety of opinion among Chief Human Resources Officers regarding the immediacy of the impact of artificial intelligence and robotics on employment and skills.[5] However, regardless of the specific industry or driver of change, it is clear that the overall pace of industry transformation is wholly unprecedented. Disruptive changes to industry sectors are already re-configuring business models and skill sets—and will do so at an accelerated pace in the next five years. The current anxious debate about the long-term impact of artificial intelligence and robotics notwithstanding, our focus is on today's workforce and talent strategies and how they can contribute to successfully managing this transition.

EMPLOYMENT TRENDS

Recent discussions about the employment impact of disruptive change have often been polarized between 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.[6] It is clear from our data that while forecasts vary by industry and region, momentous change is underway and that, ultimately, it is our actions today that will determine whether that change mainly results in massive displacement of workers or the emergence of new opportunities. Without urgent and targeted action today to manage the near-term transition

Figure 4: Employment effect of drivers of change, all job types
Compound growth rate, 2015-2020, %[7]



Source: Future of Jobs Survey, World Economic Forum.
Note: Names of drivers have been abbreviated to ensure legibility.

and build a workforce with futureproof skills, governments will have to cope with ever-growing unemployment and inequality, and businesses with a shrinking consumer base. Our dataset aims to bring specificity to the debate and to the options for action, by providing the perspective of Chief Human Resources Officers of leading employers who are among those at the frontline of the emerging trends and are key actors in implementing future workforce strategies.

Impact of Disruptive Change on Employment

Overall, our respondents seem to take a negative view regarding the upcoming employment impact of artificial intelligence, although not on a scale that would lead to widespread societal upheaval—at least up until the year 2020. By contrast, further unpacking the bundle of technological drivers of change in the mould of the Fourth Industrial Revolution yields a rather more optimistic picture regarding the job creation potential of technologies such as Big Data analytics, mobile internet, the Internet of Things and robotics. However, by far the biggest expected drivers of employment creation are demographic and socio-economic in nature; in particular, the opportunities offered by young demographics and rising middle classes in emerging markets and the rising economic power and aspirations of women. Conversely, our respondents share a stark premonition that increasing geopolitical volatility risks being the biggest threat—by far—to employment and job creation at the global level.

However, this aggregate-level view of the driving forces behind employment change masks significant variation and important nuances at the level of individual job families and occupations. Our respondents expect strong employment growth across the Architecture and Engineering and Computer and Mathematical job families, a moderate decline in Manufacturing and Production roles and a significant decline in Office and Administrative roles. Other sizeable job families, such as Business and Financial Operations, Sales and Related and Construction and Extraction have a largely flat global employment outlook over the 2015–2020 period. Further unpacking these

Table 4: Employment effect of drivers of change, by job family

Compound growth rate, 2015-2020, %

Job family/Driver of change	Employment outlook
Computer and Mathematical	**3.21%**
Rapid urbanization	6.11%
Middle class in emerging markets	5.00%
Changing nature of work, flexible work	4.94%
Sharing economy, crowdsourcing	4.88%
Processing power, Big Data	4.59%
Internet of Things	4.54%
Geopolitical volatility	3.89%
Mobile internet, cloud technology	3.71%
Consumer ethics, privacy issues	2.40%
Architecture and Engineering	**2.71%**
Middle class in emerging markets	5.88%
Robotics, autonomous transport	4.49%
Climate change, natural resources	3.68%
Internet of Things	3.54%
Adv. manufacturing, 3D printing	3.33%
Changing nature of work, flexible work	3.18%
New energy supplies and technologies	2.25%
Geopolitical volatility	1.33%
Management	**0.97%**
Young demographics in emerging markets	2.14%
Geopolitical volatility	1.67%
New energy supplies and technologies	1.44%
Processing power, Big Data	1.39%
Changing nature of work, flexible work	0.90%
Middle class in emerging markets	0.72%
Mobile internet, cloud technology	0.62%
Climate change, natural resources	0.40%
Longevity, ageing societies	0.23%
Business and Financial Operations	**0.70%**
Sharing economy, crowdsourcing	3.11%
Middle class in emerging markets	1.96%
Changing nature of work, flexible work	1.88%
Young demographics in emerging markets	1.67%
Geopolitical volatility	1.59%
Climate change, natural resources	1.39%
Processing power, Big Data	1.34%
Mobile internet, cloud technology	1.03%
Consumer ethics, privacy issues	0.54%

Job family/Driver of change	Employment outlook
Sales and Related	**0.46%**
Processing power, Big Data	1.25%
Sharing economy, crowdsourcing	0.58%
Mobile internet, cloud technology	0.43%
Internet of Things	–0.89%
Middle class in emerging markets	–1.14%
Consumer ethics, privacy issues	–1.28%
Geopolitical volatility	–1.50%
Changing nature of work, flexible work	–1.51%
New energy supplies and technologies	–1.58%
Installation and Maintenance	**–0.15%**
Climate change, natural resources	3.00%
Changing nature of work, flexible work	0.45%
Mobile internet, cloud technology	–3.89%
Internet of Things	–8.00%
Construction and Extraction	**–0.93%**
New energy supplies and technologies	1.38%
Climate change, natural resources	0.38%
Geopolitical volatility	–0.07%
Changing nature of work, flexible work	–0.11%
Arts, Design, Entertainment, Sports and Media	**–1.03%**
Mobile internet, cloud technology	0.95%
Middle class in emerging markets	–0.83%
Geopolitical volatility	–1.00%
Manufacturing and Production	**–1.63%**
Adv. materials, biotechnology	0.67%
Robotics, autonomous transport	–0.83%
New energy supplies and technologies	–1.81%
Middle class in emerging markets	–2.16%
Climate change, natural resources	–2.45%
Geopolitical volatility	–2.47%
Changing nature of work, flexible work	–2.99%
Longevity, ageing societies	–3.13%
Adv. manufacturing, 3D printing	–3.60%
Office and Administrative	**–4.91%**
Changing nature of work, flexible work	–2.77%
New energy supplies and technologies	–3.33%
Mobile internet, cloud technology	–5.82%
Processing power, Big Data	–6.06%
Consumer ethics, privacy issues	–6.18%
Internet of Things	–6.20%
Rapid urbanization	–6.36%
Climate change, natural resources	–6.67%
Geopolitical volatility	–9.72%

Source: Future of Jobs Survey, World Economic Forum.
Note: Names of drivers have been abbreviated to ensure legibility.

expectations according to the factors driving employment change makes clear the true scale of impending industry and occupational transformation. See Table 4 for details on these expectations.

The expected global decline in total Manufacturing and Production roles is driven by labour-substituting technologies such as additive manufacturing and 3D printing as much as by more resource-efficient sustainable product use, lower demand growth in ageing societies and threats to global supply chains due to geopolitical volatility. Some cautious optimism is warranted due to increased manufacturing demand for advanced materials and comparatively favourable expectations around robotics, pointing to the latter's potential for labour-complementing productivity enhancement rather than pure job replacement.

Conversely, 3D printing, resource-efficient sustainable production and robotics are all seen as strong drivers of employment growth in the Architecture and Engineering job family, in light of a continued and fast-growing need for skilled technicians and specialists to create and manage advanced and automated production systems. This is expected to lead to a transformation of manufacturing into a highly sophisticated sector where high-skilled engineers are in strong demand to make the industrial Internet of Things a reality.

The fortunes of other job families due to these same factors are mixed. Installation and Maintenance jobs, for example, will see great productivity enhancements and strong growth in green jobs such as the installation, retrofitting, repair and maintenance of smart meters and renewable energy technologies in residential and office buildings, but—at an aggregate level—will also come face-to-face with the efficiency-saving and labour-substituting aspect of the Internet of Things. Similarly, despite some challenges, global demographics will sustain demand for Construction and Extraction jobs. Resource-efficiency is expected to be another key driving factor for this job family, at least in the case of construction, in the creation of new and improvement of existing housing stock, often using new construction techniques, materials and approaches.

Automation of checkout processes and smart inventory management through sensors and other applications of the Internet of Things are some of the factors expected to lead to a decrease in demand for traditional roles in the Sales and Related job family. Consumer ethics and green consumption practices are likewise anticipated to impact negatively on traditional roles in the job family, though perhaps with an upside for employees with skills in accrediting and advising on eco-labelled products. The strongest employment growth in the sector is expected to come from a continued shift towards online shopping and the application of Big Data analytics to derive and act upon insights from customer data and preferences to provide a personalised shopping experience.

Two further job families with mainly flat aggregate employment outlooks over the coming years are Business and Financial Operations and Management. Each is affected by a very wide range of factors, hinting at the scale of transformation and upskilling needs these job families will undergo over the coming years.

Strong employment growth in the Computer and Mathematical job family is driven by trends beyond technology, such as rapid urbanization in developing countries, as well as by disruptions that negatively affect the employment outlook in other job families, such as geopolitical volatility and privacy issues—as companies from virtually all industries seek to recruit specialists that can help them apply tools such as Big Data analytics and data visualization to better understand and cope with these issues.

The biggest employment decline of any job family is expected in Office and Administrative roles, which are expected to be negatively affected by a perfect storm of technological trends that have the potential to make many of them redundant, such as mobile internet and cloud technology, Big Data analytics and the Internet of Things, but also factors such as climate change and resource efficiency and workplace flexibility that undermine the rationale for maintaining a large workforce within these roles.

Interestingly, our respondents expect a comparatively small employment impact from two disruptions that currently receive significant attention. Where it is mentioned, the artificial intelligence and machine learning driver is expected to lead to negative employment outcomes in job families such as Education and Training, Legal and Business and Financial Operations. However, it appears our respondents do not believe that these technologies will have advanced significantly enough by the year 2020 to have a more widespread impact on global employment levels. Similarly, the sharing economy may have the potential to radically transform the way work is organized and regulated in certain job families, with all the opportunities and challenges this entails; but where it is mentioned as a driver of change to employment, its effect is largely seen as benign in the next five years. Our analysis reveals that upcoming disruptions to the employment landscape are going to be a lot more complex and multi-faceted than conveyed by a narrow focus only on automation, and that we must act within the current window offered by the varying speeds of technological transformations to prepare.

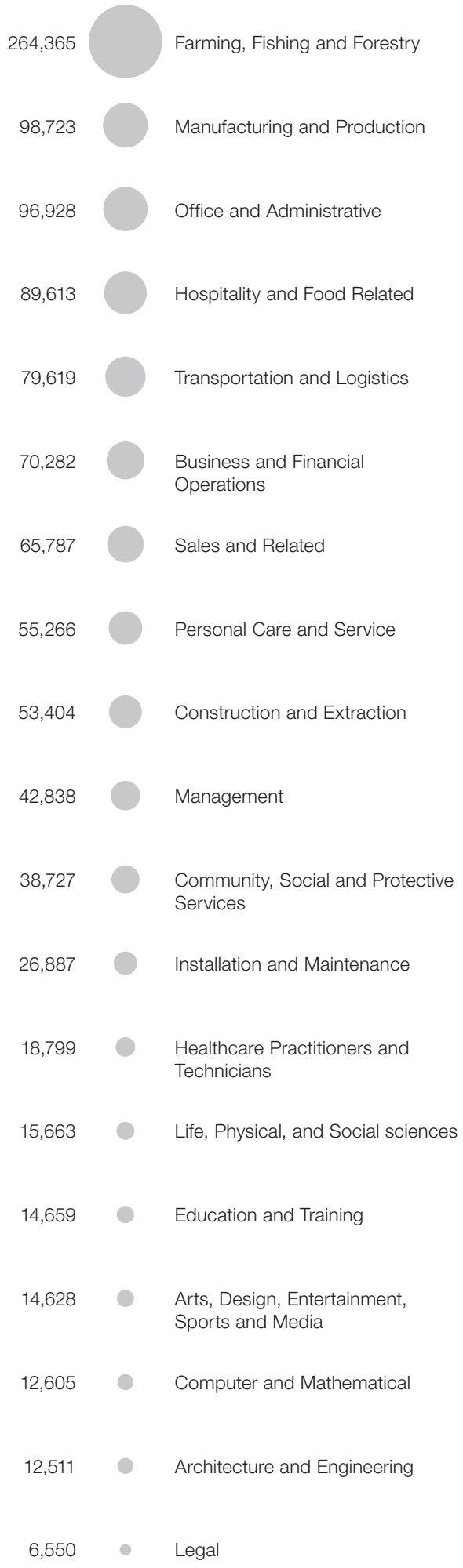
Global Net Employment Effects

The survey results provide direct information on the expected relative employment changes to job families over the period 2015–2020. It is possible to extrapolate from these values the estimated numbers of jobs created or lost in absolute terms worldwide. Between them, the 15 economies covered by our data account for about 1.86 billion workers, approximately 65% of the world's total workforce. Using the standardized occupational classification behind our research framework, we have estimated the total number of people employed in any given job family in each of our focus countries (although for China, which accounts for 770 million workers out of our total, this data is unfortunately not available in a directly comparable format[8]).Therefore, we can give an estimate of the net effect on global employment of the trends and disruptions anticipated by the respondents covered by our *Report.*

According to these calculations, current trends could lead to a net employment impact of more than 5.1 million jobs lost to disruptive labour market changes over the period 2015–2020, with a total loss of 7.1 million jobs—two thirds of which are concentrated in the Office and Administrative job family—and a total gain of 2 million jobs, in several smaller job families. A number of conclusions stand out:

- The global workforce is expected by our respondents to experience significant churn between job families and functions, with administrative and routine white-collar office functions at risk of being decimated and strong growth in Computer and Mathematical

Figure 5: Total workforce by job family
Employees (thousands, all focus countries)



and Architecture and Engineering related fields. Manufacturing and Production roles are also expected to see a further bottoming out but might have the worst behind them and still retain relatively good potential for upskilling, redeployment and productivity enhancement through technology rather than pure substitution.

- Employment growth is expected to derive disproportionately from smaller, generally high-skilled job families that will be unable to absorb job losses coming from other parts of the labour market. Even if they could, significant reskilling would be needed. This factor plus the increase in global unemployment due to global population growth and slow job creation over the period 2015-2019[9] leaves no room for complacency.

- Once emerging markets and developing countries are added into the equation, any discussion of the Future of Jobs remains incomplete without recognizing that a significant share of the global workforce remains employed in agriculture, about which both current technology optimists and alarmists have comparatively little to say. Similarly, a potential field of employment growth around which our survey yielded only limited data points concerns the Personal Care and Service job family, since jobs in this field are not typically found on a large scale among large multinational employers.[10] Indeed, there is cause for optimism about growth in these roles as demand for such services grows due to demographic and social factors.

- There is a strong gender dimension to expected employment changes whereby, notably, gender gaps appear to be more pronounced within both high growth and declining job families. For example, women make up low numbers in the fast-growing STEM job families, pointing, on current trends, to a deteriorating gender gap over time; but also low numbers within job families such as Manufacturing and Production or Construction and Extraction, where expected job losses will disproportionately affect men. However, female employment is also concentrated in low-growth or declining job families such as Sales, Business and Financial Operations and Office and Administrative, indicating, if our respondents' expectations come to pass, a possible reversal of some of the gains made in workplace gender parity over the past decade.

Employment Trends by Industry

From an industry-level perspective, there is a modestly positive outlook for employment across most sectors over the 2015–2020 period. However, underneath this aggregate outlook there is once again significant relative growth in some job families and significant relative decline in others, resulting from the accelerating pace of transformation within many industries. For further details, please also refer to the Industry Profiles in Part 2 of the *Report.*

Figure 6: Net employment outlook by job family, 2015–2020
Employees (thousands, all focus countries)

The Computer and Mathematical job family is anticipated by our respondents to experience very high growth centred on data analysts and software and applications developers—not just within the Information and Communication Technology industry but across a wide range of industries, including Financial Services & Investors, Media, Entertainment and Information, Mobility and Professional Services, as computing power and Big Data analytics constitutes a significant driver of employment growth in each.

In fact, employment growth for Computer and Mathematical roles is expected to be least pronounced in the Information and Communication Technology sector itself, hinting at the accelerated demand for data analysis skills and ICT literacy across, and uptake of these tools by, other industries. For example, the Media, Entertainment and Information industry is expecting a flat employment outlook with regard to its core Arts, Design, Entertainment, Sports and Media job family, combined with high growth in the Computer and Mathematical field, as the industry fully embraces its digital transformation.

In this same vein, solid job growth is expected for Architecture and Engineering roles, particularly in the Consumer, Information and Communication Technology and Mobility industries. By contrast, demand for additional engineering talent in its traditional core Basic and Infrastructure and Energy industries is fairly flat. Both of the latter are also expecting declining demand for Manufacturing and Production and Construction and Extraction roles such as Chemical Processing Plant Operators and Mining and Petroleum Extraction Workers, as both industries are facing headwinds over the coming years.

The Consumer industry is likewise reducing its Manufacturing and Production roles but anticipates at least stable overall demand for Sales and Related jobs, as rising middle classes in emerging markets, changing consumer values and, in particular, the rising economic power of women, are significant drivers of job growth in the sector.

The Mobility industry is anticipating significant growth in Transportation and Logistics roles, as it plays its traditional role of connecting countries and industries in the wake of increasing globalization as well as, increasingly, catering to travellers from rising middle classes in emerging markets. However, geopolitical volatility and its associated threat to global travel and supply chains are perceived as major negative drivers of employment outlook in the industry. On the automotive manufacturing side of the sector, disruptions such as advanced robotics, autonomous transport, 3D printing and new energy technologies will have some of the most direct impacts on jobs of any industry.

Similarly, the Financial Services & Investors sector will undergo a significant shift, with major job growth for Computer and Mathematical roles such as data analysts, information security analysts and database and network professionals. A rising middle class and young demographics in emerging markets are significant sources of future job growth in the sector.

Table 5: Employment effect of drivers of change, by industry
Compound growth rate, 2015-2020, %

Industry/Driver of change	Employment outlook
Basic and Infrastructure	**0.61%**
Rapid urbanization	7.00%
Middle class in emerging markets	3.33%
New energy supplies and technologies	2.00%
Climate change, natural resources	1.39%
Changing nature of work, flexible work	0.29%
Robotics, autonomous transport	0.00%
Longevity, ageing societies	–7.00%
Geopolitical volatility	–7.27%
Consumer	**1.72%**
Women's economic power, aspirations	3.75%
Consumer ethics, privacy issues	2.00%
Changing nature of work, flexible work	1.50%
Middle class in emerging markets	1.25%
Climate change, natural resources	1.25%
New energy supplies and technologies	1.00%
Geopolitical volatility	0.00%
Energy	**1.54%**
New energy supplies and technologies	2.19%
Changing nature of work, flexible work	1.00%
Climate change, natural resources	0.83%
Geopolitical volatility	–5.00%
Financial Services & Investors	**1.54%**
Young demographics in emerging markets	6.25%
Middle class in emerging markets	5.00%
Processing power, Big Data	1.54%
Mobile internet, cloud technology	1.15%
Sharing economy, crowdsourcing	0.83%
Consumer ethics, privacy issues	0.83%
Changing nature of work, flexible work	0.63%
Geopolitical volatility	–2.22%
Healthcare	**–0.37%**
Mobile internet, cloud technology	–3.00%

Industry/Driver of change	Employment outlook
Information and Communication Technology	**2.91%**
Processing power, Big Data	5.00%
Mobile internet, cloud technology	4.78%
Consumer ethics, privacy issues	3.33%
New energy supplies and technologies	2.50%
Internet of Things	2.27%
Changing nature of work, flexible work	2.08%
Longevity, ageing societies	–1.25%
Media, Entertainment and Information	**2.31%**
Processing power, Big Data	8.00%
Mobile internet, cloud technology	3.57%
Changing nature of work, flexible work	–2.00%
Mobility	**1.61%**
Climate change, natural resources	2.50%
New energy supplies and technologies	2.50%
Middle class in emerging markets	2.27%
Robotics, autonomous transport	1.25%
Artificial intelligence	1.25%
Mobile internet, cloud technology	1.00%
Adv. manufacturing, 3D printing	1.00%
Changing nature of work, flexible work	0.56%
Geopolitical volatility	–6.00%
Professional Services	**2.45%**
Women's economic power, aspirations	5.00%
Middle class in emerging markets	5.00%
Changing nature of work, flexible work	4.00%
Processing power, Big Data	2.35%
Mobile internet, cloud technology	2.14%
Sharing economy, crowdsourcing	1.67%
Internet of Things	1.00%
Consumer ethics, privacy issues	0.71%
Longevity, ageing societies	0.00%

Source: Future of Jobs Survey, World Economic Forum.
Note: Names of drivers have been abbreviated to ensure legibility.

Many industry observers expect a substantial increase in the number of jobs in the Healthcare sector due to demographic trends such a longevity and ageing populations in advanced economies. However, our survey respondents expect a stable employment outlook for the industry over the coming five years—and a net negative impact on the number of jobs from disruptions such as mobile internet and cloud technology, enabling widespread application of telemedicine. What seems certain is that the skills profile of many jobs in the sector will change significantly.

Our respondents anticipate that the Professional Services industry will experience employment growth over the 2015–2020 period, particularly in data analytics roles, especially as the consulting arm of the sector experiences growth by advising all others on their respective transformations. Accordingly, factors affecting jobs in the industry are influenced by those affecting all the others. With regards to business models in the Professional Services industry itself, some of the major influences will be automation or globalized crowdsourcing via online platforms of high-skilled but repetitive work processes, leading to increased off-shoring of back office roles and a rise in time-limited, project-based contracts.

New and Emerging Roles

Our research also explicitly asked respondents about new and emerging job categories and functions that they expect to become critically important to their industry by the year 2020, and where within their global operations they would expect to locate such roles.

Two job types stand out due to the frequency and consistency with which they were mentioned across practically all industries and geographies. The first are data analysts, as already frequently mentioned above, which companies expect will help them make sense and derive insights from the torrent of data generated by the technological disruptions referenced above. The second

are specialized sales representatives, as practically every industry will need to become skilled in commercializing and explaining their offerings to business or government clients and consumers, whether due to the innovative technical nature of the products themselves, due to their being targeted at new client types with which the company is not yet familiar, or both.

Other new specialties frequently mentioned include new types of human resources and organizational development specialists, engineering specialties such as materials, bio-chemicals, nanotech and robotics, regulatory and government relations specialists, geospatial information systems experts and commercial and industrial designers.

A particular need is also seen in industries as varied as Energy and Media, Entertainment and Information for a new type of senior manager who will successfully steer companies through the upcoming change and disruption.

Once more, there is a gender gap dimension to these findings, as the growth of new and emerging roles in computer, technology and engineering-related fields is outpacing the rate at which women are currently entering those types of jobs—putting them at risk of missing out on tomorrow's best job opportunities and aggravating hiring processes for companies due to a more restricted talent pool.

We also asked respondents to identify roles where there may be consistent decline. Across a wide range of sectors including Basic and Infrastructure, Energy, Financial Services & Investors, Information and Communication Technology as well as Professional Services, Office and Administrative functions are poised for major redundancies. One particular set of jobs affected by this, for example, are customer service roles, which will become obsolete due to mobile internet technology to monitor service quality online as a means of maintaining effective customer relationship management.

Changes in Job Quality and Ease of Recruitment

In addition to the quantity of jobs, disruptive changes to industries and business models will also affect the quality, skills requirements and day-to-day content of virtually every job. Overall, our respondents expect a relative increase in compensation for in-demand jobs in every industry surveyed, in line with increased productivity and skills requirements. They also expect an overall increase in work-life balance in all industries except the Consumer sector, where the outlook for this dimension remains stable. Expectations are less clear with regard to overall job security, which is expected to increase in the Energy, Financial Services, Healthcare and Information and Communication Technology sectors, but to decrease in the Basic and Infrastructure, Consumer, Media, Entertainment and Information, Mobility and Professional Services industries. It is important to note that these are aggregate results for entire industries. For example, Energy includes renewables and utilities in addition to oil and gas. See Part 2 for further details in the Industry Profiles.

An additional dimension to consider is the general trend towards flexible work, identified by our respondents as one of the biggest drivers of transformation of business models in many industries and therefore also one of the topmost concerns at the national level in many of the *Report's* focus countries. Telecommuting, co-working spaces, virtual teams, freelancing and online talent platforms are all on the rise, transcending the physical boundaries of the office or factory floor and redefining the boundary between one's job and private life in the process. Modern forms of workers' organization, such as digital freelancers' unions, and updated labour market regulations are beginning to emerge to complement these new organizational models. The challenge for employers, individuals and governments alike is going to be to work out ways and means to ensure that the changing nature of work benefits everyone.

Given the overall disruption industries are experiencing, it is not surprising that, with current trends, competition for talent in in-demand job families such as Computer and Mathematical and Architecture and Engineering and other strategic and specialist roles will be fierce, and finding efficient ways of securing a solid talent pipeline a priority for virtually every industry.

Most strategic and specialist roles across industries, countries and job families are already perceived as hard to recruit for currently and—with few exceptions—the situation is expected to worsen significantly over the 2015-2020 period, notably in the Consumer, Information and Communication Technology, Basic and Infrastructure and Media, Entertainment and Information industries (Figure 7).

Across key job families, recruitment is currently perceived as most difficult for traditional middle-skilled and skilled trade occupations, such as in Installation and Maintenance, as well as for Architecture and Engineering and Computer and Mathematical roles. By 2020 our respondents expect that it will be significantly more difficult to recruit specialists across most job families, particularly so for Computer and Mathematical roles, given the war for talent that is already shaping up in this field today. Interestingly, Office and Administrative roles will be among the hardest jobs to recruit for in absolute terms by 2020, presumably partly due to the perceived unattractiveness of the field, if current employment projections come to pass, and the very different core skills requirements this field may have going forward. By contrast, recruitment for standard white collar Business and Financial Operations roles is currently perceived as comparatively easy, and the talent pipeline is expected to marginally improve even further in the future.

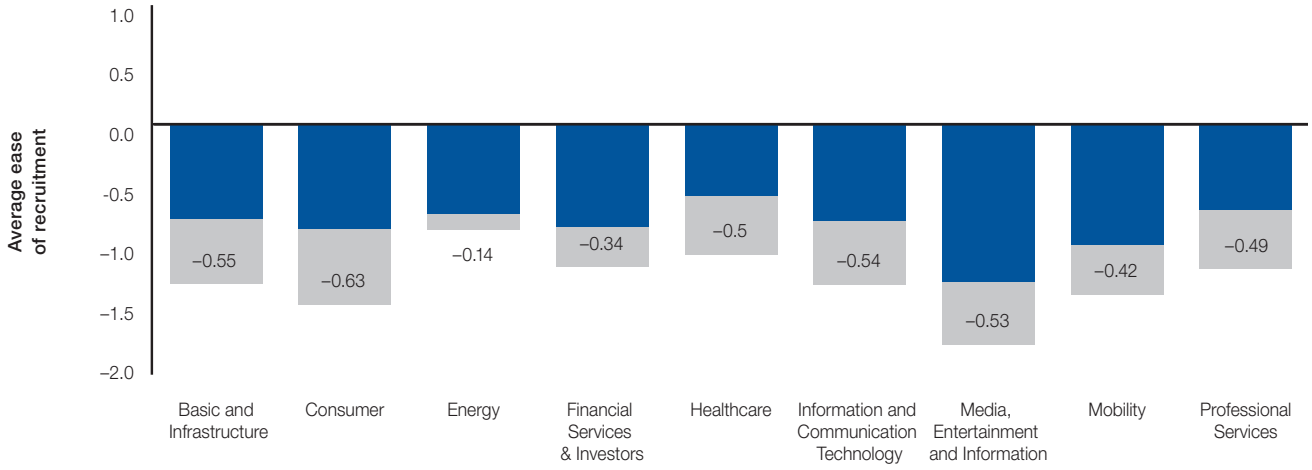
There are significant variations in perceived ease of recruitment by geography, although finding specialists is expected to become more difficult across all selected economies over the 2015–2020 period. The situation will be particularly difficult in Japan, exacerbated by the country's ageing demographics.

Our respondents also note that whereas it is often harder to recruit women than men for many specialist roles, particularly for jobs concentrated in the Computer and Mathematical and Architecture and Engineering job families, this trend is expected to improve somewhat over the 2015–2020 period. The largest progress in overcoming this

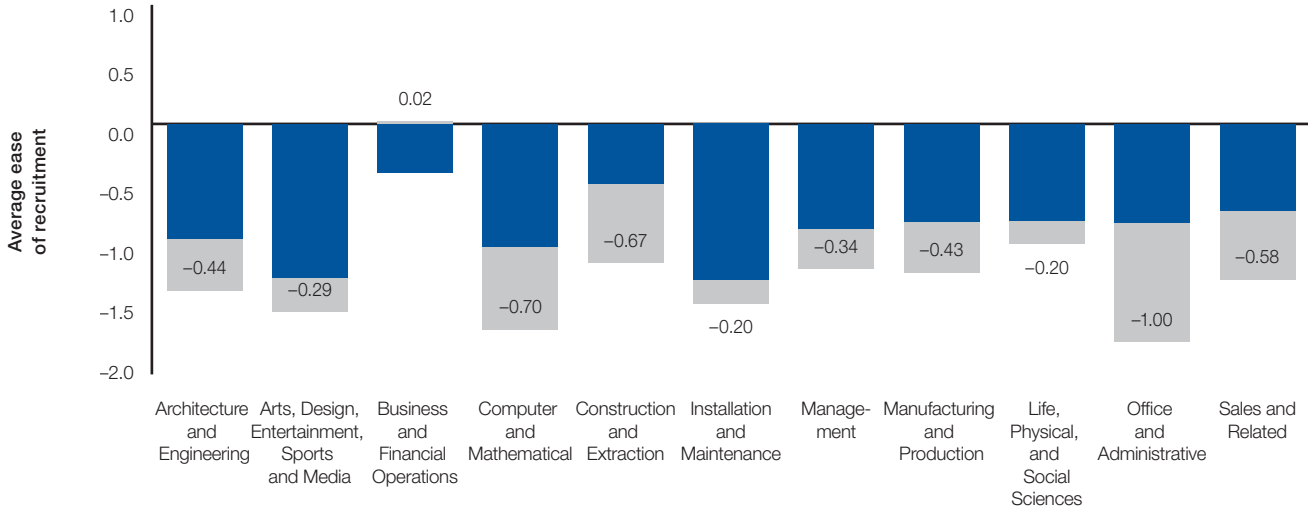
Figure 7: Expected change in ease of recruitment, 2015–2020

Perception rating on a –2 ("very hard") to +2 ("very easy") scale

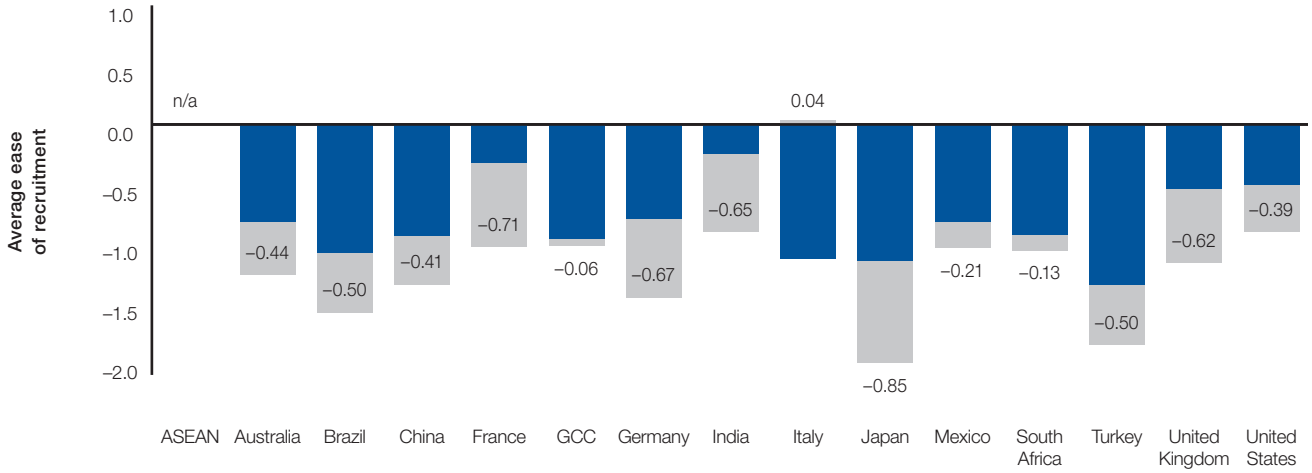
INDUSTRIES



JOB FAMILIES

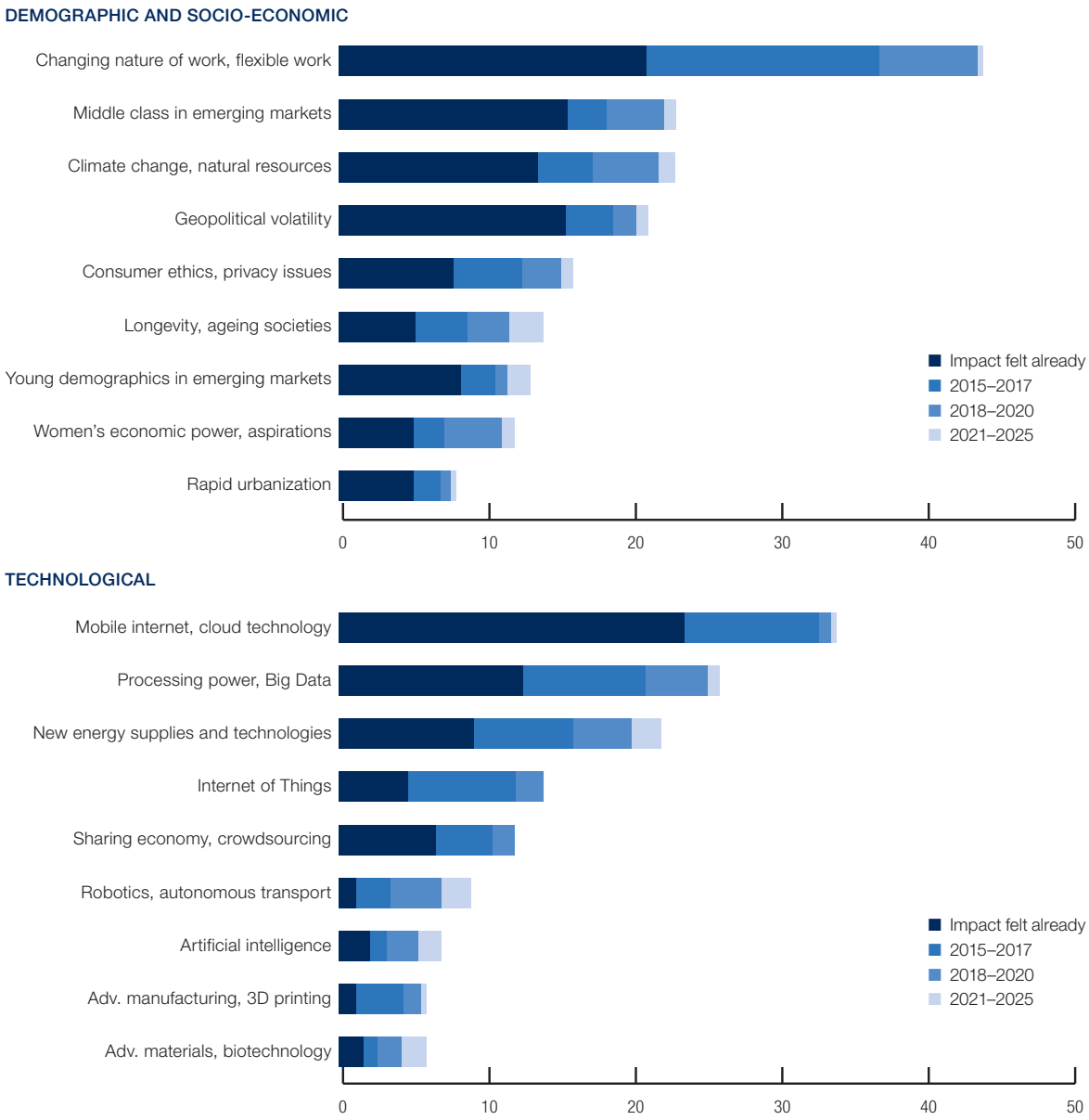


COUNTRY/REGION



Source: Future of Jobs Survey, World Economic Forum.

Figure 8A: Drivers of change, time to impact on business models
Share of respondents, %



Source: Future of Jobs Survey, World Economic Forum.
Note: Names of drivers have been abbreviated to ensure legibility.

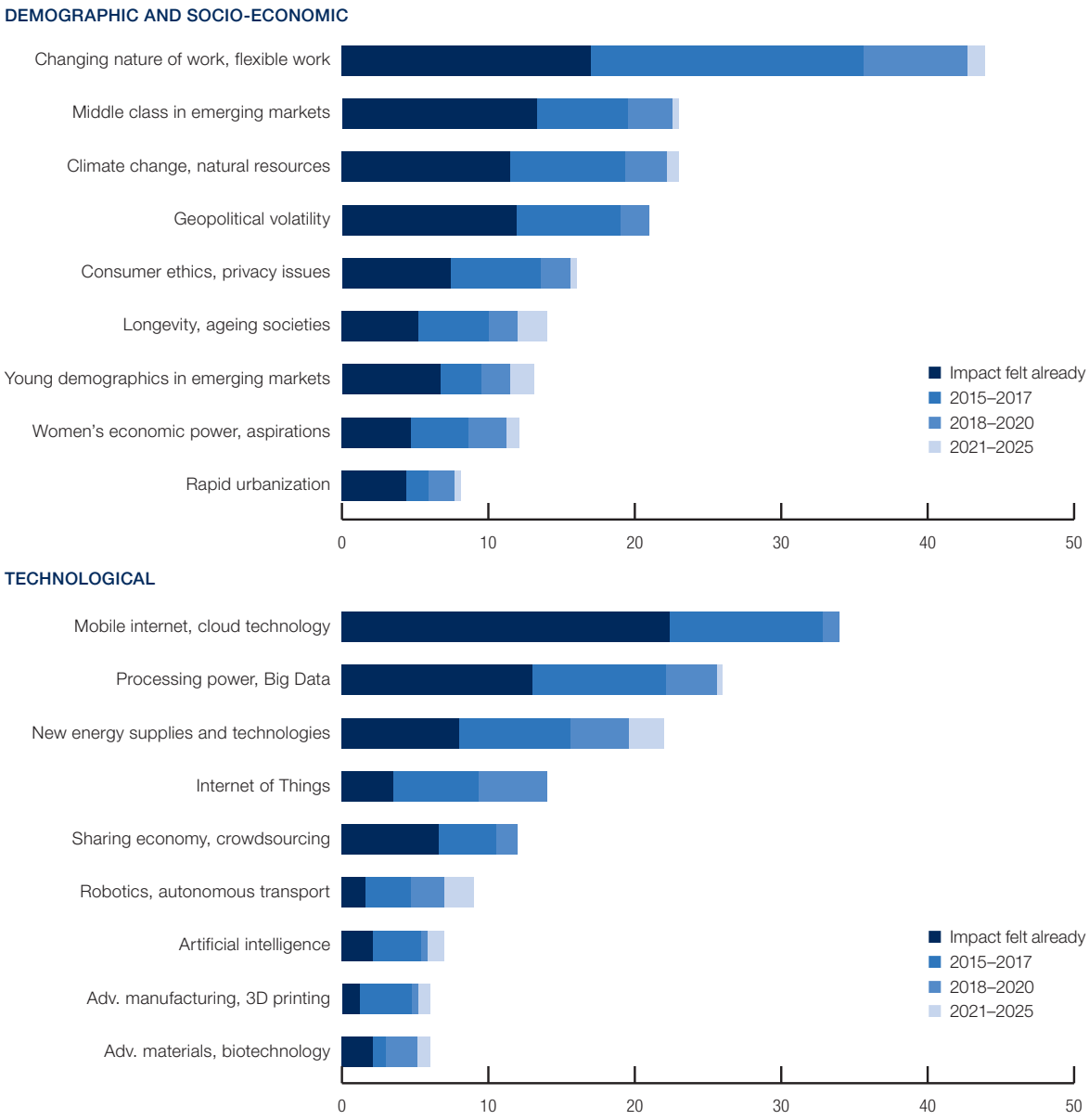
gender penalty for specialist recruitment is expected in the Basic and Infrastructure, Mobility and Media, Entertainment and Information industries, though it is expected to persist, for example, in the Information and Communication Technology sector. For more details on this gender gap dimension and its implications please refer to Chapter 2.

SKILLS STABILITY

The accelerating pace of technological, demographic and socio-economic disruption is transforming industries and business models, changing the skills that employers need and shortening the shelf-life of employees' existing skill sets in the process. For example, technological disruptions such as robotics and machine learning—rather than completely replacing existing occupations and job categories—are likely to substitute specific tasks previously carried out as part of these jobs, freeing workers up to focus on new tasks and leading to rapidly changing core skill sets in these occupations.[11] Even those jobs that are less directly affected by technological change and have a largely stable employment outlook—say, marketing or supply chain professionals targeting a new demographic in an emerging market—may require very different skill sets just a few years from now as the ecosystems within which they operate change.

In this new environment, business model change often translates to skill set disruption almost simultaneously and with only a minimal time lag (Figure 8A). Our respondents report that a tangible impact of many of these disruptions on the adequacy of employees' existing skill sets can already be felt in a wide range of jobs and industries today (Figure 8B).

Figure 8B: Drivers of change, time to impact on employee skills
Share of respondents, %



Source: Future of Jobs Survey, World Economic Forum.
Note: Names of drivers have been abbreviated to ensure legibility.

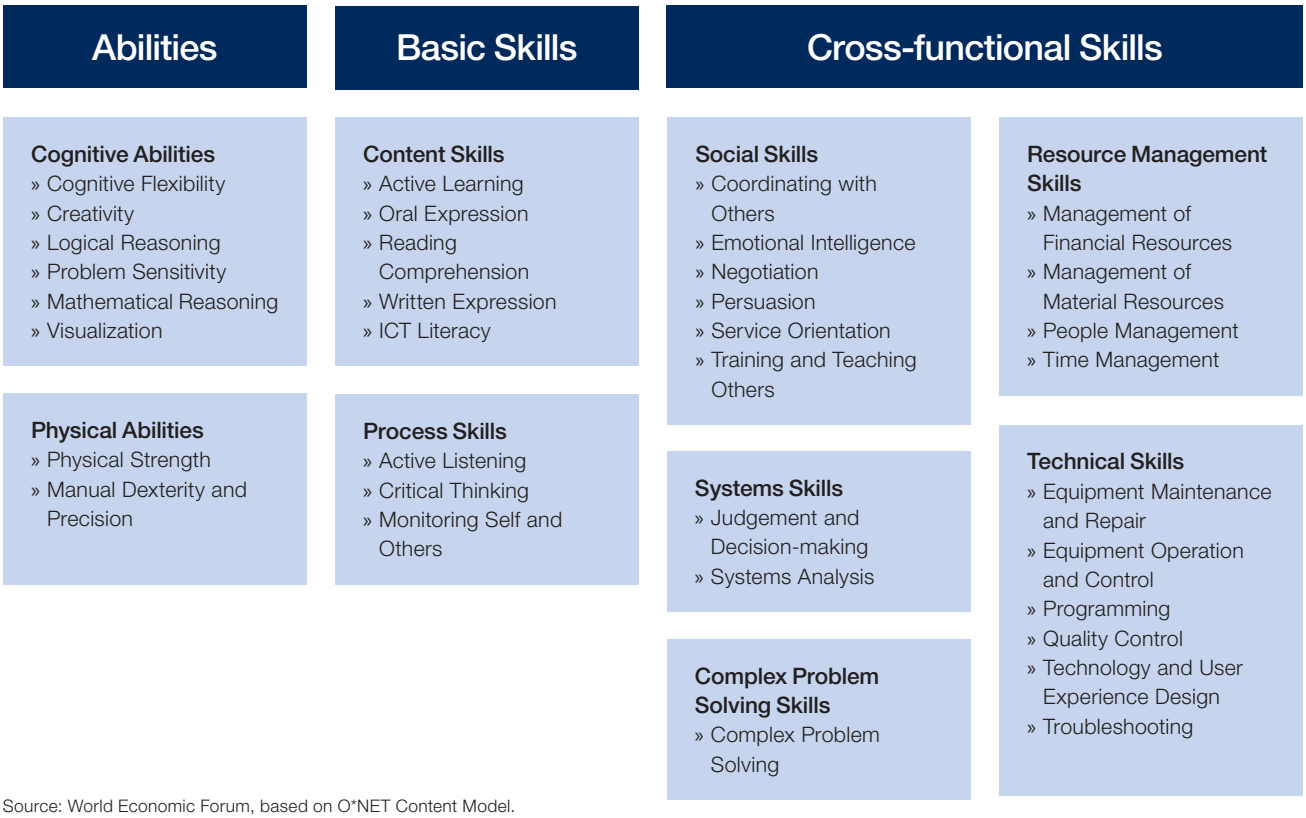
Impact of Disruptive Change on Existing Skill Sets

During previous industrial revolutions, it has often taken decades to build the training systems and labour market institutions needed to develop major new skill sets on a large scale. Given the upcoming pace and scale of disruption brought about by the Fourth Industrial Revolution, however, this may simply not be an option.[12]

For example, current technological trends are bringing about an unprecedented rate of change in the core curriculum content of many academic fields, with nearly 50% of subject knowledge acquired during the first year of a four-year technical degree outdated by the time students graduate, according to one popular estimate.[13] A focus on the state of the talent pipeline for traditional formal qualifications and hard skills therefore risks dramatically understating the scale of impending skill set disruption if a large part of the existing subject knowledge of the current workforce will be outdated in just a few years.

Beyond hard skills and formal qualifications, employers are often equally concerned about the work-related practical skills or competences that current employees (or prospective new hires) are able to use in order to perform various job tasks successfully.[14] Focusing on a core set of 35 work-relevant skills and abilities that are widely used across all industry sectors and job families (see Figure 9)—derived from the same classification as our occupation-level data[15]—the *Report* finds that these practical skills, too, will be subject to accelerating change and significant disruption in the immediate future. On average, by 2020, more than a third of the desired core skill sets of most occupations will be comprised of skills that are not yet considered crucial to the job today, according to our respondents. At an industry

Figure 9: Core work-related skills



Source: World Economic Forum, based on O*NET Content Model.
Note: See Appendix A for further details.

level, the highest expected level of skills stability over the 2015–2020 period is found in the Media, Entertainment and Information sector, already profoundly transformed in recent years, while the largest amount of skills disruption is expected to occur in the Financial Services & Investors industry.[16]

There are various reasons for such dramatic shifts in expected skills requirements. As noted earlier, in the face of rapidly rising computing power, an ability to work with data and make data-based decisions will become an increasingly vital skill across many job families as employers scramble to build a workforce with solid skills in data analysis and presentation (e.g. through visualization) and the amount of potentially useful digital information generated and stored keeps increasing exponentially. In the Consumer sector, for example, vast amounts of data will allow for increased sophistication in inventory management, customer segmentation and product personalization, involving some use and familiarity with technology by jobs at all levels, from retail assistant through to more senior positions.

Businesses in industry sectors such as Mobility, Energy, Financial Services & Investors and Information and Communication Technology are increasingly finding themselves confronted with new consumer concerns about issues such as carbon footprints, food safety, labour standards and privacy. From a skills perspective, they will need to learn to more quickly anticipate these new consumer values, to translate them into product offerings and to become ever more knowledgeable about the processes involved in meeting these demands and the impact this may have on their employees' current skill sets and working practices.

Table 6: Skills Stability, 2015–2020, industries overall

Industry group	Unstable	Stable
Industries Overall	**35%**	**65%**
Media, Entertainment and Information	27%	73%
Consumer	30%	71%
Healthcare	29%	71%
Energy	30%	70%
Professional Services	33%	67%
Information and Communication Technology	35%	65%
Mobility	39%	61%
Basic and Infrastructure	42%	58%
Financial Services & Investors	43%	57%

Source: Future of Jobs Survey, World Economic Forum.

While most jobs require use of a wide range of skills, somewhat different skill set combinations are sought after in different industry sectors. Our dataset allows us some generalized observations about the impact of various disruptive changes on skills demand at an aggregate industry level (see Table 7).

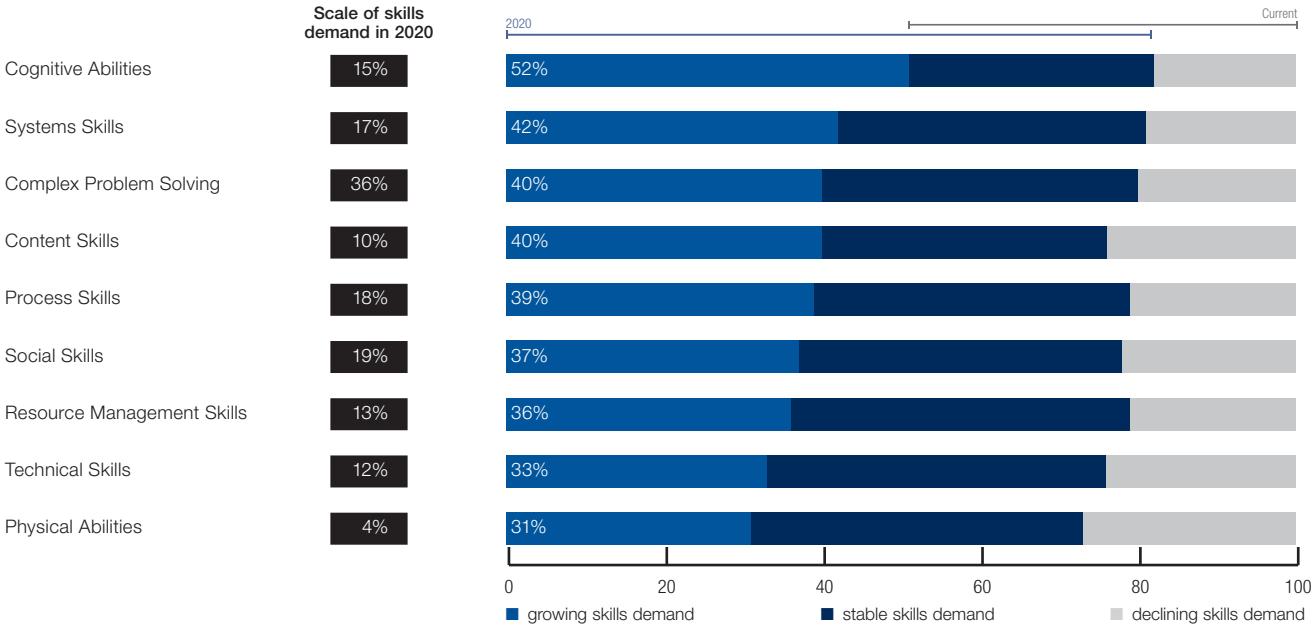
With regard to the overall scale of demand for various skills in 2020, more than one third (36%) of all jobs across all industries are expected by our respondents to require complex problem-solving as one of their core skills, compared to less than 1 in 20 jobs (4%) that will have a core

Table 7: Demand for skills in different industry sectors and overall, 2015 and 2020
Share of jobs requiring skills family as part of their core skill set, %

	BAS		CON		EN		FS		HE		ICT		MEI		MOB		PS		OVERALL	
Skills family	Current	2020	Current	2020	Current	2020	Current	2020	Current	2020	Current	2020	Current	2020	Current	2020	Current	2020	**Current**	**2020**
Complex Problem Solving Skills	42	33	28	31	49	38	35	39	35	36	36	46	—	—	32	34	35	38	**36**	**36**
Social Skills	17	17	26	27	27	28	32	23	30	28	20	19	27	32	22	20	26	24	**20**	**19**
Process Skills	10	19	21	22	24	29	36	34	25	36	26	25	27	31	18	22	37	29	**18**	**18**
Systems Skills	22	26	28	25	24	18	23	22	—	—	26	24	—	—	16	23	16	16	**16**	**17**
Resource Management Skills	21	15	38	35	29	24	20	20	—	—	16	19	38	32	26	28	24	29	**14**	**13**
Technical Skills	25	20	20	18	29	22	5	16	—	—	22	20	—	—	26	21	19	18	**14**	**12**
Cognitive Abilities	10	19	13	25	—	—	15	23	35	34	20	23	—	—	11	27	19	22	**11**	**15**
Content Skills	6	13	—	—	—	—	22	24	—	—	19	18	—	—	22	28	11	15	**10**	**10**
Physical Abilities	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	**5**	**4**

Source: Future of Jobs Survey, World Economic Forum.

Figure 10: Change in demand for core work-related skills, 2015-2020, all industries
Share of jobs requiring skills family as part of their core skill set, %



Source: Future of Jobs Survey, World Economic Forum.

requirement for physical abilities such as physical strength or dexterity. However, along with the impact of disruptive changes on these sectors, it is anticipated that complex problem solving skills will become somewhat less important in industries that are heavily technical today—such as Basic and Infrastructure and Energy—in which technology may automate and take on a bigger part of these complex tasks going forward, and will ascend in those industries, such as Professional Services and Information and Communication Technology, that are expected to become more complex and analytical due to these trends.

Overall, social skills—such as persuasion, emotional intelligence and teaching others—will be in higher demand across industries than narrow technical skills, such as programming or equipment operation and control. Content skills (which include ICT literacy and active learning),

Table 8A: Distribution of recent university graduates by degree subject and country
Share of degree holders, %

	ASEAN	AUS	BRA	FRA	GCC	DEU	ITA	JPN	MEX	TUR	UK	USA
Agriculture	4	1	2	1	0	2	2	3	2	3	1	1
Education	16	8	20	3	8	9	7	7	12	10	10	10
Engineering, Manufacturing, Construction	19	8	7	15	16	15	13	17	21	12	9	7
Health and Welfare	9	17	15	15	6	19	16	13	9	6	16	17
Humanities and Arts	6	10	2	10	18	16	15	15	4	8	16	12
Sciences	5	8	5	10	13	13	7	3	6	9	13	9
Services	5	3	3	4	2	3	3	8	1	5	2	8
Social Sciences, Business, Law	32	45	41	42	36	23	32	27	45	47	32	36
Unspecified	4	0	5	0	0	0	5	7	0	0	1	0

Source: World Economic Forum, *Human Capital Report 2015,* based on UNESCO Institute of Statistics, ISCED 2011.
Note: Most recent year available; data not available for China, India, South Africa.

