THE AGING WORKFORCE AND EMERGING TECHNOLOGIES FOR CAPTURING AND RETRIEVING KNOWLEDGE

Ing. Pablo Pereira

Accenture

Introduction

Companies in developed nations, as well as those in many developing countries, face a major workforce-related challenge: Depending on the industry sector, as much as half of the workforce will be eligible for retirement in the next five to 10 years. Worse yet, this development is not a short-term problem, as the working-age population will continue to age over the next 30 to 40 years. This challenge is compounded by the fact that there is a much smaller talent pool coming up. With workers aging and fewer people in succeeding generations, companies will experience a significant exodus of talent and experience in the next two decades and a shortage of new employees to step into roles requiring specialized skills that are in short supply.

Without fully addressing the aging workforce challenge, companies will find themselves unable to operate in a way that meets the needs, expectations and perceptions of their customers.

Without a highly skilled and productive workforce—something that will become increasingly difficult to create and maintain as workforce shortages grow in the coming years—an organization will find it difficult to remain competitive and consistently achieve its revenue and profitability goals over the long term.

In the Energy industry in particular, the average age of the workers is 50 years old. In the next ten years approximately half of the workforce will be retired.

The challenge for the companies will be to capture and generate the knowledge to minimize the loss of experience. That is, to develop their workforce and create new ways of training (through knowledge repositories, on the job training, collaborative training though online knowledge databases, etc.) so that the knowledge and experience accumulated by the soon to retire employees does not retire with them.

Development

You have probably heard the common expression "…Everything is related to everything…". This phrase is absolutely valid when the matter at hand is the workforce development. There are many issues that influence the creation, maintenance and continuous improvement of human skills. To further analyze the issue proposed by this paper, we must first present a series of concurrent facts, to later connect them and finally propose alternative solutions for the problem.

First of all, to understand this problem comprehensively, we must identify the general context where this issue lays in.

Fact 1: The Aging World

The workforce in many countries is aging, and some industry sectors and geographies will begin to feel the impact of this aging in as little as five to 10 years. Even more critical, this is not a short-term problem that will abate anytime soon. In fact, the population of developed countries is expected to only get older over the next several decades.

Globally, life expectancy has increased from 45 to 65 since World War II and shows no signs of slowing. In fact, continuing advances in medicine and science likely will push life expectancy to 100 and possibly higher in the next few decades.

In Argentina, by the year 2025, the number of people aged 60 or more will exceed 9.5 millions. By the same year, Brazil will become the sixth country in the world with the largest group of aged residents, and although it has always been considered a *young* country, it is starting to lose this characteristic, showing a considerable growth in the over 60 age group, which is now 9% of the population.

Italy, Japan and Spain will have as many people aged 60 or more as people between the ages of 15 and 59 by 2040. By 2030, 28 percent of Germany's population, and 20 percent of the United States', will be older than 65—and 19 million people in the United Kingdom will be over 60. In Canada, one in five people will be 65 or older by 2026—a major jump from one in eight in 2001.1 In Europe as a whole, the over- 65 population is anticipated to rise from 15.4 percent of the European Union population in 1995 to 22.4 percent by 2025.

The aging trend will last for several decades because, quite simply, people live longer and produce fewer offspring. For instance, average life expectancy has reached 80 in Japan and 83 in the United States. By 2075, at today's rates, average US life expectancy is projected to reach 87.

Decreasing birth rates are also a major factor. In the past 30 years, the worldwide birth rate has been nearly halved—from 5.0 children per woman to 2.7. In the developed world, it is even lower—1.6, which is lower than the 2.1 replacement rate needed to maintain stationary population.

Fact 2: Aging world *and* earlier Retirement

Globally, the elderly account for 15 percent of the population in the developed world, compared with 2 percent to 3 percent 150 years ago.

These trends are reflected in the demographics of workforces across most industries. In the United States, for example, more than 25 percent of the working-age population will reach retirement age by 2010, resulting in a potential worker shortage of nearly 10 million people[1]. While the aging workforce is problematic for all, it is especially troubling for several important industry sectors.

