PLANT SERVICES

Smart Solutions for Reliable Operations

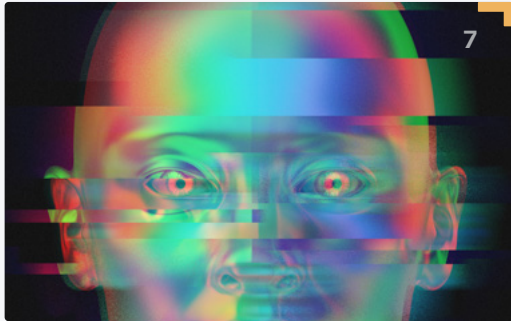2024 LEADERSHIP eBOOK

LEADING M&R FOR THE FUTURE WORKFORCE

The nature of manufacturing maintenance work is changing, at the same time the work-force itself is shifting. While industry faces workforce challenges with hiring, training, and retaining workers, new technologies will also provide more efficient and sustainable ways to work. It's a delicate balance in fluctuation, and managers are challenged with connecting the pieces that are their skilled workers into an efficient organization. Maintenance leaders face challenges specific to reliability and asset management, but in many cases, people management and leadership skills are universal, and good leaders know the people-side of the business too. This ebook covers how to be a better M&R leader, as well as:

- the nature of human error and how to overcome it

- why ego is the enemy (and you should get yourself a mentor)

- the skills shortage: how to address it

- the future of M&R: hard and soft skills.

LEADERS CREATE LEADERS

Sometimes all a new leader needs is a little nudge in the right direction

Written by

Joe Kuhn
President, Lean Driven Reliability, LLC

In 1987 at the age of 22, I began my career as a maintenance engineer at a large aluminum rolling complex in Southern Indiana. The place was massive; imagine one mile by one mile of buildings and grounds. More than 2,500 employees came together to produce nearly a billion pounds of coiled aluminum sheet for the beverage and food packaging industry.

Eighteen months into my career, I began to make a small yet perceivable impact in a maintenance shop accountable for maintaining mill rolls and bearings. I worked well with the craftsmen, management, and our internal customers. A senior technical supervisor by the name of Ed Toon took notice of me. He pulled me aside in the summer of 1988 and stated, "you know Joe, you can run this place someday." Assuming I heard wrong, I replied, "What?" Ed proceeded to tell me he expected me to be running the entire rolling complex in the future.

I thought he was just going to say the roll grind shop of 64 employees, but this crazy man was talking about the whole operation. My career goal to this point was to be an engineer and retire in 30 plus years as a senior staff engineer; a lofty pinnacle for an engineer. Ed continued by asking me to consider filling in for vacations and working weekends as a supervisor to gain leadership experience. He volunteered to coach and mentor me along the way. That nudge by Ed was a fork in the road in my career. Leadership was not even on my radar. I had studied four years to be an engineer, and I was just beginning to feel comfortable being an individual contributor on a team.

Fast forward 13 assignments and 29 years, in 2017, I was promoted to operations manager of the site just as Ed foretold. I loved my career. I have since retired to consult, write, and speak on operations management. Where would my career have gone without one seemingly insignificant nudge? Would I have never had the self-confidence to envision myself as leader without the words of a respected co-worker? "Leaders create leaders" is a sign Ed inspired me to post on my office door for decades.

As the new operations manager, one of my first tasks was to assess the talent of the team, for I had worked for corporate as the director of reliability and maintenance and as a plant manager at another site for the previous eight years. I was satisfied with my direct staff (which the organizational level called managers), but the "elephant in the room" was the massive lack of leadership at the department level (a level called superintendents). As a collective group, the incumbents reacted to events, awaited instructions from the manager level, and were given no training and development (this will be the subject of a later article). Further, we had three open positions for superintendents, and no one internal to the plant has expressed interest in the roles. I set up a meeting with my leadership team to discuss the problem and solution.

At the meeting, my team proceeded to explain to me that performance expectations have changed. These jobs are very hard and do not provide the right work-life balance; and despite our best efforts, we just cannot find anyone to hire. "We know the superintendent group is weak, but we feel lucky to have the ones we have. Engineers, technicians, and our top performers all want to remain individual contributors. Times have changed." To my frustration, this justification went on for nearly an hour.

