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DIGITAL ADOPTION: THE MISSING LINK IN PRODUCTIVITY GROWTH



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EXECUTIVE SUMMARY

Britain's manufacturers continue to move forwards, transforming their businesses by taking advantage of the digital adoption revolution to build greater resilience, increase their international competitiveness and improve productivity. Over two-thirds of respondents to our survey said that past investment in digital technologies had paid off and left them better able to cope with the current challenging economic conditions. Some 58% said they were able to move quickly and provide new critical components where needed and a further 40% said it helped their business increase productivity by streamlining processes using powerful big data analysis tools.

With companies facing unprecedented financial challenges and energy cost pressures, the evidence shows that nearly half of the manufacturers are already at the "evolution" stage of their digital adoption maturity stages. They have already adopted processes based on digital data and seen productivity increase as a result. 25% are at the "conception" stage and are still looking at what digital solutions can deliver for their individual businesses. A further 8% are now making a profit having implemented new digital technologies and findings from digital data and made positive changes to how they interact with customers and suppliers.

Those manufacturers who have the adequate cash flow to continue adopting new technologies are performing better in the current challenging environment, while those who do not have adequate funds are being left behind with falling productivity and weaker resilience. The story is largely positive: over three-quarters of manufacturers have increased spending on digital technologies and just 6% said their investment has dropped, seeing digital as a critical area which cannot be allowed to stall. Our research also revealed that increased production flexibility, labour efficiency and improved profitability top the table as the main benefits behind the adoption of digital.

The focus is now on production areas such as equipment maintenance, with 45% of businesses currently introducing new digital tools to detect faults quickly and keep production at an optimum level. We can see that manufacturers are addressing current supply issues and looking for solutions within the digital technologies; three in ten manufacturers are using digital tech to improve their supply chain management with a further 40% looking at how to introduce digital analysis in this area.

The average spend on new digital technologies is between £50,000 to £500,000 and 80% of all manufacturers are looking to increase digital spending in the next 24 months. There are many factors that make digital adoption successful with an impact on productivity, it's not only a matter of getting a new piece of equipment. The evidence shows the necessity of a vision that consists of leadership, knowledge and finance. The majority of those who have invested in digital expect productivity to increase (63%) and to date, a typical manufacturing business (83%) has replaced up to 10% of its manufacturing processes with technology, automation, and data connectivity.

However, there is still much to do, and Government must continue to play its part to supercharge digital progress in manufacturing. The Made Smarter programme – which helps companies identify where digital adoption can best help their company boost productivity and delivers hands-on implementation support – must be rolled out across all the regions of the UK. The scheme should be expanded to include industrial decarbonisation as digital and green increasingly go hand-in-hand, with digital solutions to decarbonisation key to success.

In addition, the Research and Development (R&D) tax credit should be expanded immediately to include capital expenditure.

PART 1

DIGITAL

TRANSFORMATION

IN MANUFACTURING

THE STAGES OF DIGITAL TRANSFORMATION

Many manufacturers are seeing and taking advantage of digital adoption. Make UK's most recent survey, in partnership with Infor, has revealed that, far from standing still, manufacturers have firm plans to further transform their factories.

The global pandemic and the UK's exit from the EU are just two of the external drivers that have swayed larger cohorts of manufacturers to adapt their processes, digitalise their systems, and invest in new industrial digital technologies.

While the concept of digitalisation is fast becoming well-established, what does it mean? And when we talk about where manufacturers are on their 'digital journey' where is the start of the journey and where is the end?

Digitalisation happens when at least one new digital technology is implemented to change a business process. This can be, as we explore later, anywhere within a manufacturing business: production, invoicing and even energy management. The digital technologies used to implement this change will likely differ depending on the outcome the business wants to achieve.

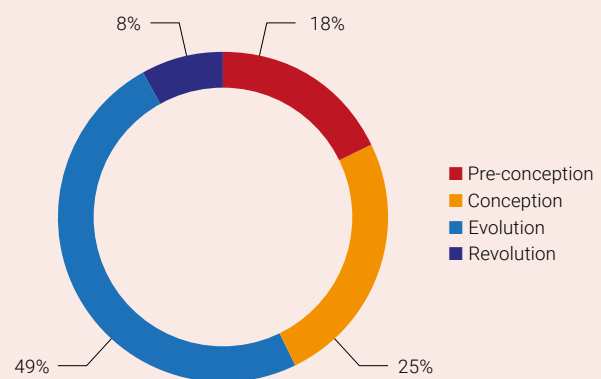
The four stages of distribution and adoption of digital transformation

There are different stages of digitalisation starting with pre-conception and ending with revolution.

Pre-conception: Doing nothing. Around one in five (18%) manufacturers are still in this stage. These companies may be unaware of the advantages of investing in and adopting digital technologies. They may be aware but be facing barriers. We explore this in more detail later in our report.