In the United States, for instance:

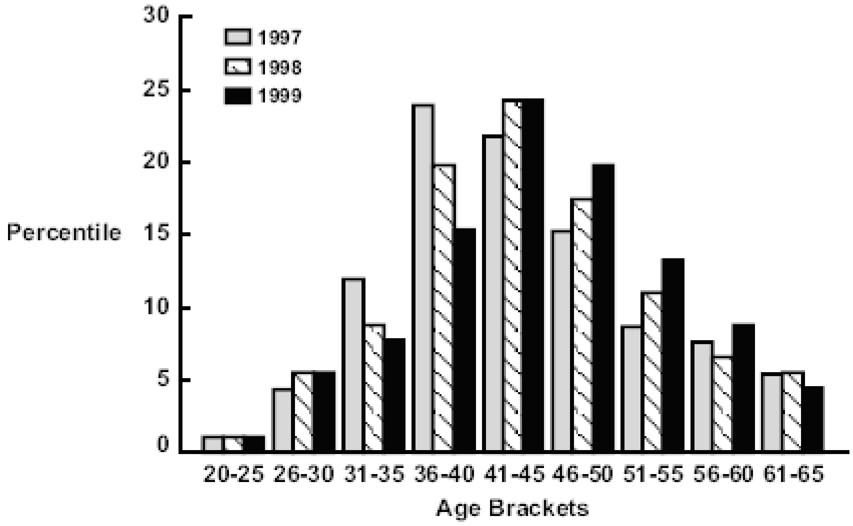
• The Bureau of Labor Statistics cites six sectors as especially vulnerable to impacts caused by the aging workforce: manufacturing (particularly oil and gas), public administration, educational services, transportation, health services and construction.[2]

•The National Science Board estimates that one fourth of the US engineering and science workforces are 50 or older and retiring by 2010.[3]

• The workforce in the utilities industry is 3.3 years older than the national average of workers, and the average utility employee is just under 50 years old.[4]

• Fifty percent of the US oil industry is eligible to retire in five years[5] (see Figure 1).

Figure 1 – Western Oil Industry: Demographics for Petroleum Engineers[6]



Source: Cambridge Energy Research Associates.
Data: SPE
10112-1

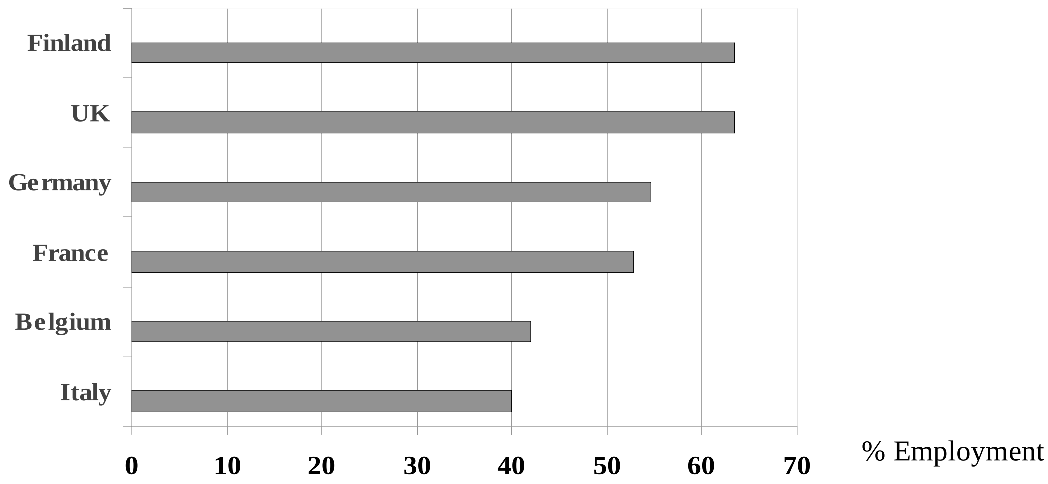
In Europe and Asia, the situation is very much the same: “Old-line”, industrial sectors such as manufacturing, energy and utilities, as well as nursing and teaching, tend to be feeling the heat more intensely than other sectors. The impact of workforce aging is compounded by the fact that people in many countries are leaving the workforce at a younger age. In the United States, the average retirement age has fallen from 67 in 1950 to an estimated 61 today[7], while in Canada the median age of retirement dropped from 65 in 1976 to 61 in 1999[8]. In France, the reduction of the legal retirement age to 60 led to a drop of 3.5 years in the average age of retirement—from 62 to 58.5 between 1968 and 1995.[9]

Europeans overall are exiting the workforce at a younger age than ever— typically, much younger than their counterparts in the United States. The average retirement age of European workers fell from 66.2 in 1950 to 59.8 in 2000.

