

WHITE
PAPER

Manufacturing in the digital age

How to transform with Industry 4.0.

6 key elements

Introduction

The current trend of automation and data exchange in physical technologies—known as the Fourth Industrial Revolution, or Industry 4.0—is set to have a vast and lasting impact on the manufacturing industry.

No part of your business will be left untouched from the Industry 4.0 effect—from operations and supply chain to research and development, to sales and marketing. The development of the smart factory, where manufacturers can combine artificial intelligence, machine learning and the connectivity of the Internet of things (IoT), aims to make great strides forward in digital manufacturing. This technological revolution is designed to increase digitalization and the interconnection of products, value chains and business models, allowing you to connect all your physical assets by a digital thread.

“Industry 4.0 is expected to drive productivity increases comparable to those generated by the introduction of the steam engine in the Industrial Revolution. Globally, it is expected to deliver between \$1.2 trillion and \$3.7 trillion in value.”



But just how ready is the industry?

Overall, just 20.7 percent¹ of manufacturing organizations surveyed rated themselves as “highly prepared” to address the emerging business models the Fourth Industrial Revolution brings. However, for those willing to embrace this digital revolution, the upsides are astonishing—uplifts in network bandwidth, expanded reporting capabilities, unprecedented efficiency—and that’s just the tip of the iceberg. Whether this is opportunity or obstacle, profit or pitfall will be determined by how your business reacts to the magnitude of change and the systems you put in place to master the benefits of digital transformation for intelligent manufacturing. There is no one way to digital transformation, and every business in every sector is different. Yet, there are some vital elements that every manufacturer needs to consider in order to deliver Industry 4.0 growth and embrace the revolution.



Element 1

Are you ready to transform?

It's essential to consider how Industry 4.0 will impact every element of your manufacturing operations and business before embarking on the process. To get where you want to go, you need to understand where you currently are. An internal audit to assess production lines and identify inefficiencies will aid in identifying the areas prime for transformation.

Expert help from specialists who can deliver an end-to-end solution will make sure you are asking the right questions to help align transformation goals to achieving the business outcomes you desire.

Element 2

Reducing complexity

Complex is rarely clever, and smart is almost always simple. The digitalisation of your manufacturing business by Industry 4.0 has the potential to simplify supply chains, tailor assembly lines and reduce costly, timely and complicated repairs to machines. This process will see redundant legacy systems replaced with a single, enterprise-wide solution, bringing down costs and boosting efficiency.

Eliminating complexity will free up more time to invest in research and development, improving customer relationships and managing operations efficiently, which leads to better production and profits. However, none of these ends are inevitable. Clever may not be complex, but careful planning and understanding of digital processes is needed to get the results you are after. Having a clear understanding of the intended goals and outcomes of any transformation project can remove much of the friction associated with implementing advanced new systems and processes.

Element 3

Cybersecurity

Industry 4.0 will see an explosion of connectivity, allowing many more of your devices to talk to each other. Yet, this makes keeping data safe even more challenging.

The Internet of things allows your physical devices to remotely share and receive data and commands between systems and other devices, making processes faster, more agile, more intelligent and more efficient.

However, with increased connectivity comes increased vulnerability. The more data handoff points there are, the greater the exposure to attacks and disruption from cyber criminals. With any cyber attack potentially having a devastating impact on profits, brand reputation and assets, cybersecurity is an issue that businesses will need to deal with parallel to transformation, not as an afterthought.

Taking steps to improve cybersecurity when adopting Industry 4.0 is imperative. You need to take a preemptive role assessing where your most valuable data lives and predict what inherent vulnerabilities are most likely to be exploited.

Threat intelligence is key—both to anticipate threats, and to respond with agility if a breach occurs. However, you should be wary of getting lost in too much data. In this sense, “less is more” is a useful adage, and you would do well to concentrate on ensuring the fidelity and quality of your intelligence, rather than focus on its quantity.

Only then should discussions turn to where to invest in protection. It should be remembered, though, that many major attacks can be thwarted simply through good governance. Whatever type of organization you work for, a robust cybersecurity strategy must start with getting the basics right.

In the rush to move over to digital operations, we must all consider how to use the best of our existing skills, particularly around areas like compliance and security.

Element 4

Know your customers

Businesses are increasingly determined by the relationships they have with their customers. More than ever, customer expectations have skyrocketed. It's vital to harness the power of new technology to meet their demands.

Industry 4.0 has led to a more responsive value chain. That means that manufacturers can reach end users more easily, allowing you to adapt your business model to service their requirements faster.

Another great leap is coming in digital fabrication, which will allow mass customization of products to suit the individual needs of each customer. With software and robotics embedded into assembly lines, the ability to adapt to a wide variety of specifications will only increase.

Gaining a greater understanding of your customer and their demands is essential in order to take the next step to Industry 4.0, allowing benefits to flow both back to the business and on to the customer.



Element 5

Moving products and services to the cloud

Industry 4.0 will impact every part of your business. To fully realize the benefits brought about by new and continued technological innovation, developing and implementing a cloud migration strategy is a necessary step for all businesses seeking to survive and prosper in Industry 4.0.

If your business hasn't already started on its journey of migrating to the cloud, you will need to consider how this undertaking will impact your products, processes and supply chain.

