

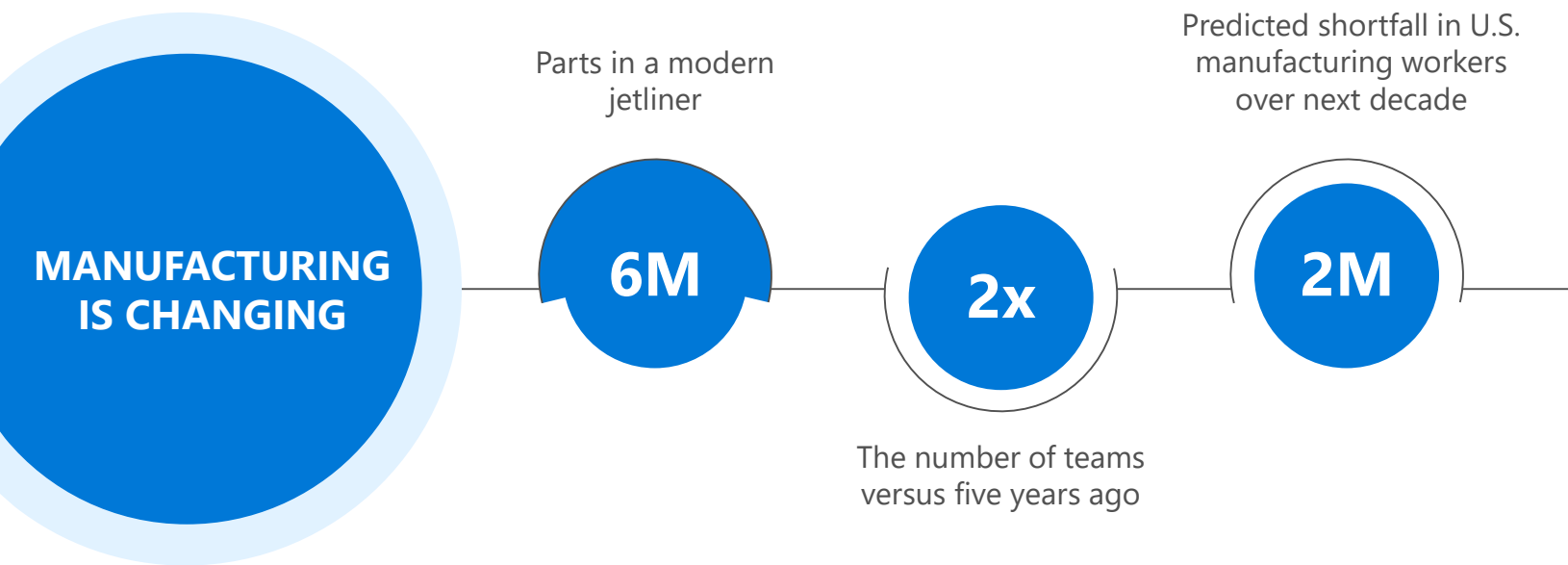
Microsoft Services



# Transform Manufacturing with a Mobile Workforce



# Empowering employees to do their work anywhere, anytime they need



Manufacturing is in the midst of a new industrial revolution. Steam, mass production, electronics and IT all drove previous revolutions. Today a fourth revolution is blurring the line between the digital and the physical. Manufacturers now have unprecedented access to processing power, digital storage, and access to knowledge.

All of that presents enormous opportunity but manufacturing also is facing challenges. It is becoming more complex as products grow more sophisticated and global competition grows. Meanwhile, the manufacturing workforce is changing; baby boomers are retiring in droves, taking with them extensive institutional knowledge. The result is a growing skills gap in manufacturing. Coming into the workplace now are millennials who have a very different perception of how to do a job. They're more collaborative – workplace teams now are twice as prevalent as they were five years ago. And they want to do their jobs with the same digital tools they use in everyday lives.

There's a way to work more effectively, manage manufacturing complexity, and adapt to a changing workforce: Empowering workers with greater mobility. By giving employees the ability to perform their job nearly anywhere, manufacturers can create a workplace that is agile, adaptable, and competitive.



