WORLD ECONOMIC FORUM

COMMITTED TO IMPROVING THE STATE OF THE WORLD

Global Talent Risk – Seven Responses

in collaboration with
The Boston Consulting Group

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Foreword

We are entering the era of unparalleled talent scarcity, which, if left unaddressed, will put a brake on economic growth around the world, and will fundamentally change the way we approach the workforce challenges.

No country, no organization can remain competitive unless talent – the engine force of economies – is there to ensure success of organizations in turbulent times, handle the political, social agenda and boost research and innovations.

Twenty years from now, the world will need millions of new business professionals, engineers, doctors, IT specialists, scientific researches, technicians, teachers, plumbers and nurses. Twenty years from now, we may not have them.

Just as the problem is multifaceted, so is the solution. While today's rhetoric focuses on telling businesses to "create new jobs," we believe that the creation of new jobs is inextricably tied to providing the right skills for those jobs through education, training and retraining. We must invest in the future by taking on the long-term task of training new talent and retraining existing talent. At the same time, we must compete with other jurisdictions to attract the best and the brightest from around the world and, critically – to retain the talent within our borders.

In Québec, we have focused our efforts on attracting foreign talent and, more importantly, integrating such foreign nationals successfully into the labour market. For example, we encourage temporary skilled workers and foreign students graduating from Québec educational institutions to stay in the province through a simplified immigration programme. We are incentivizing skilled workers to immigrate to Québec through an economic immigration programme. We have also negotiated a new space of professional mobility between the citizens of Québec and France.

Although competitiveness is a priority for us, we must also realize that sharing best practices with the rest of the world will help support a globally talented workforce for the future, which is also in the best interests of our state. Therefore, we are ready and open to share our experiences since we believe that immediate attention and interdisciplinary action must be taken by governments, businesses, academia and civil society on a global basis. A global problem calls for a global solution, and we believe that the reallocation of talent through mobility schemes is an integral part of the answer.

We must be daring and commit to a course of action that allows effective sharing of these best practices among governments, business and academia. The World Economic Forum has gathered over 100 experts and practitioners who have spent at least two years exploring the magnitude of these talent shortages. The Talent Mobility project has taken on the analysis of best practices on this issue and developed a set of comprehensive recommendations that can be applied across multiple stakeholders. Equipped with the research offered by this project, it is now our responsibility, as members of the international community, to take action.

On behalf of the government of Québec, I am proud to announce our commitment to addressing the issues of talent mobility today. I invite you to join us in this endeavour.

Jean Charest, Premier of Québec, Canada

Talent and skills scarcities – The Numbers

The talent gap is a challenge for employers everywhere. To sustain economic growth, by 2030 the United States will need to add **more than 25 million workers** and Europe will need to add **more than 24 million employees.**[1]

There are an estimated **214 million international migrants** worldwide. Collectively, they would make up the **world's fifth-largest nation**.[2]

Migration is not only a South-to-North phenomenon; in fact, **40%** of the world's migrants move from one developing country to another.[3]

Foreign nationals are authors of the majority of patent applications filed by many US companies: **65%** at Merck and **64%** at GE and **60%** at Cisco.[4]

Foreign-born workers with university or equivalent qualifications make up just **2%** of the European labour market, compared with **4.5%** in the United States, **8%** in Australia and nearly **10%** in Canada.[5]

With 45 million new entrants in the global job market annually – most of them young – **300 million new jobs** will be needed between now and 2015 to keep pace with the growth in the labour force.[6]

In North and West Africa, more than one-quarter of the population is **under age 15** and unemployment rates for young people exceed **30%**.[7]

Employability will continue to be a huge problem worldwide. Because of the uneven quality of education systems, only **25%** of Indian and **20%** of Russian professionals are currently considered employable by multinationals.[8]

Compared to today, in 2050, most G7 and all BRIC countries will have **more than doubled age 65 and older dependency ratios**, and all except India will have more aged societies than today's most aged society (Japan).[9]

Even China faces long-term talent shortages. The number of those aged 60 and older is expanding rapidly, already forming **12.5% of the nation's population**. The country's one-child policy and its drop in birth rates means that by 2050 the **10 workers** now supporting each senior citizen will fall to **2.5**.[10]

Eighty-nine per cent of women who voluntarily leave their jobs — for example to raise a child — want to go back to work but only **40%** have been able to find full-time, mainstream jobs.[11]

Executive summary

Despite today's high unemployment rates, the global talent risk is growing. Soon staggering talent gaps will appear in large parts of the world threatening economic growth. Economies will struggle to remain competitive while organizations will compete for talent on an unprecedented scale. Now, human capital is replacing financial capital as the engine of economic prosperity.

The roots of the looming talent scarcity are no mystery. The Northern hemisphere faces talent shortages in a wide range of occupational clusters largely because populations are ageing rapidly and educational standards are insufficient. The United States, for example, will need to add more than 25 million workers by 2030 to sustain economic growth, while Europe will need more than 45 million. In Germany, according to a recent assessment, 70% of employers are hard-pressed to find the right people.[12] In developed countries, ageing and the retirement of baby boomers will have significant implications for how to manage workforce quantity, quality and costs.

Many countries in the Southern hemisphere report workforce surpluses due to high economic growth and stable birth rates. However, there are questions about the employability of these workers — whether they have the necessary skills to get jobs and work effectively. The uneven quality of educational systems in developing countries is one reason why workers are not receiving the training they need to thrive in an increasingly global economy. As one example, only 25% of Indian professionals are considered employable by multinationals.[13]

The talent crisis demands bold responses. Skills for high-demand jobs in 2020 must be developed now. Demand will be highest for well-educated professionals, technicians and managers. All over the globe — in developed, newly industrialized, BRIC and developing countries — demand is soaring for these professions. Professionals will be in particularly high demand by companies in trade, transport and communication in developing nations. Healthcare research and development (R&D) will generate enormous demand for skilled labour worldwide, mining companies will need project planners and web designers will be in demand throughout many industries. Demand for other jobs will taper off as technologies render them obsolete. Filling higher-demand positions will require improved and more extensive vocational training, starting today.

To be employable in 2020, graduates must be technologically literate and acquire transferable, cross-cultural learning skills. Any nation or company that continues to rely on conventional learning and routine, siloed work without fostering a culture of continuous learning will face an ever-deepening talent gap.

"The millennials, a generation born digital, are completely at ease with technology and will have a much stronger impact on social behaviour than we currently assume. As they enter the workforce, they represent a huge engine of transformation for every institution – public and private."

– Klaus Schwab, Founder and Executive Chairman, World Economic Forum, 2010[14]

Talent mobility is inevitable. Despite protectionist attitudes that have intensified during the downturn, labour migration will rise over the long term. Globalization is fuelling mobility, as more companies expand abroad and people consider foreign postings as a natural part of professional development. Beyond the positive effects that talent circulation brings to both developed and developing countries, the larger point is that mobility will persist in inclusive societies, enabling equal opportunities.

Companies and countries will compete for the best and the brightest. Talent scarcity is driving the growth of an internationally mobile creative class that encompasses five generations of workers.[15] Competition for talent will come not only from the company down the street, but also from the employer on the other side of the world. It will be a seller's market, with talented individuals having many choices. Both countries and companies will need to brand themselves as locations of choice to attract this talent.

The concept of mobility extends beyond labour migration. Many government and business leaders have long relied on migrant workers to fill their talent gaps. But migration alone cannot make up for the massive talent shortfall we will soon face. The solution lies in expanding the definition of talent mobility to encompass movement across both geographical and non-geographical boundaries.

A holistic approach to the global talent risk will help companies and governments structure their efforts to solve the talent gap. This study proposes solutions around seven responses to global talent risk identified during a review of best practices. More than 320 current practices of countries and organizations have been evaluated and, along with additional quantitative and qualitative research, condensed into blueprints for action on how to attract, move, develop, diversify and retain talent. The seven responses to global talent risk are:

1. **Introduce strategic workforce planning.** Strategic workforce planning means modelling labour supply and demand for different job families to understand current and future imbalances and develop strategies for addressing them.

2. **Ease migration.** The economic downturn and rising unemployment rates have further soured attitudes toward migrants, with countries reducing quotas, setting tougher entry requirements, refusing to renew temporary work permits and even paying workers to go home. Innovative points-based migration systems and a "migration-friendly" branding by states and companies are necessary to attract the right talent globally.

3. **Foster brain circulation.** Brain drain has long been a nagging concern of developing countries. However, there are strategies that can help turn the brain drain into a brain gain, as students and professionals come home to apply skills learned abroad.

4. **Increase employability.** Governments and companies can do more to boost the skills levels of both the current and future workforce. What is needed is an adaptable but efficient education system that includes practical and theoretical skills, lifelong learning and upskilling.

5. **Develop a talent "trellis".** Talent development is key to ensuring a sustainable pool of highly skilled resources. Governments and companies must focus on going from career tracks to a trellis, building the skills required for the jobs of tomorrow and offering horizontal and vertical career and education paths.

6. **Encourage temporary and virtual mobility.** Temporary mobility covers short-term work or study in another location, offering relatively easy opportunities to access required skills, while virtual mobility is made possible by a networked world, enabling individuals to carry out their profession regardless of their location.

7. **Extend the pool.** Large pools of developed talent are currently under-utilized. Countries and companies need to establish policies to tap into the skill sets of women, older professionals, the disadvantaged and immigrants. Easily available childcare, flexible work schemes, mentoring and advisory roles, and improved options for licensing and recognizing credentials represent solutions to barriers faced by these groups.

Global mobility of talent is becoming as critical as the global mobility of goods and capital. The seven responses to the global talent risk are indispensable for companies and countries to win their share in tomorrow's global high-skills marketplace. The largest gains, however, will come from coordinated efforts among states, companies, international organizations, academia and civil societies worldwide as they think beyond national borders and recognize the global benefits of mobile talent.

Given the limitations of international collaboration in the area of talent mobility, **concerted, multistakeholder action is needed** to raise awareness of the impending talent crisis, increase best practices and information sharing, and advocate for policy changes.

A pragmatic, result-driven and content-based approach focused on effective sharing of good practices can provide opportunities to tackle imbalances of human capital markets. An action built around such concept, supported by governments, businesses and thought leaders, can accelerate change and make a concrete impact.

The World Economic Forum seeks to catalyse this action at the World Economic Forum Annual Meeting 2011 in Davos-Klosters.

1. Introduction: rising to the new challenges of global talent risk

Companies need the right talent to grow and innovate. Economies need new jobs for economic development. While governments and international organizations call for the creation of new jobs, companies cannot find qualified talent – individuals with skills critical to business and an upper secondary or tertiary education, such as engineers, IT developers and analysts.

The disconnect between public and private sectors prompted the World Economic Forum to gather decision-makers to explore the skills gaps and talent mobility challenges ahead. The interdisciplinary nature of these issues requires governments, academia, businesses and civil society to collaborate to provide the talent necessary for economic growth in both developing and developed countries.

In 2009, the Forum, in cooperation with the Boston Consulting Group (BCG), decided to complement the multistakeholder dialogue with an in-depth analysis of the talent supply and demand trends. To focus the work and ensure that concrete recommendations could be generated, the analysis concentrated on highly skilled talent.

Last year's report, *Stimulating Economies through Fostering Talent Mobility*, presented an analysis of workforce development and labour demand, including employability and immigration. Based on data from 22 countries and 12 industries, the report predicted vast talent gaps between the supply and demand of highly skilled workers would appear by 2020.

This year the all-important jobs perspective has been added to the study and we have broadened the sample of countries. As a result, we can provide a unique, three-dimensional overview of the talent shortages by 2020 and 2030 across 25 countries, 13 industries and nine occupational clusters. Moreover, the study has allowed us to forecast, with the imperfections of forecasting taken into consideration, which occupations will be in greatest demand by 2020 and 2030.

This year's work includes a review of trends reshaping human capital markets — the megatrends such as globalization and ageing populations, as well as industry- specific trends, such as the green movement in construction and customizability in manufacturing. The World Economic Forum, in collaboration with BCG and the partners involved in the project, has:

- Interviewed and brought into the dialogue more than 100 experts and practitioners
- Reviewed more than 300 good practices in the area of talent mobility
- Aggregated the best solutions into universally applicable blueprints to propose responses to the global talent risk
- Developed a set of recommendations for governments, businesses, academia and civil society

The 2011 talent mobility report has been developed in a particular context. Unemployment rates have remained high. Policy-makers in most countries have put job creation at the top of their agendas. With the first meeting of G20 Labour Ministers in April 2010 in Washington DC, new opportunities for international collaboration have emerged.

This report offers a vision for how to redesign approaches to talent mobility, based on the outcomes of analysis and dialogue with the decision-makers. This vision takes into account the slow recovery of global economies coupled with strong protectionist attitudes, immigration caps, high unemployment rates and disconnects between the public and private sectors.

2. The future talent gap: examining supply and demand

Methodology and approach

Last year, our talent mobility study developed a matrix of high-skills challenges across 22 countries and 12 industries to acknowledge the complexity of skills-gap forecasting and to demonstrate trends affecting industries across countries and across industry sectors.

Building on last year's work, this year the focus shifted toward jobs, strengthening the analysis and creating the dataset required to develop concrete recommendations. The most pressing talent gaps can now be identified not only by industry and country but also by occupational cluster.

Outlook: This study analyses countries and industries facing talent shortages within the next two decades to identify the job families that will experience high demand growth as well as the jobs (and associated skills) where supply will exceed demand by 2020 and beyond.

Countries examined: Expanding the list of countries examined to 25 provides a representative mix of developed, newly industrialized and developing economies. Brazil, Russia, India and China – the BRIC countries – were clustered together to acknowledge their prominent economic roles and their demographic and economic challenges.

Industries examined: Economic activities in each focus country were analysed for 13 industries: mining, manufacturing, utilities, construction, trade, hotels, transportation and communication, financial intermediation, information technology (IT) and business services, public administration and defence, education, healthcare and other services. These industries cover all secondary and tertiary sectors listed by the International Standard Industrial Classification of All Economic Activities in the United Nations' system for classifying economic data (see definition of industries in the Appendix).

Occupations examined: The occupational clusters described in this report correlate with those used by most national statistical institutes as well as the International Labour Organization (ILO) to compare workforce composition and distribution internationally. The scope of these clusters is defined by the International Standard Classification of Occupations (ISCO- 88, see definition in the Appendix.)[16] The definition of skills levels for these clusters is based on the International Standard Classification of Education (ISCED) and on the nature of the skills required to carry out the job duties. For purposes of this analysis, "talent" is defined as the economically active population with an upper secondary or tertiary education and expertise critical to business.

Challenges of matching supply and demand and economic modelling

Our analysis combined demographics and macroeconomic modelling — including factors such as potential GDP growth, expected capital stock growth, economically active population per industry and occupation or total factor productivity — with qualitative assessments of employability and future skills and talent shifts per industry. The study further focused on the impact of mega-trends and industry trends. Talent gaps become evident when compound annual growth rates (CAGR) of talent supply and talent demand are compared. Such comparisons highlight areas where talent shortages are increasing. However, the study did not delve into other economic side effects or dynamics of talent scarcity, such as factor-price shifts (wage increases), that might affect productivity or hamper economic growth potential.