I then asked each one of the 12 persons in the room, to tell me their personal stories of how they jumped from an individual contributor to leadership. In the exercise, every manager identified a consequential nudge in great detail almost word for word as if it happened yesterday. Four of the 12, named me as the nudger

> **I then asked each one of the 12 persons in the room, to tell me their personal stories of how they jumped from an individual contributor to leadership.**

(I made up this word). I summarized the exercise by stating that everyone here was nudged. I then asked, how many people in the plant have you personally nudged? Crickets; not a single leader had taken the time to alter a career. "Leaders create leaders," I stated emphatically.

Everyone left the meeting with a task; in the next two weeks we were to find and nudge at least one person with proven leadership potential. Two weeks later at the follow-up meeting, we highlighted 12 enthusiastic applicants for the open positions; we went from zero to 12 because we cared enough to have a conversation.

I have worked and consulted in dozens of plants. I am a mentor and a coach to several more. What is crystal clear to me is that there is a vacuum of leadership in maintenance and reliability. I see two reasons for this:

1. **Maintenance is hard, often thankless, and is dominated by negative feedback. No one thanks the technician, planner, supervisor, or manager for all the equipment running well yesterday. Even if a reliability trend is improving, yesterday's unplanned downtime dominates the headlines. Production leadership roles tend to get the glory for productivity, quality, and revenue accomplishments leading to promotions and bonuses. Consequently, the best leaders migrate to production.**

2. **In maintenance, technical skills are prized over leadership skills. Management strongly prefers to hire and promote people capable of troubleshooting, root cause problem solving and executing an outage. Creating and communicating a vision, taking risks, and implementing best practices systemically, is a "nice to have."**

Great leaders can change these cultural norms. This is your call to action. The reliability and maintenance profession is desperate for leaders. Best practices have been known for decades, yet deployment eludes us resulting in plant closures, poor performance, low employee morale, and high turnover. Reliability journeys start and fail in months. We must do better, but culture change is only possible with great leaders.

Every reader of this article is asked to find one person this week to nudge. Genuinely tell them the leadership characteristics you see in them, tell them you believe in them, and inform them that you will actively coach them on the journey. You can be that fork in the road. It will make all the difference. △

Joe Kuhn, CMRP, former plant manager, engineer, and global reliability consultant, is now president of Lean Driven Reliability LLC. His YouTube Channel offers content on creating a reliability culture as well as financial independence to help you retire early. Contact Joe Kuhn at *joekuhn1964@gmail.com*.

THE ACHILLES HEEL OF HUMAN ERROR IN ASSET RELIABILITY

When human error is the root cause, the cause becomes the failure mode

Written by

Jeff Shiver
Founder, People and Processes, Inc

No doubt, humans add value to an organization. They provide creativity and expertise to the process and ideas for improvement. They are flexible, can adapt to changes, and perform tasks that machines are not capable of yet. But humans are also the Achilles heel in reliability vulnerabilities. American writer and humorist Kurt Vonnegut wrote, "If it weren't for the people always getting tangled up with the machinery... Earth would be an engineer's paradise."

U.S. Department of Defense (DoD) statistics suggest that human error is a causal factor in 80-90% of all mishaps. In John Moubray's RCMII book, more than 70% of equipment failures are self-induced, with 40% coming from human error. Winston Ledet's work at DuPont suggests that 84% of failures are due to careless work habits. If these numbers are so high, shouldn't we do something about it?

To explain the categories of human error, we can consider two models. The DoD's Human Factors Analysis and Classification System (HFACS 8.0, April 2023) uses the same groupings presented by James Reason in his model: organizational influences, unsafe supervision, unsafe acts, and preconditions for unsafe acts. Secondly, Benjamin Blanchard, Dinesh Verma, and Elmer Peterson's

book Maintainability grouped the main factors impacting the interaction between people and machines under four headings. These are anthropometric, human sensory, physiological, and psychological factors.

