



FourJaw
Manufacturing Analytics



MANUFACTURER'S GUIDE

Getting Started With Industry 4.0

By Robin Hartley, CTO, FourJaw

Introduction

Contents

Part 1: What is Industry 4.0?

Part 2: Do I need to be Industry 4.0 to succeed?

Part 3: What does Industry 4.0 look like for me?

Everyone in the manufacturing industry has heard this before: “Industry 4.0 has arrived, and it will offer us amazing benefits!”. Unfortunately, for many manufacturers, particularly SMEs, this lofty promise has persisted but not materialised due to prohibitive costs and complexity. To make things more confusing for manufacturers, there’s an excess of disparate views of what Industry 4.0 is, many of which are simply incorrect. As a result, we at FourJaw have created this guide to explain what Industry 4.0 really is, if it’s required for success, and how a machining SME would go about implementing it in 2022.

Part 1:

What is Industry 4.0?

The 4th industrial revolution, also called Industry 4.0 only makes sense if we look at the three industrial revolutions that have come before:

Industry 1.0: The introduction of steam power and water power

Industry 2.0: The introduction of electricity and high-throughput production lines

Industry 3.0: The introduction of computational control systems and automation

Industry 4.0: The introduction of networking and communication between siloed systems

Based on this, most manufacturing businesses today qualify as Industry 3.0. To see if this describes your business, check if any of the following sound familiar:

- The costs we quote our customers don't accurately reflect the true manufacturing costs we incur.
- Our production schedule and planned times don't match our actual factory floor operations.
- We struggle to manage our capacity to make efficient use of our production assets.
- Communication barriers between departments often lead to inefficiencies.

If you have experience of any of the above, then that's a symptom of Industry 3.0 – there are lots of different systems that work very well looking inwards to their own area, but there is no cross-system information sharing.

Because of this, problems normally arise from the gaps in between systems when people have to make decisions without having all the information they need. As a few examples:

- How can I competitively quote for work if I don't know my true manufacturing costs?
- How do I efficiently schedule production if I don't know the true capacity of my machines?
- How do I drive continuous improvement if I can't quantify reasons for lost productivity?

It is often left to people to plug these gaps and, as you might imagine, it can be a thankless task!

Furthermore, it is often a matter of opinion as to where the true problem lies – is it the commercial side of the business promising customers unrealistic lead times, or is it the production side of the business failing to deliver on an appropriate timescale?

Without objective information, it is impossible to know. However, the answer often lies in a misunderstanding – both commercial and production staff are working hard to deliver the best they can, but due to a lack of information sharing, the two sides of the business become misaligned.

There is often a win-win situation to be found when objective information is available to provide the foundation for an informed discussion. In this case, orders which require a competitive lead time for a successful sales process can be prioritised, in exchange for longer lead times on less critical orders which can create the room needed in the production schedule.

From the above you will see that Industry 4.0 is about using technology to plug the gaps between systems, and helping people make informed decisions in their day-to-day roles.

Industry 4.0 is about aligning people within a manufacturing business through objective information.

The 30-second summary

Industry 4.0 is about connecting digital systems together to make manufacturing businesses more productive, competitive and resilient.

When information is siloed between different areas of a manufacturing business, it becomes difficult to deliver profit, maintain quality, achieve lead times and make the most of your production assets.

By efficiently sharing information between factory floor staff, production managers, commercial staff and directors, Industry 4.0 promises to break down information silos and allow manufacturing businesses to operate as one joined-up unit.

Much like continuous improvement, Industry 4.0 is not one specific technology, but is a concept that will look different for each business that implements it.

Part 2:

Do I need to be Industry 4.0 to succeed?

We have discussed how manufacturing businesses evolve to have siloes of information in each of the different systems they operate - it's in the gaps between these systems where inefficiencies arise. Industry 4.0 is a wide range of software products that bridge these gaps between siloed systems and give you objective information upon which to make informed and effective decisions.

However, it's important to note that the sharing of information between siloed systems can be done without technology. There are many no-tech or low-tech tools which you'll have seen on factory floors such as paper-based reports, Kanban boards and word of mouth.

Here at FourJaw, we are well-aware that our customers could employ a person to walk around their factory floor with a clipboard, writing down minute-by-minute what their machines are doing. This is a valid way to do machine monitoring, but it intuitively seems a bit ridiculous, and the reason why gets to the heart of why businesses adopt Industry 4.0...

