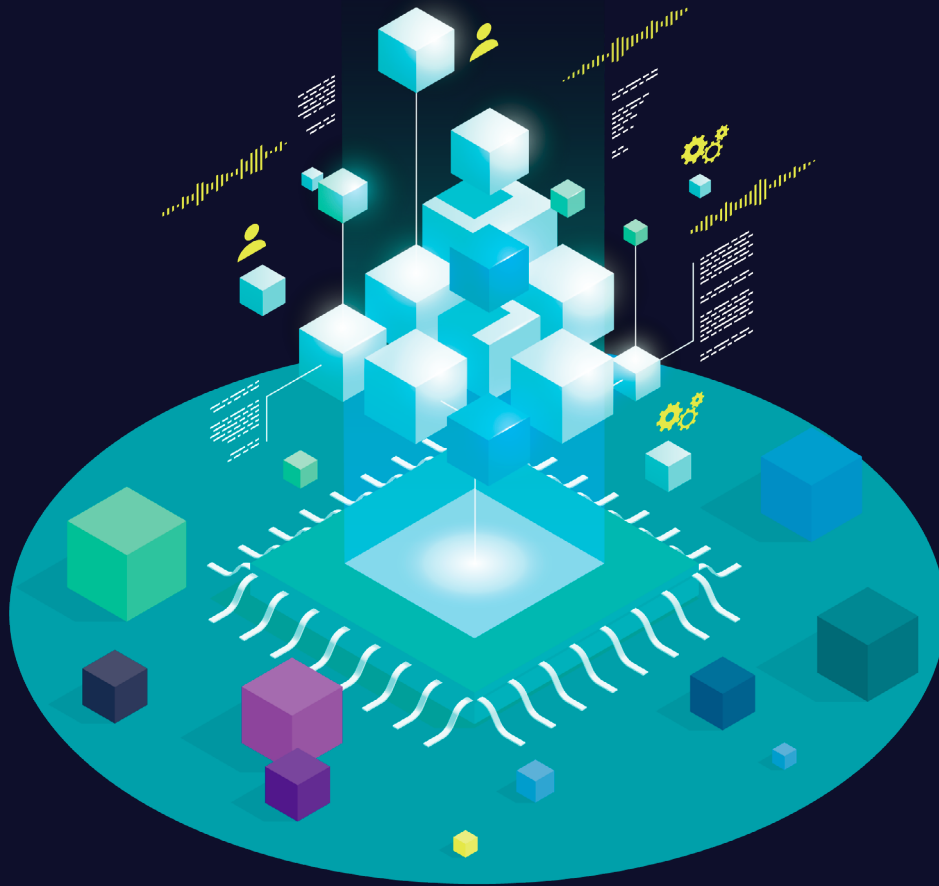


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SIEMENS ADVANTA

Digital Transformation

A smarter way back to growth

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1. Introduction

The UK economy is on the road to recovery, and this has caused a sudden rise in demand for highly-engineered products at a time when supply chains are already stressed. Given the broad disruption resulting from the COVID-19 pandemic and the inherent supply chain weaknesses it has highlighted – such as increasing raw material prices and critical staff shortages across many sectors – manufacturers have no time to waste when it comes to finding ways to improve their productivity and supply chain performance, whilst driving enhanced value for customers.

While some have well-developed digital transformation plans in place, others are struggling to understand the benefits that a long list of Industry 4.0 technologies, such as the Internet of Things (IoT), automation, big data analytics, AI and machine learning, could bring for their business.

The fast pace of digital adoption in many industry sectors, which accelerated during the pandemic, means manufacturers can't afford to delay. They must now turbo-charge their digital transformation plans or risk losing market share to agile competitors.

In collaboration with Cranfield University, we have conducted a joint research study with 38 manufacturing companies in the UK to find out where they are on their digital transformation journeys and what challenges need to be overcome. In addition to setting out the study's main findings, this paper provides a Digital Transformation Roadmap to support Board-level decision makers in planning a smarter way back to growth.

COVID-19 has brought about a seismic shift in the way businesses interact with their customers and supply chains and this is the biggest driver of investment in digital transformation. Those businesses that had invested in digitalisation before the pandemic have been reaping the rewards of their enhanced agility. Others must now catch up or risk missing out on growth opportunities in recovery.