Conception: In the thinking stage. A quarter of businesses are in the conception stage. At this point, they are figuring

Chart 1: The Four phases of the 4IR transformation – where are manufacturers



Source: Innovation Monitor (2022), Make UK/Infor

out what new digital technologies can offer to their business and how to apply them successfully. They are looking around at their peers and competitors and looking for impartial advice about what technologies are needed if needed at all.

Evolution: Transformation stage. Almost half of manufacturers are in what is arguably the most intense and interesting stage, whereby businesses are implementing changes to their processes based on insights from data, and are putting technologies in place (e.g., sensors) to create or capture more data. Analysing data captured by digital technologies takes place here, with businesses developing projects for internal change.

Revolution: The profit stage. Almost one in ten (8%) manufacturers are in this final stage. Internal changes are spilling out with other businesses noticing the change externally. They are changing the way they both add and gain

value and how they interact with customers and suppliers based on the use of new digital technologies.

If Make UK wanted to set the manufacturing sector a goal it would be this: for every manufacturing business to be in the final, revolution stage.

By pushing manufacturers into the revolution stage, we will see increased efficiency and productivity in the sector and wider individual business benefits.

This report looks closely at what it takes to:

- Make the first step out of pre-conception and into the conception
- Move from thinking to doing and switch from conception to evolution
- And finally reap the benefits by transitioning from evolution to revolution.

FROM THE SHOP FLOOR TO THE BACK OFFICE: WHERE DIGITALISATION IS TAKING PLACE

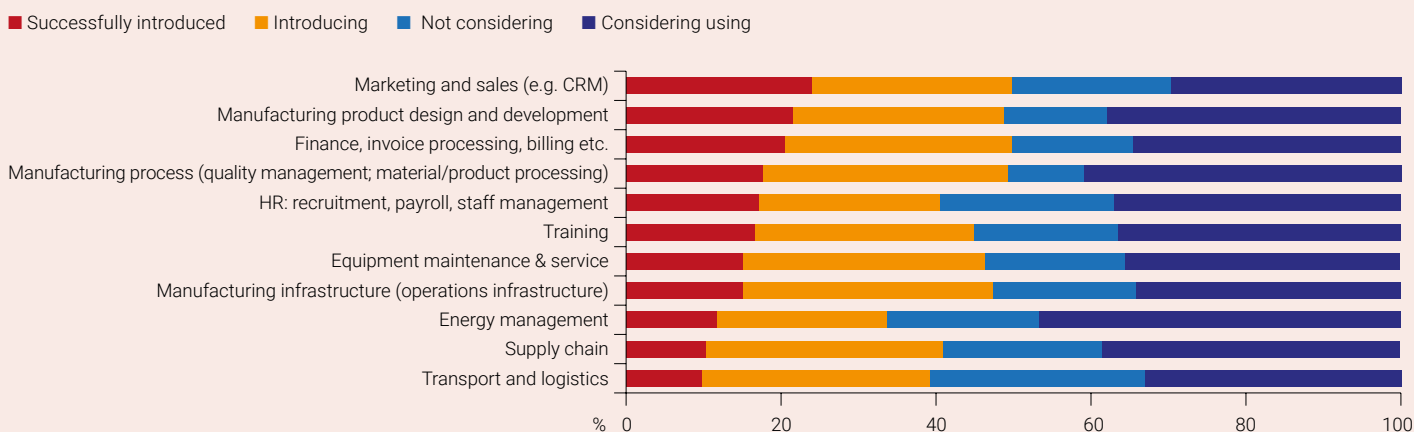
When we talk about new digital technologies in this report, we are referring to wide group of technologies such as Enterprise Resource Planning (ERP), Manufacturing Execution Systems (MES), simulation, cloud computing, nanotechnology, industrial digital technologies (IDTs) such as robots, additive manufacturing, Virtual Reality (VR), Artificial Intelligence (AI), Augmented Reality (AR), nanotechnology, 5G and more to improve productivity and efficiency across all areas of business.

Areas within manufacturing businesses that are seeing the most digital transformation are marketing, product design, manufacturing processes and finance. These are cited as the top areas where digital technologies have been successfully introduced (50%, 49% and 49% respectively).

This trend is occurring because digital technologies are well established within these areas already. For example, manufacturers have been using systems to increase sales through e-commerce, manage data with established CRM software, as well as utilising marketing and invoicing software. Many of these do not require significant finance (such as a loan from a bank) to adopt compared to technologies such as additive manufacturing or robotics.

