

Automation in the chemicals sector

Value is clear, but even more to come

In late 2016, ABB conducted a survey with *Chemical Engineering* magazine of more than 300 chemical industry professionals about their firms' use of and investment in automation technology. The responses produced some interesting and even unexpected results.

While the evolution and proliferation of automation technologies like distributed control systems, PLCs and wireless communication continue, the level of automation investment varies widely between companies. Still, while industry players understand the need for automation, many have yet to realize its full value.

The survey polled mostly engineering professionals but also included finance and management roles. Companies were divided by number of employees into four categories: small (1-50), small-mid (51-300), medium (301-1,000) and large (1,001+).

In terms of overall outlook, there was broad agreement that the future looks bright. Of the professionals polled, more than half saw their business performing better in 2017 than in the previous year and 24% indicated it would remain the same. Similarly, there was a clear convergence of opinion around the major challenges facing the industry.

The challenges... and how to address them

We asked respondents to select the three most pressing factors affecting their business, and the top five answers broke into two distinct tiers. In the top level were "global competition" and "materials costs." Below these was a second cluster of three answers: "energy costs", "cyclic or volatile markets" and "skill shortages or training issues."

One interesting fact about these top responses is that only two—energy costs and skills/training—are directly addressable by the company. The other three are simply facts of life for chemical companies operating in today's market. That limits what these firms can do to control costs and drive growth, and it puts a spotlight on solutions that address those areas.

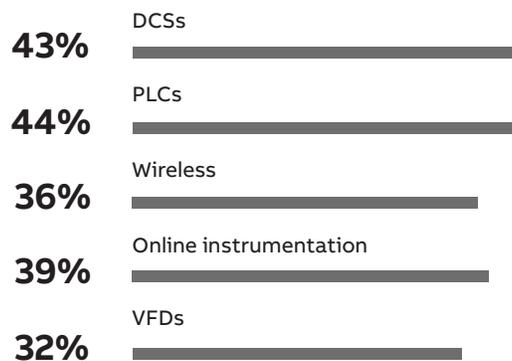
When asked how they plan to meet the challenges identified in the previous question, there was a similar cluster of top responses. Survey participants were asked to choose three actions, and the top three were selected significantly more often than the rest:



New offerings and revamping production lines both imply changes to and/or investment in automation technology. They also would seem to indicate an additional need for training. This sets up a paradox in which the solutions chemicals firms are pursuing to address their top challenges are subject to the same forces that create those challenges.

Where are chemicals producers spending?

Spending on automation is definitely on the rise, with only 17% of survey participants indicating a decline in either opex or capex in 2017. Most saw both categories rising or holding steady. In terms of what's on companies' shopping lists, there was no clear leader or group of technologies that rose above the rest. The top five responses were:



Anticipated investments varied widely, however, depending on company size. Respondents working at large firms anticipated spending across the board but mostly on DCS and PLCs. Medium size firms showed a stronger focus on DCS with 60% saying they would buy the technology. This might indicate a sense among second-tier firms that a DCS is essential to support the growth needed to join the top tier whereas larger players perhaps have already made investments in DCS and are now looking to expand system capability, throughput or integration.

Interestingly, the small-mid category had by far the most anticipated investment in terms of volume if not dollar value. A whopping 71% expect to invest in PLCs in the next 18 months, with strong majorities anticipating investments in online instrumentation and variable frequency drives as well. In fact, small-mid companies are set to make more individual investments than their competitors, whether large or small, in each of the top five categories listed above, save only for DCS.

Among small firms, no technology drew a majority of respondents with the top choices being PLCs and DCS.

The future is bright, but it's not clear

As noted earlier, survey respondents across the board see a bright future, and they also seem to appreciate the vital role automation will play in it. Asked to react to the statement “plant automation has a decisive influence on our profitability,” 79% indicated they agree or strongly agree. Only 6% disagreed.

However, this optimistic view is clouded by the fact that a significant minority (40%) of respondents did not agree that they were “confident and knowledgeable about our place in world of automation.” Why are so many industry professionals at best unsure about their company’s ability to realize value from investments in automation? Look no further than their own experience.

Only one in five of the professionals we surveyed indicated their automation systems had delivered “all that their vendors promised.” More than twice as many reported bad experiences and another third weren’t sure.

The survey did not attempt to ferret out all of the

underlying reasons for these unmet expectations, but there are many possibilities. The control system may not be properly maintained; too many people might have access to make changes to the system; operators might lack adequate training, leading to bad habits like shelving frequent alarms.

Integration seems to be a common challenge. When asked if they’d “had issues integrating legacy systems,” only 16% of respondents disagreed, thus indicating a favorable outcome. More than half agreed or strongly agreed that they had experienced problems. Given how much of any technology’s value is attached to how well it plays with others, this is clearly an area for improvement for vendors and users alike.

Key(s) to success

Once a process is automated, management will look for opportunities to improve further. Objectives might include reducing energy consumption, increasing yield, or eliminating waste. This lets the company move from simply “doing more” to “doing better.”

Process industries are using automation to move beyond simply gathering and analyzing data to begin applying it. The technology has reached the point where it now produces “actionable intelligence” that leads to concrete steps that allow the company to do more and do better. The challenge now lies not in the technology per se, but in how it is used.

As the data reported here shows, the implementation of automation technology is at least as important as choosing and procuring it, probably more so. Applying the best practices of project management is a must, as is a focus on the integration of legacy systems. Take the time to understand the relationships and interdependencies between systems, and invest in training to ensure operators are getting the most out of the technology once it’s installed.

The chemicals industry is enjoying a period of renewed growth, but as automation technology continues to advance, the bar is raised ever higher. To compete in this market, it is no longer enough to gather and analyze data. Chemicals companies must leverage their automation investments to take action. Systems integration, operator training, and a holistic view of the process are some of the keys to successful implementation that closes the loop of sense-analyze-act.

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