EXTERNAL FACTORS

Anthropometric factors refer to the physical characteristics of the human body that can affect performance and contribute to human error. These factors can include body size, shape, and strength. Errors occur because the hand or arm cannot fit in the space or the individual is not strong enough to lift or move an item. One example of anthropometric factors contributing to human error is when a worker cannot reach a control panel or button because it is too high or too low for their height. This can cause the worker to strain or stretch to reach the controls, increasing the likelihood of mistakes and reducing overall efficiency.

With human sensory factors, when working with machinery, a worker can be affected by poor lighting or noise levels, making it difficult to see or hear important cues or signals. For example, a worker may misinterpret a warning signal or overlook a malfunctioning component, leading to errors or accidents.

Physiological factors can contribute to human error in equipment reliability. These factors include physical and mental fatigue, stress, and illness. Physical and mental fatigue can impair a worker's ability to perform tasks safely and efficiently. When workers are fatigued, their reaction time may be slowed, and their decision-making abilities may be impaired, increasing the likelihood of errors. For example, a fatigued worker may be more likely to overlook a critical step in a procedure or make a mistake when handling machinery.

The three categories above relate to external events, which can cause a human to make an error. They are easy to address but may require considerable expense to do so. The last grouping of psychological factors is more complex and challenging.

PSYCHOLOGICAL FACTORS

Within psychological factors, we can classify errors as unintended or intended. "Unintended" errors can be split into two categories, slips and lapses. These are skill-based errors. Mistakes occur when someone does things incorrectly, even though they may have done it correctly many times before. Lapses occur when a technician leaves a critical step in a process or sequence. Maybe they leave a tool inside the equipment or forget to open a process valve.

"Intended" errors can be split into mistakes and violations. Within the mistakes category, there are rule-based mistakes and

> **Physiological factors can contribute to human error in equipment reliability. These factors include physical and mental fatigue, stress, and illness.**

knowledge-based mistakes. With rule-based mistakes, the error can come from the misapplication of a good rule or applying a bad one. With knowledge-based mistakes, inappropriate responses are provided to an abnormal situation with no rules. Mistakes like these are less likely when operators and maintainers are trained in the systems and how the processes work.

Lastly, in the Intended actions category are violations. Violations can be routine violations, exceptional violations, and acts of sabotage. An example of a routine violation is not wearing hearing protection when the site requires it. Exceptional violations are when someone rushes out to the plant floor without their safety glasses because they could not find them or did not have time to look for them. Sabotage is a malicious act that creates failure.

PEOPLE STILL OVERCOME HUMAN ERROR
When determining that human error is the root cause, the cause becomes the failure mode. If the failure is an inappropriate response to other failures, it is listed as a failure effect. The best way to overcome human error is to involve people. People commit errors, can identify errors, and can provide effective solutions. △

Jeff Shiver, CMRP, is a founder and managing principal at People and Processes, Inc. Jeff guides people to achieve success in maintenance and reliability practices using common sense approaches. Visit *www. PeopleandProcesses.com* or email *JShiver@PeopleandProcesses.com*.

EGO
IS THE
ENEMY

Don't let busy work blind you to the truth on the ground at your plant

Written by

Joe Kuhn
President, Lean Driven Reliability, LLC

A common discussion topic for reliability and maintenance consultants in the hallways at a conference is, "Why are best practices not in place in every plant? Best practices have been known for decades. We are teaching the same practices and results over and over again."

My current hypothesis is one word: "Ego."

Epictetus the well-known Greek stoic philosopher proclaimed, "It is impossible for a man to learn what he thinks he already knows." The title of this article is a quote credited to Ryan Holiday, an author, speaker, and modern-day stoic. This absence of best practices drives up costs, restricts output, reduces quality and increases safety and environmental risks. The business case could not be clearer.

Most plant leaders will claim to have tried "the reliability thing;" it failed. The story is nearly always the same: leadership orders the deployment of best practices without

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addressing culture. They fail to recognize that much of this culture is set by the decision making of the leadership. These decisions are based on incomplete and incorrect data, and not inspired by the wisdom of others who have solved similar problems in the past.

Consequently, nearly all change efforts fail for these two reasons: (1) reluctance to seek outside help, and (2) failure to know reality on the factory floor. It is no wonder best practices remain a panacea. Leaders are forced to conclude, "We must be different." I have seen this tendency in 100% of the plants (42 in eight countries) that I have worked in or with in my 37-year career. I can say with conviction, you are not different.

