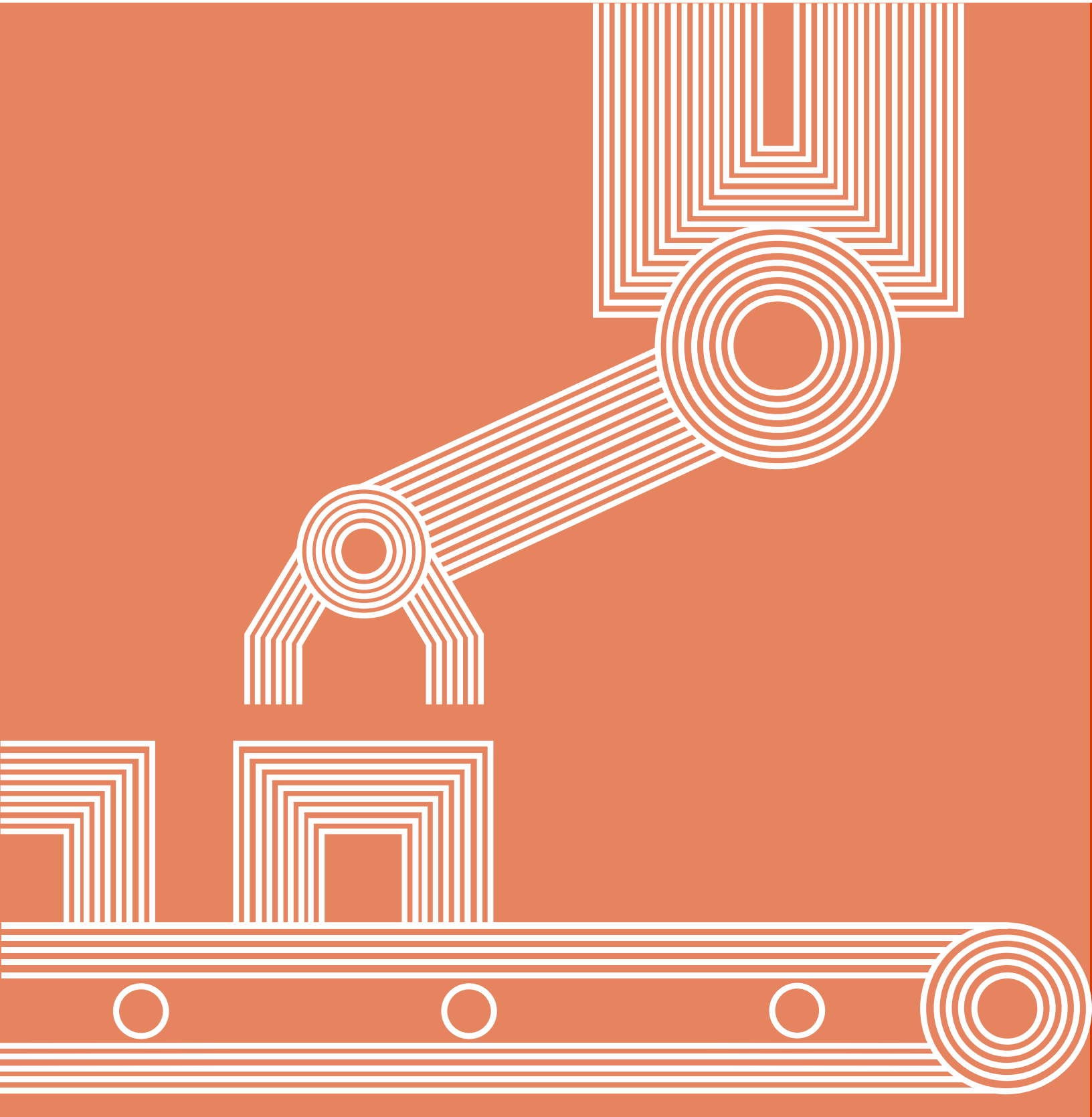
Microsoft

A Strategic Approach to Digital Transformation in Manufacturing Industries



Executive Summary

Digital transformation holds the potential to transform every manufacturing operation. **Process transformation** means converting traditional processes to more efficient digital systems that can increase efficiency dramatically, improving all aspects of the operations. **Product and service transformation** means creating new value-add services that can both improve the manufacturing environment and the customer experience while opening new revenue streams.

