

The New Control System Integrator

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The Future of the Integration Field and How to Stay Ahead of the Curve

Integrators are the human face of the industrial automation industry – but if you look closer, you’ll see how their face has changed in light of the ever-changing landscape of information technology.

Control system integrators have long served the automation industry as the technical and mechanical specialists who bridge the gap between people and the machines, devices and software they use. For process manufacturers, the machines, devices and automation software packages are all essential to a successful process – but it is the integrator who gets everything to work together.

Modern information technologies have transformed how integrators get things done on a daily basis and has even affected the kinds of things they do. Technology is progressing at such a rapid pace that it’s almost impossible to keep track of it all. Modern information technologies have affected virtually every part of our everyday life from how we communicate, how we relax, how we socialize and especially how

	The Internet	page 5
	SQL Databases	page 6, 12
	OPC-UA	page 7
	Mobile Devices	page 8
	Server-Centric Applications	page 9
	MES	page 11
	PLC Programming	page 11
	Networking	page 13
	Software Programming	page 13
	SCADA System Security	page 14

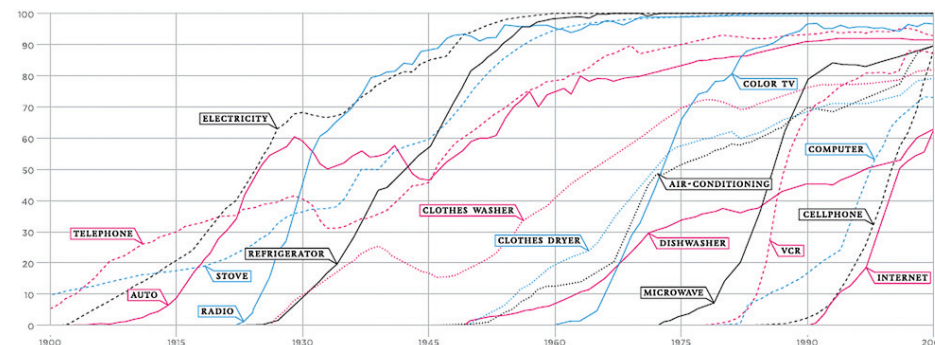
we work. Those who can’t keep pace are in danger of being left behind.

New World, New Challenges for Manufacturing Companies

The world has changed in terms of how readily we accept new technologies. It took close to 50 years before half of American households had a functional telephone, but it only took about 10 years for the Internet to be in 50% of U.S. homes.

Consumption Spreads Faster Today

Percent of U.S. Households



The graph to the left (from The New York Times, designed by Nicholas Felton) shows the rate of consumption of technologies in U.S. households from 1900 to 2005.

nytimes.com. 2008. The New York Times. 10 Feb. 2008
<http://www.nytimes.com/imagepages/2008/02/10/opinion/10op.graphic.ready.html>

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It seems that much of the world has simply gotten used to the rapid change of technology and has even come to expect it. One of the major catalysts for technological change has been the Internet because of the way it facilitates the rapid distribution of data around the worldwide community.

For businesses, the Internet has made the world both a smaller and bigger place at the same time. Smaller because it's so much quicker to communicate with a global audience and bigger because it has opened up entirely new markets that never would have been within reach before.

This kind of connection can be a boon for businesses, but it comes at a cost – steeper competition. The new business world is more competitive now than ever, and that makes the cost of not staying ahead of the curve for new technology and trends that much higher.

The highly competitive manufacturing industry is especially affected by this new global business landscape. Manufacturers have to look for every competitive edge they can get and often have to do more with less in order to compete on a global scale.

Top quality control system integrators can be a huge part of helping manufacturers stay ahead of their competition; in fact, they can be the key difference.

A forward-thinking control system integrator doesn't only give their clients the control system they need that moment – they give them the system that can take their client into the next decade and beyond. A top quality integrator is one who keeps their feet firmly rooted in the solid foundations of their discipline's past, but with an eye fixed on the future.

Manufacturers & Integrators

With so much riding on successfully charting a manufacturing company's course for the future, it's important to know what to look for in a control system integrator, and what the future holds for the industry.

At Inductive Automation, part of our mission is to inform and educate in ways that will help move the industrial automation market into a productive future. As part of that effort we have investigated this topic to help prepare manufacturers in knowing what to

consider when choosing a control system integrator to hook up their machines, devices and software.

For integrators, this paper will help inform them on the latest technologies and trends that are shaping the future of the integration field.

We Asked the Experts

To get this information we went right to the experts themselves. We surveyed a pool of more than 6,000 integrators from various industries around the world. The pool was comprised of a wide cross-section of integration firms, ranging from smaller operations to some of the largest and most successful integration firms in the world.



We asked them two basic questions:

1. Which new technology has most changed the role of control system integrators in the industry today?

2. What skill set will be the most valuable in the future for control system integrators?

We found the results of our survey to be informative, insightful, and even surprising. For your benefit the results and responses of our survey have been analyzed and summarized in the form of this paper. Our hope is that this information can be a help to you in making informed decisions moving forward into the future.



