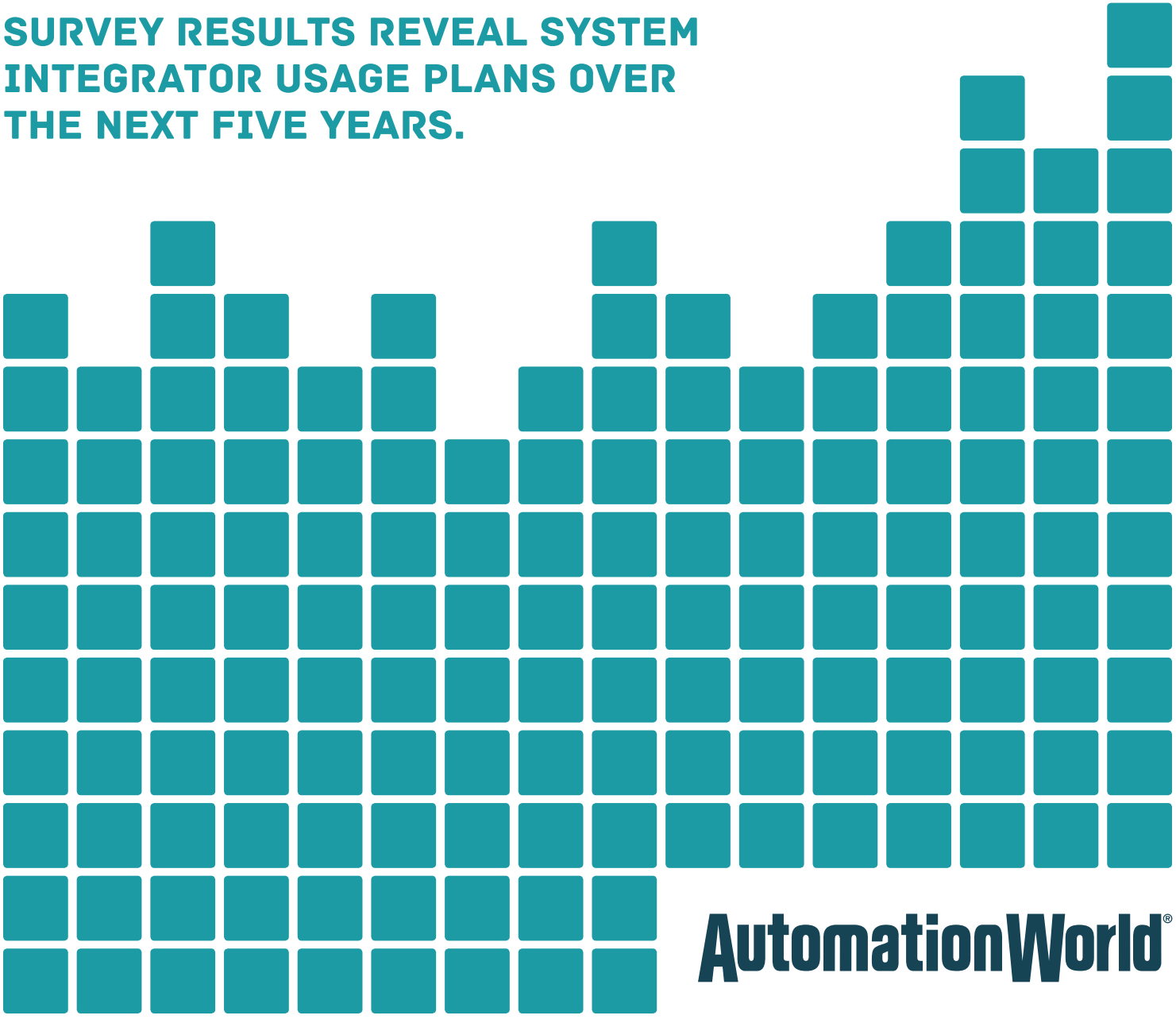
EXCLUSIVE SURVEY

THE CHANGING ROLE OF THE SYSTEMS INTEGRATOR

SUMMER 2014

NEW RESEARCH SHOWS HOW, WHY, AND WHEN COMPANIES RELY ON CONTROLS SYSTEM INTEGRATORS. SURVEY RESULTS REVEAL SYSTEM INTEGRATOR USAGE PLANS OVER THE NEXT FIVE YEARS.