For most of my own career I wanted to project control and confidence; I needed no help. "I got this," was my mantra. Outside experts had nothing to offer my team because we knew our plant best and our challenges were unique. Any outside expert forced on me was placated for a time and shown the door. We got back to business after the annoying distraction. My team and I were the smartest in the room; we knew the challenges and the levers to improve.

In fact, this path taken did result in several points of recognition: new reliability records, improved cost performance, and production records. I believed these "press clippings" and loved telling the stories of our team's successes. Sound familiar?

With the benefit of hindsight and life wisdom, I can clearly see my ego was hindering growth and the speed of change. I was the obstacle. The biggest regret of my career is the fact that I rarely had a mentor. I restricted my growth, ideas, and lessons learned to my direct experience. While I read a lot, I chose not to learn from others to accelerate our team results as well as my career.

Ego. We all have biases, blind spots, and weaknesses. Acting like I did not was a plow I chose to pull during my journey. Armed with false confidence and under the guise of being more productive I would spend my days in the office, in conference rooms and reading and sending emails, getting things done.

Unfortunately, I am not special. Now older and wiser, I have discovered less than 50% of the current state performance of a plant can be surmised with key performance indicators (KPIs), opinion, and experience. The remaining 50% is only known through intense observation on the shop floor via a process called "Chalk Circle Observation," a term pioneered by Toichi Ohno of Toyota. The new understanding from observation unleashes simple and free action items you can complete in just days for rapid and sustainable results. Ego blocks us from learning from observation and, worse, encourages us to take action armed with 50% of the data. What can go wrong?

> **Nearly all change efforts fail for these two reasons: (1) reluctance to seek outside help, and (2) failure to know reality on the factory floor.**

What actions can you take on Monday to accelerate your journey to a culture of reliability by conquering the ego:

- **Get a mentor for yourself and your team members. This can be inside or outside of your organization. Seek someone that can not only sponsor your career, but also challenge you to see your gaps, blind spots, and biases. Note: you can have more than one mentor.**
- **Get an internal or external expert on lean and have them train your leadership team on how to see waste in your plant through observation. Under the guidance of this coach, perform observations to demonstrate competence. Lastly, have the expert highlight and discuss how every reliability and maintenance best practice targets a plant waste.**
- **Schedule eight straight hours on the shop floor next week to observe current state on a critical issue at your plant. This can be a bottleneck production center, a poor reliability asset, or targeting understanding of technician efficiency or lack of precision. I highly recommend adding observation time to your standard work each month. Expect to be shocked with new insights. Further, expect your career to accelerate given this new skill.**
- **Keep a monthly journal of what you have learned from others. This can be from books, magazines, podcasts, YouTube, your mentor, peers, or an expert. Read the full list each month to reinforce your value of continuous learning from others.**
- **In that same monthly journal, keep track of your professional failures. Remember: Failure equals learning. Failure also keeps you humble and in search of solutions. Often that solution has been discovered by others in decades past.**

Culture changes one experience at a time; create at least one every week. Go forth and do great things – you've got this. ◬

Joe Kuhn, CMRP, former plant manager, engineer, and global reliability consultant, is now president of Lean Driven Reliability LLC. His YouTube Channel offers content on creating a reliability culture as well as financial independence to help you retire early. Contact Joe Kuhn at *joekuhn1964@gmail.com*.

HOW TO ADDRESS THE SKILLS SHORTAGE IN MAINTENANCE

Bridging the gap takes a little strategic planning and some key tactics

Written by

Joe Anderson
Chief Operating Officer, ReliabilityX

In industries ranging from manufacturing to healthcare, maintenance plays a critical role in ensuring the smooth operation of equipment and facilities. However, a growing concern looms over these industries: the skills shortage in maintenance.

This shortage is not just a matter of finding warm bodies to fill roles, but rather a complex issue that demands strategic solutions. Understanding the nature of this shortage and its implications is key to developing effective strategies to bridge the gap.

THE NATURE OF THE SKILLS SHORTAGE
The skills shortage in maintenance is multifaceted, stemming from various factors:

- **Technological Advancements:** As equipment becomes more complex and technologically advanced, the skills required to maintain them also evolve. Many maintenance professionals

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lack the training and expertise to work with modern machinery, leading to a gap in skills.

