



Delivering the  
Digital Enterprise.  
Step-by-step.

# The Future of Manufacturing

Unlock the power of the  
Microsoft Eco-system



# Introduction

Manufacturing is an industry that is constantly evolving. Innovation is at the heart of manufacturing and creates continued disruption across the industry. The latest wave of innovation known as industry 4.0 is the data and connected revolution. Where we once imagined a future with factories focused on the digital, robot-driven production floors, reality has transcended the factory floor to include the entire manufacturing ecosystem - connecting employees, processes, machines, data and customers - far beyond what was once envisioned.

This guide discusses emerging trends in manufacturing and how Microsoft solutions improve competitiveness and efficiencies. This guide is targeted at manufacturers of all shapes and sizes - from engineering products to food processing.

Manufacturers have already invested heavily in smart factory initiatives consequently seeing 17-20% productivity gains. Yes, the “factory of the future” involves machines, products, and people but contrary to past fears of automation and robots replacing people, the factory of the future is empowering people. Dynamics 365 and Microsoft Azure offers Manufacturers the ability to digitally transform.



## This guide covers:

- » Current trends in manufacturing
- » The Microsoft toolset
- » Dynamics 365
- » Azure



# Trends in manufacturing

Manufacturing is always changing - we have identified five emerging trends to look out for. These trends represent a range of challenges for manufacturers to overcome but also huge opportunities.

## 1. Intelligent Manufacturing

Connected intelligent systems in the cloud have enabled manufacturing to become smarter. Supported with smart sensors and advanced data processing, manufacturing can be more connected and intelligent than ever.

All of the data you capture can be used by artificial intelligence (AI) and machine learning (ML) algorithms to help you make better decisions. Intelligence is helping manufacturers in the following areas:

1. Intelligent systems can be used to analyse large amounts of data and detect anomalies. In manufacturing, this can be used to help identify faulty products, to predict when a machine will need maintenance or to detect potential safety issues in and around a factory. These tools are also being used to help mitigate risk by ensuring regulatory compliance and improving operations, flagging abnormal changes or anomalies for further investigation.
2. Artificially intelligent systems can be used to organise and classify data categorically. Through classification – sometimes referred to as segmentation or clustering – businesses can leverage AI to sort materials, reconcile transactions, categorise expenses and even look for interactions between categories to identify correlations.
3. AI systems can be used to perform probability analysis. These tools give managers the ability to run quicker and more accurate data models. This enables them to quickly test how changes to specific variables will impact outcomes, for example, how making changes to the production line will impact output or how adjustments to a product formula will alter product performance. These tools can be used to optimise systems, processes and decision making, through real-time data analysis. Intelligence systems can calculate the probability of various outcomes and adjust accordingly. For example, analytical models can be used to reduce injuries by slowing down a machine when a sensor identifies a potential issue, or it can cut costs by automatically changing resource allocation across the organisation to minimise waste.





## 2. Manufacturing Technology Evolves

Manufacturing technology continues to evolve, unlocking new opportunities to improve manufacturing processes, better support employees and create new, innovative products. Some examples of these new manufacturing technologies include:

- » **3D Printing/Additive Manufacturing** - Additive manufacturing has been a buzzword within the industry for quite some time, but it's now beginning to gain momentum. Smithers Pira reports that the additive manufacturing market is expected to reach £42 billion by 2027.
- » **Testing** – Using AI powered models we can now create a digital twin of products that we can then run simulations on. We can then test how these products will react to real world factors. This is particularly effective for complex technology and extreme circumstances. This is much newer than you might think..., Ford only started trialling this in 2017! Before this cars were made by creating a clay model and putting it in a wind tunnel, they are now building a digital twin and interacting with it using augmented reality (AR). This can all be done digitally, allowing much quicker development cycles.
- » **Advanced materials** - Computer modelling tools now enable companies to design materials with the exact properties they're seeking, in a much more efficient and cost-effective manner than traditional R&D trials.