AutomationWorld®

THE CHANGING ROLE OF THE SYSTEMS INTEGRATOR

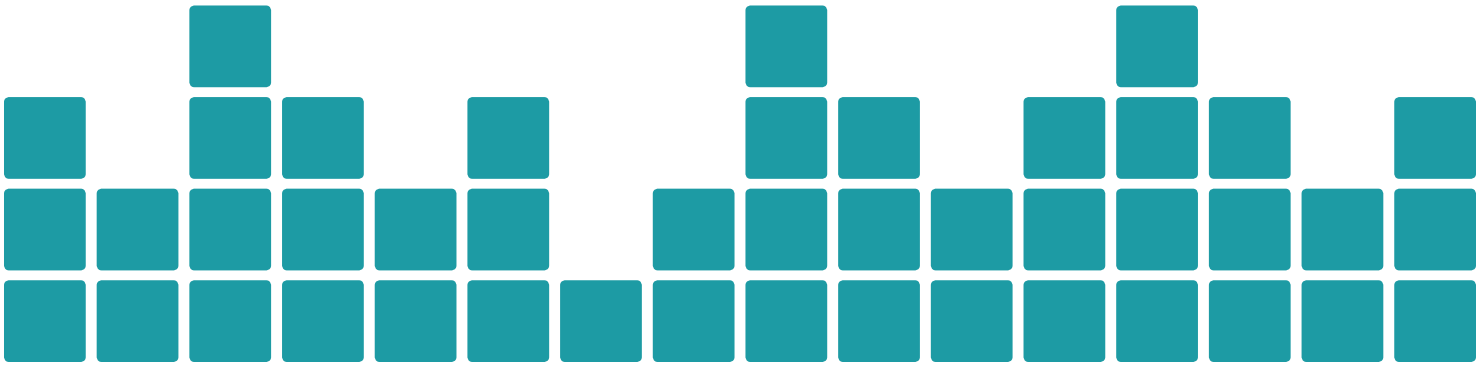
The role of the automation integrator is evolving as discrete and process automation baby boomers walk out the plant door one last time on their way to retirement.

Using an integrator? Getting the ultimate benefits from the relationship? Or still trying to decide if the integrator route is for you?

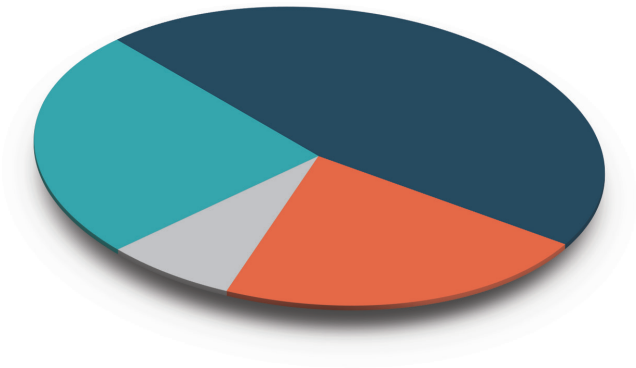
In this reader survey, conducted by the editors of Automation World, your peers share how, when and why they use controls system integrators.

Lacking in-house resources? Need to speed up project completion? There's plenty of reasons to use an integrator, but not all projects go smoothly. Read about some of the pitfalls and disappointments first-hand.

More than 300 automation professionals from factories and processing plants shared plans for future use of integrators. The following report will allow you to benchmark your own company's experience.



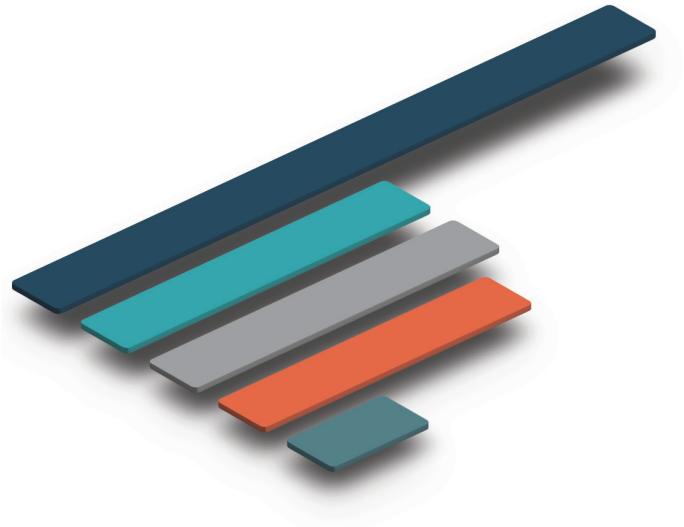
1. WHEN WAS THE LAST TIME YOU USED A SYSTEM INTEGRATOR?



