The North American Chemical Industry: Building a Workforce for Tomorrow

Prepared by Accenture at the request of the American Chemistry Council
Chemical industry executives face a growing range of workforce-related challenges, from the looming retirement of baby boomers to finding the right skills in a competitive labor market. These challenges are unfolding against a backdrop of ongoing change in the industry, and talent will be critical to both driving and responding to that change.
Recent research sponsored by the American Chemistry Council (ACC) and conducted by Accenture found that industry executives are well aware of these issues. At the same time, they see growing potential for innovation and growth in the industry—and they recognize that a focus on building the right workforce will be key to realizing that potential.

The industry workforce is changing, as is the nature of work itself. It is clear that chemical companies will need more sophisticated skills on more fronts, greater flexibility in the workforce and constant increases in efficiency. To meet those needs, human resources (HR) will have to work with leaders throughout the company to develop innovative new approaches to finding, developing and retaining people.

The challenges are significant, with many of these changes just beginning to happen. Fortunately, executives have an opportunity to proactively shape the workforce and find the talent their companies need to sustain success and drive tomorrow’s high performance.

**Acknowledgements**

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According to the research results, industry executives see today’s workforce challenges as real and significant. When it comes to baby boomer retirements, for example, 86 percent of survey respondents said that profitability in the chemical industry will suffer if those talent losses are not resolved in the next three to five years. Most of the respondents reported that talent problems are now having an impact on cost, operations and efficiency/performance. But executives are making plans to address these issues—and more than 90 percent said they expect to have the workforce they need in the future.

Evolving workforce challenges go well beyond the replacement of departing retirees. They are emerging in many areas, and they are complicated and interwoven. The research revealed three main types of challenges: skill sourcing; complex and changing demographics; and readiness to leverage digital technology.
Skill sourcing

Attracting and developing employees with the necessary skillsets is increasingly important in light of the chemical industry’s growing need for digital skills and innovation. Survey respondents said that the top three challenges on this front are:

- Finding people with the right technical skills, cultural fit, creativity and problem-solving mindsets.
- Transferring knowledge.
- Building digital technology aptitude for everyday activities and operations, including manufacturing.

It is important to note that these were the top challenges across the board for different types of workers—that is, for both professionals and craft/plant workers.

A key barrier to finding the right talent is the way the industry is viewed by potential recruits. Eighty-seven percent of respondents agreed that the chemical industry as a whole needs to change its image to attract talent, and 76 percent felt that the image is “not cool enough.” Of the total number of graduates in fields considered fundamental to the chemical industry, 30 percent are working in the sector. The rest have been going into other areas of business. (Figure 1)

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Figure 1: Chemical industry professions compete with other technical industries and government jobs, some at higher pay levels.

US employment of chemical engineers, chemists and material scientists, May 2015

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<thead>
<tr>
<th>Industries</th>
<th>Employment</th>
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Complex and changing demographics

Retaining millennials is another critical challenge for the industry. Less than a third (28 percent) of respondents said that their companies retained at least 90 percent of the millennial employees hired in the past three years. Most respondents (68 percent) said that 30 to 50 percent of these millennials left their jobs. Ironically, results from another Accenture study indicated that approximately 70 percent of 2016 college graduates plan to stay with their first job for at least three years.1 This suggests a gap in millennial expectations versus day-to-day experiences.

Meanwhile, the ACC-sponsored research found that baby boomer retirements are coming faster than many companies might expect. Almost 40 percent of respondents noted that a significant portion of their workforce (20 to 40 percent) is eligible for retirement in the next three to five years.

These issues at both ends of the workforce spectrum are exacerbated by the situation with the industry’s largest group of workers. Over the past decade, weak chemical industry growth, workforce reductions (which favored keeping experienced employees) and improving productivity led to less hiring in North America. One result is an overreliance on workers who have 15 to 25 years' experience—essentially Generation X employees. We see this issue in US manufacturing, where Generation X comprises 45 percent of the workforce. The situation is more problematic for the US chemicals labor force, which is made up of 50 percent of Generation X employees. (Figure 2) This causes a challenge, as Generation X is the smallest portion of the US population overall, and yet is key to replacing boomers, mentoring millennials and maintaining institutional knowledge.

In general, chemical companies have tried to address this shortage by poaching workers from other chemical companies, creating intense competition for a limited talent pool. In addition, older Generation X employees are getting closer to retirement, which will only intensify the issue in future years.

