World Wide Technology

THE FUTURE OF IIOT: 5 STEPS TO BUILDING A BETTER MANUFACTURER

THE CURRENT STATE OF THE MANUFACTURING INDUSTRY

The concept of the digital factory seems almost counter-intuitive to those outside of the manufacturing industry. Most think of factories as physical in nature, comprising hefty, isolated machinery, while the word 'digital' suggests a transition towards a more fluid, software-led approach.

Yet the manufacturing sector, just like nearly every other segment of industry, has started to make substantial investments in the digitisation of their core lines of business – connecting the previously unconnected in order to collect and analyse valuable operational data. Successful digitisation strategies drive significant business, financial and operational gains, but require an organisational culture of innovation, a passion for learning, and a "coalition of the willing" across business, IT, cybersecurity, and manufacturing. This has challenged executive teams to re-evaluate how their organisation operates.

For manufacturing leaders, this digitisation journey brings an entirely new set of challenges and opportunities. According to Frost & Sullivan's Manufacturing Leadership Council Survey, 97 percent of manufacturing leaders believe the emergence of cyber-physical systems, digitisation and information-driven factories requires a substantially different approach and set of skills. Nearly half say smart manufacturing is only superficially understood, while 22 percent state they are only starting to scratch the surface.

The prospective benefits of the transformation are well aligned with board-level objectives; faster, more efficient operations facilitated through self-optimising systems, substantial reductions in overheads and access to a greater range and depth of analytics are just some of the reasons to pursue a digital agenda. Unlocking this value does not come without impediments, and executives across the sector are dealing with a range of pressures. These include coordinating a range of stakeholders across business, manufacturing, IT and security functions and laying out an industrial Internet of Things (IIoT) strategy that guides the process and drives improvements.

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OF MANUFACTURING LEADERS BELIEVE DIGITAL FACTORIES REQUIRE A DIFFERENT APPROACH AND SET OF SKILLS

RISK DOWN, PROFIT UP – WWT'S EVENT

The topic of implementing digital strategy formed the basis for a panel event WWT ran in July 2019 in conjunction with Meet the Boss, Fortinet and Nozomi Networks. Titled 'Risk down, profit up: how to build a better manufacturer with the Industrial Internet of Things,' the discussion focused on the secure convergence of IT, operation and manufacturing systems. It investigated how manufacturers can introduce and manage IoT environments in a way that enhances value capture and cost efficiencies, while simultaneously giving priority to security considerations.

The panel featured respected industry personalities including John Allen of GSK, Michelle Balderson of Fortinet and WWT's Don Rogers. Engaging with an active and informed audience, they discussed how manufacturers can reduce risk, raise profits and use IIoT to build a secure, connected industrial environment that supports the business' future needs.

In this report, we share the five key themes discussed over the course of the evening and offer guidance on how their learnings can be adopted as part of an IIoT strategy.

> "The Industrial Internet of Things is about digitisation, leveraging digital technologies to improve our traditionally static processes. Digitisation means that these processes gain greater efficiency and need to be more dynamic. For manufacturers, IIoT requires a continuous evolution of your processes to effectively secure your environment."
>
> Michelle Balderson, Director, Operational Technology and Critical Infrastructure, Fortinet

#1: DRIVING THE TRANSITION FROM STATIC TO A FLUID, CONTINUOUS PROCESS

The panel began by discussing how the nature of manufacturing plants is changing. Once standalone objects, the operational technologies (OT) used in manufacturing are now designed with a greater focus on sensor-based machinery and data analytics. The masses of data these sensors create enable efforts towards continual process improvement. The panel discussed examples of industries that have embraced the transition. The automotive sector was highlighted as one space where manufacturers have been able to successfully use advances in mobility and wireless technology to remove frictions in long, static production lines and allow for instant maintenance and issue resolution.

The panel also discussed the flip side of the coin: the risk of data overload. They shared instances where companies collect more data than they can possibly act upon, making the process impractical and incurring substantial costs as a consequence. Deriving tangible value out of IoT data, the panellists advised, starts with realising you need to restructure. They argued that the components of IoT – interfaces, APIs and devices – are nothing new to IT teams; the difference is in the scale. Reorienting around these exponential increases in data volumes can help to prioritise data sources and filter the value from the noise.

