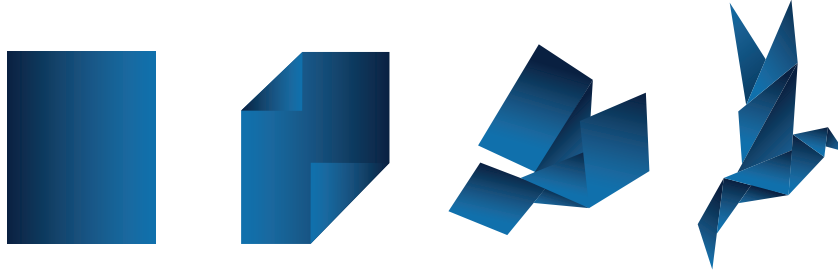# Making Your Old SCADA System New Again

Pros & Cons of Switching to New SCADA Software

Don't look at converting to new software as only a chance to update your system, but as a golden opportunity to elevate your SCADA system to new heights.

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Pros & Cons of Switching to New SCADA Software

With the right knowledge and tools something old can be transformed into something new.

Is upgrading your SCADA system worth it? If your company uses SCADA (supervisory control and data acquisition) software, a time will come when your system becomes outdated and you discover that updating to the newest version of your software can come with a high price tag.

Paying the price of updating your current software means you'll keep everything you've grown accustomed to. However you could get more bang for your buck if you buy new SCADA software that offers more features and benefits than you currently get with your existing software. When it comes time to upgrade, it's a prime opportunity to consider switching over to new software that offers more functionality.

Either way, you're going to be spending a good amount of money. So the question is, which is the better investment?

Weighing the Options

Both choices come at a cost and must be weighed out accurately to make a wise decision.

On one hand there's the option of updating the old SCADA software. But the cost of updating can be very high – especially for large-scale SCADA systems – and the updated system may not even come with improved functionality. On the other hand you could gain new functionality by converting to a new SCADA software solution, but there are costs to consider in this option as well, such as licensing, conversion, installation, and training.

If you find yourself in this situation, calculating the cost of staying with your current traditional SCADA software should be easy to figure out because you are already very familiar with it. However, assessing the cost of converting to a new solution is harder because advances of modern SCADA software in the last few years have changed the equation.

Switching to modern SCADA software solutions that are built on IT (information technology) standards such as SQL databases, web-based deployment and cross-platform compatibility offer major advantages over their older counterparts. These can include game-changing features like unlimited clients and seamless enterprise-wide interoperability between business systems. These new features can increase the value of a new SCADA system and must be factored into your decision about whether it's time to abandon your old system and convert to a new one.

Below we'll evaluate the major pain points of software conversion and why they may not be as painful as you may think. We will also discuss how to make the most of your old system so switching to new software doesn't have to mean starting from scratch.

Major Pain Points of Conversion

Despite the advantages that modern SCADA software offers, there are many reasons that companies choose not to convert to a new SCADA system. The three most common reasons are licensing cost, training time, and loss of investment.

Most reasons surround some common pain points that companies face when converting from their old SCADA system to a new one. The reality is that these pain points might not be as painful as they first appear and if you don't fully understand them it will be difficult to make a good decision for your company.

Conversion Pain Point #1: Licensing Cost

One of the biggest factors to consider when converting to a new SCADA system is the monetary cost. Costs will vary depending on which SCADA software package you are considering. While these costs can be pretty substantial, in order to put them into perspective you must also look at the cost of staying with your old system. In many cases, simply updating an old SCADA software package to its newest version can cost just as much – if not more – than converting to a new SCADA software package.

Henry Palechek is the Information and Process Control Supervisor for a large water district in California and has been working in the instrumentation field since 1986. He played a major role in the conversion process the water district went through several years ago when they chose to transition from their traditional SCADA software, which had been in use for 13 years, to a new SCADA software solution built on modern IT standards. He explained that the cost of updating their old SCADA software was one of the main reasons the water district started seeking another alternative.

"Due to a compatibility issue between our operating system and our old software, we were being forced to update our SCADA software from version 7.1 to version 7.1.1," said Palechek. "That was only a version change of one, one-hundredth of a point, and for that update we were going to have to pay a hefty new license fee.

"For that cost we were getting no new functionality, just the same software that we basically already had.