Figure 2: Due to lack of hiring for the past decade, 15 to 25 year experienced workers have a larger share of the workforce.
Readiness to leverage digital technology

Industry executives see promise in using digital technology—such as artificial intelligence, collaboration tools, data analytics, mobile applications, robots and wearables—to address workforce issues. Eighty-seven percent of those surveyed believe that the companies that embrace advancements like these will gain competitive advantage—and the majority (89 percent) said that their organizations are starting to make the shift.

However, the industry’s use of new technology is happening relatively slowly. For example:

- Sixty percent of respondents indicated they are adapting to digital technologies, but are meeting some resistance.
- Although 78 percent of respondents agree that digital technologies can decrease the need for employees through automation, only 32 percent have taken action on that front, suggesting opportunities to use technology to alleviate talent gaps.
- Digital technologies can be important to addressing knowledge transfer—one of the top three workforce issues cited in the research. However, most respondents still rely on flexible contracts for retirees to mentor new staff. Only 34 percent leverage some form of process documentation and on-demand training to support new entrants. And only 30 percent promote centers of excellence that provide a central, shared source of scarce knowledge.

With such barriers in mind, most respondents (87 percent) said that making the shift to new technology will depend on changing the industry’s mindset and require new leadership skills.
Recommendations for Shaping Tomorrow's Workforce

Based on the research, chemical companies can explore a number of actions to help ensure that they have the right workforce in the future. Their talent strategy should be based on an understanding of the company’s business plans and goals, as well as trends reshaping the industry, business and society. Thus, the development of the strategy should involve not just HR, but also procurement, business units and C-suite executives.

The strategy should go beyond current supply-and-demand issues, filling vacant roles or retiring baby boomers. It should be based on a strategic view of the skills and knowledge that will be required in the future. What business will the company be in five years from now? What technologies will be in use? How will the regulatory environment evolve? How will automation change work and workforce requirements?

Overall, the strategy should identify the critical skills that will be required in the future and what needs to shift. It should include both strategic short-term bets, as well as long-term actions to close gaps. Armed with this strategy, companies can take action in the following ways:
1. Extend the concept of "workforce"

The chemical industry will need to find innovative approaches to dealing with waves of retirements while building flexibility to cope with a changing business. Given this requirement, a company’s talent strategy should include an integrated view of the entire workforce—not only traditional full-time employees, but also a range of contractors and freelancers, as well as workers from partners, universities and temporary agencies. This will allow companies to create a "liquid workforce"—one that can draw on various types of workers to adapt as the business evolves and fill in skill gaps as new needs arise.

With this approach, companies can expand their efforts to provide differentiated experiences and career options to various "tiers" of employees. For example, higher levels of compensation and accelerated development opportunities could be offered to workers with critical skills in key roles, whereas freelancers could be used to fill general positions. The company can also determine where to focus resources as it shapes the workforce of the future, while increasing employee flexibility and building deep expertise where it matters most.

2. Offer value to target talent pools—especially millennials

To help reach potential workers, chemical companies can develop employee value propositions that define how the company will appeal to candidates in every stage of the employee lifecycle—from compensation to career paths.

The employee value proposition should emphasize factors that are important to millennials, such as development opportunities, flexibility and work-life balance. The company’s use of digital technology can be an important part of the mix. As just one example, millennials are most likely to make the shift to advanced technology—thus, they will presumably be disappointed if a company is slow to adopt new tools. Clearly, companies will need to follow through on the promises made in the value proposition in order to retain millennials and the generations that come after.

Companies can also identify and foster “moments that matter”—the specific opportunities to enhance employees’ connections to company culture, learning and performance-based rewards.

In addition, executives can rethink their approach to recruiting graduates. Today, chemical companies often pay higher salaries for new hires from top-ranked schools, especially in the digital technology realm. However, a clear understanding of what skills are critical to the company’s future growth makes it possible to determine where paying that premium adds value and where it does not.

In many cases, it might be more cost-effective to pursue graduates from schools that are not at the top of the list—individuals who are often quite capable and highly motivated to perform well and stay with the company. And some chemical companies report success in recruiting outside the traditional pool of STEM (science, technology, engineering, math) university graduates, and then training these new hires in the technical knowledge needed for their jobs.

Finally, chemical companies should include plant/craft workers in their talent acquisition strategies. Initiatives such as high-school outreach programs and collaboration with community colleges can help companies attract more millennials, Generation Z and digital natives.