The figures for current shares of talent per occupational cluster and future skill shifts were based on expert interviews by industry and country. The lingering effects of the economic downturn and uncertainty about recovery in various countries made accurate growth predictions challenging. We examined a range of economic development scenarios to adequately represent their impact on the labour market, and we crosschecked our findings in interviews with roughly 100 industry and country experts.

Key data sources included the International Labour Organization (ILO), the United Nations, the Organisation for Economic Co-operation and Development (OECD), the United Nations Educational, Scientific and Cultural Organization (UNESCO), national statistical institutes and ministries of labour.

There are clear limits to predicting precise workforce supply and demand figures. This study showcases defined trends in workforce development in the next two decades rather than trying to give absolute numbers. Our objective is to illustrate for policy-makers and business leaders the scale and scope of talent shortages per occupational cluster. We chose not to rank the severity of talent scarcity problems.

Significant talent shortage trends expected by 2020

Based on our quantitative analysis, significant talent challenges are looming in the Northern and Southern hemispheres by 2020 and beyond (Exhibit 1). In the Northern hemisphere, the expected talent gaps will be caused mainly by demographic shifts – notably, the retirement of baby boomers. For example in the United States, Germany, Canada and the United Kingdom, immigration and expected birth rates will not balance the workforce losses caused by ageing populations.

Southern hemisphere countries, except for Australia, report no shortage trends in numbers of people, given their expected economic growth combined with higher birth rates and population sizes. However, talent gaps are still anticipated in these countries due to lower skills levels. For example in the managerial cluster ~70% of individuals in developed countries currently meet our definition of "talent," compared to ~30% in developing countries. Furthermore, due to a lack of standardized vocational training and university degrees, only ~70% of technicians (such as an associate engineer) qualify as talent in BRIC countries, compared to ~90% in developed countries. BRIC countries will also be impacted by slower workforce increases, but may be able to compensate with high productivity growth.

Countries such as Spain, Japan, Germany and Canada are among those projected to face at least as severe a talent shortage in 2030 as they will in 2020. In other cases, such as China and Australia, the gap may close somewhat as decreases in demand offset reductions in talent supply. Nevertheless, China will still face a significant issue with its workers' employability if government spending on education does not increase. Considering for example China's projected talent demand trend by 2020, resulting in a compound annual demand growth rate of ~5%, China would need to double its talent base.

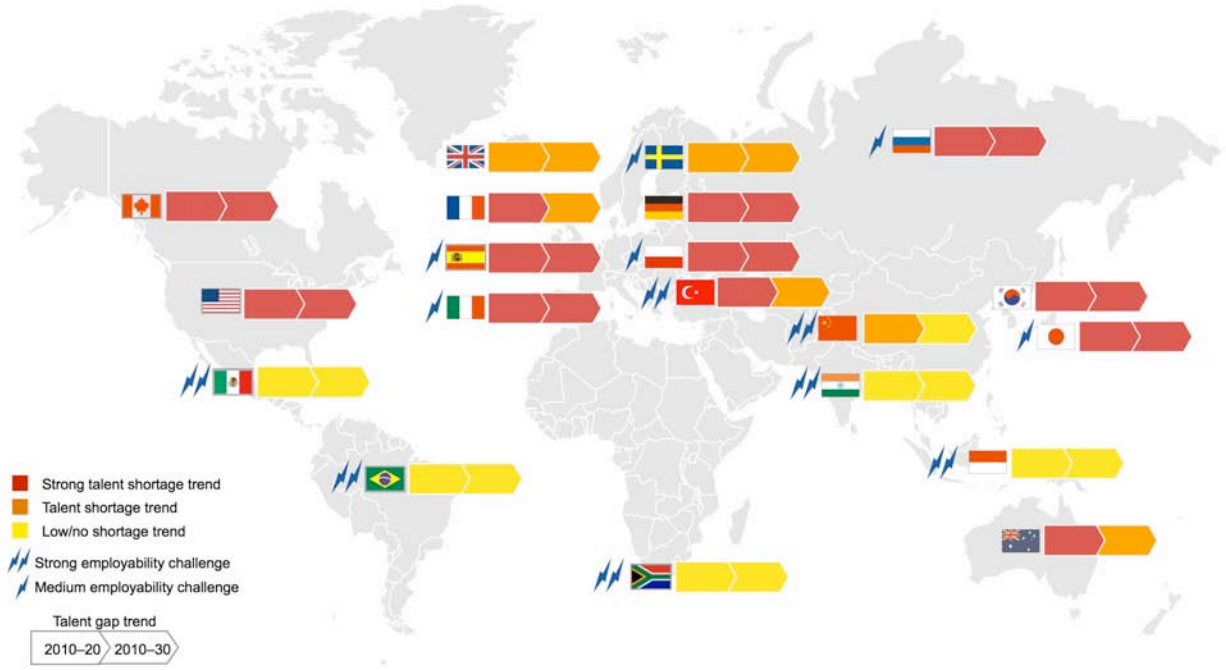
Over the next decade, Western Europe's talent supply will continuously decrease, leading to almost empty talent pipelines beyond 2020, and merely reaching an average growth rate of 0% to 1% (some countries even negative). Economic growth expectations coinciding with projected waves of retirements will force employers to find, attract and retain scarce talent.

Scale and scope of expected talent shortage trends by occupation

The quantitative analysis of talent shortages helps us understand the scale and scope of the looming talent scarcity by occupational cluster. The first column in Exhibit 2 identifies the total labour demand trend per industry across occupations and country categories. The remaining columns highlight an alarming gap in the occupational clusters for high and upper-medium skill profiles — managers, professionals and technicians.

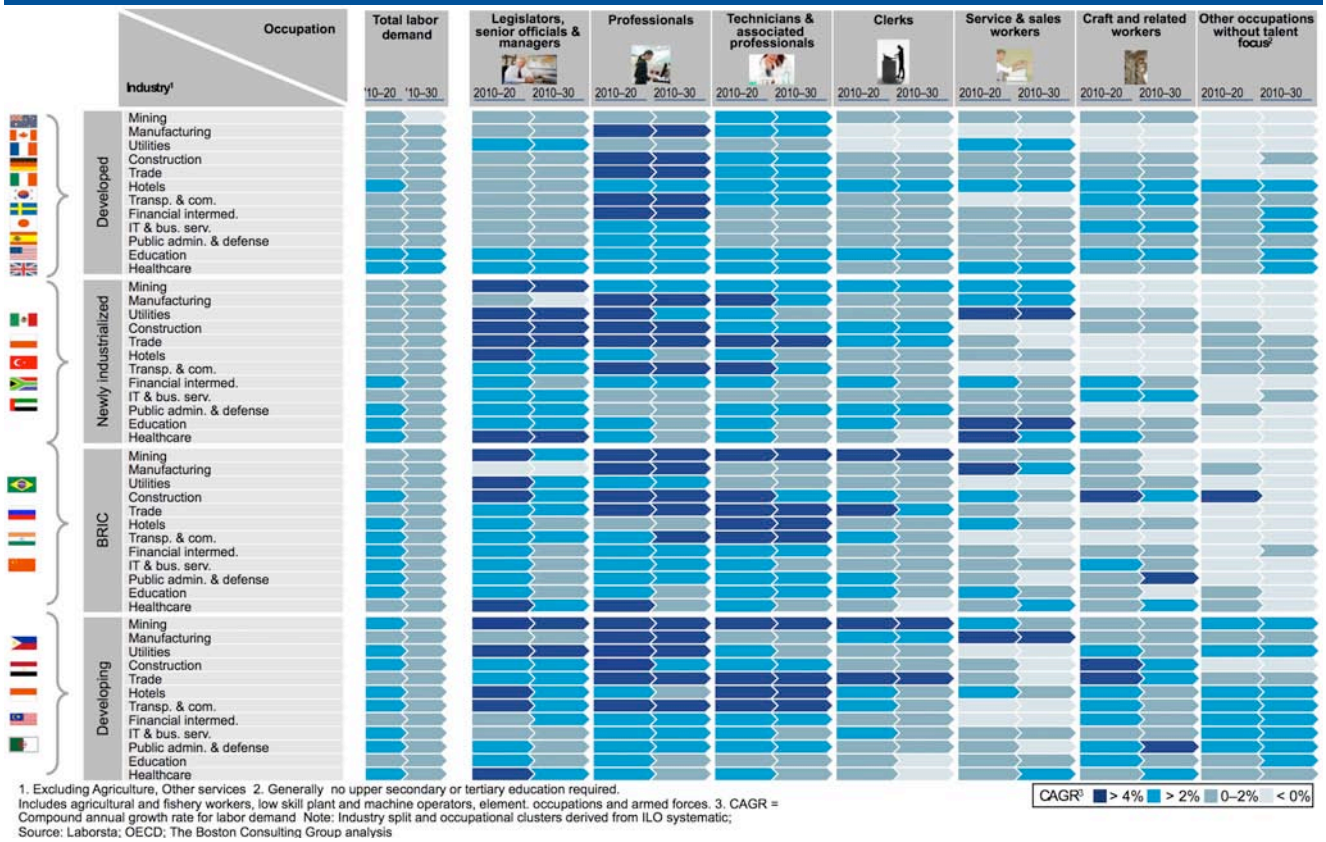
In every country category, the darker blues, representing the trend toward larger talent gaps (>4% CAGR), appear predominantly in the columns of these job clusters.

Exhibit 1: Significant talent gaps expected by 2020 and beyond
In countries with no talent shortage trend, employability is the challenge



Note: Colour codes based on compound annual growth rates of talent supply and demand by 2020 and 2030
Source: The Boston Consulting Group analysis

Exhibit 2: Worldwide highest need for professionals in 2020 and beyond



1. Excluding Agriculture, Other services 2. Generally no upper secondary or tertiary education required. Includes agricultural and fishery workers, low skill plant and machine operators, element. occupations and armed forces. 3. CAGR = Compound annual growth rate for labor demand Note: Industry split and occupational clusters derived from ILO systematic;
Source: Laborsta; OECD; The Boston Consulting Group analysis

To meet these expected demand tendencies, almost all industries and countries will require sizeable increases in the percentages of highly educated people in their workforces. For example today roughly one-third of the manufacturing workforce in developed and newly industrialized countries has an upper secondary or tertiary education. As the manufacturing industry responds to the growing demand for more innovative and sophisticated production methods, the percentage of well-educated workers will need to increase significantly. Demand trends for professionals in manufacturing are expected to exceed 4% CAGR across country types, peaking at more than 10% CAGR in developing countries in 2020 and beyond. Employees without critical knowledge and technical skills will be left behind if they do not start to re-skill soon.

The high demand trends for professionals in industries such as construction, transportation and trade across the BRICs, newly industrialized and developing countries reflect rising levels of consumption and higher standards of living. By 2020, today's labour-intensive industries will experience the largest expected talent shifts, leading to increases of 5% to 10% of the current share of talent within the workforce.

Developed countries, in particular, will experience high labour demand growth trends, peaking in the healthcare and education sectors. The higher the current talent share that an industry represents, the lower its expected percentage change of talent in the future. For the developed countries, the increasing complexity of design, materials and projects, driven by the trends of customization and sustainability, triggers an expected demand for professionals in the construction industry. In contrast, demand for low-skill jobs in manufacturing and services is expected to shrink by 2020 (-2 and -4% CAGR, respectively) as sales become centralized and virtual.

The overall industry demand profile in newly industrialized countries is similar to that in developed countries. However, we forecast a greater increase in talent share of total workforce per industry similar to that in the BRIC countries — specifically, in the transport, communication, construction and mining industries. The smallest industry demand trend will be in manufacturing, but there will be considerable talent turnover there. In newly industrialized countries the demand projection for higher-skilled professionals is growing as these companies attempt to compete globally. The demand for low-skilled workers in the education sector is also growing, as faculty hand off more administrative tasks.

What does it take to raise national competitiveness?

High-quality education and labour market efficiency are two of a dozen basic building blocks for a nation's long-term competitiveness and sustained growth. The top performers in the World Economic Forum's 2010-2011 Global Competitiveness Index make it a priority to nurture a pool of top talent. They also promote labour markets where workers can shift from one economic activity to another rapidly and at low cost.

The Index defines competitiveness as the set of institutions, policies and factors that determine the level of a country's productivity. Productivity, in turn, sets the level of prosperity that can be achieved. The Index includes a weighted average of components in areas such as institutions, infrastructure, education, market efficiency, technological readiness and business sophistication.

The Index analyses the quality of the education system, enrolment rates, brain drain and the availability of scientists and engineers. Some variables measure quantitative dimensions, while others capture the perceptions of businesses through an executive survey in more than 130 countries. In addition to basic and higher education, the Index takes into account the extent of vocational and on-the-job training, which is neglected in many economies, as a means of upgrading workers' skills.

The importance of labour market efficiency was recently highlighted by the difficulties that countries with rigid labour markets have encountered in recovering from the recession. Efficient labour markets provide a clear relationship between worker incentives and their efforts, as well as gender equity in the workplace.

Global Competitiveness Report 2010-2011

5th pillar: Higher education and training			7th pillar: Labor market efficiency			12th pillar: Innovation		
Economy	Rank	Score	Economy	Rank	Score	Economy	Rank	Score
Finland	1	6.06	Singapore	1	5.92	United States	1	5.65
Sweden	2	5.90	Switzerland	2	5.92	Switzerland	2	5.60
Denmark	3	5.84	Hong Kong SAR	3	5.82	Finland	3	5.56
Switzerland	4	5.79	United States	4	5.63	Japan	4	5.52
Singapore	5	5.77	Denmark	5	5.47	Sweden	5	5.45
Iceland	6	5.74	Canada	6	5.42	Israel	6	5.30
Belgium	7	5.71	Iceland	7	5.39	Taiwan, China	7	5.29
Canada	8	5.66	United Kingdom	8	5.29	Germany	8	5.19
United States	9	5.64	Rwanda	9	5.29	Singapore	9	5.04
Netherlands	10	5.63	Brunei Darussalam	10	5.25	Denmark	10	4.89

For more information, see http://private.weforum.org/reports-results?fq=report%3Breporttype%3A%22Competitiveness%22

The BRIC countries show a fairly constant overall labour demand growth trend across industries. For instance, in financial services, the BRICs will see much more change in their future talent line-ups than they do today, especially when compared to that in developed and newly industrialized countries. This underscores the urgency of investments in upskilling and reskilling in this industry. The demand trend in clusters such as manufacturing professionals will grow sharply as more sophisticated products are developed. Labour demand trends in commodities industries – for example, in mining – will grow steadily (~3% CAGR) because the BRICs, rich with natural resources, are consuming an increasing proportion of these resources to drive growth (China) or to increase exports (Russia and Brazil). The world's greatest labour demand in construction is found in China and India, which is not surprising, given the need to house millions of people.

Finally, in developing countries, mining has the strongest labour demand and the most need for talent in 2020 and beyond. Financial intermediation is projected to have the highest increase of talent as percentage of the total workforce compared to all other industries in developing countries by 2030 (between 6% and 8%). The demand trend for high-skills positions – management, for instance – is expected to peak beyond 6% CAGR in mining and utilities by 2020. However, considering an average compound growth rate of projected demand for managers across industries of ~3% CAGR by 2020 in developing countries, this outcome is surprising, given that these countries are several steps behind developed countries in this area. After all, the skills required to run the small businesses common in emerging nations are different from those required to manage much larger organizations in developed countries.