KEY TAKEAWAY

LESS IS MORE; START SMALL AND BUILD UP YOUR DATA ANALYTICS OPERATIONS.

> “Culture, from a foundational perspective, is one of the most important aspects in organisational change. Digital transformation requires real collaborative leadership amongst many stakeholders – including business, IT and manufacturing.”

Don Rogers, Industry Practice Manager, Manufacturing, WWT

#2: BUILDING A CULTURE AROUND THE DIGITAL FACTORY

Organisational culture is about creating a working environment based on a common mission, values, expectations and goals. The discussion identified a significant cultural gap in IIoT, where the manufacturing and IT teams have evolved separately and have different priorities and ways of operating. These differences are not irreconcilable, but a conscious effort is required to bridge the gap.

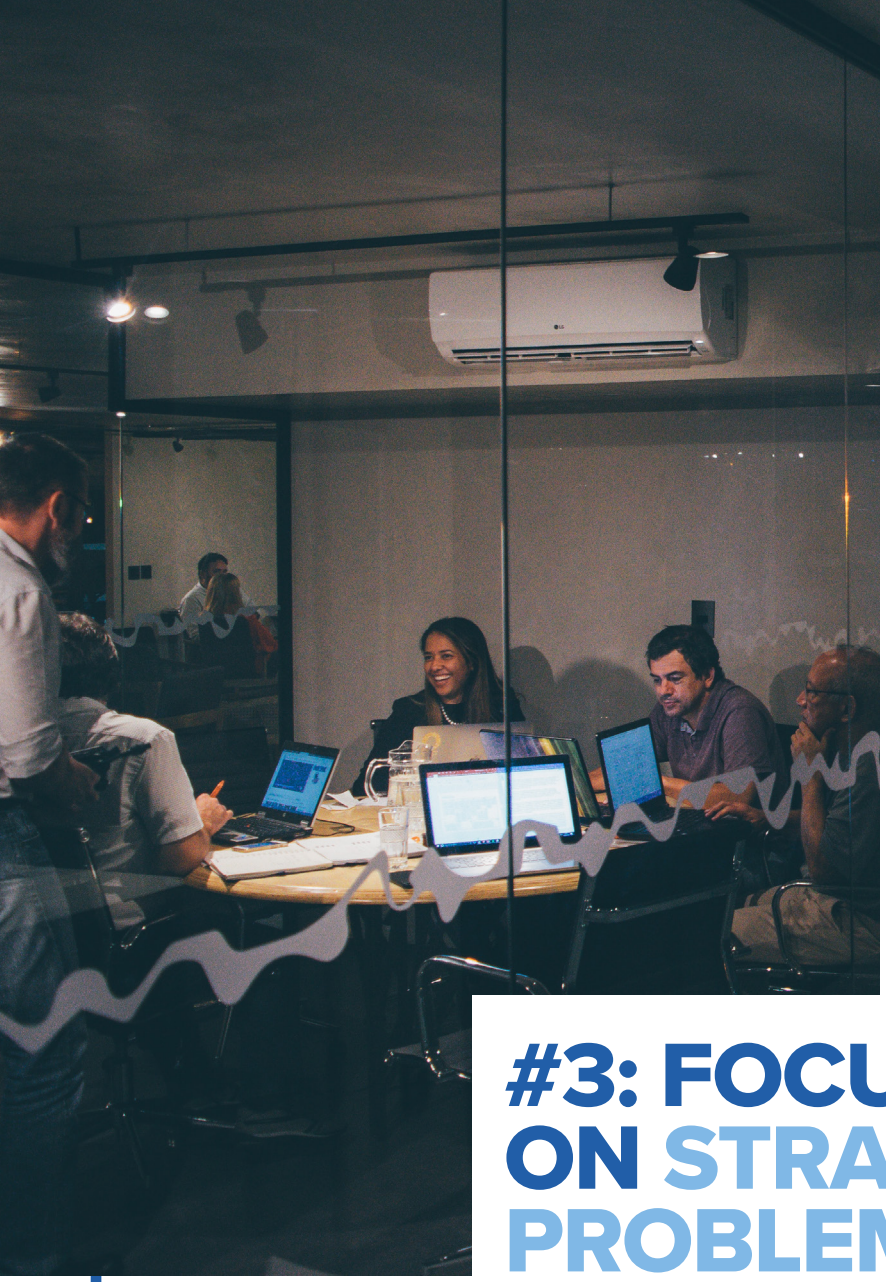
Building culture starts at the executive level. As the business’ understanding of IoT evolves, the executive group needs to consider: ‘Does it sit on the operations or IT side of the business?’ They usually come to the conclusion that the two seemingly disparate sides are actually facing the same challenges.