Table 8B: Distribution of professionals by degree subject and industry
Share of degree holders, %

	BAS	CON	EN	FS	HE	ICT	MEI	MOB	PS
Agriculture	v	2	0	0	2	0	0	0	0
Education	1	4	1	2	5	1	18	2	1
Engineering, Manufacturing, Construction	47	3	51	2	3	25	4	27	3
Health and Welfare	2	5	1	3	29	1	6	2	5
Humanities and Arts	3	17	1	5	5	4	39	3	11
Sciences	16	9	15	11	31	50	11	11	11
Services	0	4	0	1	4	0	1	10	0
Social Sciences, Business, Law	29	50	29	74	18	18	19	39	67
Unspecified	2	5	2	2	2	2	2	4	1

Source: LinkedIn.
Note: Share of LinkedIn members with stated tertiary degrees across *Future of Jobs Report* focus countries; industry classification based on World Economic Forum taxonomy, education subject classification based on ISCED 2011.

cognitive abilities (such as creativity and mathematical reasoning) and process skills (such as active listening and critical thinking) will be a growing part of the core skills requirements for many industries.

If skills demand is evolving rapidly at an aggregate industry level, the degree of changing skills requirements within individual job families and occupations is even more pronounced (Figure 10).

For example, the increasing ubiquity of mobile internet combined with the coming-of-age of the Internet of Things promises to transform the daily routine of many frontline roles in the Sales and Related, Installation and Maintenance, and Manufacturing and Production job families across all industries, requiring a much higher level of technology literacy than in the past. As an ancillary characteristic to increased automation in these fields, employees are

Box 1: Anticipating the Future of Jobs: Mapping Skills Supply

Job requirements and skills profiles are rapidly changing. Yet when it comes to the traditional tools policymakers and employers have at their disposal to navigate this change there often is a time lag of months, if not years, until updated information becomes available. Growing computing power and large amounts of data are increasingly making it possible to understand and anticipate changes in labour markets in near-real time, and to re-shape education and training policies in a timelier manner to help narrow the widening skills gap.

For example, hundreds of millions of workers across the globe have added their professional information—including their education, skills, and past and present jobs—to online talent platforms such as LinkedIn, affording these providers with unique insights into changing skills supply. Increased collaboration between stakeholders such as online talent platforms, human resources consulting firms, employers, policymakers, labour unions and education providers, has the potential to substantially improve the speed and precision of future workforce planning and managing organizational change.

In order to map labour market changes, LinkedIn's analytics describe each job function as an agglomeration of skills, enabling the platform to nowcast changes in the skills landscape as members update their professional information. This enables the platform to identify clusters of skills that are particularly associated with the profiles of members with common job functions and titles and to map how these change over time. It also allows for identifying nuances and differences between the skill sets of common job functions in different industries or geographies.

For example, the heatmap below shows how the most common skills reported by mechanical engineers vary across different industries. The dark blue color in area 1 in the chart below shows that mechanical engineers working in various sectors of the Mobility industry have similar skills. It also shows that their skills differ from the skills of mechanical engineers who work in the Healthcare industry (area 2) or the Energy and Basic and Infrastructure sectors (areas 3 and 4).

By tracking skills that were recently added to members' profiles as a percentage of those who already reported that skill, it becomes possible to identify skills whose supply is on the rise in particular industries or geographies. This supply-side analysis can be complemented with analysis of skills demand—whether based on job listings, within-job hiring rates, governmental forecasts, or employer surveys such as the one presented in this *Report*—to identify emerging skills gaps and inform training and skills programmes to prepare the workforce for future requirements.

At the national level, countries experience varying inflows and outflows of talent over time. Outflows and inflows of talent often do not have the same skills compositions, resulting in a correlation between talent mobility and changing skills gaps across countries and over time.

The Country and Regional Profiles in Part 2 of the *Report* highlight the current and expected share of strategic and specialist job functions anticipated by respondents from the corresponding industry to be recruited locally in the country. A very low local recruitment share may indicate skills shortages and a very high reliance on expatriate talent. A very high local recruitment share might indicate underutilized opportunities to diversify experience and increase knowledge transfer to the local workforce from internationally mobile experts. On the supply side, by tracking members' profile changes with regard to their home geography, the LinkedIn platform can track the rate at which countries are losing or gaining particular in-demand skills.[1] Data on both demand and supply is critical for informed decision making on talent mobility policies.

Notes

1 State, B., M. Rodriguez, et. al., "Migration of Professionals to the US: Evidence From LinkedIn Data", *Social Informatics,* pp. 531–543, 2014.

expected to have more responsibilities related to equipment control and maintenance and problem-solving skills, as well as a broader general understanding of the work processes of their company or organization.

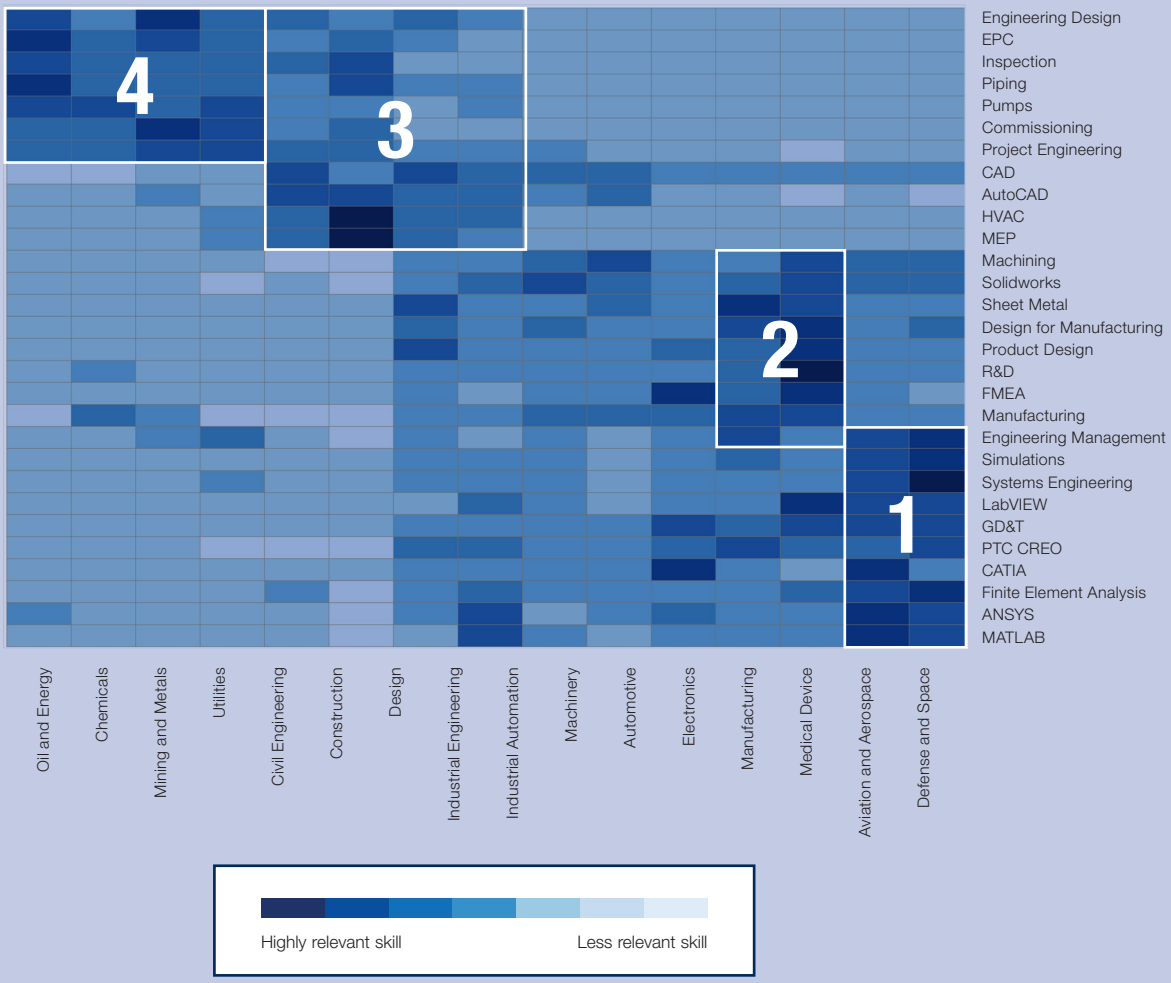
Many formerly purely technical occupations are expected to show a new demand for creative and interpersonal skills. For healthcare practitioners, for example, technological innovations will allow for increasing automation of diagnosis and personalization of treatments, redefining many medical roles towards translating and communicating this data effectively to patients. Similarly, Sales and Related jobs may see an increased demand for creative skills and ideas for promoting a memorable shopping experience, as brick-and-mortar retail has to reposition itself in relation to e-commerce and online competition.

Overall, our respondents anticipate that a wide range of occupations will require a higher degree of cognitive abilities—such as creativity, logical reasoning and problem sensitivity—as part of their core skill set. More than half (52%, the bright blue part of the bar in Figure 10) of all jobs expected to require these cognitive abilities as part of their core skill set in 2020 do not yet do so today, or only to a much smaller extent. In another 30% of jobs (the dark blue part of the bar in Figure 10), demand for these skills is currently already high and will remain so over the 2015–2020 period. Only 18% of jobs requiring high cognitive skills today are expected to do so less in the future (the grey part of the bar in Figure 10).

At the other end of the scale, among all jobs requiring physical abilities less than one third (31%) are expected to have a growing demand for these in the future, about as many as the proportion of jobs in which physical abilities are anticipated to decline in importance (27%). The skills family with the most stable demand across all jobs requiring these skills today or in the future are technical skills: nearly half (44%) of all jobs requiring these skills today will have a stable need for them in the coming years.

Box 1: Anticipating the Future of Jobs: Mapping Skills Supply *(cont'd.)*

Heatmap: Distribution of skills, mechanical engineers, different industries



Source: LinkedIn.

Understanding Current Skills Supply

Today's job markets and in-demand skills are vastly different than the ones of 10 or even five years ago, and—as demonstrated in this *Report*—the pace of change is only set to accelerate. Governments, businesses and individuals alike are increasingly concerned with identifying and forecasting skills that are relevant not just today but that will remain or become so in the future to meet business demands for talent and enable those that possess them to seize emerging opportunities.

In light of technological trends such as the ones outlined in this *Report,* in recent years many countries have undertaken significant efforts to increase the amount of STEM (science, technology, engineering and mathematics) graduates produced by their national education systems (Table 8A). While the employment trends identified by this Report certainly corroborate the importance of these efforts, it is nevertheless also clear that the potential net job creation in absolute terms in the STEM field alone will not be sufficient to absorb strains on other parts of the labour market. What we have found instead is that disruptive changes will have a significant impact on skills requirements in *all* job families and that they are creating a range of opportunities and challenges in *all* industries, not just narrowly related to 'hard knowledge', technical skills and technology. In order to manage these trends successfully, there is a need for potentially reskilling and upskilling talent from varied academic backgrounds in all industries (Table 8B).

This *Report* has focused on shifts and disruptions to skills requirements as perceived by CHROs. It is clear that even if today's skills base would conform exactly to today's perceived skills requirements, the looming skills instability challenge would be substantial. In practice, however, there are already today large mismatches between the actual supply and demand of key work-related skills (Table 8C), with 38% of employers reporting difficulties in in filling jobs

Table 8C: Distribution of skills supply, by industry
Share of skills family in industry total, %

Skills family	BAS	CON	EN	FS	HE	ICT	MEI	MOB	PS	OVERALL
Content Skills	4	4	3	5	11	3	14	3	8	**6**
Process Skills	6	4	7	6	11	3	9	3	11	**7**
Resource Management Skills	23	26	31	27	18	25	8	27	18	**23**
Complex Problem Solving Skills	8	5	7	6	7	4	3	5	5	**6**
Social Skills	40	55	33	47	47	30	50	47	48	**44**
Systems Skills	4	4	6	7	3	6	1	3	5	**4**
Technical Skills	15	2	13	2	3	29	15	12	5	**11**

Source: LinkedIn.
Note: Based on share of LinkedIn members with stated skills across *Future of Jobs Report* focus countries. LinkedIn currently has more than 400 million members in more than 200 countries and territories. Industry classification based on World Economic Forum taxonomy.

in 2015, according to ManpowerGroup's most recent *Talent Shortage Survey*.[17]

Skills mismatches may therefore emerge not just between the supply and demand of existing skills today, but also between today's skills base and future skills requirements. Efforts aimed at closing the skills gap will increasingly need to be grounded in a solid understanding of a country's or industry's skills base today and of changing future skills requirements due to disruptive change. For example, efforts to place unemployed youth in apprenticeships in certain job categories through targeted skills training may be self-defeating if skills requirements in that job category are likely to be drastically different in just a few years' time. Indeed, in some cases such efforts may be more successful if they disregard current labour market demands and past trends and instead base their models on future expectations.

Across industries, geographies and job families, an ability to understand the current skills base in near-real time and to accurately forecast, anticipate and prepare for future job contents and skills requirements will be increasingly critical for businesses, labour market policymakers, workers' organizations and individuals to succeed. Drivers of change to job markets such as Big Data analytics may themselves become useful tools in managing this process.

FUTURE WORKFORCE STRATEGY

The impact of technological, demographic and socio-economic disruptions on business models will be felt in transformations to the employment landscape and skills requirements, resulting in substantial challenges for recruiting, training and managing talent. Several industries may find themselves in a scenario of positive employment demand for hard-to-recruit specialist occupations with simultaneous skills instability across many existing roles. For example, the Mobility industries expect employment growth accompanied by a situation where nearly 40% of the skills required by key jobs in the industry are not yet part of the core skill set of these functions today.

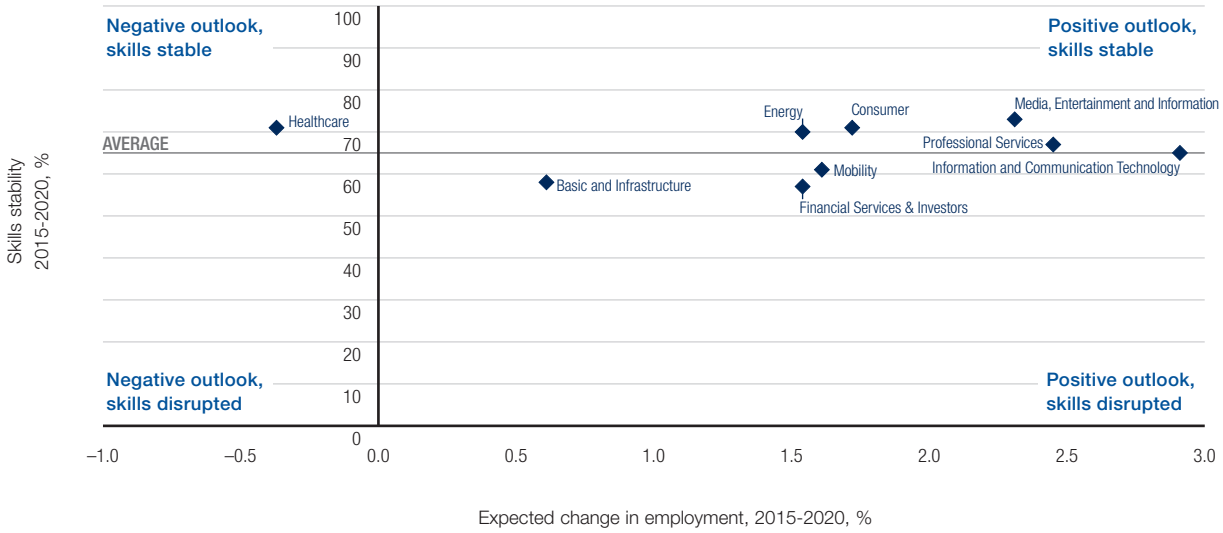
At the same time, workers in lower skilled roles, particularly in the Office and Administrative and Manufacturing and Production job families, may find themselves caught up in a vicious cycle where low skills stability means they could face redundancy without significant re- and upskilling even while disruptive change may erode employers' incentives and the business case for investing in such reskilling. Not anticipating and addressing such issues in a timely manner over the coming years may come at an enormous economic and social cost for businesses, individuals and economies and societies as a whole.

Recognition of Reskilling and Retraining as a Priority

Responses to the Future of Jobs Survey indicate that business leaders are aware of these looming challenges but have been slow to act decisively. Just over two thirds of our respondents believe that future workforce planning and change management features as a reasonably high or very high priority on the agenda of their company's or organization's senior leadership, ranging from just over half in the Basic and Infrastructure sector to four out of five respondents in Energy and Healthcare. Across all industries, about two thirds of our respondents also report intentions to invest in the reskilling of current employees as part of their change management and future workforce planning efforts, making it by far the highest-ranked such strategy overall (Figure 13). However, companies that report recognizing future workforce planning as a priority are nearly 50% more likely to plan to invest in reskilling than companies who do not (61% against 39% of respondents).

Respondents' expectations about future skills requirements also provide a relatively clear indication of where such retraining efforts might be concentrated in the most effective and efficient way. The *Report* categorizes work-relevant skills into abilities, basic skills and cross-functional skills (Figure 9), with particularly strong demand growth expected in certain cross-functional skills, cognitive abilities and basic skills such as active learning and ICT

Figure 11: Employment outlook and skills stability, by industry



Source: Future of Jobs Survey, World Economic Forum.

literacy. Applying a time lens to the potential for acquisition of these skills (what ManpowerGroup refers to as a teachable fit[18]), it seems clear that targeted training in cross-functional skills is within the remit of an individual company or even a group of companies coming together for synergy and greater efficiency. By contrast, cognitive abilities take much longer to develop and touch upon the need for high quality and inclusive secondary, primary and pre-school education. This is a field in which government policy will be required and companies can work with governments to clearly define the need and introduce new delivery models. Finally, basic skills are also traditionally acquired during formal education and before entering the workforce, but are relatively straightforward to acquire compared to cognitive abilities. This is a field in which companies have an opportunity to take a proactive approach to building their talent pipelines by working much more directly with education providers.

In addition to such efforts by individual companies there are also opportunities for redeploying skills across industry boundaries from declining to growing parts of the labour market. For example, our respondents expect a decline in Sales and Related jobs and their accompanying skill sets in the Financial Services & Investors, Professional Services and Mobility industries, but a solid growth in demand for these skill sets in the Basic and Infrastructure, Information and Communication Technology and Media, Entertainment and Information industries. There may be opportunities for greater formalized inter-industry collaboration in facilitating the transfer of these skills and enabling the receiving industries to acquire experienced talent from industries that have declining demand for those same skills.

Our research also points to similar opportunities for redeploying talent and skills in the Installation and Maintenance job family, from the Information and Communication Technology sector towards the Energy and Mobility industries, and Legal jobs, from the Professional Services industry towards the Financial Services & Investors and Basic and Infrastructure sectors. Such an approach not only makes recruiting easier for the hiring industry but also preserves employment opportunities for individuals whose skills may be falling out of favour in another sector of the economy, creating a win-win scenario for both employer and employee. More broadly still, there is a wide range of currently underutilized opportunities for building multistakeholder partnerships for better matching skills and labour market needs.[19]

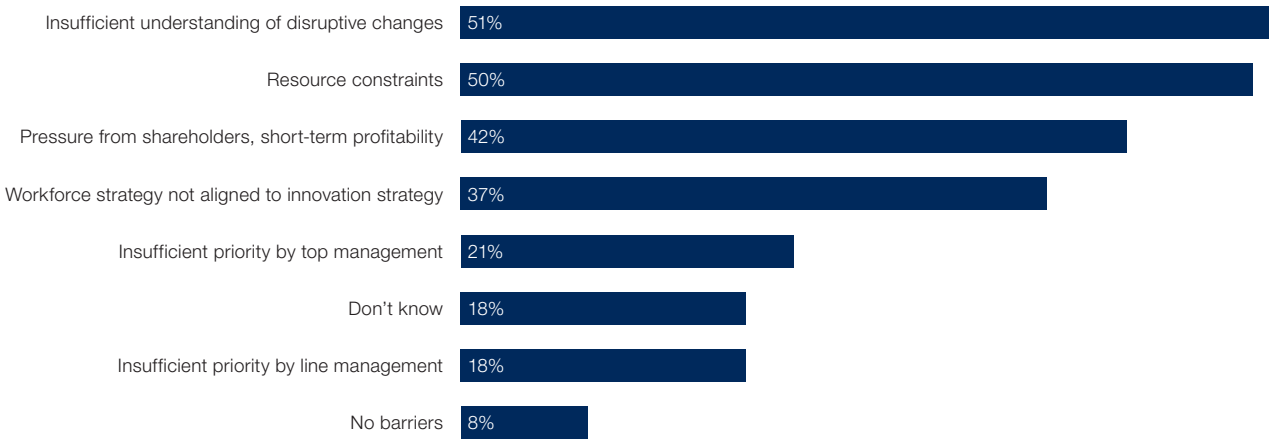
Barriers to Managing Change

Reskilling and retraining efforts may not yield the desired return if they are not cognizant of impending disruptive change and instead base their content primarily on today's requirements or past successes. Many of our respondents are acutely aware of the limitations to their current planning for disruptive change and its implications for the talent landscape. Currently, only 53% of CHROs surveyed are reasonably or highly confident regarding the adequacy of their organization's future workforce strategy to prepare for these shifts.

The main perceived barriers to a more decisive approach include a lack of understanding of the disruptive changes ahead, resource constraints and short-term profitability pressures and lack of alignment between workforce strategies and firms' innovation strategies (Figure 12). However, there are some significant differences between industries in this regard. The Information and Communication Technology sector reports a comparatively good understanding of drivers of change and instead sees resource constraints as its main barrier whereas the Media, Entertainment and Information industry—perhaps the sector that has seen the largest scale of disruption of its traditional business model to date—reports a very good understanding of the nature of disruptive changes ahead and is instead mainly concerned about short-term shareholder pressures (Table 9).

Furthermore, we find that CHROs' confidence in the adequacy of their company's or organization's workforce

Figure 12: Significance of barriers to change, industries overall
Share of respondents reporting barrier, %



Source: Future of Jobs Survey, World Economic Forum.
Note: Names of barriers have been abbreviated to ensure legibility.

strategy is strongly correlated with the perceived priority given to these issues by top management and with perceived alignment between workforce strategy and innovation strategy. Conversely, CHROs who do not see these two measures in place are over 50% more likely not to express confidence in their firm's strategy.

Envisaged Workforce Strategies

In order to meet the talent and skills challenges brought about by expected business model disruptions, companies envisage pursuing a range of innovative workforce strategies; providing employees with wider exposure to roles across the firm, stepping up efforts to target the female talent pool and collaborating with the education sector more closely than in the past are some of the more popular measures (Figure 13). Across all industries, plans to invest in reskilling current employees feature prominently among reported future workforce strategies.

However, the prevalence of insufficient understanding of disruptive changes as well as resource constraints as main barriers to managing change perhaps helps to explain the current mismatch between the magnitude of the upcoming changes and the relatively timid actions being taken by companies to address these challenges so far.

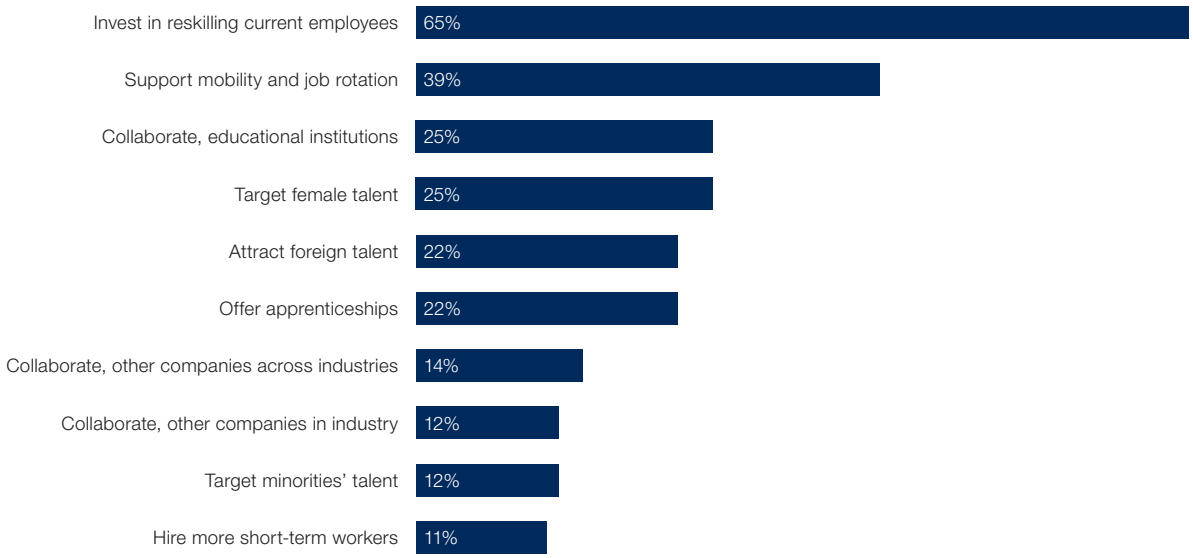
For example, a number of promising approaches appear underutilized across almost all industries. Despite widespread proclamations in support of workplace gender parity, only one in four companies envisages actively targeting female talent, ranging from 46% in the Media, Entertainment and Information sector to only 16% in Information and Communication Technology. There also seems to be varying openness to collaboration, whether within or across industries, with the latter seemingly much more acceptable. Furthermore, a focus on making better use of the accumulated experience of older employees

Table 9: Significance of barriers to change, by industry
Share of respondents reporting barrier, %

Barrier	BAS	CON	EN	FS	HE	ICT	MEI	MOB	PS	OVERALL
Insufficient understanding of disruptive changes	59	60	55	67	50	48	36	58	51	**51**
Resource constraints	54	55	55	43	75	74	36	50	49	**50**
Pressure from shareholders, short-term profitability	51	50	41	47	50	42	64	38	35	**42**
Workforce strategy not aligned to innovation strategy	38	50	32	53	50	39	50	17	37	**37**
Insufficient priority by top management	27	20	18	27	25	23	7	21	23	**21**
Don't know	16	10	36	23	50	6	14	17	19	**18**
Insufficient priority by line management	30	0	9	27	0	16	21	33	16	**18**
No barriers	5	15	14	7	8	3	7	13	7	**8**

Source: Future of Jobs Survey, World Economic Forum.
Note: Names of barriers have been abbreviated to ensure legibility.

Figure 13: Future workforce strategies, industries overall
Share of respondents pursuing strategy, %



Source: Future of Jobs Survey, World Economic Forum.
Note: Names of strategies have been abbreviated to ensure legibility.

and building an ageless workforce barely register among proposed workforce strategies.

In fact, these findings are in striking contrast with the envisaged measures of respondents who report both that they are confident in the adequacy of their future workforce strategy and that these issues are perceived as a priority for their top management. This group is more than twice as likely to be targeting female talent and minority talent and over 50% more likely to be supporting employees' mobility and job rotation within the firm. They are significantly *less* likely to plan to hire more short-term workers or to use expatriate talent, in line with their equally much higher probability to invest in internal talent and reskilling, as already noted above. There is a need in several of these areas for bolder leadership and strategic action within companies and within and across industries, including partnerships with public institutions and the education sector.

Recommendations for Action

While the implications of accelerating disruptive change to business models are far-reaching—even daunting— for employment and skills, rapid adjustment to the new reality and the opportunities it offers is possible, provided there is concerted effort by all stakeholders. For government, it will entail innovating within education and labour-related policymaking, requiring a skills evolution of its own. For the education and training sector, it will mean vast new business opportunities as it provides new services to individuals, entrepreneurs, large corporations and the public sector. The sector may become a noteworthy new source of employment itself.

For businesses to capitalize on new opportunities, they will need to put talent development and future workforce strategy front and centre to their growth. Firms can no longer be passive consumers of ready-made human capital. They require a new mindset to meet their talent needs and to optimize social outcomes. This entails several major changes in how business views and manages talent, both immediately and in the longer term. In particular, there are four areas with short term implications and three that are critical for long term resilience.

Immediate Focus

- ***Reinventing the HR Function:*** As business leaders begin to consider proactive adaptation to a new talent landscape, they need to manage skills disruption as an urgent concern. They must understand that talent is no longer a long-term issue that can be solved with tried and tested approaches that were successful in the past or by instantly replacing existing workers. Instead, as the rate of skills change accelerates across both old and new roles in all industries, proactive and innovative skill-building and talent management is an urgent issue. What this requires is an HR function that is rapidly becoming more strategic and has a seat at the table—one that employs new kinds of analytical tools to spot talent trends and skills gaps, and provides insights that can help organizations align their business, innovation and talent management strategies to maximize available opportunities to capitalize on transformational trends.

- ***Making Use of Data Analytics:*** Businesses will need to build a new approach to workforce planning and talent management, where better forecasting data and planning metrics will need to be central. Earlier mapping of emerging job categories, anticipated redundancies and changing skills requirements in response to the changing environment will allow businesses to form effective talent repurposing

Table 10: Significance of workforce strategies, by industry
Share of respondents pursuing strategy, %

Strategy	BAS	CON	EN	FS	HE	ICT	MEI	MOB	PS	OVERALL
Invest in reskilling current employees	65	75	59	67	83	81	77	83	56	**65**
Support mobility and job rotation	41	45	50	47	50	35	15	54	40	**39**
Collaborate, educational institutions	38	30	23	20	25	35	38	29	14	**25**
Target female talent	35	25	36	30	17	16	46	21	21	**25**
Attract foreign talent	35	25	41	23	42	19	15	25	7	**22**
Offer apprenticeships	14	35	23	20	8	23	31	29	33	**22**
Collaborate, other companies across industries	11	20	14	17	0	10	23	8	28	**14**
Collaborate, other companies in industry	19	5	18	10	25	10	15	0	14	**12**
Target minorities' talent	14	5	9	13	33	16	8	13	9	**12**
Hire more short-term workers	3	20	5	7	0	26	23	17	9	**11**
Hire more virtual workers	5	5	0	10	0	6	8	0	12	**6**
Collaborate, vocational training and certification providers	3	5	14	3	0	3	0	13	7	**5**
Don't know	0	0	0	17	17	13	15	0	0	**5**
Invest in older workers	11	5	5	0	0	3	8	0	5	**4**
Collaborate, private employment agencies	0	0	5	7	8	3	8	0	5	**3**
There is no strategy	8	0	0	7	0	0	0	0	0	**2**
Collaborate, labour unions	0	0	0	3	0	3	0	4	0	**1**

Source: Future of Jobs Survey, World Economic Forum.
Note: Names of strategies have been abbreviated to ensure legibility.

strategies within their company, their own industry and across industries. HR has the opportunity to add significant strategic value in predicting the skills that will be needed, and plan for changes in demand and supply. To support such efforts, the Forum's *Future of Jobs* project provides in-depth analysis on industries, countries, occupations and skills.

- ***Talent diversity—no more excuses:*** As study after study demonstrates the business benefits of workforce diversity and companies expect finding talent for many key specialist roles to become much more difficult by 2020, it is time for a fundamental change in how talent diversity issues—whether in the realm of gender, age, ethnicity or sexual orientation—are perceived and well-known barriers tackled. In this area, too, technology and data analytics may become a useful tool for advancing workforce parity, whether by facilitating objective assessment, understanding typical careers paths and cliffs, identifying unconscious biases in job ads and recruitment processes or even by using wearable technologies to understand workplace behaviours and encourage systemic change.

- ***Leveraging flexible working arrangements and online talent platforms:*** As physical and organizational boundaries are becoming increasingly blurred, organizations are going to have to become significantly more agile in the way they think about managing people's work and about the workforce as a whole. Work is what people do and not where they do it. Businesses will increasingly connect and collaborate remotely with freelancers and independent professionals through digital talent platforms. Modern forms of association such as digital freelancers' unions and updated labour market regulations will increasingly begin to emerge to complement these new organizational models. For policymakers, an important set of regulations concerns the portability of safeguards and benefits between jobs and the equivalent treatment in law of different forms of labour and employment types.

Box 2: Anticipating the Future of Jobs: The New Vision for Arab Employment

As an integral part of its practical and action-oriented application, the World Economic Forum's Global Challenge Initiative on Employment, Skills and Human Capital is deploying a number of regionally focused collaboration projects, reflecting on how emerging economies may tackle the challenge of closing skills gaps and providing job opportunities to their fast-growing young population. By tailoring and applying insights and recommendations developed at the global level, these projects support efforts to improve the state of employment, skills and human capital in local and regional contexts. Furthermore, they serve as an invaluable source of bottom-up evidence and learnings that can be elevated and shared to foster cross-regional learnings and global adaptation. Currently, the Forum is focusing on three such projects: the New Vision for Arab Employment, described in more detail below, the Africa Skills Initiative and the India Skills Initiative.

THE NEW VISION FOR ARAB EMPLOYMENT

The New Vision for Arab Employment serves as a platform for driving action and partnerships through nationally and regionally focused projects that promote collaboration and partnership between local and multinational businesses as well as governments and the education and training sector. Working in close collaboration with key business, public sector and civil society leaders, the initiative rallies key regional actors through calls-to-action and pilots best practices to effect change. It also aims at identifying key cross-cutting areas of intervention that will help address employment, skills and human capital gaps for the 21st century.

Phase 1: Understanding the regional context

Talent is one of the most critical factors for an economy's innovative capacity and growth prospects. With more than half of its population under 25 years of age and the world's highest youth unemployment rate, the Middle East and North Africa (MENA) region faces critical challenges. Concurrently, business leaders report difficulties in filling roles. In particular, persistently high youth unemployment rates in the Gulf Cooperation Council countries demonstrate that addressing youth unemployment effectively requires more than budgetary capacity and economic growth.

Launched in 2013, the aim of the first phase of the initiative was to better understand how to turn this youthful populace into a youth dividend and implement best practices of interventions to inverse the critical trend of youth unemployment. For example, the Forum's Human Capital Index showed that despite significant investment in education by many countries, the region is not equipping youth with skills for the 21st century. Out of the 124 economies covered by the Index in 2015, only two from the region—the United Arab Emirates (54) and Qatar (56)—made it into the upper half of the rankings. Kuwait (93) and Saudi Arabia (85), whose GDP per capita is at least fivefold higher, performed at a comparable level to Morocco (95) and Egypt (84), respectively, highlighting that economic performance alone is an inadequate measure of countries' abilities to successfully leverage their human capital endowment. In addition, it was found that the region runs the risk of worsening unemployment and talent shortages if skills gaps are exacerbated due to technological changes that further disrupt business models and labour markets.

Phase 2: Commitments to affect change in the region

Recognizing that longer term reform by the public sector must be complemented by the active collaboration of the private sector, the Forum's Regional Business Council for MENA launched a second phase of the initiative in 2015, aiming to invest in the continuous learning, reskilling, upskilling and job readiness of 100,000 of the region's youth by 2017. To date over 10 partners have made specific commitments to address the jobs and skills challenge in the region aimed at reducing unemployment, tackling skills gaps or facilitating talent flows through initiatives implemented directly by each company in collaboration with other stakeholders. Each commitment sets a target to achieve its outcomes against a specific set of metrics within a period of two years and meets the following criteria:

- Extends beyond the pledging organization's internal HR programme
- Consists of a new initiative or the additional scaling up of an existing initiative
- Contributes to the public good by creating added value for society and economy
- Ideally, aligns with the organization's core business strategy
- Is a multistakeholder commitment, led by the partner

In addition to a set of founding pledges that impacted nearly 50,000 youth, the initiative has engaged others to join forces in order to reach—or surpass—the goal of 100,000. The pledge model also serves as a platform for continued learning and collaboration between businesses seeking to address the region's talent value chain and as a hub for exchange with governments, civil society organizations and experts.

Phase 3: The Future of Jobs and public-private dialogue

Recognizing that current company-specific efforts must be supplemented with systemic change, the leaders of the Forum's Regional Business Council and others are engaging in a new phase of the initiative, which will directly build on the insights provided by the *Future of Jobs* Insight Report. It is expected that the Future of Jobs work will force a more precise dialogue to strengthen the existing framework of collaboration for business leaders and provide new data and analysis for better-informed decision-making in the future with a view to enhancing talent pipelines and increasing competitiveness in the region. In particular, leaders in the region are keen to understand what skills should constitute the core of education in the future and what reforms the private sector, particularly within key industries, can initiate in a dialogue with the public and education sectors to leapfrog towards a more resilient and efficient learning and skills value chain.

Furthermore, as disruptive change is expected to spread across the globe, what will be the impact in the region and how will the actors in the region prepare for this evolution? New industries and business models will emerge, new talent will be required and so this future-oriented body of work will be a critical tool to broaden the space for solutions to allow both existing and new industry sectors to thrive and support the region's overall development.

Longer Term Focus

- ***Rethinking education systems:*** By one popular estimate 65% of children entering primary schools today will ultimately work in new job types and functions that currently don't yet exist. Technological trends such as the Fourth Industrial Revolution will create many new cross-functional roles for which employees will need both technical and social and analytical skills. Most existing education systems at all levels provide highly siloed training and continue a number of 20th century practices that are hindering progress on today's talent and labour market issues. Two such legacy issues burdening formal education systems worldwide are the dichotomy between Humanities and Sciences and applied and pure training, on the one hand, and the prestige premium attached to tertiary-certified forms of education—rather than the actual content of learning—on the other hand. Put bluntly, there is simply no good reason to indefinitely maintain either of these in today's world. Businesses should work closely with governments, education providers and others to imagine what a true 21st century curriculum might look like.

- ***Incentivizing lifelong learning:*** The dwindling future population share of today's youth cohort in many ageing economies implies that simply reforming current education systems to better equip today's students to meet future skills requirements—as worthwhile and daunting as that task is—is not going to be enough to remain competitive. Ageing countries won't just need lifelong learning—they will need wholesale reskilling of existing workforces throughout their lifecycle. Governments and businesses have many opportunities to collaborate more to ensure that individuals have the time, motivation and means to seek retraining opportunities. For example, Denmark allocates funding for two weeks' certified skills training per year for adults, and the strong emphasis the country places on in-work training helps explain its very high degree of employment mobility, with 70% of workers considering mid-career transitions a 'good thing', compared to 30% or less in most other European countries.[20] At the company-level, technology can be continuously leveraged to upskill and reskill employees.

- ***Cross-industry and public-private collaboration:*** Given the complexity of the change management needed, businesses will need to realize that collaboration on talent issues, rather than competition, is no longer a nice-to-have but rather a necessary strategy. Businesses should work with industry partners to develop a clearer view on future skills and employment needs, pooling resources where appropriate to maximize benefits, and work more closely with governments to map a future view of skill demand versus supply. Resources should then be put into place regionally to upskill those out of work to fill high priority employment gaps. Such multi-sector partnerships and collaboration, when they leverage the expertise of each partner in a complementary manner, are indispensable components of implementing scalable solutions to jobs and skills challenges. While a single business can form one-to-one partnerships for its own talent needs, partnerships between multiple businesses, educational institutions and accreditation providers can result in an overall increase in the quality of the talent pool, at lower costs and with greater social benefits. Businesses also need to engage with governments on strategically redeploying redundant skills between sectors, addressing cost concerns and social stability.[21]

Chapter 2:
The Industry Gender Gap

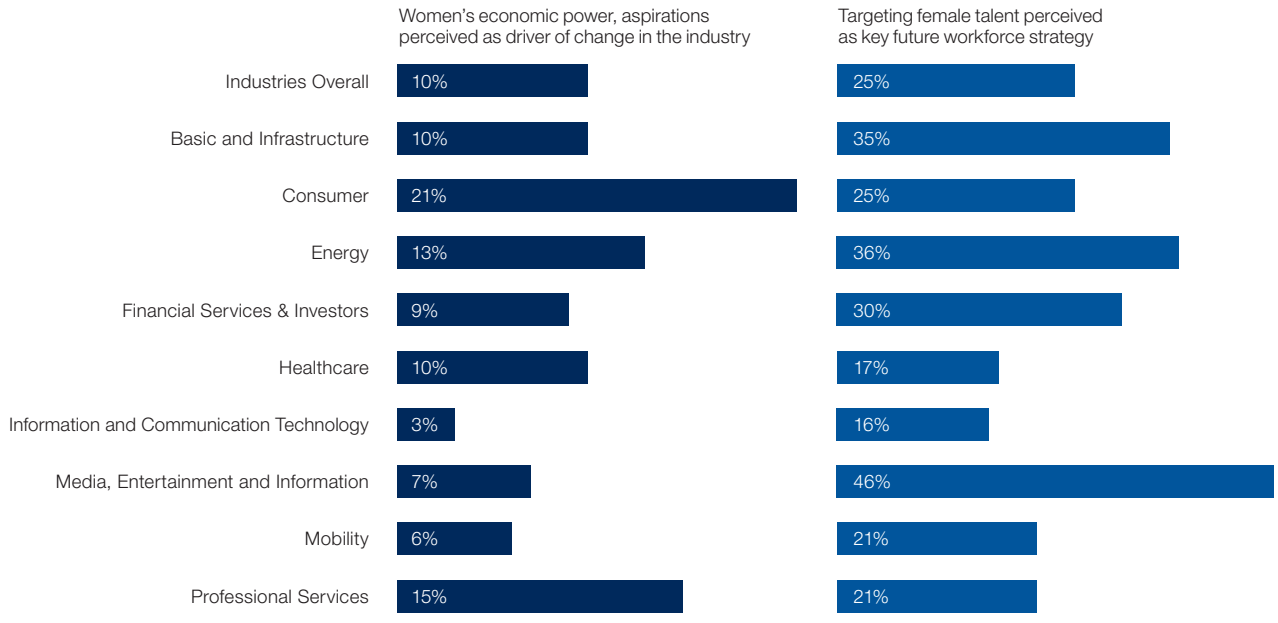
Tapping into the female talent pool is increasingly regarded as a prominent and promising area for workforce planning. The previous chapter of this *Report* found that more than a quarter of companies surveyed identified female talent as a key feature of future workforce strategy. Overall, 53% of our respondents perceive promoting women's participation as a priority item on their organization's senior leadership's agenda and 58% are confident about the efficacy of their current measures undertaken in this regard.

Similarly, women's rising labour force participation and economic power as consumers is increasingly perceived as a key driver of change across several industry sectors, such as in the Consumer industry, and one that is highly correlated with expected employment growth—an unambiguously positive trend in a somewhat turbulent landscape of technological, demographic and socio-economic change. The continuing ascent of women in the workplace is also contributing to increasingly diverse and dynamic workplace cultures.

As the Fourth Industrial Revolution takes hold in different industries and job families, it will affect female and male workers in distinct ways. By their very nature, many anticipated disruptive changes have the potential to enable the narrowing of gender gaps in many industries. For example, household work, that is still primarily the responsibility of women in most societies, could be further automated, leaving women to put their skill sets to better use, including in the formal labour market.

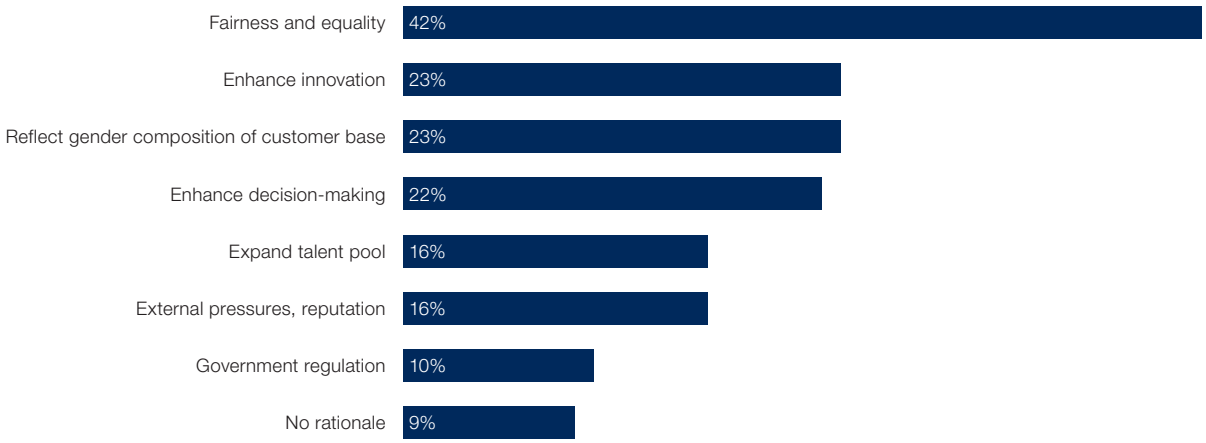
At same time, however, job families expecting the highest employment growth, such as Architecture and Engineering and Computer and Mathematical, currently have some of the lowest female participation and find it much harder than average to recruit women. As these job families take on newfound applications across industries, will sectors which previously housed few such roles but have a strong track record of employing, retaining and leveraging female talent, be more adept than others at addressing their skills shortages by recruiting female talent? At the declining end of the labour market, the drivers of change identified by our respondents will heavily disrupt two of the job families most clearly dominated by women and men: Office and Administrative and Manufacturing and Production, respectively. In short, as industries prepare to adapt to disruptive change the dynamics of the industry gender gap will be at the centre of many facets of the new employment landscape.

Figure 14: Gender parity as part of future workforce strategy
Share of respondents agreeing with statement, %



Source: Future of Jobs Survey, World Economic Forum.

Figure 15: Significance of rationales for gender parity, industries overall
Share of respondents stating rationale, %



Source: Future of Jobs Survey, World Economic Forum.
Note: Names of rationales have been abbreviated to ensure legibility.

Table 11: Significance of rationales for gender parity, by industry
Share of respondents stating rationale, %

Industry	BAS	CON	EN	FS	HE	ICT	MEI	MOB	PS	OVERALL
Fairness and equality	39	75	50	60	40	63	31	58	50	**42**
Enhance innovation	33	20	20	43	40	27	38	33	25	**23**
Reflect gender composition of customer base	14	35	40	43	30	33	31	13	39	**23**
Enhance decision-making	19	15	45	30	50	23	31	29	25	**22**
Expand talent pool	6	30	25	23	0	37	23	29	8	**16**
External pressures, reputation	28	20	5	7	10	33	15	13	17	**16**
Government regulation	22	5	15	13	10	20	8	8	3	**10**
No rationale	17	5	10	10	10	7	8	13	14	**9**
Demand by employees	6	10	10	0	10	7	15	21	11	**9**
Financial returns	11	10	0	17	10	0	31	0	22	**8**
Don't know	8	5	5	3	0	7	8	4	6	**5**

Source: Future of Jobs Survey, World Economic Forum.
Note: Names of rationales have been abbreviated to ensure legibility.

THE BUSINESS CASE FOR CHANGE

Over the past 10 years, the World Economic Forum's *Global Gender Gap Report* has been tracking the economic gender gap across different regions of the world. Progress has been uneven and slow. A mere 3% of the global economic gender gap has been closed over that period.

In addition to a values-based case for gender equality, there is an accompanying economic imperative for including women more fully into society and the workplace. Female talent remains one of the most under-utilized business resources, either squandered through lack of progression or untapped from the onset. Although women are, on average, more educated than men globally and now participate more fully in professional and technical occupations than 10 years ago, as of today, their chances to rise to positions of leadership are only 28% of those of men. Women continue to make up less of the labour force overall than men, and where they participate in the formal economy their earnings for similar work are lower.[22] The talents of half the world's potential workforce are thus often wasted or underutilized due to barriers on the path to women's successful workforce integration.

In general, women's participation in the workforce is no longer perceived as a social issue alone, but also as a business issue—costing women, companies and ultimately entire economies. Many business leaders increasingly

Table 12: Gender gap and female share of customer base, by industry
Share of female workforce, %

			Relative ease of recruitment		Business to business		Business to consumer		Business to government	
Industry group	Share of women	Gender wage gap	Current	2020	Current	2020	Current	2020	Current	2020
Industries Overall	**30%**	**32%**	**–0.74**	**–0.11**	**25%**	**33%**	**31%**	**33%**	**21%**	**27%**
Basic and Infrastructure	16%	35%	–0.99	–0.20	16%	28%	26%	30%	18%	24%
Consumer	33%	49%	–0.63	–0.35	14%	18%	47%	49%	11%	15%
Energy	19%	31%	–1.08	0.14	18%	23%	26%	26%	18%	19%
Financial Services & Investors	36%	38%	–0.78	–0.11	25%	34%	39%	41%	19%	29%
Healthcare	51%	15%	–0.09	–0.10	50%	43%	57%	57%	60%	60%
Information and Communication Technology	24%	25%	–0.91	–0.39	25%	33%	24%	30%	17%	21%
Media, Entertainment and Information	37%	18%	–0.67	0.28	20%	32%	48%	44%	15%	19%
Mobility	19%	39%	–0.92	–0.04	21%	30%	21%	27%	16%	19%
Professional Services	40%	22%	–0.39	–0.09	31%	45%	32%	30%	20%	28%

Source: Future of Jobs Survey, World Economic Forum.
Note: Relative ease of recruitment measured on a qualitative –2 ("much harder") to +2 ("much easier") scale. Gender wage gap refers to share of responses in the affirmative.

recognize that tackling barriers to equality can unlock new opportunities for growth. Our respondents perceive a wide range of rationales for promoting workplace gender parity, varying with the specific situation of different industries (Figure 15 and Table 11).

Overall, the most frequently cited reason for promoting female talent is the ethical imperative "fairness and equality", which was chosen by 42% of respondents. Just over a fifth of companies are further motivated by a range of rationales more closely tied to the success of their business—enhancing innovation and decision-making or reflecting the gender composition of their customer base.

Enhanced decision-making, enhanced innovation

Across all industries, nearly one in four companies reported supporting gender parity because of an expectation that it would enhance innovation, while a similar proportion cited a related reason, enhancing decision-making. The Energy and Media, Entertainment and Information industries find these rationales particularly appealing while the Consumer and Information and Communication Technology industries do not cite them as a strong motivating factor. Employing and promoting more women is one accessible way companies can bring more diverse voices into their decision-making and business development—allowing fresh thinking and disrupting business models from within before they are disrupted from without.[23] Indeed, the dividends of those diverse voices are best reaped when inclusion is not predicated on pure assimilation.[24] Similarly, companies in which women are more strongly represented at the board and at senior management levels have been shown to outperform those where they are not.[25]

Reflecting gender composition of the customer base

There is a strong correlation between companies' perception of the gender composition of their customer base and the gender composition of their workforce across various industries (Table 12). Of course, existence of this correlation does not in itself reveal the direction of that relationship; whether a more gender diverse workforce allows businesses to tap into the female client base by developing a distinctive value proposition or, inversely, whether businesses with more female clients recruit more women. Some industries are substantially more focused on this rationale than others, specifically the Professional Services, Financial Services & Investors and Consumer industries. For example, on average, just over two in five respondents from the Financial Services & Investors sector emphasize reflecting their customer base as one of their main rationales for promoting gender parity. With good reason, too: globally, women controlled 64% of household spending and 30 trillion dollars of consumer spending in 2013—and this figure is predicted to rise by almost a third over the five years to 2018.[26]

As women's workforce participation rises, they will gain further purchasing power through increased lifetime disposable income. The proportion of business-to-consumer (B2C) and business-to-business (B2B) clients who are women should therefore be expected to rise, as reflected in our respondents' projections. Most industries expect between nine and 14 percentage point growth in female B2B clients over the 2015-2020 period, particularly the Professional Services, Media, Entertainment and Information and Basic and Infrastructure sectors. Expected growth of B2C clients is lower but starting from a higher base. The Information and Communication Technology and Mobility industries expect the highest growth in their female B2C customer base, on average around six percentage points.

Expanding the talent pool and external pressures

Currently, women make up the majority of those enrolled in university in nearly 100 countries. However, "expanding the talent pool" lags behind as a perceived rationale for promoting gender parity. This may be because women's ascendance in higher education is a relatively recent phenomenon among junior cohorts of many populations and company perceptions have not kept pace with the

Table 13: Women's workforce participation, by industry
Share of female workforce, %

			Senior roles		Mid-level roles		Junior roles		Line roles		Staff roles	
Industry group	CEOs	Board members	Current	2020	Current	2020	Current	2020	Current	2020	Current	2020
Industries Overall	**9%**	**28%**	**15%**	**25%**	**24%**	**33%**	**33%**	**36%**	**30%**	**34%**	**35%**	**39%**
Basic and Infrastructure	2	35	9	17	13	21	22	29	14	23	20	27
Consumer	10	21	16	24	26	33	33	37	31	34	37	41
Energy	0	32	11	20	19	27	24	27	19	25	22	30
Financial Services & Investors	9	19	20	30	33	40	43	43	35	39	42	43
Healthcare	6	—	15	28	31	44	39	46	44	49	41	48
Information and Communication Technology	5	19	11	20	21	29	32	34	23	32	33	38
Media, Entertainment and Information	13	22	25	33	25	32	35	36	38	43	47	46
Mobility	9	17	13	21	21	30	28	33	25	31	34	36
Professional Services	9	23	22	34	33	40	39	43	44	44	44	46

Source: Future of Jobs Survey, World Economic Forum.