46% In the past year
22% More than a year ago
7% More than 5 years ago
25% Never used a control system integrator

Nearly half of respondents have used a system integrator recently (within the past year). Only a quarter of respondents have never used an integrator.

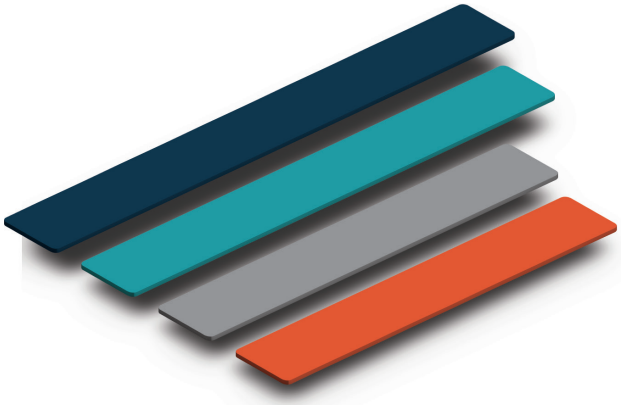
2. POSITIVE EXPERIENCES WITH SYSTEMS INTEGRATOR



49% Couldn't do project with in-house resources
25% Project completion speed
25% Lessons learned internally
22% Benefit outweighs the cost
8% Other

Not surprisingly, the biggest benefit to using an integrator was the ability to complete a project that could not have been done with in-house resources. Subsequent questions in this survey probed the reasons why in-house resources are scarce. It's also interesting to note that a full quarter of respondents cited as a positive experience lessons learned about processes through the integration project that internal company personnel were not aware of prior to the project.

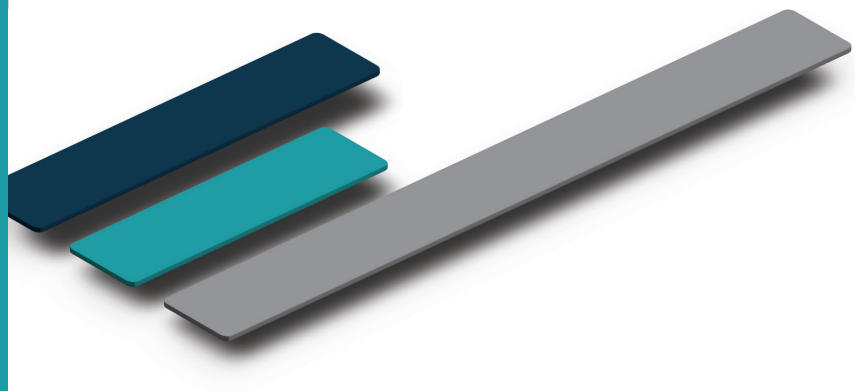
3. NEGATIVE EXPERIENCES WITH A SYSTEM INTEGRATOR



25% Expertise no better than in-house resources
23% Results not what expected
19% Cost not worth benefit received
18% Other reasons

With any contracting relationship, sometimes things go awry. Disappointment with knowledge level of system integrators relative to in-house resources was the most common negative experience, with a quarter of respondents feeling this way.