Before embarking on a digital transformation journey, it's critical to understand your objectives, adopt a holistic yet realistic approach, and partner with the right advisor who can support you on both the technology and strategy aspects of your initiative.

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Defining your path to digital transformation

Digital technology has played a vital role in the manufacturing industry for years. Compared to other industries, manufacturers are ahead of the curve when it comes to incorporating digital technology into business processes. Today though, digital is no longer simply a tactical aspect of the manufacturing business – it's becoming vital to pursue end-to-end digital transformation in order to achieve objectives like improving efficiency and quality, reducing costs and waste, and creating innovative products and services.

Digital transformation is about applying technologies to radically change traditional processes, products and services into data-driven, highly connected solutions that can be monetized through extreme efficiency gains and entirely new business models. With a digital-first approach, firms are accelerating time-to-market, providing new customer value through digital experiences, managing complex global value chains and innovating to dramatically improve the customer experience and create new revenue opportunity. In short, the promise of digital transformation is just that – transformational.

But driving digital change is easier said than done. While the benefits that digital transformation offers are tremendous, there is no single, one-size-fits all approach. Each firm's journey is unique. As a result, finding an approach that fits your business is critical. There are also a number of pitfalls to avoid. Well-crafted strategies can easily fail to be fully realized unless they are supported in the right ways, resulting in lost investment, lost time and an erosion of organizational support.

To set your firm on a course that makes sense for your business, it helps to consider three foundational guidelines. Regardless of your specific business situation, using these guidelines during the early planning stages will strengthen your overall outcomes and increase the likelihood of a successful initiative.

1. **Build a vision for your digital transformation journey**
2. **Develop a holistic and realistic strategy**
3. **Identify the right collaborative partner with the industry expertise required to deliver the change you need**

The first of these is building a f digital transformation initiative vision to undertake and your priorities in bringing about these changes. Some firms need to make process changes. Others are ready to start pursuing new digital-enabled revenue opportunies immediately. Second is understanding how key aspects of your approach can make a big difference in your results. These include how business and technology strategy relate, and how prioritizing agility contributes to better outcomes. Finally, selecting a partner who can collaborate with you and remain engaged throughout your digital transformation journey is key. The best-laid plans can easily go awry without knowledgeable execution or partners who understand the intricacies and best practices of your industry. In subsequent sections, we'll explore in more depth what each of these guidelines mean.

Build a vision for your transformation journey

There are two types of digital transformation:

- **Process transformation:** digitizing existing processes and procedures to improve efficiency and operations.
- **Product and service transformation:** developing new digital services and experiences for customers that improve satisfaction and loyalty and that create new sources of revenue.

Getting clear on the type of transformation you are going to focus on (or identifying that both types make sense, given your objectives) is an important starting point. Each has the potential to dramatically improve your trajectory of future growth and performance.