Challenge: Changing the chemical industry brand

The research underscores the need to make the industry more attractive to a broad range of potential employees, especially millennial workers. Possible activities that the chemical industry as a whole and chemical companies individually might consider include:

- Conducting social media campaigns focused on how chemistry is "cool," innovative and has a positive impact on people’s lives.
- Establishing industry consortiums/partnerships focused on building skills:
  - What do people need to learn?
  - What skills and knowledge will the industry need?
  - Creation of a consortium that offers subscription-based learning focused on important skills.
  - Facilitation of leadership development programs.
- Creating outreach programs that foster interest in chemistry, targeting high-school and middle-school students.
- Developing military veteran recruiting and assimilation programs.
3. Expand the labor pool

In the search for more experienced talent with the right skills, chemical companies have an opportunity to expand their traditional recruiting horizons. They can, for instance, consider recruiting more people from other industries. Options include the utilities and oil and gas industries, which involve a range of skills that are similar to those needed in chemicals.

What’s more, not all of the critical skills that chemical companies require will rely on industry experience; expertise in digital technologies, such as analytics and the Internet of Things, clearly transcends industry boundaries. Most likely, chemical companies will find that the future requires entirely new skills and knowledge. By definition, these cannot be acquired by poaching from other chemical companies.

Chemical companies can expand the talent pipeline in other ways as well. Alumni programs let companies stay in touch with workers who have left the organization but may come back—an important connection in the "gig economy" (an environment where companies often contract with temporary workers) and an era when people are inclined to switch companies frequently in their careers.

Workers with military training can also be a good fit in the industry, but only 30 percent of survey respondents said that they actively recruit veterans. In some cases, hiring veterans can pose some challenges, such as translating skills and credentials on veteran resumes to applicable chemical business work processes. Interviews can be another issue: the direct and concise military style of answering questions can make interviews too brief, missing the elaboration needed for recruiters to understand the value of a veteran’s background.

Companies should also consider augmenting the labor pool with talent that operates beyond the company’s walls. In particular, crowdsourcing techniques can enable companies to tap into a wide range of knowledge on an as-needed basis. By sending specific challenges out to the broader online community, companies can essentially outsource some aspects of problem-solving and feed the resulting crowdsourced insights back into the company. For example, when a large European chemical company set up a competition for outside scientists and inventors to come up with new ways to store power from the grid, it received more than 122 submissions. The company selected four promising winners and provided funding for the continued development of those innovations.
4. Shift the business culture to embrace digital

Chemical companies need to capture the knowledge of experienced workers, and today’s technology provides a range of tools for doing so—from knowledge bases to automation that embeds workers’ knowledge into processes. Advancing digital technology is playing a growing role in this arena. Inexpensive virtual-reality systems, for example, can be used to guide plant technicians through the steps involved in replacing a piece of equipment.

Technology-based knowledge transfer should be augmented with less formal techniques. As one industry executive told researchers, “You can capture knowledge, but you can’t capture experience.” To tap into that experience, companies can pair more senior workers with millennials to collaborate on projects. Retiring workers can also spend their last few months with the company focused on sharing their knowledge through forums, meetings, podcasts, etc.

Often, chemical companies will find that the future requires entirely new skills and knowledge. By definition, these cannot be acquired by poaching from other chemical companies.
For chemical companies, talent is truly a companywide topic that should draw on the perspectives of leaders across the organization. Creating a workforce that can meet the challenges of tomorrow will require new ways of using digital technology to support and empower people. It will call for new mindsets around recruiting, sourcing, development and retention. And it will require companies to question some of their fundamental concepts about the workforce. In short, it will require change throughout the company—the kind of change that depends on the active, sustained involvement of executives, including those in the C-suite.

As the research shows, chemical industry executives recognize that the ability to address workforce challenges will be a key factor in company performance in the coming years. The next step is to act on those insights. Solutions will take time—particularly those that call for changes to traditional industry approaches. Failure to tackle these challenges could potentially affect growth and profitability in the chemical industry for a long time to come.
For chemical companies, workforce-related challenges are both complicated and critical. To help executives gain a better understanding of the issues, the ACC asked Accenture to conduct research on the workforce of the future. This work included a survey of industry employees; one-on-one interviews with C-level executives from a number of North American chemical companies; and extensive secondary research that drew on multiple data sources, including the U.S. Bureau of Labor statistics.

Researchers interviewed 10 senior industry executives on the workforce challenges facing the chemical industry in North America. They then conducted an online survey of 505 North America–based chemical industry employees, including 100 C-level executives. The survey was fielded in April and May 2016. The findings were field-tested at the ACC Annual Meeting in June 2016.
References


2 Ibid.
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