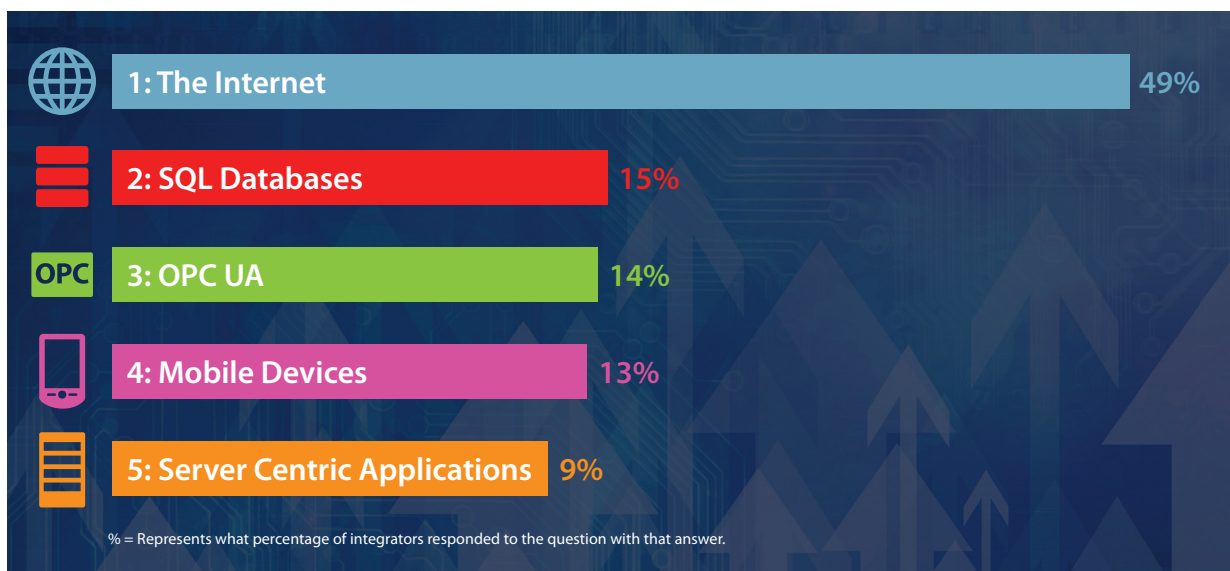
Question 1: What Technology has Most Changed Control System Integration?

In order to know where you are going you have to know where you have been. It's vitally important to understand what technologies have most changed and continue to change the field of control system integration in order to see what direction the field is moving.

For this reason we asked our pool of integrators the question:

Which new technology has most changed the role of control system integrators in the industry today?

The results and the analysis of each answer are below.



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1: The Internet – 49%

Is there anything the Internet didn't change? Clearly the expert respondents of our survey felt that the Internet has had a vast transformative effect on the field of control system integration. At 49%, the Internet was the overwhelming choice by integrators as the technology that has most changed the field today. So what have those changes been, and why are those changes important?

Wide Area Networks

Wide area networks or WANs were around before the Internet, but they were much more difficult and expensive to create. A WAN is made up of connected local area networks (LANs). These LANs consist of computers and devices that have been networked together on a local level, such as an office. When several LANs are connected across a large area they form a WAN. For most companies, data is the lifeblood of their business; without it, decisions can't be made and things don't get done.

The most efficient and secure way to share data across multiple sites is a WAN, but before the Internet, WANs were reserved for only the wealthiest and most technically savvy companies. However today – because of the Internet – setting up a WAN is easy. You just need to plug into the Internet, adhere to security protocols and get connected. The ease at which this can be done has literally changed the way most companies do business. It's now a standard for companies to have connected networks that facilitate the rapid sharing of data, communications and ideas around the company, no matter where they are.

The Web makes it possible for integrators to link multiple sites together into a WAN, even if they are on opposite sides of the world. An operations manager in California can check the status of a production line in a facility in India through a secure WAN right from his desk and see data in real time. That's a game changer.

Remote Access

Easy remote access is another major reason the Internet changed the integration field. The ability to remotely access a supervisory control and data acquisition (SCADA) system through Internet technologies such as virtual private networks (VPNs) have opened up new possibilities to integrators.

Having the ability to connect from anywhere means that integrators can now develop a new SCADA project, update old ones and even troubleshoot systems for customers around the world – all while sitting in their own office. Remote access allows any integrator to offer customers real-time assistance, regardless of location. It has also greatly widened the reach of integration firms, regardless of their size.

The Internet also gave integrators the ability to offer remote access to clients. Giving them the ability to access their control systems from another facility, their home or the field. Customers have come to expect this kind of access to their data, and as a result, it is an essential skill for integrators to know how to provide remote access to clients.