Gaining efficiency through process transformation

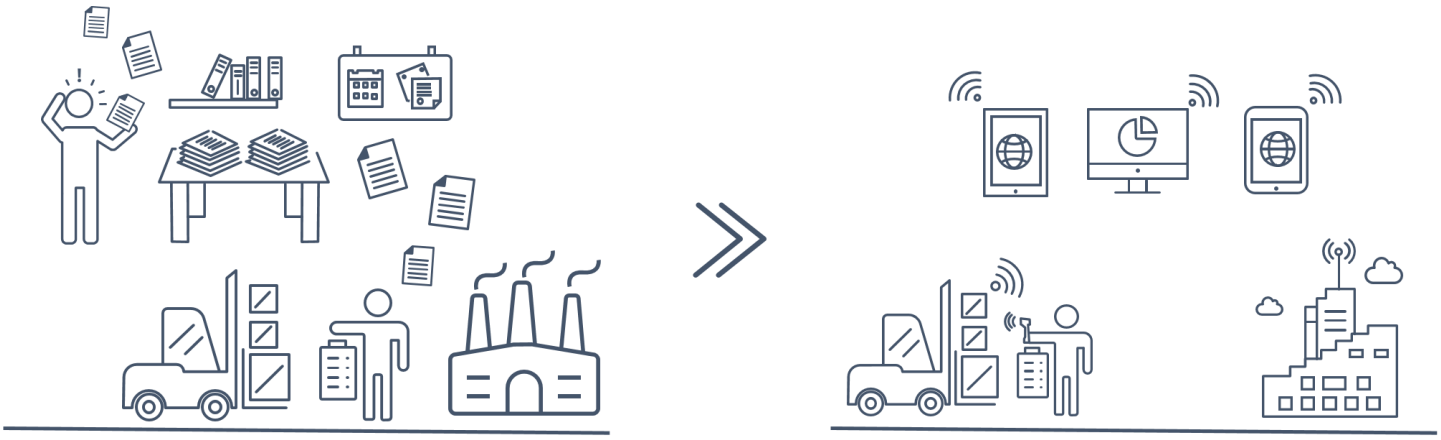
thyssenkrupp

thyssenkrupp wanted to better monitor and service their 1.1 million elevators installed around the globe. Being in some of the most famous buildings in the world, lack of insight and unpredicted failures led to costly downtime. By connecting thousands of sensors in their elevators to the Microsoft cloud, thyssenkrupp gained real-time visibility into product performance and rapid, remote diagnostic capabilities. Today, thyssenkrupp has reduced maintenance costs and elevator downtime by arming their 20,000 elevator service technicians with the ability to visualize and identify problems ahead of a job. Technicians also have remote, hands-free access to expert technical information when onsite. As thyssenkrupp has experienced, process transformation can deliver dramatic operational improvements.

Process transformation is critical for companies with legacy paper-based systems or digital systems. Without a modern digital information backbone, there are inevitably inefficiencies, such as manual processes, siloed data, and duplicative efforts. This results in limited access to information for employees, hindering their productivity. Entrenched practices and procedures may also be sources of inefficiency, necessitating retraining.

It's useful to think about process-related digital efforts in stages. First, converting and optimizing general operational processes to digital workflows can deliver immediate results, such as unifying email, calendar, messaging, voice and collaboration. This type of streamlining is highly valuable, as it makes a major difference in how efficiently an organization functions. Giving employees more access to actionable information enables them to do their jobs more effectively. From there, more advanced workflows can be developed, such as analytics-driven decision support and digital field service processes.

These new digital capabilities give employees better, more timely information, directly supporting objectives like higher first-time fix rates. The long-term benefits of process change can be wide-ranging. For instance, advanced analytics paired with remote device monitoring can analyze a wide range of systems and predict when maintenance will be needed before a component fails and causes disruption. Another benefit is better allocation of human resources, like field service engineers. Digital workflows can ensure that the optimal resource is assigned to the highest-priority activities. Insights from digital workflows pave the way for reduction in time and waste, as well as improvements in quality and production efficiency.



Paper-based Processes

Digital Transformation

Rockwell Automation

Rockwell Automation wanted to differentiate itself from competitors. Using Microsoft technologies to monitor their expensive, remote equipment, Rockwell now offers proactive, data-driven advice to customers. With full visibility into equipment performance, it's easy to alert customers to potential issues and give them precise insights into how to address them. In an industry where a single pump failure in an offshore rig can cost a company $300,000 a day in lost production, these insights are of significant value to Rockwell's customers. After partnering with Microsoft, Rockwell significantly reduced customers' troubleshooting efforts and has made the design manual consult a thing of the past.

Process transformation can rapidly make a major difference. In 2014, the 14,000-employee company Kennametal transformed communication and collaboration between locations in 60 countries by providing employees seamless videoconferencing, instant messaging and document collaboration capabilities between locations. By giving employees 24/7 access to company news, business intelligence and digital collaboration, it reduced barriers between employees working far apart and created the next best experience to working together in person.

Digital isn't just about adding a new level of reliability and speed to existing systems and processes – though it does deliver that. It also means gaining more accurate, real-time information about the performance of your business. Robotics manufacturer KUKA is a good example of how process transformation can unleash hidden potential. Engineers obtained unprecedented insight on the performance of an assembly line by connecting 60,000 devices and robots to the Microsoft cloud and running advanced analytics. Using these analytical results to predict machine failure before it occurs, KUKA engineers now minimize both planned and unplanned downtime by knowing when machines need to actually be serviced – and the best time to take them offline to minimize disruption.

Creating new opportunities with product and service transformation

Product and service transformation is about using digital technologies to deliver innovative services and experiences, which translate into new revenue potential. This often involves the computerization of entire product platforms and the monetization of data-driven services.