# Mobility helps all facets of manufacturing

A mobile strategy doesn't mean issuing new mobile devices, it's about making both the employee and the data mobile. That way employees such as a field technicians can move from home, to their truck, to the plant or a customer site – all while able to access the information needed to do the job.

Take plant management. In a large manufacturing facility, it could take 30 minutes or more for a maintenance managers to reach the scene where a piece of machinery has gone down. Once a problem is diagnosed, it may take additional time for the managers to return to their office to look up a fix or contact a supplier for assistance. During that time, operations all over a plant can be forced to delay production, causing a logjam that could take hours or even days to sort out.

That same managers, equipped with a mobile device and the ability to connect to information wherever they are, could look up repair options or call for additional help right from the site of the breakdown. That improves uptime.

Engineering also benefits from mobility. Today's manufacturer likely has offices and plants in multiple countries. Mobile-enabled engineers and designers work more easily with their counterparts around the globe. An engineering center in California can easily communicate with manufacturers in Ohio or outside the US in China or Germany to resolve issues or update product specifications.

In operations, managers equipped with mobile technology can peer deeply into their supply chain, seeing in real time the status of shipment for a set of needed parts, or making fast adjustments to supply orders based on demand for a plant's products. Operations become more agile and makes a bigger contribution to a company's balance sheet and improved customer satisfaction.

Additionally, services improve when mobility is incorporated into their daily work. Picture service technicians on a call: they could use Skype for Business connected to HoloLens to get a detailed view of the work that needs to be done. That's what ThyssenKrupp Elevator has done in an effort to gain a competitive edge through predictive maintenance. We will cover this customer scenario subsequently in this document.

ThyssenKrupp uses HoloLens to help 24,000-plus service visualize and identify problems with elevators. Watch how [here](#)

# The cloud is the foundation of a mobile strategy

How does a company make itself more mobile?  
The cloud is at the center.

With the cloud, an employee doesn't have to be mobile – the data is, creating opportunities for anywhere access. A manufacturer can easily send its CRM data to the cloud, immediately giving everyone in the company access to the latest information about customers, orders, pricing and more.

That same firm can set up field service system and even create a robust network of Internet of Things devices for a modest investment that will quickly pay a dividend in the form of great insight into operations and customer needs. Set up a proof-of-value program, then scale that quickly as the value becomes apparent, adding capabilities that might range from smart analytics to a call center.

Operational technologies built around the cloud that help foster mobility can include smart offices and buildings that link such core systems as lighting, power meters, water meters, pumps, heating and chiller plants with sensors and control systems. That improves energy efficiency and cuts costs.

Sensors attached to key pieces of equipment alert remote employees to problems such as excessive temperatures and can even be used to build a dataset on what causes a particular piece of equipment to fail. From there it's a short step to predicting when a failure will occur and proactively stepping in to correct the problem. Again, mobile technology means an employee doesn't have to be on site. They can monitor and even repair equipment remotely.

**21%**

Savings from moving  
apps to cloud  
(Business Insider)

**Empower employees by moving processing power to the cloud. So people can perform critical design tasks that formerly required a powerful workstation but now can be done with a tablet or other mobile device.**

The cloud also enables information technology that creates a more mobile workforce. Cloud-based communications tools make it easy to collaborate regardless of location.

With data widely available, employees can use data-insight tools for a deeper understanding of the manufacturing process and customer needs. Cloud-based personal productivity tools give employees what they need to do their jobs when they're on the move.

All of this can create rich experiences for employees using devices of their choosing, made secure through software that separates personal information from company information.

Taken together, the cloud and the mobility it supports can help employees in manufacturing take advantage of emerging trends. One is the growing demand for "servitization" – moving beyond building and delivering products and now linking those products with features such as remote monitoring and predictive maintenance. That creates an added business line for a manufacturing company and helps connect them more closely to customers. It also creates a pipeline of data that can be used to improve existing products and create new ones.

Think about this: Data collected from remote sensors could be used to help employees design improved versions of that product, with fast digital conceptualization and prototyping through 3D printing. Sensors embedded in the new device can then be used to compare performance with the previous configuration, providing even more insight into real-world execution.