Fortunately the Internet has also made it easier for integrators to search for support topics and immediately connect with vendors, which makes it easier to find solutions for their customers. Thanks to the Internet, having a huge in-house library of user manuals is no longer necessary because it is fast and easy to find support documentation for new and old products.

The Cloud

The cloud is a concept entirely born out of the Internet. It's the idea of using large arrays of remote Internet-based servers to store and handle data and server applications. The cloud concept is that a company has its server applications and data saved off-site, on the servers of a third-party hosted cloud service, and then that data can be accessed by connecting to the cloud server through an Internet connection.

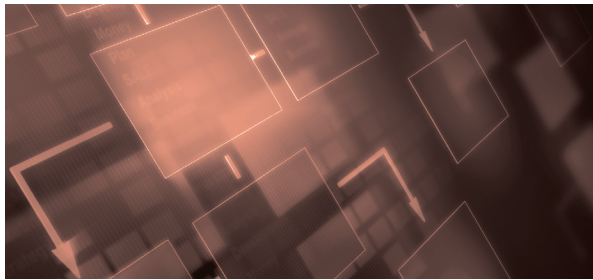
The "cloud" is one of the buzziest of buzzwords in business today, in large part because of the potential it holds. It's unclear what the future of the cloud will be in the industrial automation market and how it will affect things, but one thing does seem clear: For better or worse, the handling of more and more data and software is heading into the cloud. The cloud is an Internet technology that integrators simply must be aware of because of its potential impact on the industry and because many of their customers are moving their information to the cloud.



2: SQL Databases – 15%

Coming in with 15% of the vote, a significant number of the integrators we surveyed felt that SQL databases have had a big effect on their role and the field at large. SQL-compatible databases are the most popular databases in the world, used to store information of all types in every industry you can imagine.

SQL is not a type or brand of database; SQL is a standardized structured query language for databases. SQL databases are relational databases, which are structured like a large spreadsheet with rows, columns and cells, but are much more powerful and accessible to multiple users at the same time. SQL databases are popular for their simplicity, ease of connectivity, flexibility and most of all their ability to quickly query related data.



Connecting to Enterprise Systems

The business world on the whole has fully embraced SQL databases and as a result most standard enterprise systems use SQL databases. This is especially true for enterprise resource planning (ERP) systems. According to the integrators we surveyed, one of the most common requests they receive from their customers is to connect the data from their SCADA systems to their ERP systems.

Before SQL databases, connecting SCADA systems with other manufacturing execution systems (MES) was a real challenge. It could take multiple applications, running on multiple operating systems and an untold amount of hours and support just to get data to and from the plant floor and back to corporate planners. Now, if you use SCADA software that utilizes SQL databases, getting it to work with the databases of other MES applications is a simple process because both systems speak the same language. Since SQL is so widely used, it is very well supported so troubleshooting isn't nearly as time-consuming.

Data Analysis

SQL was created with the specific intent to make it easy to ask questions of data. The primary function of SQL is to create a query (or question) and run it against your data to retrieve an answer. Simply put, SQL was built to quickly answer complex questions about large amounts of data. The real power of SQL for analyzing data is in its ability to relate data together across multiple tables and multiple databases.

The ability to ask questions of your data is extremely empowering, and it can be used endlessly to find important answers that can positively affect the profitability of a company. There are any number of facts that can come to light when data is questioned – facts that can inform important decisions that affect a company's bottom line. Having controls data easily accessible in a SQL database makes it easier to ask and answer important questions of data.

Logging Historical Data

Traditionally, time-series data has been stored in a process historian, but relational SQL databases offer a compelling alternative. SQL databases compare favorably to process historians and even offer the major advantage of making historical data more accessible to other enterprise systems. SQL databases are less expensive, easily accessible and more easily scalable than storing historical data in a dedicated historian.

A process historian is an application specifically created to deal with time-series data. A historian is made for the storage and analysis of time-series data and as such is designed with an emphasis on the compression and speedy retrieval of large amounts of data.

Most historians use proprietary technology to compress and store data, which can make it difficult for other systems to easily communicate with them. As a result, time-series data is often kept totally separate and detached from the rest of the enterprise data; not because it has to be, but because historians make it difficult for other systems to work with.

Using an SQL database allows integrators to break away from the use of expensive proprietary process historians and use a solution that any IT department can easily support.

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OPC 3: OPC-UA – 14%

Coming in right behind SQL databases, OPC-UA was selected as the next technology that has had a great effect on the integration field. It's easy to see why. OPC is the method used to connect with devices like programmable logic controllers (PLCs) and programmable automation controllers (PACs), which are the foundation for most industrial automation systems.

In the automation industry, OPC functions similarly to how printer drivers function on a personal computer. Without it, devices just aren't able to understand each other and work together. Any change to OPC has a large effect in how integrators connect the plant floor to the rest of the enterprise.