An increasing focus for use of digital technologies are in production areas such as equipment maintenance - 45% of businesses are currently introducing new digital tools and manufacturing infrastructure. This is likely driven by both the market and products that are readily available such as AI and machine learning and tools behind predictive maintenance. Manufacturers found this technology highly effective during the pandemic. ERP has been used by manufacturers for a while, however, new possibilities of connecting different machines and software made it even more necessary and useful. The power of data can be only used and optimised when manufacturers have good operational infrastructure.

Chart 2: Spread of digitalisation across different areas of the business



Source: Make UK/Infor, Innovation Survey (2022)

Three in ten (30%) manufacturers are using digital technologies for supply chain management and a further 40% are considering doing it. Recent developments proved to manufacturers that better visibility and management of their supply chain are important. Make UK's recent report (*Operating without borders, building global supply chains resilience, Make UK/Infor 2022*) found that the barriers to supply chain transformation are the ability to respond at speed to the changes in their supply chain and a lack of visibility throughout the supply chain. Evidence gathered in this report suggests digital technologies are providing solutions to supply change management.

When it comes to using digital technologies to monitor their global supply chains, manufacturers are overwhelmingly likely to cite the use of dashboards and analytics. In fact, these are used by over half (57%) of manufacturers. Moreover, dashboards and analytics were just as likely to be used by small and micro businesses as larger firms. (*Global Supply Chain: operating without borders, Make UK, June 2022*)

Surprisingly, given the rising cost of energy and the need for companies to reduce consumption (and therefore cost), not a lot of digital adoption is currently happening in energy management. However, with energy prices not looking to fall anytime soon, almost half of manufacturers' businesses are considering using these technologies to manage energy efficiency.

There are wider benefits around sustainability too. Implementing new digital technologies and techniques can increase sustainability and improve energy efficiencies within a manufacturing business. These benefits are now being realised across the sector. Around a third (34%) of manufacturers said that digital adoption improved energy efficiencies and a third said process improvements contributed to reduce emissions. All of which are vital in achieving the sector's net zero ambitions.

PART 2

RESILIENCE AND RETURNS: THE BENEFITS OF DIGITAL ADOPTION

Manufacturers are still recovering from the past two years with significant changes due to the UK's exit from the EU and the Covid-19 pandemic. The sector was experiencing the shortest-lived recovery that we could have imagined. Moreover, the rest of the year will no doubt be challenging as manufacturers tackle high energy costs, labour shortages, increased business costs and continued supply chain challenges.

But what we have learnt over the past few years is the resilience of the sector. And those companies that have adopted digital technologies have been better able to weather the storm.

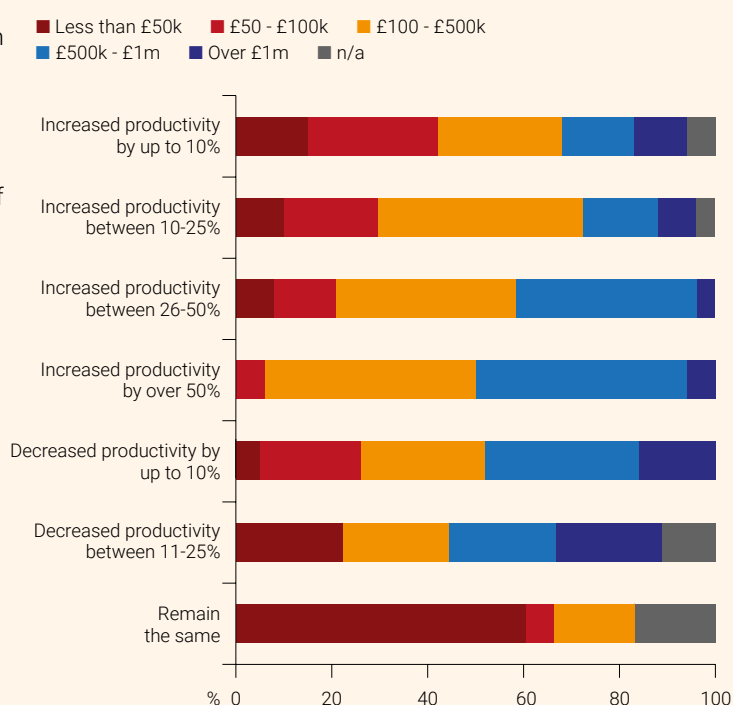
There is a strong positive relationship between improving cash flow and the likelihood of increasing investment in capital. In turn, those businesses who adopt digital technologies are more resilient in challenging times. In times of crisis, businesses are more likely to put investment plans on hold to service short-term needs. This results in an unsavoury cycle of lower productivity and growth.

For those manufacturers who have the adequate cash flow to continue adopting new technologies, they are also better performing in challenging times. Those who do not are much more likely to be left behind. Those businesses will have a hard time moving from conception to evolution, let alone enjoy the benefits of the revolution stage.



