The fourth industrial revolution is well underway, but many organizations are frustrated that their technology investments haven't yielded the expected results. The culprit? Leaders failing to adequately consider the human dimension.

We are in the midst of the fourth industrial revolution, Industry 4.0, with businesses increasingly investing in technology and upgrading their factories to take advantage of the latest advances in artificial intelligence (AI) and connectivity. We're ushering in a new era in which industrial operations are automated, connected, and data driven. So why haven't many businesses realized the bottom-line benefits of digital-ready industrial operations? Our research suggests that while the future of manufacturing depends on technology, many organizations are failing to fully consider the role of the *human* dimension.

Businesses are past the point of test pilots for Industry 4.0 and are now mobilizing smart factories and modern industrial practices at scale. Digital transformation spending is expected to reach $2.8 trillion USD in 2025 alone, topping $10 trillion in total from 2021 to 2025, according to the latest Worldwide Digital Transformation Spending Guide from the International Data Corporation (2021).

The future is being designed today, but current digital transformation efforts aren't enough

Rapid innovation and widespread access to cloud computing are expanding the digital landscape in today's society. While digital transformation has been around for more than a decade, the pace of technological innovation and the velocity of adoption have significantly increased since the global pandemic introduced its own sets of challenges and opportunities. And like many previous generations of disruption, the cost of digital tools for industrial operations declined as technology matured and adoption increased.

What we're uniquely seeing now in 2022, however, is that despite years of significant spending and attention, between 70% and 95% of digital transformation efforts are failing to deliver on their promised Return on Investment (Block 2022). This is because organizations have implemented technology with an incomplete strategic plan; they haven't unlocked the trapped value that a human and machine redesign can drive together. In other words, they have overlooked the connection between employees and technology. In addition to the array of disruptive technologies, societal factors, such as resource scarcity, inflation, geopolitical conflicts, and strained infrastructures, have all contributed to a complex industry.

Solutions can be found in the human dimension

Today's challenges and complications on the factory floor are also opportunities for improving the future of manufacturing. In the digital era, organizations must make three fundamental talent strategy shifts to reap the rewards of Industry 4.0:

- **Redefine digital leadership.** Reposition the changing face of digital leadership by encouraging fundamentally different types of skills.

- **Reimagine digital operations.** Introduce new workflows as a digital enterprise, helping leaders and employees accomplish their goals.

- **Reskill a digital workforce.** Build an upskilled and reskilled workforce that bridges the gap between people and machines.

In the following pages, we'll examine these three main pivots that organizations can take to navigate Industry 4.0 and explore ways that manufacturers can better support the people who hold the power to unlock the digital enterprise and build the future of manufacturing.

Redefine digital leadership

Position the changing face of digital leadership by **encouraging fundamentally different types of skills**

Successful digital leaders see that the future is being determined today and understand their need to rethink current behaviors, skill sets, and ways of working to effectively navigate the ongoing digital transformation and ensure a human-centric approach within their organizations. Three imperatives for leadership performance will be crucial for organizations to deliver on their digital ambitions: setting new mandates for leadership, redefining digital leadership capabilities, and rethinking build vs. buy leadership decisions.

Goal 1—Set new mandates for leadership

The work of leadership has evolved, so we have identified six new mandates for digital leadership to better support the digital transformation agenda:

- **New behaviors.** Successful digital leaders are curious, adaptable, and strategic, with a high tolerance for ambiguity and a willingness to take risks.

- **New skills and experiences.** Digital work goes beyond technology. Digital leaders need to be able to leverage data and make improvements to drive the business forward.

- **New populations to lead.** Key digital talent is highly motivated by culture, purpose, and development. Plus, highly technical populations are often neurodiverse, so leaders must be adept at understanding different ways of thinking.

- **New ways of teaming.** Work is driven more by collaboration, so traditional hierarchies are inefficient. Teams need to be nimble and adaptable to combat disruption.

- **New decisions to make.** Difficult questions around the role of technology and AI, bias, privacy, and social impact are at the forefront. "Can we build it?" has become "Should we build it?"

- **New ways to grow.** Developing as a leader for the digital journey is highly iterative and nonlinear.

Goal 2—Redefine digital leadership capability

The skillset of today's digital leader requires a fundamental behavioral shift. In a study, we analyzed the traits (natural tendencies), competencies (skills and behaviors), and drivers (values) of more than 500 best-in-class digital transformation leaders. Then, we compared them with population norms from our 4.5 million data point assessment database to create a distinctive profile of the qualities needed for the digital age. We found that high-performing digital leaders have unique characteristics, as shown in the figure below.