Interoperability

OPC-UA is a unified architecture for OPC. It's the next generation of OPC standards created to provide a more uniform and reliable framework for accessing real-time and historical data. The focus of OPC-UA is interoperability, to make it easier to connect to more diverse types of devices as well as different brands of them. OPC-UA was also designed to work with older devices and new state-of-the-art ones, creating a bridge from legacy products to new devices.

Unlike the OPC technology of the past, OPC-UA is not dependent on DCOM, a proprietary Microsoft technology that has become deprecated. This means that control systems that utilize OPC-UA no longer have to be tied to a specific brand of device or operating system, which has opened the field for new products and software. This has increased the choices and flexibility for integrators when putting in new control systems. The result is that integrators now have more options to choose from in order to create the systems their clients need.

Fast Implementation

One of the major benefits of OPC-UA for integrators is that it has greatly simplified the process of connecting devices. This can be a real time-saver and allow integrators to focus on other parts of the system.

OPC-UA is open and platform independent, which gives integrators a great deal more freedom to put a system together how they want, instead of being locked into a specific setup by proprietary technology. It also means that control systems don't have

to be tied to a specific type of operating system because of the PLCs.

Connecting to the Enterprise

An underlying benefit to all of this is that OPC-UA makes it easier and more secure to connect data coming from PLCs on the plant floor to other systems in the rest of the enterprise.

Integrators are always asked to make controls data more accessible and more available. Integrators who help their clients do this effectively are a huge asset to manufacturing companies. Manufacturers that employ integrators who can do this will reap the benefits of having real-time process and analytics of the data from their plant floor. OPC-UA is one of the key technologies that allow the modern integrator to do accomplish this.





4: Mobile Devices – 13%



Smartphones and mobile devices seem to be taking over the world. All you have to do is walk down a crowded street or step into a restaurant to notice people swiping, clicking, listening and sometimes even making a call on their smartphone.

People use their phones all the time, and they have become accustomed to getting information on-demand in the palm of their hand. It seems that expectations for instantly-accessible data haven't gone unnoticed in the industrial automation field. 13% of the integrators we surveyed said that mobile devices have a huge effect on them and on the demands of their customers.

Customer Demand

The effect that mobile devices are having on integrators is pretty easily summed up in two words: customer demand. Integrators overwhelmingly told us that the request they hear most from their customers is the ability to access their SCADA systems with their mobile device. In some ways it's like the Internet boom all over again, but this time with mobile devices. Customers want to be connected to their data, and they want that connection on-the-go.

With the success of smartphones it has become commonplace to access information ranging from social media sites, banks, cloud services and enterprise systems – so why not control systems? The fact is that people have begun to see it as a requirement, not a convenience, to access their data from their mobile device, and integrators and SCADA software vendors have struggled to keep up with the demand.

Access Data Anywhere

The demand from companies to access their control system data from mobile devices doesn't just come from higher expectations based on other industries. It's based out of the very real need to compete.

In today's economy, manufacturing companies are especially in need of getting every advantage possible. This means that manufacturers are often forced to do more with less. To do this, the workforce today needs to be mobile in order to cover more ground effectively.

Today's companies need access to their data from anywhere and at any time – from the field, from their home. Often in the field, the only Internet access that can be achieved is through the network of a mobile device. Using a mobile device to connect to HMI / SCADA systems can be a valuable asset in these instances and can even be the difference in averting a serious problem.

Dynamic Data Presentation

Another change for integrators with the rise of mobile device popularity is the shift in how their customers see and interact with their data. Smaller screen sizes and touchscreen technology have a largely affected how HMI screens are seen and used when accessed on a mobile device.

People interact with their systems differently on a touchscreen device than on a desktop computer. Quite literally, mobile devices are changing the way HMI screens look as integrators are designing screens that are more effectively formatted to device requirements.



5: Server-Centric Applications – 9%

With 9% of the vote, server-centric applications came in last, but certainly not least, in our list of the most transformative technologies on the field of integration. Traditionally software is installed on local machines and runs only where it is installed, but server-centric applications are different. Server-centric applications are installed on a server, and application clients can be launched to any machine connected to the server without individual installations.

Server-centric applications have caused a shift in how SCADA software is deployed across an enterprise and have greatly affected the way in which integrators go about installing SCADA software. With SCADA software being a major piece of the puzzle in the job of integrators, a technology like server-centric applications has made a big difference in how integrators get the job done.

No Installation

One of the biggest benefits that server-centric applications offer is how greatly they reduce the work and time needed to install SCADA software. Instead of the time-consuming task of installing software on every machine that needs it, application clients can be deployed from the server in a matter of seconds via the network or Internet. This can save hours, days, even weeks of time for integrators, giving them time to focus on other things – such as developing new HMI / SCADA projects.