For manufacturers, making your products and services cloud compatible will have seismic implications for your business. Many of these products and services will need to be reimagined with custom-designed software, allowing them to interact and respond to what they're doing, as well as the activities of those around them. This will give invaluable insight into their efficiency and how best to use them.

In moving products and services to the cloud, manufacturers are better positioned to capture and analyze the vast quantities of data and unlock further opportunities. Valuable insights into the efficiency and best use of your products, processes and supply chain can be more easily revealed and acted upon through the power and scalability of cloud computing.

Consideration should be given to how a move to the cloud works as part of the broader strategy and how it meets the demands of a business and its customers.

For example, many businesses have found that Lumen cloud solutions empower employees to deliver agility where it's needed and offer reliable performance that

exceeds their customers' expectations. Our solutions also have built-in security and service integrity, enabling companies to monitor threat levels and respond swiftly to any incidents that may arise.

Starting the journey of digital transformation can seem confusing and complex process, yet the opportunities are substantial to those businesses that get it right. That's why it's so important to find a cloud partner that not only understands digital transformation, but also what it means for your business and your sector.

This will mean you can make informed and reliable decisions that improve efficiency, boost profits and take advantage of the opportunities ahead.

At Lumen, our knowledge and experience working with manufacturing businesses can help you embrace digitalisation to increase productivity and profitability across your operations.

Element 6

Follow best practices

The final element is ensuring you've followed best practices. While it's easy to get carried away with the excitement surrounding new technologies, manufacturing processes are heavily targeted by cyber threats in the Industry 4.0 age—and cutting corners on any of the above steps could lead to trouble.

From the very beginning, security needs to be a central pillar. You need to fully understand what data is most important to you and employ multi-layered encryption to protect it from bad actors. From IP protection to identity verification, ensure you work closely with developers to secure yourself against internal and external threats.

At Lumen, we help companies adhere to best practices at every step of their journey. Take one of our electronics manufacturer clients, for example. When they initially approached providers for help gaining end-to-end control over their global network, we were the only ones able to meet the challenge.

After impressing during a trial period, we went on to revitalize their entire network, replacing multiple unmanaged collaboration tools and an in-house VoIP solution with a single Lumen managed unified communication and VoIP service. Today, all 40 of their sites are running on a Lumen converged network.

At each stage, we made sure our client was delivering on both performance and security, ensuring they had an innovative network that is designed to achieve the best possible results.

Lumen can make digital transformation seamless. From the very beginning of your journey, we can advise, guide and enable you to truly deliver on your business goals each step of the way.



Improving your operational efficiency

Industry 4.0 offers improvements to operational efficiency of industrial proportions. Innovations in digital technology are set to transform manufacturing operations.

Lumen also boasts one of the largest privately-owned IP backbones in the world. We're a cloud-agnostic application manager with certified solution status for both AWS and Microsoft Azure—meaning we have what it takes to meet the demands of the manufacturing sector.

We will help you harness advanced technology with our managed services to deliver operational efficiency, enabling you to develop new opportunities and boost your bottom line.

With around 5,000 employees across 90 locations, Mammoet, a global market leader in engineered heavy lifting and transport, needed to transform its business to reduce cost and boost flexibility and security. Lumen was able to help the organization cut network infrastructure costs by €600,000 per year while improving connectivity and productivity at customer sites.

Lumen Research Labs tracked an average of 195,000 threats per day in 2017, and impacted 104 million unique targets on average each day.

Unlocking agility

To get the best out of what Industry 4.0 has to offer, you need an agile IT strategy. In order to respond faster to increasing demand, you need a flexible, reliable infrastructure and network solution that keeps you ahead of the competition.

That means working with a partner that knows how to build cloud and network services that work in harmony with each other. Our network can adapt, with a distribution and access layer that allows you to move products and services to the cloud, while maintaining seamless end user experience and manufacturing machine uptime. That way, we allow you to transform in line with Industry 4.0.

Join the revolution

The Fourth Industrial Revolution is upon us. It has the potential to be a huge boon for business, redefining the manufacturing industry.

However, making Industry 4.0 a success for your business will involve significant changes to organizational structures and practices. Everything from IT architecture, data management, tax and regulation and culture will all be affected. Without the right skills and expertise in digital transformation, the opportunities in operational efficiency, collaboration with supply chain partners and reimagining your products and services are likely to be wasted.

We understand that to deliver the increased productivity and profitability that comes from the digitalisation of your manufacturing processes, you need the knowledge and expertise that comes from working with manufacturing businesses.

When you partner with Lumen, we will design and implement an end-to-end converged networking and multi-cloud solution that will maximize productivity and profitability, help keep you ahead of the competition and help you embrace the revolution at your door.

Footnotes

1. Deloitte, Distinctive Traits of Digital Frontrunners in Manufacturing, 2018

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About Lumen

Lumen (NYSE: CTL) is the second largest U.S. communications provider to global enterprise customers. With customers in more than 60 countries and an intense focus on the customer experience, Lumen strives to be the world’s best networking company by solving customers’ increased demand for reliable and secure connections. The company also serves as its customers’ trusted partner, helping them manage increased network and IT complexity and providing managed network and cyber security solutions that help protect their business.