# Empowering mobile workers at Rolls-Royce

We're seeing the power at the intersection of data and mobility with our customers. A great example is Rolls-Royce, which has manufactured some of the world's most respected aircraft engines and today builds the Trent-series engines that power aircraft such as the Boeing 787 and Airbus A380, A350, and A330neo. Now Rolls-Royce has recognized an important opportunity to expand the services it offers by providing meaningful insights across airline operations.

Rolls-Royce has long collected data on engine performance. Now it plans to collect an even broader set of data and use that to create insights it can market to customers. Using a cloud-based system, Rolls-Royce will aggregate data that includes snapshots of engine performance that the planes send wirelessly during a flight, massive downloads of comprehensive "black box"-type data, technical logs, and flight plans as well as forecast and actual weather data provided by third parties. From that Rolls-Royce will analyze a rich set of data and perform data modeling at scale to accurately detect operational anomalies and help customers plan relevant actions.

**40%**

of airlines' operating expenses. Even a 1 percent optimization of fuel consumption can save an airline millions of dollars annually

By taking advantage of the cloud, Rolls-Royce not only can collect that data for analysis, it makes it available to a wide range of Rolls-Royce technical personnel who can help the company and its customers improve operations and performance.

Learn more [here](#).

# ThyssenKrupp Elevator employees empowered with HoloLens

Using Microsoft HoloLens, 24,000 ThyssenKrupp elevator service technicians can now visualize and identify problems ahead of a job, and have remote, hands-free access to technical and expert information when onsite.

That's a big deal in a world where some 12 million elevators transport more than 1 billion people every day. Utilizing Microsoft HoloLens along with other Microsoft technologies, ThyssenKrupp found that its employees could dramatically improve response time, increase efficiency, raise elevator uptimes and speed up service interventions to ensure mobility equipment is always running.

By combining augmented reality and productivity solutions, technicians can be hands free while on the job, even when making remote calls to subject-matter experts and sharing holographic instructions between users. This enables more flexibility while also complying with safety regulations. In initial trials, the solution reduced the average length of ThyssenKrupp's service calls by four times.

Learn more [here](#)

**“Predicting problems enables us to have fewer service interventions, and this equipment helps us do our job faster”**

**Andreas Schierenbeck, CEO of ThyssenKrupp Elevator**



# Jabil extends factory to the cloud to give employees predictive powers

Jabil is one of the leading design and manufacturing providers in the world. It now uses predictive analytics with real-time manufacturing to extend the factory floor to the cloud, gaining better agility to meet customers' demands for increasingly faster, more customized solutions.