Gathering data, crunching numbers and sharing information is a low-value, low-skill and deeply tedious way to spend your time. People are just no good at it!

In today's globally competitive marketplace, every member of staff needs to be hyper productive, generating extensive value in their job role by making efficient use of their time.

People are at their best when completing high-value activities such as problem solving, decision making, innovating products and improving processes. These activities are what give job security to individuals, longevity to businesses, and prosperity to national economies.

... and that's where the technology comes in. Computers are the opposite of people - they do a single well-defined task day-in-day out with perfect accuracy, without getting tired and without getting bored.

Computers don't innovate, they don't invent and they can't run your business for you. However, if you have a well-defined and repetitive task, it is normally more accurate and cost effective to get a computer to do it for you.

The intention here is to get people to do what people are good at, and computers to do what computers are good at. When we get this combination right, great things can happen.

With this knowledge, we can lay out a roadmap to succeeding with Industry 4.0:

1. To become a more productive, competitive and resilient manufacturing business, we need to remove inefficiencies caused by siloed systems.
2. To do this, we need to share information across the business to break down silos in our day-to-day jobs and start managing the business as a single joined-up unit.
3. Gathering data, number crunching and sharing information are repetitive and low-value activities that are best suited to computers, software and digital systems.
4. Using this newly-available information to design and implement positive changes within your business is a high-skill, high-value activity that people are fundamentally suited to.

To address the question of whether you need Industry 4.0 to succeed, the answer is no. You could plug the gaps between your systems with the work of people, resulting to purely manual and low-tech methods. However, in a global marketplace where competitors are leveraging technology to make each and every one of their employees hyper productive, it feels like a step backwards.

Great things happen when you use Industry 4.0 technologies to remove the tedious, low-skill and low-value roadblocks from the day-to-day roles of your manufacturing colleagues, enabling them to achieve high-value work that moves your business forward.

The end result will be a more streamlined, effective and resilient business that is fit to compete in the global marketplace.

The 30-second summary

People are at their best when they're doing high-value, high-skill work that drives innovation, delivers improvement, and makes your business more prosperous. Computers are at their best when doing low-skill, low value tasks that remove roadblocks from the daily roles of manufacturing employees.

Industry 4.0 software systems automate the low-value activity of gathering and sharing information across your business, allowing people to make informed and effective decisions. By doing this, Industry 4.0 systems enable people to deliver the high-skill, high-value work that makes them, and their business, competitive in the global marketplace.

What does Industry 4.0 look like for me?

So far we've come to the following conclusions:

1. Manufacturing businesses naturally evolve through Industry 3.0 to have siloed systems. It's in the gaps between these systems where the main sources of misalignment and inefficiency arise.
2. We can plug the gaps between these siloed systems using Industry 4.0 technology, enabling manufacturing employees to be more effective and deliver higher value work.

Now you wouldn't be alone if you're thinking... "This sounds great and I get the whole idea of Industry 4.0, but I have no idea what it looks like in practice for me and my business"

Which brings us to the final problem of Industry 4.0...

Every manufacturing business has a different combination of siloed systems – you may have bought in an ERP, developed an in-house stock control system, done a partial roll-out of a work booking system and not have implemented a machine monitoring system. The scheduling might be done in Excel and the quoting is done based on historic paperwork.

For each manufacturing business, the implementations will differ, leading to a very fragmented landscape and a "no one size fits all" problem.

Here at FourJaw, we are often asked if we can integrate into work booking systems and ERPs, and there is nothing we'd like more than to say "yes". However, the principle of our business is to offer a plug-and-play, affordable, and easily rolled-out machine monitoring solution to our customers.

When each customer has a bespoke combination of systems, it would require a bespoke piece of work to do the integration, causing large upfront costs, long implementation timescales, and a lot of time and effort from the customer. It's the opposite of plug-and-play!

This is the core source of confusion around Industry 4.0 – because you have a unique combination of systems, you have a unique combination of gaps in between those systems, and therefore a unique set of problems that arise due to information falling in those gaps.

For example, your stock control and ERP system might be joined at the hip, but the finance system has no connection to your factory floor operations what-so-ever.