By encouraging these teams to work together, executives can ensure the business adopts an aligned approach to challenges such as vendor management and control system manageability. This creates a shared perspective from which to drive wide, significant change in how the business is operating.

Creating this ‘mindshare’ between IT and OT teams should be the number-one priority as it provides the foundation for the design, operation and sustainability of the IoT platform.

KEY TAKEAWAY

BREAK DOWN IT AND OT SILOS BY FOCUSING ON SHARED CHALLENGES AND GOALS.



"The risk for many businesses is finding some 'snazzy' technology and seeing what problem it can solve – this is the wrong way around. If you focus in on a problem like waste elimination, analytics or performance then you can use technology for improvement."

John Allen, VP, Information Security Transformation, GSK

#3: FOCUSING ON STRATEGIC PROBLEM-SOLVING

Technology is by definition intended for practical purposes, but where it has been poorly integrated from a process perspective, its application can be a hindrance. The panel discussed this dichotomy in manufacturing, where the temptation many executives face is to add technology as a panacea, without having identified what specific problems the technology is solving.

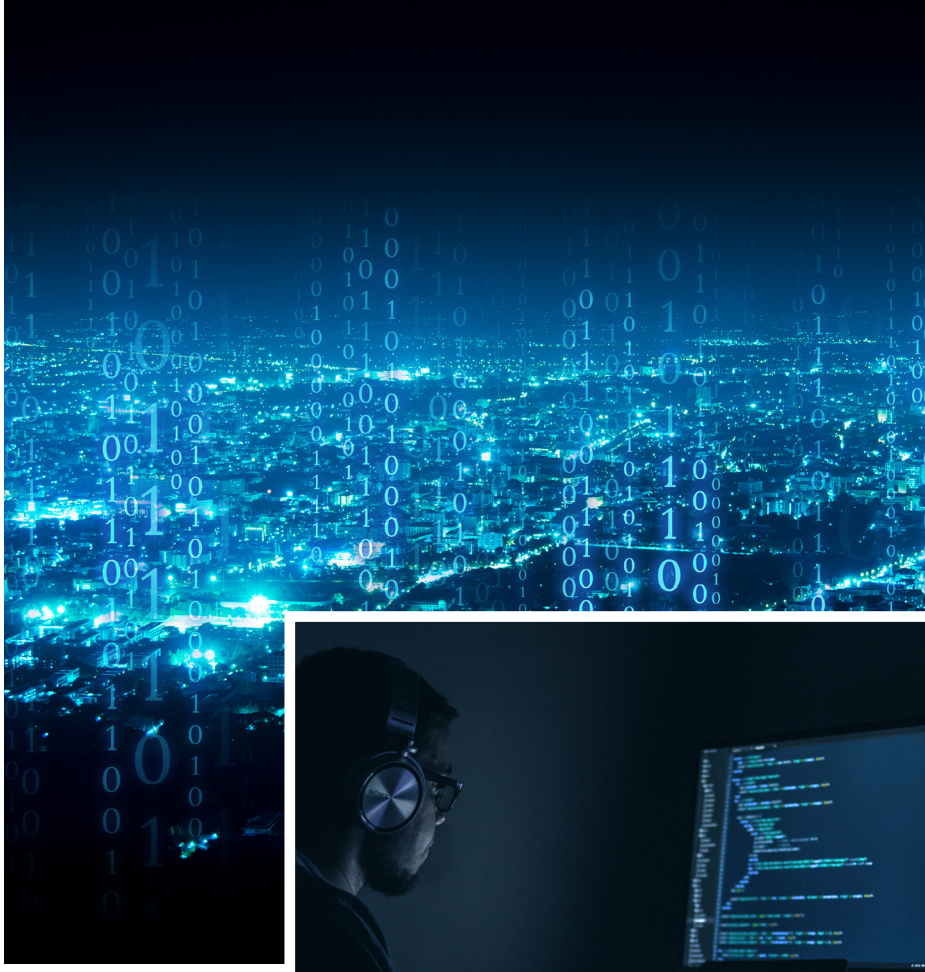
One issue identified is the prevalence of buzzwords and false expectations that pervade the sector. Our panellists said that they regularly encounter peers and others in their network that set out on ambitious digital transformation projects, such as building AI platforms and data lakes, without a clear understanding of why they need them. The inevitable consequence of building for the sake of building is waste or, as one of our panellists put it, "risking the creation of a data swamp instead of a data lake."