Exhibit 3: Megatrends and industry trends shaping demand for future exemplary key jobs
Exemplary key jobs in developed countries by 2020

Megatrends	Globalization			Technologization			Demographics			Sustainability		
Industry-trends	Sophisti-cation	Customi-zability	Market liberaliza-tion/ need	Eco-friendly	Multi-channel	Leisure trends	Volume increase	Complex-ity of products	Informa-tion avail-ability	Efficiency	Life-long learning	Ageing/ Wellness
Industry / Occupation	Mining	Manu-facturing	Utilities	Con-struction	Trade	Hotels	Transport and comm.	Financial interme-diation	IT and business services	Public Admin./ Defense	Education	Healthcare
Sen.officials & managers	Project planner	Supply-, communic. & distrib. mgr.	Marketing + R&D mgr.	International lawyer	Operation & distribution manager	General manager	Marketing manager	Head of sales, Risk manager	Client information manager	Business- & Risk manager	General manager	Rest home/ Hospital manager
Professionals	Mining and planning engineer	Physicist, PR prof., programmer	Programmer, intl. lawyer & engineers	Engineer, town & traffic planner	Product market analyst	Architect , designer & strategist	Web designer; accountant	Risk prof.; investment adviser	Legal prof., computer programmers	Economist, intl. advisor	Experienced Educators and teachers	Geriatrics, phys. therapist
Technicians & associated professionals	Metallurgical technician	Industrial robotics technician	Engineering assoc. & circuit planner	Civil engineer assoc. prof.	Client - & logistic infor-mation techn.	Quality inspector	Electronics and telecom. engineer	IT-specialist	Estate valuer + recruiter	Legal ass. profs.	Information profs. & elect. archivist	Nurses, social worker
Clerks	Production/ logistic clerk	Transport/ logistic clerk	Diverse skilled trades	Clerks digital recording & sourcing	Transport & client inform. clerk	Office support staff	Stock clerk	Statistical and finance clerks	Data entry operators	Administra-tive support staff	Administra-tive support staff	Receptionist & Transport clerk
Services and sales	Transport conductor	Diverse skilled trades	Customer service represent.	Sales represent-ative	Web advertiser & -designer	Health/ Well-ness service workers	Diverse skilled trades	Private wealth adviser	Customer service represent.	Fire fighters, police officers	Private educ. marketing & sales	Child-, and personal care worker
Craft workers	Diverse skilled trades	Diverse skilled trades	Electr. line installer/ repairer	Building frame design workers	Diverse skilled trades	Plasterer; handicraft in wood, textile	Telephone installer servicers		Com-munication electrician			

CAGR[1] ■ > 4% ■ > 2% ■ 0–2% ■ < 0%

Note: Excludes agriculture, livestock and fishing, domestic services of households, quarrying (minimal figures), other services as well as plant operators and assemblers, and armed forces. Key job identification is focused on skills and specific tasks. Table composed for developed countries, but mostly comparable key jobs named for newly industrialized and developing countries, though such countries often lag behind 10-15 years
1. CAGR = Compound annual growth rate for labor demand
Source: The Boston Consulting Group analysis

Global trends shaping demand for skill sets

"We are in the middle of a revolution of the organization of work."

– Dennis J. Snower, President, Kiel Institute for the World Economy

Macroeconomic trends will add to the pressure to find people with the right skills. For example, when 2 billion people worldwide have no access to electricity – and another 2 billion have only limited access – infrastructure spending will grow in the decades to come, creating huge demands for talent across a wide range of vocational and professional skills.[17] In our qualitative analysis, we took into account the global megatrends that affect every industry as well as industry-specific trends that will shape job markets. As jobs change, the skill sets they require will also change. The demand for talented workers in three job clusters – professionals, managers and technicians – will rise dramatically. Exhibit 3 demonstrates these points for the developed countries.

For example, the industry-specific driver of eco-friendliness and the global trend of sustainability are shaping the skill sets that will be required construction jobs. Engineers capable of integrating green technologies into current practices will be in particularly high demand, as will town and traffic planners who can tackle the challenges of ageing and develop energy-efficient infrastructure.

Why green jobs are not yet red-hot

Even though the virtues of jobs that support environmental sustainability are well recognized, there are still big gaps in how businesses and governments go about creating and supporting those jobs.

First, there is the challenge of definition. Green jobs touch on a range of skills, educational backgrounds and occupational models; they exist all along the supply chain of what are considered to be green businesses.[91] Some have much more immediate benefit for the environment than others.

For example, most people would agree that a technician who installs solar panels has a green job and requires special skills to perform that job. But are the receptionist and the sales representative for the solar panel installation firm performing green jobs? Their skills are horizontal.

Then there is the question of quantity. It is clear that green job growth is surging, however, it may still not be enough for tomorrow's needs. The Boston Consulting Group's most recent study on alternative energy reveals that some green sectors are maturing rapidly. For instance, solar photovoltaic technologies will achieve cost-competitiveness in sunny regions in just five to 10 years. And advanced biofuels are moving rapidly down the cost curve. [92] According to recent UN and ILO studies, in just two or

three decades the entire global economy will need to be well on the way to being low-carbon and sustainable.[93]

Another issue is the North-South divide. While the United Nation's Environmental Programme report demonstrates that green jobs are now being generated worldwide, the bias is still toward the developed world. These same countries account for some 80% of the world's workforce. China and Brazil seem to be making progress, but far more must be done if green employment is to become a truly global phenomenon, notes the UNEP. The underpinnings are there: ILO research indicates that across Asia, roughly 20% of government stimulus funding is going toward key climate change initiatives. China is the forefront in absolute terms.

Favourable government policies will be critical to driving growth in green jobs. For example, in the United States, the Boston Consulting Group has modelled an extremely wide range – 85% to 300% increase in green jobs for the energy efficiency, power generation and transportation sectors – based largely on different policy positions.

The requirements for manufacturing jobs are changing due to the proliferation of flexible, computer-aided manufacturing systems. To fulfil customers' expectations for personalized products, from cell phones to shoes, companies will need managers skilled in the logistics of distributing these products. Manufacturers will also need programmers for customized software as well as marketing and public relations professionals.

As Exhibit 3 shows, the trend of ageing/wellness – as distinct from disease treatment – is changing jobs in the healthcare industry. Ageing populations will drive strong demand for geriatric doctors, physical therapists and social workers.

3. When employees have the upper hand

"During the agrarian revolution, the most important resource was land. During the industrial revolution, it was capital and machinery. In post-industrial society, it is increasingly knowledge. Consequently, the growth of the 'knowledge class' will constitute a larger part of the labour force, if not the largest."

– Rakesh Khurana, Marvin Bower Professor of Leadership Development, Harvard Business School[18]

With talent gaps widening, competition for the highly skilled will intensify. The coming decades will present golden opportunities for well-educated people with critical expertise. So deep and widespread will be the talent gap that individuals willing to migrate will have unprecedented options.

The challenge is one of diversity as well as numbers. In a global economy, companies must be able to deliver localized products at the right price and with the right branding strategy to customer segments all over the world. They need a diverse and geographically dispersed workforce with intimate knowledge of and capacity to deliver to these different segments. For example, women control or substantially influence 65% of the world's US$ 12 trillion in yearly consumer spending, according to BCG estimates, providing a compelling reason to assemble teams to market to women in different regions.

Organizations will be competing for and investing in top talent. They will need to build inclusive talent pipelines and effective mechanisms for workforce training and re-training. That will apply just as much at top-management levels as it does on the factory floor. The central idea is retention: employees need to have – and be able to see – avenues along which their careers can grow.

Developing skill sets across the workforce will narrow the disparities between privileged and underprivileged groups, partly by uncovering capabilities in less-well-educated people that can be nurtured through mentoring and other opportunities. Some companies already include virtual training, business simulations and peer training in their development portfolios. However, there is a growing need for innovative and efficient training opportunities inside and outside of companies.

In a time of scarcity, companies and countries will need to be creative in identifying under-utilized or underdeveloped pools of talent and in customizing their recruiting and migration strategies. Women represent the largest pool of potential talent. Many well-educated women who leave the workforce for familial or cultural reasons are currently not being enticed to return. Even the world's leading organizations are failing to make the most of the skills of the women who are working.[19]

There are other pools of talent worth investigating. Talent is not defined by age. Many older employees or retirees have a wealth of technical, managerial and interpersonal skills. Developing countries represent new talent sources, as do second- and third-generation migrants, who often speak several languages and easily straddle different cultures.

University graduates and students are the usual talent targets. People with tertiary education have traditionally been more mobile than those with lower levels of education. Students and graduates alike have flocked to developed countries, when immigration policies allowed, as shown in Exhibit 4. In 2007, UNESCO estimated that over 2.8 million students were being educated at the tertiary level in countries other than their homes. The numbers of those studying abroad will increase significantly in the future, according to Project Atlas, a research network, tracking migration trends of the millions of students who pursue education outside of their home countries each year.[20]

Competition for international students has already heated up. Education USA, a governmental agency, has more than 450 advisory centres worldwide that recruit foreign students to study in the United States.[21] China offers stipends, health insurance and travel expenses to many foreign students. In 2007, the China Scholarship Council awarded 10,000 full scholarships – at a cost of 360 million yuan (US$ 52 million) – to international students and aims to double the number of awards by 2020.[22]

The United States, often perceived as the best location for top scientists and engineers, is strongly relying on immigrant contributions. Foreign nationals are authors on the majority of patent applications filed by many US companies: 65% at Merck, 64% at GE and 60% at Cisco.[23]

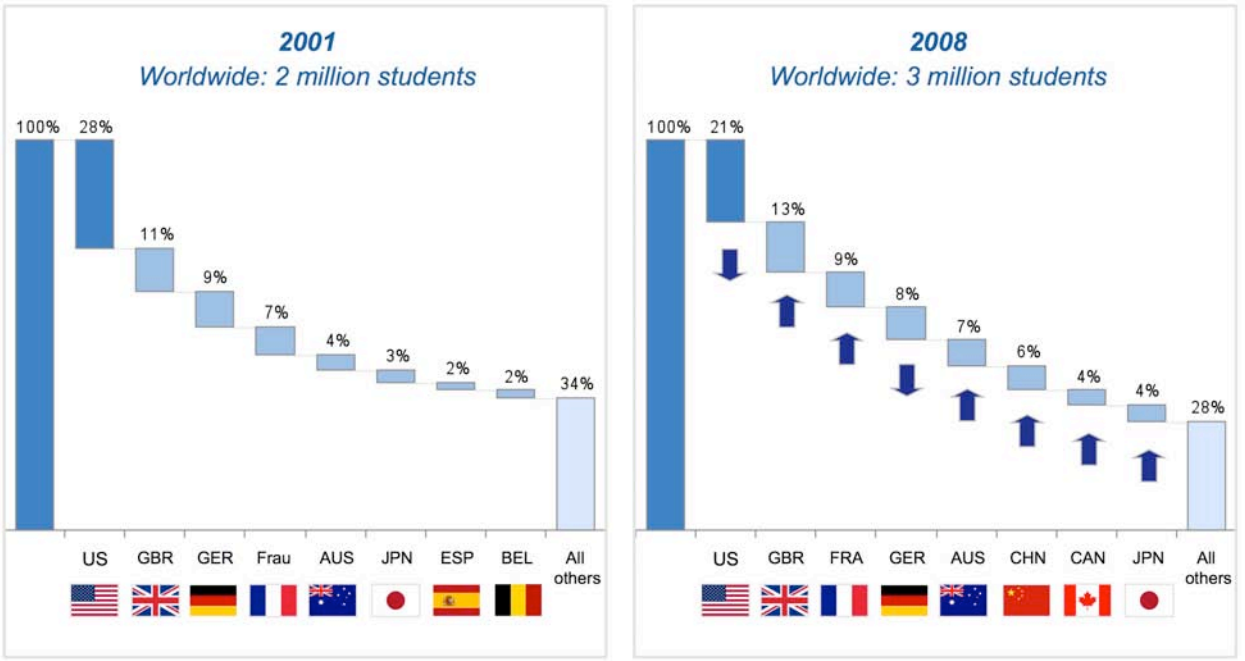
The tide is beginning to turn, however, as more countries work harder to woo their talent to return home and as tighter immigration policies reduce the numbers of students allowed to study abroad.

Currently, more Indian immigrants are moving back to India from the United States than are moving to the United States. "What was a trickle has become a flood," says one reverse immigration expert about the first brain drain in American history[24]. Career opportunities, quality of life and purchasing power are all reasons given for this reverse tide. Waits of up to a decade for permanent residency in the United States has further spurred reverse migration.

"The world is moving ahead in more integrated product markets of goods and services, in capital markets and cross-border investments, and yet we seem to want to hold up a stop-sign to labour mobility."

– Daniel Griswold, Director of the Cato Institutes[25]

Exhibit 4: English-speaking countries still at the forefront of international student destinations but others, such as China, on the rise



Source: Atlas of Student Mobility (data period 2001 and 2008); The Boston Consulting Group analysis

Walking in skilled employees' shoes

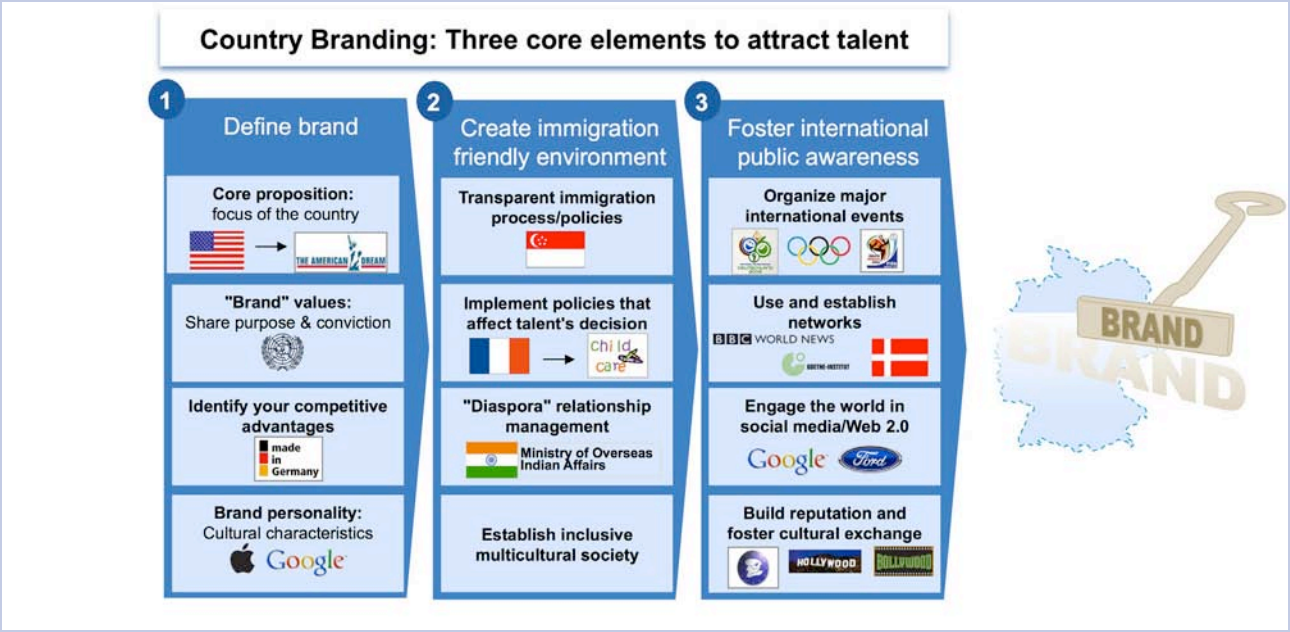
One characteristic will define the highly skilled workers of the coming decades: geographical and virtual mobility. These prized employees will know how to network, they will create billions of pieces of content to be shared on social media channels, and many will actively manage their "reputation capital". These men and women will be technologically savvy, mentally flexible and committed to learning new skills and reinventing themselves to achieve meaningful careers. Many, particularly those under age 40, will be willing to move, temporarily or permanently, to new locations to pursue opportunity.