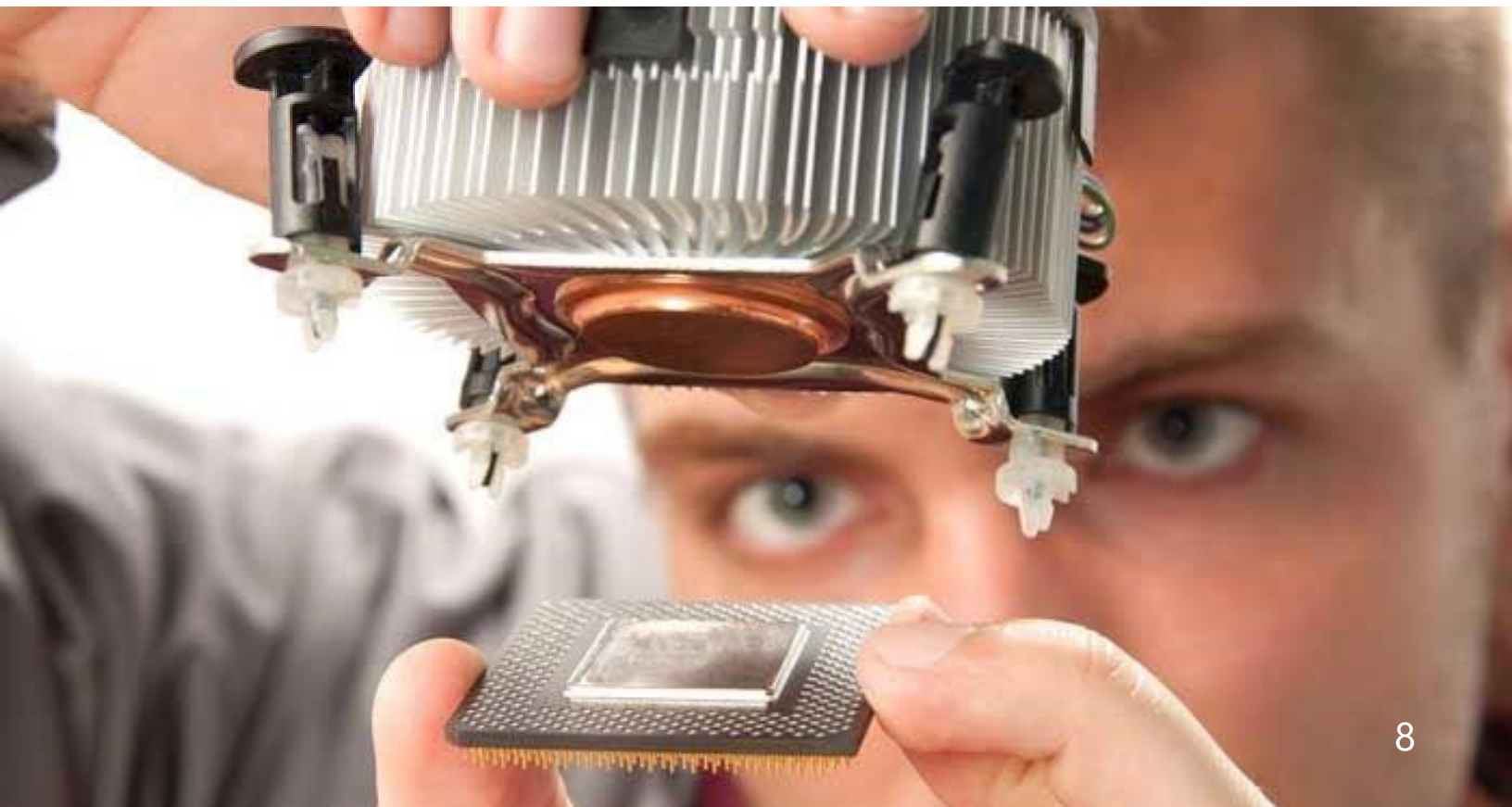
Jabil's analyzes millions of data points from machines running dozens of steps through the manufacturing process, predicting failures earlier in the process – catching a potential fault at step 2 of a 32-step process, for instance, versus missing it until step 15. That way Jabil's operators and engineers can also proactively make adjustments to equipment based on predictions, eliminating the need for unnecessary inspections that cause downtime.

As Jabil deployed the predictive analytics solutions, they were able to predict machine processes that will slow down or fail with 80% accuracy, resulting in reduce costs of scrap and re-work of 17%, and deliver energy savings of 10%.

Learn more [here](#)

**80%**

of production slow down  
predicted with accuracy





# Build your mobile workplace today

Microsoft's mobile worker solutions help manufacturers harness the power of digital, driving faster innovation and creating a competitive advantage. By connecting people to information, we can help you boost productivity and transform operations.

Learn more about our industry solutions at [Microsoft.com/discrete](http://Microsoft.com/discrete). You'll find customer stories, events and webcasts, social channels, and more.

Manufacturing is changing. Take advantage of its new direction with mobile, empowered employees.

## **DRIVE INNOVATION.**

A mobile workplace makes employees more collaborative so they can crowd-source new ideas for improved operations or new products and services.

## **IMPROVE DECISION-MAKING.**

In a mobile, digital workplace, employees have actionable information at their fingertips, so they can make the right decision on the spot.

## **IMPROVE OPERATIONS.**

Mobile workers with insight into supply chains and operations can streamline a business, reduce downtime, lower maintenance costs, and extend equipment longevity.

## **ENABLE**

## **SALESPeOPLE AND FIELD TECHNICIANS.**

By ensuring that workers have the data they need wherever they are, you make employees more productive and engaged.



# Credits



**Chris Cronin**  
Sr. Business Program  
Manager  
Manufacturing



**Rudy Dillenseger**  
Director of Industry  
Marketing



**Indranil Sircar**  
Director Industry  
Technology Strategy  
Manufacturing



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

# Imagine. Realize. Experience.

[microsoft.com/services](https://microsoft.com/services)

[microsoft.com/manufacturing](https://microsoft.com/manufacturing)