Our experts advised that executive teams start by identifying what problems they want to address and then develop a strategy for how introducing technologies can help. Digitisation holds the power to reinvent their operating processes. The question they should ask is, 'How do I leverage data to improve availability, yield and quality at scale?' This is the fundamental use case of IoT and is key to realising the value of operational data. Their approach needs to be practical, focused on building predictive models to get in front of potential issues and continually improve.

KEY TAKEAWAY

CLEARLY IDENTIFY THE PROBLEM THAT NEEDS TO BE SOLVED AND WORK BACK TO THE TECHNOLOGY SOLUTION FROM THERE.

> “Manufacturing culture typically, and rightly, focuses on safety and quality first. As the industry moves into a digitally connected world the safety agenda must embrace ‘cyber safety,’ extending our mindset from physical to virtual safety.”
>
> John Allen, VP,
> Information Security Transformation, GSK



#4: GIVING SECURITY AS HIGH A PRIORITY AS SAFETY

Manufacturing processes, conventionally built on isolated OT systems, have focused more on safety and quality than on the threat of a security breach. With greater digitisation, there is now the real risk that a cyber-attack could not only have severe implications for the security of the organisation’s systems, but also have significant implications for the safety of its workers.

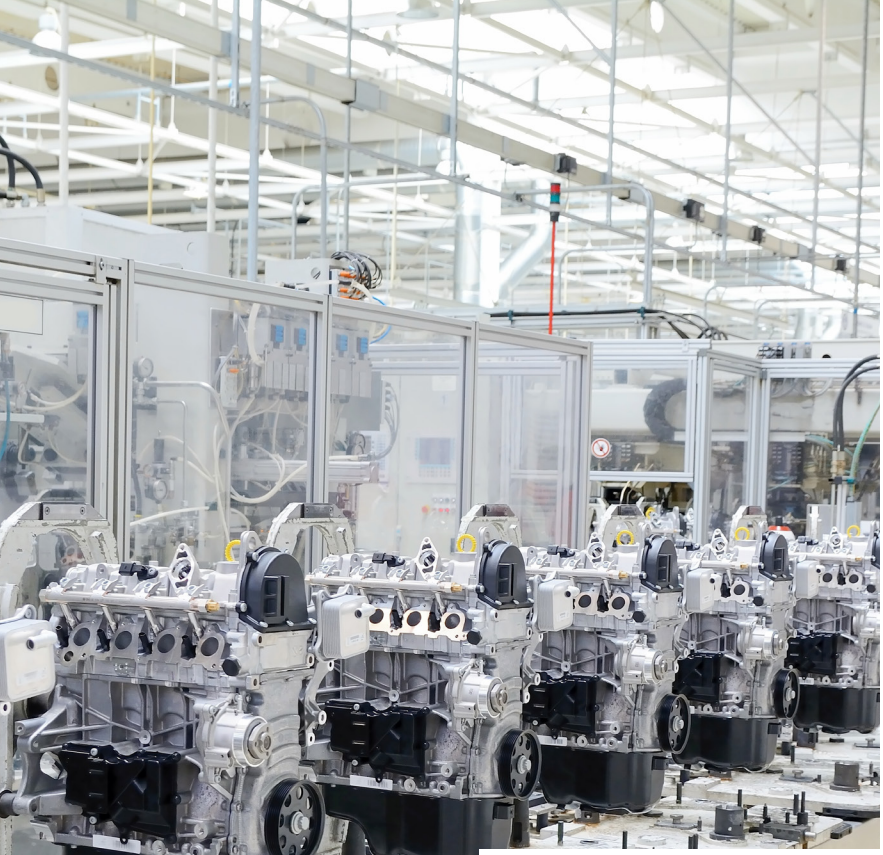
The panel discussed this in the context of the integration of OT and IT systems. As these once disparate systems are closely merged, the organisation must be cognisant of the new risks posed. Without a comprehensive industrial cyber strategy, SCADA, industrial control systems and safety systems may be compromised. The consequences could be serious – from loss of production and impairment of quality, to personal injury and loss of life.