A recent survey[10] gives further credibility to the fact that a retirement age of 65 or more is no longer the reality for many workers (see Figure 2). In a poll of more than 1,400 full-time workers worldwide aged 40 to 50, the study found that average planned age of retirement among individuals in Spain, the United Kingdom and France was approximately 61—nearly two full years lower than workers in Germany

(62.7) and Australia (62.5), substantially lower than Americans (64.1), but much higher than Chinese (56.8).

Figure 2: 2000 employment rate in people aged 50 to 64 in selected European nations



The first wave of retirements is imminent, and its impacts will be broad and deep. The consequences can be separated into two main aspects:

Macro Economic Impacts

- The increasing age and longevity of the population means more people will have to be supported by pension/social security programs - and for much longer than in the past.
- With many countries' pension programs being funded by current taxpayers - who soon will be outnumbered by those receiving benefits - severe budget strain is inevitable.
- Responsibility for increasing pension costs will have a major impact on the budgets of federal governments -impacts that could trickle down to local governments.

Human Capital/Workforce Impacts

- If they don't act now, organizations will lose a significant amount of institutional knowledge as their most experienced employees leave the workforce. Important, sometimes critical, information and expertise may literally walk out the door.
- Organizations will find themselves locked in a battle for a shrinking pool of talent and confronting the escalating salaries that will accompany a limited supply of workers.
- Organizations will face the prospect of having to do the same amount of work with much fewer employees.

Although there is an imminent threat of a general talent scarcity, an investigation reveals that very few employers recruit and retain workers older than 50 years old. According to a global survey conducted by Manpower Argentina, only 11% of the employers implement concrete strategies to recruit workers of older than 50 and only 17% retain them in their staff. (See figure 3)

Figure 3 - Recruiting and retention of aged workers[11]

In percentages

	Recruits	Retains
Argentina	11	17
France	5	6
China	20	20
Canada	15	22
USA	18	25
Japan	15	83
Global Average	16	22

Source: MANPOWER

Fact 3: Generation "Y"

If workforce aging and early retirement were not troubling enough, companies also face the worrying reality that many well-educated and highly skilled people in younger generations do not view a career in some industries as particularly attractive. This mind-set, if not altered, will further shrink the talent pool from which companies in these sectors can draw in the future.

This is especially true of what many individuals in their 20s and 30s, known as the "Generation Y", view as "unglamorous" industries—sectors such as utilities, energy, mining and manufacturing, and government. Indicative of this trend is the following statistic: The enrollment in undergraduate petroleum engineering programs in the United States has dropped by 79 percent in the past 20 years, according to a study by the University of Texas at Austin. And why? "People perceive oil and gas not to be a very attractive place to go," said Mukul Sharma, who issued the report. "The really bright high school students are concerned about media reports they read…related to this being sort of a traditional industry, not high-tech."

The generation Y members not only find *unglamorous* these particular industries, they also have a completely different approach towards their professional lives[12]. This generation, also known as the "echo boomers" or "nexters", is represented by those born from 1979 to 1994. They are the Baby Boomers progeny, the largest generation known until the latter appeared. The nexters have born to a more diverse world, and were exposed to technology from early age, making them grow and mature much faster than any other generation before. They have also been exposed to the working habits of their parent's generation, particularly to a strong role of a working mother.

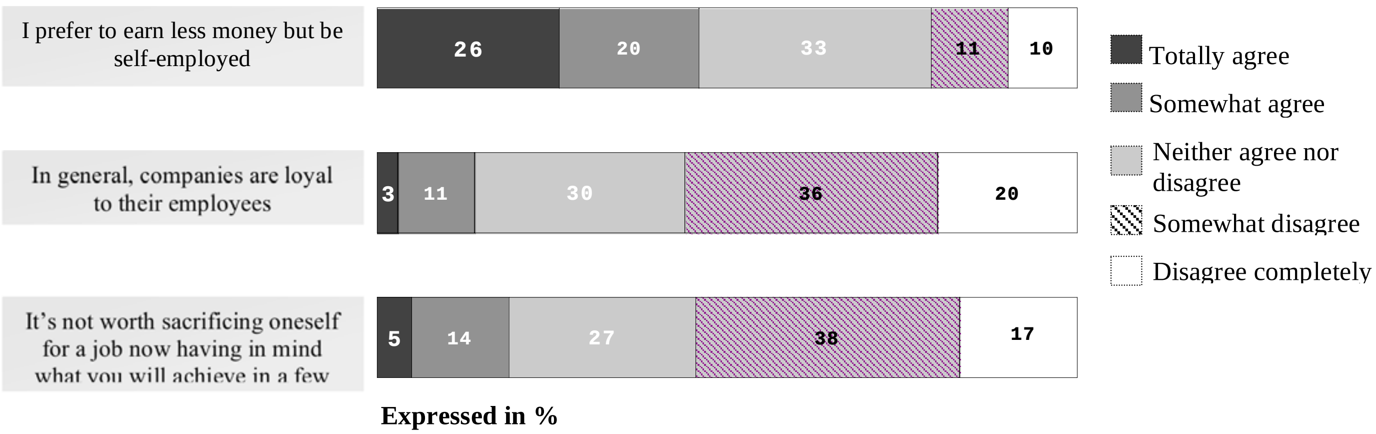
The Baby Boomers generation (approximately 1943 to 1960), which today is retiring from the market, was obsessed with obtaining a high social status, through the means of outstanding in their jobs. They tended to put a high priority on career and this translated into a life dedicated almost entirely to their work.

