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THREE TS FOR TRANSFORMATION

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By wicmpadmin September 28, 2016

Manufacturing (and the rest of our economy) faces a tumultuous market in the next few years. Accelerating change, demographic trends, and discontinuous innovation will create new challenges for all companies – but even more for manufacturers. For them, three critical elements often make the difference between success and failure for manufacturers. Talent, technology, and techniques have all been cornerstones determining past success. These three Ts will remain critical for future success – just not in the same way.

Historically, organizations could develop a competence in one of the three Ts and thrive. Most manufacturers addressed talent, technology, and techniques in a siloed fashion and thrived doing it. Markets were stable and change moved slowly, allowing operations to smoothly adapt using continuous innovation to stay competitive. In this bygone world, it was also much easier to stay on top of best practices in all three arenas.

Accelerating change, demographic trends, and discontinuous innovation throughout the market make it much more difficult to stay on top these days. We face new talent challenges as our workforce continues to age; technology is transforming the ways we make things; and techniques are morphing to support the requirements of modern manufacturing. Change has never moved so quickly, threatening successful business models in ways unthought of even a decade ago.

In the past, operations could react to the three Ts in isolation: changing policy, adding equipment, or altering processes in isolation to meet new challenges and stay competitive. Now, it's much more likely that any change in one of the Ts affect the other two.

As an example, let's consider a manufacturer adding their first robot to pack finished product into shipping cartons. Clearly, this is a technology change, using a capital investment to eliminate a tedious and difficult-to-fill job. The robot and its success now makes it necessary to either train or hire employees who can interact with robotics. Finally, these changes will also force adjustments to the techniques used to move product and record those moves. A straightforward equipment change impacted all three Ts.

There are numerous other examples of the heightened interaction between the Ts and the unexpected consequences of not addressing them together. Today, it is much harder to miss this interaction and the best companies use it to their advantage. These companies carefully consider the interaction between talent, technology, and techniques, engaging cross-functional – and sometimes intercompany – teams to explore ways to adjust approaches and tweak investments in order to realize the maximum impact.

Manufacturing is on the verge of another transformation. Accelerated innovation and change, fueled by technological advances, open new worlds of possibilities. The best companies use the

interactions between talent, technology, and techniques to reinvent their organizations to drive performance and competitiveness.

Are you one of those companies?

HUG A MANUFACTURER. CHEER ON A STEM TEACHER. ENCOURAGE A STUDENT.

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By wicmpadmin October 7, 2016

Happy Manufacturing Month! It's time to celebrate!

For most places in the country, the celebration started and ended on Friday with National Manufacturing Day. In over 2,600 events across the country, close to 500,000 people participated in various events designed to highlight modern manufacturing and encourage students to pursue STEM activities to fuel a manufacturing career.

Wisconsin couldn't fit it all into one day, so we have Manufacturing Month. Manufacturing plays a critical part in the state's economy. It drives almost 20% of our GSP and every dollar of manufacturing activity spurs another \$1.43 in support services. Manufacturing is the force behind high-tech – funding 75% of all private R&D, securing 90% of all patents, and employing 83% of the nation's PhDs. It's only fitting that we use all of October to celebrate this contribution.

Manufacturing Month creates great chances to see manufacturing in action. Manufacturers, our technical colleges, and individual communities will all hold events providing opportunities to interact with people who make things and those who support them. Find an event and jump into the world of modern manufacturing.

Madison-Kipp provided one of those opportunities this past Friday, on Manufacturing Day! After the obligatory welcome spiels by state officials, more than 100 students toured the aluminum casting plant – talking with operators and seeing technology in action that transforms slabs of aluminum into precision auto parts. The participants came away with a better appreciation of advanced manufacturing and the opportunities it creates.

If you participate in one of these events, I guarantee what you see will surprise you and make you smile. Modern manufacturing is not the dark, dumb, dangerous, and dirty experience of your grandpa's world. Instead, modern operations engage the brightest people and best technology to make tangible products. Wisconsin manufacturers compete successfully around the world. A quick visit can show you why.