In some cases, manufacturers have been offering these types of services for a while but without the speed, agility and analytic capabilities offered by today's cloud based technologies. Aircraft engine manufacturer Rolls-Royce, for instance, has been using data models for years to determine when aircraft engines require maintenance. Grounding an aircraft for maintenance is incredibly costly for an airline, so being able to schedule it precisely was a major improvement over previous methods. Now Rolls-Royce can analyze larger data sets which increases the accuracy of predictive maintenance recommendations and respond quickly to customer demands for new business or operational insights.

Beyond jet engines, products of all kinds are becoming increasingly computerized, or "smart." Smart products are built with a computing platform that makes them dynamic. For instance, a washing machine might download a new power efficiency program to reduce water or power use and the customer's bills – and similar kinds of feature enhancements could be delivered over the lifetime of the product therefore retaining its value.

Rolls-Royce

Rolls Royce has adopted improved digital systems that allow engineers to not only schedule engine downtime, but predict the specific repair actions that need to be taken and the parts they need. If an engine needs a new fuel pump urgently, for instance, that information is instantly available to maintenance crews, who can have the exact parts ready to go before the equipment fails. With hundreds of lives potentially on the line in the event of a catastrophic equipment failure, the benefits of having this information are huge. Airlines using Rolls Royce engines can be confident their engines are constantly being monitored for problems before they occur. For Rolls Royce, this not only builds customer confidence and loyalty but is also a high-margin business.

Adding digital components to products not only makes it possible to update them over time – it also enables new service delivery and improves the customer experience. For example, a smart heating furnace automatically identifies when it needs service and proactively prompts its owner to schedule a service date and time. A smart refrigerator can identify when a household needs more milk, or something is about to expire, and sends a text message alert – or automatically re-orders it. A smart power generator set can examine historical data to know when demand will be lower and reduce its fuel consumption automatically. The smart power generation solution can also offer other advice aimed at reducing costs, emissions and maintenance needs. These are just a few examples of the new scenarios that product and service transformation supports – the possibilities are broad.

Smart products can also transform the manufacturing environment itself, building on process transformation that has already been accomplished. An industrial robot assembling pickup trucks, for instance, might need maintenance ahead of schedule and notifies the plant's engineering department accordingly. Catastrophic failure is avoided, and downtime is minimized. This technology can help in the supply chain as well. Rigs on the road can be tracked in real time and re-routed automatically to avoid bad weather, for instance, heading off a supply shortage that could lead to massive revenue losses.

Perhaps most importantly, products with smart components and a digital platform enable organizations to turn their knowledge and insights into a service that can be monetized. This approach provides an avenue for adding value on an ongoing basis, and is a natural enabler of ongoing customer relationships rather than traditional transactional-based customer engagement.

Whether your plans include process transformation, product and service transformation, or both, understanding the scope of your initiative is essential. Equally important are the choices you make around strategy, technology and project approach, which we'll cover in the next section.

Develop a holistic and realistic strategy

Digital transformation can't happen in absence of a wider strategy that reflects your business objectives matched with technology. As your strategy is developed, there are three key considerations that are easy to overlook, but important to evaluate:

- The relationship between strategy and technology
- How prioritizing agility contributes to longer-term success
- The unique requirements for your industry and vertical

Align strategy and technology

Taking a holistic approach to business and technology from the outset is critical, as it makes a major positive difference in the timeline, cost and outcomes of a digital transformation effort. In contrast, pursuing a strategy independent of technology considerations invites unnecessary risk. When a firm goes down the path of developing a strategy without realizing the full potential of technology, it's all too common to find that there is a gap. For example, a strategy may seem promising, but may ultimately not be fully realized. When this happens, a digital transformation initiative must be rescoped, which means wasted time and investment. An integrated approach that incorporates both strategy and technology greatly reduces this risk.

Take an agile approach

Agility is another critical success factor, since an agile, incremental approach ultimately helps firms realize more value from digital transformation efforts. Too often, when consultants are brought in to lead transformation, the result is an unwieldy project that fails to get traction due to its massive scope.

Instead, it is more effective to develop an overall strategy at a portfolio level, and then break it down into individual projects. This enables a focused initial scope that can be expanded over time. Ultimately, the success or failure of digital transformation depends on how technology and process changes function under real-world conditions. That's why it's critical to focus an initial project on a proof of concept (POC) to support rapid learning and iteration.