Becoming the company or country of choice

"To this day, America reaps incredible economic rewards because we remain a magnet for the best and brightest from across the globe. … And in an increasingly interconnected world, the diversity of our country is a powerful advantage in global competition."
– US President Barack Obama, July 2010

What springs to mind when someone says "Germany" or "Latvia" or "Malaysia"? Do those names create positive images in the minds of prospective employees? They should.

To attract mobile talent, companies and countries must brand themselves. They must define their core propositions, values, personalities, culture and competitive advantages. Then they must promote that brand and sell themselves as a location of choice for talent of the highest calibre.



This task requires understanding of and communication with the many generations and nationalities of talent. As with customers, there is no "one-size-fits-all". Customized approaches are necessary for different ages, sexes and nationalities, based on their preferences, cultural expectations and lifestyles. Companies and countries need human resources functions that tailor the message to millennials as well as to retirees, to a German mother with a PhD as well as to a Chinese graduate student. Beyond creating a brand, organizations must establish the core values of their brands by fostering an immigration-friendly environment within a welcoming, inclusive society.

"Host countries need to deal better with diversity and multiculturalism to attract talent. We need to welcome migrants not only because they support our economy but because people from different cultures are enriching our countries"
– Bob Elton, Executive Chair, Powertech Labs Inc., Canada

With the positioning message defined, countries and companies need to lay claim to the brand's position in the minds of skilled workers all over the world. There are many options in the corporate media space – opportunities such as green technology research, funding schools and hospitals and infrastructure, all in line with the brand's value and purpose.
The most important channel for fostering international public awareness and building goodwill, however, is social media/Web 2.0. Social media is an important channel for distributing customized marketing messages to talent everywhere. The volume is definitely

there: roughly three-fourths of Internet users visit social networks. Facebook claims 500 million users who share more than 30 billion pieces of content (web links, news stories, blog posts, notes, photo albums, etc.) each month.[80] Indeed, there are more texts circling the globe each day than there are people on the planet.[81]

"Domestic identity of people is going to decrease. Look at what our children are doing online, how they communicate worldwide. Virtual mobility will be huge in the future."
– James H. Wall, Global Managing Director, Talent Solutions and Chief Diversity Officer, Deloitte

Social media should be viewed as a communication platform, not as a one-way channel for pushing specific messages. The same principle applies to reaching talent as it does to reaching customers. The greatest momentum for a brand in social media is when people "take up the flag" of the brand and carry it forward. Thousands of positive comments and recommendations may be generated in an hour or two, from every corner of the globe. However, so can negative commentary. That is why more and more companies are setting up formal structures to monitor social media and to ensure that their brands are properly represented in the digital world.

The expectations of this internationally mobile (geographical or virtual) creative class will be different from those of their forebears. Understanding these expectations will help organizations retain and develop talent, and will help countries provide the necessary framework (Exhibit 5).

Talented people seek challenge and stimulation, recognition and respect, compensation commensurate to their contributions and colleagues of similar calibre.[26] Young people's expectations for their work lives contrast starkly with those of their parents. Instead of adjusting their lives to the job, these new workers expect to adjust their jobs to their lives. Instead of long-term relationships with their employers, they will be satisfied with a planning horizon of two to five years.

"The companies that offer real recognition will keep the talent; the company that is not able to provide recognition and meaning will crack."

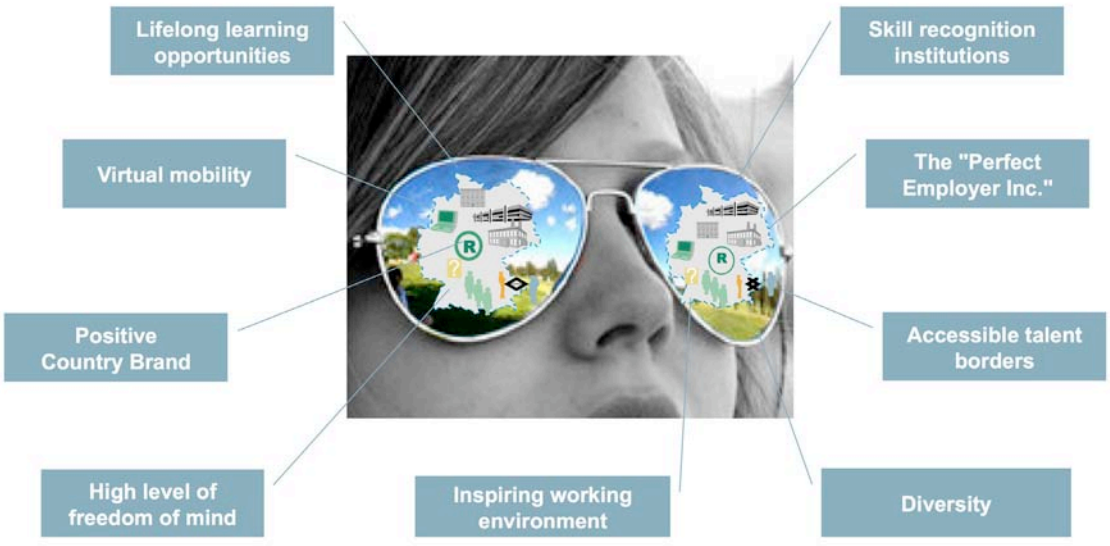
– Lord Michael Hastings of Scarisbrick, Global Head, Citizenship and Diversity, KPMG International, United Kingdom

These workers will be unwilling to spend much time on routine and rule-based tasks; they will demand strategic challenges and responsibility for important matters. To prepare for these responsibilities, talented people will expect on-demand training in areas important to their careers as well as to the company's profitability.

In the past, career success was seen as a vertical path. In the future, success is more likely to be a trellis of horizontal and diagonal moves, even between industries. Employees' perspectives will be more international and cross-cultural than national or local. Top talent will team up with employers to create meaningful work rather than accept assignments to gain security and a salary.

In the past, the company was the long-term provider; in the future, the mobile class will provide for itself. A world of choices allows talented people to raise the bar that companies must meet to hire and retain them. The interesting question is how meeting this bar will generate value and drive the bottom line.

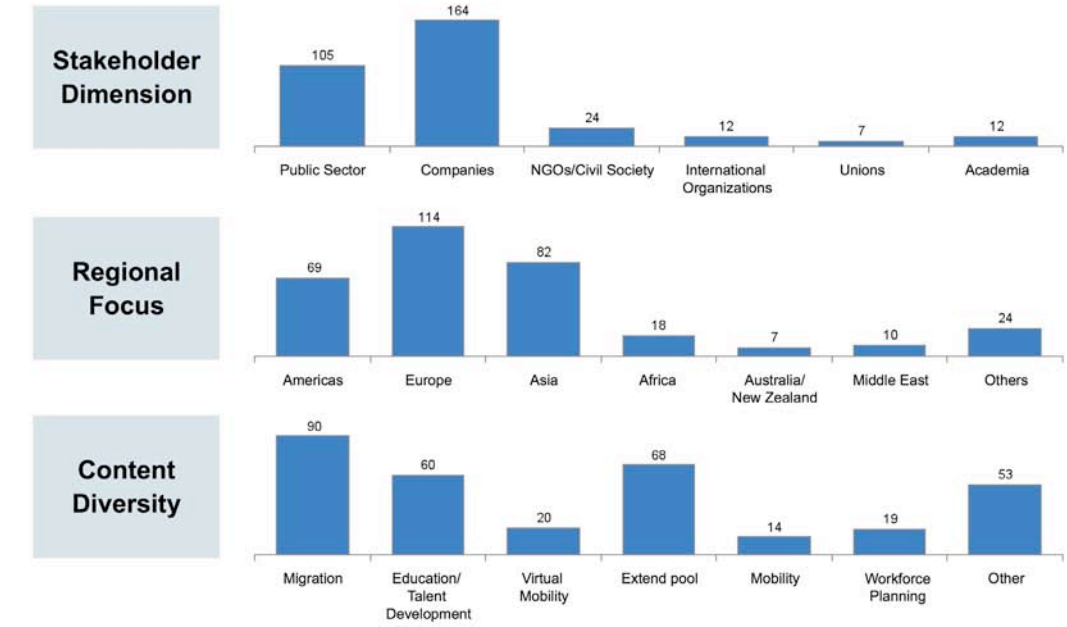
Exhibit 5: What talent wants



Source: The Boston Consulting Group analysis

4. Redrawing the talent landscape: seven responses

Exhibit 6: More than 300 good practices on managing talent scarcity



Source: The Boston Consulting Group analysis

Addressing the talent crisis requires increasing the mobility of people, skills and credentials. With this understanding of mobility, it is possible to identify best practices clustered into seven dimensions of response. Countries and organizations can apply these practices as catalysts for dialogue and action. Our literature research and interviews with over 100 experts and practitioners allowed us to develop recommendations and innovative practices for each of the seven response dimensions. We considered the needs of various stakeholders by involving experts from corporations in many sectors, multinational organizations, governmental experts and academia (Exhibit 6).

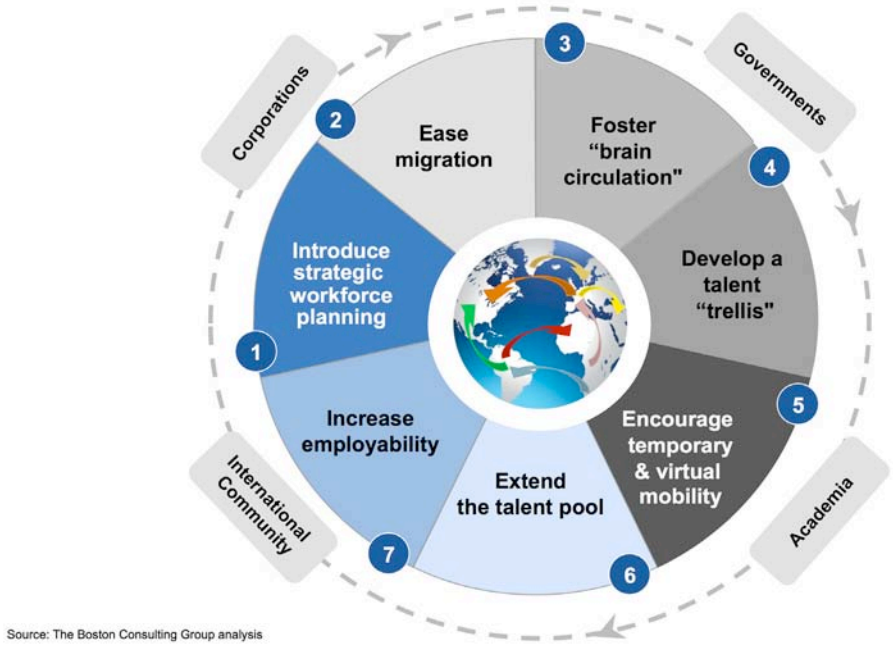
The hundreds of examples gathered for the study were scored according to: urgency, innovativeness, effectiveness, practicality, level of implementation risk, timeliness and endorsement by the Forum's Global Agenda Council on Skills and Talent Mobility (GAC) or the Steering Board (SB) of the Forum's project on talent mobility. From the refined list of examples, we selected a set of good practices based on distribution (industrial and regional) and diversity.

"The formula [for making America the wealthiest country in history] was very simple: build this really flexible, really open economy, tolerate creative destruction so dead capital is quickly redeployed to better ideas and companies, pour into it the most diverse, smart and energetic immigrants from every corner of the world and then stir and repeat, stir and repeat, stir and repeat. … [The] core driving principle should be to stimulate everything that makes us smarter and attracts more smart people to our shores. That is the best way to create good jobs."

– Thomas Friedman, Columnist, Foreign Affairs, The New York Times[27]

What can governments do to develop a talent-friendly brand and ensure they have the workforces they need to prosper? How can corporations adjust their recruiting and retention strategies to the talent scarcity ahead? And how can academia and other stakeholders foster talent mobility, in the broadened sense of the term (Exhibit 7)? To point the way, we provide recommendations in the blueprint for action with each of the seven responses.

Exhibit 7: Seven Responses to the Global Talent Risk



Source: The Boston Consulting Group analysis

Response 1: Introduce strategic workforce planning

Strategic workforce planning is the cornerstone of fact-based human resource management. This discipline enables public and private organizations to determine their talent risk (the size of any gap or surplus) and its urgency – and then to address these imbalances through of the right set of measures.

First, job families, based on required qualifications, are defined, clustering jobs group broadly to foster transparency and cross-perspectives beyond business units. Then, labour supply modelling, taking natural fluctuations and retirement into account gives an accurate picture of the composition, age structure and capabilities of the future workforce. Finally, future demand for employees, derived from factors like productivity developments, skill shifts per job family, expected technological changes and further strategic assumptions, is analysed within different scenarios to predict future growth rates of different job families.[28] After simulating personnel supply and demand the identification of the gap between the two reveals potential capacity risks and offers medium- and long-term transparency, allowing a company or government to develop concrete measures for job families in need for action.[29]

Most companies are far from having an accurate talent picture. According to a recent BCG survey,[30] only 9% of corporate respondents have adequately analysed their future workforce supply and demand. A mere 6% have begun developing retention, recruiting and talent management strategies for the job families at greatest risk of a talent gap.

Putting the necessary modelling tools in place is an issue, but the mismatch between human resource (HR) and strategic planning horizons is another. Most companies have an HR planning horizon of only one to three years. However, five to 10 years is typically required to train personnel in complex skills, set up vocational trainee programs for jobs in need and establish recruiting strategies for specific job families. Therefore, organizations will not be able to fill critical gaps for professionals, technicians and managers in 2020 unless workforce-planning tools are developed and used now.

It is just as important for cities and countries to conduct strategic workforce planning as it is for companies to determine required job families. This should be at the top of the agenda for governments at every level. Otherwise, they risk implementing fragmentary measures and ultimately being unable to find enough skilled employees to sustain growth.

Strategic workforce planning gives governments the necessary tool for determining which skill sets will be needed to fill gaps. Acting on that information, government can act to fill those gaps, such as by raising migration quotas for those skill sets or creating a variety of economic incentives.

"To foster economic growth, we need vast amounts of expertise, know-how and technical skills. An economy has to plan now in order to ensure the matching supply in 10 years from now to stay competitive. It is crucial to have a systematic method to gauge and respond to demographic risks in light of the organization's or state's strategic objectives."