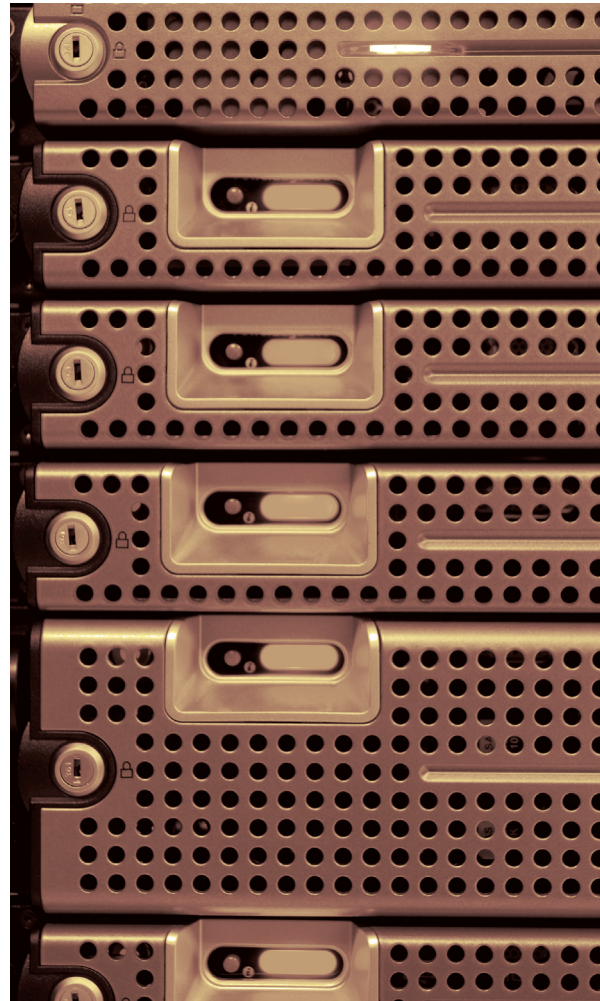
Another huge benefit of server-centric applications is the ability to launch an unlimited number of clients. This makes it easy for integrators to give access to people who need it and facilitates the effective flow of data throughout the enterprise.

Instant Updates

Since the application is located in one place – the server – the process of making updates to SCADA systems has been greatly streamlined. Instead of updating each installation of the software, updates can be made at the server level and instantly deployed across entire networks in seconds.

This is also a huge advantage when developing new HMI / SCADA projects. New projects can now be concurrently developed by multiple people at the same time. The process is seamless because development

all happens in the same place – on the server. This can save an untold amount of time, making development much quicker.



Reliability

Server-centric applications also have the advantage of being more stable. This is due in part to the fact that it's easier to set up redundancy. Since everything is stored in one place, it's a fairly straightforward process to back up the information with another redundant server or in the cloud. Fault-tolerant systems can be created by joining two servers together via a gateway, so if one goes down the other keeps running and users don't even notice a difference.



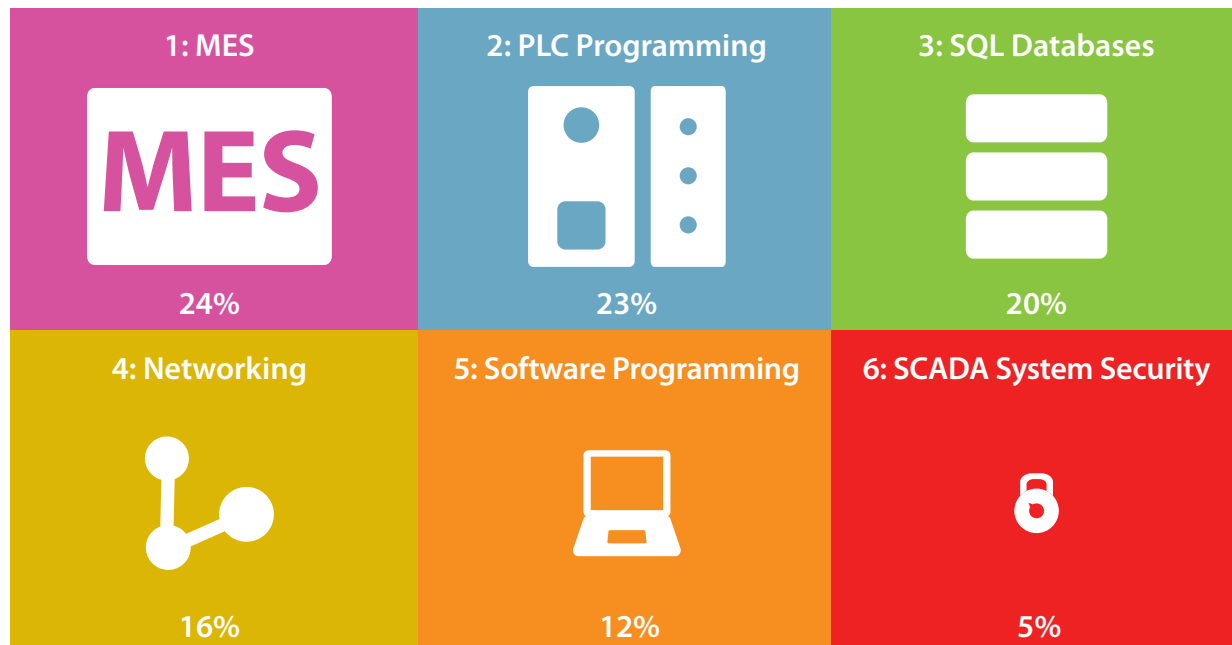
Question 2: What Skills Will Be the Most Valuable for Integrators in the Future?