## 3. Manufacturing Goes Green(er)

Green business practices have moved from obscurity for a niche audience to having mainstream appeal. This mainstream appeal is also driving political pressure and stricter regulations. Manufacturers are having to rethink their business models to achieve new greener objectives.

Manufacturers are optimising their facilities and production processes to reduce their overall energy consumption. From energy efficient heating and cooling, to finding ways to reduce overall energy consumption. A focus on reducing waste and pollution is also a large focus for the sector.

Many companies are conducting lifecycle assessments of their products to evaluate their environmental impact. This includes everything from packaging design to reduce waste, product design to reduce harmful materials and improve recyclability and the use of lean manufacturing practices to make production more efficient and environmentally friendly by reducing storage and material-management demands.





## 4. The Servitisation of Manufacturing

“Everything as a service” is a development that has been talked about for a while now. Driven by the growth of the Internet of Things (IoT) and the cloud, many manufacturers are moving from product models to service models, giving their customers more options with greater flexibility and services. This trend manifests itself in two very distinct ways:

### Customers whether they are organisations or consumers want outcomes not products.

Forward thinking manufacturers are now selling products with built-in monitoring, support and quick replacements. Customers want products to work all the time and now expect the ability to offer maintenance and support that works intelligently and with quick turn arounds. The challenge for organisations is setting up the infrastructure and the stream of data from their products to allow intelligent and predictive maintenance to meet growing demands.

### Customers expect everything to be online, easy and they expect it yesterday.

Global competition driven by improved infrastructure means your customers now have a wide range of choice when buying almost anything. This leads to raised expectations - many organisations are differentiating themselves with their ability to easily buy online with extremely quick delivery timescales and this isn't just limited to B2C. In order to compete in this market, manufacturers need to raise their game and transform their entire production, delivery and ordering processes. You need to be able to quickly gather customer requirements and then deliver the finished product as quickly as possible. This inevitably requires high levels of automation, data and streamlined processes.

## 5. Operational Technologies

Operational technology has come a long way in recent years, offering more advanced features and being much more accessible in the cloud.

Operational leaders can now access real time dashboards and reports on what is happening across the organisation. This can be used to detect unbalanced load flows, faults and improve decision making. When you combine this with artificial intelligence you can start to automatically make decisions to improve efficiency and quality. You can automatically make corrections to prevent outages, order stock based on predicted demand requirements and identify potentially faulty products.

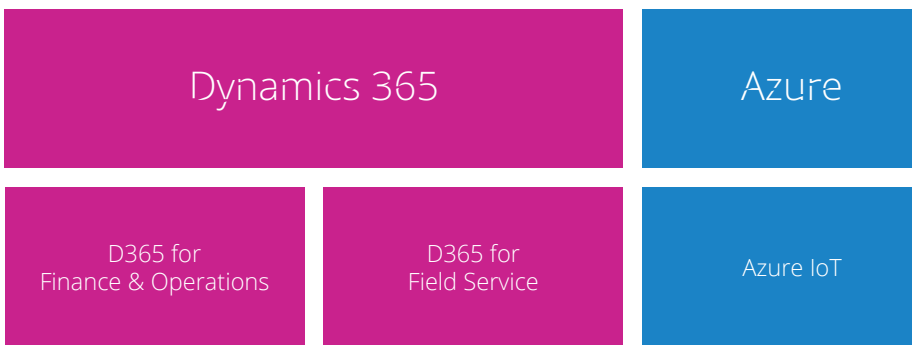




# The Microsoft Approach

Manufacturing is a sector that Microsoft has invested heavily in, providing a wide range of solutions that are specifically designed to help organisations improve their manufacturing business. Microsoft's mission for manufacturers is to support them in driving business transformation and achieving social responsibility through digital technology – enhancing digital factories, monetising connected products and creating intelligent value chains.

This section discusses how both Dynamics 365 and Azure offer services to transform manufacturing. It also covers the several Azure services available.