The opposite happens with the Echo Boomers. This particular aspect of the generation is what has a major influence in the workforce scarcity: although they are big spenders and consumers, they are less interested in spending their life dedicated to working. They have less commitment to their jobs, and are far from making sacrifices to earn the good bucks. This makes them less attracted to jobs in traditional industries, where they are reluctant to invest more of their time and effort going through longer and more demanding careers.

The core values of this generation are realism, confidence, extreme fun, and are very social oriented. In terms of dealing with money, their leitmotiv is “earn to spend”, and work is perceived as “a means to an end”.

In a recent quantitative study held in Argentina[13], of the Generation Y’s labor culture, one of the points analyzed was which their general attitudes towards work / employment were

Figure 4 – Generation Y’s general attitude towards work/ employment



Through Figure 4, we can see the overwhelming motivation young professionals have towards working independently and their mistrust towards companies. In a subsequent qualitative research, they expressed that they felt there is general labor unsteadiness, and companies may at any time let off the younger employees. In this context, working independently seems as an attractive alternative.

Another conclusion drawn from this research is that they are less willing to make sacrifices to achieve a professional career; they place their quality of life in first place.

Generation Y has high expectations of self: they aim to work faster and better than other workers and are very interested in obtaining ongoing learning: they seek out creative challenges and view colleagues as vast resources from whom to gain knowledge.[14]

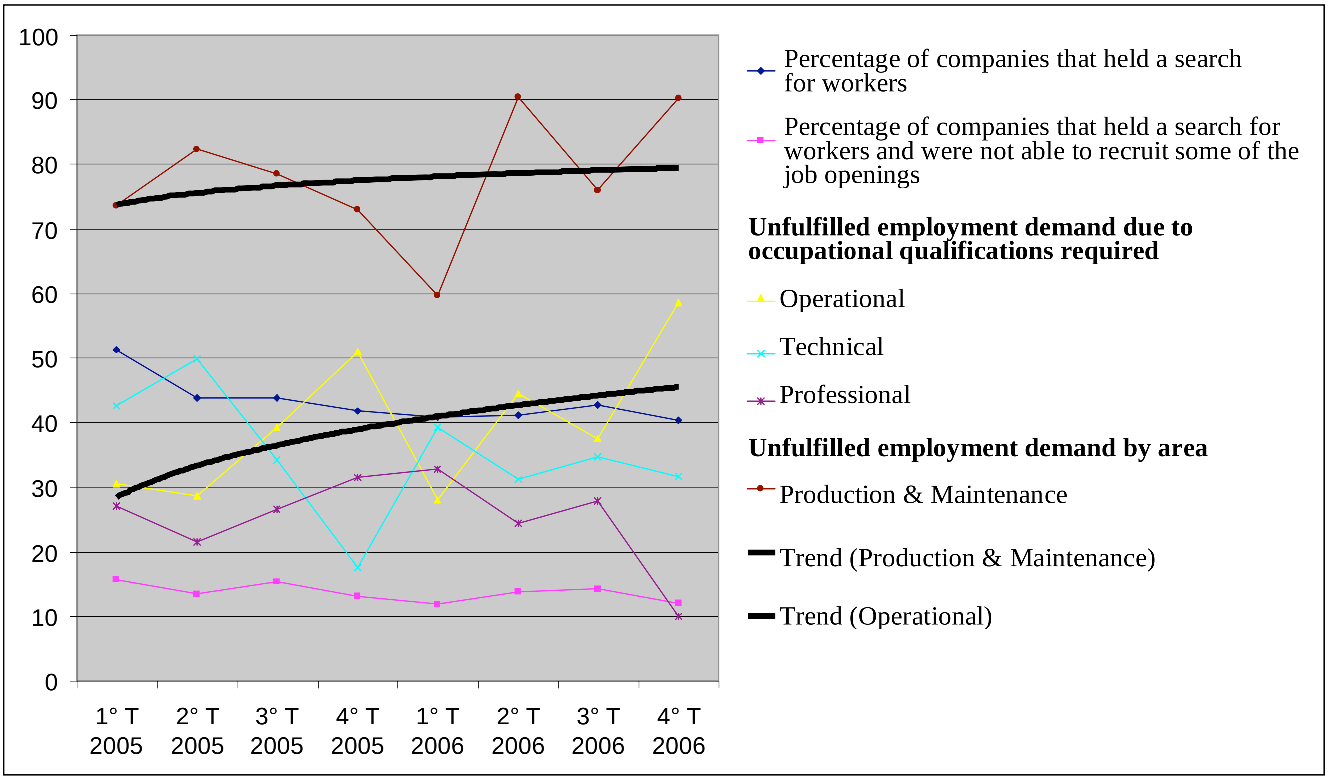
With the first wave of baby-boomer retirements imminent, and fewer new workers coming into the pipeline, it is critical for executives to understand the impacts of this potential workforce challenge. If they do not act now, companies— especially those already at the leading edge of boomer retirement— will lose a significant amount of institutional knowledge as their most experienced employees leave the workforce. They also will find themselves locked in a battle with each other for a shrinking pool of talent and confronting the escalating salaries that will accompany a limited supply of workers. The reality is that companies in most industry sectors face the prospect of having to do the same amount of work (possibly more) with fewer employees. If companies are not proactive in addressing the issue at hand, there is a very real chance that they will no longer be able to compete, much less achieve high performance. It is more likely that they will have to shrink considerably just to survive.