Table 14: Gender Gap, by job family

			Relative ease of recruitment	
Job family	Share of women	Gender wage gap	Current	2020
Architecture and Engineering	11%	27%	–1.18	–0.27
Arts, Design, Entertainment, Sports and Media	48%	12%	–0.21	0.07
Business and Financial Operations	43%	30%	–0.42	–0.16
Computer and Mathematical	23%	28%	–0.91	–0.13
Construction and Extraction	10%	48%	–1.48	–0.64
Installation and Maintenance	8%	24%	–1.43	–0.20
Management	25%	34%	–0.84	–0.03
Manufacturing and Production	20%	32%	–0.99	–0.12
Office and Administrative	54%	36%	0.21	0.31
Sales and Related	41%	35%	–0.42	–0.03

Source: Future of Jobs Survey, World Economic Forum.
Note: Relative ease of recruitment measured on a qualitative –2 ("much harder") to +2 ("much easier") scale. Gender wage gap refers to share of responses in the affirmative.

changing reality of the composition of the talent pool around them. Employers in the Information and Communication Technology and Mobility industries nevertheless find this rationale especially convincing. In Information and Communication Technology, a sector which struggles with talent shortages, no less than 37% of companies regard enhancing women's workforce participation as an opportunity for expanding the talent pool. Across all industries approximately 20% of respondents also reported they were feeling external pressures to address gender imbalances, either by media scrutiny and public opinion or by government regulation.

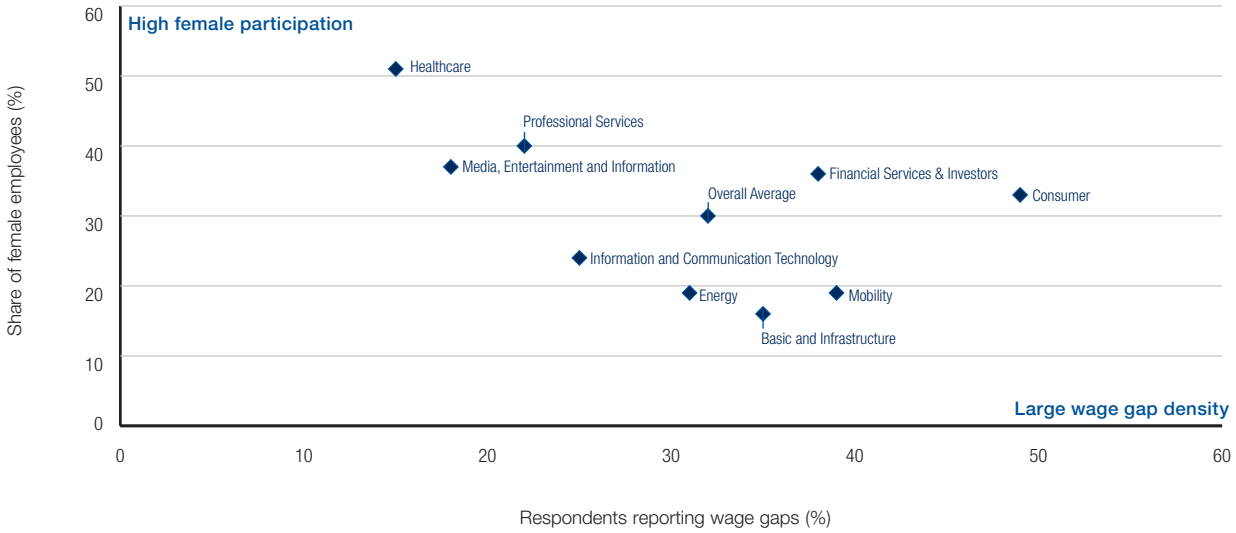
GAPS IN THE FEMALE TALENT PIPELINE

While national cultures and policies shape women's participation in national workforces, sectoral cultures and practices also play a significant role. Today's leaders have inherited company and industry cultures in which women participate to varying degrees. Across all industries, women's workforce participation at junior, middle and senior levels is dramatically different. Projecting their figures for 2020, companies expect some improvement, spread unevenly across different industries. However, across all industries there is a narrowing female talent pipeline heading towards senior management. Having invested in women as they enter in junior positions, employers appear to frequently lose their investment by failing to retain talent up the ladder (Table 13).

On average, responding CHROs predict that the gender composition of today's junior roles will be reflected in 2020's mid-level roles, and that the gender breakdown of today's mid-level roles will similarly carry through to 2020's senior roles. Across industries, there are expectations of a 7 to 9 percentage point increase in the share of women in mid-level roles by 2020 and an 8 to 13 percentage point increase in senior roles. This suggests an expectation that the workforce strategies employed to promote gender parity will be successful in retaining and promoting the majority of incoming female talent, against past experience.

The projections for industries' gender composition for senior, middle and junior roles in 2020 build on varying proportions today. Four industries—Basic and Infrastructure, Energy, Mobility and Information and Communication Technology—currently report a particularly low overall female workforce participation: 16%, 19%, 19% and 24%, respectively (Table 12). Additionally, these industries also

Figure 16: Gender wage gap and women's participation, by industry



Source: Future of Jobs Survey, World Economic Forum.

report a more dramatic drop off of female employees between junior and senior level positions. In Information and Communication Technology, women currently make up 11% of senior level roles and 32% of junior level roles. Low intake of women at the junior level translates to similar underperformance later in the pipeline.

Industries that have a comparatively high proportion of women in junior positions include: Financial Services & Investors, Healthcare, Media, Entertainment and Information and Consumer. Conversely, the Information and Communication Technology, Mobility, Energy, and Basic and Infrastructure sectors recruit fewer women into junior positions. While employers in the Basic and Infrastructure industry currently recruit a mere 22% women as part of their junior level staff, employers project that they will, on average, expand that figure to 29% in 2020. Fulfilling that prediction would see the Energy sector become the industry with the lowest proportion of women in entry level roles by 2020. However, following current predictions, Basic and Infrastructure will still remain the industry with the worst gender balance in senior roles.

These numbers reveal that companies are focusing primarily on progressing women through the pipeline to avoid losing already developed or developing talent. Few industries are targeting strong increases when it comes to hiring women into junior and entry level roles. Employers in the Healthcare and Basic and Infrastructure industries are targeting a 7 percentage point increase. Mobility employers expect to improve their initial intake by 5 percentage points. The least ambitious targets for junior level hiring are in Financial Services & Investors, Media, Entertainment and Information and Information and Communication Technology. Financial Services & Investors companies report high junior level recruitment—around 43% of their workforce at this level is female. On the other hand, Information and Communication Technology reports a 10% lower share of junior recruits, making the proportion of women at entry level 34%.

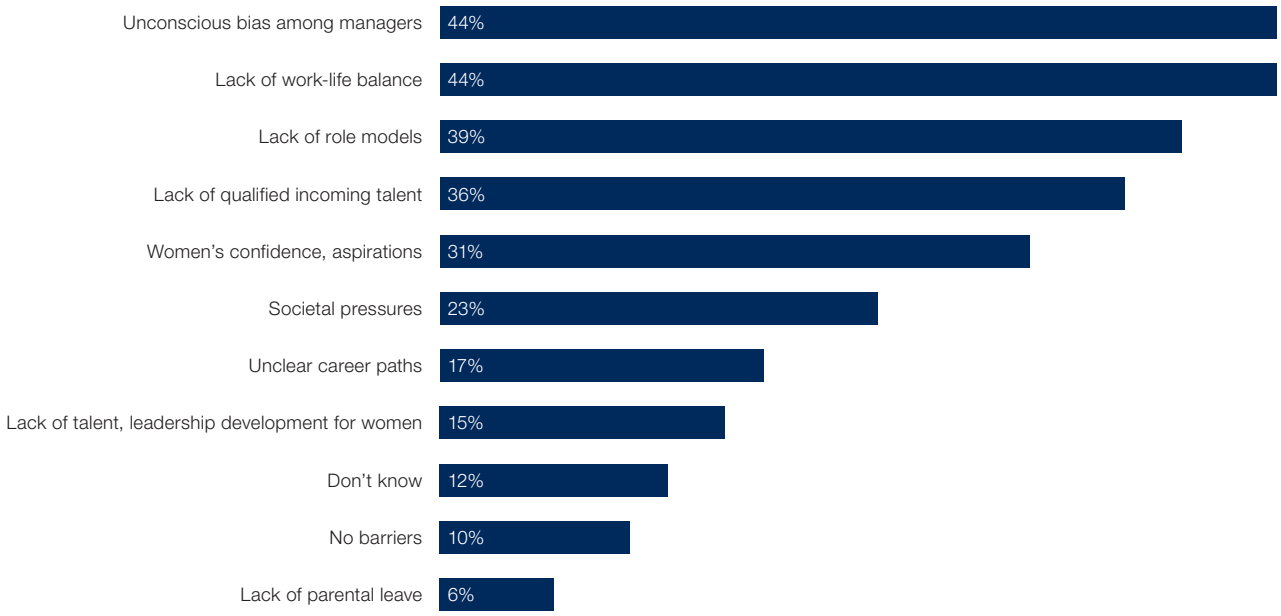
The gender balance of women on boards is similar or better to the proportion of women in senior roles. At the CEO level, however, women remain profoundly under-represented. The breakdown of women in line and staff roles highlights some of the barriers to top level positions. Women are under-represented in line roles in Mobility, Information and Communication Technology, Energy and Basic and Infrastructure, with line roles more likely to equip women with the skills and experience that would prepare them for senior positions. On average, the Mobility, Information and Communication Technology and Media, Entertainment and Information sectors are expecting to close the gap in women's line and staff role participation by 4 to 6 percentage points over the 2015-2020 period.

Overall, the figures paint a challenging picture. Across all industries, companies reported that they found women harder to recruit. The reported ease (or in this case, difficulty) of recruiting women is directly proportional to the existing gender composition of the industry. Persistent gender wage gaps are reported across all industries, even in industries where female participation is comparatively high (See Table 14 and Figure 16). The highest share of respondents stating that there was a wage gap in their industry is in the Consumer sector (49%), followed by Mobility, Financial Services & Investors and Basic and Infrastructure. That is, gender wage gaps are not always directly symmetrical to the magnitude of women's participation in the respective industry.

BARRIERS TO CHANGE

Our respondents' views concerning the barriers to women's workforce participation vary by industry and often reflect different industry cultures in addition to overarching economic and societal factors. Among overarching factors,

Figure 17: Significance of barriers to gender parity, industries overall
Share of respondents reporting barrier, %



Source: Future of Jobs Survey, World Economic Forum.
Note: Names of barriers have been abbreviated to ensure legibility.

the ones most visible through the data are the dual burden of caregiving and breadwinning, unconscious biases, traditional organizational practices in the workplace, a lack of role models, confidence, and the traditional divide between women and men in STEM education.

Women have traditionally played a larger role in the private sphere as caregivers. Today, women still on average perform a much larger share of unpaid work across countries around the world—from routine housework to childcare, the value of this labour amounts to more than 20% of GDP across most OECD countries.[27] Many employers thus believe lack of work-life balance is a key deterrent to women's participation at work. This factor thus appears to influence all industries.

While in nearly all industries and geographies there has been a marked shift away from deliberate exclusion of women from the workplace, there continue to be cultural beliefs that lead to unconscious biases. This includes perceptions that successful, competent women are less "nice"; that strong performance by women is due to hard work rather than skills; and assumptions that women are less committed to their careers.[28] In addition, especially in well-established, older organizations, workplace structures that were designed for a past era still, often unwittingly, favour men. Additionally, women's historically low participation in the labour market means they have relatively fewer role models to look towards across all industries. Research from the US, UK and Germany suggests that women have a poor perception of senior roles and lack a clear line of sight as to how senior leadership positions might help them achieve their objectives, lacking role models who can reveal the trade-offs and benefits they bring.[29] Women's confidence and aspirations are seen as another barrier. Women are less likely to want a top job—citing the stress or pressure of the role as a deterrent.[30] An often cited barrier is a lack of qualified incoming female talent in specific fields, especially in STEM education, where women currently make up only 32% graduates across the world.[31] Finally, where each industry stands specifically is often affected by how recently an industry has improved its gender balance. Given that career choices are disproportionately affected by prior experience and bias, traditionally male dominated professions often find it difficult to attract women.

Across all industries, unconscious bias among managers and lack of work-life balance are cited as the two top barriers to women's workforce integration over the 2015–2020 period. The proportion of employers reporting these two factors as their main concern is equal—44% for each. Around 36% of respondents also voiced a concern about the availability of qualified talent, in particular employers in the Energy, Information and Communication Technology and Mobility industries. This is reflected in their low estimate of the current share of female junior staff, at 24%, 32% and 28%, respectively (Figure 17). The Information and Communication Technology industry sees this issue as their main barrier to a more gender balanced workforce. Basic and Infrastructure has a similarly low number of female junior staff, but there is less emphasis by respondents on incoming talent qualification, with unconscious bias by managers instead cited as the top concern. Financial Services & Investors and Professional Services place more emphasis on women's own aspirations as a barrier, with Professional Services seeing it as the

Table 15: Significance of barriers to gender parity, by industry
Share of respondents reporting barrier, %

Barrier	BAS	CON	EN	FS	HE	ICT	MEI	MOB	PS	OVERALL
Unconscious bias among managers	50	55	70	37	50	47	46	33	42	**44**
Lack of work-life balance	42	70	30	53	20	47	54	54	42	**44**
Lack of role models	44	40	55	47	50	37	31	50	31	**39**
Lack of qualified incoming talent	33	15	60	20	40	57	15	63	36	**36**
Women's confidence, aspirations	28	30	10	43	10	37	31	29	50	**31**
Societal pressures	22	25	25	17	20	17	15	33	39	**23**
Unclear career paths	31	30	5	20	10	20	23	4	14	**17**
Lack of talent, leadership development for women	17	0	10	23	20	27	8	13	14	**15**
Don't know	6	20	15	13	30	7	31	4	17	**12**
No barriers	6	10	15	13	20	7	23	4	14	**10**
Lack of parental leave	17	5	0	7	20	0	0	13	0	**6**
No strategy	0	0	0	3	0	0	0	0	0	**0**

Source: Future of Jobs Survey, World Economic Forum.
Note: Names of barriers have been abbreviated to ensure legibility.

main limiting factor for promoting women's talent. Lack of work-life balance is perceived as a particular barrier in the Consumer and Financial Services & Investors industries. By contrast, few sectors cited lack of parental leave as an issue (Table 15).

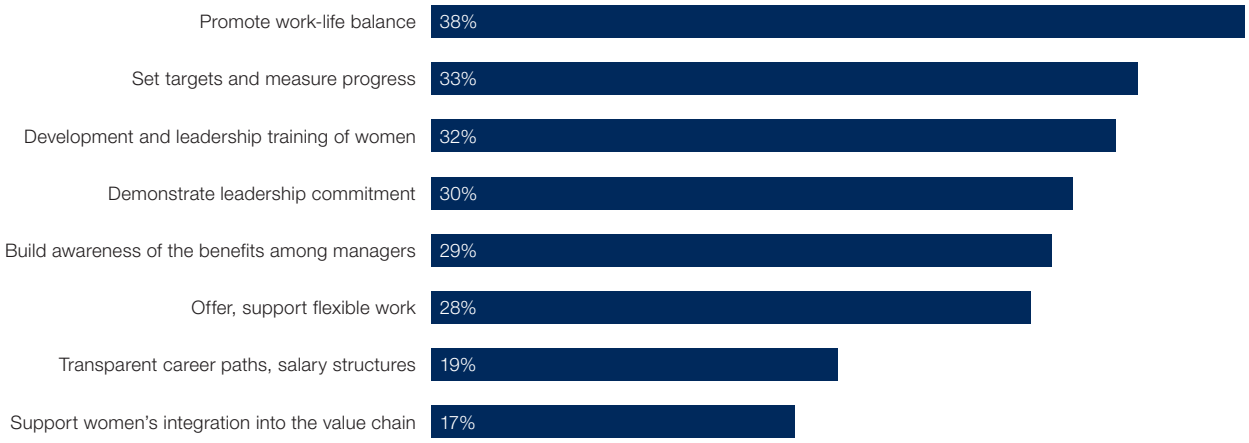
WOMEN AND WORK IN THE FOURTH INDUSTRIAL REVOLUTION

As the Fourth Industrial Revolution takes hold in different industries and job families, it will affect female and male workers and the dynamics of the industry gender gap in manifold ways. By their very nature, many of the current expected drivers of change have the potential to enable the narrowing of industry gender gaps. Household work could be further automated, relieving some of the current dual burden and allowing women to put their skills to use in the formal economy. Changes to what have traditionally been men's roles in the workforce will also reshape the division of labour at home. Similarly, many respondents and industry observers agree on the need to rethink work, taking a holistic approach to workforce planning. Shaping the new and emerging landscape of flexible working presents an unprecedented opportunity to rebalance the gender divide, for example by providing companies with a chance to explore results-driven rather than presence-driven role evaluation. Harnessed well, the emergence of new flexible working patterns and other similar trends could result in a more gender balanced workplace.[32]

However, as disruptive change is coming to business models, jobs are displaced and a new labour market materializes out of the vestiges of the old, there is also a risk that these trends and drivers of change might sustain or worsen other existing gendered inequalities.[33] At the declining end of the labour market, the drivers of change identified by our respondents will heavily disrupt some of the job families with the largest share of female employees, such as Office and Administrative roles, but also some of those with the largest traditional gender gap, such as Manufacturing and Production. From a net employment outlook perspective—by simply translating job families' reported current gender composition (Table 14) to the expected absolute job gains and losses over the 2015–2020 period calculated in the previous chapter (Figure 6)—we find that the burden of expected job losses due to disruptive change falls almost equally on women and men: 2.45 million (48%) of the expected total net job loss of 5.1 million falls on women, 2.65 million (52%) of it on men.

That, in itself, indicates widening gender gaps in the workforce, as women make up a smaller share of the overall labour force. In absolute terms, men will face nearly 4 million job losses and 1.4 million gains, approximately one job gained for every three jobs lost, whereas women will face 3 million job losses and only 0.55 million gains, more than five jobs lost for every job gained. On current trends and predictions, men will lose more than 1.7 million jobs across the Manufacturing and Production and Construction and Extraction job families, but are set to gain over 600,000 jobs in Architecture and Engineering and Computer and Mathematical functions. Women will only lose 0.37 million jobs in these two male-dominated job families but are set to gain little more than 100,000 jobs in Architecture and Engineering and Computer and Mathematical functions if current gender gap ratios persist over the 2015–2020 period—nearly one new STEM job per four jobs lost for

Figure 18: Significance of strategies for women's workforce integration, industries overall
Share of respondents pursuing strategy, %



Source: Future of Jobs Survey, World Economic Forum.
Note: Names of strategies have been abbreviated to ensure legibility.

men, but only one new STEM job per 20 jobs lost for women.

The conclusion is clear. If current industry gender gap trends persist and labour market transformation towards new and emerging roles in computer, technology and engineering-related fields continues to outpace the rate at which women are currently entering those types of jobs, women are at risk of losing out on tomorrow's best job opportunities while aggravating hiring processes for companies due to a restricted applicant pool and reducing the diversity dividend within the company.

However—while substantially more effort will be needed—our data contains some encouraging signs that current trends need *not* continue. As traditionally male-dominated job families take on newfound importance and applications in industries that previously housed few such roles but have a strong track record of employing, retaining and leveraging female talent, the current culture may drive future recruitment efforts in new roles. However more deliberate efforts will also be needed to meet talent needs and address gender gaps. As demand for talent in Architecture and Engineering and Computer and Mathematical fields—with poor gender balance—grows, governments, individuals and companies will need to ensure that the full talent pool of men and women is educated, recruited and promoted.

APPROACHES TO LEVERAGING FEMALE TALENT

The *Report's* findings confirm that targeting female talent is a strategy that is particularly characteristic of those companies that prioritize future workforce planning and change management and that are confident that they are on the right track in their approach to preparing for impending disruptive change.

In order to leverage the benefits of gender diversity, companies need to take a holistic approach, starting at the top. Actively managing talent rather than passive commitment has been shown to lead to better returns. While some of the transformations in corporate practices and public policies will entail adaptation in the short term by families, companies and the public sector, in the long term, the subsequent expansion of opportunities for women has the potential to transform the economies, societies and demographics of countries as a whole.

It is important to emphasize that these interventions do not work as a checklist of actions that will each independently produce results. Flexibility in the workplace is, alone, not enough to guarantee improving gender equality. It must be accompanied by a holistic set of priorities and long-term commitments, and by a deep understanding of the corporate, industry, and cultural context, as well as the organizational culture and local policy environment.

The World Economic Forum's online *Repository of Successful Practices for Gender Parity* pools information on the practices that have been successfully used in leading companies worldwide to close gender gaps at the company level, as well as along the companies' supply chain and surrounding communities.[34] The repository suggests six dimensions around which to focus an organization's gender parity efforts.

- ***Measurement and target setting:*** Achievable, relevant recruitment and retention targets at all levels, with an embedded accountability mechanism, are critical. Developing a disaggregated database can help to evaluate the causes of gender imbalances and track progress. Transparent salary bands to track and address male and female salary gaps are additional useful tools to understand the status quo in organizations.
- ***Mentorship and training:*** Companies have benefitted from programmes that promote guidelines on the value of diversity as an underlying culture of the organization, and impart knowledge on how to manage a more diverse workforce and how to attract, retain and promote female talent. These training programmes, for both men and women, can be relevant for shaping an environment within the broader employee base for women to successfully lead. In addition, many

Table 16: Significance of strategies for women's workforce integration, by industry
Share of respondents pursuing strategy, %

Strategies	BAS	CON	EN	FS	HE	ICT	MEI	MOB	PS	OVERALL
Promote work-life balance	32	50	15	43	10	40	46	63	47	**38**
Set targets and measure progress	46	30	40	33	50	37	23	21	36	**33**
Development and leadership training of women	35	45	35	30	30	33	23	42	31	**32**
Demonstrate leadership commitment	27	25	45	37	30	30	15	29	36	**30**
Build awareness of the benefits among managers	41	40	30	20	40	33	31	25	25	**29**
Offer, support flexible work	24	25	25	43	40	30	31	17	36	**28**
Transparent career paths, salary structures	5	30	25	23	0	37	23	29	8	**19**
Support women's integration into the value chain	11	25	25	17	30	20	15	21	14	**17**
Don't know	19	10	10	13	20	10	23	13	17	**14**
No strategy	22	5	15	20	10	7	15	8	14	**13**
Create incentives and accountability	8	0	0	7	10	3	15	8	3	**5**
Subsidize childcare	3	0	10	7	0	3	0	13	8	**5**
Offer parental leave	3	0	0	3	20	10	8	4	6	**5**
Promote gender parity through customer outreach	3	10	5	3	0	0	15	0	3	**3**
Support parents' reintegration after leave	3	0	5	0	0	3	0	4	8	**3**
Philanthropic and social responsibility efforts	0	0	10	0	0	3	0	4	3	**2**
Subsidize eldercare	0	0	0	0	0	0	0	0	3	**0**

Source: Future of Jobs Survey, World Economic Forum.
Note: Names of strategies have been abbreviated to ensure legibility.

companies have formal mentoring schemes for women seeking leadership positions, although they also find that high-potential women lack the sponsorship and tailored training needed to move into the executive ranks. A repositioning of the human resources function beyond a focus on systems and administration to talent development and training can help address specific roadblocks for women, in addition to better overall talent management.

- ***Awareness and accountability:*** The focus of many companies on building awareness indicates that the case for change still needs to be built to make progress. Accountability of the senior management and transparency of career paths and opportunities have proven to be effective practices. Ensuring that management policies, processes, systems and tools do not harbour gender-based discrimination, as well as enhancing the understanding of unconscious biases can, also make inclusive leadership more tangible.
- ***Work environment and work-life balance:*** Women are often the primary caregiver for both children and the elderly in most countries. Ensuring smooth on- and off-ramping and appropriate childcare options, and developing guidelines on implementation of work-life balance policies and mentoring for women going through a transition are important levers to ensure a sustained career progression towards management. For those companies that already offer parental leave, flexible working hours and other work-life balance programmes, the next steps lie in accelerating their use and acceptance by female and male employees.
- ***Leadership and company commitment:*** Visible leadership by the chief executive and top management on supporting women in management has proven to be one of the most important levers for progress in achieving gender diversity in a corporate context. This includes concrete and symbolic actions by top management and, in many cases, establishment of a position or department to lead diversity efforts. Regular communications by senior management on gender equality have been found to be critical.
- ***Responsibility beyond the office:*** Many companies have leveraged the opportunity to exercise external influence along the value chain, including diversity

Box 3: Anticipating the Future of Jobs: Human Capital and Gender Parity in the Oil and Gas Industry

In many industries there is a growing scope for collaboration rather than competition to address talent challenges. For example, several human capital challenges in the Oil and Gas sector are directly linked to the cyclical nature of the industry and others, primarily those that affect long-term horizons, are associated with a shortage of qualified employees, a lack of experienced mid-tenure employees, and the need to foster technological innovation. Over this long-term context, the Oil and Gas industry broadly faces obstacles in recruiting work-ready technical engineers and in developing, attracting and retaining female talent. In order to continue to serve the world's growing energy needs while improving opportunities for youth in emerging markets and for women, leaders of the Oil and Gas community aim to address these challenges collectively.

Given the long-term talent needs and skills gaps in the industry, the Forum's industry project in this space aims to develop demand-driven criteria for educational institutions working with leading companies in the sector. The first objective is to produce an industry-endorsed standard curriculum that aims at bridging the gap in training of petroleum engineers across geographies. The curriculum focuses on engineering fundamental knowledge such as mathematics and geology but also non-engineering skills such as project management, finance and communication. In order to prioritize certain regions or countries, the Future of Jobs project's insights will be used to identify critical skills gaps based on industry needs. The World Economic Forum will then play a facilitator role bringing together the industry and relevant universities and ministries in order to move forward the common dialogue.

The Forum's analysis illustrates that the Oil and Gas industry, despite on-going efforts in the field of diversity and inclusion, continues to miss out on the diversity dividend, with participation of women in the workforce still lagging behind other major industries. In order to increase efforts to tackle these persistent gender gaps along the Oil and Gas talent pipeline, major players from the industry are also coming together to collectively address contextual and industry-specific factors contributing to these gaps. Alongside a straightforward desire from many in the sector to create a more diverse workforce, interviews with Oil and Gas executives suggest they also believe that taking advantage of this huge potential talent pool is a critical business objective. Skills gaps and the looming retirement of experienced engineers and technical talent currently present in the Oil and Gas workforce mean that companies need increasingly to look elsewhere to find the talent and knowledge they require.

The group looked specifically at data on gender gaps at junior, middle, senior, board and CEO levels. A Call to Action is currently being developed that aims to state the group's vision and demonstrate the practices major players' will undertake to advance gender parity. The declaration includes a set of guiding principles that will underpin the industry's efforts on gender parity, such as: ensuring visible leadership on gender parity and company commitment at all levels; promoting gender sensitive recruitment, retention and promotion policies and setting challenging but achievable goals for gender diversity. This Call to Action will also serve as a platform to help Oil and Gas business leaders, their companies, owners and shareholders around the world address the factors contributing to the gender gap. Members of the Oil and Gas community also encourage companies to share best practices, creating an opportunity to learn from and build upon successful interventions for the benefit of the entire industry. This pilot project points to collaborative mechanisms that can be applied across other industries, in partnership with governments and educational institutions.

training for suppliers, distributors and partners and training to support women-owned businesses in the organization's value chain. External influence can also be exercised by ensuring gender neutrality in advertising, engaging girls and young women to display possible career paths and developing partnerships with gender parity-focused civil society and public sector initiatives.

Beyond individual company practices and challenges, it is clear that there are specific and common gender gap challenges within industries. This is thus an area ripe for intra-industry collaboration and for improved public-private collaboration, to balance both public and business interest. Such collaborations and partnerships are currently relatively rare but there are emerging experiments that indicate the greater efficiency for business and improved societal outcomes are possible through such approaches.

The moral case for gender equality has, in the most part, been won. The business and economic case is also increasingly understood. The Fourth Industrial Revolution now presents an unprecedented opportunity to place women's equal participation in the workplace at the heart of preparations for the shifts to come.

Endnotes

1 McLeod, Scott and Karl Fisch, "Shift Happens", https://shifthappens.wikispaces.com.

2 The structure of our survey means the base sample—the unique data points that can be used for our analysis—commonly refers to these 1,346 occupation-level responses, although in some cases it is restricted to the 371 company-level responses. For details on our survey design, or any of the other points discussed in this section, please refer to *Appendix A: Report Methodology.*

3 Please refer to: www.onetonline.org.

4 See Autor, D., 2013.

5 A recent World Economic Forum report, in collaboration with the Global Agenda Council on the Future of Software and Society, found that a significant number of disruptive technological changes are expected to reach a-in the early years of the next decade, with the earliest expected to fully take hold by 2018 and the latest by 2027 (see: "Deep Shift: Technology Tipping Points and Societal Impact").

6 See, for example: Pew Research Centre, *Key Insights: Expert Views on Artificial Intelligence, Robotics, and the Future of Jobs,* 2014.

7 Estimated employment effects have been converted into compound growth rates for the 2015–2020 period, i.e. the mean growth rate over the specified period of time if employment had grown or declined at a steady rate, which is unlikely to be the pattern observed in reality. A compound growth rate can be thought of as a way to smooth out a rate of change so that it may be more easily understood (for details, see *Appendix A: Report Methodology*).

8 For details of our net employment estimation, please see *Appendix A: Report Methodology.*

9 Source: International Labour Organization, *World Employment and Social Outlook - Trends 2015,* www.ilo.org/global/about-the-ilo/newsroom/news/WCMS_336884/lang--en/index.htm.

10 For a fuller discussion of the coverage and representativeness of our perception survey-based data, please refer to *Appendix A: Report Methodology.*

11 See, for example: Chui, Michael, James Manyika and Mehdi Miremadi, "Four fundamentals of workplace automation," *McKinsey Quarterly,* November 2015; and Cognizant, *The Robot and I: How New Digital Technologies Are Making Smart People and Businesses Smarter by Automating Rote Work,* Cognizant Center for the Future of Work, 2015.

12 See: Infosys, *Amplifying human potential: Education and skills for the fourth industrial revolution,* 2016.

13 McLeod, Scott and Karl Fisch, "Shift Happens", https://shifthappens.wikispaces.com.

14 Bessen, James, "Employers Aren't Just Whining – the "Skills Gap" Is Real", *Harvard Business Review,* 14 August 25, https://hbr.org/2014/08/employers-arent-just-whining-the-skills-gap-is-real.

15 Our empirical analysis of the O*NET Content Model found that the core skill set of most occupations consists of a range of combinations of these 35 core skills and abilities, in addition to occupation-specific specialist knowledge. Note that, unlike for occupations, a widely agreed or internationally comparable definition or taxonomy of the term 'skills' does not exist (see, for example: European Training Foundation *Anticipating and Matching Skills Demand and Supply: Synthesis of National Reports,* 2012). For details of the *Report's* adaption of O*NET's work-relevant core skills please refer to *Appendix A: Report Methodology.*

16 For details of the methodology used in this section, please refer to *Appendix A.*

17 Also see: World Economic Forum and the Global Agenda Council on Employment, *Matching Skills and Labour Market Needs: Building Social Partnerships for Better Skills and Better Jobs, 2014.*

18 See: ManpowerGroup, *Teachable Fit: A New Approach to Easing the Talent Mismatch,* 2010, http://www.manpowergroup.com/sustainability/teachable-fit-inside.html.

19 See: World Economic Forum and the Global Agenda Council on Employment, *Matching Skills and Labour Market Needs: Building Social Partnerships for Better Skills and Better Jobs, 2014.*

20 See: Gvaramadze, 2010, and Voss, 2009.

21 See: World Economic Forum, *Disrupting Unemployment: Business-led Solutions for Action, 2015.*

22 World Economic Forum, *Global Gender Gap Report, 2015.*

23 See, for example: Page, S., *The Difference: How the Power of Diversity Creates Better Groups, Firms, Schools, and Societies, 2007.*

24 See, for example: Deloitte, *Global Human Capital Trends 2014: Engaging the 21st Century Workforce, 2014.* However, the kind of diversity women bring to teams today and in the future can be debated. Existing research suggests women are seen as more collaborative and flexible, while men are more results-orientated and have more invested in topic expertise. These characteristics mirror the roles that are socially encouraged for men and women today. It might be misplaced to infer flexibility and team cohesion are the indefinite quality to women's contribution to the diversity of opinions; it might be that when traditional workplace roles for men and women are disrupted, current polarizations cease to hold true.

25 Department for Business, Innovation and Skills, *Women on Boards, 2011.*

26 See: Catalyst, *Buying Power: Global Women, 2015,* www.catalyst.org/knowledge/buying-power-global-women, and Silverstein, M. and K. Sayre, "The Female Economy", *Harvard Business Review,* September 2009.

27 OECD, "Cooking and Caring, Building and Repairing: Unpaid Work around the World", in *Society at a Glance 2011: OECD Social Indicators,* 2011.

28 McKinsey & Company, *Women in the Workplace,* 2015.

29 Centre for Talent Innovation, *Women Want Five Things,* 2014.

30 Ibid.

31 Source: UNESCO Institute for Statistics (UIS) database (September 2015); calculated from percentage of tertiary-level STEM graduates (female, male).

32 See: Mercer, *When Women Thrive Businesses Thrive,* 2014.

33 Voss, G., "The Second Shift in the Second Machine Age: Automation, Gender and the Future of Work", in *Our Work Here is Done: Visions of a Robot Economy,* NESTA, 2014.

34 See: www.weforum.org/gender-parity/closing-gender-gap.

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Appendix A: Report Methodology

RESEARCH FRAMEWORK AND SURVEY DESIGN

The analysis that forms the basis of this *Report* is the result of an extensive survey of Chief Human Resources and Chief Strategy Officers of leading global employers, and consists of four interrelated parts, providing a uniquely flexible dataset that can be recombined in various ways to obtain further specific insights into relevant dimensions of interest (see Figure A1).

The aim of our survey was to understand as comprehensively as possible expectations regarding the future of jobs, work and skills by the largest employers in some of the world's biggest economies, in order to ultimately contribute to a more informed debate on these issues and provide an evidence base and guidance to businesses, governments and civil society organizations such as labour unions and education providers.

As a starting point, we designed a survey targeted at heads of human resources departments, as well as chief strategy officers, as these are likely to hold the most detailed information on corporate policies and strategic workforce planning in light of current industry trends and disruptions. Our research framework has been informed by an extensive literature review on the various dimensions covered by the survey and by continuous consultation with leading experts from academia, international organizations, business and civil society through the World Economic Forum's Global Agenda Council on the Future of Jobs and Global Agenda Council on Gender Parity, which served as partners and advisory bodies to the study.

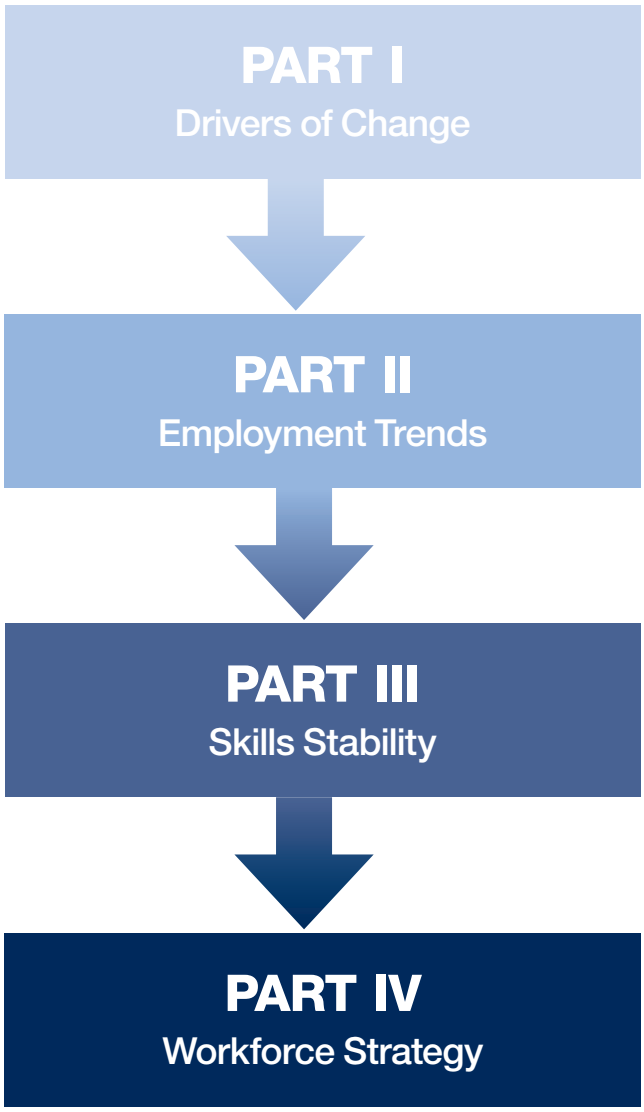
The survey collection process was carried out via online questionnaire in the first half of 2015, whereby the World Economic Forum's Employment and Gender Challenge Initiative teams worked in close collaboration with Global Agenda Council Members, Global Challenge Partners and the Forum's industry and regional teams to ensure a maximum number of responses from target companies.

The World Economic Forum team, supported by Global Agenda Council Members, used the Hoovers and Bloomberg company databases to identify target companies and compile an extensive database of contact details of human resources department directors. For target companies for which we were not able to obtain contact information, Global Agenda Council Members carried out their own research to complete the database.

Our pool of respondents comprised, as primary selection criterion, the 100 largest global employers in each target industry sector (as classified by the World Economic Forum; see Appendix B, Table B1), supplemented, as a secondary criterion, by the 50 largest national employers in each of our target countries (see target country list in Appendix B, Table B2), if these were not already included as part of the first group.[1] This approach was chosen in order to ensure sufficient geographic diversity and coverage to be able to provide balanced country-level as well as industry-level results. Furthermore, a number of leading, fast-growing small and medium-sized companies were identified qualitatively through the World Economic Forum network and included in the survey pool to account for significant future job creators and 'disruptors. In total, our target survey pool consisted of 2,450 companies.

In various instances the largest employers in a country comprised the local units of well-known multinational enterprises, meaning that our survey approach entailed

Figure A1 : Survey Framework



obtaining results from these companies both at a global, headquarter-level and from one or more of their national operations. When looking at results through a country lens, this approach was considered the most appropriate given the importance of many of these large employers in their respective local labour markets. However, when looking at results through an industry lens, it was important to avoid skewing results by double counting responses from local units of the same company. We addressed this complexity through our survey design, by asking respondents to clearly associate all employment and occupation-related responses to a specific geography.

In total, 371 individual companies responded to our survey over the first half of 2015, providing us with 1,346 unique data points around employment and occupations based in specific geographic locations across these companies' global operations. As outlined, the structure of our survey means that the sampling unit and base sample—the unique data points that can be used for most of our analysis—commonly refer to these 1,346 occupation-level responses; although in some cases, such as when looking at results through an overall industry lens, it is restricted to the 371 company-level responses to avoid double counting.

In light of the above, companies were required to provide their name as well as the title and contact information of the person filling in the survey. Respondents were assured of strict confidentiality of their data at the level of individual company-level results. In addition, participating companies were given the option to be informed of their individual results relative to the range of responses in their country and/or industry.

Our initial target list of countries comprised the three largest economies, by either GDP or population, in every world region. In addition, through industry networks, the survey was carried out in companies based in other non-targeted countries. To ensure quality of results, only countries with a critical mass of responses have been included in the final *Report.* Our threshold for inclusion was a minimum of 30 unique data points per country. Countries in our original target list for which we were unable to obtain a representative sample include Argentina, Colombia, Russian Federation, Republic of Korea, Egypt and Nigeria. In addition, due to an insufficient number of individual country-level responses, we have aggregated responses for a number of significant economies into two broader regional groupings: the Association of South East Asian Nations (ASEAN), combining results for Indonesia, Malaysia, Thailand and Singapore; and the Gulf Cooperation Council (GCC), combining results for Kuwait, Qatar, Saudi Arabia and the United Arab Emirates.

The difficulty of obtaining responses from some geographies despite the dedicated work and support of Global Agenda Council Members and the Forum's industry and regional teams appears to stem from a variety of causes, including sensitivity around the topic, concerns about confidentiality and business culture norms.

There was near gender balance (54% female, 46% male) among the Chief Human Resources Officers and other senior executives who answered the survey.

Interpretation of Results: Sample Coverage and Representativeness

Overall, our survey sample represents more than 13 million employees across nine industry sectors (Financial Services & Investors; Information and Communication Technology; Energy; Basic and Infrastructure; Mobility; Consumer; Healthcare; Media, Entertainment and Information; and Professional Services) in 13 major developed and emerging economies (Australia, Brazil, China, France, Germany, India, Italy, Japan, Mexico, South Africa, Turkey, United Kingdom, United States) and two broader regional groupings, ASEAN (combining results for Indonesia, Malaysia, Singapore, Thailand) and the GCC (combining results for Kuwait, Qatar, Saudi Arabia, and the United Arab Emirates).

In line with the *Report's* overall aim of contributing to a more informed conversation on the future of jobs and providing guidance to businesses, governments and civil society organizations, the survey largely consisted of *perception-based questions,* with response options designed to focus on the key issues outcomes and trends as perceived by decision-makers. In addition there were a number of quantitative baseline questions. That is, our study is designed to reveal what the world's leading employers *think will happen, when* they think it will happen, and *what* they propose to do about it. While, between them, the expectations and corporate practices of the leading employers represented in our sample will significantly shape the future global employment landscape, it should be stated explicitly that our trend data hopes to be roughly right rather than precisely wrong. Similarly, in highlighting companies' current thinking concerning intended change management and future workforce strategies, the *Report* aims to point to potential shortcomings and inconsistencies as a basis for further, more informed debate, rather than offering these as ready-made good practice solutions.

In taking this perspective, the *Report* consciously focuses on actors with a key role in shaping the evolution of the global labour market. While only a minority of the world's workforce is directly employed by large and emerging multinational employers such as the ones covered by our sample, these companies often act as anchors for smaller local firms, as suppliers within global value chains and as catalysts for the development of local entrepreneurship ecosystems. In addition to their own significant share of employment, workforce-planning decisions by these firms therefore have the potential to transform local labour markets through indirect employment effects that set the pace for changing skills and occupational requirements. Similarly, the inclusion of medium-sized high-growth enterprises in our sample ensures representation of the category of companies generally considered the largest source of new net job creation in most economies.[2]

Nevertheless, given the *Report's* aim of providing guidance and stimulating discussion, it is important to treat with caution the extent to which it is possible to generalize and extrapolate from our findings in a manner that could be considered representative of all trends across an entire industry or country.

Representativeness at the country level

As a first important caveat, our survey only covers wage employment jobs in the formal economy, whereas the majority of the workforce in some developing countries may be based in agriculture or in the informal sector. According to the World Bank, roughly half of the world's working population of more than 3 billion people are small farmers or self-employed in low productivity activities such as street vending, limiting our findings' applicability in these contexts.

It should be noted, however, that many informal sector jobs are also subject to dramatic change due to the same drivers of change, trends and disruptions affecting those based in large established firms. For example, the increasing ubiquity of mobile phones in developing countries has led to a mobile payments revolution, whereby a large range of informal sector transactions are now taking place via such platforms. Similarly, several technological trends hold out the promise of integrating an increasing number of informal sector workers into the global labour market in unprecedented ways, including by formally linking them to large established employers.[3]

A second consideration regarding representativeness of our results at the country level concerns the question of what percentage of the formal sector labour force is employed in large firms such as the ones in our sample. The available data suggests that, in general, fewer people in lower income countries are employed in large firms, limiting the generalizability of findings in these countries.[4]

In summary, the *Report's* survey design seems well-suited to the target countries studied, namely: developed economies and large emerging markets, with certain caveats on generalizability for the latter. It seems less applicable for extrapolating results directly for developing economies not covered by the survey, although we believe our findings may provide valuable information for long-term human capital development strategies in these countries.

More broadly, the *Report* focuses on two types of job categories in any particular country, rather than on the entirety of the national labour market as a whole: firstly, on mass employment jobs currently held by a large share of the labour force in that country; secondly, on strategic or specialist jobs that are critical to a company's operations and may link the country to the worldwide network of international production and global value chains. The first category takes its significance from the number of employees directly affected; the second category provides an outlook primarily on high-skilled jobs, often including those with a particular bearing on opportunities and threats for the country's positioning within the global economy.

Representativeness at the industry level

The main questions regarding representativeness of our findings at the industry level concern the extent to which the large employers in our sample are representative of a typical company in their industry sector as a whole, and, therefore, what percentage of the industry's workforce is employed in companies such as the ones covered by our survey. Available data shows, for example, that there are systematic differences between larger and smaller firms with regard to the amount of in-house training and skills upgrading they are offering, so our analysis of future workforce strategies will be more applicable to industry sectors with a larger share of employment in large firms.

Economic theory suggests that (in a competitive market, i.e. leaving aside monopolies, cartels and regulatory policies) firm size distribution in an industry is mostly the result of underlying structural factors—for example, some goods and services are naturally better produced in large firms; others, in smaller ones.[5]

A good approximation of the prevalence of employment in large firms in an industry is the degree of industry concentration, as measured by indicators such as the Herfindahl index[6] and the concentration ratio[7], which calculates the share in total industry output of the industry's five largest firms. Total output and gross value added in a number of industries—such as Energy, Mining and Metals, and Information and Communication Technology—are highly concentrated in a handful of large companies with tens of thousands of employees each. These large companies included in our sample account for a very large share of total employment in their industries.

For some other industries, our sample population is more representative of the industry's leading employers, rather than of the industry's total workforce as a whole. Overall, because of the differences between large enterprises and small and medium-sized ones, especially when it comes to talent management and HR strategies, it is clear that our findings are mainly applicable to larger firms—the biggest employers in each industry in particular.

A second consideration regarding representativeness of our results at the industry level concerns cross-country differences in public and private ownership. Our survey was designed to be applicable to workforces in both sectors. However, to date we have been able to obtain a critical mass of responses only from state-owned enterprises, not from public sector employers such as government departments. This caveat affected our sample selection particularly in industry sectors such as healthcare and education, which are public in some countries and partly or wholly private in others, since business databases such as Hoovers and Bloomberg do not cover entities such as public hospitals. These are a major source of employment in many countries and are undergoing similar workforce challenges and transformations as private sector companies. Given sufficient interest from these constituents, we envisage a follow-up project to the present *Report* for public sector employees, covering not only the public sector but also civil society and international organisations as a distinct industry sector.

Finally, a methodologically interesting question is the extent to which the identified trends and disruptions might themselves affect the validity of our conclusions regarding representativeness, for example by changing industry concentrations and structures through drivers of change such as 3D printing and sharing economy platforms.[8] In general, while many of these trends point to a rise in importance of freelance work and contractors, evidence suggests that much of this work will continue

Table A1: Definition of core work-related skills, based on the O*NET Content Model

Skill/ability family	Skill/ability	Definition
ABILITIES		
Cognitive Abilities	Cognitive Flexibility	The ability to generate or use different sets of rules for combining or grouping things in different ways.
	Creativity	The ability to come up with unusual or clever ideas about a given topic or situation, or to develop creative ways to solve a problem.
	Logical Reasoning	The ability to combine pieces of information to form general rules or conclusions (includes finding a relationship among seemingly unrelated events) and/or to apply general rules to specific problems to produce answers that make sense.
	Problem Sensitivity	The ability to tell when something is wrong or is likely to go wrong. It does not involve solving the problem, only recognizing there is a problem.
	Mathematical Reasoning	The ability to choose the right mathematical methods or formulas to solve a problem.
	Visualization	The ability to imagine how something will look after it is moved around or when its parts are moved or rearranged.
Physical Abilities	Manual Dexterity and Precision	The ability to make precisely coordinated movements to grasp, manipulate or assemble objects.
	Physical Strength	The ability to exert maximum muscle force to lift, push, pull, or carry objects.
BASIC SKILLS		
Content Skills	Active Learning	Understanding the implications of new information for both current and future problem-solving and decision-making.
	Oral Expression	Talking to others to convey information effectively.
	Reading Comprehension	Understanding written sentences and paragraphs in work-related documents.
	Written Expression	Communicating effectively in writing as appropriate for the needs of the audience.
	ICT Literacy	Using digital technology, communications tools, and networks to access, manage, integrate, evaluate and create information.
Process Skills	Active Listening	Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate and not interrupting at inappropriate times.
	Critical Thinking	Using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems.
	Monitoring Self and Others	Monitoring/assessing performance of yourself, other individuals or organizations to make improvements or take corrective action.

to be influenced by the workforce practices and sourcing decisions of large, established employers,[9] validating the *Report's* research framework.

Classifying Occupations: ISCO and O*NET

Given the *Report's* major aim of bringing specificity to predictions about the future of jobs at the occupation level and moving beyond broad categorizations, we have based our analysis on a recognized reference system widely used by labour market researchers: a streamlined version of the *Occupational Information Network (O*NET),* developed by the US Department of Labor in collaboration with its Bureau of Labor Statistics' *Standard Classification of Occupations (SOC).*

In its unabridged form, the O*NET-SOC taxonomy includes detailed information on 974 individual occupations in the United States, grouped into approximately 20 broader job families, which are regularly revised and updated for new and emerging occupations to keep up with the changing occupational landscape. The virtually unparalleled level of descriptive detail of O*NET allows us to dive deep into the job profile of individual occupations and to supplement our analysis with a range of job-specific further information, compiled in collaboration with industry experts and HR practitioners. For example, in addition to a complete profile of the skills and abilities currently perceived as required to perform a job successfully, O*NET provides further detailed information such as common qualifying degrees or certifications, typical activities performed on-the-job and physical working conditions—nuances which have been used by researchers such as Frey and Osborne (2013) to predict the extent of upcoming job task automation and which enable us to directly link our findings to these bodies of research for further customized analysis going forward.

O*NET also provides hard data on compensation, absolute employment numbers by occupation and their growth outlook to 2022 for the United States, which we

Table A1: Definition of core work-related skills, based on the O*NET Content Model *(cont'd.)*

Skill/ability family	Skill/ability	Definition
CROSS-FUNCTIONAL SKILLS		
Complex Problem Solving Skills	Complex Problem Solving	Developed capacities used to solve novel, ill-defined problems in complex, real-world settings.
Resource Management Skills	Management of Financial Resources	Determining how money will be spent to get the work done, and accounting for these expenditures.
	Management of Material Resources	Obtaining and seeing to the appropriate use of equipment, facilities and materials needed to do certain work.
	People Management	Motivating, developing and directing people as they work, identifying the best people for the job.
	Time Management	Managing one's own time and the time of others.
Social Skills	Coordinating with Others	Adjusting actions in relation to others' actions.
	Emotional Intelligence	Being aware of others' reactions and understanding why they react as they do.
	Negotiation	Bringing others together and trying to reconcile differences.
	Persuasion	Persuading others to change their minds or behaviour.
	Service Orientation	Actively looking for ways to help people.
	Training and Teaching Others	Teaching others how to do something.
Systems Skills	Judgement and Decision Making	Considering the relative costs and benefits of potential actions to choose the most appropriate one.
	Systems Analysis	Determining how a system should work and how changes in conditions, operations and the environment will affect outcomes.
Technical Skills	Equipment Maintenance and Repair	Performing routine maintenance on equipment and determining when and what kind of maintenance is needed and/or repairing machines or systems using the needed tools.
	Equipment Operation and Control	Watching gauges, dials or other indicators to make sure a machine is working properly; controlling operations of equipment or systems.
	Programming	Writing computer programmes for various purposes.
	Quality Control	Conducting tests and inspections of products, services or processes to evaluate quality or performance.
	Technology and User Experience Design	Generating or adapting equipment and technology to serve user needs.
	Troubleshooting	Determining causes of operating errors and deciding what to do about it.

used as one of several reference points to sense-check and calibrate our perception-based results.

In addition, the O*NET-SOC taxonomy can be converted into corresponding occupations under the International Labour Organization's *International Standard Classification of Occupations (ISCO),* allowing for internationalization of results.[10] We have made use of this possibility, for example, when estimating the absolute number of employees by job family in the *Report's* Country Profiles. Note that, due to differences in the two classification systems, an O*NET-ISCO harmonized list of occupations reduces to around 350 from O*NET's original list of 974 occupations, and it is this streamlined list of occupations that we have used in practice in the survey and *Report.* Furthermore, respondents to the Future of Jobs Survey had the ability to self-specify additional occupations they considered of particular relevance if they did not find these reflected in pre-given response options.

Finally, one implication of the structure of our survey questionnaire is that we have received an uneven number of responses per occupation—with, on the one hand, a strong convergence of data points around largest occupations in terms of employment and occupations perceived as critical/strategic for particular industries and, on the other hand, a relatively long tail of responses distributed across occupations with a lower number of individual mentions, affecting the reliability and margins of error of any individual predictions for the latter. In general, we address this by making use of O*NET's two-level structure to report results aggregated at the broader job family level, not at the level of individual occupations.

Employment Effects

Estimated employment effects have been converted into compound growth rates for the 2015–2020 period, i.e. the mean growth rate over the specified period of time if employment were to grow or decline at a steady

rate. The compound annual growth rate is essentially a representational figure that describes the rate at which a quantity would have grown if it had grown at a constant rate. The simplest limitation of a compound growth rate is that because it calculates the smooth average of growth over a period, it ignores volatility and implies that the growth during that time was steady, which is rarely the case.

Reported employment outlook totals for job families have been weighted for the frequency of underlying occupation-level data points, using the standard weighted arithmetic mean formula:

$$\bar{x} = \frac{\sum_{i=1}^{n} w_i x_i}{\sum_{i=1}^{n} w_i}$$

on the simplifying assumption that more frequently mentioned occupations will also tend to employ a correspondingly larger absolute number of people in the concerned job family.

It is possible to calculate the net absolute number of jobs expected to be created or lost in the job family whenever the underlying quantity of workers employed in the corresponding occupation is known for the country or industry. In practice, we have chosen only do this on an illustrative basis for our sample as a whole in order to keep the focus of our analysis firmly on the *relative outlook* for particular job types and job families compared to each other over the 2015–2020 period.