– Rainer Strack, Senior Partner and Managing Director, The Boston Consulting Group[31]

Best practices: plan ahead

A number of corporations have introduced strategic planning and quantitative talent analysis to uncover potential shortages and surpluses. With this knowledge they are able to determine strategic actions, hire staff with needed skills or transfer excess employees to categories with potential shortages. Deutsche Telekom for example, a leading global telecommunication operator, introduced strategic workforce planning in 2008, starting with the definition of job, families and the identification of skills it expects to need in the future. By forecasting supply and demand, Deutsche Telekom could uncover potential shortages and surpluses. With this crucial knowledge Deutsche Telekom was able to systematically determine strategic actions, hire people with needed skills or transfer excess staff to categories with potential shortages.[32] Also, RWE AG, a European utility, introduced a group-wide skills management system to track the many different skills available within the group and use them according to its needs.[33]

Malaysia puts a premium on training, matching and migration

Malaysia's economic vision is to become a developed country by 2020. To do so, it knows that it must have world-class talent. [82]

With that goal in mind, Malaysia launched its 10th Plan, emphasizing human capital development and talent mobility. The plan will overhaul the country's education system, upgrade vocational and professional training, make the labour market more flexible and retain and attract talent.

The plan will benchmark student performance against international standards and attract and develop top teaching talent. Efforts to improve labour flexibility include reforming policies governing the use of unskilled foreign workers. A talent outreach will engage the Malaysian diaspora and make the nation's cities more desirable for skilled foreign professionals.

Malaysia is one of the most developed of the emerging markets, with enviable education levels and a stable, multi-ethnic society. The nation scores well on the United Nations "Education for All" report.[83] English is widely spoken and taught in schools. Malaysians are diverse and multilingual.

However, Malaysia faces significant long-term challenges. Its education levels still fall short of those needed to realize the nation's knowledge-economy targets, according to Prime Minister Najib Razak.[84] Malaysian employers look overseas for talent. The World Bank says that unless Malaysia adds value to its economy, it will be caught in a "middle-income" trap – unable to continue to compete in high-volume, low-cost products and materials and blocked from moving up the value chain.

British Columbia gives immigrants their due

Immigrants do not always receive a generous welcome from host nations. Many professionals find themselves under-employed in their adopted homes — scientists who drive taxis, engineers who work as security guards and physicians who perform in janitorial jobs. Those scenarios are typical for professionals from emerging nations and common for those who have not mastered the host nation's language.

British Columbia sees this as a waste of valuable skills. The provincial government created the Immigrant Employment Council of British Columbia (IECBC) to offer tools for employers, including a database of immigrants looking for work, reflecting their knowledge and experience.[101] IECBC officials screen the qualifications and skills of immigrant in the database to ensure accuracy.

IECBC helps British Columbian employers access the full potential of these workers. The agency offers workshops to employers on enhancing competitiveness through internationally trained personnel, identifies current immigrant mentoring programmes and explores best mentoring practices.[102]

British Columbia's programme dovetails with the Pan-Canadian Framework for the Assessment and Recognition of Foreign Qualifications, which describes the steps that governments should take to promote successful immigrant labour market integration.[103] The framework urges: "Governments must take concerted action on the assessment and recognition of foreign qualifications in order to create an environment where immigrants are able to apply their talent."[104]

Québec, Abu Dhabi and Malaysia have programmes to achieve holistic and strategic human skills management.

The Toronto Region Immigrant Employment Council (TRIEC), matches immigrants' skills with available jobs, a form of workforce planning. A dozen companies participate in TRIEC's mentoring programme, which teaches immigrants Canadian business culture. Another TRIEC programme has established standardized, easy-to-understand qualifications for potential IT staff. "We are a big user of IT and it makes sound business sense for us to work with TRIEC and other employers to tap into the pool of resources represented by recent immigrants," said an American Express Canada executive involved in the programme. The Immigrant Employment Council of British Columbia (IECBC) offers tools for employers, including a database of immigrants looking for work.

Strategic workforce planning: blueprint for action	
Companies	**Governments**
Define job families and future critical skills.	Establish accessible institutions to model workforce demand and supply.
Model workforce supply and demand with a five to 10 year planning horizon.	Initiate a common international standard on strategic workforce planning parameters and methodology.
Undertake a gap analysis to uncover potential shortages and surpluses.	Use strategic workforce planning for a flexible migration system.
Link workforce planning to the company's business strategy.	Perform strategic workforce planning for government institutions.
Systematically determine actions from gap analysis; develop skills database for potential job rotations.	For employment agencies: Introduce job families to match skill sets for job demands – linked to a qualification framework.
Inform employees of the skills they will need in future growth areas.	Build alliances between ministries of economics, education, labour and migration on skills planning to foster the links between academia, business and government.

Response 2: Ease migration

The economic downturn has triggered more restrictive immigration policies. Across the globe, countries are reducing quotas, setting tougher entry requirements and refusing to renew temporary work permits even for highly skilled workers.

Some governments require employers to terminate foreign workers first during layoffs. Others offer migrants financial incentives to return to their home countries or make the knowledge of the language a requirement for a resident permit. Restrictive governmental reactions have been mirrored by public demonstrations against job losses, ill-informed outcries to force immigrants "back to where they belong", discrimination and racial profiling.

Before the global recession, high- and low-skilled immigrants were covered by different policies. Skilled migrants fill critical gaps that exist regardless of economic conditions. They are thought to present fewer assimilation challenges than low-skilled immigrants, who typically enter or stay illegally.[34] However, in response to public outcries over the past two years, countries have chosen to protect their native highly skilled workers through stricter policies, rather than liberalizing immigration policies for the highly skilled.[35]

To fill future critical gaps, efforts to loosen restrictive migration must begin now. Developing a migration-friendly culture and brand is important to foster migration of talent. Branding can be done by regions, national governments and cities. Denmark has opened a Work in Denmark Centre in New Delhi,[36] with a website providing information on green cards, qualifications and visa requirements. The economic downturn has made it harder for governments to promote long-term immigration policies.

Even as world economies recover, immigration will remain a politically sensitive issue. The recommendations in this report will be more successful if leaders communicate to the public that talent mobility is a driver of economic growth.

Best practices: simplify migration policies

Foreign-born workers with university or equivalent qualifications make up just 2% of the European labour market, compared with 4.5% in the United States, 8% in Australia and nearly 10% in Canada.[37] To change that trend, the EU has adopted a Directive that establishes a fast track procedure for residence and work permits analogous to the green card in the United States.

With this card, highly skilled developing-country nationals with a job offer in an EU country can immigrate with their families for up to four years. However, even with this good start, European countries could do more to foster migration. Transparent, fast and flexible migration schemes are needed, and each country needs to rethink its brand to attract more highly skilled migrants.

For example, the United Kingdom has replaced a confusing tangle of 80 work permit and entry schemes with a points-based system. The principle is simple: "The more skills you have, and the more those skills are in demand, the more points you gain, increasing your likelihood of entry to the UK."[38] Canada and Australia have also set up points systems to improve selection objectivity. Their "two-step" migration process helps migrants, especially students, quickly transition from temporary to permanent resident status, thereby improving the chances of keeping them in the country.[39]

In contrast, in other countries students receive no working permit or a visa for only one additional year after finishing their studies.

Singapore has established transparent policies and a rapid visa process for highly skilled communications professionals. The government has worked with companies and recruiters to assemble a strategic skills list. Tax benefits encourage companies to send both foreign and local talent to top universities abroad, with the condition that these individuals return to work for the company for a specified length of time.

Building a direct labour pipeline between Québec and France

The President of the French Republic, Nicolas Sarkozy, and the Premier of Québec, Canada, Jean Charest, took the initiative and agreed, during a meeting at the Élysée Palace in July 2007, to establish and conclude an agreement between Québec and France to facilitate access to regulated trades and professions from both jurisdictions.

Signed in 2008, the agreement will significantly improve labour mobility between Québec and France. Representatives of 68 trades and professions in Québec have already signed mutual recognition arrangements (MRAs) with their French counterparts, and other MRAs are still in negotiation. These arrangements determine under what conditions professional qualifications will be recognized, so that a lawyer, midwife or electrician can easily work in the other territory.

Once a profession or trade is covered by a MRA that has been implemented, an applicant can qualify online and get on a fast track to get a permit to practice his profession or trade in the other territory. Nationality is not an issue; a qualified German, say, who studied in France and has a French diploma and legal authorization to practice his profession or trade there would also be able to get the permit to practice in Québec.

Implementing an MRA can take six to 12 months, because it involves a number of consultations on both sides, namely with professional associations and ministries.
We are now in the early stages of the implementation of each agreement and the level of interest of citizens on both sides of the Atlantic is very high.

For updates on the MRAs, visit the following website:
http://www.mri.gouv.qc.ca/en/grands_dossiers/qualifications_professionnelles/index.asp

China's Thousand Talent Initiative[40], designed to attract specialists to China, offers each recipient 1 million Yuan (US$ 146,000) annually along with medical care and pensions.

While migration policy is a governmental concern, companies have opportunities to foster a migration-friendly culture. Some are implementing social and labour rights agreements in order to protect workers, including migrants. Cisco has established in India a second headquarters, its Globalization East Center, and has transferred many senior managers there. Companies such as Whirlpool have started to hire locally in India and to send staff abroad. These HR policies promote diversity but must be premised on a foundation of creating an open and welcoming culture.

Singapore attracts highly skilled foreigners

Singapore has attracted many more higher-skilled, better-educated foreigners in recent years as a result of intensive recruitment and liberalized eligibility criteria.

Most skilled professionals come from the United States, the United Kingdom, France, Australia, Japan and South Korea. In 2006, skilled workers and professionals accounted for 13.4% – about 90,000 – of Singapore's total non-resident population.

Since the 1990s policies have been introduced that target the highly skilled in non-traditional source countries, such as Malaysia, China or India. Highly skilled workers hold employment passes that allow them to bring their family members, and they are not subject to levies. Those with "P" passes generally hold university degrees and seek professional, administrative, executive or managerial jobs, while those with "Q" passes earn smaller salaries and usually have evidence of acceptable degrees, professional qualifications or specialist skills. A new category introduced in 2004, the "S" pass, assesses applicants on a points system, taking into account multiple criteria including salary, education qualifications, skills, job type and work experience.[86]

Ease migration: blueprints for action

Companies	Governments
Establish multilingual and virtual company presence to recruit beyond national borders and neighbouring countries.	Design simple, transparent and well- communicated migration policies.
Seek expertise in immigrant pools while investing in the development of current employees.	Establish point-based immigration systems based on strategic workforce planning and reduce burdens for companies employing immigrants in key strategic skills.
Recruit beyond national borders and neighbouring countries.	Set up unilateral or multilateral arrangements to recognize skills, e.g. by matching qualification frameworks.
Foster a migration-friendly culture.	Facilitate the free flow of remittances.
Brand your company internationally as "talent friendly".	Brand your country internationally as "talent friendly".

Response 3: Foster "brain circulation"

Brain drain has long been a concern for developing countries. Sub-Saharan African countries in particular are experiencing massive emigration of healthcare professionals and other highly skilled individuals. However, according to a study conducted by OECD and the World Health Organization, international migration is not the main cause of healthcare shortages in developing countries. Further, reducing migration would not be enough to address the worldwide crisis in the availability of healthcare staff.[41]

Skilled out-migration rates have been highest from small countries (<2.5 million people) and from least developed to developed countries.[42] Movements of migrants between developing countries is less well documented, though more than 74 million are estimated to have moved to neighbouring countries.[43] Today there is a new trend: large numbers of skilled workers are moving to developed and developing countries on temporary contracts.

Countries of origin benefit from migration and talent movements through remittances. In 2009, for example, India's inward remittances reached US$ 52 billion, equivalent to 3.3% of its GDP and 15% of global remittances.[44] The global estimated remittance flows sent by migrants in 2009 exceeded US$ 414 billion.[45]

Another benefit for sending countries is so-called brain circulation, which "occurs when skilled individuals live and work in foreign countries for a certain period of time, then return to their country of origin or travel to a new destination country."[46] Ultimately, what brings people home is opportunity and quality of life (security, good health care, low levels of corruption and crime) – vital components of any country's brand.

In areas such as North and West Africa, where more than one-quarter of the population is under the age of 15 and unemployment rates for young people top 30%, providing jobs is particularly important. Multinationals are an increasingly important source of employment in emerging markets, where they are investing billions of dollars to win the loyalty of new consumers.

The focus of multinational corporations on emerging markets promotes brain circulation. Multinationals bring best practices and sophisticated technology, and encourage expatriates to come home. Due to opportunities in emerging markets, companies are moving senior management across continents. The CEO of HSBC relocated from London to Hong Kong in 2009, saying: "It's about building this business in Asia."[47] *The Wall Street Journal* explained the move this way: "HSBC obviously believes that, for its shareholders, the Far East is where the money is to be made"[48] – and future talent is to be recruited.

Best practices: brain circulation to bring people home

To reach out to the 25 million Indians living abroad — the world's second-largest diaspora — India has established the Ministry of Overseas Indian Affairs.[49] "The time has come for a strong and sustained engagement between India and overseas Indians," claims the Ministry's website.[50] Ministry services include scholarship and educational programmes for diaspora children, a "Know India" programme and a community welfare fund.

Putting India's diaspora to work

Talent no longer stays in one place, at least not for long. That is good for global economic growth because it offers opportunities for brain circulation – the rich and rapid exchange of knowledge and networks worldwide.

India offers an instructive example.[95] Historically, Indians have migrated, assuming business and political prominence across 110 countries as far afield as Fiji, Australia and Kenya. The nation has more than 30 million expatriates, termed "non-resident Indians" or "NRIs" by the government. NRIs are highly visible in academia in the United States, Canada and Europe; they are prominent in Silicon Valley's high-tech community; and they are well represented in the medical, legal and engineering sectors in the developing world.

The Indian government acknowledges the importance of the nation's diaspora. "It has brought economic, financial and global benefits to India," says a website of the Ministry of Overseas Indian Affairs. The Ministry's Diaspora Services Division provides services that foster brain circulation, ranging from high-profile awards that celebrate the achievements of NRIs to access for NRIs to India's many centres of learning.

Other nations and regions are experimenting with similar brain circulation initiatives. ChileGlobal, an international network of successful Chilean business owners and senior executives (or those with an affinity for Chile), living and working abroad, is designed to weave Chile deeply into the global knowledge economy. Similarly, GlobalScot taps the talent of leading Scots and friends of Scotland to establish a worldwide network of influential individuals who can benefit the nation.

Some African nations are seeing success in specific areas. For instance, the Ethiopian North American Health Professionals Association (ENAHPA) is a network of the Ethiopian diaspora that promotes knowledge transfer and transfer of cutting-edge medical technology to Ethiopia. ENAHPA is helping to create centres of excellence in medicine in Ethiopia.

It is not easy, however, to tap successfully into the brainpower of a nation's diaspora. World Bank senior economist Yevgeny Kuznetsov and Columbia Law School Professor Charles Sabel have written extensively on why many government-led diaspora initiatives fail and what elements are needed to enable success.

Regardless of formal government efforts, coming demographic shifts will enrich brain circulation. Research suggests that the current generation of foreign students matriculating at US universities will return home faster and in greater numbers than any generation of foreign students in recent decades.[97]

China, one of the first countries to have a National Talent Development Plan, puts a similar emphasis on the role of talent in achieving its national goals. The plan establishes targets for key performance indicators such as the percentage of R&D talent in the labour force, the percentage of highly educated workers and the ratio of human capital investment to GDP.