4. PLANS TO INCREASE USE OF SYSTEM INTEGRATORS OVER NEXT FIVE YEARS



28% Yes, because it's difficult to find new engineers
21% Yes, because it's less expensive than hiring staff engineers
51% No

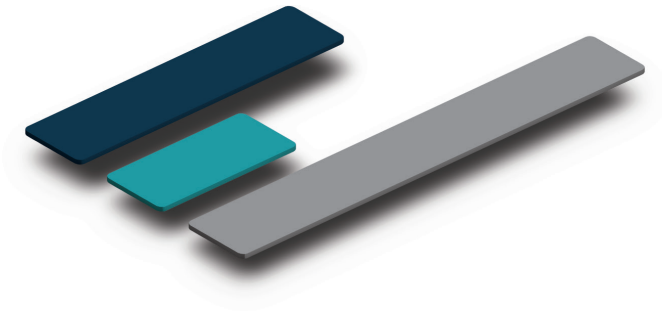
Half of respondents plan to increase their use of system integrators in the next five years as their more experienced internal engineering staff begins to retire. While the majority of that is due to the scarcity of finding and training a new generation of engineers, a significant minority feels that it's simply cheaper to rely on contracted engineering talent.

5. INTERNAL STAFFING LEVELS OF AUTOMATION ENGINEERS OVER THE LAST THREE YEARS

33% **Increased the number of industrial automation engineering employees**

17% **Reduced the number of industrial automation engineering employees**

50% **Number of automation engineering employees has stayed the same**



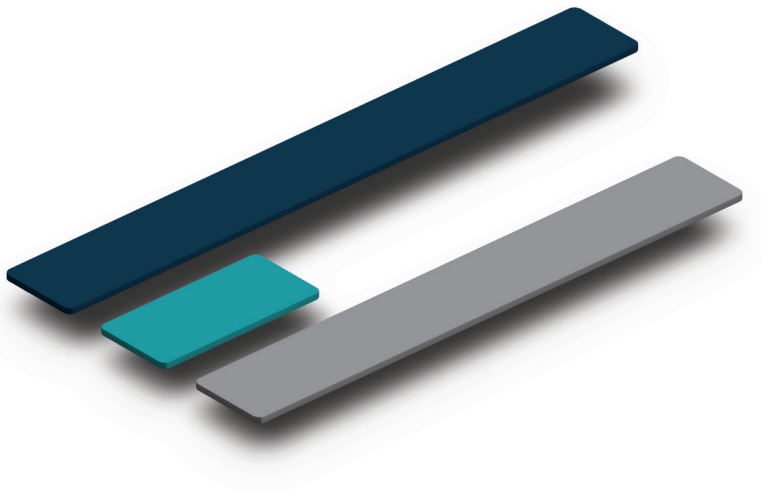
In one of the biggest surprises of the survey, and contrary to conventional wisdom, there has been a net increase of internal automation engineering staff over the last three years, suggesting that most companies will continue hire in-house engineers if they can find them.

6. RELIANCE ON SYSTEM INTEGRATORS OVER THE LAST THREE YEARS

47% **Increased our reliance on system integrators**

13% **Reduced our reliance on system integrators**

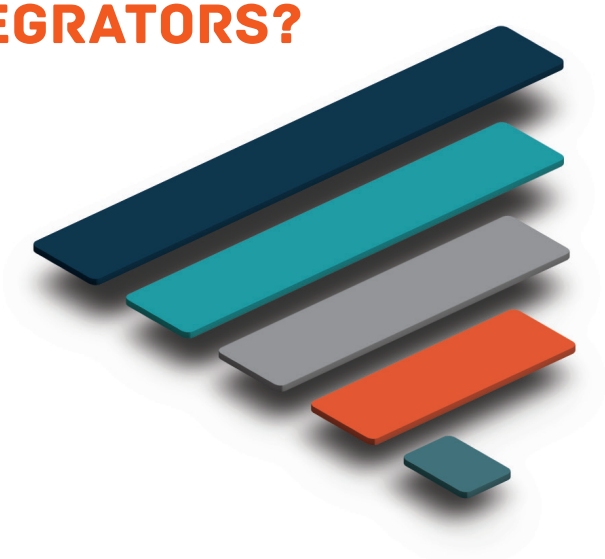
40% **Use of system integrators has remained the same**



There has been a net increase in the reliance of systems integrators over the last three years, suggesting that in-house resources, even though also on the rise, haven't kept pace with demands of new automation projects.

7. WHAT ASPECTS ARE MOST IMPORTANT IN YOUR SELECTION OF SYSTEM INTEGRATORS?

87% Application- or technology-specific experience
70% Industry-specific experience
54% Local office/support
38% Referral from trusted colleague
9% Other



Experience with a specific technology, application or industry are among the top criteria for selecting system integrators. (Note: It is possible to search the CSIA's Industrial Automation Exchange by these three criteria, in addition to geographical.)