Skills Stability

Classifying skills

The concept of skills is used in many different and sometimes ambiguous ways in different contexts and, unlike for occupations, a widely agreed shared definition or taxonomy of the term at the international level does not exist.[11] In a general sense, the term skills is used to refer to the work-related capabilities of people to perform a job successfully. It should be distinguished from the concept of abilities, which refers to more fundamental and enduring attributes of an individual, such as physical or cognitive abilities that are formed over a longer period, often beginning in early childhood education.

In national and international statistics, achieved education levels or qualifications are often used as a proxy for or representation of skills. However, this approach is of limited use for the purposes of our *Report* and has been at the heart of conflicting perceptions about the current state of skills mismatches and the availability of qualified talent between education providers and employers. The education sector refers mainly to formal qualifications and credentials, whereas actors from the employment side refer to the actual practical capabilities or competences that employees (or new graduates) are able to use.

Given the unprecedented rate of change of *both* on-the-job skills required to perform in an occupation successfully and of the content or hard knowledge of the core curriculum in many academic fields, we felt that the *Report* should adopt a taxonomy that would allow for the highest level of nuance, detail and specificity possible in order to adequately capture the pace of skill set disruption. Accordingly, the *Report's* analysis of skills focuses on a core set of 35 specific and widely used work-relevant skills and abilities that have been empirically derived from today's most-frequently cited skills and abilities across all occupations and job families in the O*NET database. Our analysis found that the core skill set of most occupations consisted of a range of combinations of these 35 core skills. In addition, respondents to the Future of Jobs Survey had the possibility to self-specify further occupation-specific skills they considered essential if they did not already find these reflected in the pre-given response options.

Table A1 shows the full list of work-related core skills and abilities that we have adapted from the O*NET database. A number of these skills have been manually combined, renamed or reclassified from their original designation within O*NET for concision and clarity.[12]

Calculating skills stability

The *Report* repeatedly uses the concept of skills stability to illustrate the degree to which, by the year 2020, particular occupations and job types are expected to require competence in new skills that have hitherto not been part of that occupation's core skill set today.

The data points for this calculation are derived from our executive survey, in which respondents were twice asked to specify the top five skills most frequently used by their specified occupation: once for today, once for the year 2020. Respondents could select their answer from the 35 skills shown in Table A1, and also had the option to self-specify skills requirements should they not be satisfied by the response options given. The degree of skills stability refers to the share of skills mentioned both in today's core skill set and re-mentioned as a core skill for the year 2020. *Growing skills demand* refers to skills only mentioned as part of occupations' specified core skill set in 2020. *Declining skills demand* refers to skills only mentioned as part of today's core skill set but not re-mentioned for 2020. The various skills stability measures used throughout the *Report* are the result of aggregating these data points for the unit of analysis in question, such as a job family or industry sector.

As elsewhere, our approach represents a streamlining of the full O*NET taxonomy—which uses a longer list of skills—in order to make it amenable for use in an executive survey. In practice, limiting what we refer to as an occupation's "core skillset" to the top five skills might mean certain skills that enter or drop out of the top five are merely experiencing a relative shift in importance, rather than being wholly new or 'never used again thereafter'. However, even such relative shifts still strongly imply substantial ongoing change and transformation of skills requirements, convincing us of the soundness and validity of skills stability as a concept as used in the *Report.*

NOTES

1 For example, the 50 largest national employers in the United States are all simultaneously part of the 100 largest employers in their respective industry globally, meaning that we did not supplement our survey pool with additional respondents from the United States. By contrast, few of South Africa's largest national employers are part of the 100 largest employers in their industry globally; in this case, we supplemented our survey pool with additional large employers from South Africa, to ensure a representation of at least 50 South Africa based companies in the sample.

2 See, for example, Djordjevic, 2013.

3 See, for example, McKinsey Global Institute, 2015.

4 World Bank, 2011.

5 Kumar, Rajan and Zingales, 2001.

6 http://en.wikipedia.org/wiki/Herfindahl_index.

7 http://en.wikipedia.org/wiki/Concentration_ratio.

8 See, for example, Zervas, Proserpio and Byers, 2015.

9 See, for example, Cappelli and Keller, 2013.

10 Official conversion tables are available at: www.bls.gov/soc/ISCO_SOC_Crosswalk.xls.

11 See, for example: European Training Foundation, *Anticipating and Matching Skills Demand and Supply: Synthesis of National Reports,* 2012.

12 A full overview of O*NET's complete skills taxonomy is available at: www.onetonline.org/skills/.

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Appendix B:
Industry and Regional Classifications

Table B1: Classification of industries

Industry Group	Industry Sector
Basic and Infrastructure	Chemicals
	Infrastructure and Urban Development
	Mining and Metals
Consumer	Agriculture, Food and Beverage
	Retail, Consumer Goods and Lifestyle
Energy	Energy Utilities and Technology
	Oil and Gas
	Renewable Energy
Financial Services & Investors	Banking and Capital Markets
	Insurance and Asset Management
	Private Investors
	Institutional Investors, Sovereign Funds, Family Offices
Healthcare	Global Health and Healthcare
Information and Communication Technology	Information Technology
	Telecommunications
Media, Entertainment and Information	Media, Entertainment and Information
Mobility	Aviation and Travel
	Automotive
	Supply Chain and Transportation
Professional Services	Professional Services

Table B2: Classification of regions

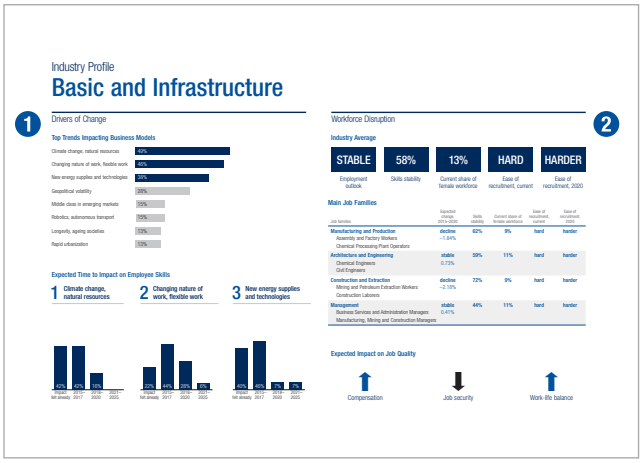
ASIA AND THE PACIFIC	EUROPE AND CENTRAL ASIA	MIDDLE EAST AND NORTH AFRICA	SUB-SAHARAN AFRICA	THE AMERICAS
ASEAN	France	Gulf Cooperation Council	South Africa	Brazil
Australia	Germany			Mexico
China	Italy			United States
India	Turkey			
Japan	United Kingdom			

Part 2

Industry, Regional and Gender Gap Profiles

User's Guide: How to Read the Industry, Regional and Gender Gap Profiles

Part II of the *Report* presents findings through an industry, regional and gender lens, with the aim of providing specific practical information to decision-makers and experts from academia, business, government and civil society. It provides deeper analysis of the overview of results in Part I through Industry Profiles, Country and Regional Profiles and Industry Gender Gap Profiles. In addition, the various Profiles are intended to provide interested companies with the opportunity to benchmark themselves relative to the range of expectations prevalent in their country and/or industry. This User's Guide provides a detailed explanation of the information contained in the various Profiles and its appropriate interpretation.



INDUSTRY PROFILES

1 DRIVERS OF CHANGE

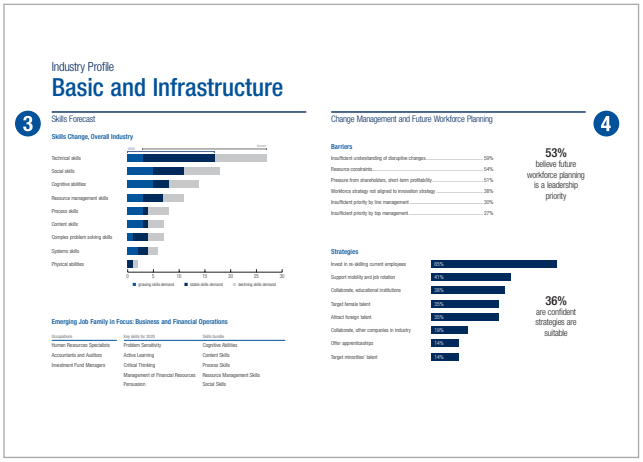
The first section of each Industry Profile provides an overview of the top trends and disruptions expected to affect the industry in question over the coming years, as well as the timeframe within which these trends and disruptions are expected to require modification to the skill sets of key job functions within the industry.

Top Trends Impacting Business Models

The bar chart represents the share of survey respondents from the industry in question who selected the stated trend or disruption as one of the top three drivers of change affecting business models in their industry. For a detailed description of each driver of change, please see Table 2 in Part I of the *Report.*

Expected Time to Impact on Employee Skills

The diagram illustrates the expected timeframe within which the top three mentioned trends or disruptions affecting business models in the industry in question are expected to require modification of skill sets of key job functions within the industry—either in order to equip employees with the skills needed to seize new business opportunities created by the trend or disruption or in order to avoid losing competitiveness due to the obsolescence of current employees' existing skill sets. Due to the different business models and different combinations of trends and disruptions prevalent in each industry, the same drivers of change may be felt differently in various industries.



2 WORKFORCE DISRUPTION

The second section of each Industry Profile aims to provide a consolidated overview of the major expected developments until the year 2020 for the industry's workforce as a whole and within each main job family in the industry in question.

Industry Average

This section provides an aggregate summary of the relative outlook for all occupations and job functions mentioned by survey respondents from the industry in question. All reported averages are simple averages across the job families and functions mentioned, i.e. results have not been weighted by the absolute number of workers employed in any given occupation. For a detailed explanation of each covered dimension, please see the next section, Main Job Families.

Main Job Families

The table gives a detailed overview of expected developments in the four job families most frequently mentioned by survey respondents from the industry in question. Categorization of occupations and job families is based on the O*NET labour market information system (see Appendix A for details).[1] All reported values are simple averages across mentioned occupations within the job family, i.e. results have not been weighted by the absolute number of employees in any given occupation. The individual occupations listed underneath each job family are for illustrative purposes and report the two occupations in the job family most frequently cited by survey respondents from the industry in question.

The table covers the following dimensions:

- **Expected change, 2015–2020:** The employment outlook for the job family, converted to a compound growth rate for the 2015–2020 period. The thresholds for the qualitative scale are: +/–1%: "stable"; +/–1% to +/–5%: "growth / decline"; more than +/–5%: "strong growth / strong decline".

- **Skills stability:** The share of an occupation's five most frequently used skills that have been identified as such by industry respondents both for today and for the year 2020, aggregated across all occupations mentioned for the job family. For a detailed description of each skill, please see Figure 9 and Table A1 in Part I of the *Report.*

- **Current share of female workforce:** The reported share of current female employees for all occupations mentioned as part of the job family, aggregated as a simple average, i.e. not weighted by the absolute number of employees in any given occupation.

- **Ease of recruitment, current:** The industry's perceived current ease or difficulty of hiring competent and qualified employees for a given role, on a qualitative –2 ("very hard") to +2 ("very easy") scale, aggregated for the job family as a simple average, i.e. not weighted by the absolute number of employees in any given occupation. The thresholds for the qualitative scale are: –2 to –1: "very hard"; –1 to –0.5: "hard"; –0.5 to +0.5: "neutral"; +0.5 to +1: "easy"; +1 to +2: "very easy".

- **Ease of recruitment, 2020:** The industry's expected cumulative change in ease of recruitment over the 2015-2020 period, aggregated across roles for the job family as a simple average. The qualitative statement is relative to the previously reported current value.

Expected Impact on Job Quality

The arrows indicate the expected cumulative change in the three dimensions listed over the 2015–2020 period, as identified by survey respondents from the industry in question on a qualitative –2 ("strong decrease") to +2 ("strong increase") scale. Reported values are simple averages across all job families mentioned for the industry and have not been weighted by the absolute number of workers employed in any given occupation. The three dimensions listed are based on a conceptual framework of job quality under development by the Organisation for Economic Co-operation and Development (OECD).[2]

- **Compensation:** The extent to which employment contributes to material living standards.

- **Job security:** The risk of job loss and its consequences.

- **Work-life balance:** The nature and content of work performed, working-time arrangements and workplace relationships.

3 SKILLS FORECAST

The third section provides an outlook on the expected evolution of skills demand over the 2015–2020 period. It looks at skills requirements both from an overall industry perspective as well as from the perspective of key skills that will be in demand as part of important new and emerging jobs in the sector. Categorization of skills is based on the O*NET labour market information system. For a detailed description of each skill, please see Figure 9 and Table A1 in Part I of the *Report.*

Skills Change, Overall Industry

The stacked bar chart is a diagrammatic representation of overall demand for the industry's most frequently used skills across all occupations and job families over the 2015–2020 period. The stacked bars are ordered by the overall magnitude of demand for the category of skills indicated and add up to 100%—the industry's total skills demand profile. The dark blue part of the stacked bars represents the share of skills from the given category for which demand is expected to remain stable. The grey part of the stacked bar represents the share of skills from the given category which is in demand today but for which demand will be on the decline by the year 2020. The bright blue part of the bar represents the share of skills from the given category that is anticipated to be in demand by the year 2020, even though this demand has not yet fully materialized today.

Accordingly, the dark blue and grey parts of the bar chart combined represent the industry's current overall skills demand profile while the bright blue and dark blue parts of the bar chart combined represent overall skills demand in the industry as expected for the year 2020. Comparing the contours of the two demand profiles and the relative change in length of the various bars provides a visual overview of skills change in the industry.

Emerging Job Family in Focus

This part of the Industry Profile dives deep into the job family that corresponds to the occupations most frequently mentioned as new and emerging by survey respondents from the industry in question. The left-hand side of the table lists the top-mentioned emerging occupations expected to

become increasingly influential in the industry by the year 2020. The right-hand side of the table lists the individual skills expected to be in demand as part of skills profile of these occupations and their corresponding skills family. Categorization of occupations and skills is based on the O*NET labour market information system.

4 CHANGE MANAGEMENT AND FUTURE WORKFORCE PLANNING

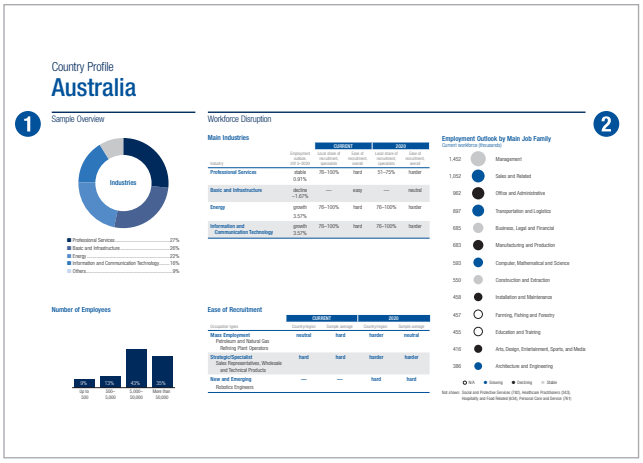
The final section of each Industry Profile focuses on the measures and strategies for adapting to the top trends and disruptions expected to affect the industry in question over the coming years that companies intend to undertake, as well as the biggest perceived barriers to successfully carrying out these measures and the perceived degree of preparedness prevalent across the industry.

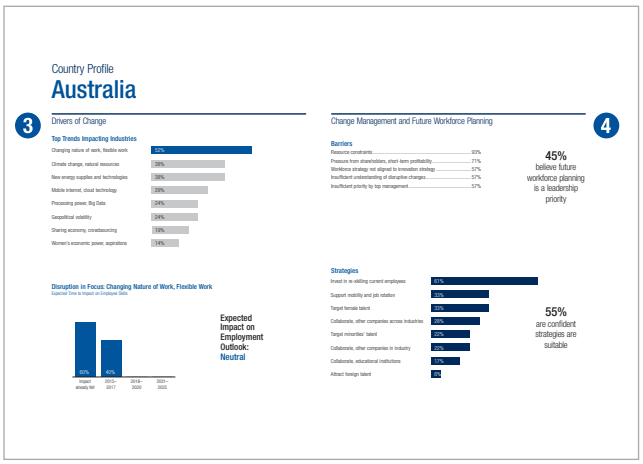
Barriers

The table lists the biggest perceived barriers to preparing the industry's workforce for disruptive change, as measured by the share of survey respondents from the industry in question who selected the stated obstacle as one of the top three impediments to successful workforce change management faced by their industry. For a detailed discussion of each barrier, please refer to Part I of the *Report.* To the right of the table is the percentage of respondents who believe that future workforce planning to prepare for disruptive change is either a "somewhat high" or "very high" priority for their organization's senior leadership.

Strategies

The bar chart represents the share of survey respondents from the industry in question who selected the stated measure as one of the top three future workforce and change management strategies they expect to undertake in their company. For a detailed discussion of each measure, please refer to Part I of the *Report.* To the right of the table is the percentage of respondents from the industry who stated that they were either "somewhat confident" or "highly confident" in the adequacy of the selected strategies.





COUNTRY AND REGIONAL PROFILES

1 SAMPLE OVERVIEW

The first section of each Country or Regional Profile contextualizes the information presented according to the industry and company size mix of received responses. Overall representativeness of country-level findings should be understood according to the primary country, industry sector(s) and/or company size segments of interest. In addition to 13 Country Profiles, there are two Regional Profiles—ASEAN and GCC.

2 WORKFORCE DISRUPTION

The second section of each Country and Regional Profile aims to provide a consolidated overview of the major expected developments over the 2015–2020 period for the country's workforce as a whole across key industries, job types and job families.

Main Industries

The table gives a detailed overview of changes in the employment landscape across key industries in the country covered by survey respondents. Reported values are a simple average of all responses received for the industry. The table covers the following dimensions:

- **Employment outlook, 2015–2020:** The expected employment change for the industry, across all job families, converted to a compound growth rate for the 2015–2020 period. The thresholds for the qualitative scale are: +/–1%: "stable"; +/–1% to +/–5%: "growth / decline"; more than +/–5%: "strong growth / strong decline".

- **Local share of recruitment, specialists:** The current and expected share of strategic and specialist job functions anticipated by respondents from the corresponding industry to be recruited locally in the country. On the one hand, a very low local recruitment share may indicate skills shortages and a very high reliance on expatriate talent that might present an opportunity for the country to build up its talent pool in a targeted manner. On the other hand, a very high local recruitment share might indicate underutilized

opportunities to diversify experience and increase knowledge transfer to the local workforce from international experts.

- **Ease of recruitment, overall:** The current and expected ease or difficulty of hiring competent and qualified employees across all roles in the industry specified, on a qualitative –2 ("very hard") to +2 ("very easy") scale, aggregated for the entire industry in question as a simple average, i.e. not weighted by the absolute number of employees in any given occupation. The thresholds for the qualitative scale are: –2 to –1: "very hard"; –1 to –0.5: "hard"; –0.5 to +0.5: "neutral"; +0.5 to +1: "easy"; +1 to +2: "very easy". The qualitative scale for "2020" is relative to the current values reported.

Ease of Recruitment

The table in this section gives a detailed overview of the perceived current and future aggregate ease of recruitment for occupations across three types of jobs: Mass Employment, Strategic/Specialist and New and Emerging. The individual occupations listed underneath each job type are for illustrative purposes and report the occupations most frequently cited by survey respondents across all industries in the country. Categorization of occupations and job families is based on the O*NET labour market information system. The thresholds for the qualitative ease of recruitment scale are the same as for the table above. Values are reported both for the country or region in question as well as for the global sample average, indicating job types in which the country or region may have a comparative advantage as well as those in which recruitment is expected to be more difficult than the world average.

Employment Outlook by Main Job Family

The bubble chart visualizes estimated total employment in different job families in the country. The colour of the bubbles indicates the job family's aggregate employment outlook on the following scale: +/–1%: "Stable"; more than +/–1%: "Growing / Declining". Insufficient response data available for job families is labelled "N/A". Estimated total employment by job family is derived from ILOSTAT data, classified according to the International Standard Classification of Occupations (ISCO) and converted to corresponding O*NET job families using the O*NET-SOC taxonomy's official conversion tables (please see Appendix A for details). No internationally comparable data was available for China and India. Estimates for ASEAN are based on Malaysia, Thailand and Vietnam, and estimates for GCC are based on Saudi Arabia only. Due to the nature of our employment survey and its target audience of large multinational employers, insufficient response data for robust predictions was generally available for the four job families not shown.

3 DRIVERS OF CHANGE

The third section of each Country and Regional Profile provides an overview of the top trends and disruptions expected to affect industries in the country in question over the coming years and an in-depth look at the top-mentioned trend or disruption across all industries.

Top Trends Impacting Industries

The bar chart represents the share of survey respondents across industries located in the country or region in question who selected the stated trend or disruption as one of the top three drivers of change affecting business models in their industry. For a detailed description of each driver of change, please see Table 2 in Part I of the *Report.*

Disruption in Focus

This section dives deep into the top-mentioned trend or disruption across industries in the country or region in question. The diagram illustrates the expected time frame within which it is expected to require modification of skill sets of key job types in the country or region—either in order to equip the country's workforce with the skills needed to seize new opportunities created by the trend or disruption in question or in order to avoid losing competitiveness due to the obsolescence of the workforce's existing skill sets. The section also reports the trend's or disruption's expected overall impact on employment outlook in the country or region.

4 CHANGE MANAGEMENT AND FUTURE WORKFORCE PLANNING

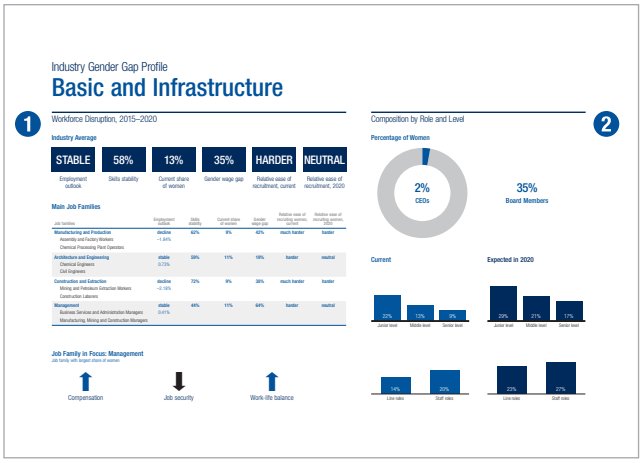
The final section of each Country and Regional Profile focuses on the measures and strategies for adapting to the anticipated top trends and disruptions that companies across industries located in the country or region in question intend to undertake, as well as the biggest perceived barriers to successfully carrying out these measures and the perceived degree of preparedness prevalent across industries in the country or region.

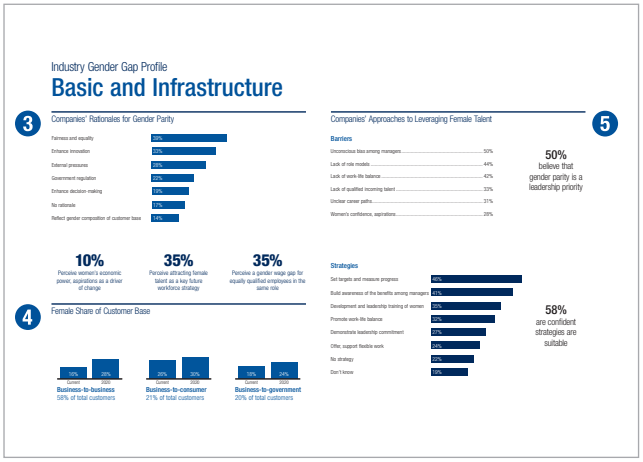
Barriers

The table lists the biggest perceived barriers to preparing the country's or region's workforce for disruptive change, as measured by the share of companies across industries located in the country or region in question who selected the stated obstacle as one of the top three impediments to successful workforce change management faced by their industry. For a detailed discussion of each barrier, please refer to Part I of the *Report.* To the right of the table is the percentage of respondents who believe that future workforce planning to prepare for disruptive change is either a "somewhat high" or "very high" priority for their organization's senior leadership.

Strategies

The bar chart represents the share of survey respondents across industries located in the country or region in question who selected the stated measure as one of the top three future workforce and change management strategies they expect to undertake in their company. For a detailed discussion of each measure, please refer to Part I of the *Report.* To the right of the table is the percentage of respondents who stated that they were either "somewhat confident" or "highly confident" in the adequacy of the selected strategies.





INDUSTRY GENDER GAP PROFILES

1 WORKFORCE DISRUPTION, 2015–2020

The first section of each Industry Gender Gap Profile aims to provide a consolidated overview of the major expected developments over the coming years for each of the industry's main job families and its workforce as a whole, with a particular focus on their implications for the evolution of the gender gap in the industry in question.

Industry Average

This section provides an aggregate summary of the relative outlook for all occupations and job functions mentioned by survey respondents from the industry in question. All reported averages are simple averages across the job families and functions mentioned, i.e. results have not been weighted by the absolute number of workers employed in any given occupation. For a detailed explanation of each covered dimension, please see the next section, Main Job Families.

Main Job Families

The table gives a detailed overview of expected developments in the four job families most frequently mentioned by survey respondents from the industry in question. Categorization of occupations and job families is based on the O*NET labour market information system. All reported values are simple averages across mentioned occupations within the job family, i.e. results have not been weighted by the absolute number of employees in any given occupation. The individual occupations listed underneath each job family are for illustrative purposes and report the two occupations in the job family most frequently cited by survey respondents from the industry in question.

The table covers the following dimensions:

- **Employment outlook:** The expected employment change for the job family, converted to a compound growth rate for the 2015–2020 period. The thresholds for the qualitative scale are: +/–1%: "stable"; +/–1% to +/–5%: "growth / decline"; more than +/–5%: "strong growth / strong decline".

- **Skills stability:** The share of an occupation's five most frequently used skills that have been identified as such by industry respondents both for today and for the year 2020, aggregated across all occupations mentioned for the job family. For a detailed description of each skill, please see Figure 9 and Table A1 in Part I of the *Report.*

- **Current share of women:** The reported share of current female employees for all occupations mentioned as part of the job family, aggregated as a simple average, i.e. not weighted by the absolute number of employees in any given occupation.

- **Gender wage gap:** The share of survey respondents from the industry in question who stated that there was a wage gap for equally qualified female employees in the same roles for the reported job family. Results have been aggregated as a simple average, i.e. not weighted by the absolute number of employees in any given occupation.

- **Relative ease of recruiting women, current:** The industry's perceived current ease or difficulty of hiring competent and qualified female talent for a given role, relative to the perceived current ease or difficulty of hiring men, on a qualitative –2 ("much harder") to +2 ("much easier") scale, aggregated for the job family

as a simple average, i.e. not weighted by the absolute number of employees in any given occupation. The thresholds for the qualitative scale are: –2 to –1: "much harder"; –1 to –0.5: "harder"; –0.5 to +0.5: "neutral"; +0.5 to +1: "easier"; +1 to +2: "much easier".

- **Relative ease of recruiting women, 2020:** The industry's expected future ease or difficulty of hiring competent and qualified female talent for a given role by the year 2020, relative to the expected future ease or difficulty of hiring men, aggregated across roles for the job family as a simple average.

Job Family in Focus

This part of the Industry Gender Gap Profile dives deep into the job quality of the industry's job family that has the largest share of women. The arrows indicate the expected cumulative change in the three dimensions listed over the 2015–2020 period, as identified by survey respondents from the industry in question on a qualitative –2 ("strong decrease") to +2 ("strong increase") scale. The three dimensions listed are based on a conceptual framework of job quality under development by the Organisation for Economic Co-operation and Development (OECD).

- **Compensation:** The extent to which employment contributes to material living standards.
- **Job security:** The risk of job loss and its consequences.
- **Work-life balance:** The nature and content of work performed, working-time arrangements and workplace relationships.

A comparison can be made with the industry's overall job quality trends, as reported in the Industry Profile.

2 COMPOSITION BY ROLE AND LEVEL

The second section of the Industry Gender Gap Profile provides an overview of the size of the workforce gender gap in the industry today and its expected evolution by the year 2020.

The first part of the section reports the current share of female CEOs and Board Members in the industry today.

The second part of the section documents reported current and estimated future female representation at junior, middle and senior levels. Somewhat simplified, the bar chart can be understood as a talent pipeline, whereby the share of today's junior level female talent partially translates to 2020's share of mid-level talent and today's mid-level female talent partially translates to 2020's senior level talent. Large upward or downward divergences from this pattern indicate either expected leakages of female talent leaving the industry or the materialized benefits of intensified promotion, retention and external recruitment efforts. Similarly, the difference between the share of female talent in 2020's junior level cohort relative to the industry's current junior level cohort provides a sense of the anticipated longer term evolution of the gender gap beyond 2020.

The final part of the section documents reported current and estimated future female representation across line roles and staff roles. A line role is one that directly advances an organization in its core work, including, in particular, the production and sales functions. A staff role supports the organization with advisory and support functions, typically including human resources, accounting, public relations and legal roles. Line managers generally have supervisory authority over those who report directly to them, whereas staff workers' primary responsibility consists in creating, collecting and analysing information that flows to line workers in the form of advice. Experience in line management functions is generally considered a stepping stone to senior leadership roles within an organization and gender gaps in these roles have historically been especially pronounced. Conversely, certain staff functions, such as human resources, have historically experienced a reverse gender gap.

3 COMPANIES' RATIONALES FOR GENDER PARITY

The bar chart represents the share of survey respondents from the industry in question who selected the stated rationale as one of the top three motivations for promoting gender parity in their company. For a detailed discussion of each rationale, please refer to Part I of the *Report.* This section of each Industry Gender Gap Profile also reports the share of survey respondents from the industry in question who perceived women's rising economic influence as one of the top three drivers of change affecting business models in their industry, who perceived attracting female talent as one of their company's top three future workforce strategies, and who reported a gender wage gap for equally qualified employees across key roles in their industry.

4 FEMALE SHARE OF CUSTOMER BASE

The fourth section of each Industry Gender Gap Profile further examines two of the key economic driving forces and rationales behind companies' growing commitment to women's workforce integration: The rising economic power of women as consumers and companies' desire to reflect their customer base in their workforce composition. Globally, women in 2013 controlled 64% of household spending and $30 trillion of consumer spending—a figure that is is predicted to rise by almost a third over the five years to 2018.[3]

The three bar charts in this section represent the reported current and expected future share of female clients across business-to-business, business-to-consumer and business-to-government market segments, including situations in which women are ultimately responsible for purchasing decisions, for example, as procurement managers, etc. The share of the corresponding market segment in the industry's current overall revenue structure is reported at the bottom of each bar chart—providing further information about the dynamics through which trends and disruptions are affecting business models in the industry. Note that the customer base of the three market segments

may not sum to 100% exactly in all instances due to omitted other market segments (for example, non-governmental organizations).

5 COMPANIES' APPROACHES TO LEVERAGING FEMALE TALENT

The final section of each Industry Gender Gap Profile focuses on the measures and strategies for harnessing female talent and promoting workplace gender parity that companies intend to undertake, as well as the biggest perceived barriers to successfully carrying out these measures and the perceived degree of urgency and determination to tackle these issues prevalent across the industry in question.

Barriers

The table lists the biggest perceived barriers to promoting workplace gender parity and leveraging female talent, as measured by the share of survey respondents from the industry in question who selected the stated obstacle as one of the top three impediments faced by women in their industry. For a detailed discussion of each barrier, please refer to Part I of the *Report.* To the right of the table is the percentage of respondents who believe that tackling gender parity issues and closing the industry gender gap is either a "somewhat high" or "very high" priority for their organization's senior leadership.

Strategies

The bar chart represents the share of survey respondents from the industry in question who selected the stated measure as one of the top three strategies for promoting workplace gender parity they expect to undertake in their company. For a detailed discussion of each measure, please refer to Part I of the *Report.* To the right of the table is the percentage of respondents from the industry who stated that they were either "somewhat confident" or "highly confident" in the adequacy of the selected strategies.

NOTES

1 www.onetonline.org.

2 Organisation for Economic Co-operation and Development (OECD), *Job Quality,* Directorate for Employment, Labour and Social Affairs – Employment, Labour and Social Affairs Committee, 16-17 October 2014.

3 See: Catalyst, *Buying Power: Global Women,* 2015, www.catalyst.org/knowledge/buying-power-global-women; Silverstein, M. and K. Sayre, "The Female Economy", *Harvard Business Review,* September 2009.

List of Industry, Regional and Gender Gap Profiles

Industry Profiles

Country and Regional Profiles

Industry Gender Gap Profiles

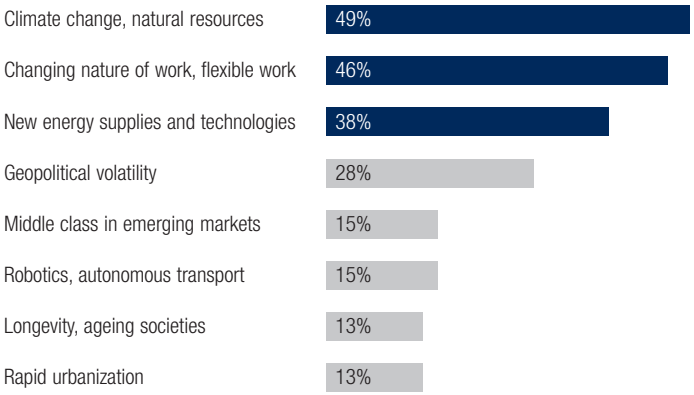
Industry Profiles

Industry Profile

Basic and Infrastructure

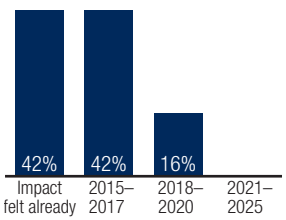
Drivers of Change

Top Trends Impacting Business Models

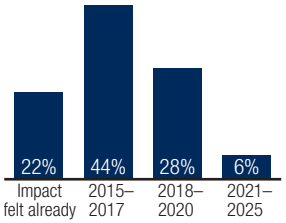


Expected Time to Impact on Employee Skills

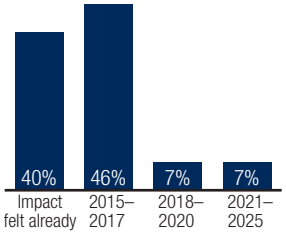
1 Climate change, natural resources



2 Changing nature of work, flexible work



3 New energy supplies and technologies



Workforce Disruption

Industry Average

STABLE	58%	13%	HARD	HARDER
Employment outlook	Skills stability	Current share of female workforce	Ease of recruitment, current	Ease of recruitment, 2020

Main Job Families

Job families	Expected change, 2015–2020	Skills stability	Current share of female workforce	Ease of recruitment, current	Ease of recruitment, 2020
Manufacturing and Production	**decline**	**62%**	**9%**	**hard**	**harder**
Assembly and Factory Workers	–1.84%				
Chemical Processing Plant Operators					
Architecture and Engineering	**stable**	**59%**	**11%**	**hard**	**harder**
Chemical Engineers	0.73%				
Civil Engineers					
Construction and Extraction	**decline**	**72%**	**9%**	**hard**	**harder**
Mining and Petroleum Extraction Workers	–2.18%				
Construction Laborers					
Management	**stable**	**44%**	**11%**	**hard**	**harder**
Business Services and Administration Managers	0.41%				
Manufacturing, Mining and Construction Managers					

Expected Impact on Job Quality

Compensation

Job security

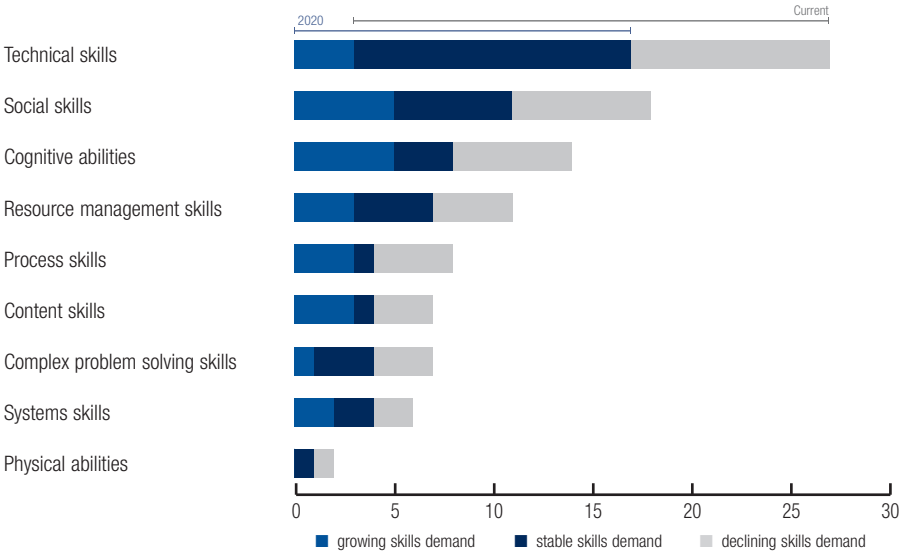
Work-life balance

Industry Profile

Basic and Infrastructure

Skills Forecast

Skills Change, Overall Industry



Emerging Job Family in Focus: Business and Financial Operations

Occupations	Key skills for 2020	Skills family
Human Resources Specialists	Problem Sensitivity	Cognitive Abilities
Accountants and Auditors	Active Learning	Content Skills
Investment Fund Managers	Critical Thinking	Process Skills
	Management of Financial Resources	Resource Management Skills
	Persuasion	Social Skills

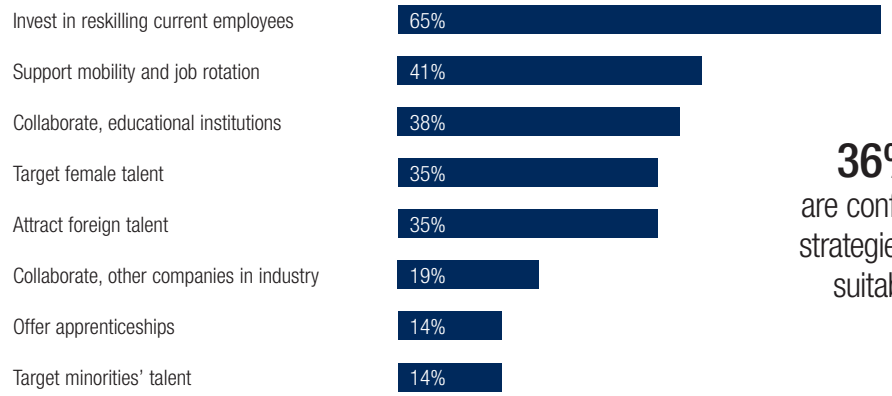
Change Management and Future Workforce Planning

Barriers

Insufficient understanding of disruptive changes	59%
Resource constraints	54%
Pressure from shareholders, short-term profitability	51%
Workforce strategy not aligned to innovation strategy	38%
Insufficient priority by line management	30%
Insufficient priority by top management	27%

53%
believe future workforce planning is a leadership priority

Strategies



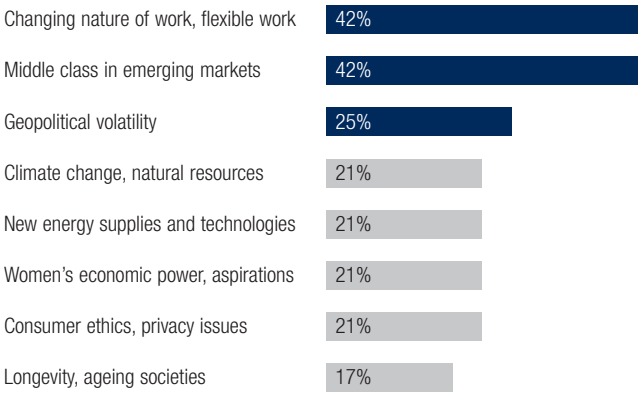
36%
are confident strategies are suitable

Industry Profile

Consumer

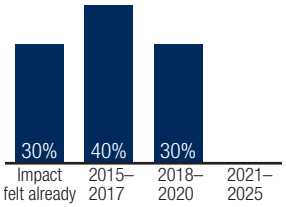
Drivers of Change

Top Trends Impacting Business Models

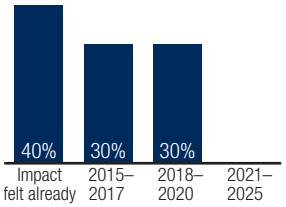


Expected Time to Impact on Employee Skills

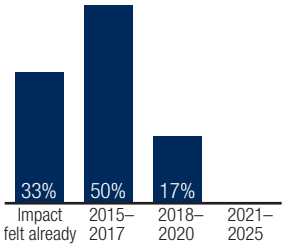
1 Changing nature of work, flexible work



2 Middle class in emerging markets



3 Geopolitical volatility



Workforce Disruption

Industry Average

STABLE	70%	27%	HARD	HARDER
Employment outlook	Skills stability	Current share of female workforce	Ease of recruitment, current	Ease of recruitment, 2020

Main Job Families

Job families	Expected change, 2015–2020	Skills stability	Current share of female workforce	Ease of recruitment, current	Ease of recruitment, 2020
Manufacturing and Production	**decline**	**62%**	**22%**	**neutral**	**harder**
Assembly and Factory Workers	–3.57%				
Food Processing and Related Trades Workers					
Sales and Related	**stable**	**78%**	**52%**	**hard**	**harder**
Shop Salespersons	0.83%				
Sales Representatives, Wholesale and Technical					
Business and Financial Operations	**stable**	**67%**	**44%**	**hard**	**harder**
Sales and Marketing Professionals	–0.88%				
Management and Organisation Analysts					
Management	**decline**	**70%**	**22%**	**hard**	**neutral**
General and Operations Managers	–1.00%				
Business Services and Administration Managers					

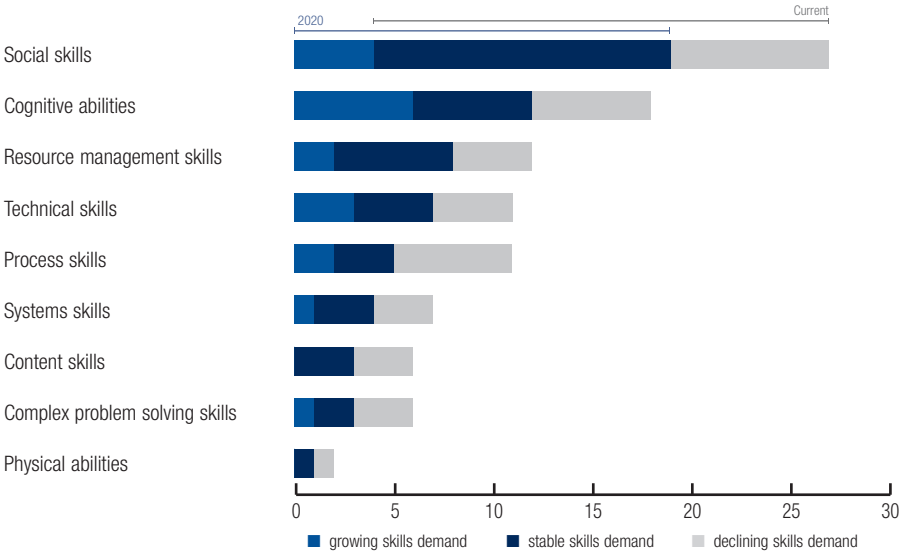
Expected Impact on Job Quality

Industry Profile

Consumer

Skills Forecast

Skills Change, Overall Industry



Emerging Job Family in Focus: Architecture and Engineering

Occupations	Key skills for 2020	Skills bundle
Biochemical Engineers	Complex Problem Solving	Complex Problem Solving Skills
Materials Engineers	Critical Thinking	Process Skills
Mechanical Engineers	Cognitive Flexibility	Cognitive Abilities
	Creativity	Cognitive Abilities
	Mathematical Reasoning	Cognitive Abilities

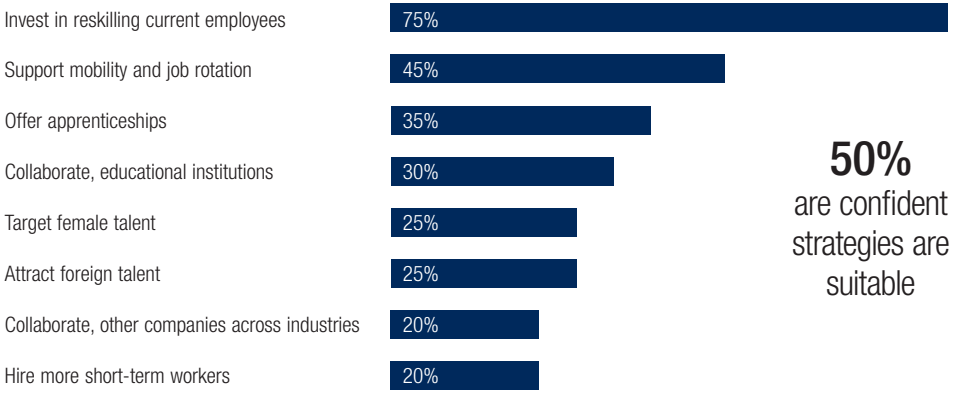
Change Management and Future Workforce Planning

Barriers

Insufficient understanding of disruptive changes	60%
Resource constraints	55%
Pressure from shareholders, short-term profitability	50%
Workforce strategy not aligned to innovation strategy	50%
Insufficient priority by top management	20%
No barriers	15%

70%
believe future workforce planning is a leadership priority

Strategies



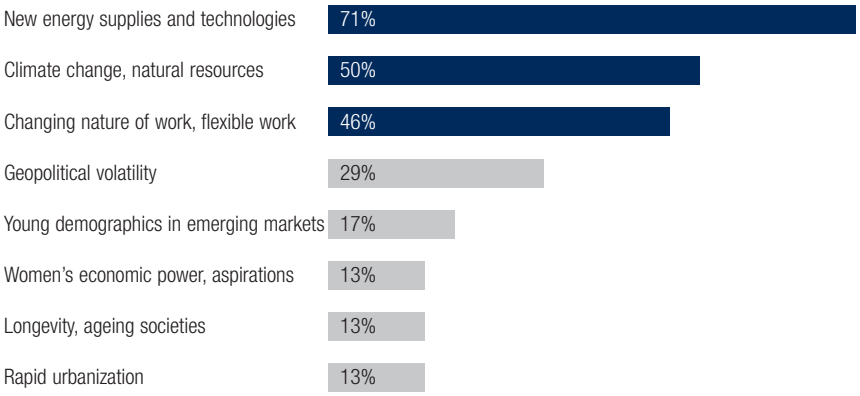
50%
are confident strategies are suitable

Industry Profile

Energy

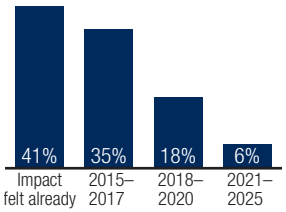
Drivers of Change

Top Trends Impacting Business Models

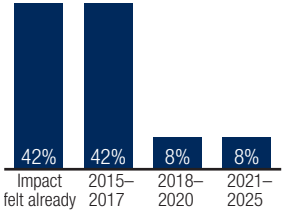


Expected Time to Impact on Employee Skills

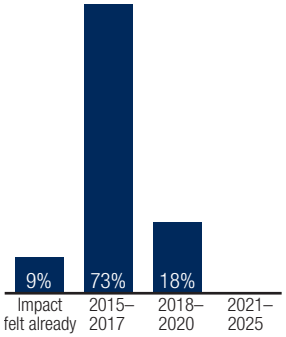
1 New energy supplies and technologies



2 Climate change, natural resources



3 Changing nature of work, flexible work



Workforce Disruption

Industry Average

STABLE	70%	15%	HARD	NEUTRAL
Employment outlook	Skills stability	Current share of female workforce	Ease of recruitment, current	Ease of recruitment, 2020

Main Job Families

Job families	Expected change, 2015–2020	Skills stability	Current share of female workforce	Ease of recruitment, current	Ease of recruitment, 2020
Architecture and Engineering	**growth**	**65%**	**11%**	**hard**	**neutral**
Energy and Petroleum Engineers	1.70%				
Electrotechnology Engineers					
Manufacturing and Production	**decline**	**62%**	**22%**	**neutral**	**easier**
Assembly and Factory Workers	–3.11%				
Petroleum and Natural Gas Refining Plant Operators					
Management	**growth**	**92%**	**16%**	**hard**	**neutral**
General and Operations Managers	2.06%				
Business Services and Administration Managers					
Construction and Extraction	**decline**	**100%**	**15%**	**easy**	**harder**
Mining and Petroleum Extraction Workers	–1.15%				
Mining and Petroleum Plant Operators					

Expected Impact on Job Quality

Compensation

Job security

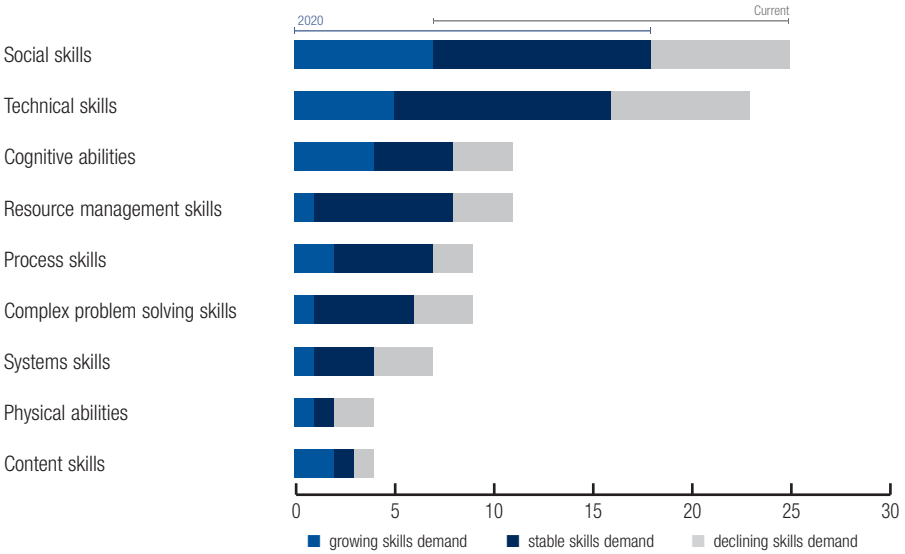
Work-life balance

Industry Profile

Energy

Skills Forecast

Skills Change, Overall Industry



Emerging Job Family in Focus: Management

Occupations	Key skills for 2020	Skills family
Managing Directors and Chief Executives	Complex Problem Solving	Complex Problem Solving Skills
General and Operations Managers	Critical Thinking	Process Skills
Business Services and Administration Managers	People Management	Resource Management Skills
	Visualization	Cognitive Abilities
	Time Management	Resource Management Skills

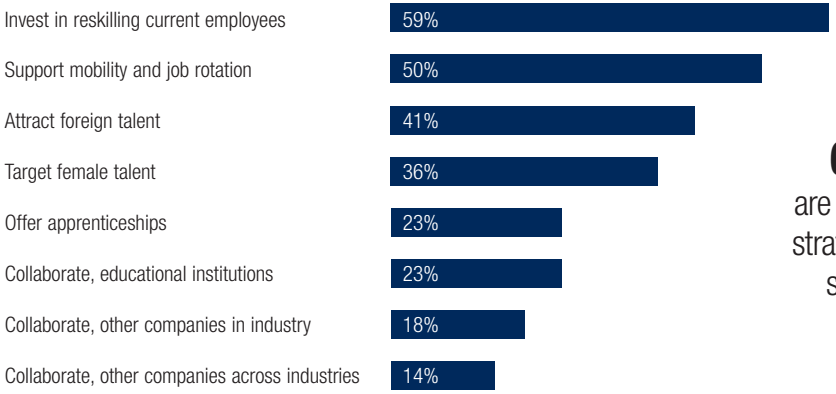
Change Management and Future Workforce Planning

Barriers

Insufficient understanding of disruptive changes	55%
Resource constraints	55%
Pressure from shareholders, short-term profitability	41%
Don't know	36%
Workforce strategy not aligned to innovation strategy	32%
Insufficient priority by top management	18%

80%
believe future workforce planning is a leadership priority

Strategies



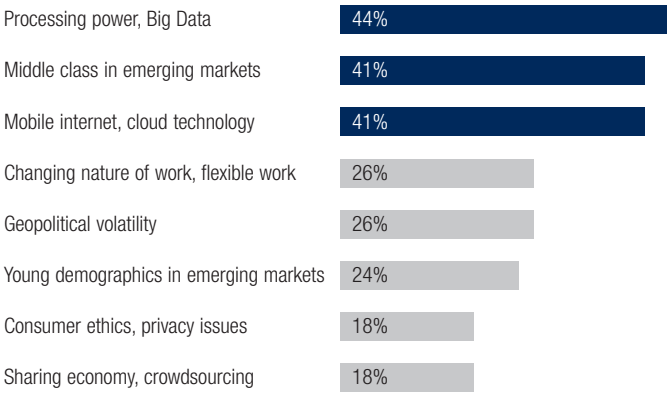
60%
are confident strategies are suitable

Industry Profile

Financial Services & Investors

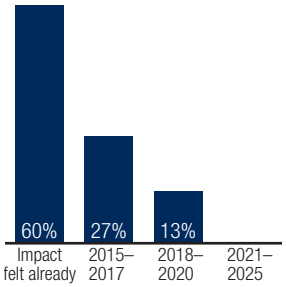
Drivers of Change

Top Trends Impacting Business Models

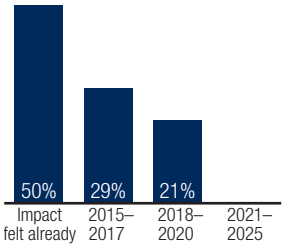


Expected Time to Impact on Employee Skills

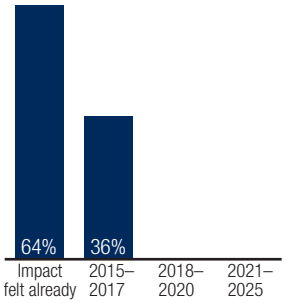
1 Processing power, Big Data



2 Middle class in emerging markets



3 Mobile internet, cloud technology



Workforce Disruption

Industry Average

GROWTH	56%	29%	HARD	HARDER
Employment outlook	Skills stability	Current share of female workforce	Ease of recruitment, current	Ease of recruitment, 2020

