A Note from Wendy and Howard...

Hello,

Industrial digital technology seems like it's improving at light-speed recently, but are there sufficient cybersecurity measures to keep a facility safe? We're weighing the **risks and benefits of adopting industrial digital technology** in our feature article, just below.

Keith Mandachit is one of our cybersecurity experts. Keith started with Huffman Engineering as a co-op in 1996 and has remained one of our most dedicated employees. His dedication spans far beyond the office walls, as you will learn in our employee spotlight this month.

When you need an expert to help solve automation challenges, we are here to help. We deliver engineered solutions tailored to your automation needs. Visit our website for more information on our areas of expertise, or call us (402) 464-6823.

Best regards,

The Huffman Engineering Inc., Team

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The Risks and Benefits of Industrial Digital Technology

Are you someone who is worried about the risks involved in implementing more digital technology in your industrial facility? For decades, the industry has largely operated under the assumption that we are less prone to hackers and cyber-attacks because of the specialized platforms air-gapped from more common systems.

Now, industrial digital technology has made tremendous progress. There are immense benefits to embracing the new technology for both convenience and financial reasons, but some in the industry remain wary of the risks and would prefer to avoid the new technology altogether.

With regards to something going wrong in a facility, Keith Mandachit, engineering manager at Huffman Engineering says, "The biggest risk is not the cyber security threats; it's the people risk. Most system problems are caused by human error. If you were going to say, 'I don't want the risk of being digitalized,' you could say the same about people. So, logically if you were trying to reduce your greatest risk of being hacked, you should avoid people."

While that prospect may sound appealing to some, it's not a very practical solution. Keith and Jay Steinman, mechanical engineer at Huffman Engineering, share a few tips below to maximize the benefits of advancing technology while also limiting the risks.

First, we can think about the "people risk" in two categories: good faith actors and bad actors. Good faith employees are those that make a mistake like operator errors, accidental deletions, etc. These risks are inherent regardless of the system, from spilled coffee on charts to exhausted employees working on push buttons. Some of those risks can be mitigated through procedures and training practices. On the other hand, Jay points out, "Monitoring technology can preempt or reduce the damage of those mistakes. When a piece of equipment is tied into a monitoring system, warnings and alerts can be created to catch errors more quickly."

Bad actors are those who seek to access and harm or harm your infrastructure in some way, including stealing data, shutting down production, or ransoming your data. There are three main ways that bad actors can infiltrate the system.

From within the system - The best way to mitigate this risk is to avoid generic logins and passwords. Each login should be assigned to only one individual so that if something goes wrong, it can easily be traced. One login per user also protects you when a registered user leaves the company; the associated access can be easily revoked. All logins should offer least-privileges, which limits access to only what the user needs.

Social engineering - It is far easier for a hacker to ask for login credentials than to guess them. Oftentimes this comes in the form of a phishing email that appears to have originated from your internal IT or a reputable source asking to confirm or change your password. Training on how to spot a phishing email can be very effective in preventing this type of breach.

Outside the system – Though less common than most people think, hacking is another way to get into a system from the outside. This risk can be mitigated with protections such as firewalls and by restricting access from computers outside the network (via IP address), not just by restricting people

and credentials. Systems within the facility must also be protected from access by outside visitors and contractors with automatic log-off and other precautions.

In all of these cases, passwords are a critical component of maintaining security. And yet, Jay says, "Misusing passwords is the biggest and most common mistake I see." Generic or group passwords, as mentioned above, are one problem. The second is using the same password everywhere. (For an entertaining story about passwords, check out this episode of the podcast *Reply All*.) Using the same password everywhere increases your risk; if your password is hacked in one place, it can be used in other locations as well. Both Keith and Jay recommend using password managers, because trying to keep track of all your different passwords can often lead to locking yourself out of your own accounts. There are numerous apps and software packages that will keep track of your passwords securely.

By taking these risk-mitigation steps, industrial facilities will be able to reap the many benefits of digitalization. A few of our favorites are:

Connection – A Virtual Private Network (VPN) creates a secure encrypted connection over the internet to another network. Being able to VPN into a facility is very convenient and can save considerable time. Plant operators can check on the system, whether in an emergency or for regular monitoring, without having to leave home and drive back to the facility. For system integrators, in the event of a problem, we can do initial troubleshooting without wasting precious minutes or hours traveling to the facility. In many cases, we can get things running again very quickly using a virtual connection.

Data – Industrial facilities can collect more data when they are connected, but more importantly, they can visualize and analyze that data automatically. This allows managers to see an issue before it causes downtime, or if they have downtime, to look back at the data, find root causes, and prevent downtime in the future.

Production – Especially in manufacturing, the powers of digitalization are revolutionizing the products being sold and how quickly they can get to market. Integrating enterprise resource planning software (ERPs) allows companies to get very granular with their inventory tracking and planning. For example, one manufacturer may use this technology to offer custom ordering and custom manufacturing. Another is tracking raw materials to automatically reorder when necessary. That's taking Just-In-Time manufacturing to a new level.