All of the technologies discussed in this paper have had a big effect on both the role of integrators and the kinds of services they can offer their customers. With the speed of technological advancement showing no signs of slowing down, it is important to keep up with all of these changes in order to stay relevant and prosperous as an integrator today. Like technology, integrators must continue to change and grow in order to keep up with the demands of their customers and stay one step ahead of the competition.

A huge part of this growth is continuing to learn the skills that will allow integrators to keep pace with the industry. In an effort to help you stay ahead of the curve we asked the integrators we surveyed the following question:

What skill set will be the most valuable in the future for control system integrators?

The results and the analysis of each answer are below.



% = Represents what percentage of integrators responded to the question with that answer.

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MES 1: MES – 24%

A manufacturing execution system (MES) is an information technology for the monitoring and management of work-in-process on a factory floor as well as historical production data.

MES software is designed to bridge the communication gap between the plant floor and the management and executive levels. It is used to keep track of real-time data in the manufacturing process as well as analyze and present it in the form of actionable information. MES software is used for tracking and improving such things as unplanned downtime, quality, recipe management, track and trace, scheduling, genealogy and many more functions.

Customers Are Demanding It

There are some people who may be surprised that the ability to work with MES came up in our survey as the number one essential skill for integrators to know in the future.

However, it's no surprise to those integrators we surveyed for one specific reason: their customers are continuing to demand more integration between their control system and MES and ERP systems.

Improving Processes With MES

MES solutions offer manufacturers the tools necessary for continued improvement of their processes to make them more efficient and ultimately more profitable. In a challenging economy many companies have been forced to do more with less. Making their process more efficient is a cost-effective way of doing that.



Of course you can't improve a process unless you track it, and MES software offers that solution. MES gives manufacturers the chance to really see what is happening with their process, and it facilitates a sense of accountability for making the process

better. The potential of integrating MES, control and ERP systems is enticing because the cross-analysis of all that data can result in immediate and impactful insights into what's actually happening in each system, how they affect each other, and how they can be improved.

Huge Potential for Growth

Integrators who have the knowledge and expertise to integrate MES software with SCADA and ERP have a real opportunity to set themselves apart from the pack by offering their clients something that they really need, and it's likely something that they don't already have.

MES is a large area for growth for integrators because many manufacturers are still stuck in the past when it comes to MES data; many often track MES data manually on paper. Automated data collection is much faster, more accurate and can give manufacturers the edge they're looking for. Being able to offer that service greatly increases an integrator's value to their customers and it's a great setup for growth in the future.

In a sense MES can be the gift that keeps on giving because it can increase efficiency, which is the equivalent of finding free money right on the plant floor. Companies can become more profitable by using MES tools to become more efficient. For integrators who offer MES services, they have the potential to deliver their clients a huge return on investment, which can greatly increase the profitability of the client and the integrator.

PLC 2: PLC Programming – 23%

A PLC or PAC is a digital computer used for the automation of electromechanical processes. PLCs are used to capture data and control machinery, usually on a factory floor. PLCs are relatively simple computers, designed with reliability and durability in mind. Most PLCs are programmed with basic ladder logic because of its apparent simplicity.

Still a Foundational Skill

PLC programming is a foundation skill for integrators because it serves as the basis for most control systems. For this reason it's not surprising at all to see PLC programming come in as the second most important integration skill to know.

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In order for a SCADA system to be of much use, data has to get from the plant floor to a database, and PLCs are the best devices suited to this task. Simple PLC logic is still the language of choice for interfacing with machines and has proven to be a solid time-tested solution for industrial controls. That is not likely to change anytime soon, which makes PLC programming an indispensable skill for integrators now and in the future.

Integrators who have strong PLC programming skills will continue to be valuable in the future, even as new technologies emerge. The reasons for this are twofold.

The first reason is that PLCs are at the heart of control systems for almost all manufacturers and even if that changes, it won't change quickly. Manufacturers value reliability above all and are slow to make changes to new technologies until they are proven. This means that PLCs will be around a long time, and even if the industry does migrate to a new technology, it will be a slow process that will still require the expertise of integrators with strong PLC programming skills.

A Skill Only Integrators Possess

The second reason is that while IT (information technology) departments already handle many of the other skills on this list, PLC programming is still foreign to most of them. Since PLC programming isn't used much outside the manufacturing industry, most IT professionals don't have to deal with it and don't know much about it. This makes an integrator with deep knowledge of how to work with PLCs totally essential.