Main Job Families

Job families	Expected change, 2015–2020	Skills stability	Current share of female workforce	Ease of recruitment, current	Ease of recruitment, 2020
Business and Financial Operations	**stable**	**63%**	**36%**	**hard**	**neutral**
Financial and Investment Advisers	0.79%				
Investment Fund Managers					
Computer and Mathematical	**growth**	**60%**	**35%**	**hard**	**harder**
Data Analysts	4.50%				
Information Security Analysts					
Sales and Related	**stable**	**70%**	**38%**	**neutral**	**neutral**
Securities and Finance Dealers and Brokers	–0.68%				
Sales and Purchasing Agents and Brokers					
Management	**growth**	**48%**	**26%**	**hard**	**neutral**
General and Operations Managers	2.20%				
Business Services and Administration Managers					

Expected Impact on Job Quality


Compensation


Job security

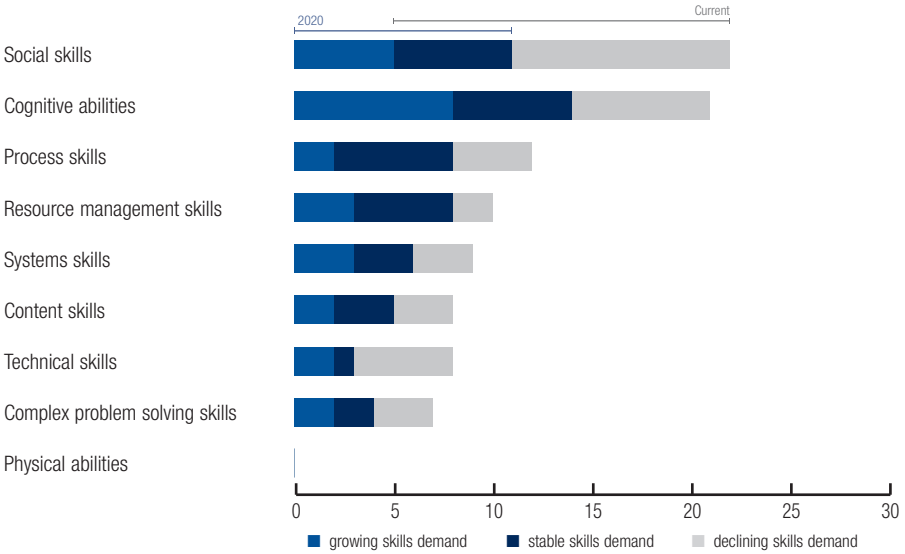

Work-life balance

Industry Profile

Financial Services & Investors

Skills Forecast

Skills Change, Overall Industry



Emerging Job Family in Focus: Computer and Mathematical

Occupations	Key skills for 2020	Skills family
Information Security Analysts	Complex Problem Solving	Complex Problem Solving Skills
Database and Network Professionals	Programming	Technical Skills
Data Analysts	Logical Reasoning	Cognitive Abilities
	Critical Thinking	Process Skills
	Creativity	Cognitive Abilities

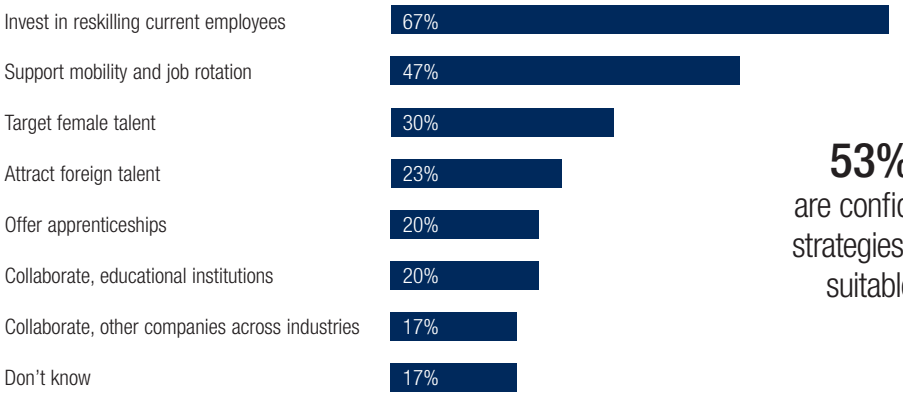
Change Management and Future Workforce Planning

Barriers

Insufficient understanding of disruptive changes 67%
Workforce strategy not aligned to innovation strategy 53%
Pressure from shareholders, short-term profitability 47%
Resource constraints 43%
Insufficient priority by top management 27%
Insufficient priority by line management 27%

67%
believe future workforce planning is a leadership priority

Strategies



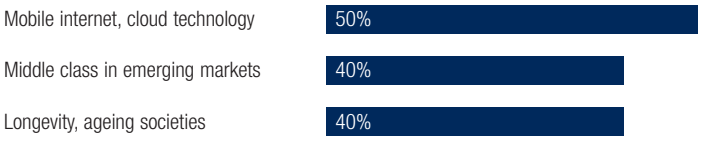
53%
are confident strategies are suitable

Industry Profile

Healthcare

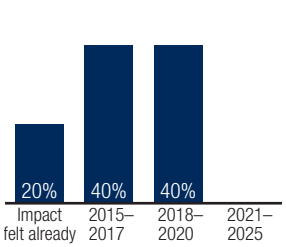
Drivers of Change

Top Trends Impacting Business Models

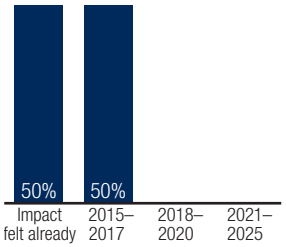


Expected Time to Impact on Employee Skills

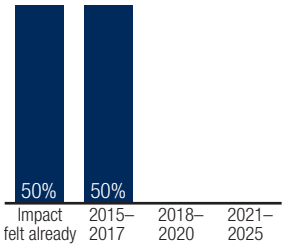
1 Mobile internet, cloud technology



2 Middle class in emerging markets



3 Longevity, ageing societies



Workforce Disruption

Industry Average

STABLE	71%	38%	HARD	HARDER
Employment outlook	Skills stability	Current share of female workforce	Ease of recruitment, current	Ease of recruitment, 2020

Main Job Families

Job families	Expected change, 2015–2020	Skills stability	Current share of female workforce	Ease of recruitment, current	Ease of recruitment, 2020
Manufacturing and Production	**stable**	**85%**	**42%**	**hard**	**neutral**
Chemical Processing Plant Operators	0.79%				
Assembly and Factory Workers					
Life, Physical, and Social Sciences	**stable**	**100%**	**40%**	**hard**	**harder**
Biologists and Geneticists	–0.71%				
Chemists and Chemical Laboratory Scientists					
Sales and Related	**decline**	**70%**	**63%**	**neutral**	**harder**
Shop Salespersons	–1.82%				
Sales Representatives, Technical and Scientific					
Personal Care and Service	**—**	**—**	**85%**	**hard**	**harder**
Personal Care Aides					

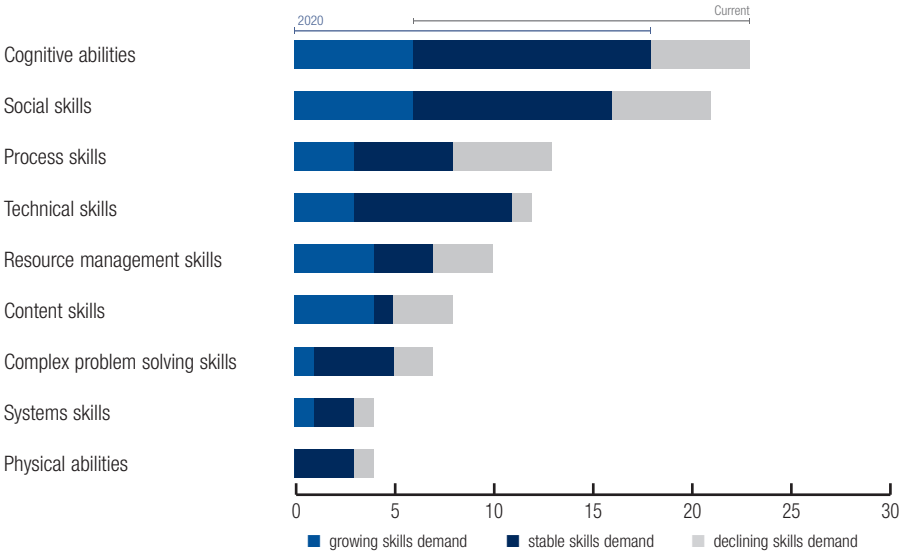
Expected Impact on Job Quality

Industry Profile

Healthcare

Skills Forecast

Skills Change, Overall Industry



Emerging Job Family in Focus: Business and Financial Operations

Occupations	Key skills for 2020	Skills family
Regulatory and Government	Problem Sensitivity	Cognitive Abilities
Associate Professionals	Active Learning	Content Skills
Sales and Marketing Professionals	Critical Thinking	Process Skills
	Management of Financial Resources	Resource Management Skills
	Persuasion	Social Skills

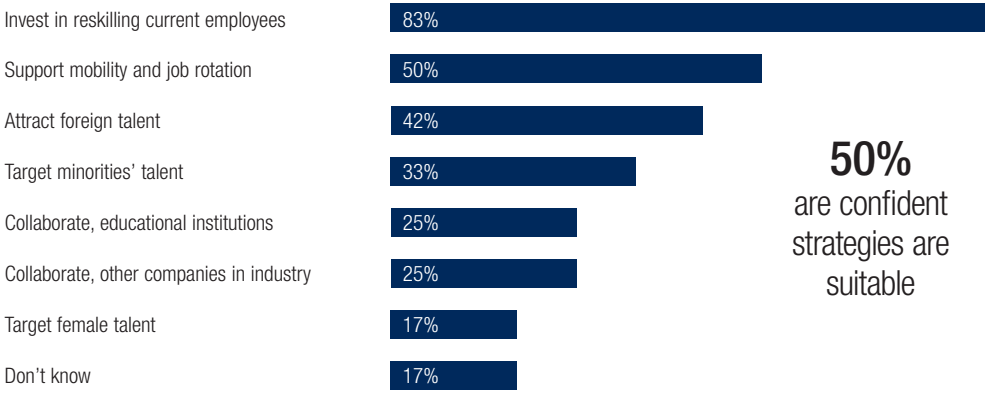
Change Management and Future Workforce Planning

Barriers

Resource constraints	75%
Insufficient understanding of disruptive changes	50%
Workforce strategy not aligned to innovation strategy	50%
Pressure from shareholders, short-term profitability	50%
Don't know	50%
Insufficient priority by top management	25%

80%
believe future workforce planning is a leadership priority

Strategies



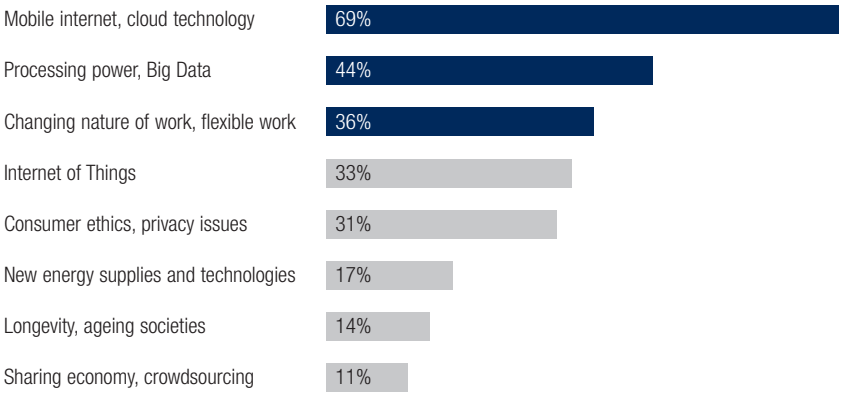
50%
are confident strategies are suitable

Industry Profile

Information and Communication Technology

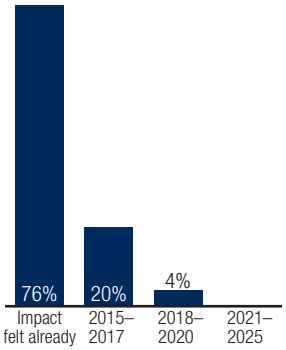
Drivers of Change

Top Trends Impacting Business Models

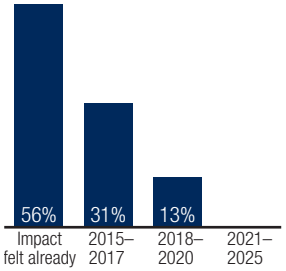


Expected Time to Impact on Employee Skills

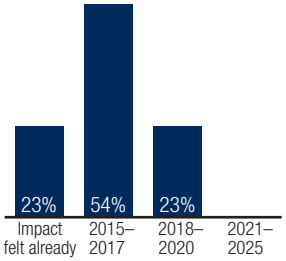
1 Mobile internet, cloud technology



2 Processing power, Big Data



3 Changing nature of work, flexible work



Workforce Disruption

Industry Average

STABLE	65%	21%	HARD	HARDER
Employment outlook	Skills stability	Current share of female workforce	Ease of recruitment, current	Ease of recruitment, 2020

Main Job Families

Job families	Expected change, 2015–2020	Skills stability	Current share of female workforce	Ease of recruitment, current	Ease of recruitment, 2020
Computer and Mathematical	**growth**	**63%**	**20%**	**hard**	**harder**
Database and Network Professionals	1.74%				
Software and Applications Developers and Analysts					
Sales and Related	**growth**	**64%**	**44%**	**neutral**	**neutral**
Telemarketers	2.14%				
Sales Representatives, Wholesale and Technical					
Installation and Maintenance	**decline**	**54%**	**9%**	**hard**	**neutral**
Mechanics and Machinery Repairers	–1.19%				
Electronics and Telecommunications Installers and Repairers					
Architecture and Engineering	**growth**	**77%**	**7%**	**hard**	**harder**
Electrotechnology Engineers	4.12				
Architects and Surveyors					

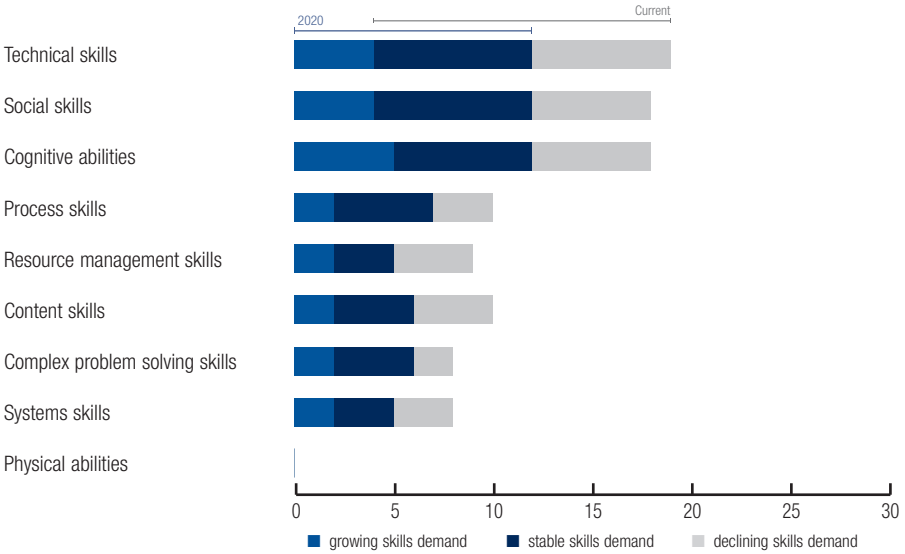
Expected Impact on Job Quality

Industry Profile

Information and Communication Technology

Skills Forecast

Skills Change, Overall Industry



Emerging Job Family in Focus: Computer and Mathematical

Occupations	Key skills for 2020	Skills family
Software and Applications Developers and Analysts	Complex Problem Solving	Complex Problem Solving Skills
Information Security Analysts	Critical Thinking	Process Skills
Data Analysts	Cognitive Flexibility	Cognitive Abilities
	Mathematical Reasoning	Cognitive Abilities
	Active Learning	Content Skills

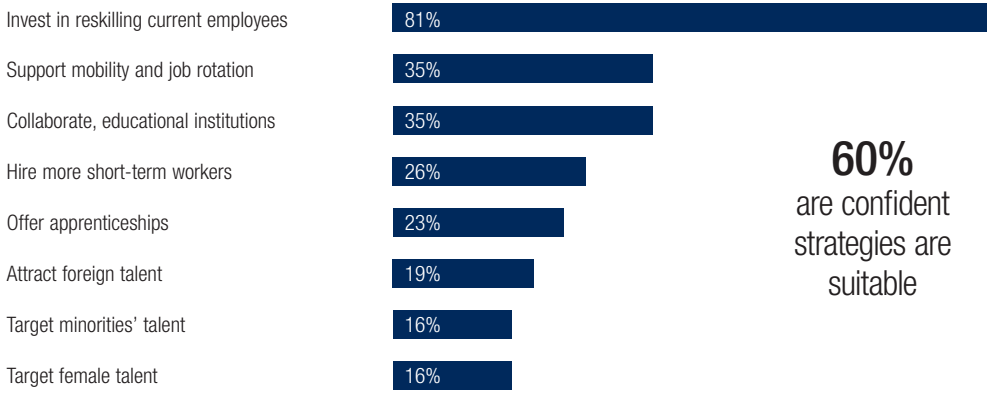
Change Management and Future Workforce Planning

Barriers

Resource constraints	74%
Insufficient understanding of disruptive changes	48%
Pressure from shareholders, short-term profitability	42%
Workforce strategy not aligned to innovation strategy	39%
Insufficient priority by top management	23%
Insufficient priority by line management	16%

73% believe future workforce planning is a leadership priority

Strategies



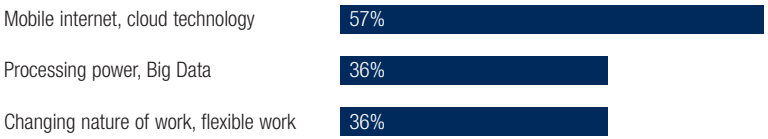
60% are confident strategies are suitable

Industry Profile

Media, Entertainment and Information

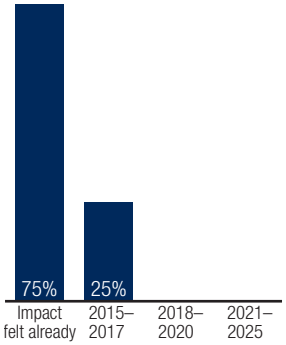
Drivers of Change

Top Trends Impacting Business Models

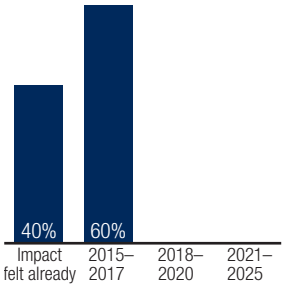


Expected Time to Impact on Employee Skills

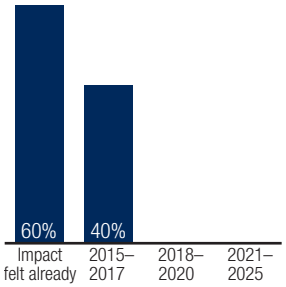
1 Mobile internet, cloud technology



2 Processing power, Big Data



3 Changing nature of work, flexible work



Workforce Disruption

Industry Average

GROWTH	73%	30%	HARD	HARDER
Employment outlook	Skills stability	Current share of female workforce	Ease of recruitment, current	Ease of recruitment, 2020

Main Job Families

Job families	Expected change, 2015–2020	Skills stability	Current share of female workforce	Ease of recruitment, current	Ease of recruitment, 2020
Arts, Design, Entertainment, Sports, and Media	**stable**	**66%**	**49%**	**very hard**	**harder**
Advertising and Public Relations Professionals	–0.59%				
Telecommunications and Broadcasting Technicians					
Computer and Mathematical	**strong growth**	**88%**	**23%**	**hard**	**harder**
Data Analysts	6.94%				
Software and Applications Developers and Analysts					
Sales and Related	**growth**	**86%**	**39%**	**neutral**	**neutral**
Cashiers and Ticket Clerks	2.69%				
Door-To-Door Sales Workers, News and Street Vendors					
Management	**growth**	**67%**	**12%**	**hard**	**neutral**
General and Operations Managers	1.67%				
Business Services and Administration Managers					

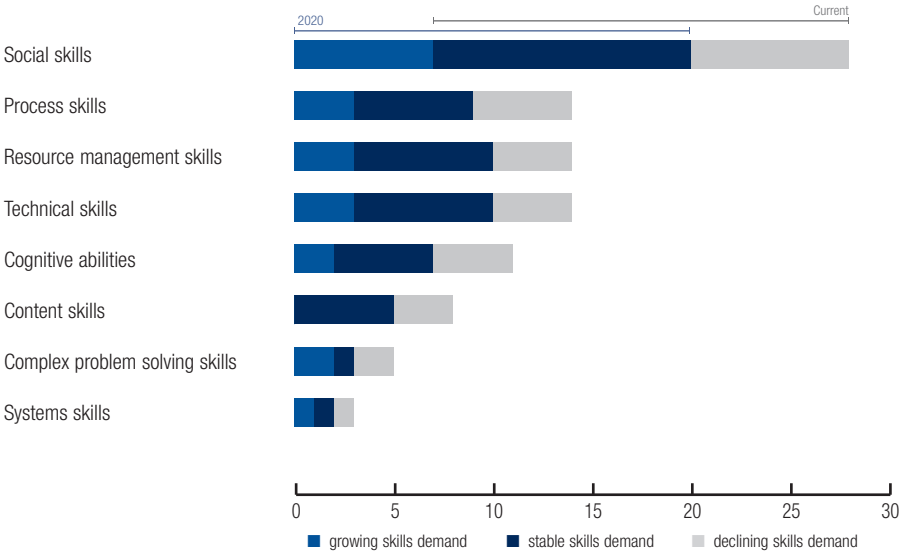
Expected Impact on Job Quality

Industry Profile

Media, Entertainment and Information

Skills Forecast

Skills Change, Overall Industry



Emerging Job Family in Focus: Management

Occupations	Key skills for 2020	Skills family
Managing Directors and Chief Executives	Critical Thinking	Process Skills
Organisational Development Specialists	People Management	Resource Management Skills
General and Operations Managers	Complex Problem Solving	Complex Problem Solving Skills
	Monitoring Self and Others	Process Skills
	Management of Financial Resources	Resource Management Skills

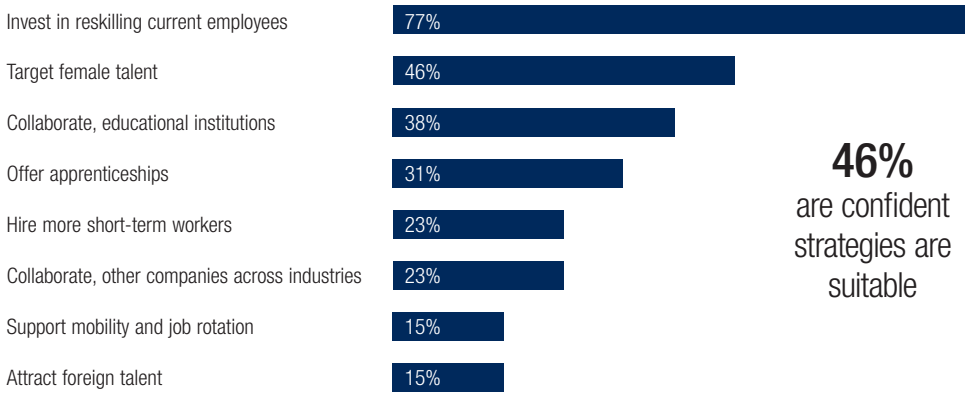
Change Management and Future Workforce Planning

Barriers

Pressure from shareholders, short-term profitability	64%
Workforce strategy not aligned to innovation strategy	50%
Resource constraints	36%
Insufficient understanding of disruptive changes	36%
Insufficient priority by line management	21%
Don't know	14%

69%
believe future workforce planning is a leadership priority

Strategies



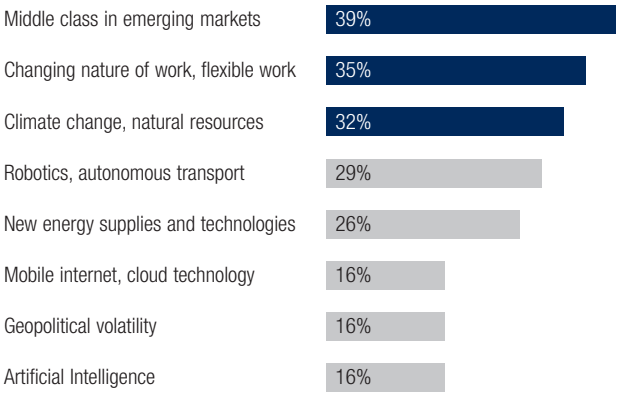
46%
are confident strategies are suitable

Industry Profile

Mobility

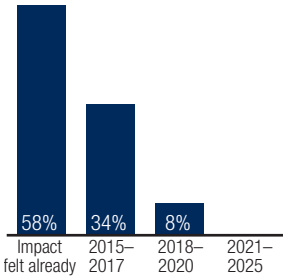
Drivers of Change

Top Trends Impacting Business Models

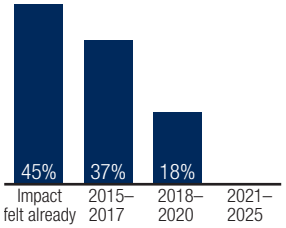


Expected Time to Impact on Employee Skills

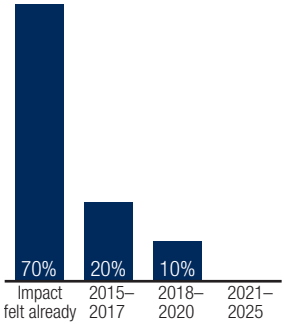
1 Middle class in emerging markets



2 Changing nature of work, flexible work



3 Climate change, natural resources



Workforce Disruption

Industry Average

STABLE	61%	16%	HARD	HARDER
Employment outlook	Skills stability	Current share of female workforce	Ease of recruitment, current	Ease of recruitment, 2020

Main Job Families

Job families	Expected change, 2015–2020	Skills stability	Current share of female workforce	Ease of recruitment, current	Ease of recruitment, 2020
Manufacturing and Production	**decline**	**66%**	**18%**	**neutral**	**harder**
Assembly and Factory Workers	–1.43%				
Sheet and Structural Metal Workers					
Architecture and Engineering	**growth**	**62%**	**13%**	**hard**	**harder**
Electrotechnology Engineers	4.83%				
Industrial and Production Engineers					
Transportation and Logistics	**growth**	**63%**	**13%**	**hard**	**harder**
Supply Chain and Logistics Specialists	3.13%				
Transportation Attendants and Conductors					
Sales and Related	**decline**	**4%**	**16%**	**hard**	**neutral**
Sales and Marketing Professionals	–1.88%				
Sales Representatives, Wholesale and Technical					

Expected Impact on Job Quality

Compensation

Job security

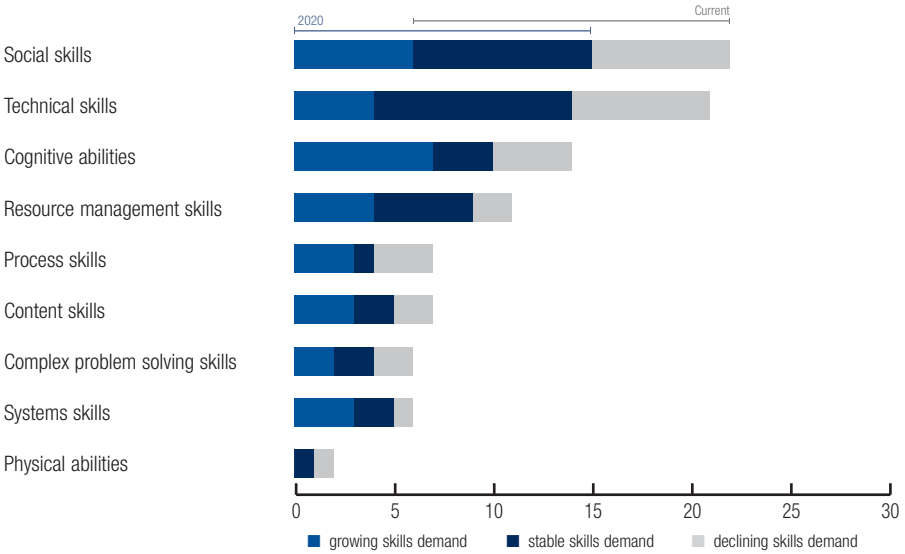
Work-life balance

Industry Profile

Mobility

Skills Forecast

Skills Change, Overall Industry



Emerging Job Families in Focus: Computer and Mathematical & Arts and Design

Occupations	Key skills for 2020	Skills family
Data Analysts	Creativity	Cognitive Abilities
Software and Applications Developers and Analysts	Active Learning	Content Skills
Commercial and Industrial Designers	Time Management	Resource Management Skills
	Negotiation	Social Skills
	Programming	Technical Skills

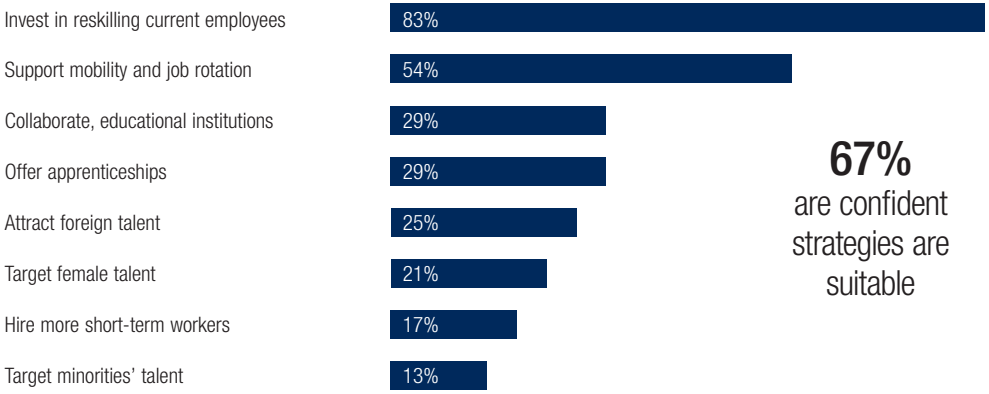
Change Management and Future Workforce Planning

Barriers

Insufficient understanding of disruptive changes	58%
Resource constraints	50%
Pressure from shareholders, short-term profitability	38%
Insufficient priority by line management	33%
Insufficient priority by top management	21%
Workforce strategy not aligned to innovation strategy	17%

71%
believe future workforce planning is a leadership priority

Strategies



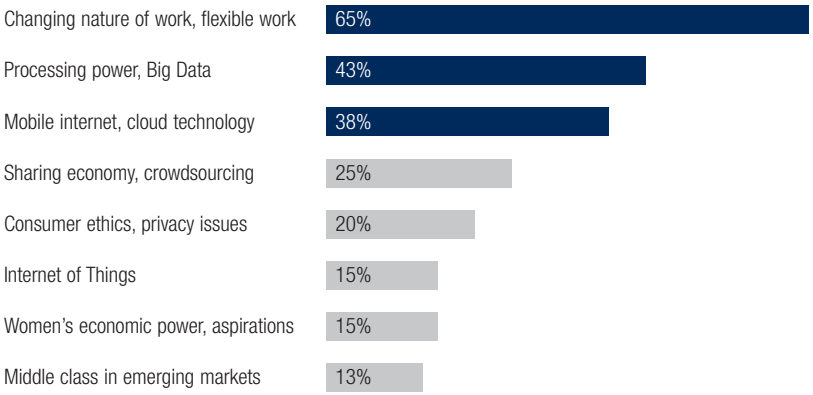
67%
are confident strategies are suitable

Industry Profile

Professional Services

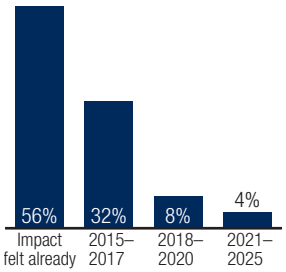
Drivers of Change

Top Trends Impacting Business Models

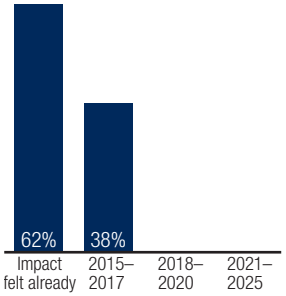


Expected Time to Impact on Employee Skills

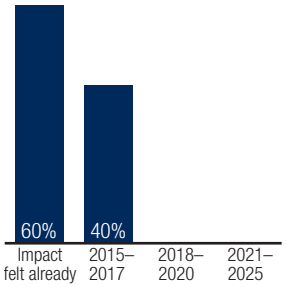
1 Changing nature of work, flexible work



2 Processing power, Big Data



3 Mobile internet, cloud technology



Workforce Disruption

Industry Average

STABLE	67%	30%	HARD	HARDER
Employment outlook	Skills stability	Current share of female workforce	Ease of recruitment, current	Ease of recruitment, 2020

Main Job Families

Job families	Expected change, 2015–2020	Skills stability	Current share of female workforce	Ease of recruitment, current	Ease of recruitment, 2020
Business and Financial Operations	**stable**	**77%**	**48%**	**neutral**	**harder**
Management and Organisation Analysts	0.33%				
Human Resources Specialists					
Computer and Mathematical	**strong growth**	**54%**	**17%**	**hard**	**harder**
Data Analysts	5.31%				
Software and Applications Developers and Analysts					
Management	**growth**	**65%**	**29%**	**hard**	**neutral**
General and Operations Managers	1.00%				
Business Services and Administration Managers					
Sales and Related	**decline**	**54%**	**56%**	**hard**	**harder**
Sales and Marketing Professionals	–3.21%				
Real Estate Sales Agents					

Expected Impact on Job Quality

Compensation

Job security

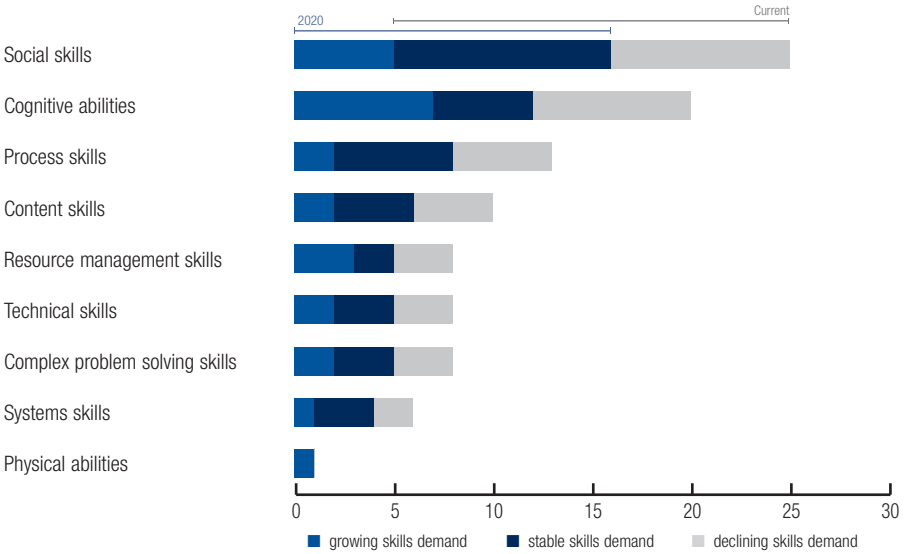
Work-life balance

Industry Profile

Professional Services

Skills Forecast

Skills Change, Overall Industry



Emerging Job Family in Focus: Computer and Mathematical

Occupations	Key skills for 2020	Skills family
Mathematicians, Actuaries and Statisticians	Complex Problem Solving	Complex Problem Solving Skills
Geospatial Information Scientists and Technologists	Problem Sensitivity	Cognitive Abilities
Data Analysts	Logical Reasoning	Cognitive Abilities
	Mathematical Reasoning	Cognitive Abilities
	ICT Literacy	Content Skills

Change Management and Future Workforce Planning

Barriers

Insufficient understanding of disruptive changes 51%

Resource constraints 49%

Workforce strategy not aligned to innovation strategy 37%

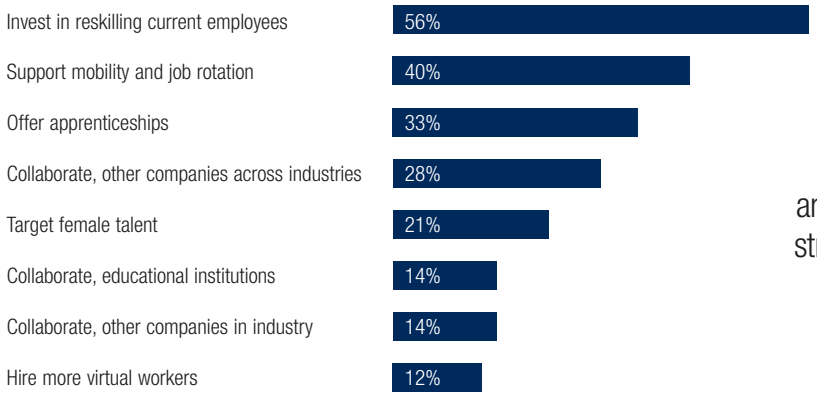
Pressure from shareholders, short-term profitability 35%

Insufficient priority by top management 23%

Don't know 19%

61%
believe future workforce planning is a leadership priority

Strategies



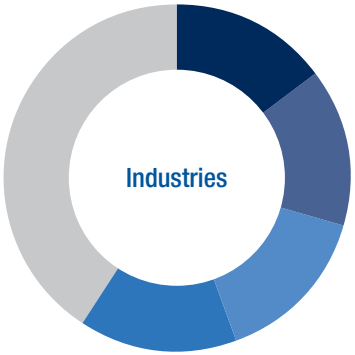
58%
are confident strategies are suitable

Country and Regional Profiles

Regional Profile

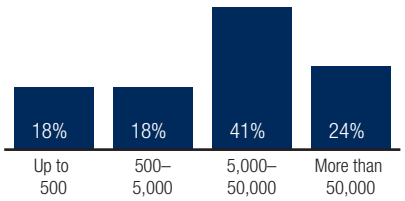
Association of Southeast Asian Nations

Sample Overview



- Professional Services 15%
- Energy 15%
- Financial Services & Investors 15%
- Consumer 14%
- Others 41%

Number of Employees



Workforce Disruption

Main Industries

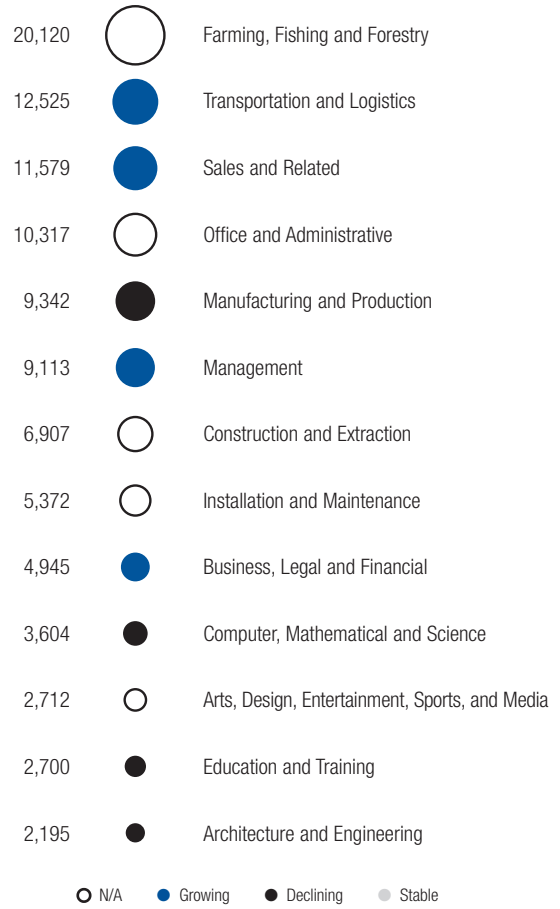
Industry	Employment outlook, 2015–2020	CURRENT: Local share of recruitment, specialists	CURRENT: Ease of recruitment, overall	2020: Local share of recruitment, specialists	2020: Ease of recruitment, overall
Consumer	—	—	easy	—	harder
Energy	—	—	hard	—	easier
Financial Services & Investors	—	—	easy	51–75%	easier
Professional Services	—	—	very hard	—	harder

Ease of Recruitment

Occupation types	CURRENT: Country/region	CURRENT: Sample average	2020: Country/region	2020: Sample average
Mass Employment Assembly and Factory Workers	**neutral**	**hard**	**harder**	**neutral**
Strategic/Specialist Financial Analysts	**easy**	**hard**	**neutral**	**harder**
New and Emerging Business Services and Administration Managers	**—**	**—**	**hard**	**hard**

Employment Outlook by Main Job Family

Current workforce (thousands)



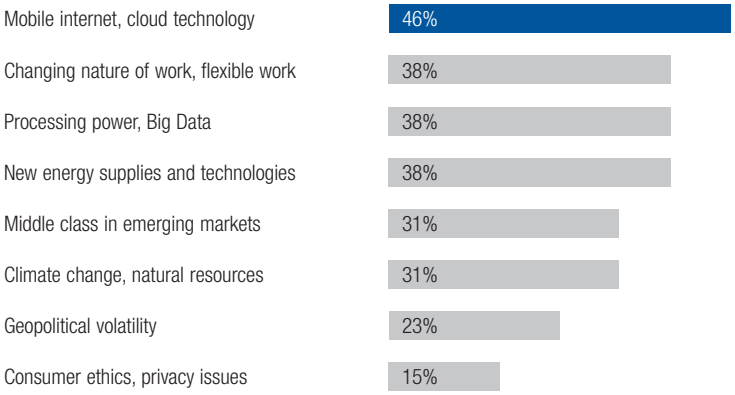
Not shown: Social and Protective Services (7,226), Healthcare Practitioners (2,419), Hospitality and Food Related (7,046), Personal Care and Service (10,862)

Regional Profile

Association of Southeast Asian Nations

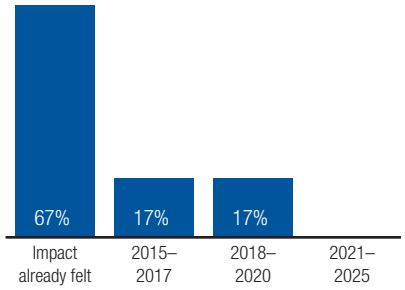
Drivers of Change

Top Trends Impacting Industries



Disruption in Focus: Mobile internet, Cloud Technology

Expected Time to Impact on Employee Skills



Expected Impact on Employment Outlook: Negative

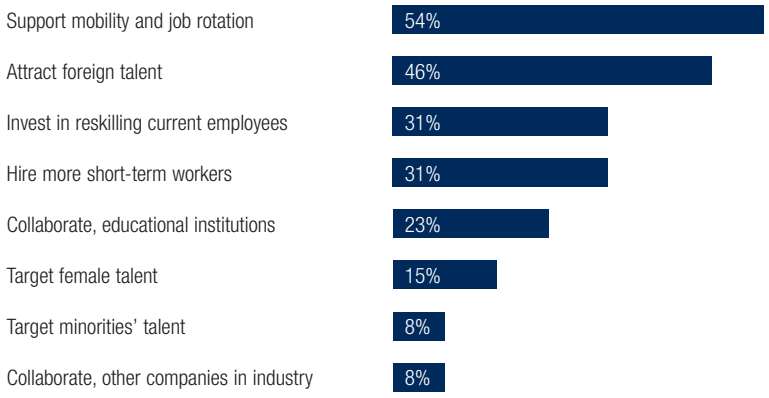
Change Management and Future Workforce Planning

Barriers

Pressure from shareholders, short-term profitability	40%
Resource constraints	40%
Workforce strategy not aligned to innovation strategy	35%
Insufficient understanding of disruptive changes	25%
Don't know	20%

64% believe future workforce planning is a leadership priority

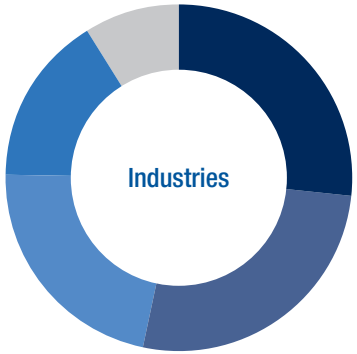
Strategies



50% are confident strategies are suitable

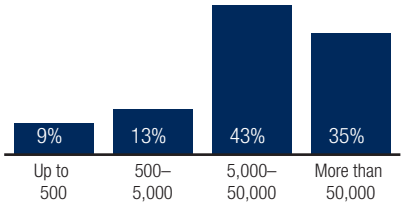
Country Profile
Australia

Sample Overview



- Professional Services 27%
- Basic and Infrastructure 26%
- Energy 22%
- Information and Communication Technology 16%
- Others 9%

Number of Employees



Workforce Disruption

Main Industries

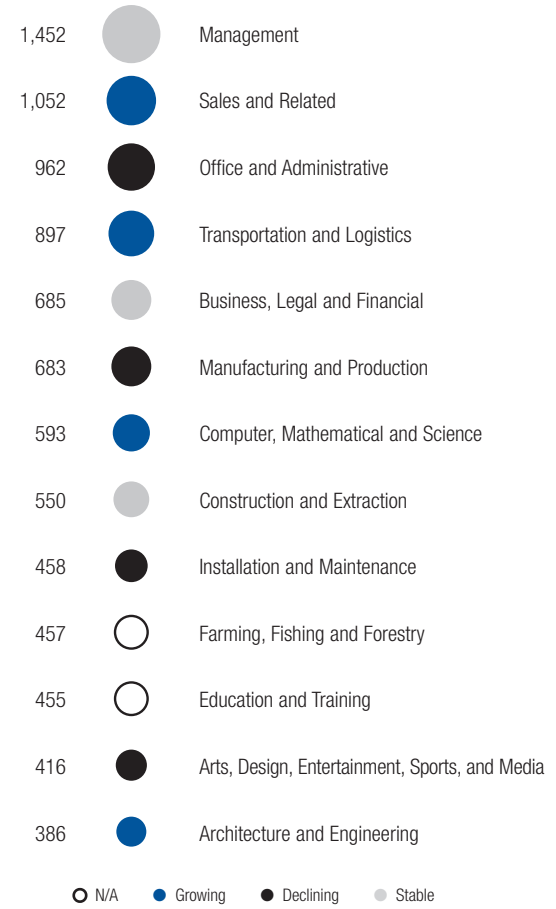
Industry	Employment outlook, 2015–2020	CURRENT: Local share of recruitment, specialists	CURRENT: Ease of recruitment, overall	2020: Local share of recruitment, specialists	2020: Ease of recruitment, overall
Professional Services	stable 0.91%	76–100%	hard	51–75%	harder
Basic and Infrastructure	decline –1.67%	—	easy	—	neutral
Energy	growth 3.57%	76–100%	hard	76–100%	harder
Information and Communication Technology	growth 3.57%	76–100%	hard	76–100%	harder

Ease of Recruitment

Occupation types	CURRENT: Country/region	CURRENT: Sample average	2020: Country/region	2020: Sample average
Mass Employment Petroleum and Natural Gas Refining Plant Operators	**neutral**	**hard**	**harder**	**neutral**
Strategic/Specialist Sales Representatives, Wholesale and Technical Products	**hard**	**hard**	**harder**	**harder**
New and Emerging Robotics Engineers	**—**	**—**	**hard**	**hard**

Employment Outlook by Main Job Family

Current workforce (thousands)



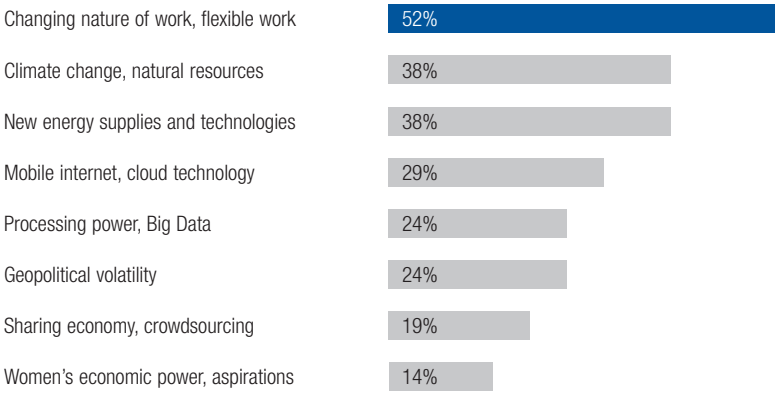
Not shown: Social and Protective Services (782), Healthcare Practitioners (343), Hospitality and Food Related (634), Personal Care and Service (761)

Country Profile

Australia

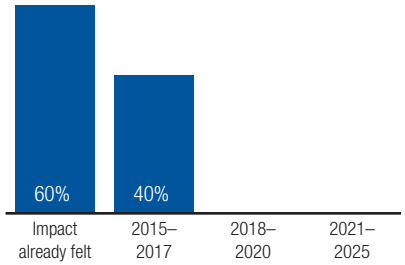
Drivers of Change

Top Trends Impacting Industries



Disruption in Focus: Changing Nature of Work, Flexible Work

Expected Time to Impact on Employee Skills



Expected Impact on Employment Outlook: Neutral

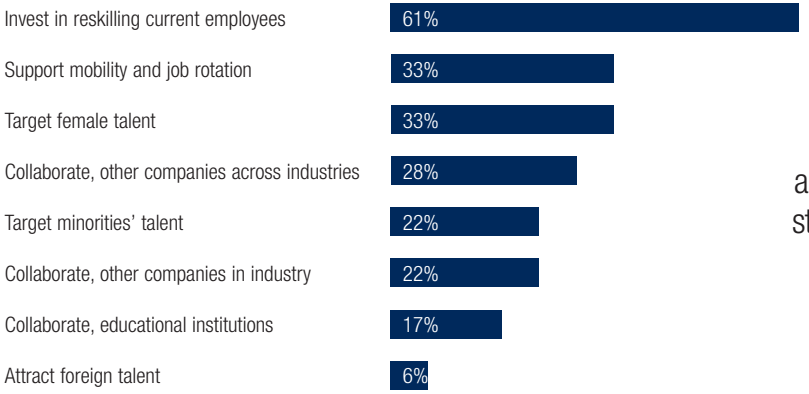
Change Management and Future Workforce Planning

Barriers

Resource constraints	93%
Pressure from shareholders, short-term profitability	71%
Workforce strategy not aligned to innovation strategy	57%
Insufficient understanding of disruptive changes	57%
Insufficient priority by top management	57%

45% believe future workforce planning is a leadership priority

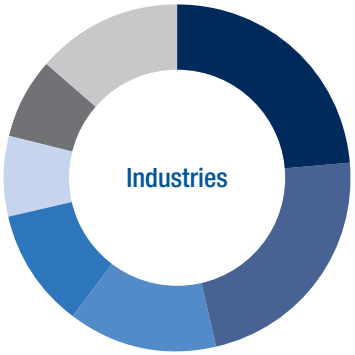
Strategies



55% are confident strategies are suitable

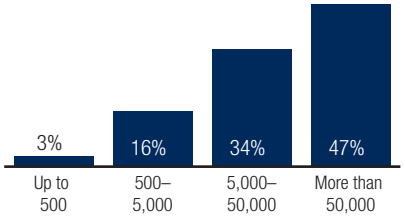
Country Profile
Brazil

Sample Overview



- Professional Services 24%
- Mobility 23%
- Consumer 14%
- Basic and Infrastructure 11%
- Energy 8%
- Information and Communication Technology 8%
- Others 14%

Number of Employees



Workforce Disruption

Main Industries

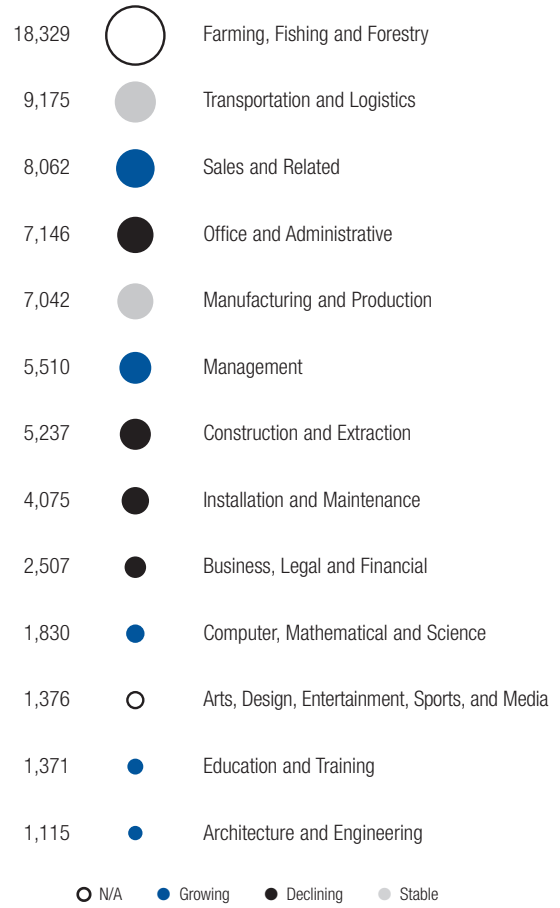
Industry	Employment outlook, 2015–2020	CURRENT: Local share of recruitment, specialists	CURRENT: Ease of recruitment, overall	2020: Local share of recruitment, specialists	2020: Ease of recruitment, overall
Professional Services	stable –0.71%	76–100%	hard	—	harder
Mobility	growth 3.08%	76–100%	hard	76–100%	harder
Consumer	decline –1.11%	76–100%	hard	76–100%	neutral
Basic and Infrastructure	decline –2.00%	—	easy	—	neutral
Information and Communication Technology	strong decline –5.00%	—	neutral	—	harder
Energy	strong decline –6.00%	—	neutral	—	neutral