Manufacturing engages the best our state has to offer and shares it with the world. Sharp people find ways to use their talents in ways that excite their hearts as well as flex their minds. These operations provide a platform to put our best research and education to work improving our society. Together, all of these efforts make Wisconsin a better place to work, live, and thrive!

Manufacturing Month is a terrific time to discover these things for yourself! See the great jobs and economic strength that emanate from the manufacturing sector. Watch our best research and technology come to life as a matter of routine. Most importantly – see how cool it is to make stuff.

Your life will change after you've participated in Manufacturing Month. Suddenly, the urge to hug a manufacturer will rush over you. You will cheer on those teachers who push their students in STEM disciplines. Finally, you will step up and encourage students to pursue their dreams through careers in manufacturing. OK...maybe not. Still, it will let you see why some of us get so excited about manufacturing and its role in our future prosperity.

Happy Manufacturing Month!

SKILLS GAP TO A BODY GAP

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By wicmpadmin October 18, 2016

We face a serious challenge to our economic future. Our Skills Gap is quickly changing into a Body Gap. People in Wisconsin address the Skills Gap as well as anyone in the country. Unfortunately, all of this effort will not be enough to overcome changing demographics. A shrinking workforce will require companies to improve productivity by almost 30% in order to maintain our present lifestyle. Making this transformation requires a new integrated approach, centered on three Ts: Talent, Technology, and Techniques.

Wisconsin addresses the Skills Gap as well as anyone. We built great alliances between industry, education, government, and other invested organizations to create effective approaches to train available workers to fill needed positions. There are many robust solutions in motion. They work together to engage the best possible workforce. These solutions take practical – not theoretical – approaches to deliver real results. My travels and discussions with people throughout the country validate the fact that Wisconsin leads the pack when it comes to workforce development.

Unfortunately, all of this terrific work won't be enough to address the coming Body Gap. The demographics tell us that we are missing 20 million people in our workforce because Generation X accounts for only 70 million people – not the 90 million expected from historical trends. In Wisconsin, that translates to workforce numbers that will remain flat – at best – through 2024. That means modest 3% economic growth will require a 29% increase in productivity during the same period. Some experts think the workforce could actually shrink by as much as 40%. A shrinking workforce makes the situation even worse.

These numbers paint a dark picture, requiring productivity improvements not seen in the U.S. in 40 years. If we don't reach these levels, Wisconsin economic growth will stall and our standard of living will fall.

Conversely, this situation also presents a tremendous opportunity for us to transform our communities. We will need every possible worker to fill available slots, requiring us to tap atypical sources to grow our workforce. This demand creates a once-in-our-lifetime opportunity to pull large populations out of poverty and into the middle class. It's a daunting challenge, requiring diligent, focused effort. Still, the hard work can create huge rewards.

Our ultimate success depends upon an integrated approach to Talent, Technology, and Techniques – the Three Ts. In the past, companies could be successful by mastering one of these Ts. Now, companies must master – and integrate – all three into their business models. It's not enough to approach these elements individually. Complicating the situation is a disconnect between

manufacturers on the front lines and solution providers. Most solutions are siloed approaches, championing a single product or agenda. Most manufacturers have the perspective to create an integrated approach, but lack access to the most effective solutions. It's important to synthesize integrated approaches and that requires a different mindset from the key players. I believe that change is coming and we will take advantage of our leadership position.

Wisconsin is well positioned for the future. We have some of the best and strongest manufacturers in the world, our key players cooperate on difficult issues, and the infrastructure exists for a comprehensive approach to Talent, Technology, and Technique to address the Body Gap. Our ability to take effective action will revitalize Wisconsin's economy and secure a bright future.