At Huffman Engineering, we're open to discussing your digital upgrades and cyber security risk mitigation. We've been considering cyber security concerns for integration projects in all types of industries since before Y2K. If we can help, please contact us.

If you're interested in more detail about cybersecurity tips, we have a much longer article being published in a trade magazine soon. To be notified when it goes live, click below.

SEND ME A REMINDER

Spotlight - Keith Mandachit

In this edition, we are highlighting longtime Huffman Engineering employee Keith Mandachit. Keith started at Huffman Engineering in 1996 as a co-op student, building and wiring control panels, working on CAD drawings, and helping on project start-ups. Recently, Keith moved from Senior Engineer to Huffman's first Engineering Manager.

Since being hired full time in 1998, Keith has proved himself invaluable to the Huffman Engineering team. His technical accomplishments run the gamut from programming HMIs, operator interfaces, and PLCs, configuring databases/historians and creating reports, developing validation and qualification documents, and designing and setting up networks. He is the personification of Huffman's core values and "we before me" mentality, jumping in wherever he is needed, like training new engineers and handling the IT duties of the company.

"From a quiet, unsure college Co-op student to one of our most reliable technical experts, Keith has brought a valuable perspective to Huffman Engineering Inc. and that is his willingness to learn and grow," said Howard Huffman, president of Huffman Engineering. "He is a good example to others who work with him of one of our core values which is continually reinventing. He is curious, a learner, and readily shares his knowledge with others. We are glad he is part of our team."

In his more than 20 years with Huffman Engineering, Keith has worked on a wide variety of projects in all industries the company serves. Keith has extensive experience with numerous PLC, HMI, Database/Reporting, and Networking platforms. When he's not rescuing major companies from ransomware attacks, Keith is often found working on projects in the pharmaceutical industry, such as:

- Collecting data from tablet presses
- All kinds of programming for film coaters, fluid bed dryers, mixers, autoclaves, lyophilizers, pneumatic conveying systems and various other equipment
- Qualification and validation documentation development
- Vision inspection and laser engraving systems for packaging lines
- Sharepoint design/programming

Originally from Kansas City, MO, Keith attended the University of Missouri-Rolla (now known as Missouri S&T) and graduated with a degree in electrical engineering before moving to Lincoln in 1998. Keith and wife Mandy have sons TJ (age 17) and Ty (age 13). The family has two beloved dogs: Lola, a Schnoodle and Leia, a Shiapoo.

Stemming in part from Mandy's career with a student exchange organization, the family has hosted several foreign exchange students, and Keith loves helping them enjoy their time in the US. The have a German "daughter," Kerstin, (age 25) and Brazilian "daughter," Bruna (age 20).

Their passion for learning about other cultures extends to travel as well. Keith and Mandy have visited 19 countries in Europe, Central America, South America, and the Caribbean – so far.

"We also love to find different ways to serve others," Keith says. "This past year we took in a girl who works for staff with The Navigators, a Christian college student ministry. I like to call her our exchange student from Wyoming."

Indeed, Keith has found numerous ways to serve others. The same dedication that Keith brings to work every day extends to many organizations in Nebraska. When their sons were younger, Keith and Mandy shared the role of president of the PTA for three years at the elementary school their sons attended. Keith has been a soccer coach for many seasons, a youth leader for middle and high school students for 19 years, and he serves on the board for North Pointe Community Church. He also volunteers with the Boy Scouts of America, both in Cub Scouts and in Boys Scouts.

Keith helped start the FIRST LEGO League and FIRST Tech Challenge in Nebraska and coached robotics teams for several years. He has volunteered on planning committees and helped run the tournaments for the past 9 years. However, not all of Keith's volunteering is youth-centered. To pursue his interest in cooking, Keith learned how to smoke BBQ by becoming a certified BBQ judge for the Kansas City BBQ Society.

Keith's accomplishments have been recognized by outside organizations as well. In 2012, he was named to Control Engineering's Leaders Under 40. In 2014, he was presented with the Rising Star Award at the annual Control Systems Integrator Association conference. The Rising Star award recognizes members who are new to the field who have demonstrated attributes of a future leader, innovative approaches, and commitment to the industry. Now, Keith has added CSIA to the lengthy list of volunteer organizations, where he serves on the awards committee.

Asked what he enjoys most about working at Huffman Engineering, Keith says, "I love getting the opportunity to make things work for our customers and developing a relationship with them at the same time."

In Case You Missed It...

Huffman Hits the Road in Nebraska and Colorado

Huffman Engineering Becomes a Schneider Electric Certified Alliance Partner

Huffman Engineering Hires Electrical Engineer Joe Dodendorf and Mechanical Engineer Grant Benson for Lincoln Office

Safety Risk Assessments

Blog post by Jason Weedin

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