Ease of Recruitment

Occupation types	CURRENT: Country/region	CURRENT: Sample average	2020: Country/region	2020: Sample average
Mass Employment Assembly and Factory Workers	**neutral**	**hard**	**neutral**	**neutral**
Strategic/Specialist Software and Applications Developers and Analysts	**hard**	**hard**	**harder**	**harder**
New and Emerging Biochemical Engineers	**—**	**—**	**hard**	**hard**

Employment Outlook by Main Job Family

Current workforce (thousands)



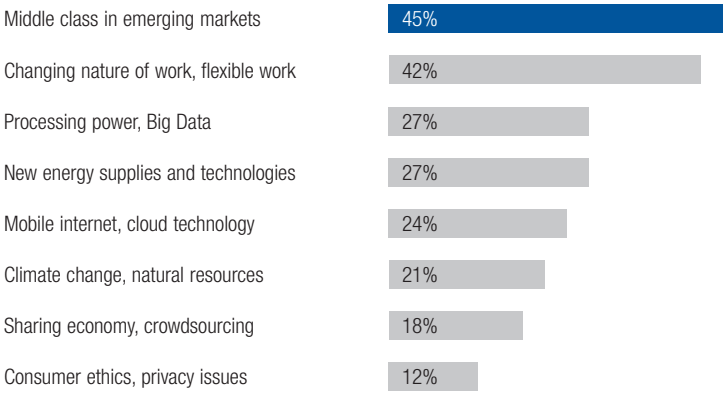
Not shown: Social and Protective Services (4,699), Healthcare Practitioners (1,227), Hospitality and Food Related (4,992), Personal Care and Service (8,257)

Country Profile

Brazil

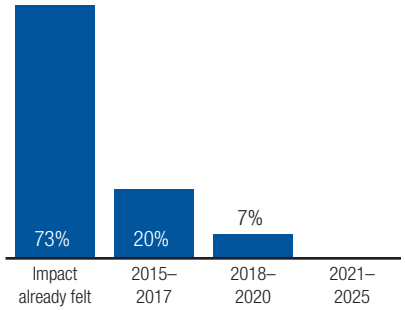
Drivers of Change

Top Trends Impacting Industries



Disruption in Focus: Middle class in emerging markets

Expected Time to Impact on Employee Skills



Expected Impact on Employment Outlook: Negative

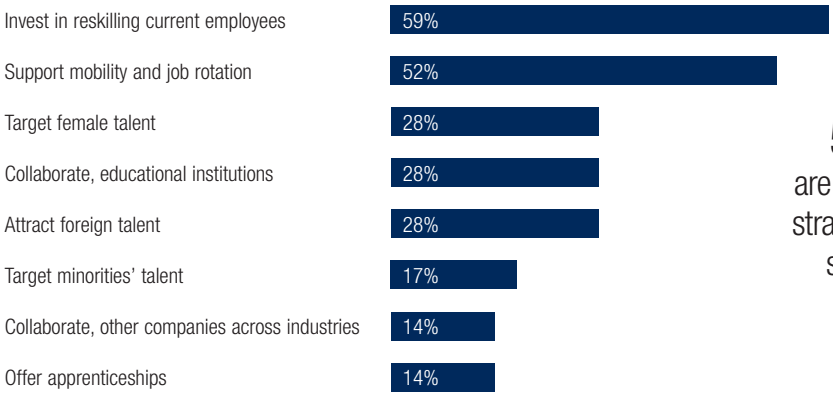
Change Management and Future Workforce Planning

Barriers

Insufficient understanding of disruptive changes	55%
Workforce strategy not aligned to innovation strategy	48%
Pressure from shareholders, short-term profitability	48%
Resource constraints	34%
Insufficient priority by top management	28%

69% believe future workforce planning is a leadership priority

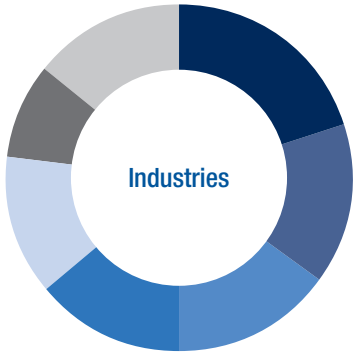
Strategies



52% are confident strategies are suitable

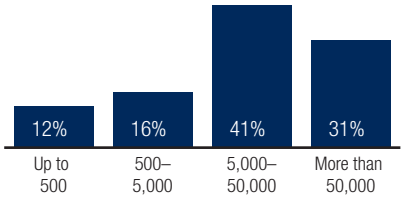
Country Profile
China

Sample Overview



- Professional Services 20%
- Mobility 15%
- Basic and Infrastructure 15%
- Energy 14%
- Financial Services & Investors 13%
- Consumer 9%
- Others 14%

Number of Employees



Workforce Disruption

Main Industries

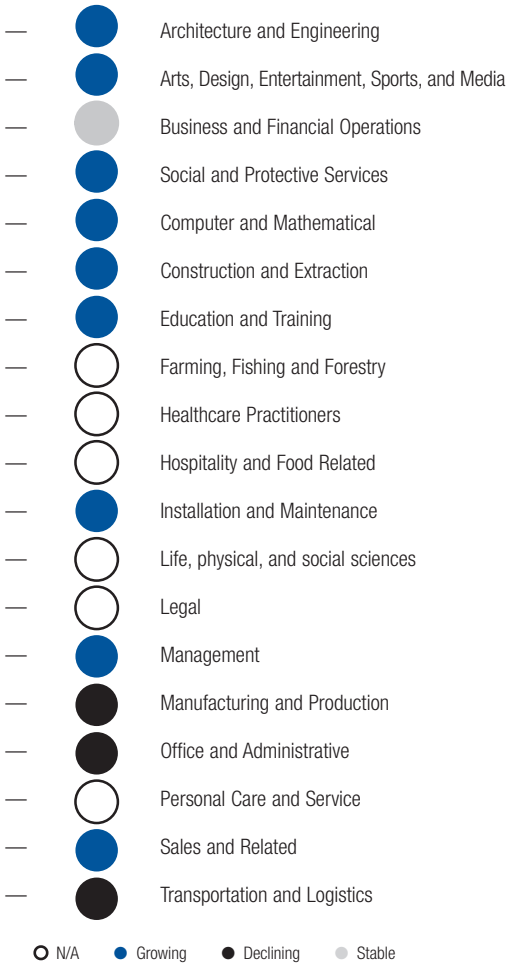
Industry	Employment outlook, 2015–2020	CURRENT: Local share of recruitment, specialists	CURRENT: Ease of recruitment, overall	2020: Local share of recruitment, specialists	2020: Ease of recruitment, overall
Professional Services	decline –1.48%	51–75%	hard	51–75%	harder
Mobility	growth 3.06%	51–75%	hard	76–100%	harder
Basic and Infrastructure	stable 0.50%	76–100%	hard	26–50%	harder
Energy	growth 2.06%	26–50%	hard	76–100%	neutral
Financial Services & Investors	growth 2.06%	76–100%	hard	26–50%	harder
Consumer	stable –0.56%	51–75%	hard	51–75%	harder

Ease of Recruitment

Occupation types	CURRENT: Country/region	CURRENT: Sample average	2020: Country/region	2020: Sample average
Mass Employment Assembly and Factory Workers	**hard**	**hard**	**harder**	**neutral**
Strategic/Specialist Sales Representatives, Wholesale and Technical Products	**hard**	**hard**	**harder**	**harder**
New and Emerging Financial and Investment Advisers	—	—	**hard**	**hard**

Employment Outlook by Main Job Family

Current workforce (thousands)

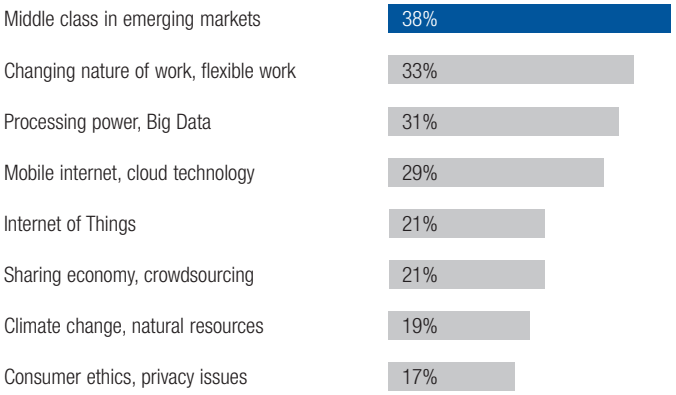


Country Profile

China

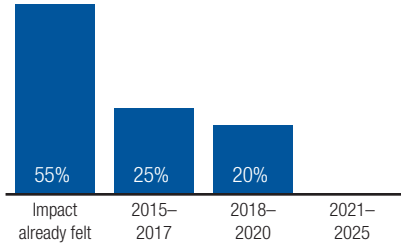
Drivers of Change

Top Trends Impacting Industries



Disruption in Focus: Middle class in emerging markets

Expected Time to Impact on Employee Skills



Expected Impact on Employment Outlook: Neutral

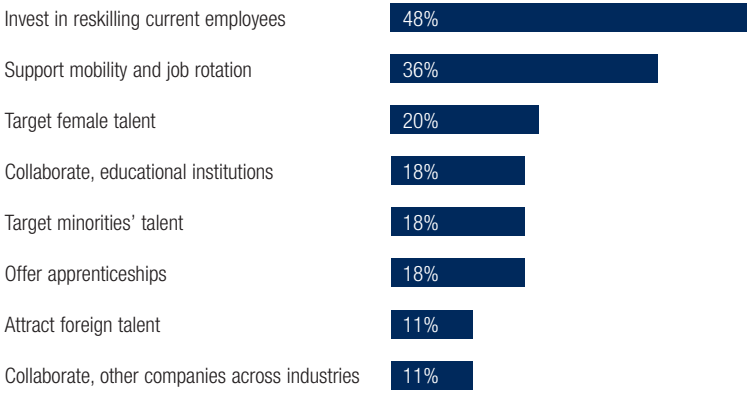
Change Management and Future Workforce Planning

Barriers

Insufficient understanding of disruptive changes	64%
Resource constraints	55%
Workforce strategy not aligned to innovation strategy	50%
Pressure from shareholders, short-term profitability	39%
Insufficient priority by top management	34%

61% believe future workforce planning is a leadership priority

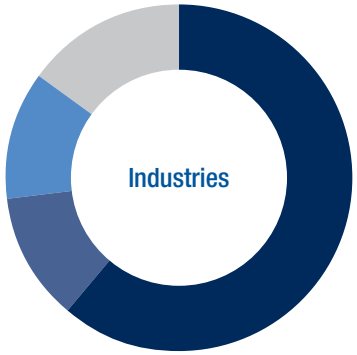
Strategies



50% are confident strategies are suitable

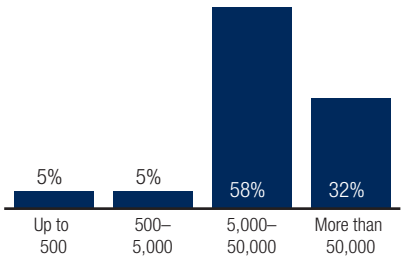
Country Profile
France

Sample Overview



- Professional Services 62%
- Mobility 12%
- Financial Services & Investors 12%
- Others 14%

Number of Employees



Workforce Disruption

Main Industries

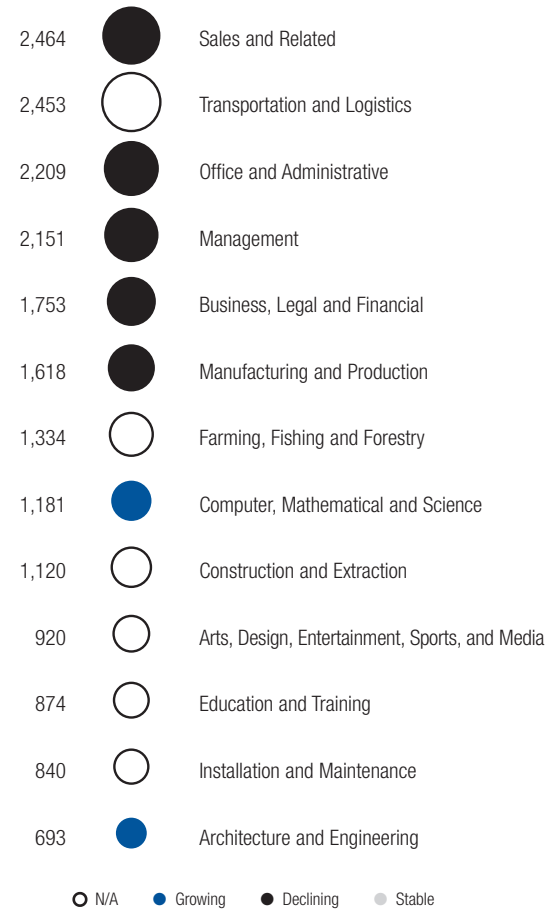
Industry	Employment outlook, 2015–2020	CURRENT: Local share of recruitment, specialists	CURRENT: Ease of recruitment, overall	2020: Local share of recruitment, specialists	2020: Ease of recruitment, overall
Professional Services	decline –3.53%	76–100%	hard	—	harder
Mobility	growth 1.25%	—	hard	—	harder
Financial Services & Investors	growth 0.00%	76–100%	neutral	—	neutral

Ease of Recruitment

Occupation types	CURRENT: Country/region	CURRENT: Sample average	2020: Country/region	2020: Sample average
Mass Employment Sales and Marketing Professionals	neutral	hard	neutral	neutral
Strategic/Specialist Sales and Marketing Professionals	hard	hard	harder	harder
New and Emerging Sales Representatives, Wholesale and Technical Products	—	—	neutral	hard

Employment Outlook by Main Job Family

Current workforce (thousands)



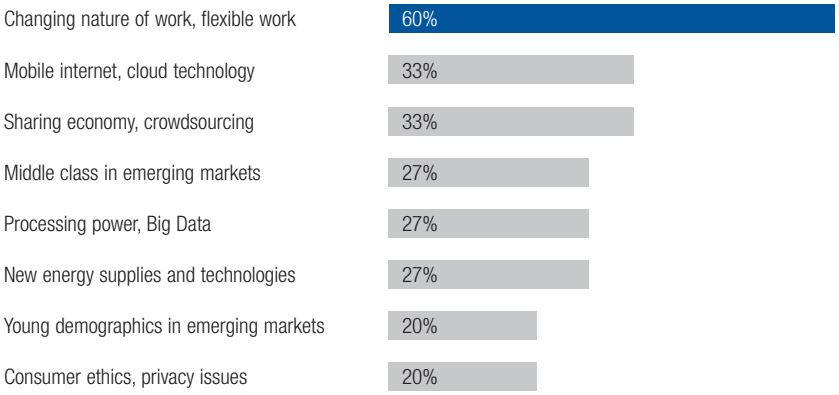
Not shown: Social and Protective Services (1,745), Healthcare Practitioners (849), Hospitality and Food Related (1,420), Personal Care and Service (1,843)

Country Profile

France

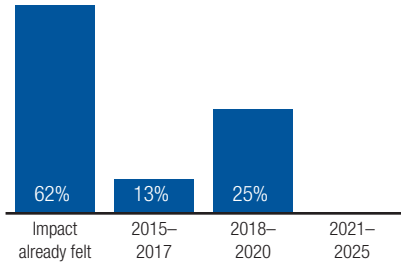
Drivers of Change

Top Trends Impacting Industries



Disruption in Focus: Changing Nature of Work, Flexible Work

Expected Time to Impact on Employee Skills



Expected Impact on Employment Outlook: Negative

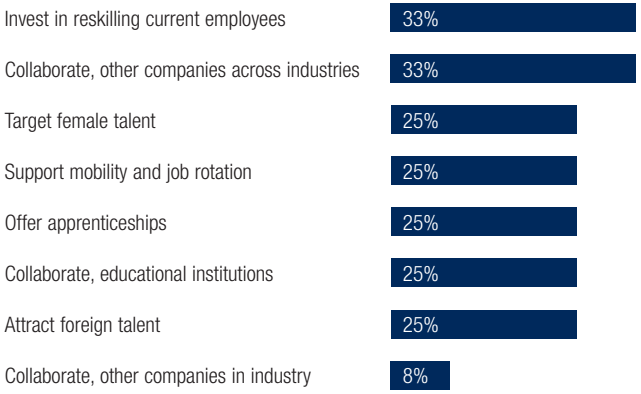
Change Management and Future Workforce Planning

Barriers

Workforce strategy not aligned to innovation strategy	67%
Don't know	67%
Resource constraints	50%
Insufficient understanding of disruptive changes	42%
Pressure from shareholders, short-term profitability	42%

75% believe future workforce planning is a leadership priority

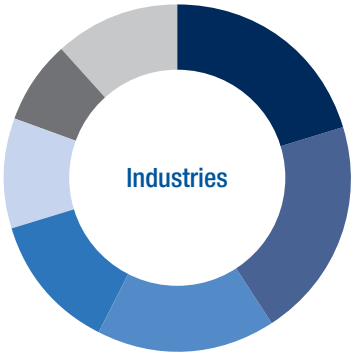
Strategies



58% are confident strategies are suitable

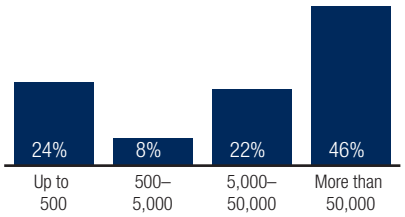
Country Profile
Germany

Sample Overview



- Basic and Infrastructure 21%
- Mobility 21%
- Professional Services 17%
- Energy 13%
- Financial Services & Investors 10%
- Information and Communication Technology 8%
- Others 12%

Number of Employees



Workforce Disruption

Main Industries

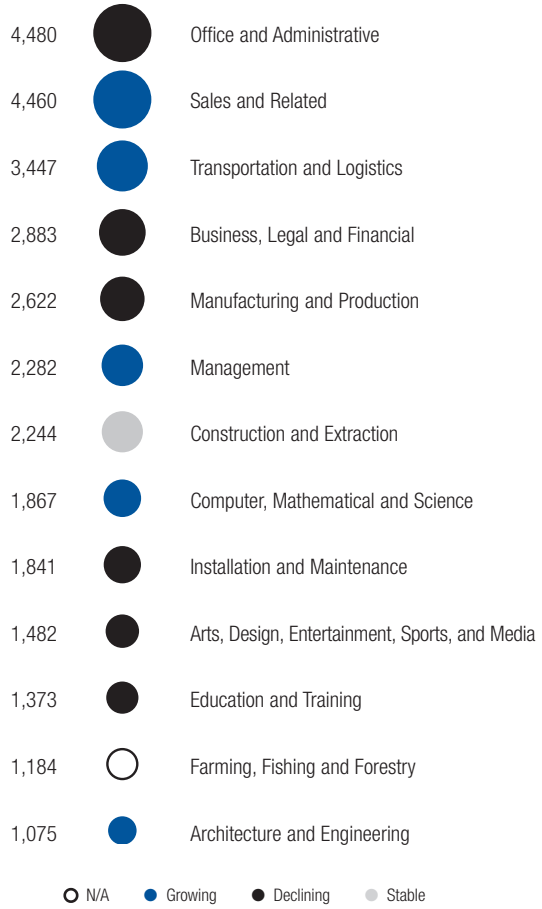
Industry	Employment outlook, 2015–2020	CURRENT: Local share of recruitment, specialists	CURRENT: Ease of recruitment, overall	2020: Local share of recruitment, specialists	2020: Ease of recruitment, overall
Basic and Infrastructure	growth 1.88%	26–50%	hard	51–75%	harder
Mobility	decline –3.67%	51–75%	hard	51–75%	harder
Professional Services	stable 0.56%	76–100%	very hard	26–50%	harder
Energy	decline –1.00%	26–50%	easy	51–75%	neutral
Financial Services & Investors	stable –0.63%	51–75%	neutral	26–50%	harder
Information and Communication Technology	growth 3.33%	—	hard	—	neutral

Ease of Recruitment

Occupation types	CURRENT: Country/region	CURRENT: Sample average	2020: Country/region	2020: Sample average
Mass Employment Assembly and Factory Workers	neutral	hard	harder	neutral
Strategic/Specialist Sales Representatives, Wholesale and Technical Products	hard	hard	harder	harder
New and Emerging Sales Representatives, Wholesale and Technical Products	—	—	hard	hard

Employment Outlook by Main Job Family

Current workforce (thousands)



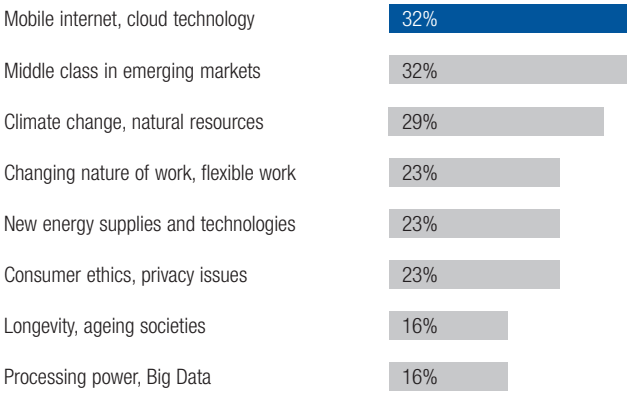
Not shown: Social and Protective Services (2,569), Healthcare Practitioners (1,390), Hospitality and Food Related (1,978), Personal Care and Service (2,471)

Country Profile

Germany

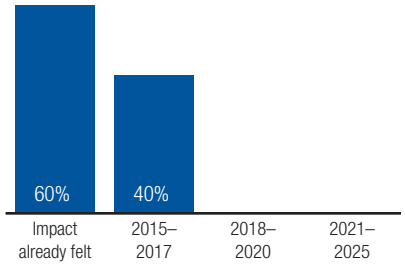
Drivers of Change

Top Trends Impacting Industries



Disruption in Focus: Mobile internet, cloud technology

Expected Time to Impact on Employee Skills



Expected Impact on Employment Outlook: Neutral

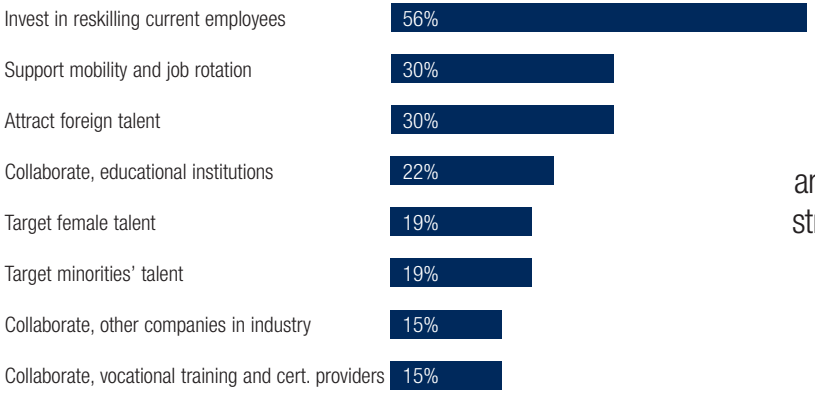
Change Management and Future Workforce Planning

Barriers

Insufficient understanding of disruptive changes	70%
Resource constraints	63%
Pressure from shareholders, short-term profitability	52%
Workforce strategy not aligned to innovation strategy	33%
Insufficient priority by line management	26%

74% believe future workforce planning is a leadership priority

Strategies

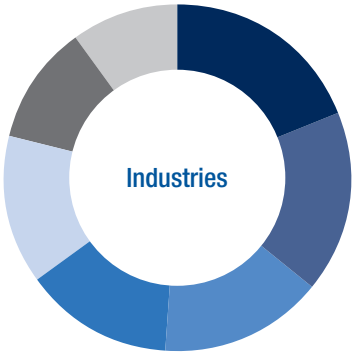


52% are confident strategies are suitable

Regional Profile

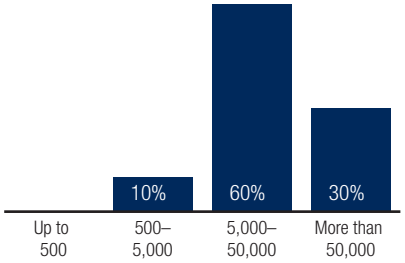
Gulf Cooperation Council

Sample Overview



- Consumer 19%
- Information and Communication Technology 17%
- Professional Services 15%
- Financial Services & Investors 14%
- Energy 14%
- Basic and Infrastructure 11%
- Others 10%

Number of Employees



Workforce Disruption

Main Industries

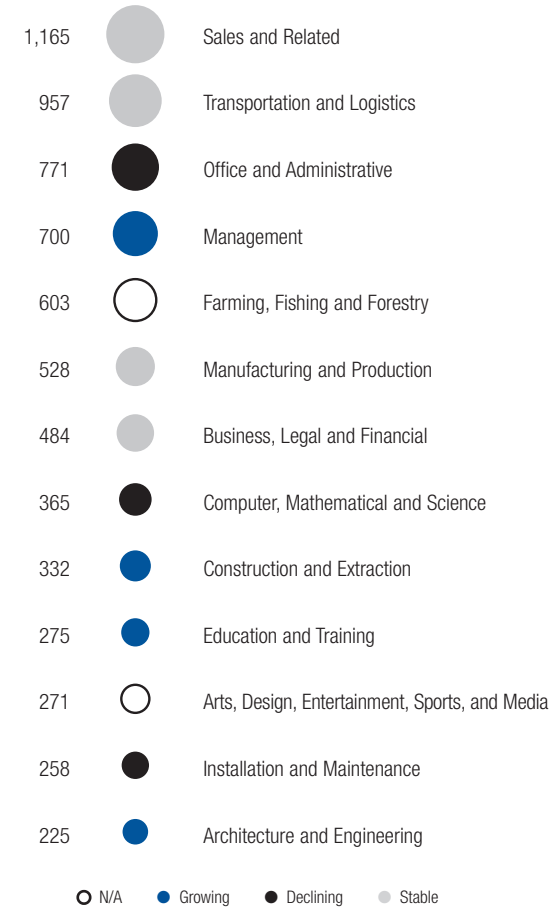
Industry	Employment outlook, 2015–2020	CURRENT: Local share of recruitment, specialists	CURRENT: Ease of recruitment, overall	2020: Local share of recruitment, specialists	2020: Ease of recruitment, overall
Consumer	stable 0.00%	51–75%	hard	26–50%	neutral
Information and Communication Technology	stable 0.56%	51–75%	hard	26–50%	hard
Professional Services	decline –2.73%	—	hard	—	hard
Financial Services & Investors	growth 3.75%	26–50%	hard	26–50%	hard
Energy	growth 2.14%	51–75%	neutral	76–100%	easier
Basic and Infrastructure	decline –1.43%	26–50%	hard	0–25%	easier

Ease of Recruitment

Occupation types	CURRENT: Country/region	CURRENT: Sample average	2020: Country/region	2020: Sample average
Mass Employment Assembly and Factory Workers	hard	hard	neutral	neutral
Strategic/Specialist General and Operations Managers	hard	hard	neutral	harder
New and Emerging Managing Directors and Chief Executives	—	—	very hard	hard

Employment Outlook by Main Job Family

Current workforce (thousands)



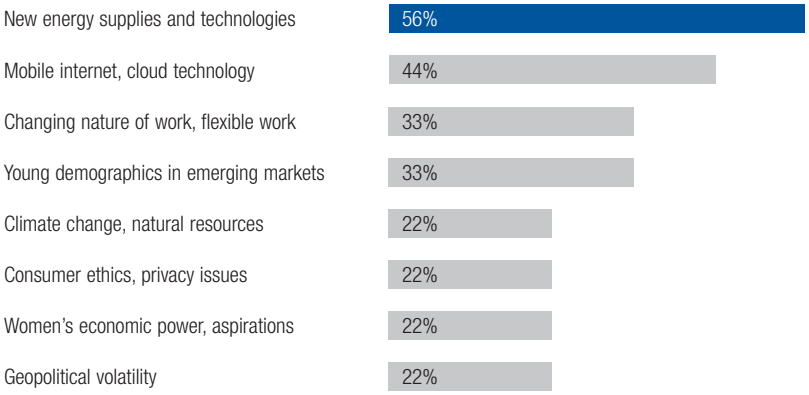
Not shown: Social and Protective Services (1,383), Healthcare Practitioners (238), Hospitality and Food Related (1,288), Personal Care and Service (1,226)

Regional Profile

Gulf Cooperation Council

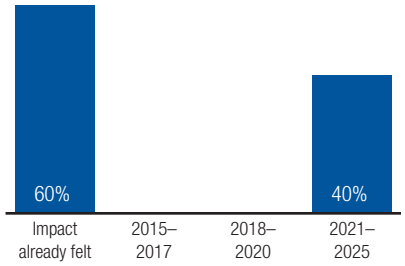
Drivers of Change

Top Trends Impacting Industries



Disruption in Focus: New Energy Supplies and Technologies

Expected Time to Impact on Employee Skills



Expected Impact on Employment Outlook: Positive

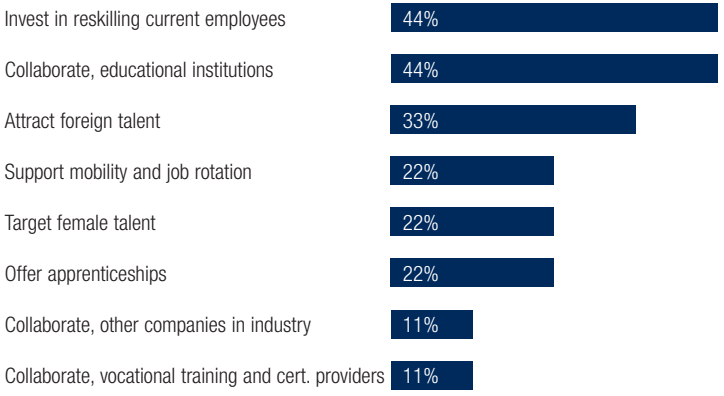
Change Management and Future Workforce Planning

Barriers

Resource constraints	56%
Workforce strategy not aligned to innovation strategy	56%
Insufficient understanding of disruptive changes	33%
No barriers	33%
Insufficient priority by top management	22%

67% believe future workforce planning is a leadership priority

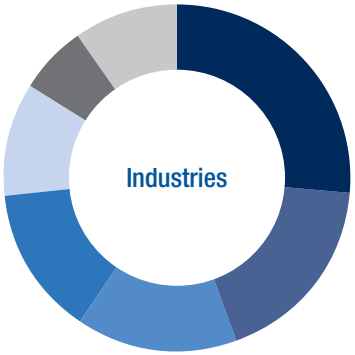
Strategies



89% are confident strategies are suitable

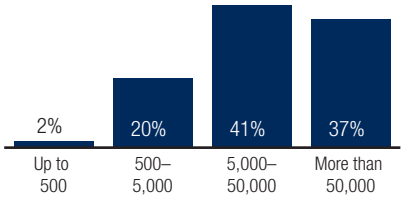
Country Profile
India

Sample Overview



- Information and Communication Technology 27%
- Mobility 18%
- Energy 15%
- Basic and Infrastructure 14%
- Professional Services 11%
- Consumer 6%
- Others 10%

Number of Employees



Workforce Disruption

Main Industries

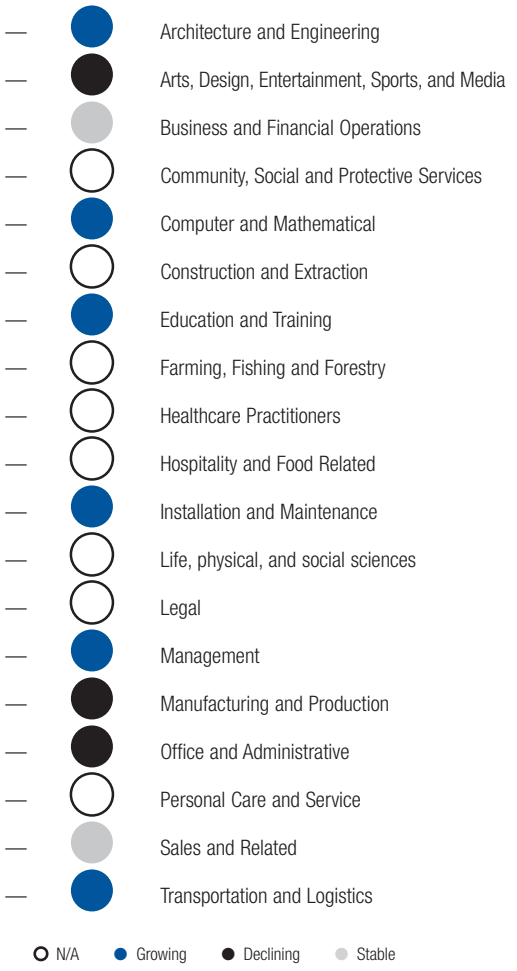
Industry	Employment outlook, 2015–2020	CURRENT: Local share of recruitment, specialists	CURRENT: Ease of recruitment, overall	2020: Local share of recruitment, specialists	2020: Ease of recruitment, overall
Information and Communication Technology	stable –0.38%	51–75%	neutral	51–75%	neutral
Mobility	growth 1.15%	76–100%	neutral	76–100%	neutral
Energy	growth 1.36%	76–100%	hard	76–100%	harder
Basic and Infrastructure	growth 3.13%	76–100%	hard	51–75%	harder
Professional Services	strong growth 5.00%	51–75%	easy	26–50%	harder
Consumer	strong growth 5.00%	76–100%	hard	51–75%	neutral

Ease of Recruitment

Occupation types	CURRENT: Country/region	CURRENT: Sample average	2020: Country/region	2020: Sample average
Mass Employment Database and Network Professionals	**neutral**	**hard**	**neutral**	**neutral**
Strategic/Specialist Software and Applications Developers and Analysts	**hard**	**hard**	**harder**	**harder**
New and Emerging Data Analysts	—	—	**hard**	**hard**

Employment Outlook by Main Job Family

Current workforce (thousands)

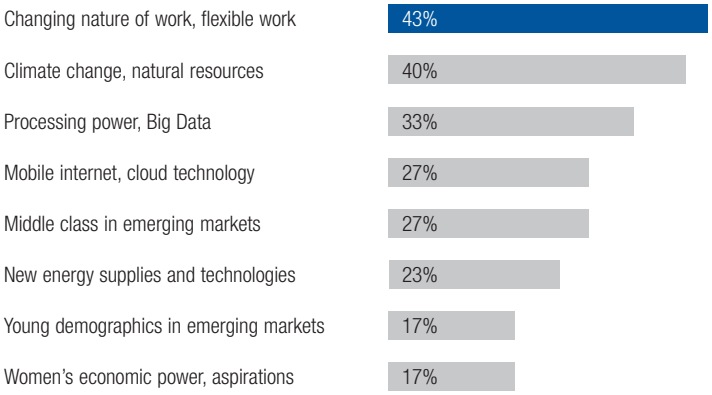


Country Profile

India

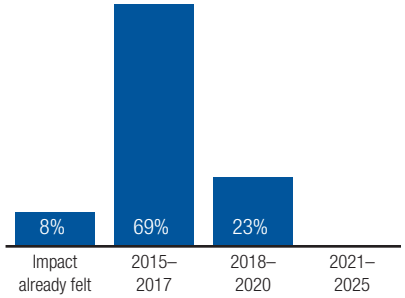
Drivers of Change

Top Trends Impacting Industries



Disruption in Focus: Changing Nature of Work, Flexible Work

Expected Time to Impact on Employee Skills



Expected Impact on Employment Outlook: Positive

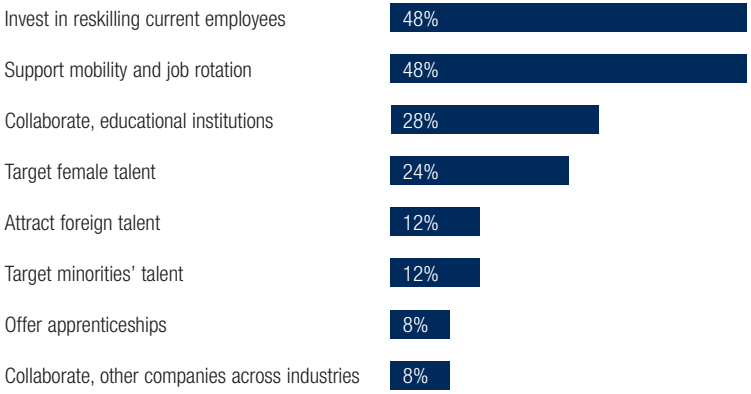
Change Management and Future Workforce Planning

Barriers

Insufficient understanding of disruptive changes	68%
Resource constraints	48%
Pressure from shareholders, short-term profitability	40%
Workforce strategy not aligned to innovation strategy	28%
Insufficient priority by line management	24%

76% believe future workforce planning is a leadership priority

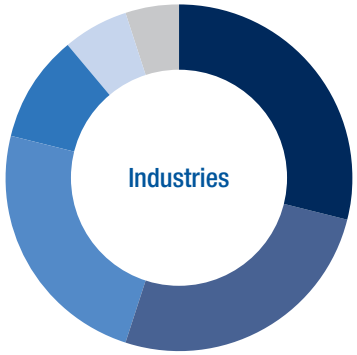
Strategies



60% are confident strategies are suitable

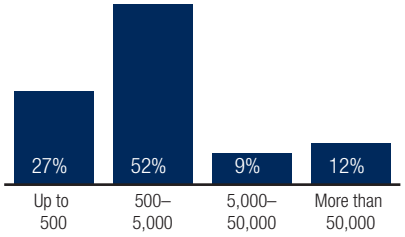
Country Profile
Italy

Sample Overview



- Mobility 29%
- Basic and Infrastructure 26%
- Consumer 24%
- Information and Communication Technology 10%
- Energy 6%
- Others 5%

Number of Employees



Workforce Disruption

Main Industries

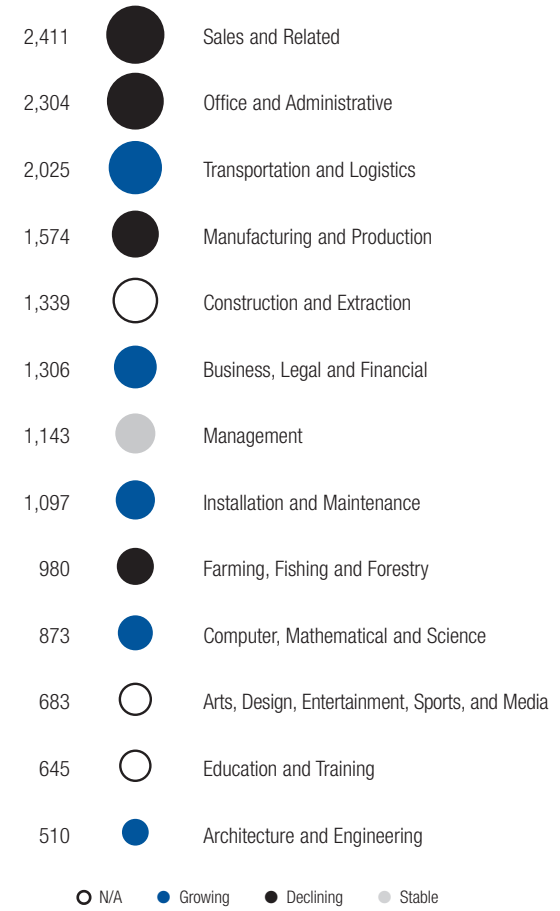
Industry	Employment outlook, 2015–2020	CURRENT: Local share of recruitment, specialists	CURRENT: Ease of recruitment, overall	2020: Local share of recruitment, specialists	2020: Ease of recruitment, overall
Mobility	stable 0.18%	76–100%	hard	51–75%	easier
Basic and Infrastructure	stable –0.58%	51–75%	hard	51–75%	neutral
Consumer	decline –1.82%	76–100%	hard	51–75%	harder
Information and Communication Technology	stable 0.56%	76–100%	hard	—	harder
Energy	growth 1.67%	51–75%	hard	26–50%	easier

Ease of Recruitment

Occupation types	CURRENT: Country/region	CURRENT: Sample average	2020: Country/region	2020: Sample average
Mass Employment Assembly and Factory Workers	neutral	hard	neutral	neutral
Strategic/Specialist Electrotechnology Engineers	hard	hard	neutral	harder
New and Emerging Materials Engineers	—	—	very hard	hard

Employment Outlook by Main Job Family

Current workforce (thousands)



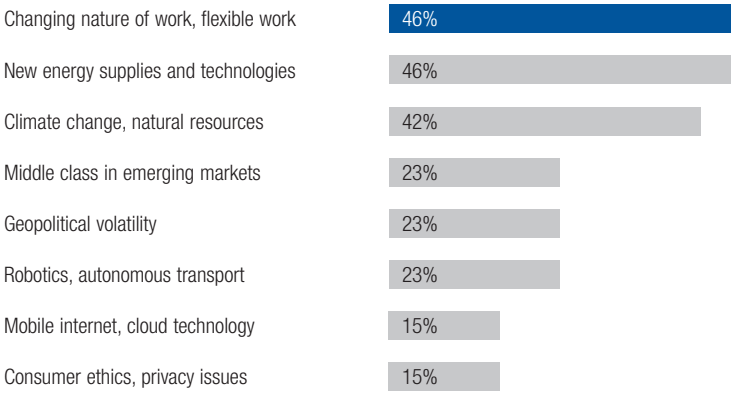
Not shown: Social and Protective Services (1,511), Healthcare Practitioners (632), Hospitality and Food Related (1,303), Personal Care and Service (1,706)

Country Profile

Italy

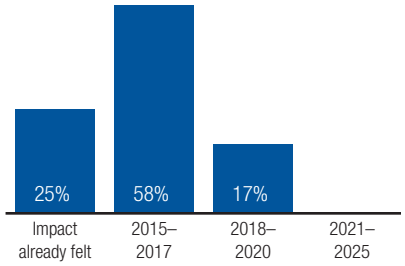
Drivers of Change

Top Trends Impacting Industries



Disruption in Focus: Changing Nature of Work, Flexible Work

Expected Time to Impact on Employee Skills



Expected Impact on Employment Outlook: Negative

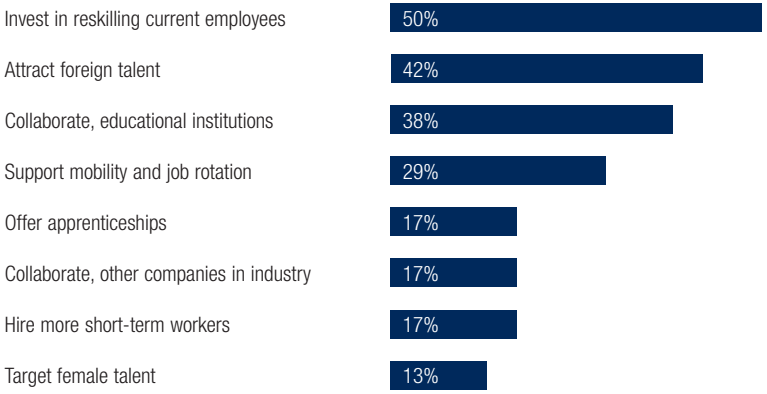
Change Management and Future Workforce Planning

Barriers

Pressure from shareholders, short-term profitability	46%
Resource constraints	38%
Insufficient understanding of disruptive changes	33%
Workforce strategy not aligned to innovation strategy	29%
Insufficient priority by top management	29%

63% believe future workforce planning is a leadership priority

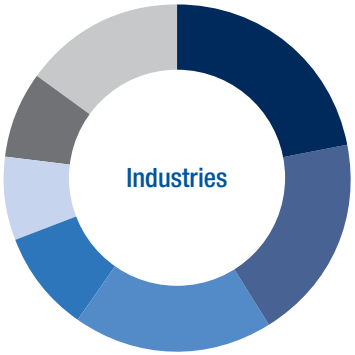
Strategies



46% are confident strategies are suitable

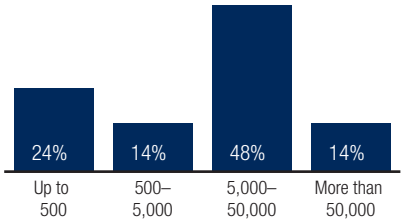
Country Profile
Japan

Sample Overview



- Information and Communication Technology.....22%
- Professional Services.....19%
- Basic and Infrastructure.....19%
- Media, Entertainment and Information.....9%
- Consumer.....8%
- Financial Services & Investors.....8%
- Others.....15%

Number of Employees



Workforce Disruption

Main Industries

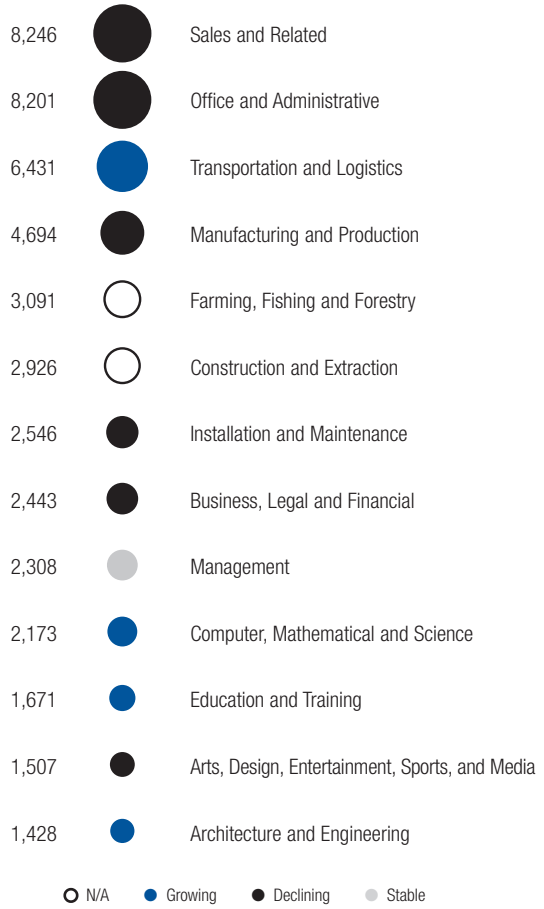
Industry	Employment outlook, 2015–2020	CURRENT: Local share of recruitment, specialists	CURRENT: Ease of recruitment, overall	2020: Local share of recruitment, specialists	2020: Ease of recruitment, overall
Information and Communication Technology	growth 2.78%	51–75%	hard	76–100%	harder
Professional Services	stable 0.00%	76–100%	hard	51–75%	harder
Basic and Infrastructure	stable 0.20%	51–75%	hard	51–75%	harder
Media, Entertainment and Information	stable 0.00%	51–75%	very hard	76–100%	harder
Financial Services & Investors	decline –3.00%	76–100%	hard	76–100%	harder
Consumer	decline –4.44%	76–100%	hard	76–100%	harder

Ease of Recruitment

Occupation types	CURRENT: Country/region	CURRENT: Sample average	2020: Country/region	2020: Sample average
Mass Employment Sales Representatives, Wholesale and Technical Products	**hard**	**hard**	**harder**	**neutral**
Strategic/Specialist Electrotechnology Engineers	**hard**	**hard**	**harder**	**harder**
New and Emerging Personal Care Workers in Health Services	—	—	**hard**	**hard**

Employment Outlook by Main Job Family

Current workforce (thousands)



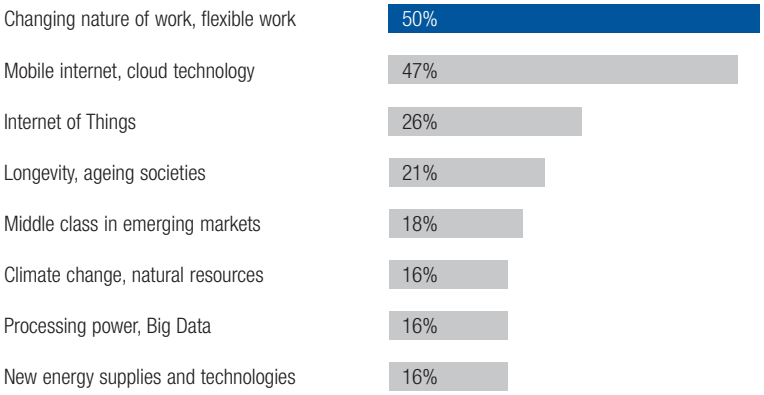
Not shown: Social and Protective Services (4,683), Healthcare Practitioners (1,230), Hospitality and Food Related (4,205), Personal Care and Service (4,507)

Country Profile

Japan

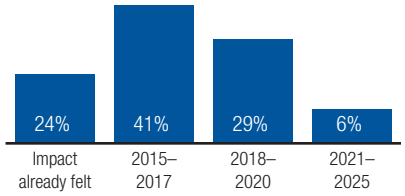
Drivers of Change

Top Trends Impacting Industries



Disruption in Focus: Changing Nature of Work, Flexible Work

Expected Time to Impact on Employee Skills



Expected Impact on Employment Outlook: Neutral

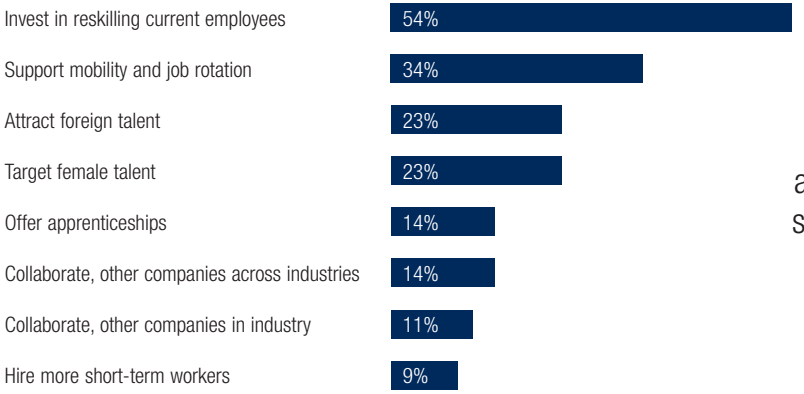
Change Management and Future Workforce Planning

Barriers

Resource constraints	69%
Workforce strategy not aligned to innovation strategy	49%
Insufficient understanding of disruptive changes	43%
Pressure from shareholders, short-term profitability	43%
Don't know	29%

86% believe future workforce planning is a leadership priority

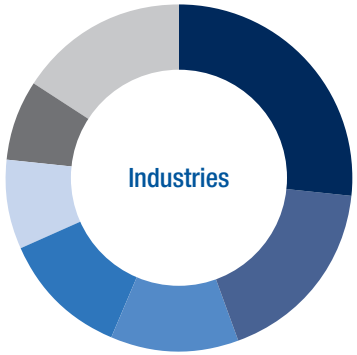
Strategies



43% are confident strategies are suitable

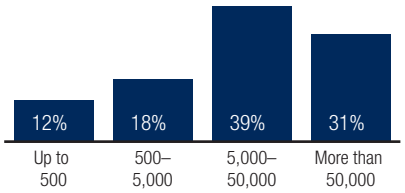
Country Profile
Mexico

Sample Overview



- Consumer 27%
- Mobility 18%
- Basic and Infrastructure 12%
- Financial Services & Investors 12%
- Information and Communication Technology 8%
- Energy 7%
- Others 16%

Number of Employees



Workforce Disruption

Main Industries

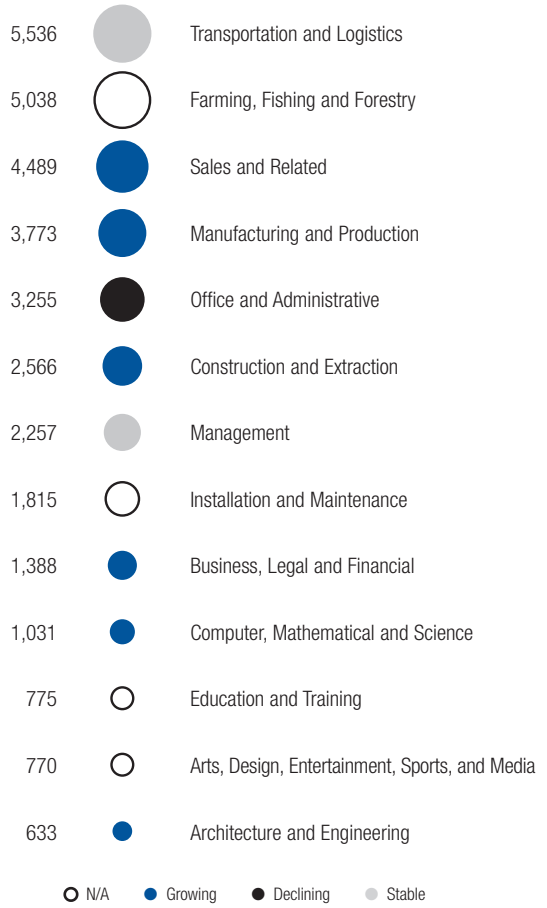
Industry	Employment outlook, 2015–2020	CURRENT: Local share of recruitment, specialists	CURRENT: Ease of recruitment, overall	2020: Local share of recruitment, specialists	2020: Ease of recruitment, overall
Consumer	stable 0.00%	76–100%	hard	76–100%	harder
Mobility	growth 1.54%	51–75%	hard	26–50%	harder
Financial Services & Investors	growth 4.00%	76–100%	hard	51–75%	harder
Basic and Infrastructure	growth 2.92%	76–100%	neutral	—	harder
Information and Communication Technology	growth 2.50%	76–100%	hard	—	easier
Energy	growth 1.88%	76–100%	hard	76–100%	easier