## Dynamics 365

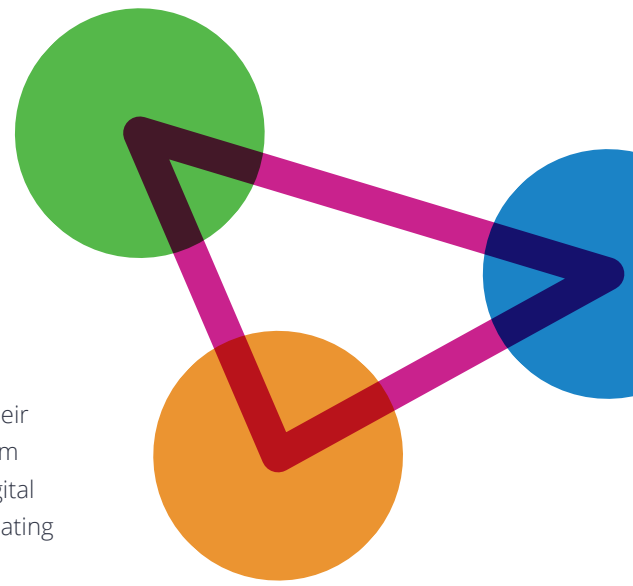
Dynamics 365 is Microsoft's latest suite of business applications. You should think of Dynamics 365 as a platform to build your business around. It has all the core capability you need and now Microsoft are building applications that are targeted towards particular business functions. You can easily build custom applications and extend your capability through third party solutions to find the perfect blend for your organisation.

Two of the Dynamics 365 solutions are particularly relevant to manufacturers.

## Dynamics 365 Finance and Operations

Dynamics 365 for Finance and Operations is Microsoft's back office business application, built on Microsoft Azure. It unifies financials and business operations across finance, manufacturing, supply chain, warehouse, stock and transportation management with an intelligent and intuitive user interface for running modern global enterprises.

Dynamics 365 for Finance and Operations brings together a set of adaptable ERP capabilities, BI, infrastructure, compute and database services in a single offering. It enables organisations to run industry specific operational business processes that are extendable with specific solutions from business partners. Organisations can match their business growth by easily adding users and business processes with a 'pay-as-you-go' model.





## Manufacturing

Dynamics 365 for Finance and Operations has a range of dedicated manufacturing functionality, it is so much more than just a Manufacturing Resource Planning (MRP) system.



**Optimise supply chain operations** – By collecting, integrating and visualising global supply chain data worldwide, manufacturers can gain better visibility into their operations from production to sales all with role-based dashboards in Dynamics 365.

**Streamline the management of assets, products and production** – With a consolidated view that unifies process oversight and provides real-time insight, manufacturers can institutionalise efficiency gains and use connected devices to monitor and resolve issues remotely.

**Engage customers in powerful new ways** – Your customer engagement approach needs to be tailored with both self-directed services and value-added personal options available depending on customer needs. The ability to connect your CRM with Dynamics 365 for Finance and Operations allows you to provide that one unified view to respond to customers needs and provide great customer service.

**Transform service centres into profit centres** – Thanks to the ever-decreasing cost of IoT sensors, sophisticated mobile devices and cloud-based data aggregation, manufacturers can now improve service quality and margins by offering remote monitoring and proactive maintenance services that supplement break/fix support. Dynamics 365 supports and connects with your IoT data more intelligently.

**Accelerate innovation for a competitive edge** – The best way for manufacturers to pursue innovation is to understand their business more deeply – from customer usage through to supply chain sourcing and production. With IoT-enabled parts, assets and products, manufacturers can gain the insights required to innovate. Data from connected products and equipment can empower developers, engineers and technicians to collaborate.

**Empower employees to work more effectively** – When a company can provide 360-degree views of customer assets and work order history, technicians are empowered by a better understanding of not only the job in front of them, but of other similar and successful field service engagements. This goes hand in hand with empowering service agents to provide instant feedback, using machine learning to find similar cases for troubleshooting and scheduling a visit or evaluation. The simple and recognisable interface provided by Dynamics 365 also helps to drive user adoption.