Using a POC to prove, refine or refactor objectives is an agile foundational method that makes it possible to achieve results in a shorter timeframe and build a roadmap forward. It also provides the opportunity to improve or enhance the plan as needed to create long-term change.

Ensure relevance to your vertical

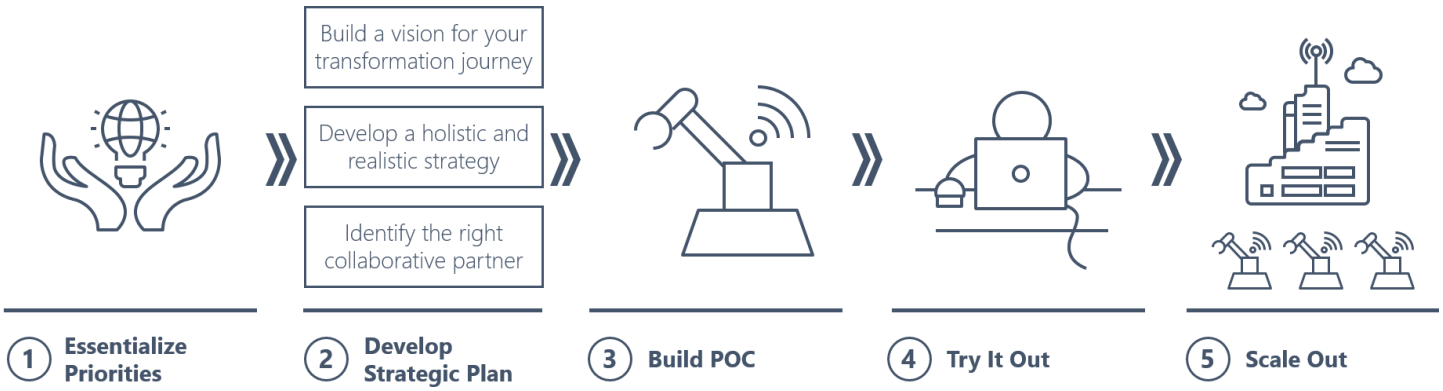
A strategy that reflect your industry vertical is essential. Not all verticals have the same needs when it comes to digital transformation. The aerospace industry has specific challenges and opportunities, some of which, but not all, are shared by other verticals. It's important to be able to draw upon expertise that's specific to your vertical to ensure you're taking advantage of all possible opportunities offered by digital transformation. A vertical-oriented approach can even be the difference between transformation and a stalled project.

No matter which form of digital transformation you're pursuing, the odds of a successful initiative increase when you think holistically about business and technology strategy, take an agile approach and apply a vertical-specific lens.

Identify the right collaborative partner with industry expertise

Given the challenges and the risks inherent in a paradigm-altering shift like digital transformation, it's important to avoid going it alone. Transformation efforts grounded in industry and vertical expertise are more likely to fit your individual circumstances and result in better, more relevant solutions. Whoever you choose to help should have an intimate knowledge of your objectives and scope, a deep understanding of the technology being used and a strong base of experience helping others with digital transformation initiatives.

It's also important to choose a partner that can help you think through the entire digital transformation journey while also assisting with the full execution of that vision. Partners should be extremely familiar with the underlying technology involved with the transformation. They should be able to offer deep knowledge of the specific vertical because most partners try to approach these projects with only general knowledge of the manufacturing industry, not specific expertise. This is important because it ensures that all the thinking in the planning phase is carried out without the scope creep that can work its way into this type of project. Planning and setting up a proof of concept is an important step, but ultimately the success or failure of digital transformation depends on getting to the broad rollout stage.



Microsoft can partner with you throughout the journey

It's also critical to make sure the technology you're using doesn't change the overall strategy or adversely influence the objectives you're pursuing. Long-term strategy should come first and technology should support your goals, not the other way around. Having the right experts on hand who can guide your digital transformation approach helps ensure the success and viability of your strategic plans.