"The Chinese Talent Development Plan (2010-2020) is comprehensive, coherent and concrete. Drawing on international experiences and taking into consideration its current and future needs, China adopted a holistic approach that emphasizes the importance of innovation and talent for its modernization and sustainable development."
– Jane Zhang, Vice-President, China Association for Employment Promotion (CAEP), People's Republic of China

Sending its youth abroad, and then facilitating their return, is part of China's plan to transform from a labour-intensive country to a talent-rich one by 2020.[51] Policies introduced in 2002 grant preferential treatment to returning students for housing and work permits. Job centres and associations have been created to reintegrate returnees.

China's 10-year master plan for talent development

In June 2010 the Chinese government released its national talent development plan to create a highly skilled national workforce in the next decade. "The National Medium- and Long-term Talent Development Plan (2010-2020)", is China's first programme for human resources development nationwide.

The plan reflects China's recognition that it cannot grow long term by labour arbitrage – low-cost labour – or by relying on its prowess in manufacturing. Nor is it enough to have vast financial resources. China's past success was built mainly on its population dividend and investment. Its future growth must rely more on better nurturing and using talent in China and attracting talent from all over the world. To climb the ladder of technology, elevate its value chain and produce world-name brands with reputations for quality, innovation and service, China has to place more emphasis on talent. It plans to increase its talent pool from the current 114 million people to 180 million people by 2020.[105]

None of this will happen overnight. In revisiting its 30-year-old national development strategy, China is coping with the following five trends:

1. A shift from a "population dividend" to a "talent dividend". Due to its large workforce size, China was able to offer cheap labour to drive past economic growth and thus thrive on its population dividend. But today, increases in life expectancy and family planning have led to a population that is rapidly ageing. The number of people aged 60 and older is growing rapidly, now forming 12.5% of the nation's population. Also in China it will be the quality of workforce, not the quantity that matters for future economic growth."

2. A move from "Made in China" to "Created in China". China is the world's largest manufacturer and exporter, but it lacks brand names recognized by consumers globally. By investing in innovation, design, development and marketing, China can change perceptions about its contributions to the global economy.

3. An emphasis on attracting human capital more than financial capital. For years, China has ranked as a top recipient of foreign direct investment. It has the world's largest foreign exchange reserve and enjoys a vast trade surplus. But it continues to suffer a large deficit in terms of bright minds, "exporting" many more students and scholars than it imports. Although the rate of those returning to China is now about 30%, only about 8% of highly qualified personnel such as US-educated PhDs in science and engineering return to China.[106] China is now placing more emphasis on getting its expatriates to return and wooing talent from other countries.

4. A spotlight on software. China is well known for its landmark infrastructure projects over the past 30 years, from the Three Gorges Dam to its high-speed railways. Now the nation is investing in software. China Daily points to the need for software investments in education, research and development, public health, energy conservation, environmental protection and social welfare for balanced development.

5. The shift from an investment-driven to a talent-driven economy. To maintain economic growth and develop an equitable and stable society, an increase of private domestic demand is a crucial lever. According to China Daily, this will put heavier reliance on well-paid sectors such as services, and less focus on sectors such as manufacturing. It will mean promoting a modern service sector.

Smaller initiatives can also be successful. Mali has established a scheme to attract African scientists working on malaria research. The government funds the education of promising young graduates at leading foreign universities. Students are expected to return to Mali during their studies to undertake research. The goals are to integrate their work with that of international and local academics and to provide a stimulating environment to facilitate their retention.

Employers should consider ways to foster geographical brain circulation within their organizations. Because family factors are pivotal to people's career decisions, the International Monetary Fund offers relocation support and career services not only for employees but also for their spouses. Novartis, an international pharmaceutical company, has hired HR professionals from India to recruit talent globally.

Brain circulation: blueprints for action	
Companies	**Governments**
Offer generous return packages to highly skilled people and relocation assistance, including spouse career services and child care programmes	As a sending state, eliminate disincentives for migration and return
Keep your talent mobile through: Horizontal and vertical mobility within the company International assignments Job rotation	Facilitate the free flow of remittances
Encourage employees to take short-term assignments or sabbaticals abroad	Build international consensus for a comprehensive global system of work permit fees
Encourage foreign employees to build relationships with potential partners businesses in their home countries	Provide diaspora networks to engage nationals abroad

Response 4: Develop a talent "trellis"

Developmental opportunities are an important element of the brands of companies, cities, states, or countries. Thus, public institutions, education systems, as well as private entities, must ensure that they offer multiple vertical and horizontal career and education pathways. These development pathways are critical for the flourishing of talent and retaining good performers. As talent becomes more mobile and as people's expectations toward their employers shift from patriarchy to partnership, the human resources function must adapt. Instead of climbing up a single vertical career ladder from technical skills to management, for example, many people will expect a horizontal or diagonal lattice of assignments. And, instead of adjusting their life to their job, an increasing number will adjust their job to their life through part-time and virtual work.

Companies and governments must retain talent and ensure they have the skill sets to meet strategic goals under a number of different possible market scenarios. Because specialized skill sets require years to master, it is essential to start people on these pathways five or 10 years before these skills will be required.
Besides developing people's individual skill sets, companies and governments need to build workforce competencies, bringing together the right mix of people and giving them the resources to create new value for the organization. Employers further need to give meaning to retain scarce talent in the long term, such as offering *pro bono* and social impact opportunities.
Creating competencies within an organization opens opportunities for people to uncover and pursue previously unrecognized talents. With lifetime jobs and predictable career trajectories largely things of the past, reinvention will become increasingly accepted and expected. Paul Reilly, Chief Executive Officer of Raymond James Financial, observes: "During my career, I had to reinvent myself five times, and that is what talent will have to do even more often in the future."[52] James H. Wall, Global Managing Director, Talent Solutions and Chief Diversity Officer for Deloitte, agreed: "If you can customize music and coffee, then you can also customize careers."[53]

"Talent is the gift that keeps on giving; it's self-regenerating. If you invest in talent, the returns will be exponential and lasting."

– Sylvia Ann Hewlett, President, Center for Work Life Policy, (CWLP)[54]

Best practices: horizontal and vertical talent development

Today's talent wants to be challenged, to learn and to grow further intellectually. Therefore, some IT companies allow employees to work on independent research one day a week, while other companies, such as Air Products, provide intensive cultural training for cultural literacy of their staff.[55] Human resource departments of leading companies such as Best Buy, P&G and Sysco use sophisticated data collection technology and analysis to get the most value from their talent and to further develop it in the most efficient way. Laszlo Bock, Google's Vice President for People Operations, explained how the team keeps a close eye on metrics associated with retention: "It's not the company-provided lunch that keeps people here. "Googlers" tell us that there are three reasons they stay: the mission, the quality of the people and the chance to build the skill set of a better leader or entrepreneur."[56]

The states of California, Indiana and Iowa support lifelong learning accounts to encourage working adults to go back to school. These accounts typically work like retirement accounts. People receive tax credits for contributing to their accounts, while their employers receive favourable tax treatment for matching the employees' contributions. These funds can be used to pay for tuition, fees, books and supplies, and are portable from job to job.

School charters need to be refashioned to better encourage creative thinking, entrepreneurial skills, a global perspective and mental agility. For example independent social enterprises in the "Teach For All" network promote educational opportunity by enlisting their nations' top graduates to teach for two years in high-need areas across 15 nations and to work throughout their lives for educational equity. [57]

An international talent development initiative is the 2010 agreement between the Governments of Vietnam and the Central African Republic (CAR), to cooperate in mining and building a pilot vocational training school in CAR. Under the agreement, CAR students and teachers will study in Vietnam's vocational schools and Vietnamese experts will be sent to CAR to help improve technical capacity and operations of agencies in charge of national strategies on the vocational and technical training.[58]

Talent development: blueprints for action	
Companies	**Governments**
"Step into the talent's shoes" to understand what diverse, talented employees seek (compensation, organizational flexibility, meaningfulness of business, etc.)	Increase social and educational mobility and invest in teaching, cultural recognition and development opportunities
Develop long-term retention strategies to retain scarce talent (e.g. flexible career systems)	Cooperate with other governments and companies to support school and university education as well as vocational training in target industries
Provide a variety of development opportunities, such as virtual/cultural training, entrepreneurial training, peer-to-peer learning and lifelong learning	Foster life-long talent development. Help citizens of all ages to re-skill for the job challenges ahead
Ensure horizontal and vertical mobility opportunities	Provide scholarships to promising students from migrant, minority, or disadvantaged backgrounds
Build an international profile and use web 2.0/social media to attract, recruit and retain scarce talent	Encourage early childhood stimulation and education including learning new languages

Response 5: Encourage temporary mobility and virtual work

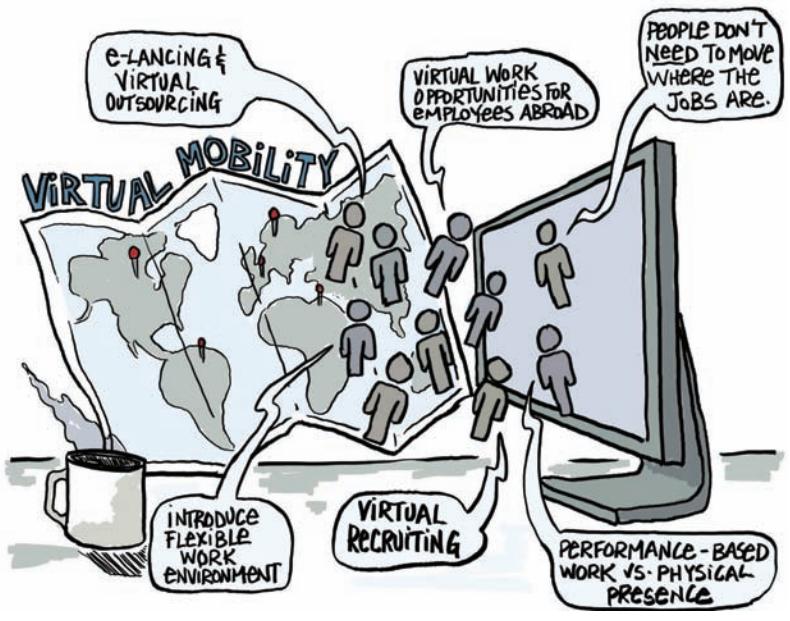
Temporary mobility covers short-term work or study in another location, while virtual mobility is made possible by a networked world. It is no longer necessary to move people to where the jobs are (except for some industries such as mining) or move the jobs to where the people are. Today, Pakistani women, for example, can work from their homes for US software companies. LivePerson[59] can build an online business providing advice from professionals (e.g. chemists, doctors).

"According to our research ~30% of tasks in multinational corporations could be done virtually. Virtual mobility can also take a lead in women inclusion and enablement that have previously been excluded from the active labour force."

– David Arkless, President, Corporate and Government Affairs, Manpower Inc.

Flexible working hours and virtual offices support a performance-based work culture in which results are more highly valued than physical presence in the office. Furthermore, virtual mobility is an opportunity to build strong ties to a country's expatriates, as shown by ChileGlobal using its network to build relationships with citizens abroad.

However, as virtual work expands through online platforms, challenges appear with the opportunities. Regulation of virtual labour is far less advanced than in the traditional workplace. Labour laws, employment protection and minimum wage are often poorly enforced.



But virtual mobility, once it overcomes legal constraints, will provide opportunities to governments and corporations to develop an international and diverse workforce spread across the globe virtually connected without visa restrictions. Virtual mobility enables individuals to join the economically active population wherever they are without being limited by nationality, national borders or social and cultural resentments.

Best practices: temporary and virtual mobility at its best

For temporary mobility, WebEx supports a rotation program (West-East and East-West) driven by its business strategy[60]. Boehringer Ingelheim funds short-term – up to six months – international assignments for its employees, with full support for families (e.g. child care, elder care, paid monthly visits)[61]. When one Venezuelan employee took an assignment in Ecuador, the company sent her mother along with her.

Governments are supporting both physical and virtual mobility. US government for example is promoting e-government principles by providing online chat Q&A during business hours. The European Union has implemented educational exchange programs (ERASMUS and SOCRATES) between European universities for more than 160,000 students and vocational trainees each year to foster cultural exchange and mobility. And SES, a German NGO, is sending more than 8,600 senior experts abroad for short-term assignments to help public and private sector organizations.[62]

A results-only work environment (ROWE), which gives each employee the freedom to do their job when and where they want, is an example of virtual mobility. Productivity rose by over 35% in Best Buy departments that implemented a ROWE.[63] Now other organizations, including public agencies such as the Human Services and Public Health Department of Hennepin County, Minnesota, are trying this approach. All meetings are optional, according to ROWE principles, and expected results are explicitly defined. ROWE proponents claim the scheme combats "presenteeism", when employees are physically at work but mentally disengaged.[64]

Virtual mobility can be used for specific purposes, such as Intel's virtual recruiting events. An Intel representative presents an audio or video presentation, and prospective employees can submit topic and job questions. Intel also offers a variety of social networking opportunities — blogs, podcasts, video, Facebook and Twitter — to allow interested individuals to interact with Intel employees around the world.[65]

Mobility presents many new business opportunities. Flexjobs[66] is one of many job boards for freelancers, for example. The growth of "e-lancer" businesses, composed of one or more workers connected by electronic networks, will enable more people to undertake full or part-time work from home.[67] These may be outsourced tasks from other companies. For example TasksEveryDay[68] provides advice from professionals (e.g., chemists and doctors) online or virtual assistants 24 hours a day to perform business-related activities such as research and travel booking.[69]

Senior Experten Service (SES): a clearinghouse for applied wisdom

Lengthy experience in a profession has tremendous value that may lie fallow after retirement. Many people who retire from full-time employment still want to participate in the word of work, but at a different pace and with new challenges. How can they find such engagement?

Senior Experten Service (SES), a non-profit foundation started in Germany in 1983, offers such an opportunity. It gives practical assistance to small enterprises around the world, fostering brain circulation by providing value to both receiving and sending countries.[85]

Retirees who volunteer with SES train specialist workers and managers. They typically work with small enterprises, providers of vocational training, healthcare services, and occasionally with organizations such as the German Agency for Technical Cooperation. Assignments last from a few weeks to six months, and the volunteer experts receive room, board, insurance and expenses.

SES has more than 8,800 registered experts, with expertise ranging from agriculture to paint manufacturing and ecotourism to wood processing. In 2009, roughly 1,600 assignments in 79 countries were carried out.

Experts work with mango farmers in Pakistan to combat a crop-killing disease, engineer pilot sewage works in Cambodia, establish an orthopaedic department at a hospital in Honduras and improve quality control of food and cosmetic products in Ethiopia.

Companies in developed countries benefit as well. Dieter Roth, a retired lacquer specialist, helped a company in Germany that extracts and processes raw materials for paint, glass and paper suppliers. Roth helped the firm improve the covering power and brilliance of the firm's lacquer, thus raising specialty sales. Other experts in Germany serve as mentors and coaches to young vocational students.

"I envision a status of holistic talent mobility where nationality does not matter anymore and in which people can move physically and virtually. Virtual mobility is a great trend that we need to strengthen!"