## Manufacturing Functionality

Microsoft Dynamics 365 offers the following manufacturing functionality:

### Finite and infinite capacity and materials planning

– Create maximum flexibility with tightly controlled scheduling including finite or infinite capacity scheduling practices. Including the ability to support multiple plans to simulate material and capacity requirements based on varied scenarios.

**Job scheduling and sequencing** – Detailed scheduling and capacity planning with the ability to separate each operation into individual tasks. Job scheduling allows for the synchronisation of a production order's other jobs with the flexibility to specify start and finish times.

**Resource management** – Help to identify long-term staffing requirements by providing a skills library for tracking employee skills, experience, certifications and other distinctions. A search tool within the module matches employee skills with availability offering best-fit scheduling options.

**Shop floor management** – Provide detailed insight into the production environment by automating the collection of employee schedule information and production data.

**Work order management** – Job costing aids in developing more flexible business structures by specifying crucial cost-saving opportunities.

**Production configuration** – Multiple attributes and rules in product building to create a custom BOM with each order.

**Quality management** – Manage and improve turnaround time when dealing with nonconforming products and link diagnostic results to correction tasks to rectify problems and prevent future recurrences.

**Lean manufacturing** – Combine various supply, sourcing and production strategies in a mixed-mode manufacturing environment such as production orders, purchase orders, batch orders and transfer orders.

**Forecast scheduling** – Enable long-term planning of materials and capacity by calculating gross requirements based on forecasts.

**Audit trails** – Dynamics 365 allows you to track every step in your manufacturing process providing clear audit trails, supporting compliance. This can be linked to HR data on certifications and training to ensure only fully certified employees carry out certain roles.





## Extendable

Easily extend the capability available from Dynamics 365 for Finance and Operations using the Power Platform. PowerApps and Flow allow you to create custom applications and automate workflows.

This allows you to tailor the access, data and processes your different departments need. For example, you could create a simple inventory management app that lets you search for items and tell you a count or location, or even scan a barcode on the product and give you the information.

There is a range of add-ons available from Microsoft AppSource and you can work with partners to create a custom application that works with Dynamics 365 for Finance and Operations.

## Field Service

Dynamics 365 for Field Service is designed for manufacturers with mobile service agents and engineers and specifically to route demand, provide information on the go and to prioritise cases for a mobile workforce. Dynamics 365 for Field Service has the ability to connect with Dynamics 365 for Finance and Operations to provide a joined up experience.

[Optimise your resources](#) - Automate and improve scheduling to dispatch the right technician and get the most value out of your resources.

[Make technicians more effective](#) - Empower technicians with a 360-degree view of your customers and real-time guidance to improve resolution time and earn customer trust.

[Engage your customers](#) - Provide customers with self-service portals, proactive updates and technician tracking to ensure a positive experience at every step.