Fact 4: Energy industry: unfulfilled employment demand

During 2005 and 2006 the INDEC institute held a study to analyze the employment demand, and how many of these job searches were left vacant. The conclusions of this study are presented in Figure 4, were the following aspects are included:

- Percentage of companies that held a search for workers
- Percentage of companies that held search for workers and were not able to recruit some of the job openings
- Unfulfilled employment demand due to occupational qualifications required
    - Operational
    - Technical
    - Professional
- Unfulfilled employment demand by area
    - Production and Maintenance

Figure 5 – Unfulfilled employment demand



In this graph we can appreciate a slight yet constant increase of unfulfilled jobs, which marks a tendency to continue growing that way over the next years. This is more prominent when the occupational qualifications required are operational ( ).

Fact 5: Lack of skilled labor

During the past year the main local newspapers have published more than 50 articles and interviews expressing this critical matter. The press coverage of this issue is a sign of local concern: business men and CEOs have recurrently manifested their worry on the lack of skilled workers for manufacturing industries.

Some examples:

“Today’s lack of technical skilled labor in the country may become our Achilles’ heel on becoming a technological platform” - Date: 26/05/2006 | Country: Chile | Source: El Mercurio

“Many companies are regretting the lack of technical skilled workers” – Headline on Date: 22/05/2006 | Country: Argentina | Source: InfoBAE

“Toyota’s CEO, Aníbal Borderes, expressed that having grown 150% during the last three years, the main obstacle to continue incrementing the production activity of the automotive terminal strives in the lack of technical skilled labor, an issue perceived as a bottleneck” - Date: 03/05/2006 | Country: Argentina | Source: InfoBAE

“The lack of skilled labor affects 75% of the labor market. In construction alone, 40% of the employment demand has not been fulfilled. The problem has worsened in activities were less qualifications are required. In the industry, the unfulfilled employment demand exceeded 25%. The difficulties of important industry sectors to satisfy their employment demand have already become a real and growing problem for the Argentine economy.” - Date: 29/12/2006 | Country: Argentina | Source: El Cronista | Page: 6/Section: Economía & Política

“Siderar had to delay the set off of a coke battery due to lack of skilled labor” - Date: 23/01/2007 | Country: Argentina | Source: Punto Biz

“According to different evaluations, the labor market evidences a growing scarcity of specialists and qualified workers, which affects the expansion potential of numerous activities.” - Date: 18/01/2007 | Country: Argentina | Source: Clarín | Page: 26/Sección: Opinión

“Although the economy has been growing and this made the employment demand increase, companies in the manufacturing industry are complaining about the lack of skilled labor.” - Date: 13/12/2006 | Country: Argentina | Source: La Nación