Among the various illustrative examples raised was an incident at a German steel mill. Hackers used an attack on IT infrastructure to manipulate operational systems in order to take control of blast furnaces and cause massive damage.

With such risks looming, ‘cyber safety’ must now be elevated to an organisational priority. This requires a cultural adoption of security as a fundamental principle of how the business operates. A focus on security should not, however, act as a barrier to innovation. By building security into processes, an organisation can enable innovation initiatives matched to their risk tolerance and safety objectives.

KEY TAKEAWAY

MAKE ‘CYBER SAFETY’ A CORE PART OF YOUR EXECUTIVE TEAM’S LEXICON.



> "OT has traditionally been about physical processes. IoT introduces the sensorisation of OT and industrial applications. As more industrial IoT devices come online, it is important that your OT segmentation strategy account for both modern and legacy technology, otherwise you may end up disrupting your legacy environment."
>
> Michelle Balderson, Director, Operational Technology and Critical Infrastructure, Fortinet

#5: FINDING NEW COST EFFICIENCIES AND ELIMINATING WASTE

The final theme covered by the panel related to operational efficiency. The speakers discussed a common issue they observe where the digital transformation process has developed in a distributed way, lacking a cohesive strategy across the different ends of the business. This creates silos and unnecessary inefficiencies, and can limit the success of digital initiatives.

Examples of such inefficiencies discussed included the duplication of efforts across the operational and IT sides of the business, and the risk of the operations team adopting IT applications outside of the cyber security team's line of vision – so called shadow IT – due to misalignment between the departments.

KEY TAKEAWAY

LET THE DATA DRIVE DECISION-MAKING.

The solution to these issues, the panellists agreed, will come from building processes around the use of analytics as well as the required underlying technology infrastructure. Leadership needs to think carefully about what strategy it adopts to drive the value of data analytics back to the business and create a feedback loop for improvement.

The panel also discussed issues around legacy systems, which more often than not will need to continue to operate in a smart factory environment. These systems continue to rely on physical control processes, often detached from IT systems, and typically don't produce a lot of data. How these systems are managed needs to be carefully considered as part of a digital strategy.

> "Organisations' digitisation strategies related to safety, security and operational excellence can be supported with the smart use of AI and machine learning tools, and by leveraging experienced external resources. These can patch over a lack of internal competence and quickly start to deliver continuous business value."
>
> Tony Atkins, UK&I Sales Director, Nozomi Networks

EMBARKING ON THE JOURNEY TOWARDS A BETTER MANUFACTURING ENVIRONMENT

As we approach the advent of the truly digital factory, the challenges manufacturers face are clear. The risks of organisational silos, misalignment on initiatives and wasted resources are genuine concerns that could serve to derail transformation projects. The new cyber safety aspect is also a pressing concern, with high-profile cases showing the risks that can arise from integrating IT and OT systems without strong security checks in place.

For manufacturing leaders, a transformation involves balancing a number of priorities, including trying to drive the value of data analytics back to the business, securing the IIoT environment and coordinating people, resources and data – all at the same time. In reality, these can't all be done at once. The approach taken must therefore seek to develop a comprehensive strategy – comprising frameworks, practices and cultures – and to execute step by step.

As our panellists agreed: it's a journey. Set the process in motion, seek incremental improvements, create alignment with the broader business and expand upon that. Not only will you build a better manufacturing operation, but also a safer and more profitable one.

"Fundamentally, you get the most out of technology by first defining the business outcomes and objectives, then aligning stakeholders across business, IT and manufacturing to execute. That's a mindset change."

Don Rogers, Industry Practice Manager, Manufacturing, WWT

READY TO EMBARK ON YOUR JOURNEY?

WWT applies a five-stage approach to digitising your manufacturing operations:

1. Ideas, aspirations and objectives: where do you want to take your business?
2. Fact-finding: discovering your current state
3. Solution mapping: determining routes to meeting your objectives
4. Outcome-focused agile implementation: from quick wins to transformation at scale
5. Realise business value, continually optimise

To find out more, please contact **don.rogers@wwt.com**

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