About the research study

Sponsored by Vendigital which is now part of the Siemens Advanta organisation, the field research was carried out by postgraduate students at **Cranfield University** in Q2 2021. A total of **38 companies** participated in the research, which involved an online survey of **senior-level decision makers**, followed by a series of one-to-one interviews.

Research participant insight

Digital is essential to most (if not all) parts of our business. For example, we now use digital tools extensively for rapid product development in a collaborative environment and we incorporate digital technologies into our products. Our customers now recognise the benefit we provide through more digital systems and see the value added through better optimised systems and more connected products. Our customers now expect us to fully embrace digital technologies and, if we don't, we will lose out to our competitors, fail to win new orders and fail to grow.

2. Realising the benefits

A definition of digital transformation: digital transformation in the manufacturing industry can be defined as changing the way that data is used to improve processes and make better, faster decisions.

In order to prioritise and sanction investments in Industry 4.0 technologies, Board-level decision makers need to understand the value they could bring to their business.

The research study confirmed that 'production efficiency' is the most important driver of investment in digital transformation strategies, followed by internal process quality and agility. Board-level decision makers need to know that the expenditure they are making will deliver value to the business by improving productivity and streamlining processes.

Deciding when and how to invest is not as easy as it sounds however, as manufacturers are likely to have several overlapping digitalisation initiatives underway at once. The distinct nature of the technologies deployed and the complexities associated with their application, can make it difficult to assess their respective value.





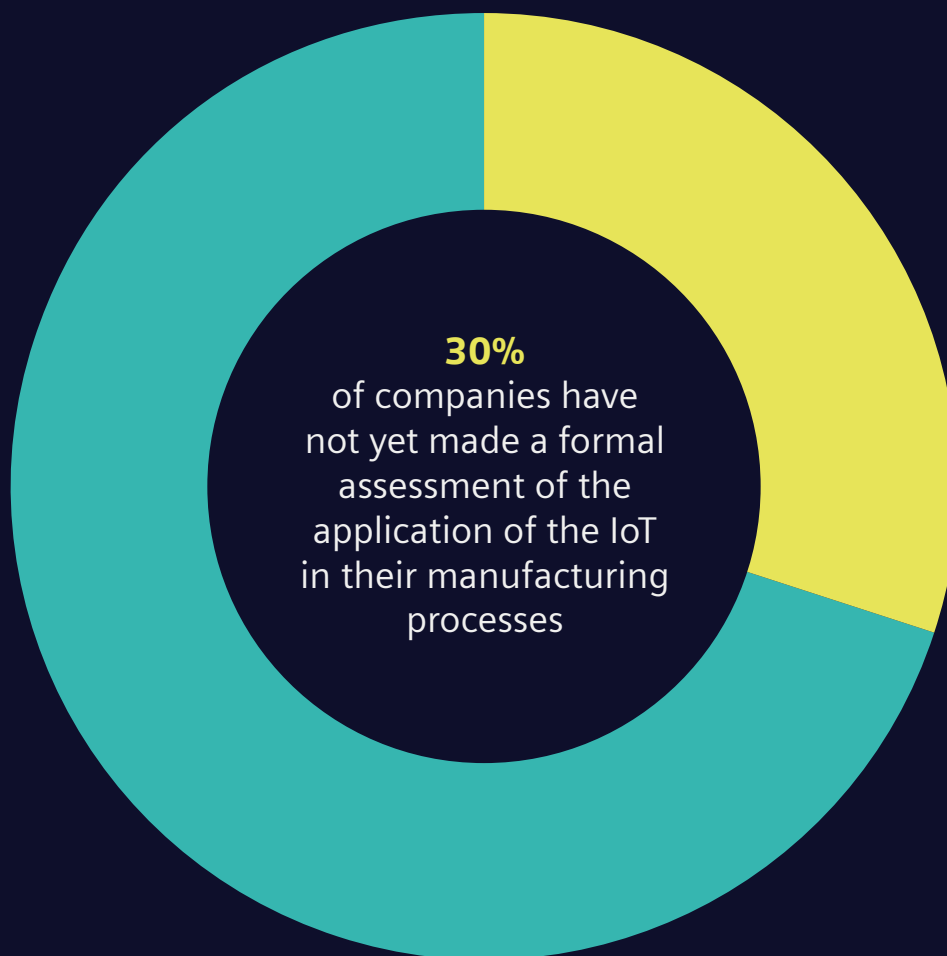
The benefits of investing in digital transformation in manufacturing are typically focused in five main areas:

Benefits of investing in digital transformation



Assessing the value that could be delivered by implementing a specific technology, such as the IoT for example – which can be crucial to obtaining real-time information to improve decision making – is a skilled analytical undertaking, which is likely to require external support. For some manufacturers, a lack of skills could be holding back progress. For example, the research study found that 30% of companies have not yet made a formal assessment of the application of the IoT in their manufacturing processes and a further 30% are at testing stage. Only 7% of respondents had completed an assessment of its potential benefits.

Overall, the research study concluded that digital transformation in the manufacturing sector has only reached an 'initial stage'.



Source: The present data is based on own research in this field

The value that can be created by digital transformation in manufacturing is considerable, but realising it can be challenging. Businesses need to understand the value that their investments will bring, develop a bespoke Industry 4.0 framework and ensure the prioritised technologies are implemented in a fully-integrated, cross-functional way.

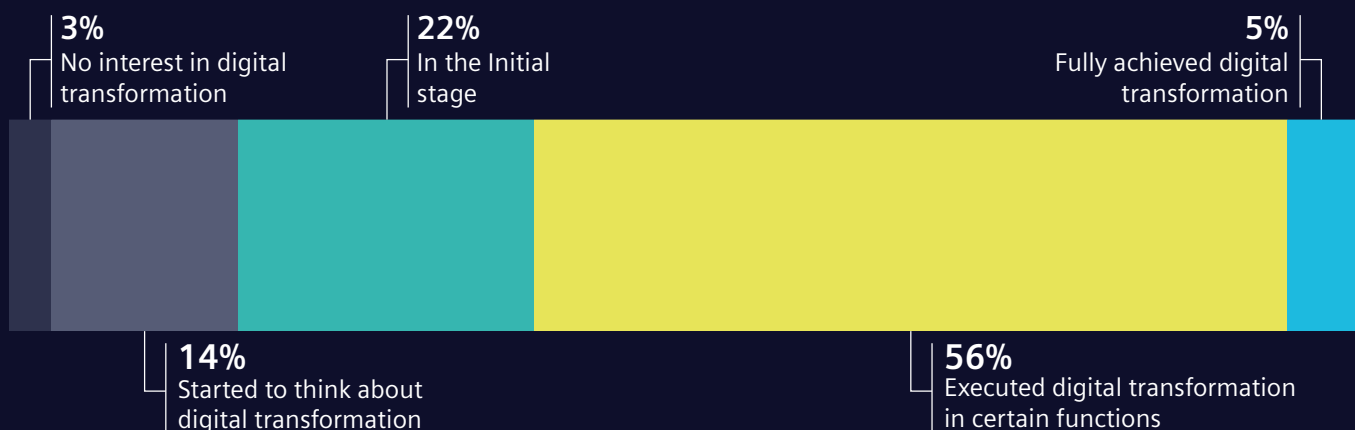
3. The integration gap

The research study found that while manufacturers are investing in digital transformation initiatives, they may not be delivering optimal value.

56% of manufacturers said that digital transformation had been achieved in certain business functions. A further 5% said that their digital transformation was complete. However, further analysis of the interviews suggested that a significant proportion of respondents were unaware of the need to integrate enabling technologies to achieve maximum value.

While manufacturers are investing in digital transformation initiatives, they may not be delivering optimal value.

Current level of digital transformation activities within organisations



Source: The present data is based on own research in this field





Too many businesses are missing a trick by failing to integrate the digital technologies they are introducing. This is like paying for a smartphone and then only using it to send text messages. True digital transformation often involves an education process at the outset to ensure decision makers understand its value-driving potential.

While experimental initiatives, such as pilot projects, are useful as a mean of demonstrating value, they may have contributed to a fragmented approach to investment in Industry 4.0 technologies. Furthermore, a lack of skills to support the integration process may be preventing companies from achieving cross-functional digital transformation.

Another reason for the lack of focus on integration could be that the study's respondents didn't have access to a pre-defined Industry 4.0 Framework. This is most likely due to the fact that there is a general lack of such frameworks in the manufacturing sector and some respondents were in the process of creating their own. While this is a sensible approach, as the journey to digital transformation will not be the same for every business, it is vital that all Industry 4.0 enabling technologies are considered on route to digital transformation.