“The high price of copper has triggered off great dynamism in the industry. But there are certain aspects that are concerning: the lack of skilled labor…” - Date: 21/10/2006 | Country: Chile | Source: El Mercurio (Santiago - Santiago)

“According to businessmen, hiring skilled workers is getting harder by the minute; they warn that the lack of skilled workers may become a curb on the economic growth. Moreover, it induces higher costs for companies, because they have to address training and education projects to attract, retain and motivate the new professionals. […] the major problem they face and that worries them is the impossibility to find qualified workers to fulfill the growing employment demand that is being generated by the reactivation of the economy." - Date: 15/09/2006 | Country: Argentina | Source: InfoBAE

"Rolando Meninato, CEO of Dow Química Argentina, emphasized the inconvenient that his company is going through in the labor field. "Worker rotation has increased and recruiting timelines to find personnel to fill in replacements or new positions resulting from employment growth are increasingly tougher" - Date: 15/09/2006 | Country: Argentina | Source: InfoBAE

"The department of Social and Market Researches of the UCES University surveyed 280 businessmen of the metals industry during the 2006 FIMAQH trade fare. They found that the lack of skilled workers is the main hold back to continue growing." - Date: 07/10/2006 | Country: Argentina | Source: La Nación

"Lack of interest for senior talents. Although there is an imminent threat of qualified workers scarcity, an investigation revealed that very few employers recruit and retain workers over 50 years old. A global research held by Manpower Argentina established that only 11 % of employers implement strategies to recruit workers over 50, and only 17% retains them in their staff.
"Many employers are not considering the percentage of workers in their workforce who are eligible for retirement over the next 5 to 10 years, and the resulting potential loss of productivity and knowledge capital when these employees leave the company" expressed Alfredo Fagalde, CEO of Manpower Argentina. The counterparties are Japan and Singapore, where 83% and 53% of the surveyed employers respectively, retain their older employees." - Country: Argentina Source: Clarín (Hard Copy) Date: 24/04/2007

These headlines and article abstracts demonstrate this is a hot topic, with real consequences already starting to come into sight.

All the facts previously exposed lead to the following conclusion: It's no secret that the workforce in many countries is aging, and that companies will begin to feel the impact of this aging in as little as five to 10 years, and Argentina will not be the exception.

And as the workforce ages, organizations will need to do more with fewer people, and will have to work to actively maintain and preserve the knowledge generated in-company. Technology can help by delivering and retaining knowledge and expertise where it is most needed and more effectively automating areas where it is not.

Knowledge is power: Use it wisely

Many organizations are failing to capture critical workforce knowledge and experience from older employees facing retirement, and few organizations are transferring that knowledge to newer employees, according to survey findings.[10]

The survey of more than 500 full-time workers between 40 and 50 years of age found that nearly half (45 percent) of respondents' organizations do not have formal workforce planning processes and/or tools in place to capture their workplace knowledge.

Additionally, one-quarter (26 percent) of respondents said that their organizations will let them retire without any transfer of knowledge. Just 20 percent said they anticipate an intensive, months-long process of knowledge transfer prior to their leaving, 28 percent said they believe the knowledge-transfer process will last one or two weeks, and 16 percent think they will simply have an informal discussion with others in the organization prior to retirement.[15]

Just as companies in the late 1990s came to appreciate the critical nature of their information systems, so companies and governments in 2010 and beyond will have to appreciate the critical nature of their workforces and will devise new programs to improve their speed to optimal performance.

For companies to fully understand the impacts of workforce aging and other related trends, they will primarily need to identify how well prepared they are to address the issue; develop a detailed road map to eliminate key human capital shortcomings in their organizations; and build and implement the capabilities critical to achieving high performance.

The approach should encompass three broad steps:

1. Diagnose the breadth of the problem

2. Develop a human capital management strategy for addressing the problem

3. Implement a broad-based solution

To effectively address the workforce challenge, an organization first must understand the extent of the problem and how well the organization is positioned to alleviate it.

The diagnostic enables the organization to evaluate the potential magnitude of aging workforce impacts by assessing the financial impact of lost productivity; lost customer knowledge and relationships; lost product, service and process knowledge; and increased risks of making suboptimal business decisions when experienced employees retire. These impacts of not solving an aging workforce problem can be weighed against the costs of replacing retiring workers, training new or incumbent workers in critical skill areas, and other interventions to fix the problem. The results can highlight the potential cumulative cost of the mismanagement of or failure to anticipate aging workforce trends on overall operating costs.