– Yoko Ishikura, Professor, Graduate School of International Corporate Strategy, Hitotsubashi University

Temporary and virtual mobility: blueprints for action	
Companies	**Governments**
Introduce flexible work arrangements	Set up pilots for virtual government services and opportunities
Explore virtual work opportunities for employees abroad	Provide incentives to work virtually
Set up rotation programmes and short-term assignment between business units and geographies	Foster "two step" migration and retention of international students
Foster virtual recruiting events and activities	Set up short-term visa processes that allow multiple entries for skilled immigrants

Response 6: Extend the talent pool

There are large pools of developed, but currently underutilized, talent. Both countries and companies need to establish policies to tap into the skill sets of women, older professionals, the disadvantaged and immigrants. Easily available childcare, flexible work schemes, mentoring and advisory roles and improved options for licensing and recognizing credentials represent solutions to barriers faced by these groups.

Increasing the number of educated women in the labour force will benefit countries and companies. Research shows that having a larger number of women in management positions improves a company's bottom line. Productivity also rises with teams composed of an equal number of men and women.[70] Companies need to retain the women in their workforce; twice as many women as men consider leaving their employment because of for example the company's public image or community responsibilities.[71]

Many women still hit a thick glass ceiling

Women comprise 55% of college graduates worldwide. Yet, in many countries and within many companies, they are an underused and underappreciated resource.

The steady entry of women into the workforce has contributed greatly to the Eurozone's labour market success, accounting for 0.44% of its 2.1% average annual growth since 1995. If female employment were as high as male employment, all else equal, GDP would rise by 13% in Europe and 9% in the United States.[87] Higher disposable incomes would increase consumption of services and goods.

Women's work opportunities matter. Various studies show a significant correlation between corporate financial performance and gender diversity. For companies with current or predicted skill shortages, women form a large, relatively untapped pool of talent.[88]

For women who have taken time off to rear children or care for sick or ageing family members, returning to work can be difficult. A recent survey in more than 100 countries found that 89% of women who voluntarily left their jobs for a period of time want to go back to work, but only 40% of these were able to find full-time, mainstream jobs.[89]

Longstanding cultural norms in many emerging markets undermine women's aspirations. In certain countries, women are harassed by men when commuting on trains, fired for having a second child, or prohibited from travelling alone for work. Family-related pressures such as elder care and work-related obstacles such as outright bias conspire to force women in emerging markets to settle for dead-end jobs or leave the workforce, note Sylvia Ann Hewlett and Ripa Rashid in their recent study.[90]

Hewlett and Rashid suggest that forward-thinking companies can do several things to mine the opportunities qualified women represent:

- *Find talent early*, as Google is trying to do in India through its India Women in Engineering Award worth $US 2,000.
- *Help them build social networks*, as Siemens, Intel and General Electric are doing in several different countries.
- *Give them international exposure* by supplying support including childcare, paid monthly visits for spouses, or opportunities for family members to come along for the stay.

Women are overcoming workplace hurdles every day, but they need support. Multinational companies and governments can provide that support and will benefit from a concerted effort to break through the glass ceiling.

International students represent another attractive labour pool because they have earned the required qualifications domestically. The cost of their training is often partially borne by the receiving country or the immigrants themselves, so hiring from this pool has fewer adverse effects on the countries of origin than recruiting from the ranks of qualified workers abroad.[72]

Countries and companies need to revamp their hiring and talent identification processes. For example, social media is now a key channel for both finding and assessing the qualifications of candidates. Talent analytics is increasingly being used to identify and search for specific skill sets rather than relying on traditional criteria such as a specific degree from the "right" school. Such an approach makes it easier to assess qualifications achieved abroad.

Best practices: go beyond the obvious

GE's talent spotting and mentoring programme for women, particularly in Arab countries, is an example of a good practice. Siemens AG has created a Global Leadership Organization of Women (GLOW) to foster the careers of its high-potential women. The network, which now has several spin-offs around the globe, encourages diversity in the company's leadership ranks.[73]

The United Kingdom's Pension Bonus Scheme engages the older workforce by providing incentives for later retirement (including a lump-sum, non-taxable payment). IBM is pursuing a similar goal by giving managers the opportunity to work part-time as a way of retaining their leadership skills, knowledge and insight. And ABB Schweiz AG gives older workers flexibility, allowing employees to retire early at age 58, while some may work for an ABB consulting business until age 65.[74]

To attract talented young workers, many corporations have created intern retention programmes for top students and soon-to-be graduates. A global IT learning-solutions company is hiring entire teams of students. The company is partnering with business schools to run collegiate business plan competitions. In teams, students identify entrepreneurial business opportunities relevant to the company's brand. If an idea is selected, the entire team is hired, the initiative is funded and the team runs the business.[75]

Strong German economy seeks qualified talent for long relationships

Germany has one of the strongest economies in the world, with high productivity and a steady stream of exports even after the crisis, with decreasing unemployment rates. Yet, Germany and Japan are the only major industrialized countries with net emigration.

Was ist los? What is going on is a combination of factors that make it challenging for employers to find enough workers with the right skills.

According to recent research, German companies need 70,000 new engineers per year, yet only 47,000 engineering students are graduating from university, and one of 10 of those graduates returns to their home country.[109] Partly as a result of emigration, some 60% of DAX-listed companies said in a recent survey that they expect to have problems sourcing skilled labour.[110]

Ageing demographics also play a role. Each year, 550,000 high-skilled workers will be needed in Germany to replace retirees, estimates the Federal Agency of Employment.[111]

The national government has launched various initiatives to address the current scarcity of talent and to deepen the pool, such as a national treaty for more vocational training. One initiative, called Perspective 50Plus, aims to expand employment opportunities for older people, after a government study of employers found that only a small percentage of employers had initiated training opportunities for older workers. This builds on the recent raising of the official retirement age to 67.

Government-sponsored research, undertaken by Fraunhofer Institute, is analyzing the culture within cooperating companies to understand how to improve opportunities for high-potential female employees. One goal is to raise the level of women in management, which in early 2010 was 3.2% in senior management and 12.5% in middle management among DAX-listed German companies.[112]

Coordination among federal ministries and German states, which are responsible for education, would further improve the country's talent strategy. Having one responsible ministry is a logical way to build a holistic strategy. Keeping qualified immigrants and promoting opportunities for women and older workers could go a long way toward filling German's talent gaps.

Extend the talent pool: blueprints for action	
Companies	**Governments**
Create a presence for the company brand at universities locally and internationally	Make retirement policies more flexible and incentivize continued careers beyond 60
Display cultural sensitivity in targeting minorities and women	Encourage diversity in private and public sectors
Hire graduates from abroad with limited language skills and offer intensive language courses	Set up national internship and externship platforms to match talent to employer needs
Give employees support to contribute part-time as they raise families	Introduce incentive schemes to increase the inclusion and leverage of migrant and elderly workers
Engage retirees (your own or those of other companies) to mentor, consult or complete short-term assignments	Increase day care and preschool opportunities
Recruit from other industries' pools with similar skill sets	Increase women's participation in the labour market

Response 7: Increase employability

In both developed and developing countries, high rates of unemployment underline the mismatch between people's skill sets and available jobs. Employers are begging for qualified applicants, at the same time governments are pushing the private sector to create jobs and provide vocational training. Most of these unfilled jobs require specialized knowledge and years of training.

Resolving this mismatch requires governments to prioritize education as essential to prosperity in an era of talent scarcity. It requires educational institutions, through partnerships with corporations and other organizations, to produce graduates with transferable, in-demand skill sets. Currently, many educational systems produce graduates well versed in fact-based learning, routine and rule-based work and silo-thinking, but lacking in critical thinking and communication and creativity skills. Graduates lack desired technical skills and know-how, such as information technologies, biotechnologies and manufacturing specialties.

"The bottom line is education. There are a lot of people who are so undereducated that they cannot even start to learn the more advanced and technical skills. So, basic education is key!"

– Karen Myers, Retired, Vice-President, Global Government Relations, CA Technologies[76]

Best practices: increased employability matters

Governments have undertaken a variety of initiatives to improve employability. In both the Middle East and Southeast Asia, for example, governments cooperate with other nations in the region to recognize qualifications for specialists such as nurses, doctors and dentists. The German government helps companies establish cooperative vocational training programmes through the "Jobstarter" programme;[77] it also funds GTZ, an organization that supports "developing and emerging countries in building their capacities and managing the learning and change processes involved."[78]

Talent shortages hit Asia-Pacific hard — but Vietnam hits back

Japanese employers are challenged to find enough qualified workers as the nation's workforce ages. But other Asia Pacific nations have similar problems. More than half of all employers in Singapore report the same difficulties, as do 44% of those in Hong Kong, according to Manpower Inc.'s fifth annual Talent Shortage survey.[107]

Talent shortages in the Asia-Pacific region are higher than the global average and sales-representative positions are the hardest jobs to fill, closely followed by technicians and engineers.

"This problem, left unchecked, will become steadily more acute as the global economy continues to improve," Manpower Inc. Chairman and CEO Jeff Joerres told attendees at a session at the World Economic Forum on East Asia. "The region requires a more educated workforce, and we need to devise sound strategies to better equip the next generation of workers with the skills that employers desperately need in order to ensure the region remains economically competitive during the up cycle."

Vietnam, one of the region's rising stars, is hoping to forestall similar problems. Manpower Inc. is working with Vietnam's Ministry of Labour, Invalids and Social Affairs to address employment challenges. The collaboration aims to develop the employment market and labour information systems, forecast labour market needs and identify skill requirements of enterprises in Vietnam. Vietnam is interested in exploring how education and training systems can better respond to private sector skills needs. The partnership will further promote development by organizing study tours and seminars to exchange information on international practices and experiences.

The South African Network of Skills Abroad (SANSA) calls on members of its diaspora network to train people at home. *Joblinge* is a public-private partnership (PPP) in Germany that mentors unemployed pupils. Likewise, Infosys cooperates with Indian universities to teach IT skills, a strategy that has been adapted in Mexico and Malaysia. In this way, the Indian IT market leader ensures that students learn the technical skills they need for the industry.

The solutions across the seven responses to the global talent risk can help both companies and countries to remain competitive. There are no one-size-fits all recipes to talent mobility challenges and the success of a practice is often rooted in the local context. However, awareness of existing practices increases chances for positive policy changes. Since talent mobility often involves crossing national borders, there is a need for policy coordination at the international level.

Infosys Campus Connect: helping graduates to be "industry ready"

Infosys Technologies ensures that engineering graduates are highly productive from day one. The Indian IT leader has developed a programme called "Campus Connect" – a forum where the best practices in the IT industry in general, and at Infosys in particular, are shared with engineering colleges.

Launched in mid-2004, the programme has been a huge success.[98] More than 400 partnering colleges are involved. More than 130 workshops on technical skills and soft skills have been held in India, along with 600 road shows and roughly 300 seminars in colleges. With these initiatives, over 100,000 students have been trained and 5000 faculty members have benefited. At the same time, more than 175,000 students have registered in Campus Connect's online programme. The initiative has recently been extended to Malaysia and Mexico.[99]

Campus Connect's success is rooted in its focus on increasing students' employability. While nations such as India and China have poured resources and funding into increasing their numbers of graduates — particularly in science and technology fields — industry leaders understand that quality and preparation for the "real world" are as important as sheer numbers of well-educated graduates.

Infosys' initiative emphasizes alignment — meshing the needs of colleges, their faculty and students with those of the IT industry. It focuses on sustaining the long-term growth of the IT industry with a steady, predictable pipeline of top talent. "We don't want to increase the number of engineering colleges, or the number of graduates," reads Infosys' description of Campus Connect. "We intend to increase the employability of students. We want to have a consistent output, irrespective of all variables involved."

One example of Campus Connect at work is the "train the trainer" programmes, which give college faculty experiential knowledge so they can enrich their course curricula and transfer the benefits to students.

In addition, the SPARK programme, started by Infosys, has touched the lives of more than 100,000 young students in the last two and half years. This nation-wide programme aims to provide youth with hands-on experience in IT to enhance the pool of talent.[100] SPARK was launched in August 2008 and has over 4,000 volunteers organization-wide, who spend their free time to run the programme.

Increase employability: blueprints for action

Companies	Governments
Make education a priority of the corporate social responsibility agenda (e.g. through *pro bono* training locally and internationally)	Drive educational reform comprehensively and in alignment with future skill requirements (strategic workforce planning) from preschool to higher education
Offer internships and vocational training opportunities	Invest in pre- and post-university career counselling
Offer certified training opportunities beyond current job and educational leaves to foster upskilling	Set up a (virtual) internship platform and cross-qualification programmes (i.e. mini-MBAs for non-economics graduates, unemployment skilling) on a national level
Engage with academia and government to equip talent with a balance of theoretical and practical skills (e.g. "teach the teachers" programme)	Foster entrepreneurial training, life-long learning opportunities and mentoring with support of the private sector
	Leverage public-private partnerships to up-skill and re-skill the unemployed workforce

5. International dialogue and stakeholder cooperation – need for action

The recent economic crisis has highlighted the interconnectedness of today's world challenges and the need to develop interdisciplinary solutions. Governments or businesses alone cannot address the impending global talent crisis. Yet, the disconnects continue between a public sector urging the creation of new jobs and a private sector struggling to find skilled employees.

This chapter focuses on areas where multistakeholder dialogue can make a positive impact, and where businesses' perspectives can add the most value to the development of talent mobility policies and projects.

Challenges of multistakeholder cooperation

National law largely covers talent mobility, migration and education policies as well as workforce regulations. Employment and migration are among the most political issues, directly affecting election results. In this context, the scope for international collaboration in the field of talent mobility may be limited. For instance, although the United Nations acknowledges the positive impact of talent mobility and brain circulation, its member states are reluctant to commit to joint action on migration policies.

A relatively successful and important system of cooperation exists among international organizations to protect the rights of people to learn, work, migrate and enjoy equal opportunities. However, more can be done to enable people to take advantages of these rights. International cooperation should focus more on training and developing in-demand skills to help people to find jobs and make it possible for them to move to where the jobs are.

International organizations recognize that more needs to be done to support countries in equipping people with tools necessary to meet market demand. For instance, the development banks, the ILO, the OECD and UNESCO agreed at the G20 meeting in Seoul in November 2010 to a multi-year action plan to support lower-income countries enhance their strategies to develop skills, improve productivity in existing jobs and promote investment in new jobs.

The complexity of talent mobility requires a systematic dialogue. Although governments and international organizations often coordinate their policies, there is no globally recognized platform to facilitate sharing and implementing good practices. NGOs and academia contribute to the collaboration, but businesses perspectives are too often neglected. The UN Global Compact could be an appropriate place for the needed multistakeholder dialogue. Since 2008, the Global Compact has had a Labour Working Group that collaborates with the ILO and the OECD to advance four labour principles – freedom of association, elimination of forced labour, abolition of child labour and elimination of discrimination. However, the Working Group does not specifically address talent mobility challenges.

Opportunities: addressing interconnected challenges in an interdisciplinary way

The crisis has necessitated stronger collaboration among stakeholders and focused the attention of policymakers on unemployment.

Opportunities for the G20. There is further evidence of the positive impact of increased talent mobility in a joint study by OECD, ILO, the World Bank and the World Trade Organization mandated by G20 Leaders in Toronto in June 2010 and reviewed in Seoul in November 2010. The positive correlation between free trade and increased employment signals the need for global mobility of talent to follow the global mobility of goods and the global mobility of capital.