In this way, it falls on your shoulders to navigate the whole Industry 4.0 ecosystem and try to figure out what will work for your unique situation – not an easy challenge for anyone!

The best way to tackle this, is to borrow a concept from the world of software development – it's called Pain Driven Development. This is the idea that you simply identify what part of your job, business or workflow is causing you the most pain and start there.

It avoids the “analysis paralysis” that often comes when we feel we need to solve every problem at once with one massive company-wide implementation project. Pain Driven Development tells us we don't have to do that – we simply identify what is the biggest challenge at the minute and get to work on solving that.

If you feel you would like to start your Industry 4.0 journey but don't have the time, knowledge or motivation to evaluate the plethora of Industry 4.0 options out there, then don't feel you have to. Instead, look inwards to your business and identify the one area that is really causing you trouble.

It might be that in your business, quality is a massive issue – lots of parts are being scrapped and it's causing a nightmare for your profit margins, production schedule and lead times. If that's the case, then a quality management system is the ideal thing to start with.

In a lot of cases, simply understanding what happens on the factory floor is the key source of pain within a manufacturing business. If you don't know when your machines are working, you can't know your production costs and therefore quoting for work and staying competitive becomes a real struggle. It's also tough to know your true capacity and therefore efficiently schedule production to get the most from your machines. In cases like this, manufacturers often look at something like the FourJaw machine monitoring system to get a handle on the production side of their business.

Once you can define your key pain point, it will signpost you to the type of solution you need and it becomes a much more manageable task to start testing what will work for you.

The second thing is to look for systems where you can dip your toe in without much commitment – if you like what you see once you're up and running, then by all means take it further. However, if it's rubbish once you've installed, then you should reserve the right to cancel, and quickly!

There is a new wave of software systems coming to the manufacturing industry that are easy to install and require very little commitment – think of your 30 day Netflix free trial but for an ERP, or a stock control system.

By following Pain Driven Development and choosing a low-commitment software provider, you can:

1. Quickly identify your main pain points that are holding back your business.
2. Test out a low-commitment solution that you think will do the job.
3. If it lives up to expectation, roll-out. If not, move on!

This simple process is the key to achieving Industry 4.0, without having a PhD in cloud computing or conducting a year-long evaluation of the market. You're the expert in what causes the most pain in your business, and using the try-before-you-buy approach, you de-risk testing potential solutions to the point where it's a no-brainer.

To summarise, nobody can say exactly what Industry 4.0 looks like for you, because it will be unique to the systems you are running. However, by identifying your key sources of pain, dipping in your toe with low-commitment solutions, and only progressing when things work for you, you've got everything you need to get started. Good luck!

The 30-second summary

Industry 4.0 is difficult to implement as each manufacturing business will have a unique combination of financial, operational and technical systems, causing a unique set of problems in their day-to-day work. Therefore, identifying the correct Industry 4.0 technology to solve these problems becomes an onerous research exercise with endless possibilities. This leads to "analysis paralysis" and prevents many businesses from moving forward.

You can overcome this by following the principles of Pain Driven Development - start by looking inwards to identify the most painful part of your day-to-day work. Then, choose a system that should solve this pain point which you can trial with minimal commitment. If the system works, roll-out and move on to your next pain point. If it doesn't, cancel and try a different system.

Technology comes into our personal lives this way, from Spotify and Netflix to Dropbox and Amazon Prime. Try before you buy is the modern way, so why not harness it to drive adoption of Industry 4.0 systems in your business.

About FourJaw



The UK's first machine monitoring platform that works for any machine, in any factory.

FourJaw's machine monitoring platform was designed specifically for the needs of small and medium-sized businesses (SMEs) that have been left behind by the smart factory movement due to prohibitive costs and complexity. The end result is a cost-effective and scalable machine monitoring platform that can be used on any machine, regardless of age, size, or model.

Unlike other machine monitoring solutions which require complex and expensive implementation, our innovative IoT device simply clips onto any and every machine in the time it takes to brew a cup of coffee.

Simply put, optimising production, increasing utilisation, and maximising profitability through machine monitoring has never been easier or more affordable for manufacturers.

FourJaw, Oxo House, 4 Joiner St, Sheffield S3 8GW, United Kingdom

Tel. +44/(0)114 400 0158

sales@fourjaw.com

www.fourjaw.com