The diagnostic also helps benchmark the effectiveness of the human capital processes needed to address aging workforce issues and improve the overall workforce experience.

After completing the diagnostic, an organization then must develop an overall strategy for, in the short term, retaining employees eligible for retirement who possess critical skills and, for the longer term, capturing the knowledge of these people and transferring it to remaining employees. The organization also must define how it will replace, develop and manage these skills once these employees retire. This includes identifying the changes required in the organization's recruiting, hiring and knowledge management practices, as well as how new workforce models, processes and technologies will be adopted to support these changes. The principal actions in this phase should be:

1. Defining the organization's future human capital requirements. Corporate and HR leadership need to work together to determine which skills, behaviors and jobs are required as well as which aspects of the organization culture must be strengthened or developed, for the company to remain competitive in the coming years.

2. Conducting a gap assessment to identify where human capital change efforts should be focused and in what order. Considering the results of the diagnostic and the organization's future requirements, the organization must define:

• Changes necessary in the company's culture and technology to promote and support knowledge sharing and retention.

• The critical competencies, skills, knowledge and job classifications that are most affected by the imminent retirement of key workers and supervisors, and how important those competencies, skills, knowledge and job classifications are.

• How the organization will capture those critical competencies, skills and knowledge and transfer them to remaining employees.

• How it will recruit and hire new workers with those critical skills, and what training and development programs are necessary to build those skills among existing employees. Concurrently, the organization also must consider options that it can provide to keep key individuals with critical skills for as long as possible (such as phased retirement, flexible work options, participation in communities of knowledge and alumni programs).

• Where the organization must reinforce its succession plan for retiring managers and executives, and its leadership development program for current and new hires to ensure it has sufficient "bench strength" to carry the company into the future.

• Rewards and recognition programs and performance metrics more appropriate for the new work environment.

• New capabilities needed to help guide the organization through what will be a major change initiative.

A comprehensive human capital management strategy is absolutely essential to proactively identify and address the major workforce challenges an organization will face in the coming years.

With the human capital strategy defined, the organization should then implement a broad-based solution. The organization must begin to act out the changes necessary to close the gaps identified in the previous stage.

Most organizations will find their efforts centering on addressing three overarching needs: capturing knowledge to minimize knowledge loss; attracting, developing, training and retaining critical capabilities (including older workers); and doing more with less (people and money).

Meeting those needs will require a variety of innovative approaches and solutions.

Capturing and transferring knowledge

For many companies, the first order of business will be to implement a formal process to ensure that the organization captures the experience and expertise of retiring workers and transfers this knowledge to retirees' successors.

The approach is not about technology replacing people. Rather, that the real opportunity lies in applying new technology to enable higher workforce and organizational productivity through effective knowledge capturing, sharing and utilization.

A viable approach for this could be the Knowledge Retention and Transfer. This approach encompasses the tools and methods necessary to identify and capture critical

Knowledge—both explicit and tacit—from experienced employees, and make this knowledge available to less-experienced employees on an ongoing basis at the point of need.

Some solutions that can be implemented are: eLearning Content, Collaborative training tools, Knowledge repository, Knowledge Transfer Portal, Knowledge Transfer Metrics and Mobile Knowledge Capture.

These emerging collaboration tools support remote apprenticeship, providing an integrated knowledge transfer plan that should focus on day to day work activities, responsibilities and objectives. These solutions facilitate the access to relevant knowledge and experts through individualized portals.

Attract and retain workers

Organizations must also adopt new solutions to help them increase the talent pool, and more effectively attract, develop and retain critical capabilities, including older workers. Although this is not a long term measure, it is up to battle the talent loss. A solution for this is Talent Management, a set of internally consistent programs, policies and processes for managing the workforce; defines the workforce culture, skills, leadership goals and employer/employee contract.

Do more with less

With large numbers of older employees leaving, fewer employees entering the system and budget constraints, organizations will come under increasing pressure to do more with less money and fewer people. To solve this, there are two business models that can help organizations deal with this: shared services and outsourcing. By shedding non-core functions, companies not only free up existing staff for more critical roles, but also take advantage of the economies of scale, either by joining forces in a shared service model or the ones offered by the outsourcing service provider (internal or external).