It was simply a forced toll for continuing to travel down the same road we had been going down … so we started looking for a new road."

Part of the problem the water district was facing was the continued *future* cost of updating their software, beyond the immediate expense of upgrading. Expensive forced updates and costly support contracts have become a staple for many of the traditional SCADA software vendors. These costs add up over time and can become a huge burden.

Tip: Consider Licensing in the Long Run

When looking for new SCADA software find one that has a simple and flexible licensing model. One such licensing model to look for is server-centric SCADA that only requires the purchase of a single license for the server, instead of requiring a license for every client.

Web-based software is often licensed this way, because you only need to place the software in one central location, which can be accessed by any client machine. Also to note, a web-based architecture greatly speeds up development time because you create each screen once, and launch it immediately to any client machine.

A licensing model like this can prove to be much more affordable in the long run, even with factoring in the cost of the initial license and software integration costs.

Conversion Pain Point #2: Training Time

With change comes the need to adapt, and when companies look at the possibility of converting from their old SCADA software to a new software package, training is a big consideration. There are costs in both time and money when learning a new SCADA software package.

When a company uses a SCADA system for a long time it grows accustomed to how the software works and what its quirks are. There is a degree of uncertainty that comes with moving in a new direction and because of this, many companies opt to stay with the system they know, even if it's flawed.

The only problem with this thinking is that eventually things change. It's not a matter of whether or not to adapt; it's a matter of when to adapt.

SCADA software is always changing and a new version of the software could change how tasks are accomplished in the system. This means that even companies that decide to stay with their current SCADA solution have no guarantee that they won't spend more money training their staff to adapt to a newer version of their software, even if they are already fully trained.

Whenever a new SCADA software solution is adopted there is going to be a learning curve, but that learning curve may not be as steep as you think. Henry Palechek remembers what it was like to train on the water district's new SCADA software package:

"We had been using our old system for a long time so the new system took some adjusting to," Palechek recalled. "Sure, there was a learning curve but it wasn't that much of one and once we learned how to do the basics the rest came easy. The real benefit was that there was a lot of stuff that was really hard – if not impossible – in our old system but was a snap in the new one. That really saved us some time and was a huge advantage of the new system."

Some modern SCADA software packages are designed to be easier to use than older traditional SCADA applications. This could mean that converting to a modern SCADA software package could save on training time in the long run because new employees can learn the new SCADA system faster.

Additionally, if the modern SCADA solution you choose adds powerful new features and functionality that were previously impossible, employees trained in the new software will be more productive and effective than before. In effect this can increase the value of a company's entire workforce, which can easily offset the cost in time and money needed to train them.

Tip: Free Your System From Proprietary Technology
When looking for modern SCADA software to replace your old one, find one that offers a strong training program and good IT support. Avoid SCADA software packages that rely heavily on proprietary technologies because they will be harder to support and will likely lock you into an expensive support contract.

Conversion Pain Point #3: Loss of Investment

The cost of licensing software and training staff are investments that companies have to make in their SCADA systems, but there are other investments that have to be made as well.

Some other important investments are the cost in time, manpower and hardware that are often required to get a new SCADA system off the ground. Abandoning an old SCADA system in favor of a new one can be a tough pill to swallow for many companies because they have heavily invested in their SCADA systems over the years and don't want to see all that work go to waste.

The fact of the matter is that even if a company stayed with their old SCADA system built with traditional SCADA software, there is still a high likelihood that a forced upgrade to a new version of that software would result in a loss of investment as well.

Many traditional SCADA software solutions put out new versions of their software that are not totally compatible with previous versions. This often means that parts of a SCADA system – if not the entire system – have to be recreated in the new version of the software, resulting in a loss of time and money with no new functionality to show for it.

If only there was a magic button that could convert everything from an old SCADA system built with traditional SCADA software and seamlessly put it into the format of new, modern SCADA software. Such a button would allow companies to retain the majority of their investment in their old SCADA systems. While there are some products that say they can do just this very thing, it is unfortunately rarely the case.

These magic-button types of utilities never work the way they promise; they may convert some things but they never work one hundred percent. There is often extensive cleanup work that needs to be done,

Look instead for modern SCADA software that embraces IT standard technologies that are widely used and commonly supported. Following this tip will help you find modern SCADA software that will make the job of training easier and less of an expense in the future.

and in many cases the cleanup work takes longer than rebuilding a SCADA project from scratch.