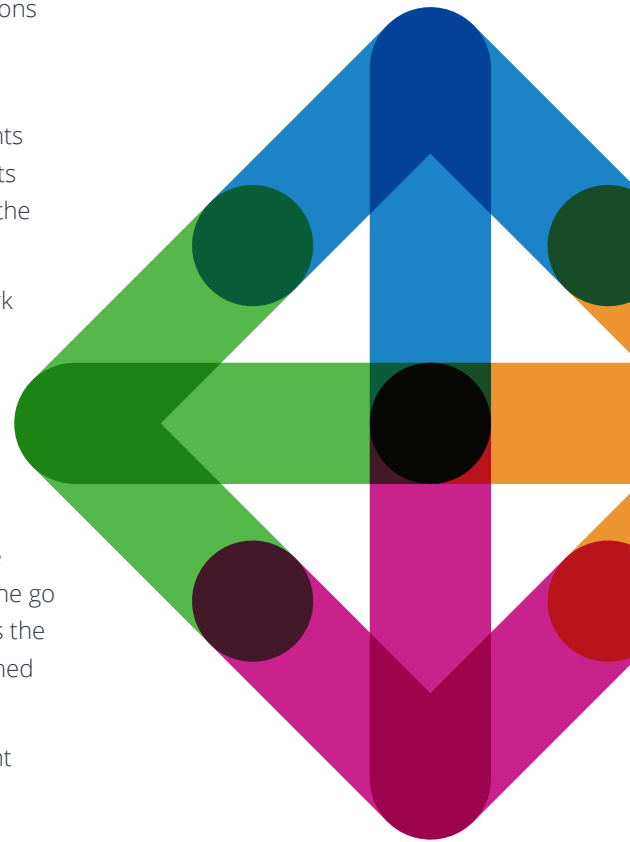
[Innovate with an adaptable platform](#) - Drive innovation with an application that is easy to tailor, extend and connect to the other apps and services you already use.

## Azure

Microsoft Azure is a cloud platform offering hundreds of packaged services across a range of areas that help manufacturers. This can be as simple as extra computing power to run models with bespoke AI and ML capability and a range of out of the box IoT services for manufacturing.

The broad adoption of smart sensor technology, connectivity improvements and advancements in cloud computing have helped drive adoption and evolution of Industrial IoT. The industrial IoT is poised to have a major impact on manufacturing and the global economy, projected to create £11 trillion of global GDP by 2030.

There are a number of Azure IoT services designed specifically for manufacturing.





## Azure IoT connected manufacturing

Microsoft's Connected Factory solution brings end-to-end production visibility within reach. By connecting existing assets and equipment across global locations, manufacturers are able to generate live performance data without disrupting production. The solution is quick and easy to set up and get started allowing manufacturers to go at their own pace.

Connected Factory's global summary dashboard aggregates performance data to provide a holistic view of equipment efficiency and key performance indicators. This enables manufacturers to compare factory performance, and as well as the performance of equivalent machines at multiple sites. With this information, business can gain insights into what is contributing to performance variation among factories that can be used to optimise performance across all sites.

## Azure IoT predictive maintenance

The Azure IoT Predictive Maintenance solution gives you better visibility into equipment status, letting you resolve issues before they disrupt your business.

Monitor your assets in near-real time by collecting data through Azure IoT solution accelerators. This allows you to create automatic alerts and actions, such as remote diagnostics, maintenance requests and other workflows.

The solution allows you to then perform historical analysis of your data so you can predict when you need to service equipment.

## Azure IoT remote monitoring

With the Azure IoT Remote Monitoring solution you can monitor assets from afar. The solution helps you understand equipment conditions, enabling you to provide over-the-wire updates and fine-tune processes.

To optimise business processes in the long term, the solution applies analytics techniques, such as machine learning, to your data. The smart system performs in-operation analysis to find correlations across multiple data streams – allowing you to improve costs, uptime, and product quality. Plus, you can leverage new predictive maintenance programs to perform historical analysis of your data and resolve issues before they disrupt your business.





# Find out more

Incremental Group helps manufacturers understand and exploit Microsoft technology to drive improvements in their business one step at a time. We work with a wide range of manufacturers across the country including: HiETA Technologies, Harbro, United Fish Industries, Gray Adams, Scottish Leather Group and many more.

We are a leading Microsoft Dynamics Gold Partner helping organisations to drive digital transformation with Microsoft Dynamics 365, AX, NAV and GP solutions. We help organisations with new implementations and upgrades, project recovery and ongoing support.

## **Book a free 1 Hour Demo – Manufacturing in Dynamics 365**

Dynamics 365 for Finance and Operations offers manufacturers a wide range of capability to manage their production process and optimise their operations. In our briefing we will explain and demonstrate how the solution achieves this.

Book now - <https://www2.incrementalgroup.co.uk/dynamics/manufacturingbriefing>