- Aging Workforce: In many industries, a significant portion of the maintenance workforce is approaching retirement age. As these experienced workers retire, there are not enough younger workers with the necessary skills to replace them.
- Perception of Maintenance Work: Maintenance work is often seen as less glamorous than other professions, leading to fewer people pursuing careers in this field. This perception gap contributes to a shortage of skilled workers entering the maintenance workforce.
- Lack of Training Programs: In some regions or industries, there may be a lack of training programs that provide the specific skills needed for maintenance roles. This limits the pipeline of skilled workers entering the field.

IMPLICATIONS OF THE SKILLS SHORTAGE

The skills shortage in maintenance has several implications for industries and organizations:

- Increased Downtime: Without enough skilled maintenance professionals, organizations may experience more frequent equipment breakdowns and longer downtime, impacting productivity and profitability.
- Higher Costs: Organizations may need to rely more on outsourcing maintenance work or hiring contractors, which can be more costly than having an in-house maintenance team.
- Safety Concerns: Inadequate maintenance can lead to safety hazards in the workplace, posing risks to employees and potentially resulting in accidents or injuries.
- Competitive Disadvantage: Organizations that cannot maintain their equipment effectively may fall behind competitors who can operate more efficiently and reliably.

ADDRESSING THE SKILLS SHORTAGE

To address the skills shortage in maintenance, organizations and policymakers can consider the following strategies:

- Invest in Training and Education: Develop and expand training programs that provide the specific skills needed

Maintenance work is often seen as less glamorous than other professions, leading to fewer people pursuing careers in this field.

for modern maintenance roles. This includes technical skills related to machinery and equipment, as well as soft skills such as problem-solving and teamwork.

- **Promote the Field:** Raise awareness about the opportunities and rewards of a career in maintenance. Highlight the importance of maintenance work in keeping industries running smoothly and showcase the potential for advancement and growth in the field.
- **Modernize Recruitment Practices:** Use innovative recruitment methods, such as targeting younger demographics through social media and online platforms. Emphasize the value of diversity and inclusion in the maintenance workforce.
- **Collaborate with Educational Institutions:** Partner with schools, colleges, and vocational training centers to develop curriculum that aligns with the skills needed in maintenance roles. Provide opportunities for students to gain hands-on experience through internships or apprenticeships.
- **Offer Competitive Compensation and Benefits:** To attract and retain skilled maintenance professionals, organizations should offer competitive compensation packages that reflect the value of their work. This includes not only salary but also benefits such as healthcare, retirement plans, and professional development opportunities.

CONCLUSION

The skills shortage in maintenance is a pressing issue that requires proactive and collaborative solutions. By investing in training, promoting the field, and modernizing recruitment practices, organizations can attract and retain skilled maintenance professionals. Addressing the skills shortage not only benefits individual organizations but also contributes to the overall efficiency, safety, and sustainability of industries and economies. △

Joe Anderson is a partner and chief operating officer for ReliabilityX. Joe helps companies reach their full potential through improvement gains and lowering costs, giving them a competitive advantage on their journey to excellence. As an active columnist in Plant Services magazine, Joe shares his over 25 years of experience in maintenance, reliability and management excellence in various industries with the world through his writing. He is a CMRP, CRL, CARO, MLT2, MLA1, LSSGB, IAM-55k, CRL Black Belt and was recognized as one of the top 50 leaders in the country by the United States Congress, being awarded the National Leadership Award. He has also brought humor to the world through his experiences, and it can be seen in the character creation of Captain Unreliability.

THE FUTURE OF MAINTENANCE AND RELIABILITY IS A COMBINATION OF HARD AND SOFT SKILLS

Written by

Thomas Wilk
Editor in Chief, Plant Services

Last January, ChatGPT and generative AI took the world by storm as the latest technologies of several poised to change manufacturing and heavy industry. To kick off the new year, Plant Services asked several expert practitioners and consultants to tackle questions on the ways that technology and market forces have shaped the M&R industry over the past 10 years.