Figure 1: Digital leader profile—Key characteristics of high-performing digital leaders

Traits	Competencies	Drivers
CURIOSITY Tackles problems in a novel way, sees patterns in complex information, and pursues deep understanding.	**CULTIVATES INNOVATION** Creates new and better ways for the global organization to be successful.	**INDEPENDENCE** Prefers an entrepreneurial approach and limited organizational constraints.
RISK-TAKING Willing to take a stand or make changes based on limited information.	**MANAGES AMBIGUITY** Operates effectively, even when things are uncertain, or the way forward is unclear.	**STRUCTURE** Prefers asymmetric, unstructured work environments.
ADAPTABILITY Comfortable with unanticipated changes of direction or approach.	**HAS A STRATEGIC MINDSET** Looks ahead to future possibilities and translates them into breakthrough strategies.	**CHALLENGE** Motivated by achievement in the face of tough obstacles.
TOLERANCE OF AMBIGUITY Comfortable with uncertain, vague, or contradictory information that prevents a clear understanding or direction.	**ENGAGES AND INSPIRES** Creates a climate where people are motivated to do their best to understand people's motivations, engages them in the work, and builds a sense of energy toward common goals.	**COLLABORATION** Prefers work-related interdependence, group decision-making, and pursuing shared goals.
CONFIDENCE Believes they can influence positive outcomes.	**DRIVES RESULTS** Consistently achieves results even under tough circumstances.	**POWER** Motivated to seek influence, recognition, and increasing levels of responsibility.
NEED FOR ACHIEVEMENT Tends to work intensely to achieve and exceed difficult standards.	**IS RESILIENT** Rebounds from setbacks and adversity when facing difficult situations.	**BALANCE** Motivated to integrate work and life in a sustainable, enjoyable, and meaningful way.
CREDIBILITY Has a high degree of belief they control the course of events in their life.	**COLLABORATES** Builds partnerships and works with others to meet shared objectives.	
ASSERTIVENESS Comfortable taking charge and directing others.	**COMMUNICATES EFFECTIVELY** Develops and delivers multimodal communications that convey a clear understanding of the unique needs of different audiences.	

These unique characteristics represent a behavioral shift:

- **From** being technical and process-oriented **to** being adaptive and nimble.

- **From** relying on authority to being able **to** leverage influence.

- **From** relying on experience to solve problems to elevating creativity **to** innovate for the future.

- **From** reactivity **to** experimentalism.

- **From** preoccupation with perfection over iteration **to** excellence at the core and speed at the edge.

- **From** complete data being required **to** make decisions to incomplete data not being a barrier to making smart decisions.

The work in today's factories is drastically different than it was decades ago. The leadership, therefore, must also be different. In order to meet today's challenges, leaders need to adopt an Enterprise Leadership mindset—a radical perspective change that involves breaking siloes and weighing multiple perspectives simultaneously.

While previous generations of industrial leaders gave directions and left operational resources alone to get the task done, information today constantly flows in all directions. Now, machines are equipped with sensors that send data to managers via cloud-based software programs. Take, for example, a machine running too hot—a remote operator may get an alert about it before the person using the machine even notices anything. At that point, the remote operator can walk the technician through the steps for fixing the problem. Or, better yet, algorithms can ingest previously disparate data and make correlations to predict failure before it occurs, driving teams to collaborate more on systems-wide data, operations, and equipment.

Today's leaders need to collaborate and problem-solve with their teams—not only to find out when equipment overheats and fix it, but also to figure out why the machine overheated in the first place and prevent it from happening again.

As factories and supply chain operations evolve through the next industrial revolution, digital leaders must get the most out of the organization. While it may be tempting to look externally for leaders from digital backgrounds, such as managers at big technology companies, it's essential to make sure their leadership style will match the team. Machine operators, for example, have already faced transitioning from using wrenches to using software applications to troubleshoot equipment issues. How will they react if they feel their new boss is pushing more new technology?

The right leader will be an ambassador of change who embraces an Enterprise Leadership mindset by considering all aspects of the business with equal weight, ultimately making decisions that serve the entire ecosystem. They will find ways to make the new processes and tools more approachable and less intimidating. Assessments can help you identify people with competencies (such as the ability to engage and inspire) that will ease the transition.

Goal 3—Rethink build vs. buy leadership decisions. Organizations must look to build as well as buy their leaders of the future.

In a recent supply chain study, we asked 229 leaders across 37 countries in various sectors the question "Where are you looking for future supply chain leaders?" The responses show that organizations are increasingly implementing a twin-track approach to sourcing their required leadership skills. While 66 percent of respondents are looking externally, 62 percent continue to seek and develop leaders from within their organization.

Internal candidates are already familiar with the organization and its mission, but external hires can bring a fresh perspective. When looking at external candidates, keep in mind that the people best suited for leading digital transformations don't always follow traditional career paths. As we discuss in another piece on finding great digital leaders, resumes with short tenures, no-name employers, and disjointed jobs could be flagged as signs of job-hopping and lack of direction. However, they may also be the recipe for an excellent digital leader—someone with a pioneering spirit who is curious enough to try new endeavors and has a high tolerance for ambiguity.

Reimagine digital operations

Introduce new workflows as a digital enterprise, helping leaders and employees **accomplish** their **goals**

In all segments of manufacturing and supply chain operations, technological advancements are significantly improving visibility and accessibility to everything—products, people, and information. Accordingly, companies are changing the way they operate. There is an abundance of data, endless flexibility, and real-time updates. For example, you previously may have used enterprise resource planning software that updated once or twice a year. Now, your cloud-based software updates system parameters on an ongoing basis.