There is a good reason why there is not a real magic conversion button out there and it boils down to language barriers. Old SCADA software is just built much differently than modern SCADA software; different scripting languages, different architectures, and different ways of handling data. While old SCADA software and modern SCADA software do many of the same things, they do them in totally different ways.

So there is no magic conversion button, but that is not necessarily a bad thing. Modern SCADA systems are designed to be much easier to work with both now and in the future.

For example, modern SCADA software that leverages SQL databases makes data easier to work with by putting it in a non-proprietary format. This means that once you make the move to a modern system, if you do need to convert to something else in the future, your system data will be in a format that is much more convertible than it was in the past.

Modern SCADA systems that are built on current IT standard technologies will retain more of your investment when you move forward in the future.

Tip: Converting is a Golden Opportunity
One of the upsides of not having a magic button to convert your system to a new software package is that you won't end up with a new system that is still stuck in the past. Your old SCADA system was designed with the tools you had at the time. With a new set of shiny tools that modern SCADA software can provide, you can build a much better system than before.

The advantage of looking at your system again with new tools and fresh eyes is that you can think of innovative ways to make it better. This innovative thinking can potentially yield some amazing results for your company and they simply wouldn't have happened if there was a magic button because it can't do the kind of thinking that you can do.

Don't look at converting to new software as only a chance to update your system, but as a golden opportunity to elevate your SCADA system to new heights.

What You Can Salvage From an Old SCADA System

The reality is that while it is impossible for companies to recoup everything they have put into their old systems, converting to a new system does not necessarily mean starting over. There are a lot of things that can be converted from an old SCADA system to a new one, making the conversion much easier.

The Native Americans who lived off the wide open Great Plains region of North America had a rule they lived by that can be applied to companies looking to retain their investment when converting to a new SCADA system: Use every part of the buffalo.

From the buffalo these Native Americans were able to get virtually everything they needed to stay alive: food, clothing, tools and more. They saw every part of the buffalo as valuable and were ingenious about coming up with ways to use every piece to help them survive.

Likewise, when converting from an old SCADA system to a new one, don't look at the old system as

worthless. Every piece of it can hold some useful information that can either be directly translated into a new system or used to inform you as to how to make the new system better. Being smart and resourceful about your SCADA software conversion will allow you to squeeze every drop of value out of your old system. The following are a few things that you can salvage from you old SCADA system.

PLC Tags

A tag is a data point captured at the PLC (programmable logic controller) and passed onto the SCADA system. Tags are created by the user and can be defined and structured in whatever way best suits the function of the SCADA system. When building a new SCADA system, defining and organizing tags is a very important and time-consuming part of the job. Fortunately tags can be transferred to modern SCADA systems. Some modern SCADA systems come with utilities to import tags from an old

system into the new one – saving you the hassle of defining the tags all over again.

To get even greater benefits from importing tags into a modern SCADA system, look for a system that is easy to connect to, with included OPC-UA compatibility. This will allow you to keep all your tags in one place, which will make finding them much easier. Avoid SCADA systems that make you pay per tag used; this will really cost you if you decide to expand your system.

Historical Data
Historical data is time-series data that has been stored, usually in a process historian. Historical data can be very useful and is especially important in creating accurate trending charts. Most process historians use proprietary flat file types that are often very difficult, if not impossible, for other systems to work with. However just because the data has been stored in a historian doesn't mean you can't incorporate it into a new system.

In some cases it is possible to import historical data in a modern SCADA system, depending on what modern SCADA software solution you choose and how you have saved your historical data. Data from some historians can be imported in a SQL database, which makes it much easier to work with than when it is stuck in a process historian.

When choosing modern SCADA software to convert to, look for one that takes full advantage of SQL databases so you can get your data into an open format that is accessible to other programs.

SQL databases are the most commonly used databases in the world and are already used by most standard enterprise systems. Storing your historical data in a SQL database will make it possible to cross-reference it with data from throughout your entire enterprise. This can result in a wide variety of revealing insights into the interconnectivity of processes across your entire company.