3: SQL Databases – 20%

As mentioned earlier in this paper, SQL is a standardized structured query language for relational databases. A database is a central clearinghouse for information. It digitally stores any variety of information you can imagine. Databases are not defined by what kind of information they store, but rather the structure in which they store data.

Every true database requires a database management system (DBMS), and a relational DBMS is the most widely used. A relational database is one that stores information in the basic structure of tables

made up of rows, columns, and cells. You can think of it like a big spreadsheet, just way more flexible and powerful. Relational databases are extremely popular, so much so that they pretty much define what the word “database” means. When you think of a database, you are more or less thinking of a relational database, and SQL is the most common query language for relational databases.

SQL databases are the most commonly used database in the world and are already in use by most MES and ERP systems. SQL is also being increasingly used to manage the data in SCADA systems. As a result of the wide use of SQL and its increasing prominence in the industrial automation field, it has become more important than ever for integrators to broaden their skills in working with SQL databases.

The integrators we surveyed told us that their clients are always asking them to get more data into the hands of more people. Most of the data that companies have is stored in SQL databases, which requires integrators to know SQL in order to work effectively with that data.

Databases Are Friends of IT Departments

Integrators who know SQL also have the added advantage of being able to communicate more effectively with IT departments, which can make a huge difference, especially when trying to win new clients. IT departments are much more likely to give their seal of approval to SCADA systems that use standard information technologies like SQL than those that are built on proprietary technology.

SQL Skills Open a New World

Possessing a SQL skill set also increases the kind of work an integrator can do. This skill set opens a new potential for greater growth in the future, especially because many companies already have a SCADA system in place.

While most integrators just update and maintain a previously-installed SCADA system, the modern integrator can offer more services to customers by leveraging the data that customers already have and relate it to data from other enterprise systems. This service offers a higher value to a manufacturing company.

SQL is perfect for this application, and integrators who can add SQL to their toolkit will be able to offer a more complete package of services to their clients in the future.

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4: Networking – 16%

A network is a collection of interconnected computers, network servers and other devices. The components of a network are connected together by communication channels – governed by communication protocols – that facilitate the sharing of resources and information.



Often classified by size, networks can range from a local area network that can consist of as few as two connected computers, to a wide area network that can consist of thousands of computers spanning the globe. The Internet is itself a network made up of the connection of millions of other networks. Simply put, a network is how information gets from point A to point B through standard communication protocols.

Networking is important to integrators because without communication there is little integration. Networks connect people with data, which is an essential role of an integrator. As the network of the World Wide Web grows larger and companies expand their reach even further, they will need to deliver data to the right people, no matter where they are. Strong networking skills are important in delivering scalable solutions that will grow with companies as they expand.

An Ever-Growing Skill

Communication technologies have continually improved over the years, and networks have become larger and more complex. There are more ways now to set up system architectures than ever before, which have given integrators more possible solutions to communication problems.

This also means that there are also more variables to consider than ever before, and this will likely increase in the future. Integrators who have developed their networking skills will be better equipped to handle new challenges moving forward.

5: Software Programming – 12%

Software programming is a broad term that generally describes the process of writing, testing, debugging and maintaining the source code for software programs. Integrators who know how to write custom code are highly valuable.

A huge part of integration is getting all the different systems and pieces of software to talk with each other. Having knowledge of some of the more common programming languages gives integrators more flexibility when working with a SCADA system. They can often extend the usefulness of a given piece of SCADA software.

SCADA Software is Not Enough

One thing many of the integrators we surveyed told us was that customers were always asking for more functionality from their existing SCADA software. Many companies are often unsatisfied with the out-of-the-box functionality of their SCADA software package, and they want a customized solution to fit their customized process.

This makes sense, especially for manufacturing companies that have spent years refining their process to work for them. Companies often have to change how they do things to fit the way their software is preconfigured. They want integrators to make the software conform to their processes and ways of doing things, instead of the other way around.

Integrators with software programming skills can offer clients custom-made solutions, which often eliminate the need for more add-on software and can increase the functionality of existing SCADA systems. This kind of skill can make an integrator endlessly valuable to their clients because they can offer innovative new solutions to problems that other integrators can't. Integrators with this skill will be able to say 'yes' to client's requests much more than saying 'no'. That could make all the difference in winning new jobs in the future.

Coding for the Future

There are many programming languages out there, but many integrators we surveyed stressed the importance of using programming languages like Java and Python that are based on open standards and are easily supported.

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Integrators who offer custom code based on open standards are looking out for the best interests of their customers. Open standard languages don't trap a company into using only the original code author to maintain and update the code over the long-haul. This is important to manufacturers because they need to know that if for some reason their original integrator is no longer available – moves, retires, etc. – they can maintain their system without too much hassle.