Goal 1—Recognize the new and rearchitect the job

As another example, with elevated supply chain disruption as the new norm, agile and end-to-end planning has quickly become a common board level topic. The operational change requires transforming from traditionally discrete, serial exercises, to a continuous, high visibility environment. Planning and scheduling are no longer daily, weekly, monthly efforts but a constant and fluid condition. The enabling technology is a digital twin, spanning all the supply chain planning time horizons from long-term strategic network planning to medium-term Sales and Operations Planning and short-term tactical Supply Chain Execution.

While emerging capabilities, like supply chain "control towers" and open architecture "platforms," are very valuable digital tools, high performing companies recognize how these technical advances can reshape work itself and create fundamentally new roles. Buying up the latest, digital shiny objects is not enough to push organizations up the maturity curve. It's not a quick fix that guarantees supply chain orchestration; highly informed and fast decision-making; or improved on time delivery, inventory management, and customer experience. You need to institutionalize new ways of working.

Goal 2—Rewrite your cost structure and increase productivity

Too often costs are displaced, not reduced. Simply purchasing new technology won't rewrite the overall cost structure. For instance, introducing extended reality to maintenance, repair, and operations may push an organization up the digital curve, but expanding the concept to remote operating centers with on-demand access to knowledge across the globe while eliminating travel, opens the door to rewriting and reducing your cost structure. Achieving a wholistic vision, fundamentally changing the way work gets done, creates a competitive advantage rather than just introducing change to pullout short-term costs.

With the change of new workflows comes the risk of reduced employee engagement and productivity. As you introduce more automation, employees may fear that technology is there to replace them. Good leaders treat their teams with respect by being upfront about how their jobs will change. They can emphasize the benefits and empathize with the anticipated challenges. They might, for example, point out how new technologies reduce the need for tedious tasks. It can also include setting employees up for success by acknowledging the disruption to their usual workflows, helping them understand why change is essential and showing them how they fit into the future operating model.

Reskill a digital workforce

Build an **upskilled** and **reskilled** workforce that **bridges the gap** between people and machines

Just like leaders, employee teams must undergo a transformational workforce journey. This will require a human-centric approach grounded in a foundational understanding that technology serves to augment human capabilities, not replace them. It is only then that efficiency improvements and cost savings are not short-lived temporary events and are actually what leadership and stakeholders desire: real transformation setting the direction for the workforce of the future.

Goal 1—Focus on the workforce of the future

Crafting the workforce of the future means proactively responding to how the digital era is reshaping today's job architectures. It is critical to target efforts to attract, hire, train, and retain the right workforce biased toward future needs and not just current ones. New skills, both hard and soft, will be needed to perform in a more dynamic, digitized work environment. For companies to reshape their workforce, they need to understand the gap and build a talent strategy in pragmatic and sustainable ways for key areas.

Goal 2—Organizations must commit to evolving alongside technologies and employees

To recognize the return on automation technology investment, organizations must dedicate resources to learning and development through increased employee training and education. At the same time, employees must be inclined and encouraged to learn new skills and take on new responsibilities to adapt new systems to best fit for business objectives.

Companies need to take a close look at redesigning their supply chain roles, mindsets, and skillsets to match new realities ushered in by increased automation, such as:

- Declining demand for old skillsets

- Nontraditional career paths

- Real-time, continuous learning, development, and feedback

- Diverse viewpoints and a highly inclusive culture, where constructive debate is facilitated

- Empowered decision-making

- Increasing the pace of information flow and robust communication

- High learning agility and business acumen

Just like building or buying leaders, manufacturers shouldn't choose between developing their in-house top talent and looking outside the company for people who have digital skills. They can take a hybrid approach by first identifying the necessary skills, competencies, and behaviors then nurturing the people who already know the ins and outs of the organization and seeking external candidates to fill certain vacancies.

Conclusion

Investing in these new skills and mindsets will provide you with a competitive advantage. Many organizations have poured time and money into technology. Now, it's time to shift the focus to people. After all, even the most advanced tools are only as good as the people who use them. People and machines need to work together. In today's industrial settings, digital maturity is a crucial factor for whether you get ahead or fall behind the competition. Ultimately, the foundation of digital maturity growth is people—not simply the digital gadgets themselves.

Today's imperative for operations executives goes far beyond simply bolting the latest digital technologies onto their manufacturing and supply chain assets. Instead, they must reimagine how to create entirely new capabilities at the intersection of digital technologies and their human capital—the next-generation knowledge workers running their operations. To succeed, business leaders will need to continue to innovate and adapt, changing the mindset for the next generation of digital investments. In doing so, they will achieve a greater ROI, such as:

- **Increased employee engagement** to retain an already scarce talent pool.

- **Attraction of new, top talent** who can introduce perspective and see around the curve in this digital era.

- **Matched pace with value stream partners** (upstream and downstream), who expect more advanced capabilities.

- **Powered innovation to maintain a competitive advantage** protecting and growing market share.

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