Reuse Your Old Project Structure
You don't need to lose the project structure from your current SCADA system. The project structure is the thinking, organizing, planning, and design work that goes into creating the

basic framework for a SCADA system. This includes things like what kinds of screens need to be created for the system, what functions should be on each screen and the sequence of those screens. These are all things that had to be done when creating the old SCADA system, so they shouldn't be wasted when creating the new one.

When the water district that Henry Palechek worked for was converting their system with modern SCADA software, they were able to utilize the project structure of their old system in a clever way.

Palechek explained their strategy: "We hooked up our old system and our new one to a third-party server that was parsing out our control data. While we developed our new system we had our old system up on another screen and we were able to use it as a kind of blueprint for our new one.

"Because both the old and new system were hooked up to the same data source, we were able to purposely trip alarms to see if our new system was working in the way we needed. It worked out really well, and thanks to that process and some great new development tools from our new software, we got through the development phase pretty quickly."

The benefit of revisiting the project structure of your old system is that you can shed new light on it with your new modern SCADA software solution. New functions and features can give you a more streamlined approach when creating your SCADA system, allowing you to build it better than before. Look for a modern SCADA software package that has powerful time-saving development tools so you can create your system in the fastest and most efficient way possible.

Make sure that when you create a new SCADA system you have the full version of your old project and the SCADA project designer it was created in. This is necessary in order to actually see what is going on behind the scenes of your old SCADA system.

Having access to the scripts and tags used to make the functions of each screen work properly will eliminate a lot of guesswork when creating a new system, making things go much quicker.

The Lemon

Imagine you were in the market for a new car and you found one that did the basics of what you needed it to do, but there were a few catches:

1 The car would only drive on a few roads which the dealer outlined for you.

2 When you had to replace a part in the car it was often incompatible with other parts, so you would have to upgrade them as well.

3 The car would only work with a specific type of tire, which you would have to buy separately.
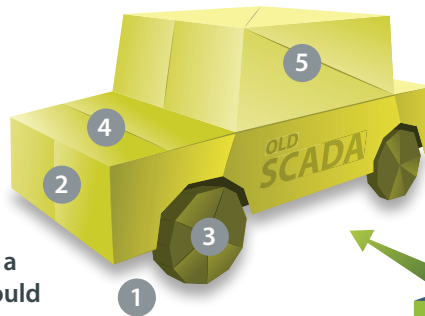
4 To maintain the car you could only use authorized mechanics and you had to pay a huge yearly fee to even have access to them.

5 Every few years because of updates to the car or its parts, you were forced to buy a new license to continue to drive the car you already paid for.

Would you buy this car?

In effect, the car in the above example is similar to what many companies in the manufacturing industry have been buying for years in the form of their old traditional SCADA software packages. Traditional SCADA software vendors have gone to great lengths to build software that locks its users into a continued relationship with them. For many manufacturing companies this relationship has grown very one-sided, with them continuing to shell out more money year after year just to use the system they already possess.

The water district that Henry Palechek is part of was in just such a dilemma. He explained why he thinks converting to a new modern SCADA solution was right for them:

"Many of the traditional SCADA software companies will say that you can use their software to create a SCADA system that will last for 12 to 15 years, but that is just not true. The reality is if you have SCADA software that is dependent on a specific OS (operating system) your SCADA system will only really last as long as the OS.

"Once there is an update to the OS, it forces you to go update your SCADA software – which is what happened to us. In my opinion, any SCADA software that is not designed specifically with longevity in mind is a flawed piece of software and needs to be replaced. Otherwise it's only a matter of time until you're forced to rip it out and start over anyway. We moved to a new SCADA software solution that is cross-platform compatible and we haven't looked back since."

As a company the real question you need to ask when it comes to the decision of between updating your old system or converting to a new one is this: Knowing what you know now, would you buy your old system again? If the answer is no, then it's time to convert. The good news is that with modern SCADA software solutions available today you may never have to ask this question again.

Tip: Trademarks of Modern SCADA Software
When looking for the modern SCADA software solution that will fit your company, here are some things to look for.

1. Licensed by the server so you get unlimited clients and tags.

2. Web-based installation and deployment for ease of setup and maintenance.

3. Rapid application development tools to help you get your new system created quickly.

4. Open, accessible format for your data so you don't get locked into a proprietary system.

5. Cross-platform compatibility so you don't hassle with never-ending updates for operating systems.

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