The research study found that while most manufacturers had a good knowledge of Industry 4.0 enabling technologies, some were perceived as more important than others. For example, cybersecurity and automation were ranked as 'high importance', with less focus being given to blockchain, augmented reality, or autonomous robots. The former elements highlight the importance of establishing the real foundations on which to deploy the more detailed and specific Industry 4.0 applications. Another foundational element that ranked 6th on the survey was big data analytics, being the cornerstone and key catalyst of any digital transformation, allowing businesses to make calculated and strategic business decisions in real-time.

While experimental initiatives, such as pilot projects, are useful as a mean of demonstrating value, they may have contributed to a fragmented approach to investment in Industry 4.0 technologies.

4. Overcoming challenges and changing attitudes

UK industry must overcome a number of internal and external challenges to achieve digital transformation.

Business leaders need to have a clear understanding of the company's digital transformation plans and what success will look like, and share this with the entire workforce.





According to the respondents, the top challenges to digital transformation are concerns about funding and a general lack of skills, particularly when it comes to integrating Industry 4.0 technologies. A high number of businesses also felt that 'resistance to change' within their organisations was a significant barrier. The latter was regarded as equally important as a general lack of digital transformation skills.

From a cultural perspective, it is clear that some businesses are struggling to make digital transformation an empowering experience for employees. Some may well feel that their jobs are being undermined by the digital technologies under trial rather than viewing their introduction as an opportunity for skills development.

Weak leadership in this area can mean that instead of dealing with this issue head on digital transformation initiatives are given to the IT team to look after, and employees are given little information about what is going on. To address this, business leaders need to have a clear understanding of the company's digital transformation plans and what success will look like, and share this with the entire workforce. Employees should also have a role in delivering the transformation and in supporting the needs of the future business.

The most successful digital transformations have cultural change at their heart, helping to create organisations that are more dynamic and innovative. As well as having a positive effect on productivity, this appeals to current employees and future candidates.

A man with dark hair and a beard is shown in profile, wearing a black HTC Vive VR headset. He is holding a black VR controller in his right hand. He is wearing a blue button-down shirt. The background is a blurred indoor setting with large windows.

Research participant insight

The biggest challenge has really been around the culture and mindset towards change, particularly when something works but is perhaps not optimal. It is about the short term pain of learning and adopting new and unfamiliar processes for long term gain. But after some pilot studies and initial capability commences, I think that really starts to bring people along the journey and shows that change can be a good thing.

5. Digital transformation roadmap: A blueprint for achieving digital transformation

The research study found that most UK manufacturers don't have access to a digital transformation framework to assist them in adopting Industry 4.0 technologies and achieving optimal value.

The digital transformation roadmap that follows is designed to help businesses to develop robust plans and ensure that Board-level executives have access to the data needed to drive their investment decisions. It can also help to ensure that all relevant technologies and the skills needs of the organisation are fully considered.



Digital transformation roadmap

Siemens Advanta's Digital Transformation Roadmap aims to support businesses on their digital transformation journeys, regardless of what stage they have reached.



Raising awareness and understanding

Board-level executives need to improve their awareness and understanding of the value that digital transformation can bring in improving process and production efficiency. They also need to understand the importance of shifting to an operating model that allows them to make agile, data-driven decisions.

For digital transformation to be successful, it's not simply about using the right technology platforms and systems. There needs to be just as much focus on the corporate culture and mindset, along with the organisational activities, processes, competencies and operating models.



Leadership and training

There are three key requirements for effective digital leadership:

1. Change must be driven from the top of the organisation to create the credibility and momentum necessary for a successful change programme
2. Digitisation must be recognised as a core objective across the business and functional areas
3. The relationship between digital transformation and business goals must be clearly communicated

Strong leadership at Board level will help to address cultural issues, such as resistance to change. The appointment of Digital Transformation Champions will improve internal communication and help to empower employees to get involved and support the transformation process.

A skills gap in areas such as data analytics and knowledge of how to integrate Industry 4.0 technologies could prevent businesses from achieving optimal value from their investments. Greater focus on skills acquisition and upskilling existing employees is required.