OUR NEXT CHALLENGE: THE BODY GAP

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By wicmpadmin October 27, 2016

Great people form the backbone of successful companies. That's particularly true of manufacturing operations and the skills needed to handle their diverse requirements. These organizations depend on a steady supply of talent and Wisconsin did a great job opening the talent pipeline by closing the Skills Gap. Terrific initiatives throughout the state allow workers to improve their lives by taking advantage of opportunities in manufacturing. Unfortunately, demographics are quickly turning that Skills Gap into a Body Gap requiring entirely different solutions. The Skills Gap is a complicated problem, but the Body Gap will be even thornier because our options are more limited.

Wisconsin does a terrific job addressing the Skills Gap and it's great fun travelling the state to see different regions' approaches to this challenge. Recently, I was in Green Bay, celebrating the Northeast Wisconsin Manufacturing Alliance's (NEWMA) success in building strong alliances with educators, students, and the community to promote manufacturing careers. This alliance recognizes teachers, promotes connections, and exposes entire communities to the broad benefits of manufacturing careers. They opened new career pathways and possibilities for students in their region. These activities strengthen the talent pipeline and refresh workforce skills to meet changing market demands.

Even in Madison, we're beginning to recognize that four years of college may not be a great career path for our best and brightest. The most important thing we can do for our kids is to keep the doors open to as many opportunities as possible. I don't know about you, but I wasn't all that clear about what I wanted to do when I was 18 years-old. Why would we ask today's young adults – faced with a broadening world of opportunities – to limit their horizons by prematurely making the specialization choices that college degrees require? Our desperate need for talent and lifelong learners – caused by accelerating change and increasing complexity – make it important to encourage our future leaders to build their careers in non-traditional ways. Forward-looking organizations aligned to this mindset are solidifying their talent pipelines by creating more opportunities for students to explore their options.

Wisconsin did great work solving half the workforce problem facing our economy, as the Skills Gap is quickly closing. Unfortunately, this alone will not be enough to address the impending Body Gap. The demographics are in motion and look daunting. There aren't enough people to grow our

economy without reaching out to non-traditional labor sources and improving our productivity by 30% or more.

The Skills Gap was a complicated challenge, but the Body Gap is even worse. The single-dimension initiatives working to stem the Skills Gap will not work going forward because the Body Gap hampers traditional solutions. The future situation will also be more complicated because most companies will not react in time. The symptoms of the Body Gap are identical to the Skills Gap – not enough skilled workers to fill positions – though the solutions are very different. These slow reactions will further limit companies' options.

If we want to grow and improve our standard of living, then we need to effectively address the Body Gap. That requires a coordinated, multi-pronged response across Three Ts: Talent, Technology, and Techniques. Pushing these Ts results in a fourth T: Transformation.

In the past, organizations could thrive by excelling in one of the Ts. Now, success requires an integrated approach because of the shortage of Talent, accelerating change in Technology, and the new work Techniques ubiquitous connectivity makes possible. Only harnessing the leverage between the 3Ts will generate the Transformation we need to grow.

Old solutions and change approaches don't lead to Transformation and won't close the Body Gap. Our productivity statistics for the past 20 years show diminishing results from continuous improvement. Low, single-digit productivity growth will not deliver the results we need to meet this challenge. Also, continuous innovation approaches prevent us from realizing the full potential of new technology. That's the same-old "paving the cow path" approach to innovation that disappointed us 30 years ago.

Only disruptive change and innovation across the 3Ts will generate Transformation. Our organizations face a critical decision: Disrupt or be disrupted. It's much easier to stay on the slow-and-steady path and live with the status quo and incremental change. After all, it's worked in the past, right? The difference now is that there are companies in every industry exploring new ways to engage customers in order to upset entire markets. Accelerating technological change enables more and more upstart companies to challenge incumbents. Are you willing to bet your future that another Uber won't disrupt your industry?

Fortunately, great Wisconsin resources and alliances are available to transform organizations. The expertise and dedication these people bring to complex situations lowers the risk of transformational change. If you're looking to start this journey, be sure you pick a partner that can demonstrate impact and who shows a willingness to find the best resources – even (especially) if it means someone else benefits. Effective change pathways are well developed, but require a step of faith in order to move forward. That faith and the right partners will lead to transformation.