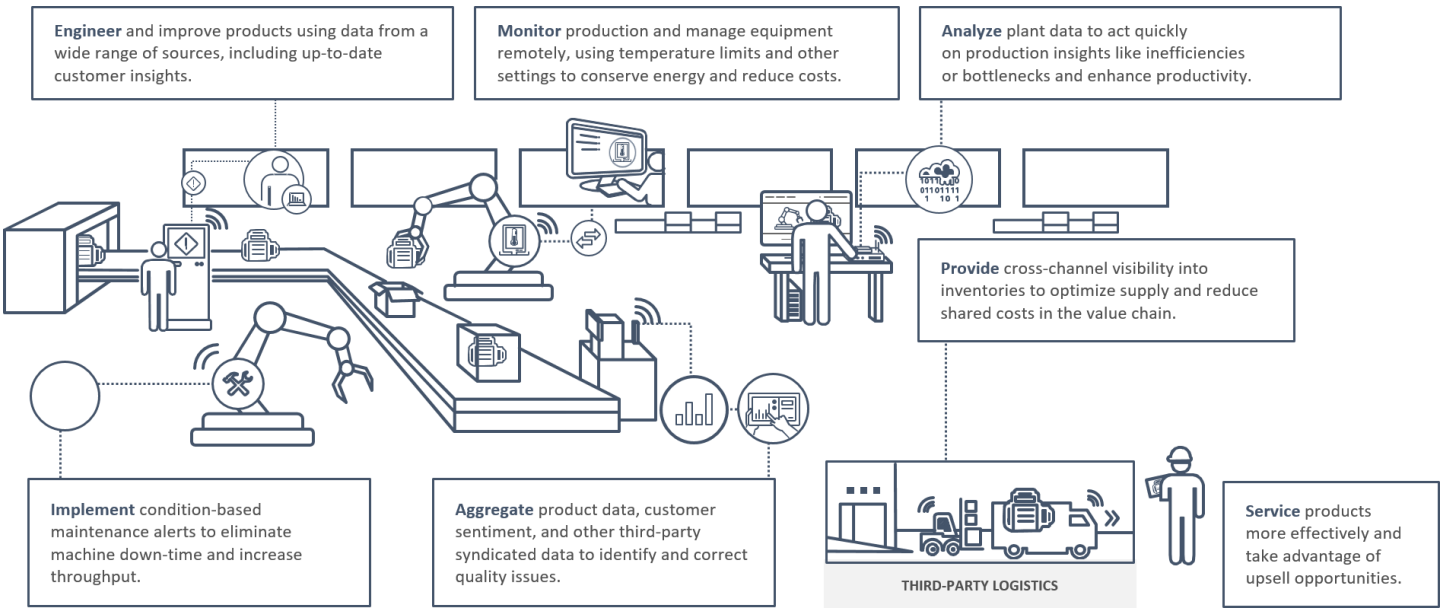
The Microsoft difference

Microsoft understands the unique challenges of the manufacturing industry and verticals in the digital age.

Working with Microsoft ensures that your digital transformation initiatives will be grounded in careful consideration of the guiding principles we've just outlined.

Microsoft Services works with you as a collaborative partner to deliver on your specific, unique objectives. Our teams are trained to understand the goal, identify risks and walk with your company through each step of transformation. We bring unique expertise that can only come from the company that designs and builds the tools that organization use every day. That's because we have access to the experts who actually develop the products you're deploying. We've led the way in enterprise technology for decades and we're applying that background, combined with industry knowledge and expertise, to help unlock new opportunities via digital transformation.

Transform with help from Microsoft experts



Microsoft team members have deep experience in both the manufacturing industry and in specific verticals, embodying the ideal of vertical integration between strategy and the technology that delivers change. They're not just consultants working from a script, but have often worked in the industries they are working with and understand them to the core. This expertise influences every aspect of the advice Microsoft team members give our customers. Having depth in the industry means the advice our teams give is grounded in industry realities. Our teams of industry experts take a strategic view of the change you want to achieve, help you translate that into actionable plans, and participate in the execution process.

By partnering with you, Microsoft helps you drive transformative change while minimizing risk. We believe in a unified approach to digital transformation, one that involves both business and technology considerations and one that maximizes agility and flexibility. That means keeping an eye on how digital transformation actually impacts your core business. We can help you scope both the process and external changes you may need to make, and find the right processes to transform now versus later. We also provide on-the-ground expertise to ensure that your initiative is successful.