Assessing the value of Industry 4.0 technologies

For many companies, Industry 4.0 is viewed as a set of tools to drive operational efficiency and asset performance. However, if viewed more strategically, Industry 4.0 techniques can join smart products and smart processes together to drive enhanced value for customers and the wider supply chain. Connecting smart products with smart processes can unlock the value of Industry 4.0.

Businesses can exploit this value by:

1. Determining how their smart products can integrate into their customers' processes and operations
2. Putting in place the right operating model, focusing on IT infrastructure, internal capabilities and processes
3. Leveraging customer data and performance-based product data to improve how products are designed, developed and manufactured

Board-level executives need access to a smart data environment to inform their decisions and this must be established at the start of the digital transformation journey.



Developing a bespoke Industry 4.0 framework

Once the value creation potential of the company's digital transformation vision has been fully assessed, a framework for delivery should be developed. Each business must develop its own bespoke Industry 4.0 framework as this will vary according to its current operating model and strategic vision for the future.

Many companies will not have the right digital infrastructure in place. To network smart technologies and new technology-based operating models, companies will have to adapt their existing IT infrastructure or implement entirely new solutions.



Driving value through integration

An integrated digital transformation strategy will provide a clear vision backed by a set of strategic imperatives and tangible business outcomes. Linking it to the overall business strategy will enable a sustainable competitive advantage.

Opportunities to enhance value creation through the integration of digital technologies should be kept under constant review as the company's digital transformation journey gets underway.



Tracking the benefits

More often than not, monitoring and tracking benefits is regarded as good corporate hygiene, but sometimes companies fail to adequately measure the success of their transformation.

Four key areas to focus on are:

1. Creating a clear mandate and accountability to monitor progress, and to tackle roadblocks and challenges
2. Defining detailed operational or financial metrics, linked to the digital transformation, while being ready to embrace unforeseen benefits and intangible added value
3. Tracking outcomes regularly at strategic, programme and initiative levels
4. Maintaining a 'single source of the truth' on data

The smart data environment created as part of the company's digital transformation will not only help to track the benefits, it will also provide a dynamic model to guide its strategic planning.

6. Conclusion

UK manufacturers must learn from the challenges of the last 18 months, and fast forward their digital transformation plans in order to drive competitiveness in the future and take advantage now of demand-side opportunities to drive growth in their recovery.

It's critical that they don't wait for things to be 'back to normal' as they probably won't ever be - businesses that thrive will embrace the 'new normal' and drive digital transformation across their enterprise.

The research study undertaken by Cranfield University and Siemens Advanta demonstrates that some companies' digital transformation plans are not advancing quickly enough and a lack of skills in areas such as data analytics and how to integrate Industry 4.0 technologies, is preventing them from achieving optimal value.

The absence of vital planning tools such as a generic roadmap to guide manufacturers on their digital transformation journeys could be preventing businesses from accelerating their delivery plans. Even those that have trialled Industry 4.0 technologies already may lack access to the dynamic data and capabilities needed to support a business case for further investment. This may be preventing them from achieving integration and cross-functional implementation.

Board-level decision makers can't afford to keep treading water when it comes to investing in digital transformation. Now is the time to prioritise investment in digital transformation and recognise their potential to drive growth and enterprise value in the future.

The UK manufacturing sector appreciates the importance of digital transformation and the applications of the enabling technologies of Industry 4.0. The sector is in the initial stage of the transformation journey. Addressing current skills shortages, developing a clear digital transformation process and having demonstration pilot projects are critical to boosting this process. The role of digital transformation in driving the competitive position of UK manufacturing is already clear, and will become even more vital in the years ahead.

About Siemens Advanta

Siemens Advanta is a strategic advisor and trusted implementation partner for digital and sustainability transformations on an enterprise level. Drawing on the Siemens tech stack, Siemens Advanta delivers end-to-end solutions, from strategy and operations consulting to solution architecture and implementation. With comprehensive expertise in IT and OT, Siemens Advanta combines extensive experience from Siemens' own transformation journey with an established reliability stemming from customer projects across diverse industries and countries. By leveraging the power of Siemens businesses and its partners, Siemens Advanta helps customers unlock the full value of Siemens technologies across their entire value chain. Headquartered in Munich, Germany, Siemens Advanta operates with a global network of about 800 employees in 18 countries and 47 offices.

For more information, visit www.siemens-advanta.com

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