Chris Pepin is the founder of Progressive Reliability, a manufacturing talent and consulting firm that is also a proud supporter of K9s for Warriors and Operation New Uniform. In this interview, Chris outlines several actions that organizations can take to achieve recruiting success, and explains why that communication skills (especially multilingual) are increasingly valuable and necessary for maintenance and reliability professionals.

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1. HOW HAS THE CORE SKILL SET (AND/OR TOOLBOX) OF THE AVERAGE MECHANICAL PLANT MILLWRIGHT CHANGED OVER THE PAST 10 YEARS?

I would say for the average millwright, the mechanical/technical piece hasn't changed very much in five years. Let's face it, we've still got plants with equipment going back to the 1930s. I think right now, the biggest challenge is doing more with less. People are asked to operate at a higher activity level with less trust. With the amount of turnover continuing in so many places, you've got to be able to interface and adapt to new people more often. Doubly so if you're going to stabilize by curating an environment that's worthy of commitment.

Also, the challenge is often more environmental than technical. We're working with a lot more bilingual sites, which isn't the core skill set you're probably thinking about, but it's certainly an environmental change that's going on. We've worked with plants that are Spanish-speaking only. You're going to have language barriers going on – northeast, southwest, south, you name it.

2. HOW HAS THE CORE SKILL SET (AND/OR TOOLBOX) OF THE AVERAGE RELIABILITY MANAGER CHANGED OVER THE PAST 10 YEARS?

With reliability, the fundamentals are still the fundamentals, more now than ever. There's no new technology that's going to replace

> **I think right now, the biggest challenge is doing more with less.**
>
> [Chris Pepin , founder of Progressive Reliability]

the importance of asset criticality and asset hierarchy. It doesn't matter how great the promise of your new industry X.0 equipment is for productivity, the fundamentals remain. I think, in fact, as you add connectivity complexities and digital intervention in the environment, the ability to focus on the fundamentals of reliability have become even more important. Because of this, we have more large corporate clients right now that are committed to top-down reliability initiatives, so as reliability engineer you have a big seat at the table.

The other thing is leaders today are working with three to four generations on-site at the same time. We've got Boomers, Gen X, Millennials, and Gen Z; so that creates a lot of viewpoints to manage. Diversity of thought and diversity of perspective is a major reality today, so the importance of communication and the importance of buy-in has expanded beyond previous years.

3. WHAT KINDS OF INDUSTRY 4.0 TECHNOLOGIES DO YOU CONSIDER TO BE TABLE STAKES FOR CURRENT MAINTENANCE AND/OR RELIABILITY PROFESSIONALS?

We're still way early in the adoption curve of Industry 4.0, and it comes with specialty roles. So, things have started showing up on your electrical and instrumentation (E&I) side. We've seen these new technologies change the asset hierarchy and criticality significantly, because suddenly there's a new interface that's driving complications with complexity. We recently toured a facility that had multiple machines down in each of 6 locations because of server issues completely unrelated to the site. That's quite a contagion. So, the more unified the technology gets, the more widespread the issues become, and the more important it becomes to reassess your hierarchy.

IoT is in the adoption curve where things are picking up significantly. AI appears to be somewhat behind IoT, likely not for long. I believe AI is going to come up quick and make a refreshing impact on information access, knowledge capture and completely disrupt how we do training.

4. WHICH INDUSTRY VERTICALS, IF ANY, TEND TO BE QUICK TO EMBRACE NEWER TECHNOLOGIES LIKE IOT OR AI? (THIS CAN INCLUDE PUBLIC UTILITIES)

Among our clients, we've found early adoption is driven more by management culture and niche application maturity than industry

GET THE BIG PICTURE.

Read the full interviews with:

¬ **Luke Clark**, senior program manager for HECO Apollo

¬ **Shon Isenhour**, CMRP, founder and owner at Eruditio

¬ **Chris Pepin**, founder and managing partner at Progressive Reliability

¬ **Jeff Shiver**, CMRP, founder and managing principal at People and Processes

vertical. So you're generally going to have individual champions, a specialized use case, or you're going to have a culture of innovation and each must be underpinned by the temperament to work through adoption and into optimization.