The G20 process can be successful because its agenda is comprehensive and its dialogue mechanism is relatively effective. Moreover, the political will of governments has now been combined with the support of chief executives from the largest multinationals through their involvement in the G20 Business Summit. Two out of 12 issues tackled by the participating CEOs – creating green jobs and addressing youth unemployment – are linked to the talent mobility challenges ahead.

Responses to the *Global Talent Risk discussed at the Cross-Industry Meetings on Talent Mobility in Brussels, May 2010 and in Montreal, October 2010*

The European Approach. Coordination of employment and migration policies among European Union Member States demonstrates how countries can collaborate to increase employment, improve education systems and foster talent mobility. The EU collaboration mechanisms illustrate what can happen after labour markets open to migrant workers.

"New Skills for New Jobs", is one of the EU's Europe 2020 Flagship Initiatives.[79] The EU has also developed the European Framework for Key Competences for Lifelong Learning, the European Qualifications Framework (EQF) and the multilingual European Skills Competences and Occupations taxonomy (ESCO) covering several thousand occupations. It is important to touch on initiatives such as the Europass, which helps to provide a clear picture of qualifications, skills and competences, understandable across national borders, or the European Job Mobility Portal, which is designed to make it easier to match labour supply and demand.

These are not the only forums where talent challenges can be addressed. For example, in 2011, the United Nations General Assembly will hold an "Informal Thematic Debate on International Migration and Development". UNICEF, which will be chairing the Global Migration Group (GMG) during 2011, is planning to involve non-government stakeholders in its Expert Group Meeting, which will likely be held in parallel with the Informal Thematic Debate in the General Assembly.

The World Economic Forum's Network of Global Agenda Councils creates a unique platform for thought leaders from academia, government, business and other fields to capture the best knowledge on key issues and integrate it into global collaboration and decision-making processes.

Action is needed to address the global talent risk

Recognizing the need for action, the World Economic Forum's Global Agenda Council on Skills and Talent Mobility presented an early proposal to policy-makers at the Global Redesign Summit in Doha, Qatar, in May 2010. The Council proposed a concerted, multistakeholder, systematic process of cooperation and dialogue on talent mobility among relevant international institutions, governments and businesses. It recommended an effective dialogue mechanism, redesigned talent mobility policies and experiments with pilot projects to share best practices and prototype solutions.

During the second part of 2010, this vision for action was further developed. It will be presented at the World Economic Forum Annual Meeting 2011 in Davos-Klosters in January. Here is a glimpse of the ideas for broader action. Specifically, a commitment to action should:

1. Raise awareness of the scale and consequences of the talent crisis. Broader awareness is a prerequisite for changing the mindset of decision-makers at all levels.

2. Form an alliance to share good practices. Given the urgency and complexity of the talent challenge, sharing good practices is an effective way to accelerate change and focus scarce resources. A trusted group of experts should help countries and companies implement relevant solutions. The group should create a credible repository of good practices and serve as an advisory network to policy-makers.

The World Economic Forum has committed to support this action until it is ready to continue independently.

The action should have a multistakeholder character and combine a commitment from the private sector with strong political will from the public sector. The action and the collected good practices should take into account not only business needs for skills but also factors such as the slow recovery of global economies, strong protectionist attitudes, high unemployment rates, the need to create jobs and issues related to the protection of workers and migrants against exploitation, abuse and discrimination.

A multistakeholder action to address the *Global Talent Risk suggested by the Global Agenda Council on Skills and Talent Mobility at the Global Redesign Summit in Doha, May 2010 and at the Summit on Global Agenda, Dubai, November 2010*

6. Conclusion

The worst global talent shortages are yet to come. Our research over the past two years provides compelling evidence that the talent crisis will affect every region in the coming years. The problem is no longer a mere talent mismatch — talent here but not there. The supply-demand analysis presented in this report shows that widespread talent scarcity will persist for decades. That scarcity will redefine human capital practices and ways of doing business for a long time to come.

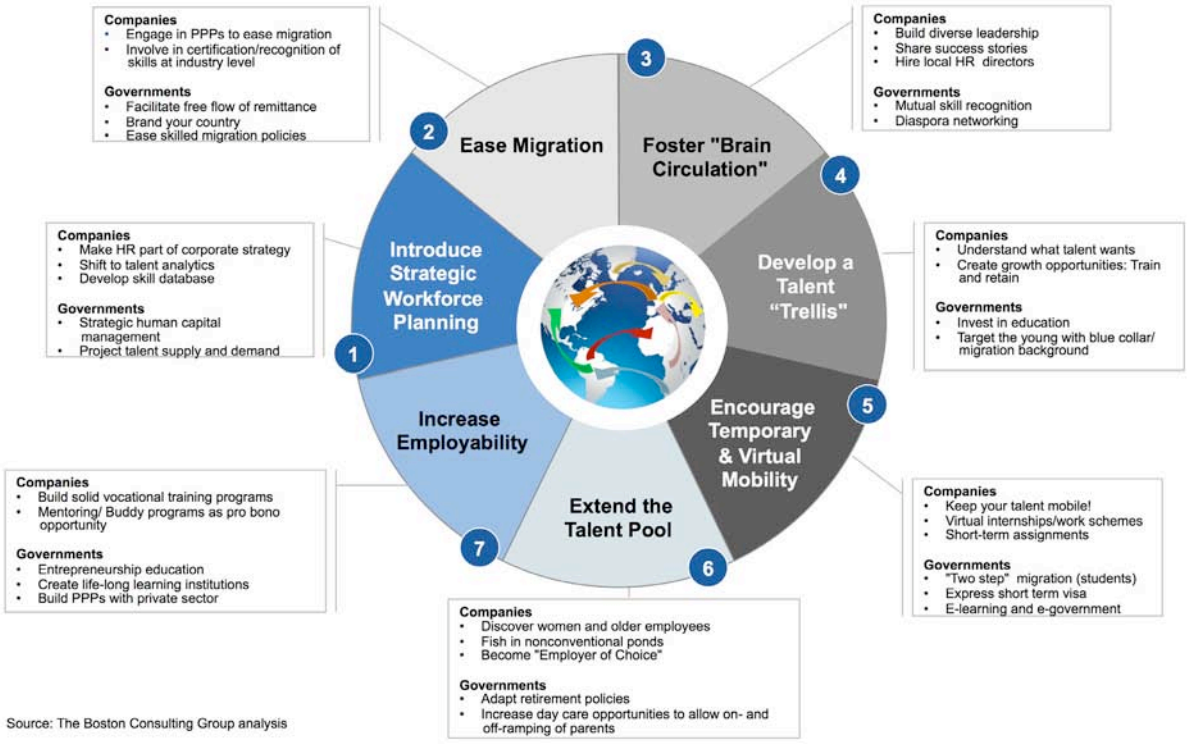
Talent mobility requires action. The severity of the coming shortages means that the international community and governments must now commit to action. Filling higher-demand positions will require improved and more extensive education and migration policies.

Government and business leaders must collaborate effectively towards interdisciplinary solutions. No single approach will work for every business or every nation. What works in California's Silicon Valley is unlikely to succeed in Brazil's oil and gas sector or Vietnam's banking industry. Instead, the seven responses to address the global talent risk can support the design of tailored solutions. The key recommendations summarized below can serve as a checklist for formulating strategies, crafting plans, creating blueprints and assigning resources.

Daunting though the challenge may be it is possible to prepare for the age of talent deficits. The heart of the challenge lies not in how to prepare, but in the willingness to prepare. It will demand strong political will and unequivocal endorsement and cooperation from business leaders. It calls for unusual collaboration, not competition, among companies and among countries. And it requires real recognition that the talent shortfall is not just a problem for "them"; it is, and will be, a problem for us all.

The World Economic Forum and its partners recognize that government leaders and business executives around the world are already stepping forward to promote talent mobility and prepare for the global talent crisis. We hope that this report helps them to accelerate those efforts.

Exhibit 8: Global Talent Risk: Checklist for companies and governments



Source: The Boston Consulting Group analysis

Appendix

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List of definitions of covered industries

The list is based on the International Standard Industrial Classification of All Economic Activities, from the United Nations, Revision 3.1, (ISIC Rev. 3.1).

Manufacturing
- Manufacture of food products and beverages
- Manufacture of tobacco products
- Manufacture of textiles
- Manufacture of wearing apparel; dressing and dyeing of fur
- Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear
- Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
- Manufacture of paper and paper products

- Publishing, printing and reproduction of recorded media
- Manufacture of coke, refined petroleum products and nuclear fuel
- Manufacture of chemicals and chemical products
- Manufacture of rubber and plastics products
- Manufacture of other non-metallic mineral products
- Manufacture of basic metals
- Manufacture of fabricated metal products, except machinery and equipment
- Manufacture of machinery and equipment n.e.c.
- Manufacture of office, accounting and computing machinery
- Manufacture of electrical machinery and apparatus n.e.c.
- Manufacture of radio, television and communication equipment and apparatus
- Manufacture of medical, precision and optical instruments, watches and clocks
- Manufacture of motor vehicles, trailers and semi-trailers
- Manufacture of other transport equipment
- Manufacture of furniture; manufacturing n.e.c.
- Recycling

Utilities (electricity, gas and water supply)

- Electricity, gas, steam and hot water supply
- Collection, purification and distribution of water

Engineering and Construction

Retail and Wholesale (wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods)

- Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of automotive fuel
- Wholesale trade and commission trade, except of motor vehicles and motorcycles
- Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods

Leisure (hotels and restaurants)

Transport and Telecommunication (transport, storage and communications)

- Land transport; transport via pipelines
- Water transport
- Air transport
- Supporting and auxiliary transport activities; activities of travel agencies
- Post and telecommunications

Financial Services

- Financial intermediation, except insurance and pension funding
- Insurance and pension funding, except compulsory social security
- Activities auxiliary to financial intermediation

IT, Business Services and Real Estate

- Real estate activities
- Renting of machinery and equipment without operator and of personal and household goods
- Computer and related activities
- Research and development
- Other business activities

Mining and Quarrying

Public administration (public administration and defence; compulsory social security)

Education

Healthcare (health and social work)

Other

List of definitions of International Standard Classification of Occupation (ISCO-88)

The International Standard Classification of Occupations (ISCO) is one of the main international classifications for which ILO is responsible. It is a tool for organizing jobs into a clearly defined set of groups according to the tasks and duties undertaken in the job. Its main aims are to provide:

- A basis for the international reporting, comparison and exchange of statistical and administrative data about occupations
- A model for the development of national and regional classifications of occupations
- A system that can be used directly in countries that have not developed their own national classifications

It is intended for use in statistical applications and in a variety of client oriented applications. Client oriented applications include the matching of job seekers with job vacancies, the management of short- or long-term migration of workers between countries and the development of vocational training programmes and guidance.
The first version of ISCO was adopted in 1957 by the Ninth International Conference of Labour Statisticians (ICLS). It is

known as ISCO-58. This version was superseded by ISCO-68, which was adopted by the Eleventh ICLS in 1966. The third version, ISCO-88, was adopted by the Fourteenth ICLS in 1987. Many current national occupational classifications are based on one of these three ISCO versions.

ISCO has recently been updated to take into account developments in the world of work since 1988 and to make improvements in light of experience gained in using ISCO-88. The updating did not change the basic principles and top structure of ISCO-88 but significant structural changes were made in some areas. The updated classification was adopted in December 2007 and is known as ISCO-08. Many countries are now updating their national classification either based on ISCO-08 or to improve alignment with the new international statistical standard. However, since there is not yet consistency in regards to the use of ISCO-08 across national statistical institutes, this report is based on the ISCO-88.

ISCO-88 major groups, number of sub-groups and skill level:

Exhibit 9: ISCO 88 major groups, number of sub-groups and skill level

Major group ISCO	Sub-major groups	Minor groups	Unit groups	Skill level
Legislators, senior officials and managers	3	8	33	–
Professionals	4	18	55	4th
Technicians and associate professionals	4	21	73	3rd
Clerks	2	7	23	2nd
Service workers and shop and market sales workers	2	9	23	2nd
Skilled agricultural and fishery workers	2	6	17	2nd
Craft and related workers	4	16	70	2nd
Plant and machine operators and assemblers	3	20	70	2nd
Elementary occupations	3	10	25	1st
Armed forces	1	1	1	–
Totals	**28**	**116**	**390**	

Occupational cluster descriptions for the purpose of this study:

1. **Managers**:[113] This cluster includes legislators, senior officials, chief executives and general and corporate managers who plan, direct and coordinate the policies and activities of governments, businesses and other organizations.

2. **Professionals**: Professionals increase the existing stock of knowledge, apply scientific or artistic concepts and theories, or teach in a systematic manner. Most occupations in this cluster — such as engineers, lawyers, economists, computing professionals, teachers and health professionals — require skills at the fourth ISCO skill level (postgraduates with tertiary education).

3. **Technicians and associated professionals**: These workers perform mostly technical and related tasks connected with research and the application of scientific, artistic, or operational methods. These occupations, which typically require skills at the third ISCO skill level (upper secondary or tertiary education), include industrial robot controllers, photographers and medical assistants.

4. **Clerks**: This cluster performs clerical duties associated with money-handling operations, travel arrangements, requests for information and appointments. Most of these jobs, such as secretaries, cashiers, or transport clerks, require skills at the second ISCO skill level (at least lower secondary education).

5. **Service workers, shop and market sales personnel**: These workers provide personal services related to travel, housekeeping, catering, personal care, or protection, or they demonstrate and sell goods. Most occupations require skills at the second ISCO skill level (at least lower secondary education).

6. **Skilled agricultural and fishery workers**: This group includes occupations that require skills at the second ISCO skill level (at least secondary education or equivalent critical skills and knowledge), such as crop growers, gardeners and dairy and livestock producers.

7. **Craft and related trade workers**: Workers in this group apply their skills in the fields of mining and construction, making or repairing machinery, printing, processed food, textiles, or articles including handicraft goods. Most of these occupations, such as builders, bricklayers, plumbers, or electronic mechanics, require skills at the second ISCO skill level.

8. **Plant and machine operators and assemblers**: These workers operate and monitor industrial and agricultural machinery and equipment, drive and operate trains, motor vehicles and mobile machinery, or assemble products. Most occupations in this cluster require skills at the second ISCO skill level.

9. **Elementary occupations**: These consist of simple and routine tasks that mainly require the use of hand tools plus physical effort. Most occupations in this cluster, such as cleaners, building caretakers, doorkeepers or labourers, require skills at the first ISCO skill level.

10. **Armed Forces**: Due to limited data availability armed forces were excluded from this analysis[114].

List of Definitions of UNESCO's International Standard Classification of Education

The world's education systems vary widely in terms of structure and curricular content. Consequently, it can be difficult for national policy-makers to compare their own education systems with those of other countries in order to learn from their experiences. UNESCO developed the International Standard Classification of Education (ISCED) to facilitate comparisons of education statistics and indicators of different countries on the basis of uniform and internationally agreed definitions. First developed in the 1970s, the current version, known as ISCED 1997, was formally adopted in November 1997.

The ISCED distinguishes between six levels of education:

Level 0 - Pre-primary education
Level 1 - Primary education or first stage of basic education
Level 2 - Lower secondary or second stage of basic education
Level 3 - (Upper) secondary education
Level 4 - Post-secondary non-tertiary education
Level 5 - First stage of tertiary education
Level 6 - Second stage of tertiary education

List of Exhibits

List of Sources

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