6: SCADA System Security – 5%

The term “system security” in our survey referred to the safeguards, protocols and procedures that ensure the safety of the controls and data of a SCADA system.

The subject of SCADA system security is growing more important every day as the Internet continues to further connect everything together. A lack of security can open a system up to virus attacks that can cripple processes, potentially costing a company a lot of time and money.

With so many devices going online, even machinery on the plant floor is being connected to the Internet. The reality for today's manufacturers is that even if a piece of plant equipment is in the dark depths of a facility, it doesn't mean it's not easily accessible electronically.

Security Isn't Just For IT Departments

While network security is well within the realm of IT departments, integrators should take an active role in SCADA system security. Many IT departments are unfamiliar with SCADA, and may not give it the time and attention needed to ensure its security. Integrators need to have enough security knowledge to bridge that gap.

Strong system security expertise can set an integrator apart from the competition. An integrator with these skills is an attractive choice to manufacturers, especially those with highly-sensitive processes and data.

With the Internet came great technological changes, but also increased risk. Security threats to SCADA systems posed by the Internet only seem to be increasing, making system security an important skill for modern integrators now, and even more essential for the future.

Who is the New Control System Integrator?

A new integrator has emerged. He is a champion of the latest technologies. The Internet, SQL databases, mobile devices and other changes have not held him back, but have propelled him forward to greater heights in service to his customers.



He can offer solutions to his customers that were never possible before, because he has leveraged these new technologies to benefit his customers. As customers continue to demand more connectivity for their data and systems, this new integrator is rising to meet the challenge.

But the new integrator has not forgotten his foundation. He has merely added to it. Foundation skills such as PLC programming remain as important as ever, and lay the groundwork for building newer skills such as working with MES and SQL databases as these technologies have grown in importance.

As customer demands continue to evolve and technology advances, integrators must be ever prepared to help facilitate the success of their clients with the latest tools and a rock-solid basis of past experience. Modern technologies and associated customer needs have changed the role of integrators, and will continue to shape their future.

Embracing the Future

Steve Hechtman, the founder and CEO of Inductive Automation has more than 30 years of experience as a control system integrator and is a widely respected innovator in the field. Steve's frustrations with the limitations of legacy SCADA software led him to start Inductive Automation in order to create SCADA software solutions for the future. A big part

► The New Control System Integrator



of Steve's success has been to embrace new technologies and the possibilities they offer in solving today's problems.

"There are some integrators who just stick with what they know; they're old-school so they just stay away from technology that's unfamiliar to them," said Steve. "These guys are encountering a glass ceiling they think they can't get through. What they don't know is that the ceiling isn't really there. You can walk right through it if you are willing to expand your comprehension and learn new things. The future has all kinds of new possibilities, but you have to be willing to embrace it."

New, modern web-based SCADA software that fully utilizes SQL databases opens up new possibilities for integrators that would have been impossible before. Steve explained: "The Internet is amazing. On one project we used a corporate WAN to combine sites all across the country. They were all linked together and all logging data to a central server from which reports from any of the sites could be generated.

"This was all possible by virtue of the fact that we could put the PLCs on the Ethernet along with all the servers; everything on the same WAN. We can also maintain everything remotely; it really is amazing. It's a real thrill as an integrator to be able to do that, to see it all come together and to be able to offer that value to your customers. Something like this just wasn't possible before the Internet. We just wouldn't have been able to do it without these new technologies."

Grounded in the Past

As exciting and as bright as the future may be, it is important for integrators to remember how they got to where they are in the first place. It would be foolish to throw out the wisdom of the past for the promise of the future. For this reason it's important to remember the foundation that makes integrators special, and makes them a valuable and essential part of the automation industry.

Steve explained what skills integrators must never lose: "No matter how technology changes, there will always be a place of the plant floor for guys who can fix stuff and make it run – always, always, always. You need to have that sense, that skill for how to get the job done, for how to make things work.

You can never lose that, no matter what new tools are invented, you can never replace that common sense and intuition that a good integrator can bring to the table.

"You have to remember that at its core, the job of integration is to work with people, not machines. You have to be able to be one-on-one with your customers. They need to see you and talk with you in order to build a relationship of trust. The trust is so important, you can't fake it.



"The Internet is great, but you can't let it become a crutch. Remote connectivity is no replacement for human connection. We have these great tools, but your skill as an integrator to solve people's problems and to give their control system a human face – one they can trust – that skill is invaluable. It will always be the most important one to have as an integrator, you can never lose it. If you give your customers the service they are entitled to, what they deserve, then you will be a good integrator – now and in the future."

The new control system integrator should embrace the future, but also have their feet firmly grounded in the past. This really defines who the new control system integrator is and what qualities companies should look for when choosing an integrator that will stand the test of time. Integrators who have a solid foundation of problem-solving and an open mind for future technological advancements in the field will position themselves for success today and for many, many tomorrows to come.



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