5. WHEN NEW CONDITION MONITORING OR ASSET MANAGEMENT TECHNOLOGIES ARE INTRODUCED, WHICH MEMBERS OF THE TEAM ARE THE ONES DRIVING THESE PROJECTS? DOES IT MAKE A DIFFERENCE IF THE NEW TECHNOLOGY IS HARDWARE OR SOFTWARE?

With anything like this, you've got to be thinking about adoption, change management and process improvement, together. And, again, successful adoption is heavily influenced by how high the champion needs to be in the organization, and who shares the vision for its adoption.

The next piece is, who is empowered and how well are they empowered to get it running? How are they equipped to manage the "testing an iteration" events? And how much meddling is involved? For example, with an ultrasound probe, there's not a lot of meddling. You can go in, and you can physically see (or hear) something happening and gain those quick wins. The more complex the solution and the more teams or cultures involved, the longer the dark tunnel will be until you see the light.

We're working on a project right now, a massive CMMS migration along with some new site acquisitions, that we're doing systems integration work for. Fortunately, this client understands there is no shortcut to positive outcomes, because the quality of the information in the CMMS is the power of the CMMS. That's one difference between hardware and software. A lot of times hardware is super fun and you can see the return immediately. Handheld tools have the cool factor. With software, the quality of the design, build, information, and adoption all directly affect whether it succeeds. There's a lot of decisions and a lot of scrutiny.

By the way, let's be real, it's an extremely small tribe of visionaries who truly enjoy the software implementation process. And sometimes diagnostic hardware can create disruption in fiefdoms because suddenly, this new thing is seeing the unseen, and people or teams can sometimes express defensiveness about it. There are varying degrees of cultural awareness that will be required, and making sure to curate a frame for empowering your workforce on a unified vision is the fundamental thing that we're always looking for.

Sometimes diagnostic hardware can create disruption in fiefdoms because suddenly, this new thing is seeing the unseen, and people or teams can sometimes express defensiveness about it.

[Chris Pepin , founder of Progressive Reliability]

6. IN YOUR OPINION, WHAT ARE ONE OR TWO THINGS THAT WOULD MAKE AN IMPACT IN ALLEVIATING THE HIRING CHALLENGES CURRENTLY ASSOCIATED WITH THE M&R JOB MARKET?

Number one, despite all the data, despite all the challenges, despite all the stories, there are and will continue to be companies that are incredible at hiring. We have a belief about success in America, and it's that "anyone can be successful here," which is at the core of our American dream. The reality is, successful people do come from anywhere, any background, any set of circumstances, and we see it all the time. But anyone isn't going to be everyone because one must be willing to do what is required. It's the same thing with hiring: any company can do it well, but not every company will. Is your team willing to make the sacrifices other's wont in order to win? If hiring is a priority, you can win. If hiring is one of your top three priorities, you can win. It may be useful to consider a saying we use in setting our goals here - if you have more than three priorities, you have none. The tasks will be many – the priorities should be few.

The next thing is, you must use every option, often, at scale. If you want to do the process you've been doing for eight years, you're going to find that you're only getting maybe 20% of what you used to get back then. However, if you're willing to adopt the full set of talent tools and tactics, then not only will you get better, you become a magnetic organization in the process. Hiring a great talent vendor? It can certainly be a supportive piece of your mix, but you still must demonstrate value & carry momentum. The opportunity to stand out right now is better than it's ever been, because quality people find each other within the noise. If you rise with real value, even a little bit, you'll get outsized returns because of how powerful digital networks have become.

Finally, the biggest talent secret that I can share is that 70% of great hires come from internal referrals. When you have great people, they attract great referrals. When you have mediocre people, they attract mediocre referrals. Make sure you're working for & rewarding the referrals you want. Be relentless about it. We want to see great teams doing the right things so they can get the best people. It's why we publish our processes in public. Meaningful work is essential. When great people have great jobs we make a big beneficial impact on our families, communities, and country. △

Thomas Wilk joined Plant Services as editor in chief in 2014. Previously, Wilk was content strategist / mobile media manager at Panduit. Prior to Panduit, Tom was lead editor for Battelle Memorial Institute's Environmental Restoration team, and taught business and technical writing at Ohio State University for eight years. Tom holds a BA from the University of Illinois and an MA from Ohio State University