An example of possible solutions

There are existing training solutions that offer companies the possibility to combine multiple learning mediums in one integrated program for developing their employees in different areas (Supply Chain, Finance, Human Resources, Maintenance, etc.). The idea is to increase significantly the knowledge creation efficiency. The quality of these solutions is funded on a intense collaboration effort between Universities, companies and certification associations and is conceived as a blended training solution which combines multiple learning mediums: Online Courses, Distance Learning Program, Forums, Simulations, Certifications, E-books and workshops - a complementary program of classroom sessions for connecting theory with practical activities and the company's business, as well as encouraging networking. The ability to find knowledge whenever is needed, as well as having opportunities to share and discuss experiences with peers is a powerful experience.

Such type of tools provide the company's employees with World Class Content, with curriculum plans designed according to competency model/ job positions and a global training easily replicated in all company locations. Overall, it works on the development of networking skills and provides a practical application to business reality.

The only way to accomplish a knowledge creation solution with this level of quality is only possible when multiple parties collaborate intensively to achieve it. The training paradigm is changing, for good.

Conclusion

While it is true that statistics can be manipulated to support a story, in the case of the workforce challenge the numbers do not lie. The largest segment of the working population will be retiring in the next five to 10 years, and the potential talent pool behind that cadre is smaller, less experienced and likely to be more expensive by virtue of its limited supply.

As companies around the world struggle with this emerging scenario, it is more critical than ever for them to take a holistic, comprehensive view of their human capital needs today and in the future. As part of that effort, they should ensure that they have the mechanisms in place to capture knowledge to minimize loss of critical expertise; attract, develop and retain key capabilities (including older workers); and do more with fewer people and less money.

The aging workforce issue is part of a larger challenge that companies face: how to create and sustain a "high performance anatomy," where the focus is on creating cultural and organizational characteristics—as well as hiring, developing and retaining superior talent—that help companies out-execute their competition. Without a highly skilled and productive workforce—something that will become increasingly difficult to create and maintain as workforce shortages grow in the coming years—an organization will find it difficult to remain competitive and consistently achieve its revenue and profitability goals over the long term.

About the authors

Pablo Pereira is a Senior Executive at Accenture. He has always worked for the Energy industry, engaging consulting projects in the areas of supply chain, maintenance and operations. He has worked in projects in Argentina, Brasil and United States, among others.

pablo.pereira@accenture.com

Tel: 4318-8694

Matias Castellano is a manager with the Management Consulting practice of Accenture, who has worked mainly in efficiency and performance improvements and supply chain projects for Energy companies.

matias.castellano@accenture.com

Tel: 4318-8532

Bibliography

1. “The Aging Workforce: The Reality of the Impact of Older Workers and Eldercare in the Workplace,” Nancy R. Lockwood, HRMagazine, Society for Human Resource Management, December 2003.

2. “Gauging the Labor Force Effects from Retiring Baby-Boomers,” Arlene Dohm, Monthly Labor Review, July 2000, US Department of Labor, Bureau of Labor Statistics, http://www.bls.gov/opub/mlr/2000/07/art2full.pdf

3. “Design Talent no Longer White, Male, Middle-Aged,” Jacqueline Rast, DesignIntelligence Issues, July 12, 2004, http://www.di.net/article.php?article_id=341

4. “Five Issues That Keep HR Managers in the Power Industry Awake at Night and What to Do About Them,” Arthur O’Donnell, Monthly Purple Penguin Newsletter, September 2004, http://www.energyoverseer.com/WebPDFs/search=’aging%20workforce%20utilities

5. “Software Firms See Opportunity in Oil Industry’s Talent Crunch,” Angel Gonzalez.

6. “The demographic Wall. What will be the role of digital technologies in reducing petroprofessional shortages?” – CERA Research, 2001.

7. “Facts from EBRI: Trends in Early Retirement,” Employee Benefit Research Institute, July 2001, http://www.ebri.org/facts/0701fact.htm

8. “The Aging Workforce and Human Resources Development Implications for Sector Councils,” Alliance of Sector Councils.

9. “Policy Responses to Population Ageing and Population Decline in France,” Georges P. Tapinos.

10. Accenture Survey 10 May 2005 - Employee Knowledge and Experience at Risk http://accenture.tekgroup.com/article_print.cfm?article_id=4214

11. “Los gerentes de finanzas son los que reciben mejor paga”, Clarín 24/04/2007

12. “Generations at Work: Managing the Clash of Veterans, Boomers, Xers, and Nexters in Your Workplace” - Authors: Ron Zemke, Claire Raines and Bob Filipczak (October 1999)

13. Accenture study of Labor Culture of the 20-30 age group – October 2006

14. Generation Y: They've arrived at work with a new attitude, USA TODAY – November 2005

15. Where have all the gurus gone? By Charles Nebolsky and Dadong Wan