Ease of Recruitment

Occupation types	CURRENT: Country/region	CURRENT: Sample average	2020: Country/region	2020: Sample average
Mass Employment Assembly and Factory Workers	neutral	hard	neutral	neutral
Strategic/Specialist Business Services and Administration Managers	hard	hard	harder	harder
New and Emerging Food Processing and Related Trades Workers	—	—	hard	hard

Employment Outlook by Main Job Family

Current workforce (thousands)



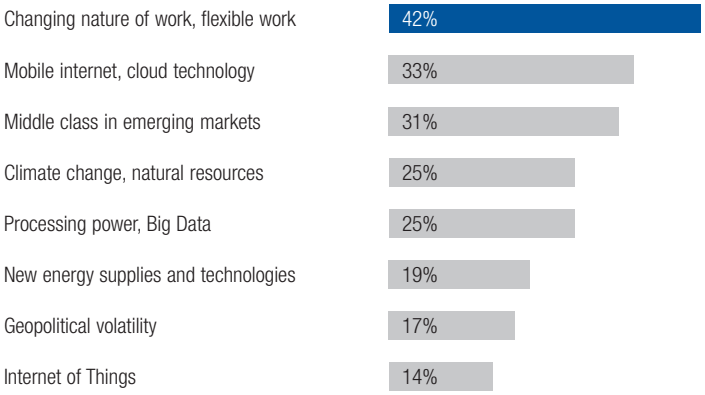
Not shown: Social and Protective Services (3,565), Healthcare Practitioners (681), Hospitality and Food Related (3,834), Personal Care and Service (5,886)

Country Profile

Mexico

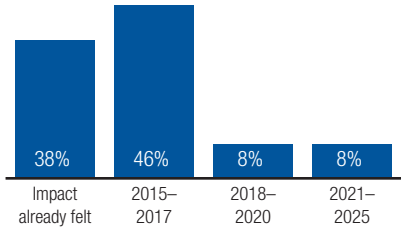
Drivers of Change

Top Trends Impacting Industries



Disruption in Focus: Changing Nature of Work, Flexible Work

Expected Time to Impact on Employee Skills



Expected Impact on Employment Outlook: Positive

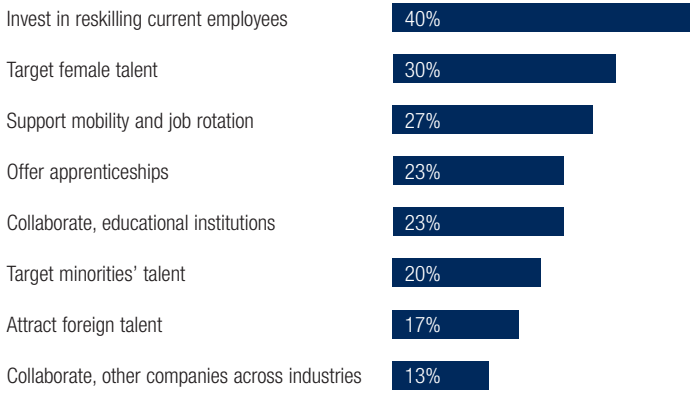
Change Management and Future Workforce Planning

Barriers

Insufficient understanding of disruptive changes	63%
Pressure from shareholders, short-term profitability	57%
Resource constraints	53%
Workforce strategy not aligned to innovation strategy	30%
Don't know	27%

80% believe future workforce planning is a leadership priority

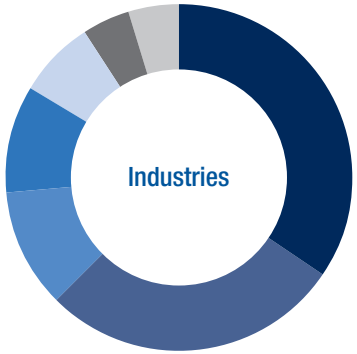
Strategies



63% are confident strategies are suitable

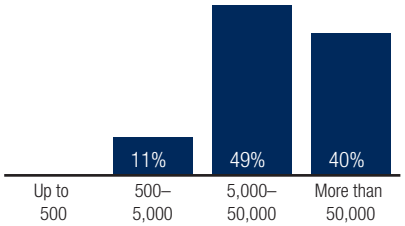
Country Profile
South Africa

Sample Overview



- Financial Services & Investors 35%
- Basic and Infrastructure 28%
- Information and Communication Technology 11%
- Mobility 10%
- Professional Services 7%
- Consumer 5%
- Others 5%

Number of Employees



Workforce Disruption

Main Industries

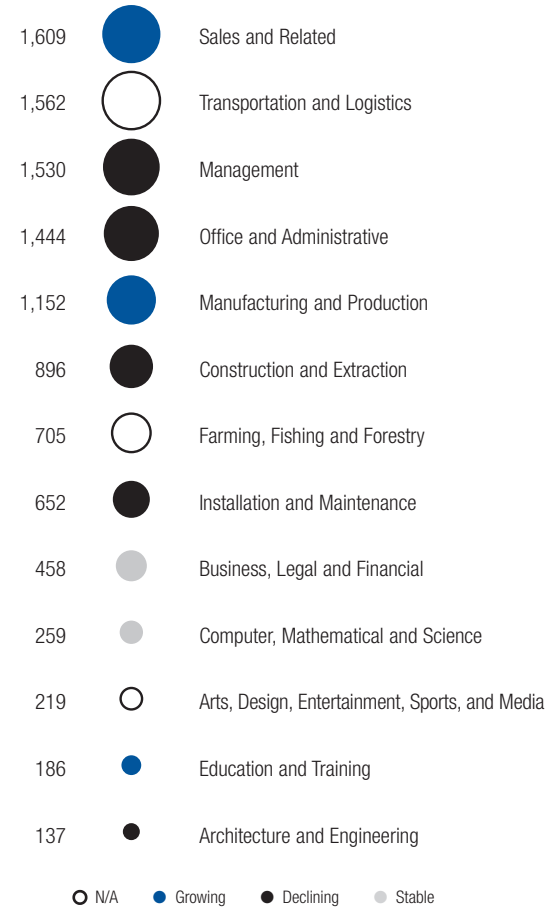
Industry	Employment outlook, 2015–2020	CURRENT: Local share of recruitment, specialists	CURRENT: Ease of recruitment, overall	2020: Local share of recruitment, specialists	2020: Ease of recruitment, overall
Financial Services & Investors	growth 1.25%	76–100%	hard	51–75%	neutral
Basic and Infrastructure	decline –3.79%	51–75%	hard	51–75%	harder
Information and Communication Technology	decline –3.75%	76–100%	hard	76–100%	neutral
Mobility	growth 2.78%	76–100%	hard	—	harder
Professional Services	decline –1.25%	—	easy	—	harder
Consumer	decline –2.00%	—	neutral	—	neutral

Ease of Recruitment

Occupation types	CURRENT: Country/region	CURRENT: Sample average	2020: Country/region	2020: Sample average
Mass Employment Assembly and Factory Workers	**hard**	**hard**	**neutral**	**neutral**
Strategic/Specialist Sales and Marketing Professionals	**hard**	**hard**	**neutral**	**harder**
New and Emerging Data Analysts	**—**	**—**	**very hard**	**hard**

Employment Outlook by Main Job Family

Current workforce (thousands)



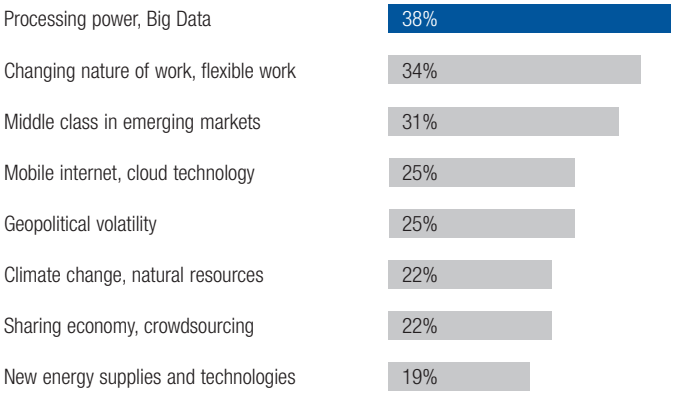
Not shown: Social and Protective Services (808), Healthcare Practitioners (218), Hospitality and Food Related (894), Personal Care and Service (1,596)

Country Profile

South Africa

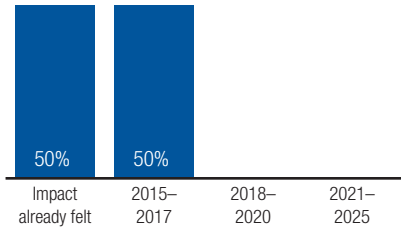
Drivers of Change

Top Trends Impacting Industries



Disruption in Focus: Processing power, Big Data

Expected Time to Impact on Employee Skills



Expected Impact on Employment Outlook: Negative

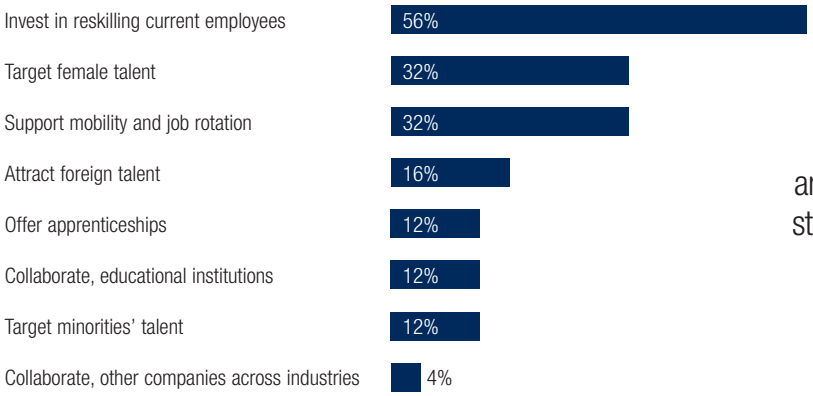
Change Management and Future Workforce Planning

Barriers

Insufficient understanding of disruptive changes	68%
Resource constraints	52%
Workforce strategy not aligned to innovation strategy	44%
Pressure from shareholders, short-term profitability	36%
Insufficient priority by line management	28%

60% believe future workforce planning is a leadership priority

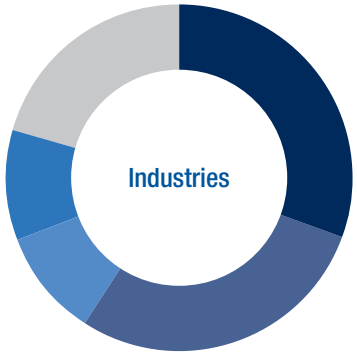
Strategies



44% are confident strategies are suitable

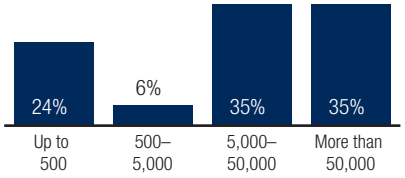
Country Profile
Turkey

Sample Overview



- Media, Entertainment and Information 31%
- Financial Services & Investors 29%
- Mobility 10%
- Consumer 10%
- Others 20%

Number of Employees



Workforce Disruption

Main Industries

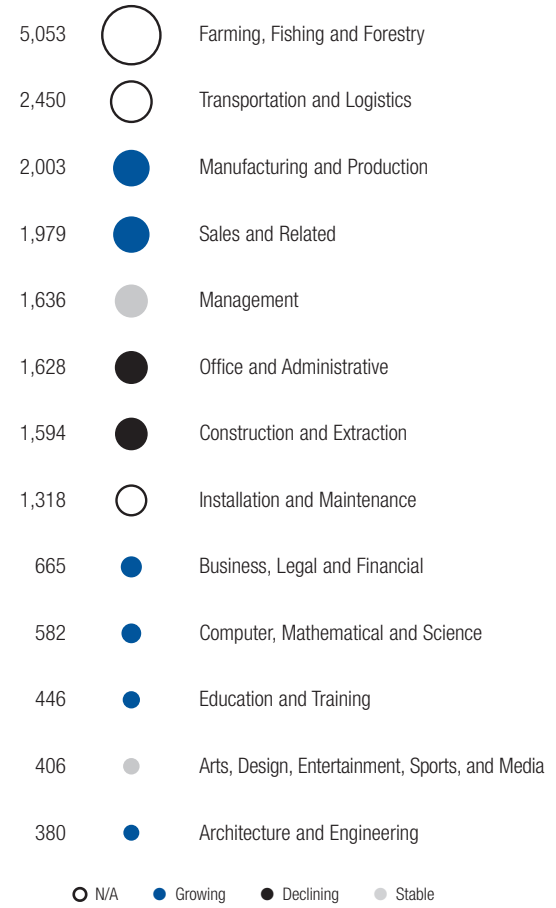
Industry	Employment outlook, 2015–2020	CURRENT: Local share of recruitment, specialists	CURRENT: Ease of recruitment, overall	2020: Local share of recruitment, specialists	2020: Ease of recruitment, overall
Media, Entertainment and Information	stable 0.00%	51–75%	very hard	51–75%	harder
Financial Services & Investors	growth 4.62%	51–75%	hard	26–50%	neutral
Consumer	growth 4.00%	76–100%	hard	76–100%	harder
Mobility	growth 1.00%	76–100%	hard	76–100%	harder

Ease of Recruitment

Occupation types	CURRENT: Country/region	CURRENT: Sample average	2020: Country/region	2020: Sample average
Mass Employment Assembly and Factory Workers	**hard**	**hard**	**neutral**	**neutral**
Strategic/Specialist Assembly and Factory Workers	**very hard**	**hard**	**harder**	**harder**
New and Emerging Nanosystems Engineers	—	—	**hard**	**hard**

Employment Outlook by Main Job Family

Current workforce (thousands)



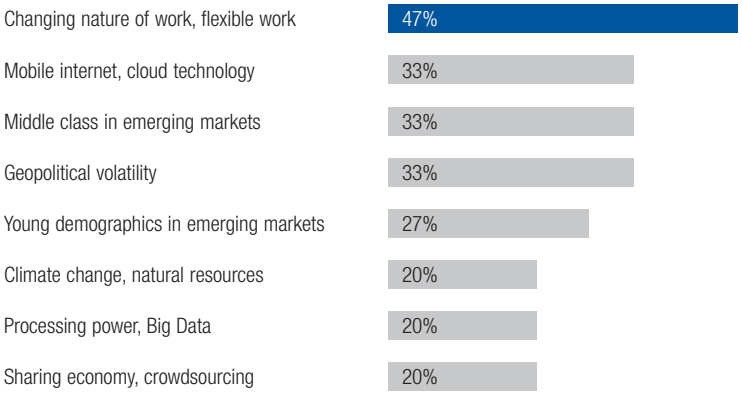
Not shown: Social and Protective Services (1,554), Healthcare Practitioners (334), Hospitality and Food Related (1,596), Personal Care and Service (2,309)

Country Profile

Turkey

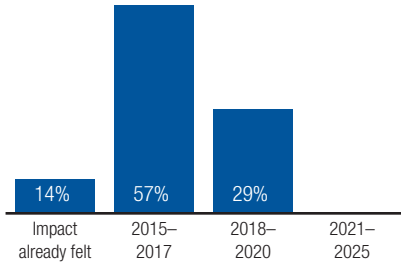
Drivers of Change

Top Trends Impacting Industries



Disruption in Focus: Changing Nature of Work, Flexible Work

Expected Time to Impact on Employee Skills



Expected Impact on Employment Outlook: Positive

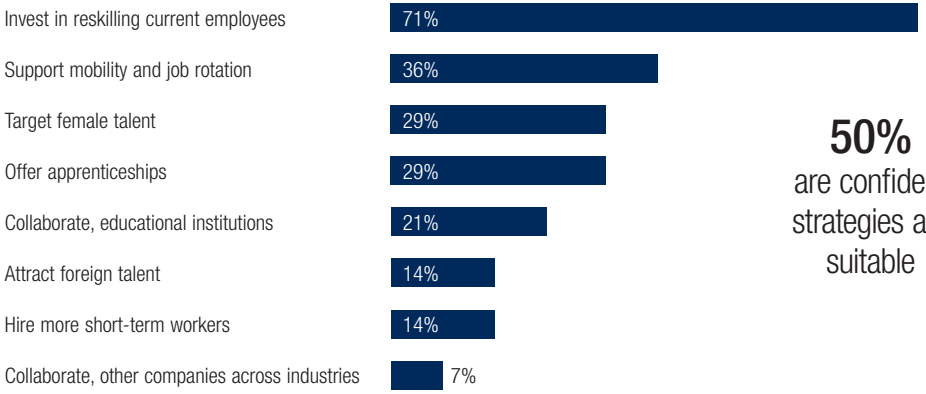
Change Management and Future Workforce Planning

Barriers

Insufficient understanding of disruptive changes	50%
Resource constraints	50%
Pressure from shareholders, short-term profitability	50%
Workforce strategy not aligned to innovation strategy	50%
Don't know	36%

64% believe future workforce planning is a leadership priority

Strategies

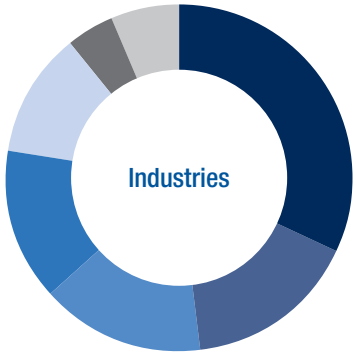


50% are confident strategies are suitable

Country Profile

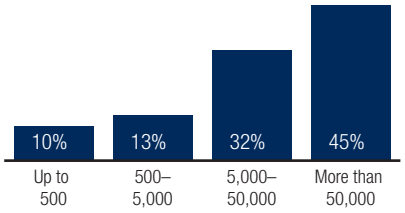
United Kingdom

Sample Overview



- Professional Services 32%
- Financial Services & Investors 16%
- Media, Entertainment and Information 15%
- Information and Communication Technology 14%
- Energy 12%
- Basic and Infrastructure 4%
- Others 6%

Number of Employees



Workforce Disruption

Main Industries

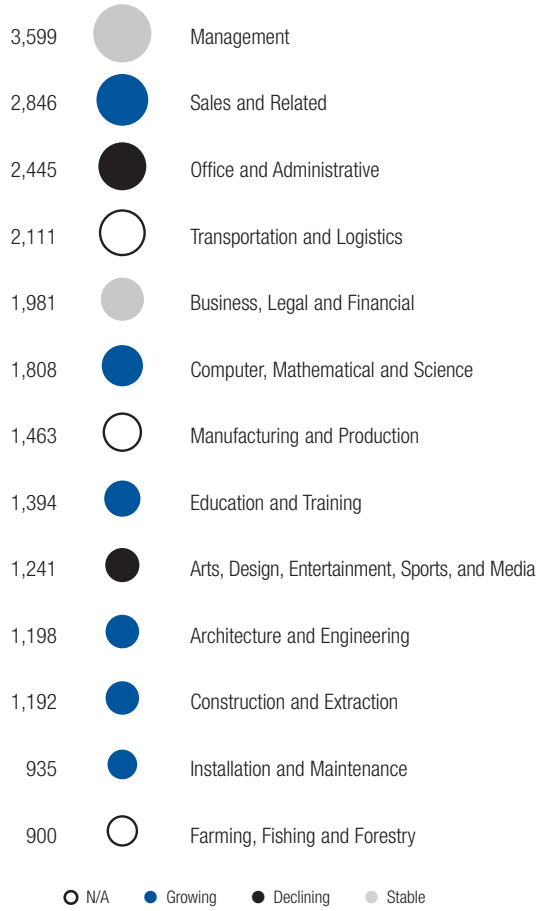
Industry	Employment outlook, 2015–2020	CURRENT: Local share of recruitment, specialists	CURRENT: Ease of recruitment, overall	2020: Local share of recruitment, specialists	2020: Ease of recruitment, overall
Professional Services	stable 0.16%	51–75%	neutral	26–50%	neutral
Financial Services & Investors	stable 0.00%	76–100%	neutral	51–75%	harder
Media, Entertainment and Information	growth 2.50%	76–100%	hard	51–75%	harder
Information and Communication Technology	growth 1.36%	51–75%	hard	51–75%	harder
Energy	growth 2.69%	26–50%	hard	0–25%	harder
Basic and Infrastructure	decline –1.00%	—	neutral	—	neutral

Ease of Recruitment

Occupation types	CURRENT: Country/region	CURRENT: Sample average	2020: Country/region	2020: Sample average
Mass Employment Client Information and Customer Service Workers	**neutral**	**hard**	**neutral**	**neutral**
Strategic/Specialist Lawyers	**hard**	**hard**	**harder**	**harder**
New and Emerging Software and Applications Developers and Analysts	—	—	**neutral**	**hard**

Employment Outlook by Main Job Family

Current workforce (thousands)



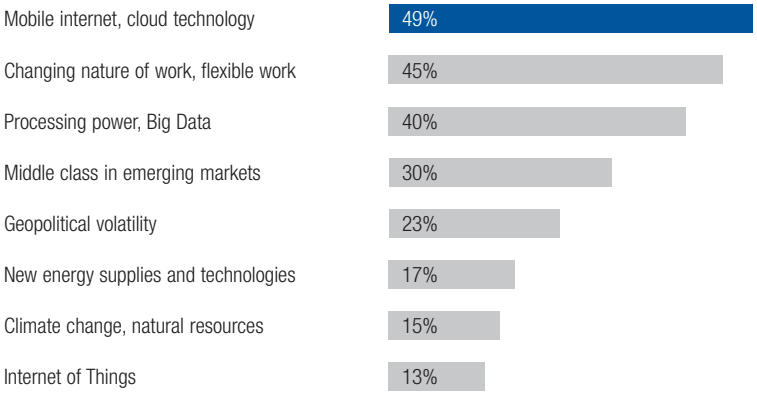
Not shown: Social and Protective Services (2,294), Healthcare Practitioners (1,002), Hospitality and Food Related (1,855), Personal Care and Service (2,218)

Country Profile

United Kingdom

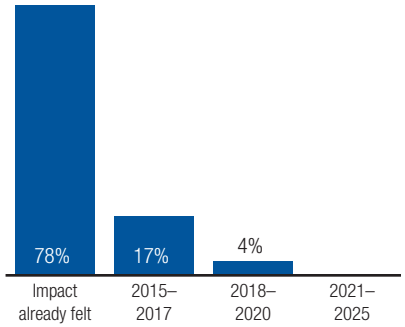
Drivers of Change

Top Trends Impacting Industries



Disruption in Focus: Mobile internet, cloud technology

Expected Time to Impact on Employee Skills



Expected Impact on Employment Outlook: Neutral

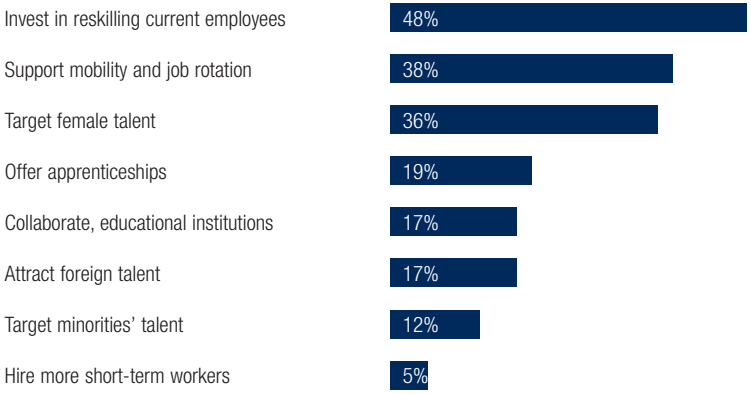
Change Management and Future Workforce Planning

Barriers

Insufficient understanding of disruptive changes	62%
Resource constraints	55%
Pressure from shareholders, short-term profitability	45%
Workforce strategy not aligned to innovation strategy	36%
Insufficient priority by top management	24%

76% believe future workforce planning is a leadership priority

Strategies

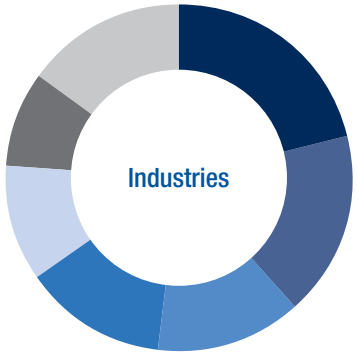


57% are confident strategies are suitable

Country Profile

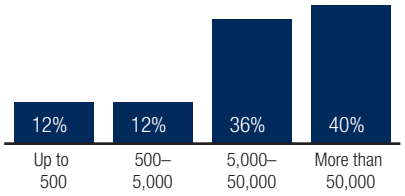
United States

Sample Overview



- Professional Services 21%
- Financial Services & Investors 17%
- Information and Communication Technology 13%
- Basic and Infrastructure 13%
- Healthcare 11%
- Energy 9%
- Others 15%

Number of Employees



Workforce Disruption

Main Industries

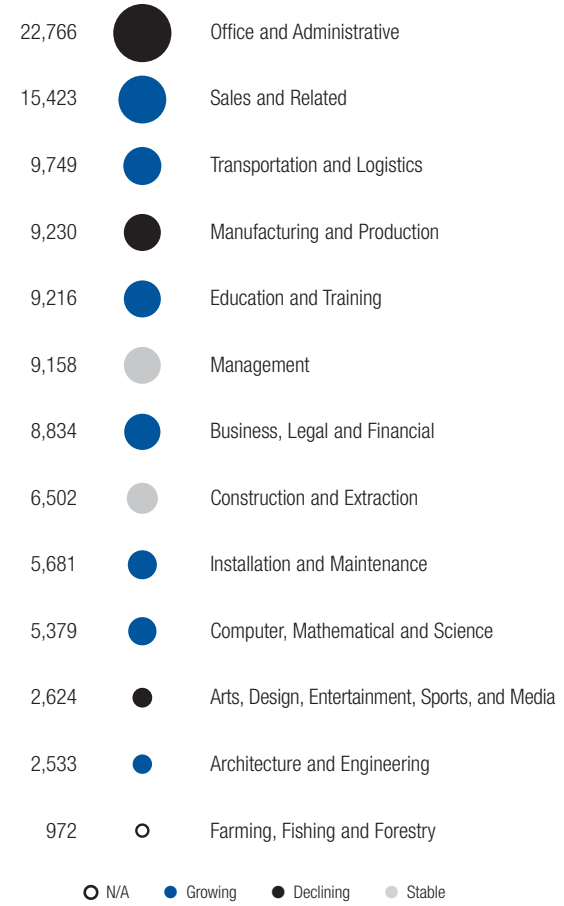
Industry	Employment outlook, 2015–2020	CURRENT: Local share of recruitment, specialists	CURRENT: Ease of recruitment, overall	2020: Local share of recruitment, specialists	2020: Ease of recruitment, overall
Professional Services	growth 1.77%	51–75%	neutral	26–50%	harder
Financial Services & Investors	growth 2.76%	51–75%	hard	26–50%	neutral
Information and Communication Technology	stable 0.43%	26–50%	neutral	26–50%	neutral
Basic and Infrastructure	stable 0.21%	51–75%	hard	26–50%	harder
Healthcare	decline –2.14%	51–75%	hard	26–50%	harder
Energy	decline –2.35%	26–50%	hard	26–50%	neutral

Ease of Recruitment

Occupation types	CURRENT: Country/region	CURRENT: Sample average	2020: Country/region	2020: Sample average
Mass Employment Assembly and Factory Workers	**neutral**	**hard**	**neutral**	**neutral**
Strategic/Specialist Data Analysts	**hard**	**hard**	**harder**	**harder**
New and Emerging Data Analysts	—	—	**hard**	**hard**

Employment Outlook by Main Job Family

Current workforce (thousands)



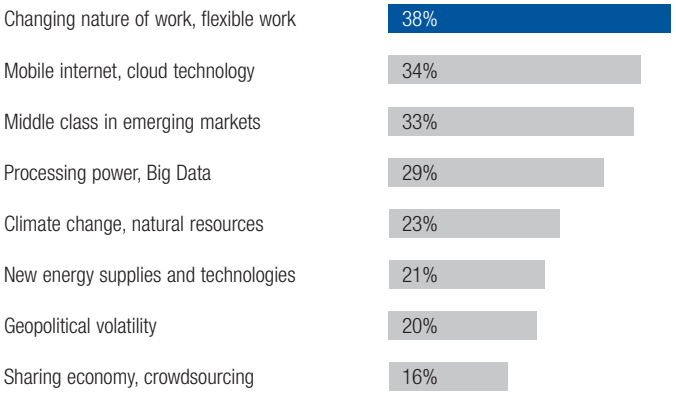
Not shown: Social and Protective Services (5,909), Healthcare Practitioners (8,236), Hospitality and Food Related (12468), Personal Care and Service (11,623)

Country Profile

United States

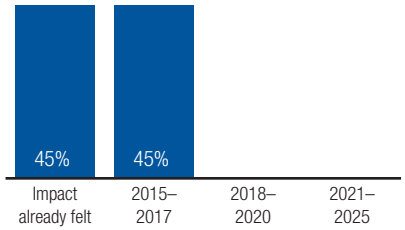
Drivers of Change

Top Trends Impacting Industries



Disruption in Focus: Changing Nature of Work, Flexible Work

Expected Time to Impact on Employee Skills



Expected Impact on Employment Outlook: Neutral

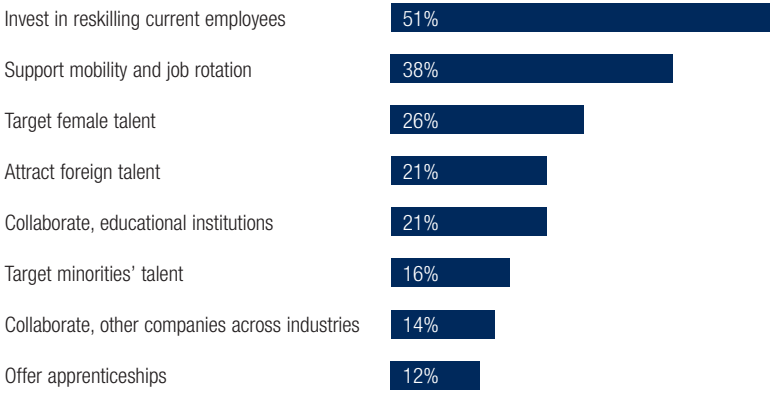
Change Management and Future Workforce Planning

Barriers

Insufficient understanding of disruptive changes	60%
Resource constraints	55%
Pressure from shareholders, short-term profitability	48%
Workforce strategy not aligned to innovation strategy	40%
Insufficient priority by line management	22%

74% believe future workforce planning is a leadership priority

Strategies



56% are confident strategies are suitable

Industry Gender Gap Profiles

Industry Gender Gap Profile

Basic and Infrastructure

Workforce Disruption, 2015–2020

Industry Average

STABLE	58%	13%	35%	HARDER	NEUTRAL
Employment outlook	Skills stability	Current share of women	Gender wage gap	Relative ease of recruitment, current	Relative ease of recruitment, 2020

Main Job Families

Job families	Employment outlook	Skills stability	Current share of women	Gender wage gap	Relative ease of recruiting women, current	Relative ease of recruiting women, 2020
Manufacturing and Production	**decline**	**62%**	**9%**	**42%**	**much harder**	**harder**
Assembly and Factory Workers	–1.84%					
Chemical Processing Plant Operators						
Architecture and Engineering	**stable**	**59%**	**11%**	**19%**	**harder**	**neutral**
Chemical Engineers	0.73%					
Civil Engineers						
Construction and Extraction	**decline**	**72%**	**9%**	**38%**	**much harder**	**harder**
Mining and Petroleum Extraction Workers	–2.18%					
Construction Laborers						
Management	**stable**	**44%**	**11%**	**64%**	**harder**	**neutral**
Business Services and Administration Managers	0.41%					
Manufacturing, Mining and Construction Managers						

Job Family in Focus: Management

Job family with largest share of women

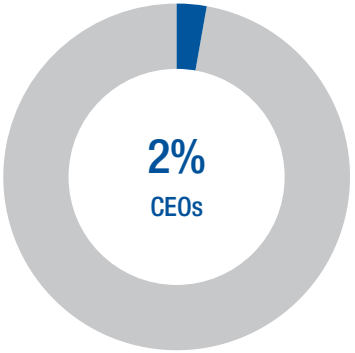
↑ Compensation

↓ Job security

↑ Work-life balance

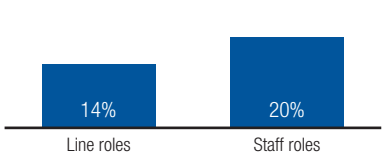
Composition by Role and Level

Percentage of Women

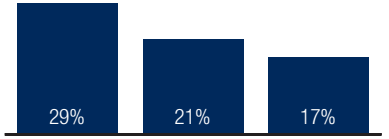


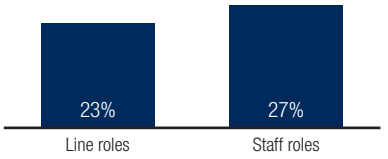
35%
Board Members

Current



Expected in 2020

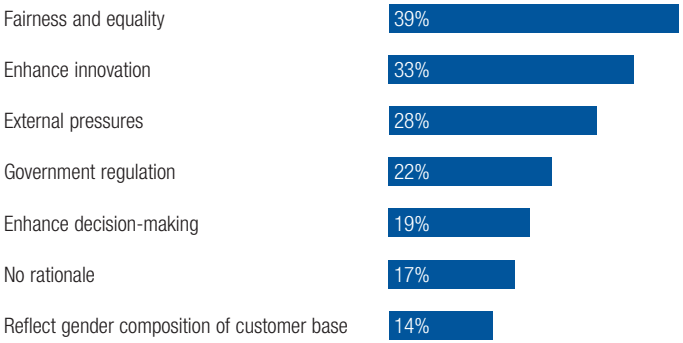




Industry Gender Gap Profile

Basic and Infrastructure

Companies' Rationales for Gender Parity

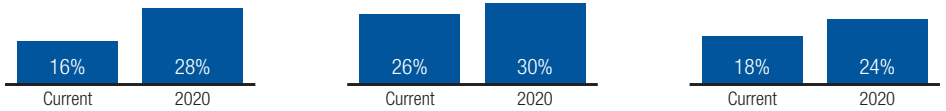


10%
Perceive women's economic power, aspirations as a driver of change

35%
Perceive attracting female talent as a key future workforce strategy

35%
Perceive a gender wage gap for equally qualified employees in the same role

Female Share of Customer Base



Business-to-business
58% of total customers

Business-to-consumer
21% of total customers

Business-to-government
20% of total customers

Companies' Approaches to Leveraging Female Talent

Barriers

Unconscious bias among managers	50%
Lack of role models	44%
Lack of work-life balance	42%
Lack of qualified incoming talent	33%
Unclear career paths	31%
Women's confidence, aspirations	28%

50%
believe that gender parity is a leadership priority

Strategies

58%
are confident strategies are suitable

Industry Gender Gap Profile
Consumer

Workforce Disruption, 2015–2020

Industry Average

STABLE	70%	27%	49%	HARDER	HARDER
Employment outlook	Skills stability	Current share of women	Gender wage gap	Relative ease of recruitment, current	Relative ease of recruitment, 2020

Main Job Families

Job families	Employment outlook	Skills stability	Current share of women	Gender wage gap	Relative ease of recruiting women, current	Relative ease of recruiting women, 2020
Manufacturing and Production Assembly and Factory Workers Food Processing and Related Trades Workers	**decline** –3.57%	**62%**	**22%**	**43%**	**harder**	**harder**
Sales and Related Shop Salespersons Sales Representatives, Wholesale and Technical	**stable** 0.83%	**78%**	**52%**	**47%**	**harder**	**harder**
Business and Financial Operations Sales and Marketing Professionals Management and Organisation Analysts	**stable** –0.88%	**67%**	**44%**	**83%**	**harder**	**neutral**
Management General and Operations Managers Business Services and Administration Managers	**decline** –1.00%	**70%**	**22%**	**50%**	**harder**	**harder**

Job Family in Focus: Sales and Related

Job family with largest share of women

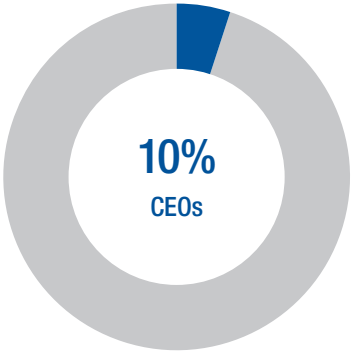
Compensation ⬆

Job security ⬇

Work-life balance ⟷

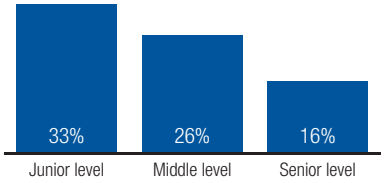
Composition by Role and Level

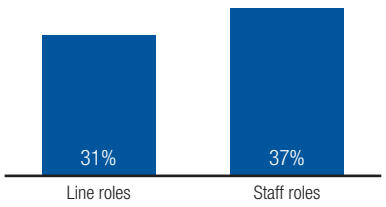
Percentage of Women



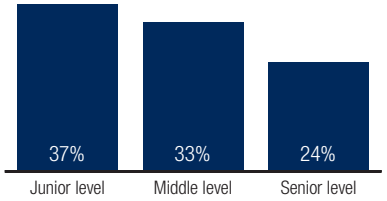
21%
Board Members

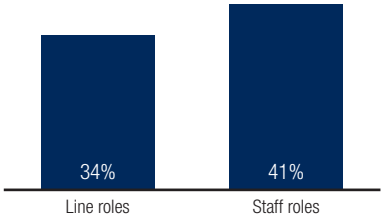
Current





Expected in 2020

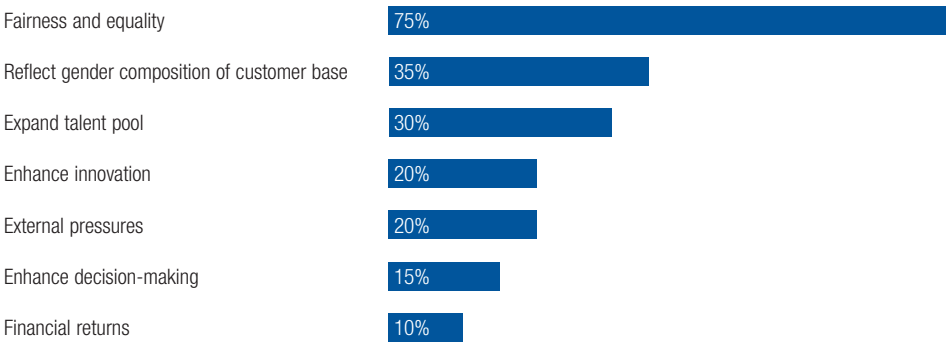




Industry Gender Gap Profile

Consumer

Companies' Rationales for Gender Parity

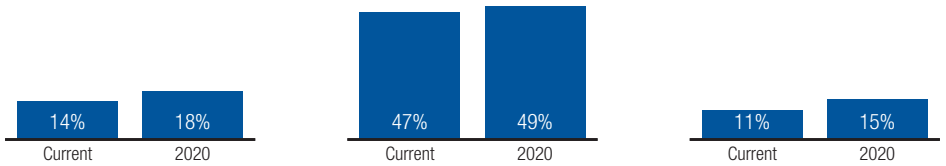


21%
Perceive women's economic power, aspirations as a driver of change

25%
Perceive attracting female talent as a key future workforce strategy

49%
Perceive a gender wage gap for equally qualified employees in the same role

Female Share of Customer Base



Business-to-business
24% of total customers

Business-to-consumer
65% of total customers

Business-to-government
11% of total customers

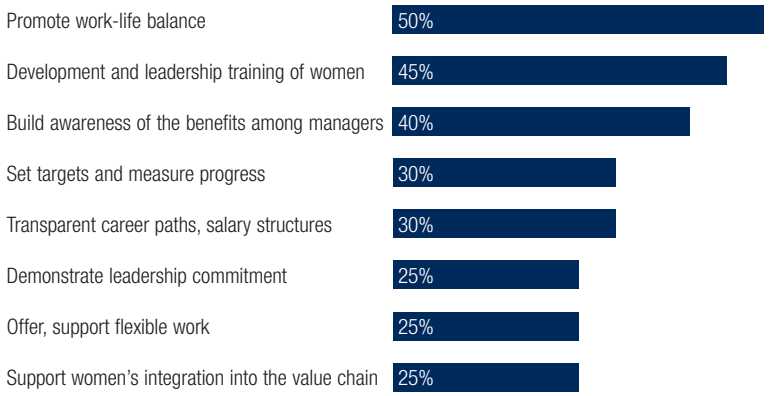
Companies' Approaches to Leveraging Female Talent

Barriers

Lack of work-life balance	70%
Unconscious bias among managers	55%
Lack of role models	40%
Unclear career paths	30%
Women's confidence, aspirations	30%
Societal pressures	25%

60%
believe that gender parity is a leadership priority

Strategies



55%
are confident strategies are suitable

Industry Gender Gap Profile

Energy

Workforce Disruption, 2015–2020

Industry Average

STABLE	70%	15%	31%	HARDER	NEUTRAL
Employment outlook	Skills stability	Current share of women	Gender wage gap	Relative ease of recruitment, current	Relative ease of recruitment, 2020

Main Job Families

Job families	Employment outlook	Skills stability	Current share of women	Gender wage gap	Relative ease of recruiting women, current	Relative ease of recruiting women, 2020
Architecture and Engineering	**growth**	**65%**	**11%**	**33%**	**harder**	**neutral**
Energy and Petroleum Engineers	1.70%					
Electrotechnology Engineers						
Manufacturing and Production	**decline**	**62%**	**22%**	**23%**	**harder**	**neutral**
Assembly and Factory Workers	–3.11%					
Petroleum and Natural Gas Refining Plant Operators						
Management	**growth**	**92%**	**16%**	**50%**	**harder**	**easier**
General and Operations Managers	2.06%					
Business Services and Administration Managers						
Construction and Extraction	**decline**	**100%**	**15%**	**20%**	**harder**	**harder**
Mining and Petroleum Extraction Workers	–1.15%					
Mining and Petroleum Plant Operators						

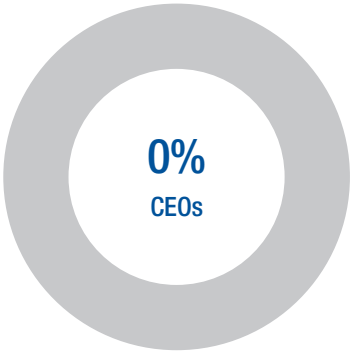
Job Family in Focus: Manufacturing and Production

Job family with largest share of women

↑	↓	↑
Compensation	Job security	Work-life balance

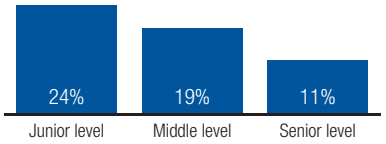
Composition by Role and Level

Percentage of Women

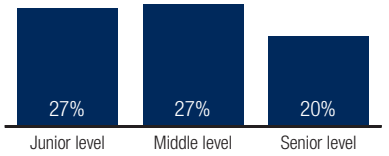


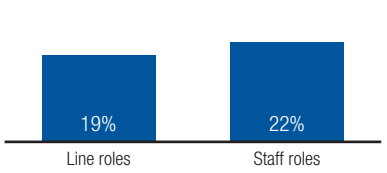
32%
Board Members

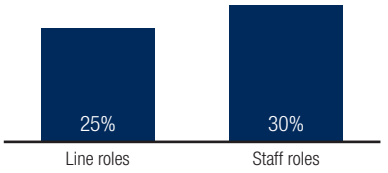
Current



Expected in 2020



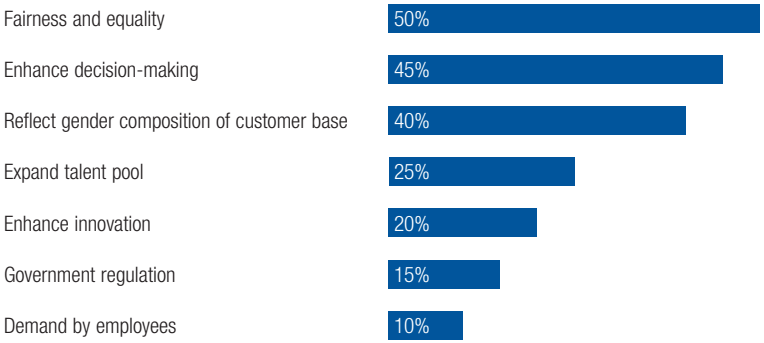




Industry Gender Gap Profile

Energy

Companies' Rationales for Gender Parity

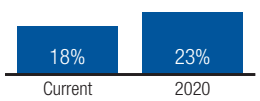


13%
Perceive women's economic power, aspirations as a driver of change

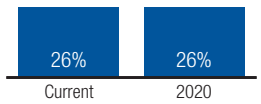
36%
Perceive attracting female talent as a key future workforce strategy

31%
Perceive a gender wage gap for equally qualified employees in the same role

Female Share of Customer Base



Business-to-business
51% of total customers



Business-to-consumer
19% of total customers

Business-to-government
21% of total customers

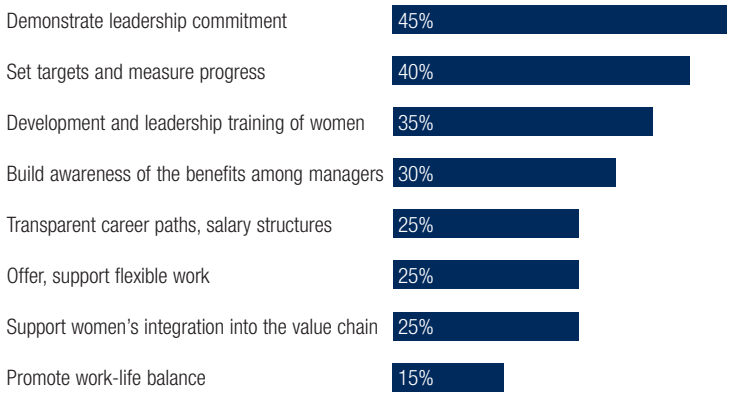
Companies' Approaches to Leveraging Female Talent

Barriers

Unconscious bias among managers	70%
Lack of qualified incoming talent	60%
Lack of role models	55%
Lack of work-life balance	30%
Societal pressures	25%
Don't know	15%

75%
believe that gender parity is a leadership priority

Strategies



65%
are confident strategies are suitable

Industry Gender Gap Profile

Financial Services & Investors

Workforce Disruption, 2015–2020

Industry Average

GROWTH	57%	29%	38%	HARDER	NEUTRAL
Employment outlook	Skills stability	Current share of women	Gender wage gap	Relative ease of recruitment, current	Relative ease of recruitment, 2020

Main Job Families

Job families	Employment outlook	Skills stability	Current share of women	Gender wage gap	Relative ease of recruiting women, current	Relative ease of recruiting women, 2020
Business and Financial Operations	**stable**	**63%**	**36%**	**36%**	**harder**	**neutral**
Financial and Investment Advisers	0.79%					
Investment Fund Managers						
Computer and Mathematical	**growth**	**60%**	**35%**	**27%**	**harder**	**harder**
Data Analysts	4.50%					
Information Security Analysts						
Sales and Related	**stable**	**70%**	**38%**	**63%**	**harder**	**easier**
Securities and Finance Dealers and Brokers	–0.68%					
Sales and Purchasing Agents and Brokers						
Management	**growth**	**48%**	**26%**	**7%**	**harder**	**neutral**
General and Operations Managers	2.20%					
Business Services and Administration Managers						

Job Family in Focus: Sales and Related

Job family with largest share of women

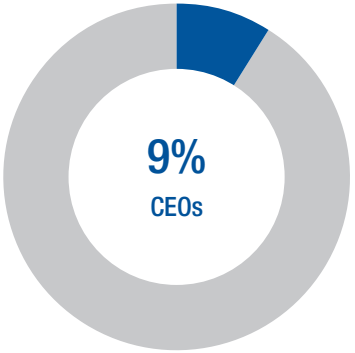
Compensation

Job security

Work-life balance

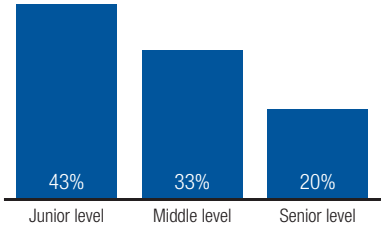
Composition by Role and Level

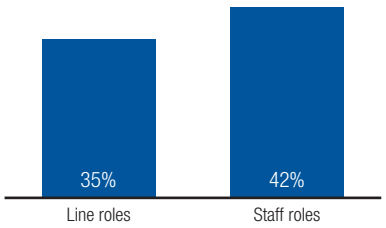
Percentage of Women



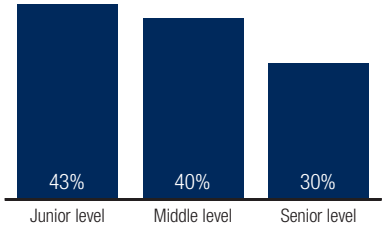
35%
Board Members

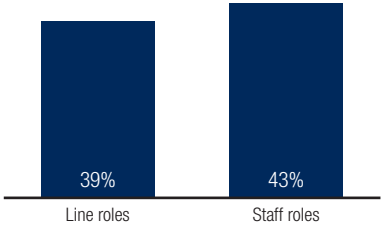
Current





Expected in 2020

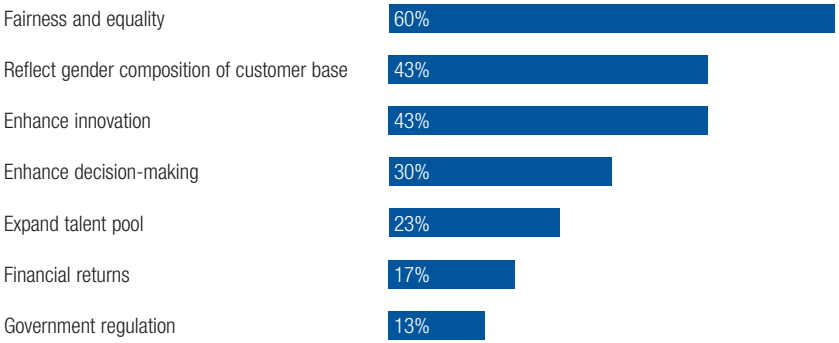




Industry Gender Gap Profile

Financial Services & Investors

Companies' Rationales for Gender Parity

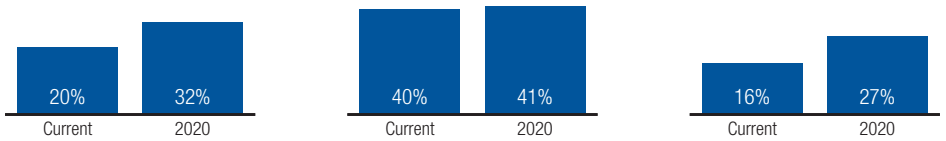


9%
Perceive women's economic power, aspirations as a driver of change

30%
Perceive attracting female talent as a key future workforce strategy

38%
Perceive a gender wage gap for equally qualified employees in the same role

Female Share of Customer Base



Business-to-business
37% of total customers

Business-to-consumer
39% of total customers

Business-to-government
16% of total customers

Companies' Approaches to Leveraging Female Talent

Barriers

Lack of work-life balance	53%
Lack of role models	47%
Women's confidence, aspirations	43%
Unconscious bias among managers	37%
Lack of talent, leadership development for women	23%
Unclear career paths	20%

63%
believe that gender parity is a leadership priority

Strategies

70%
are confident strategies are suitable

Industry Gender Gap Profile
Healthcare

Workforce Disruption, 2015–2020

Industry Average

STABLE	71%	38%	15%	NEUTRAL	NEUTRAL
Employment outlook	Skills stability	Current share of women	Gender wage gap	Relative ease of recruitment, current	Relative ease of recruitment, 2020

Main Job Families

Job families	Employment outlook	Skills stability	Current share of women	Gender wage gap	Relative ease of recruiting women, current	Relative ease of recruiting women, 2020
Manufacturing and Production	**stable**	**85%**	**42%**	**0%**	**neutral**	**neutral**
Chemical Processing Plant Operators	0.79%					
Assembly and Factory Workers						
Life, Physical, and Social Sciences	**stable**	**100%**	**40%**	**0%**	**neutral**	**neutral**
Biologists and Geneticists	-0.71%					
Chemists and Chemical Laboratory Scientists						
Sales and Related	**decline**	**70%**	**63%**	**25%**	**harder**	**neutral**
Shop Salespersons	–1.82%					
Sales Representatives, Technical and Scientific						
Personal Care and Service	—	—	**85%**	—	**easier**	**harder**
Personal Care Aides						

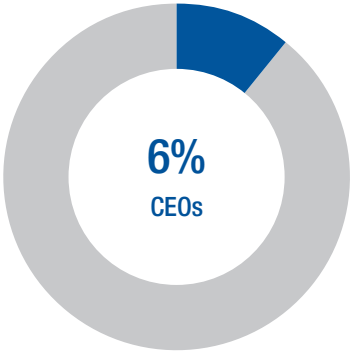
Job Family in Focus: Personal Care and Service