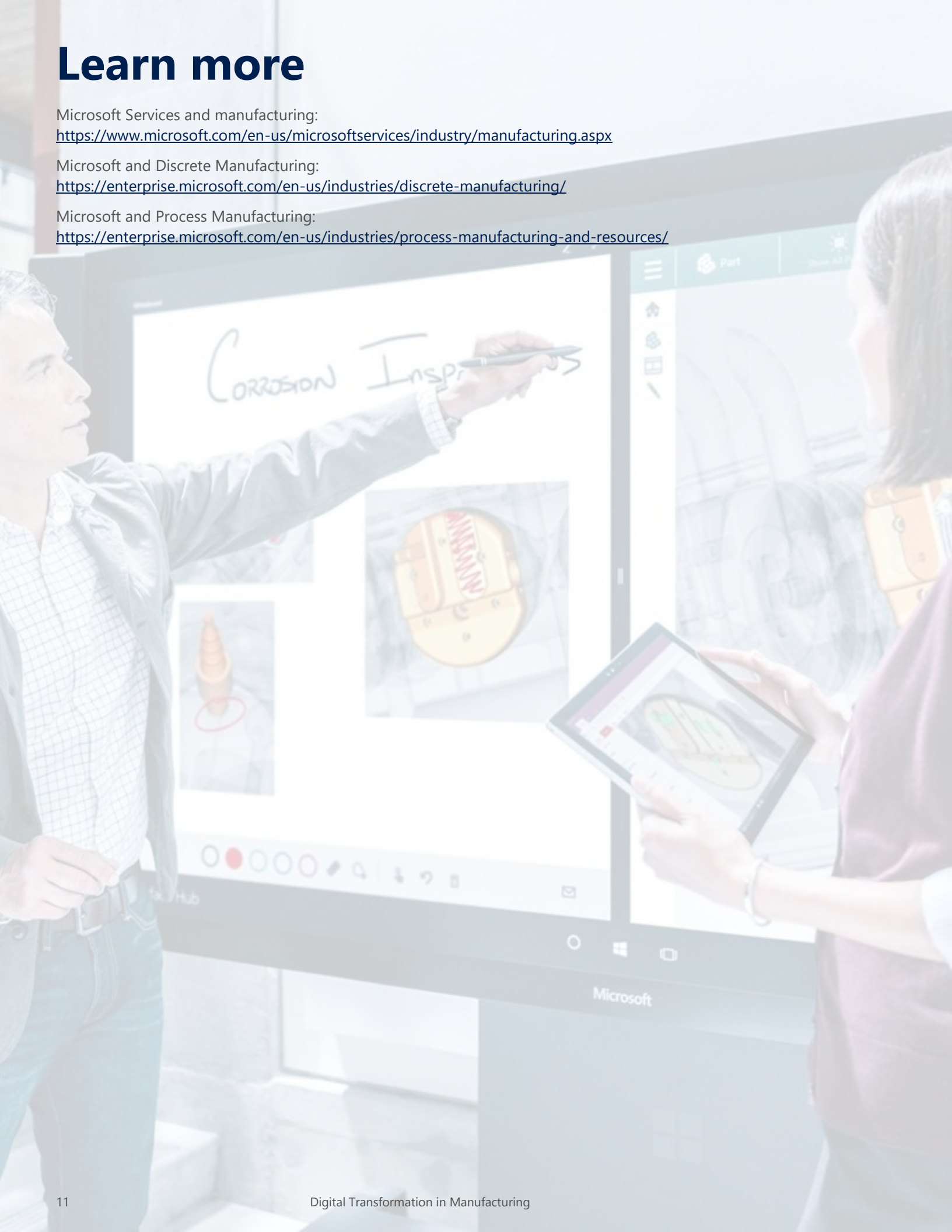
Digital transformation needs to deliver results that matter and help you achieve wider business goals. By choosing Microsoft, you're also helping improve the next generation of those products and ensure that they meet the changing needs of your business. **We look forward to helping you unlock the opportunities that digital transformation presents.**

Learn more

Microsoft Services and manufacturing:
https://www.microsoft.com/en-us/microsoftservices/industry/manufacturing.aspx

Microsoft and Discrete Manufacturing:
https://enterprise.microsoft.com/en-us/industries/discrete-manufacturing/

Microsoft and Process Manufacturing:
https://enterprise.microsoft.com/en-us/industries/process-manufacturing-and-resources/



Microsoft Services empowers organizations
to accelerate the value imagined and realized
from their digital experiences.

Imagine.
Realize.
Experience.

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