I'm optimistic about our future and the changes we can make together. Wisconsinites enjoy challenges and working together to build a brighter tomorrow. We did a great job addressing the Skills Gap and serve as a shining example to the rest of the country. That's a terrific warm-up for tackling the Body Gap. We will certainly succeed once again. We have the will, the expertise, and the alliances necessary to keep our part of the world in the forefront of manufacturing.

TACKLING THE FIRST T: TALENT

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By wicmpadmin November 10, 2016

Wisconsin faces a new challenge: The Body Gap. The demographics heading our way promise a workforce that's not big enough to grow the economy without historic levels of productivity improvement. This productivity increase requires an integrated strategy around 3Ts: Talent, Technology, and Techniques. The normal siloed approach will not deliver the Transformation necessary to meet this challenge.

Organizations' Talent strategies will be key to address the Body Gap – and most will need a radical change in their approach to address the competition for the best workers, the upgrades needed to implement new solutions, and the expectations workers will have about their jobs and employers.

Demographics are changing the Skills Gap into a Body Gap. Generation X – the generation between the Boomers and the Millennials – is 20 million people smaller than it should be. The combination of these missing workers and Boomers retiring creates a crisis for Wisconsin, the U.S., and all of the developing world. The Wisconsin workforce could shrink by double-digit rates, putting tremendous pressure on all employers. Even if our workforce remains flat, we will need an average productivity increase of 30% to maintain historical growth levels.

That level of productivity growth requires radical Transformation – possible only through an integrated approach to the 3Ts – Talent, Technology, and Techniques. Incremental improvement shows diminishing returns over time and siloed approaches will just not work. Success in the past could come through singular approaches to issues. Now, the new productivity challenge requires us to leverage multiple resources across a spectrum of capabilities. Leveraging all 3Ts creates a fourth: Transformation.

Talent may be the most difficult T to embrace. Traditional approaches fall along the continuum from “Command-and-Control” to “Kumbaya.” Command-and-Control evolved from military models and was adopted by early conglomerates. The approach limits freedom, surprises, and any kind of innovation. The “Kumbaya” approach is an overreaction to Command-and-Control that creates a supportive environment, non-traditional workplace, and focuses on employee satisfaction. Neither approach truly drives performance or innovation.

Modern Talent approaches drive performance through engagement and accountability. Most employers mangle the true definition of engagement. To them, engagement means telling employees why they're doing something. Employees receive a bit more information, but not much latitude to change their worlds. Truly engaged employees act – and are treated like – owners. Clear objectives and strict accountability to those standards drive engagement. This combination creates a strong culture with high standards.

A clear vision for the future and an iron-clad set of principles drive strong culture in the best companies. Writing this blog reminded me of my time as an intern at a major package delivery company. They had a clear vision to serve every address in the U.S. and finally reached that goal during that time. Part of the challenge involved logistical hurdles (mules delivering packages to western canyons). The other hurdle involved the challenges of complying with 50 states' delivery regulations. That's where the biggest delays and dilemmas existed.

One particular state maintained a set of regulations that restricted intrastate operations, designating specific carriers for certain addresses and goods. Those regulations effectively prevented UPS from reaching their delivery goals for more than two decades. During that time, they were provided multiple opportunities to buy their way around these regulations, but refused. Then they went one step further, making this story a part of their corporate lore by discussing their refusals with employees. This reinforced their values and demonstrated what they were willing to do (and not do) to make their vision a reality. The story sticks with me more than 30 years later.

Most companies fail to build this type of strong culture because they fail to go through the hard work necessary to create a clear vision and build the strength to adhere to a meaningful set of principles. That doesn't mean these companies are run by bad people. Most are just too busy keeping their customers happy. I find that's especially true in this entrepreneurial golden age with more market opportunities than ever before. Investing time to reflect and react is a very hard decision in most places. Done right, it provides focus for future action and the structure for a virtuous circle of beliefs and growth.