Job family with largest share of women

—	—	—
Compensation	Job security	Work-life balance

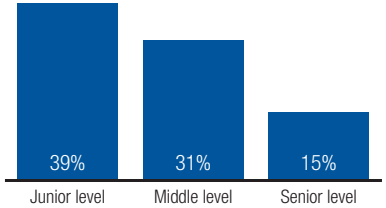
Composition by Role and Level

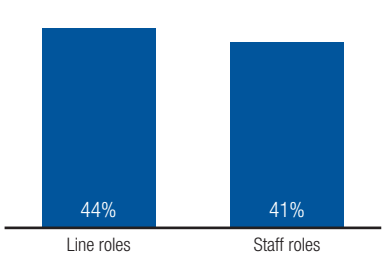
Percentage of Women



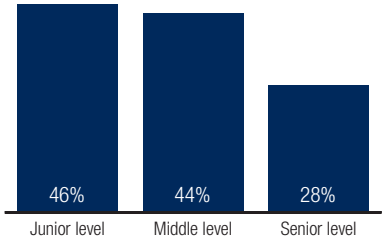
—
Board Members

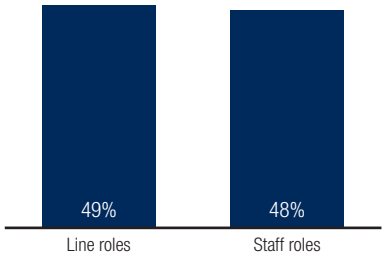
Current





Expected in 2020

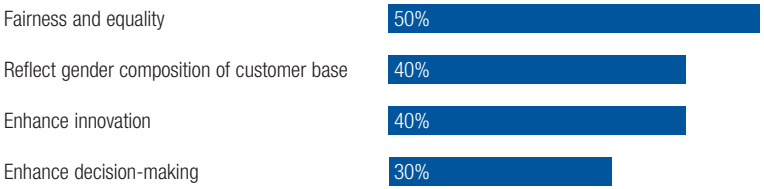




Industry Gender Gap Profile

Healthcare

Companies' Rationales for Gender Parity

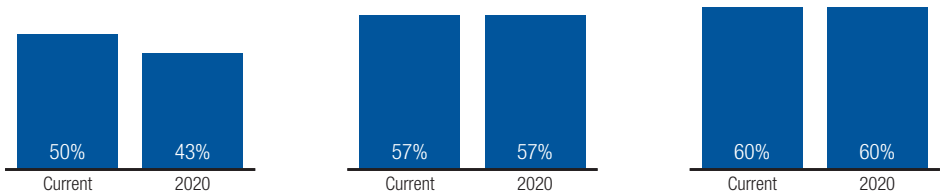


10%
Perceive women's economic power, aspirations as a driver of change

17%
Perceive attracting female talent as a key future workforce strategy

15%
Perceive a gender wage gap for equally qualified employees in the same role

Female Share of Customer Base



Companies' Approaches to Leveraging Female Talent

Barriers

60%
believe that gender parity is a leadership priority

Strategies

60%
are confident strategies are suitable

Industry Gender Gap Profile

Information and Communication Technology

Workforce Disruption, 2015–2020

Industry Average

STABLE	65%	21%	25%	HARDER	HARDER
Employment outlook	Skills stability	Current share of women	Gender wage gap	Relative ease of recruitment, current	Relative ease of recruitment, 2020

Main Job Families

Job families	Employment outlook	Skills stability	Current share of women	Gender wage gap	Relative ease of recruiting women, current	Relative ease of recruiting women, 2020
Computer and Mathematical	**growth**	**63%**	**20%**	**33%**	**harder**	**harder**
Database and Network Professionals	1.74%					
Software and Applications Developers and Analysts						
Sales and Related	**growth**	**64%**	**44%**	**25%**	**harder**	**neutral**
Telemarketers	2.14%					
Sales Representatives, Wholesale and Technical						
Installation and Maintenance	**decline**	**54%**	**9%**	**30%**	**harder**	**neutral**
Mechanics and Machinery Repairers	–1.19%					
Electronics and Telecommunications Installers and Repairers						
Architecture and Engineering	**growth**	**77%**	**7%**	**8%**	**harder**	**harder**
Electrotechnology Engineers	4.12%					
Architects and Surveyors						

Job Family in Focus: Sales and Related

Job family with largest share of women

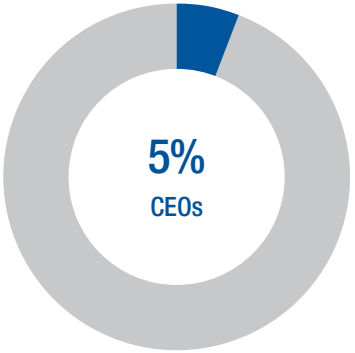
↑ Compensation

↑ Job security

↑ Work-life balance

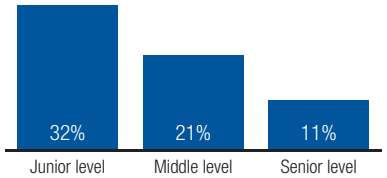
Composition by Role and Level

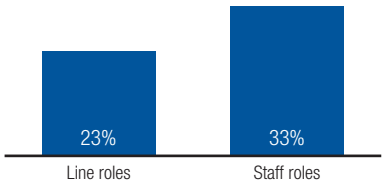
Percentage of Women



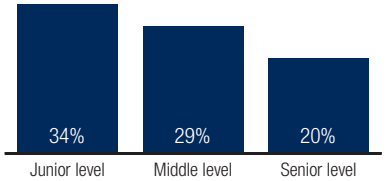
19%
Board Members

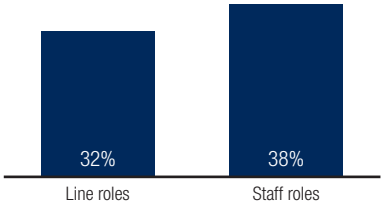
Current





Expected in 2020

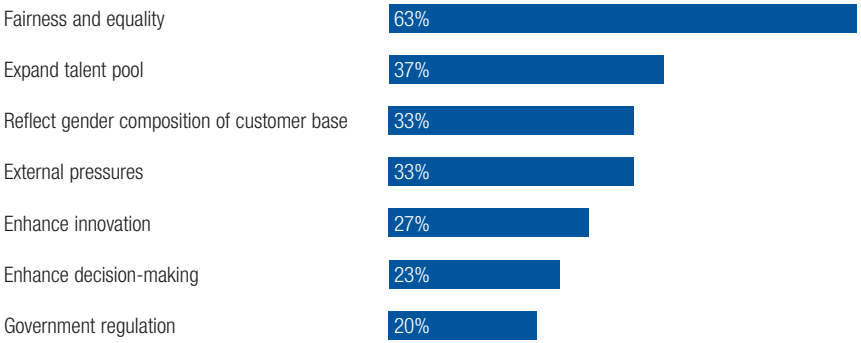




Industry Gender Gap Profile

Information and Communication Technology

Companies' Rationales for Gender Parity

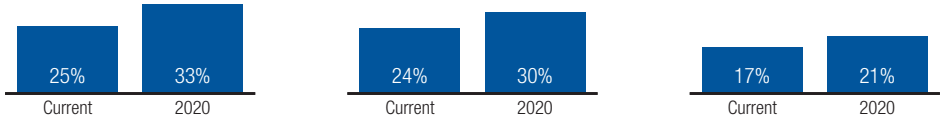


3%
Perceive women's economic power, aspirations as a driver of change

16%
Perceive attracting female talent as a key future workforce strategy

25%
Perceive a gender wage gap for equally qualified employees in the same role

Female Share of Customer Base



Business-to-business
53% of total customers

Business-to-consumer
29% of total customers

Business-to-government
18% of total customers

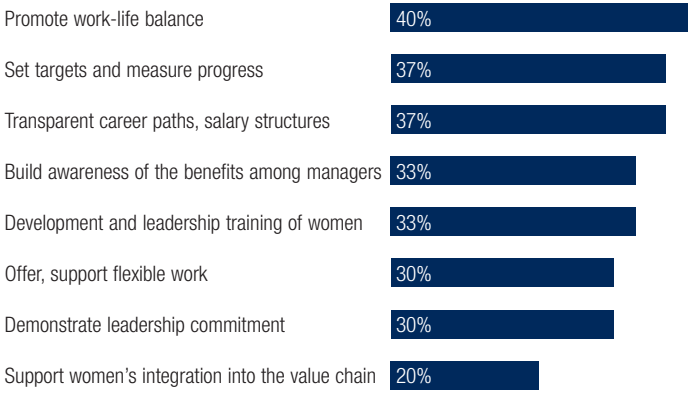
Companies' Approaches to Leveraging Female Talent

Barriers

Lack of qualified incoming talent	57%
Lack of work-life balance	47%
Unconscious bias among managers	47%
Lack of role models	37%
Women's confidence, aspirations	37%
Lack of talent, leadership development for women	27%

37%
believe that gender parity is a leadership priority

Strategies



47%
are confident strategies are suitable

Industry Gender Gap Profile

Media, Entertainment and Information

Workforce Disruption, 2015–2020

Industry Average

GROWTH	73%	30%	18%	HARDER	EASIER
Employment outlook	Skills stability	Current share of women	Gender wage gap	Relative ease of recruitment, current	Relative ease of recruitment, 2020

Main Job Families

Job families	Employment outlook	Skills stability	Current share of women	Gender wage gap	Relative ease of recruiting women, current	Relative ease of recruiting women, 2020
Arts, Design, Entertainment, Sports, and Media	**stable**	**66%**	**49%**	**15%**	**neutral**	**neutral**
Advertising and Public Relations Professionals	–0.59%					
Telecommunications and Broadcasting Technicians						
Computer and Mathematical	**strong growth**	**88%**	**23%**	**11%**	**harder**	**easier**
Data Analysts	6.94%					
Software and Applications Developers and Analysts						
Sales and Related	**growth**	**86%**	**39%**	**13%**	**harder**	**easier**
Cashiers and Ticket Clerks	2.69%					
Door-To-Door Sales Workers, News and Street Vendors						
Management	**growth**	**67%**	**12%**	**33%**	**harder**	**easier**
General and Operations Managers	1.67%					
Business Services and Administration Managers						

Job Family in Focus: Arts, Design, Entertainment, Sports, and Media

Job family with largest share of women

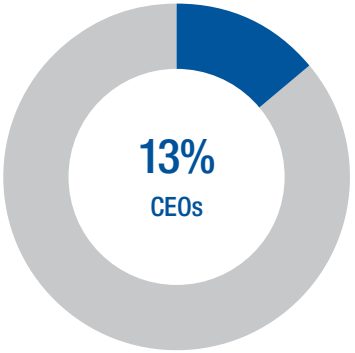
Compensation ⟷

Job security ↓

Work-life balance ⟷

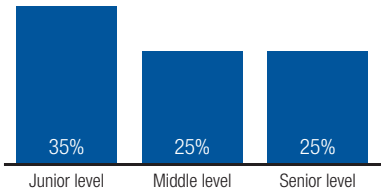
Composition by Role and Level

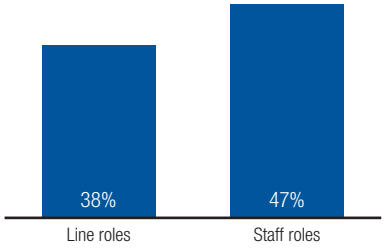
Percentage of Women



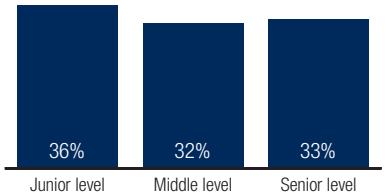
22%
Board Members

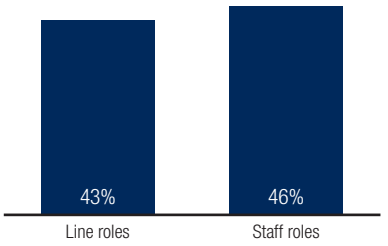
Current





Expected in 2020

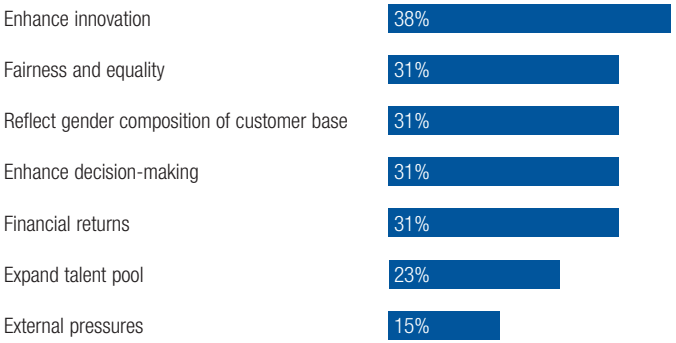




Industry Gender Gap Profile

Media, Entertainment and Information

Companies' Rationales for Gender Parity

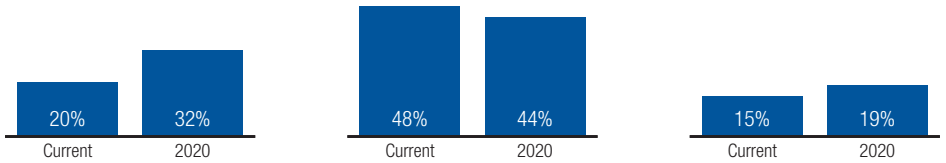


7%
Perceive women's economic power, aspirations as a driver of change

46%
Perceive attracting female talent as a key future workforce strategy

18%
Perceive a gender wage gap for equally qualified employees in the same role

Female Share of Customer Base



Business-to-business
41% of total customers

Business-to-consumer
42% of total customers

Business-to-government
11% of total customers

Companies' Approaches to Leveraging Female Talent

Barriers

Lack of work-life balance	54%
Unconscious bias among managers	46%
Lack of role models	31%
Don't know	31%
Women's confidence, aspirations	31%
No barriers	23%

46%
believe that gender parity is a leadership priority

Strategies

62%
are confident strategies are suitable

Industry Gender Gap Profile
Mobility

Workforce Disruption, 2015–2020

Industry Average

STABLE	61%	16%	39%	HARDER	NEUTRAL
Employment outlook	Skills stability	Current share of women	Gender wage gap	Relative ease of recruitment, current	Relative ease of recruitment, 2020

Main Job Families

Job families	Employment outlook	Skills stability	Current share of women	Gender wage gap	Relative ease of recruiting women, current	Relative ease of recruiting women, 2020
Manufacturing and Production	**decline**	**66%**	**18%**	**30%**	**harder**	**neutral**
Assembly and Factory Workers	–1.43%					
Sheet and Structural Metal Workers						
Architecture and Engineering	**growth**	**62%**	**13%**	**36%**	**harder**	**harder**
Electrotechnology Engineers	4.83%					
Industrial and Production Engineers						
Transportation and Logistics	**growth**	**63%**	**13%**	**13%**	**harder**	**neutral**
Supply Chain and Logistics Specialists	3.13%					
Transportation Attendants and Conductors						
Sales and Related	**decline**	**40%**	**16%**	**33%**	**harder**	**neutral**
Sales and Marketing Professionals	–1.88%					
Sales Representatives, Wholesale and Technical						

Job Family in Focus: Manufacturing and Production

Job family with largest share of women

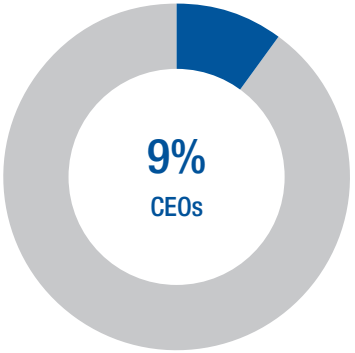
↑ Compensation

↓ Job security

↓ Work-life balance

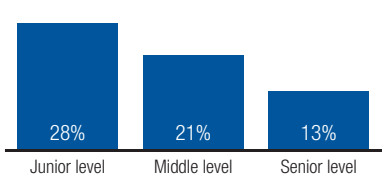
Composition by Role and Level

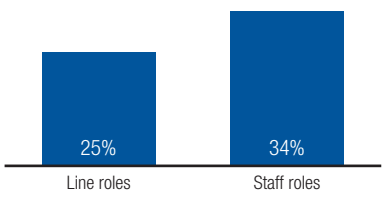
Percentage of Women



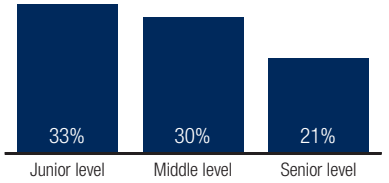
17%
Board Members

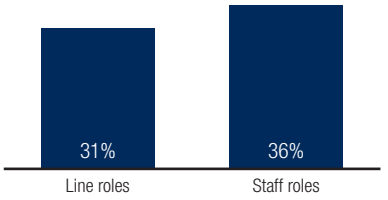
Current





Expected in 2020

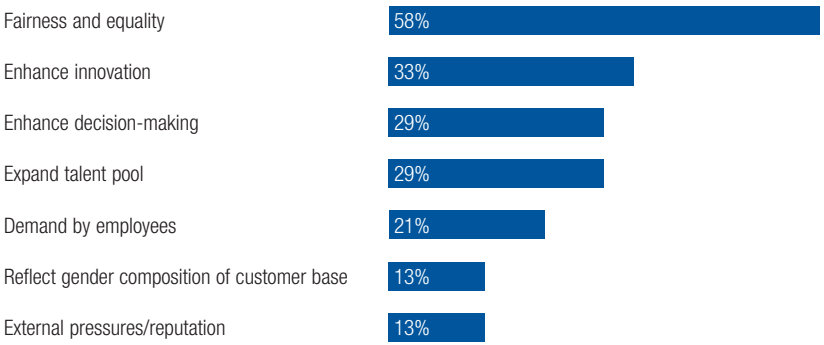




Industry Gender Gap Profile

Mobility

Companies' Rationales for Gender Parity

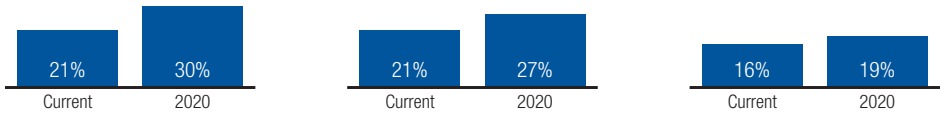


6%
Perceive women's economic power, aspirations as a driver of change

21%
Perceive attracting female talent as a key future workforce strategy

39%
Perceive a gender wage gap for equally qualified employees in the same role

Female Share of Customer Base



Business-to-business
51% of total customers

Business-to-consumer
31% of total customers

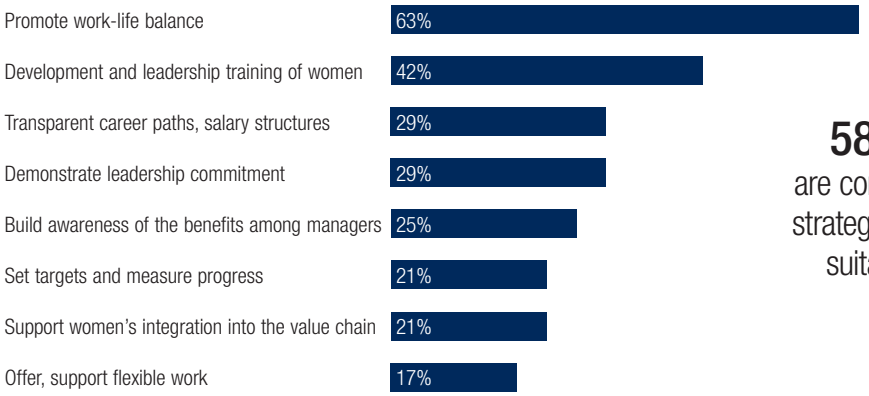
Business-to-government
18% of total customers

Companies' Approaches to Leveraging Female Talent

Barriers

54%
believe that gender parity is a leadership priority

Strategies



58%
are confident strategies are suitable

Industry Gender Gap Profile

Professional Services

Workforce Disruption, 2015–2020

Industry Average

STABLE	67%	30%	22%	HARDER	NEUTRAL
Employment outlook	Skills stability	Current share of women	Gender wage gap	Relative ease of recruitment, current	Relative ease of recruitment, 2020

Main Job Families

Job families	Employment outlook	Skills stability	Current share of women	Gender wage gap	Relative ease of recruiting women, current	Relative ease of recruiting women, 2020
Business and Financial Operations	**stable**	**77%**	**48%**	**15%**	**neutral**	**neutral**
Management and Organisation Analysts	0.33%					
Human Resources Specialists						
Computer and Mathematical	**strong growth**	**54%**	**17%**	**31%**	**harder**	**harder**
Data Analysts	5.31%					
Software and Applications Developers and Analysts						
Management	**growth**	**65%**	**29%**	**21%**	**harder**	**easier**
General and Operations Managers	1.00%					
Business Services and Administration Managers						
Sales and Related	**decline**	**54%**	**56%**	**8%**	**neutral**	**neutral**
Sales and Marketing Professionals	–3.21%					
Real Estate Sales Agents						

Job Family in Focus: Sales and Related

Job family with largest share of women

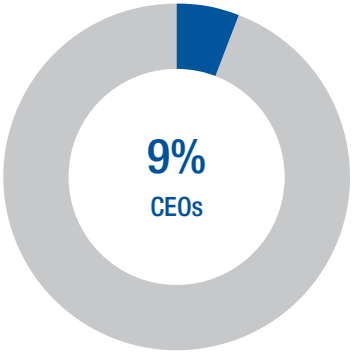
Compensation

Job security

Work-life balance

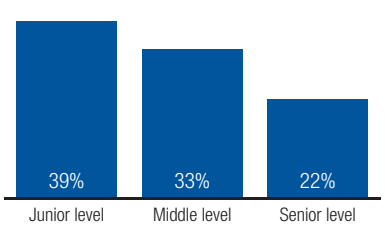
Composition by Role and Level

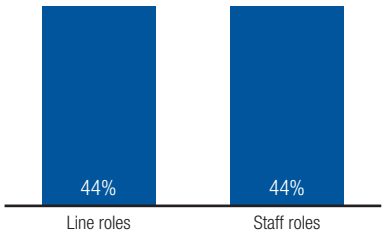
Percentage of Women



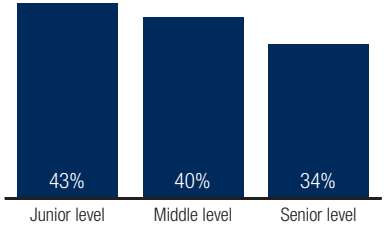
23%
Board Members

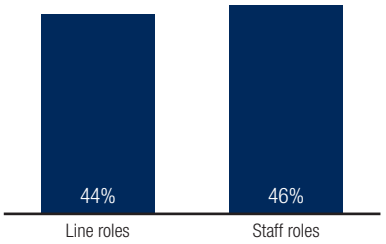
Current





Expected in 2020

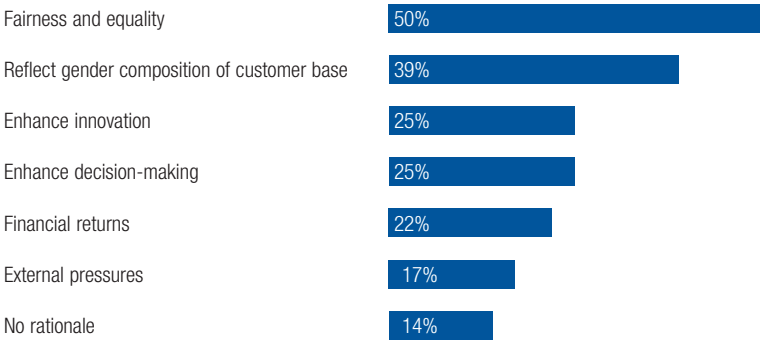




Industry Gender Gap Profile

Professional Services

Companies' Rationales for Gender Parity

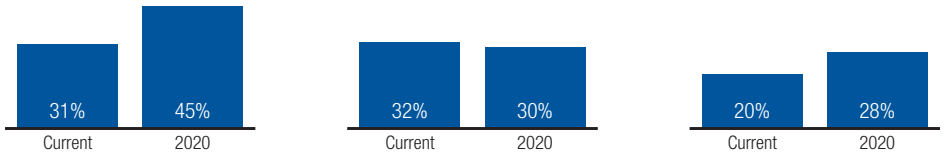


15%
Perceive women's economic power, aspirations as a driver of change

21%
Perceive attracting female talent as a key future workforce strategy

22%
Perceive a gender wage gap for equally qualified employees in the same role

Female Share of Customer Base



Business-to-business
61% of total customers

Business-to-consumer
23% of total customers

Business-to-government
17% of total customers

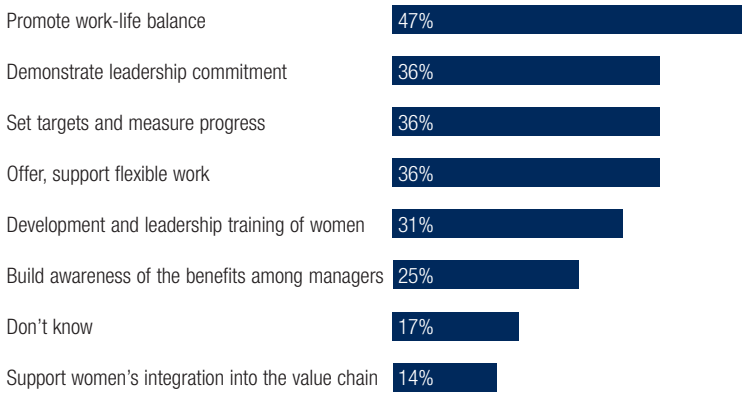
Companies' Approaches to Leveraging Female Talent

Barriers

Women's confidence, aspirations	50%
Lack of work-life balance	42%
Unconscious bias among managers	42%
Societal pressures	39%
Lack of qualified incoming talent	36%
Lack of role models	31%

42%
believe that gender parity is a leadership priority

Strategies



50%
are confident strategies are suitable

Acknowledgements

GLOBAL AGENDA COUNCIL ON THE FUTURE OF JOBS

Jeffrey Joerres, Executive Chairman Emeritus, ManpowerGroup; Council Chair

Jamie McAuliffe, President and CEO, Education for Employment; Council Vice-Chair

Umran Beba, Senior Vice-President and Chief Human Resources Officer, Asia, Middle East and Africa, PepsiCo Inc.

Azita Berar Awad, Director, Employment Policy Department, International Labour Organization (ILO) (since June 2015)

Tan Chorh-Chuan, President, National University of Singapore

Arturo Condo, President, INCAE Business School

Pascaline Descy, Head, Research and Policy Analysis, European Centre for the Development of Vocational Training (CEDEFOP)

John Evans, General Secretary, Trade Union Advisory Committee to the Organisation for Economic Co-operation and Development

John Irons, Managing Director, Rockefeller Foundation

Yoko Ishikura, Professor Emeritus, Hitotsubashi University

Chauncy Lennon, Senior Program Director, Workforce Development, JPMorgan Chase

Andrew McAfee, Principal Research Scientist, MIT Center for Digital Business

Patricia Milligan, Global Leader, Multinational Client Group, Mercer

Vikas Pota, Chief Executive, Varkey Foundation

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J. Frank Brown, Managing Director and Chief Operating Officer, General Atlantic LLC; Council Chair

Mara Swan, Executive Vice-President, Global Strategy and Talent, ManpowerGroup; Council Vice-Chair

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Rick Goings, Chairman and Chief Executive Officer, Tupperware Brands Corporation

Herminia Ibarra, Cora Chaired Professor of Leadership and Learning and Professor of Organizational Behaviour, INSEAD

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AT THE WORLD ECONOMIC FORUM

Richard Samans, Head of the Centre for the Global Agenda; Member of the Managing Board

Saadia Zahidi, Head, Gender Parity and Employment Initiatives; Member of the Executive Committee

Till Alexander Leopold, Project Lead, Employment, Skills and Human Capital Initiative; Council Manager

Vesselina Ratcheva, Data Analyst, Gender Parity and Employment Initiatives

(Cont'd.)

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Vesselina Ratcheva is a Data Analyst working in the World Economic Forum's Human Capital and Gender Parity team. She is responsible for data processing, analysis and visualization. Vesselina was previously responsible for Data, Research and Evaluation at National Numeracy, a skills charity in the United Kingdom. She has worked on a variety of research projects for the past 10 years, covering international migration, experiences of urban infrastructure, political mobilization, organizational culture and national identity—consistently using mixed research methods. She holds a PhD in Social Anthropology, an MSc in Comparative and Cross Cultural Research Methods and a BA in Social Anthropology and Maths. Ratcheva is dedicated to exploring the best ways to ensure more just social and political systems with a specific focus on skills, employment and work, identity (gender, ethnic) and culture.

Saadia Zahidi is Head of the Global Challenge on Employment, Skills and Human Capital, Head of the Global Challenge on Gender Parity and Member of the Executive Committee at the World Economic Forum. Zahidi founded and co-authors the Forum's *Global Gender Gap Report,* the *Corporate Gender Gap Report,* the *Human Capital Report,* the *Future of Jobs Report* and the *Industry Gender Gap Report.* In her work on gender as well as employment, Zahidi has translated analysis into action by mobilizing a wide network of constituents—business leaders, governments, civil society and academia—to work together to set targets, share best practices, create new public-private partnerships, muster resources and change mindsets. In past roles, she has managed civil society and international organization portfolios at the Forum and was also previously an Economist with the Forum's Global Competitiveness Programme. Zahidi serves as a board member and advisor for several organizations and is a frequent speaker at international conferences and in the media. She earned her BA in Economics at Smith College, MPhil in International Economics at the Graduate Institute of International Studies and MPA at the Harvard Kennedy School. Her research interests include issues of gender equality, women's leadership, skills gaps, employment and human capital. She is currently writing a book on *Womenomics in the Muslim World* and was awarded the inaugural Bracken Bower Prize by the Financial Times and McKinsey for this project. She is a native of Pakistan.

The World Economic Forum would like to thank Adecco Group, African Rainbow Minerals, Alghanim Industries, AlixPartners, The Bahrain Economic Development Board, Chobani, The Coca-Cola Company, Edelman, GEMS Education, Infosys, LinkedIn, ManpowerGroup, Mercer (MMC), Microsoft Corporation, Pearson, The Rockefeller Foundation, SAP, Saudi Aramco, Siemens, Tata Consultancy Services, Tupperware Brands Corporation, Uber, Workday, WPP and Zain for their invaluable support of the Global Challenge Initiative on Employment, Skills and Human Capital and this *Report.*

Adecco

better work, better life

The Adecco Group, based in Zurich, Switzerland, is the world's leading provider of HR solutions. With more than 32,000 FTE employees and around 5,100 branches in over 60 countries and territories around the world, Adecco Group offers a wide variety of services, connecting around 700,000 associates with its clients every day. The services offered fall into the broad categories of temporary staffing, permanent placement, career transition and talent development, as well as outsourcing and consulting. Adecco inspires individuals and organisations to work more effectively and efficiently and creates greater choice in the domain of work, for the benefit of all concerned. As the world's leading provider of HR solutions—a business that has a positive impact on millions of people every day—it is conscious of its global role. Helping people to better work, better life is its common purpose and the way in which it contributes to society. Adecco Group is a Fortune Global 500 company.

www.adecco.com

ARM

African Rainbow Minerals

African Rainbow Minerals (ARM) is a leading South African diversified mining and minerals company with long-life, low unit cost operations and significant growth opportunities. ARM mines iron ore, manganese ore and alloys, chrome ore and alloys, platinum group metals, copper, nickel and coal. The company also has an investment in gold through its shareholding in Harmony. ARM is committed to responsible environmental stewardship as a fundamental part of sustainable value creation.

www.arm.co.za

Alghanim INDUSTRIES

Alghanim Industries is one of the largest privately owned companies in the Gulf region. Founded in 1932, the company has since grown into a multi-billion dollar conglomerate, employing more than 14,000 employees in 30 businesses and operating in over 40 countries across the Middle East and North Africa, Turkey, India and emerging Asian economies.

www.alghanim.com

AlixPartners

When it really matters.

AlixPartners is a global business advisory firm recognized for deep expertise in restoring performance and creating value. Its managing directors work alongside boards of directors, lenders, investors, government institutions and the legal community to provide complementary services across corporate finance, information management, litigation support and organizational effectiveness to address financial and commercial challenges at all stages of the business lifecycle.

www.alixpartners.com

مجلس التنمية الاقتصادية البحرين BAHRAIN ECONOMIC DEVELOPMENT BOARD

The Bahrain Economic Development Board (EDB) is a dynamic public agency with responsibility for attracting inward investment into Bahrain focusing on target economic sectors in which the Kingdom offers significant strengths. Key areas include manufacturing, ICT, and logistics and transport services. The financial services sector in Bahrain is particularly strong and the EDB supports the continuing growth of the banking industry and key sub-sectors, including Islamic finance, wealth management, asset management, and insurance and re-insurance.

www.bahrainedb.com

Chobani was founded on the belief that people have great taste—they just need great options. Chobani produces high-quality, authentic, strained Greek yogurt products made with only natural ingredients from its New York and Idaho plants. Chobani is committed to using milk from regional farms and strengthening its surrounding local economies. Chobani gives 10% of its annual profits to charities worldwide through the company's charitable foundation. Chobani products are available in the US, Australia, in Asia and Latin America.

www.chobani.com

The Coca-Cola Company (NYSE: KO) is the world's largest beverage company, refreshing consumers with more than 500 sparkling and still brands. Led by Coca-Cola, one of the world's most valuable and recognizable brands, the Company's portfolio features 16 billion-dollar brands including Diet Coke, Fanta, Sprite, Coca-Cola Zero, vitaminwater, Powerade, Minute Maid, Simply, Georgia and Del Valle. Globally, it is the No. 1 provider of sparkling beverages, ready-to-drink coffees, and juices and juice drinks. Through the world's largest beverage distribution system, consumers in more than 200 countries enjoy its beverages at a rate of more than 1.8 billion servings a day. With an enduring commitment to building sustainable communities, the Company is focused on initiatives that reduce its environmental footprint, support active, healthy living, create a safe, inclusive work environment, and enhance the economic development of the communities where it operates. Together with its bottling partners, it ranks among the world's top 10 private employers with more than 700,000 system associates.

www.thecocacolacompany.com

Edelman is a leading global communications marketing firm that partners with many of the world's largest and emerging businesses and organizations, helping them evolve, promote and protect their brands and reputations. It has 65 offices and more than 5,500 employees worldwide, as well as affiliates in more than 30 cities.

www.edelman.com

GEMS Education is a leading international education provider. It runs high-performing schools and offers consulting services to the public and private sectors. For over 55 years, it has provided high-quality education to hundreds of thousands of children. GEMS has a global network of award-winning schools which provide high-quality holistic education to more than 250,000 students. It employs over 20,000 education professionals, specialists and staff. Its world-class leadership team combines business and education expertise from around the globe.

www.gemseducation.com

Infosys is a global leader in consulting, technology, outsourcing and next-generation services. It enables clients in more than 50 countries to stay a step ahead of the competition. Its expertise spans industries. From helping build lighter and stronger passenger jets and creating more fuel efficient cars, to enabling banks to provide financial inclusion to the most remote corners of the globe, Infosys delivers powerful innovations. And in doing so, it changes the way the world works and lives.

www.infosys.com

LinkedIn connects the world's professionals to make them more productive and successful and transforms the ways companies hire, market and sell. Our vision is to create economic opportunity for every member of the global workforce through the ongoing development of the world's first Economic Graph. LinkedIn has more than 400 million members and has offices around the world.

www.linkedin.com

ManpowerGroup™ (NYSE: MAN) is the world's workforce expert, creating innovative workforce solutions, for more than 65 years. It connects more than 600,000 people to meaningful work across a wide range of skills and industries every day. Through its ManpowerGroup family of brands—Manpower®, Experis®, Right Management® and ManpowerGroup® Solutions—it helps more than 400,000 clients in 80 countries and territories address their critical talent needs, providing comprehensive solutions to resource, manage and develop talent. In 2015, ManpowerGroup was named one of the World's Most Ethical Companies for the fifth consecutive year and one of Fortune's Most Admired Companies, confirming its position as the most trusted and admired brand in the industry. ManpowerGroup makes powering the world of work humanly possible.

www.manpowergroup.com

Mercer is a global consulting leader in talent, health, retirement and investments. Mercer helps clients around the world advance the health, wealth and careers of their most vital asset – their people. Mercer's more than 20,000 employees are based in 43 countries and the firm operates in over 140 countries. Mercer is a wholly owned subsidiary of Marsh & McLennan Companies (NYSE: MMC), a global professional services firm offering clients advice and solutions in the areas of risk, strategy and people. With annual revenue of $13 billion and 57,000 colleagues worldwide, Marsh & McLennan Companies is also the parent company of Marsh, a leader in insurance broking and risk management; Guy Carpenter, a leader in providing risk and reinsurance intermediary services; and Oliver Wyman, a leader in management consulting.

www.mercer.com

Microsoft is a worldwide leader in software, services and solutions that help people and businesses realize their full potential. Since it was founded in 1975, it has worked to achieve this mission by creating technology that transforms the way people work, play and communicate. Microsoft does business throughout the world, with over 90,000 employees and offices in more than 100 countries. Through its people, partnerships and technology, the company helps to address some of the world's most pressing societal challenges and create social and economic opportunities that improve people's lives. Microsoft upholds a belief that social and economic opportunity go hand in hand. When individuals, communities and governments thrive, so does business. To support this cycle, the company focuses on strengthening economies, addressing societal challenges, promoting a healthy online environment and managing a sustainable business.

www.microsoft.com

Pearson is the world's leading education company. From pre-school to high school, early learning to professional certification, its curriculum materials, multimedia learning tools and testing programmes help to educate millions of people worldwide—more than any other private enterprise.

www.pearson.com

The Rockefeller Foundation supports work to advance inclusive economies that expand opportunities for more broadly shared prosperity and to build greater resilience by helping people, communities and institutions prepare for, withstand and emerge stronger from acute shocks and chronic stresses. This affirms its pioneering philanthropic mission—since 1913—to promote the well-being of humanity throughout the world.

www.rockefellerfoundation.org

As market leader in enterprise application software, SAP (NYSE: SAP) helps companies of all sizes and industries run better. From back office to boardroom, warehouse to storefront, desktop to mobile device, SAP empowers people and organizations to work together more efficiently and use business insight more effectively to stay ahead of the competition. SAP applications and services enable more than 296,000 customers to operate profitably, adapt continuously and grow sustainably.

www.sap.com

Saudi Aramco is a leading, globally integrated energy and chemicals company. From producing approximately one in every eight barrels of the world's crude oil supply to developing new energy technologies, Saudi Aramco's global team is dedicated to creating positive impacts. The company relentlessly pursues the ideas that make its resources more dependable, more sustainable, and more useful. By strategically conducting its commercial activities in ways that trigger economic multiplier effects, the company delivers added value to the communities in which it operates. Whether it is the energy of its resources or the intellectual and creative energy of its people, Saudi Aramco is focused on harnessing the full potential of both for the benefit of the greatest number of people possible.

www.saudiaramco.com

Siemens AG (Berlin and Munich) is a global technology powerhouse that has stood for engineering excellence, innovation, quality, reliability and internationality for more than 165 years. The company is active in more than 200 countries, focusing on the areas of electrification, automation and digitalization. One of the world's largest producers of energy-efficient, resource-saving technologies, Siemens is No. 1 in offshore wind turbine construction, a leading supplier of combined cycle turbines for power generation, a major provider of power transmission solutions, and a pioneer in infrastructure solutions as well as automation, drive and software solutions for industry. The company is also a leading provider of medical imaging equipment—such as computed tomography and magnetic resonance imaging systems—and a leader in laboratory diagnostics as well as clinical IT. In fiscal 2014, which ended on 30 September 2014, Siemens generated revenue from continuing operations of 71.9 billion euros and net income of 5.5 billion euros. At the end of September 2014, the company had around 357,000 employees worldwide.

www.siemens.com

Tata Consultancy Services (TCS) is a global IT services company that was rated as the fastest growing brand in its industry worldwide in 2015, with a brand value of $8.27 billion. It ranks in the topmost tier of its industry in terms of market capitalization, employees and brand value, and is the industry leader in customer satisfaction. TCS offers a consulting-led, integrated portfolio of IT, business process services, infrastructure, engineering and assurance services. The company is recognized as the top employer in its industry, with over 335,000 of the world's best-trained consultants working in 46 countries. Under the leadership of its current CEO, N. Chandrasekaran, TCS has grown at a compounded annual rate of 26% over the past three years and has generated consolidated revenues of $15.5 billion for the year ended 31 March 2015.

www.tcs.com

Tupperware Brands Corporation is the leading global marketer of innovative, premium products across multiple brands, utilizing a relationship-based selling method through an independent sales force of 2.9 million. For more than 65 years, Tupperware Brands has connected women through its worldwide sales force—propelling the organization's business objectives while positively impacting the lives of women through a unique business model that educates and empowers through economic opportunities, training and enhanced self-confidence.

www.tupperwarebrands.com

Uber is evolving the way the world moves. By seamlessly connecting riders to drivers through its apps, it makes cities more accessible, opening up more possibilities for riders and more business for drivers. From its founding in 2009 to its launches in hundreds of cities today, Uber's rapidly expanding global presence continues to bring people and their cities closer.

www.uber.com

Workday is a leading provider of enterprise cloud applications for finance and human resources. Founded in 2005, Workday delivers financial management, human capital management, and analytics applications designed for the world's largest companies, educational institutions, and government agencies. More than 1,000 organizations, ranging from medium-sized businesses to Fortune 500 enterprises, have selected Workday.

www.workday.com

WPP is the world's leading communications services group, with billings of $72.3 billion and revenues of $17.3 billion in 2013, providing national, multinational and global clients with advertising; media investment management; data investment management; public relations & public affairs; branding & identity; healthcare communications; and direct, digital, interactive, promotion & specialist communications. WPP's worldwide companies include JWT, Ogilvy & Mather, Y&R, Grey Group, United Network, GroupM, Mindshare, MEC, MediaCom, Maxus, Kantar (including Millward Brown and TNS), Burson-Marsteller, Hill+Knowlton Strategies, Cohn & Wolfe, RLM Finsbury, Ogilvy Public Relations, Landor, Brand Union, Fitch, Sudler & Hennessey, Ogilvy CommonHealth Worldwide, ghg, AKQA, OgilvyOne, Wunderman and WPP Digital, among others. WPP companies provide communications services to clients worldwide, including 350 of the Fortune Global 500; all 30 of the Dow Jones 30; 63 of the NASDAQ 100; and 31 of the Fortune e-50. Collectively, WPP employs 179,000 people (including associates) in more than 3,000 offices in 111 countries.

www.wpp.com

Zain is a leading telecommunications operator across the Middle East and Africa providing mobile voice and data services to over 44.3 million active customers as of 31 December 2014. With a commercial presence in eight countries, Zain operates in Kuwait, Bahrain, Iraq, Jordan, Saudi Arabia, South Sudan and Sudan. In Lebanon, the Group manages touch on behalf of the government. In Morocco, Zain has a 15.5% stake in INWI through a joint venture. Zain is listed on the Kuwait Stock Exchange.

www.zain.com

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www.alghanim.com

A.T. Kearney is a leading global management consulting firm with offices in more than 40 countries. Since 1926, A.T. Kearney has been a trusted adviser to the world's foremost organizations. A.T. Kearney is a partner-owned firm, committed to helping clients achieve immediate impact and growing advantage on their most mission-critical issues.

www.atkearney.com

Bank of America is one of the world's largest financial institutions, serving individual consumers, small- and middle-market businesses and large corporations with banking, investing, asset management and other financial and risk management products and services. The company provides unmatched convenience in the United States, serving approximately 48 million consumer and small business relationships with some 4,800 retail banking offices and around 16,000 ATMs, and award-winning online banking with 31 million active users and approximately 18 million mobile users.

www.bankofamerica.com

Bloomberg, L.P. is the leading global provider of financial data, analytics, news and media. Bloomberg provides real-time financial information to more than 310,000 subscribers; through Bloomberg Law, Bloomberg Government and Bloomberg New Energy Finance, the company provides data, news, and analytics to decision makers in industries beyond finance. Bloomberg News, TV, Radio, Mobile, Internet and two magazines—Businessweek and Markets—cover the world with over 2,300 news professionals. The company employs more than 17,000 people in 192 locations around the world.

www.bloomberg.com

At total consolidated sales of €2.46 billion and over 10,000 employees in 18 countries, Hubert Burda Media is one of Europe's largest consumer internet companies. Burda's digital activities have been the main driver of the company's growth. Hubert Burda Media reaches over 160 million users online; 40 million consumers enter into paying relationships with one of Burda's 400 brands. As Germany's leading magazine publishing house, the company offers about 80 magazines in Germany and another 240 magazines all over the world.

www.hubert-burda-media.com

Centene Corporation, a Fortune 500 company, is a diversified, multi-national healthcare enterprise that provides a portfolio of services to government-sponsored healthcare programs, focusing on under-insured and uninsured individuals. Many receive benefits provided under Medicaid, including the State Children's Health Insurance Program (CHIP), as well as Aged, Blind or Disabled (ABD), Foster Care and Long Term Care (LTC), in addition to other state-sponsored/hybrid programs and Medicare (Special Needs Plans). The Company operates local health plans and offers a range of health insurance solutions. It also contracts with other healthcare and commercial organizations to provide specialty services including behavioral health management, care management software, correctional healthcare services, dental benefits management, in-home health services, life and health management, managed vision, pharmacy benefits management, specialty pharmacy and telehealth services.

www.centene.com

The Coca-Cola Company (NYSE: KO) is the world's largest beverage company, refreshing consumers with more than 500 sparkling and still brands. Led by Coca-Cola, one of the world's most valuable and recognizable brands, the Company's portfolio features 16 billion-dollar brands including Diet Coke, Fanta, Sprite, Coca-Cola Zero, vitaminwater, Powerade, Minute Maid, Simply, Georgia and Del Valle. Globally, it is the No. 1 provider of sparkling beverages, ready-to-drink coffees, and juices and juice drinks. Through the world's largest beverage distribution system, consumers in more than 200 countries enjoy its beverages at a rate of more than 1.8 billion servings a day. With an enduring commitment to building sustainable communities, the Company is focused on initiatives that reduce its environmental footprint, support active, healthy living, create a safe, inclusive work environment, and enhance the economic development of the communities where it operates. Together with its bottling partners, it ranks among the world's top 10 private employers with more than 700,000 system associates.

www.thecocacolacompany.com

EY is a global leader in assurance, tax, transaction and advisory services. The insights and quality services it delivers help build trust and confidence in the capital markets and in economies the world over. EY develops outstanding leaders who team to deliver on its promises to all of its stakeholders. EY plays a critical role in building a better working world for its people, its clients and its communities.

www.ey.com

Heidrick & Struggles serves the executive talent and leadership needs of the world's top organizations as the premier provider of leadership consulting, culture shaping and senior-level executive search services. The consultants of Heidrick leverage deep expertise across every industry sector and an unparalleled global presence. Heidrick & Struggles pioneered the profession of executive search more than 60 years ago. Today, the firm serves as a trusted adviser, providing integrated leadership solutions and helping its clients change the world, one leadership team at a time.

www.heidrick.com

JLL (NYSE: JLL) is a professional services and investment management firm offering specialized real estate services to clients seeking increased value by owning, occupying and investing in real estate. With annual fee revenue of $4.7 billion and gross revenue of $5.4 billion, JLL has more than 230 corporate offices, operates in 80 countries and has a global workforce of approximately 58,000. On behalf of its clients, the firm provides management and real estate outsourcing services for a property portfolio of 3.4 billion square feet, or 316 million square metres, and completed $118 billion in sales, acquisitions and finance transactions in 2014. Its investment management business, LaSalle Investment Management, has $55.3 billion of real estate assets under management. JLL is the brand name, and a registered trademark, of Jones Lang LaSalle.

www.joneslanglasalle.com

Johnson Controls is a global diversified technology and industrial leader serving customers in more than 150 countries. Its 170,000 employees create quality products, services and solutions to optimize energy and operational efficiencies of buildings; lead-acid automotive batteries and advanced batteries for hybrid and electric vehicles; and seating components and systems for automobiles. The company's commitment to sustainability dates back to 1885, with the invention of the first electric room thermostat. Through its growth strategies and by increasing market share, Johnson Controls is committed to delivering value to shareholders and making its customers successful. In 2014, Johnson Controls reported annual sales of $42.8 billion and is consistently ranked on the U.S. Fortune 500 and Global Fortune 500. Johnson Controls is committed to good corporate governance and community service. In 2015, Corporate Responsibility Magazine recognized Johnson Controls the no. 14 company in its annual "100 Best Corporate Citizens" list, confirming its position as an ethical and trusted brand in the industries it serves.

www.johnsoncontrols.com

ManpowerGroup™ (NYSE: MAN) is the world's workforce expert, creating innovative workforce solutions, for more than 65 years. It connects more than 600,000 people to meaningful work across a wide range of skills and industries every day. Through its ManpowerGroup family of brands—Manpower®, Experis®, Right Management® and ManpowerGroup® Solutions—it helps more than 400,000 clients in 80 countries and territories address their critical talent needs, providing comprehensive solutions to resource, manage and develop talent. In 2015, ManpowerGroup was named one of the World's Most Ethical Companies for the fifth consecutive year and one of Fortune's Most Admired Companies, confirming its position as the most trusted and admired brand in the industry. ManpowerGroup makes powering the world of work humanly possible.

www.manpowergroup.com

Old Mutual provides investment, savings, insurance and banking services to more than 17 million customers in Africa, the Americas, Asia and Europe. Originating in South Africa in 1845, Old Mutual has been listed on the London and Johannesburg Stock Exchanges, among others, since 1999. In the year ended 31 December 2014, the Group reported adjusted operating profit before tax of £1.6 billion (on an IFRS basis) and had £319 billion of funds under management from core operations. For further information on Old Mutual plc, please visit the corporate website at www.oldmutual.com.

www.oldmutual.com

Omnicom Group Inc.

Omnicom is a strategic holding company headquartered in New York. It manages a portfolio of global market leaders in the disciplines of advertising, marketing services, specialty communications, interactive/digital media and media buying services. Omnicom Group companies cover more than 30 marketing communications disciplines across more than 200 strategic brand platforms, comprising three global advertising agency networks, leading national advertising agencies, a global network of more than 175 marketing services companies and a media group that includes two of the world's premier providers of media planning and buying services. Omnicom's commitment to excellence, quality and client satisfaction is a primary reason why its record of new business wins and longevity of major client relationships are the best in the business. Its agency brands are consistently acknowledged as having the best creative talent in the world in all disciplines. A leader in digital media, Omnicom Group has been ranked number one in digital share of revenue among all holding companies.

www.omnicomgroup.com

ooredoo

Ooredoo is a leading international communications company delivering mobile, fixed, broadband internet and corporate managed services tailored to the needs of consumers and businesses across markets in the Middle East, North Africa and Southeast Asia. As a community-focused company, Ooredoo is guided by its vision of enriching people's lives and its belief that it can stimulate human growth by leveraging communications to help people achieve their full potential. Ooredoo has a presence in markets such as Qatar, Kuwait, Oman, Algeria, Tunisia, Iraq, Palestine, the Maldives, Myanmar and Indonesia. The company was named "Best Mobile Operator of the Year" at the World Communication Awards 2013. The company reported revenues of US$ 9.1 billion in 2014 and had a consolidated global customer base of more than 107 million people as of 31 December 2014. Ooredoo's shares are listed on the Qatar Exchange and the Abu Dhabi Securities Exchange.

www.ooredoo.com

pwc

At PwC, our purpose is to build trust in society and solve important problems. We're a network of firms in 157 countries with more than 208,000 people who are committed to delivering quality in assurance, advisory and tax services. Find out more and tell us what matters to you by visiting us at www.pwc.com. PwC refers to the PwC network and/or one or more of its member firms, each of which is a separate legal entity. Please see www.pwc.com/structure for further details.

www.pwc.com

RENAULT NISSAN

Founded in 1999, the Renault-Nissan Alliance is the longest-lasting cross-cultural combination among major automakers. It sells one in 10 cars globally and employs nearly 450,000 people in nearly 200 countries. Renault and Nissan are separate companies but enjoy a cross-shareholding partnership which focuses on results-driven synergies and respects brand and corporate identities. The Alliance has expanded to include collaborations with Germany's Daimler, China's Dong Feng and Russia's AvtoVAZ, among others. Renault and Nissan are the only automakers mass-producing and selling zero-emission vehicles, including the Nissan LEAF and Renault Zoe, which are 100% electric and can be fully recharged with purely renewable energy. Together, the Alliance has sold more than 200,000 electric vehicles—more than all of the other major automakers combined. The Alliance is committed to expanding the zero-emission infrastructure around the world and has agreements with over 100 cities, states and countries that are working to ensure electric vehicles are both affordable and convenient.

www.alliance-renault-nissan.com

Takeda Pharmaceutical is a global pharmaceutical company with a presence in more than 70 countries around the world. The company has a history spanning over 230 years and is currently the top pharmaceutical company in Japan and Asia, as well as one of the top 20 pharmaceutical firms globally. It pursues its mission to strive towards better health for people worldwide through leading innovation in medicine in four therapeutic areas: CNS, cardiovascular and metabolic diseases, gastroenterology and oncology.

www.takeda.com

Tupperware Brands Corporation is the leading global marketer of innovative, premium products across multiple brands, utilizing a relationship-based selling method through an independent sales force of 2.9 million. For more than 65 years, Tupperware Brands has connected women through its worldwide sales force—propelling the organization's business objectives while positively impacting the lives of women through a unique business model that educates and empowers through economic opportunities, training and enhanced self-confidence.

www.tupperwarebrands.com

WORLD ECONOMIC FORUM

COMMITTED TO IMPROVING THE STATE OF THE WORLD

The World Economic Forum, committed to improving the state of the world, is the International Organization for Public-Private Cooperation.

The Forum engages the foremost political, business and other leaders of society to shape global, regional and industry agendas.

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