8. WHAT DO YOU FEEL A SYSTEM INTEGRATOR IS MOST RESPONSIBLE FOR?

56% Testing – Commissioning and Site Acceptance
54% Machine and process safety
54% Project-management execution
49% Identify possible risks
46% Testing – Factory Acceptance
44% People safety
38% Project-management plan development
37% Operator training
28% Budget management
27% Personnel management
26% Regulatory compliance
23% Maintenance planning
22% Information security
13% Maintenance (ongoing)
10% Change orders

Aside from project management and testing, two of the more surprising top five criteria that end users feel system integrators are responsible for are safety (machine or process) and identifying project risks. While integrators should certainly take responsibility for risk associated with their performance, it could be argued that, ultimately, the end user should carry ultimate responsibility for all aspects of a project that could go awry, including but not limited to the performance of the contractor hired to implement that project.

SURVEY METHODOLOGY

To gather responses for this Automation World survey, two e-mail invitations were sent to Automation World's e-mail database during June 2014. Respondents who identified themselves as working for automation suppliers or system integrators were filtered out of the results, resulting in a net total of 337 end user readers completing the survey. The respondents were from a broad mix of process, discrete and hybrid industries, with nearly half (48%) working for large companies (1,000 or more employees). Just over two-thirds live and work in the U.S. and Canada.

SOLVING THE SKILLS GAP WITH SYSTEM INTEGRATORS

Numerous solutions to address the skills gap problem facing manufacturers are available. From partnerships between manufacturers and local community colleges to adapting the engineering education model, real action is being taken to address manufacturers' need for more skilled workers. The problem is that all of the steps being taken require years to fully develop, meaning that none of them adequately address the problem facing manufacturers now.

The Control System Integrators Association (CSIA) <www.controlsys.org> has been working with its system integrator members to better position its members' collective and individual expertise to address the skills gap issue for manufacturers today. To help understand the issue better with an eye toward developing a more comprehensive approach to the issue, CSIA partnered with Automation World to develop a survey that would provide an overview of how the manufacturing industries assess system integrators. Armed with this kind of information, the CSIA can better understand how to position system integrators' capabilities to address skills gap issues in the near term.

The survey showed that manufacturers are very familiar with system integrators in general. Nearly 50 percent have worked on a project with a system integrator in the past year, and some 75 percent have worked with a system integrator at some point in the past five years.

Respondent's opinions of system integrators was also largely favorable, with almost 50 percent noting that system integration firm's ability to complete the project was something the manufacturer could not have done on their own with in-house expertise. Another 25 percent cited value in the lessons they learned

after working with a system integrator; they also favorably recognized the speed with which projects were completed with the help of a system integrator.

The Skills Gap Problem

As for the skills gap, respondents had plenty to say about the problems they're facing. Comments include:

It's very hard to replace senior level control system engineer. New engineers do not have same skill level or work ethics. Without understanding field instrumentation, it is hard to understand our systems. We have also found that new engineers do not want to take time to understand the fundamentals of field instrumentation.

The workforce is not competent and it affects the execution time of the project and the quality of the documentation and presentation.

Skills gap is present. Automation technologies are changing very fast and there's no easy way to follow actual trends. Cycles of changes are getting shorter and shorter.

Control engineers right out of school lacks hands-on skills; plus they are not experienced with industrial standard practices.

We have experienced controls professionals, just not many of them. Big projects need to be done with outside resources.

Over time we spent a lot of effort trying to find experienced engineers. We were largely unsuccessful and realized that we needed to build the experience step by step with our own people. We need to shift the role of the senior engineers from project work to monitoring and resource development.

It seems as if the industry believes a controls engineer is no more than a software designer. However, a controls engineer needs to be well versed in building schematics, laying out panels, and troubleshooting problems that may include understanding mechanics. Too many new controls engineers do not have the skill sets required to do a job without having multiple people helping.

Some respondents note that they are already using system integrators to address these issues, or plan to do so soon. Twenty-eight percent of respondents said they plan to use system integrators in the near term because it is "difficult to find the next generation of engineers." Another 21 percent said they plan to use system integrators because it is less expensive than hiring and training staff engineers.