These virtuous circles create the strong, healthy cultures that foster growth and attract the best people. These people want to make a difference in companies that:

- Hold a crystal clear vision for the future, shared by the entire organization;
- Provide the freedom and independence necessary to make the vision a reality;
- Engage a set of iron-clad values and operating principles to guide and coordinate these independent actions; and
- Maintain an action bias toward truly meaningful goals.

The best players want the freedom to make a difference and be held to very high standards. Only companies with strong, healthy cultures can hold onto these employees over the long haul.

The Talent component of the 3Ts require this strong foundation. These conditions create a fertile field for growth and development, building a receptivity to change and new ideas. That's a critical mindset necessary to integrate all 3Ts in their strategies. A strong Talent strategy is a critical – though not sufficient – condition for success.

There's still more work to do in order to reach the 30% productivity improvement we need to grow in the future. Together – we will make it happen!

YOU'RE MISSING THE POINT

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By wicmpadmin November 30, 2016

I keep reading about how we need to create more jobs in order to boost our economy. These stories miss the point that jobs are not the issue – workers are. We are missing 20 million people in the current workforce and will need every available worker – and more – to keep the economy growing. Filling this Body Gap means finding workers in non-traditional places. Any organization looking to grow in the future will need to engage these new sources.

Available jobs is no longer the issue holding back growth. Workers are. We've done a good job addressing the Skills Gap – continuing to align resources to train and engage available people.

Unfortunately, all that good work will not be enough as that Skills Gap morphs into a Body Gap. We need more people to fill open jobs and grow our economy. There are more open opportunities than any time since the Great Recession. The Wisconsin unemployment rate is at 4.1% and Madison's is a microscopic 2.6% – both numbers well below full employment rates. There are over 87,000 jobs open in Wisconsin – and over 5 million in the entire U.S.

These numbers foretell the front edge of the Body Gap and demographic trends will make the situation even worse. The Boomers are retiring, revealing the 20 million worker shortfall in Generation X. This is not just a Wisconsin or Midwest problem. The entire developed world faces the same issue: not enough workers. In this environment, traditional workforce efforts face an uphill battle because everyone needs more people.

This means we will need to find workers in non-traditional places, requiring new efforts to tap the disabled, discouraged, and chronically unemployed. These efforts require coordinated and aligned efforts from business, government, education, and community organizations in order to bring these people into the workforce. Traditional training, recruiting, and outreach approaches will not be enough to find all the workers we need. This will not be easy and requires new thinking and new approaches. Even with these new approaches, maintaining our present workforce will be a struggle.

For Wisconsin – even with a flat workforce – we will need productivity growth of 30% or more to maintain our growth. We haven't seen productivity improvement rates like that since World War III!

It's tough to mobilize the correct resources because the Body Gap looks like the Skills Gap, but the solutions are very different. The Body Gap is still about connecting skilled workers with open jobs. The important difference is that there are not enough bodies for all those openings. The Skills Gap actions are all necessary – but not sufficient – to address the Body Gap. Effective action requires a comprehensive strategy encompassing the three Ts: Talent, Technology, and Techniques.

Growth depends on that comprehensive approach. Organizations must find ways to deliver more with fewer people. This means rethinking value propositions, investing in new technology, and finding new ways to fully engage the people working with you. Few organizations will find it possible to grow by simply maintaining the status quo.

For most groups, this ends up being a choice between growth or extinction. Accelerating change puts organizations at risk and new technology can transform entire industries. The Body Gap only adds more complication and pressure to the situation. Modern organizations can choose to take advantage of these changes or risk becoming irrelevant – either because the organization's competitiveness slips or its inability to fill demand opens opportunities for others. This is certainly not a time for the timid.

I believe Wisconsin leaders will make the difficult decisions and take the complex action necessary create a brighter future. Business, education, government, and other groups aligned to address the Skills Gap. This same alignment will be needed for this larger challenge. We need everyone – and their ideas – in order to succeed.

It's a difficult challenge, but we face a once-in-our-lifetime opportunity to lift a whole generation out of poverty. We have the capabilities and resources to make this happen. The jobs are there and we need people to fill them. It's time to act – together – and keep our state moving ahead!

DO YOU HAVE ANY CLUE WHAT YOU'RE DOING?

Home / Do You Have any Clue What You're Doing?

By wicmpadmin December 1, 2016

I hear that question often. Most times it comes right before I learn something new. In other situations, it tells me to pay closer attention. Technology is one of those fields where we should all be asking ourselves this question.

Change is accelerating and technology is a key driver – especially in manufacturing. Two major technologies drive change and another enables the change to occur quickly and effectively. At the same time, these technologies have a dark side created by the challenges associated with Cyber-Security. These technologies and the change they create make it essential for every manufacturer to ask themselves “Do you have any clue what you’re doing?”

Manufacturing is being turned inside out by additive manufacturing (3D printing) and robotics. Additive manufacturing changes all the design rules and collapses economies of scale. Designers can finally focus on fitness for use, not on how to make a complex design work. Now, if you can draw it, you can make it with additive manufacturing. This technology also makes very small (n=1) custom runs economically viable. Think about it. Additive manufacturing makes it possible – and in many cases practical – to manufacture anything, almost anywhere, in lot sizes of one.

Robotics and the automation it facilitates are also transforming manufacturing. Moore’s Law may be dead in microchips, but it’s alive and well in automation. Costs are plummeting and capabilities skyrocketing. Robots that cost \$250,000 and required another \$250,000 in safety equipment ten years ago can now be installed for less than \$50,000. Even the smallest companies can invest in the technology, eliminate their least desirable and most mundane jobs, and increase their market competitiveness.

The combination of additive manufacturing and robotics transforms the way products can be designed, produced, and customized. Here in Madison, there are companies following this path and transforming their businesses. Robots perform difficult and dangerous jobs, freeing employees to work on other tasks that create more value. Additive manufacturing makes customization and prototyping quicker and more feasible. In our work, we’ve documented ways that additive manufacturing can transform traditional manufacturing processes. Have you followed these trends? Do you have any clue what you’re doing?

Connected devices – the Internet of Things (IoT) – make the other technologies more effective. Portability and computing power are the leveraged capabilities in this enabling technology. They put more data in operators’ hands and make it available anywhere in the world. The IoT technology can unlock new potential in operations around the world. It can also bring companies to their knees if implemented recklessly.

It’s critical to use the data and power to ask the right questions. In many cases, we see this technology being used to “pave cow paths” – providing remote data to perform tasks that we’ve done for decades in other ways. The siren call of this technology is to improve the efficiency of individual pieces of equipment or operations while actually damaging the capability of the entire system. The

ability to use connected devices provides tremendous power – to build or destroy value. Before engaging this technology, here's the question: Do you have any clue what you're doing?

All of this technology comes with a dark side: All the risks and challenges of cyber-shenanigans. Cyber-Security is one of the most daunting and pervasive concerns across all industries. Every connected device is another access point for a cyber criminal. Every employee can trigger a successful breach. Every technology contains weak points that can be exploited. All of this makes it essential to assess your operation's cyber risk and make conscious decisions about what risks to accept and which to mitigate. Tools like the new National Institute of Standards and Technology Cyber-Security Framework makes that process easier to take the right actions.

Technology accelerates change – especially in dynamic industries like manufacturing. It accelerates change, but should be a part of an integrated strategy that also includes two other Ts: Talent and Techniques. Putting these three Ts together leads to effective transformation across the organization. The integration of the three Ts leads to exploration that causes the right questions to be asked before major changes and investments become ingrained. Following an integrated process that leverages the 3Ts effectively will leave you in a better place. A place where when someone asks, "Do you have any clue...?"

Your answer will be, "Why yes...yes I do!"