However, half of respondents said they had no plans to use system integrators to address the gap being created by retiring senior level engineers. Combine the overwhelming number of respondents' concerns about the skills gap, along with the fact that 50 percent say they have not hired new automation engineers in the past three years, and its easy to see the near-term problem facing manufacturers.

How Do System Integrators Fill the Skills Gap?

One of the possible reasons for the disconnect among those manufacturers that have no plans to use system integrators to address the skills gap is that these manufacturers likely don't view system integrators as a potential solution to their skills gap problem. After all, 45 percent of respondents were not familiar with the CSIA—an organization focused on vetting and improving the business viability of system integrators. With more than 400 member firms located in 27 countries, the CSIA hosts the CSIA Exchange, a website designed to help manufacturers connect with system integrators capable of addressing their project needs.

In terms of what, specifically, a system integrator can do to help manufacturers address their skills gap issues, Ed Diehl, co-CEO of Concept Systems Inc., a certified member of the Control System Integrators Association, says, "System integrators provide manufacturers with a skilled team that can tackle anything from leading a large-scale integration effort for a new process, retrofitting obsolete control systems, or developing an innovative automated approach to an old problem. Many system integrators also provide ongoing service, support, and maintenance for your automated systems."

Diehl highlighted five specific examples of how system integrators can help fill the manufacturing skills gap:

Service, support, and maintenance. "Many system integrators have dedicated service and support staff," says Diehl. "You can pre-purchase a set number of hours for the year to address whatever needs to be done in your plant. This is an effective way to augment your staff and handle small upgrades, make process improvements, replace obsolete equipment, train staff, etc. System integrators do this for a number of manufacturers and it works well by relieving the stress on the manufacturer's internal support team. The integrator comes in for a set number of days per week and handles the punch list or provides service as needed on an on-call basis. For example, I've got such a contract with one manufacturer that typically engages one of my engineers just a few hours a month. But once in a while the tasks involve a specialty technology, or a short downtime window, and I'm able to bring in additional resources just to tackle that particular task."

Lead integrator. When a big line expansion needs to be done, even manufacturers with dedicated engineering teams can be maxed out. Teaming with a system integrator that can manage and staff all the control and information pieces for a large project makes a lot of sense, says Diehl. "In this situation, system integrators work as an extension of the client's project team. System integration firms are able to staff up during key points in the project," he adds. "In contrast to a typical temporary staffing firm, the system integrator brings both talented people and a structured project methodology to these projects."

Control retrofits. Many manufacturers have obsolete, unsupported control systems running critical production centers. Downtime risks due to a control failure increase every day that old system is still in place, notes Diehl, yet there are also risks associated with a retrofit that goes wrong. "Teaming with a system integrator is an effective risk management strategy," says Diehl. "Many integrators have the technical experience with your old and new technology, combined with a risk management strategy that includes factory acceptance testing in advance of the shutdown, hour-by-hour conversion plans, contingency plans, and backup resources. System integrators regularly retrofit mission-critical systems within very short scheduled downtime periods."

Innovative automation solutions. You probably have many areas in your facility where you think we can do that better/faster/safer/easier if we automate, but there isn't one machine or work cell on the market that does the trick. Many system integrators thrive on the challenge of integrating proven automation technologies together in new ways to solve old problems, according to Diehl. "System integrators regularly leverage what they have seen in other industries and applications to solve such problems," he says. "For example, 3D scanners I've used for years in the wood products industry

work wonders for food packaging inspection."

An extension of your team. "You bring the knowledge of your specific processes and market needs, the system integrator brings a working knowledge of leveraging automation technologies," Diehl says. "By working with your system integrator as a partner, you can solve some big manufacturing challenges while eliminating the need to hire additional skilled staff."

With this information fresh in mind, and a skills gap problem likely right in front of you, check out the Control System Integrators Association<www.controlsys.org> to find a system integrator partner. Within the CSIA integrator membership, manufacturers have access to some 14,000 trained and experienced control engineers, automation engineers and technicians. Their backgrounds are as varied and diverse as the technologies that run your plant, bringing a high level of insight and fresh ideas to the table.