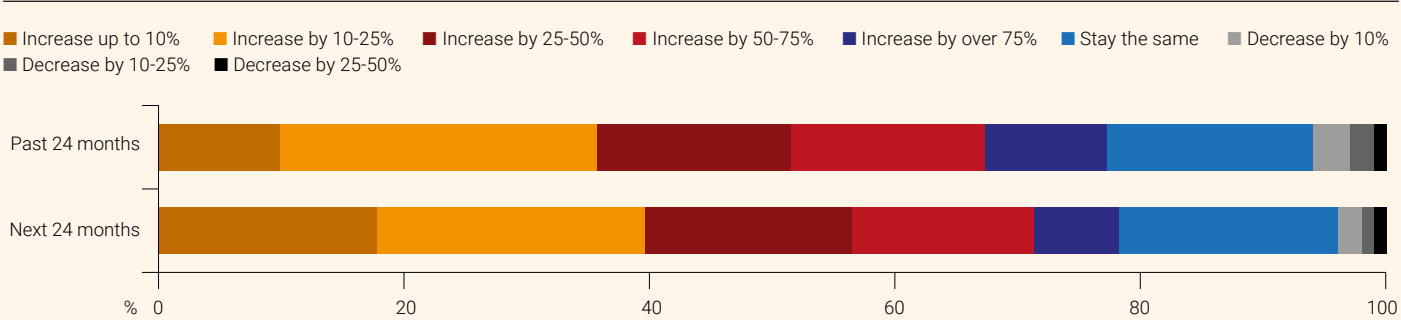
of manufacturers on average spend £50K to £500K on new digital technologies.

Chart 3: Average spend on digital technologies among manufacturers by the number of employees



Source: Make UK/Infor, Innovation Survey (2022)

Chart 4: Manufacturers’ spending on digital tech is set to increase further



Source: Make UK/Infor, Innovation Survey (2022)

Fortunately, most manufacturers continue to prioritise investment in digital technologies. Over three-quarters (77%) of manufacturers have increased spending on digital technologies - 17% say spending has stayed the same and just 6% have decreased spend.

Spending is set to increase further. Eight in ten (80%) manufacturers are planning to increase that spending in the next 24 months with only 3.5% set to decrease spending.

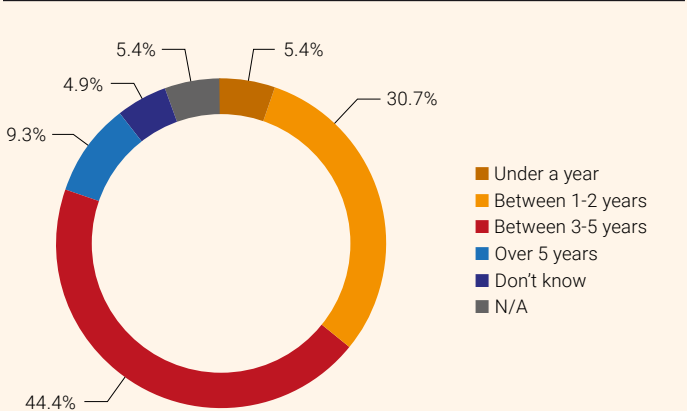
When is the all-important payback period?

Three-quarters (75%) of manufacturers that have successfully adopted new digital technologies are expecting a return on investment between one and five years.

Moreover, they are confident they will reap the benefits of this investment, and this will help them to stay ahead of their competitors. Indeed, almost three-quarters (73%) said if they did not invest in new digital technologies they will fall behind their competitors. In addition, half said investing in the new digital tech allowed them to stay five years ahead of their competition.

Having an evident payback period is crucial for many manufacturers who will need to demonstrate the potential return on investment of digital adoption. Indeed, two in five (42%) manufacturers said investing in digital technologies without a guarantee of success is too risky for their business.

Chart 5: Payback periods after investing in the digital technologies



Source: Innovation Monitor (2022), Make UK/Infor

DIGITAL TECHNOLOGIES CAN BUILD GREATER RESILIENCE, INCREASE AGILITY, HELP TO STAY COMPETITIVE AND IMPROVE PRODUCTIVITY

Over two-thirds (67%) of respondents said that their past investment in digital technologies has paid off and they were better prepared to weather the storm

One in six (58%) were able to move faster and produce new critical components

63% said it helped their business to be more productive.

Our research revealed that increased production flexibility (32%), labour efficiency (31%) and improved profitability (27%) top the table as the main benefits behind the adoption of digital technologies. Many manufacturers see it as an investment which reaps many benefits. Adopting digital technologies such as big data analysis tools, AI, robots, and additive manufacturing (3D printing) impacts the manufacturing processes and optimises them. They experience a better use of resources (30%) and improved quality among many other benefits. These changes make their companies more efficient and get ahead of their competitors.

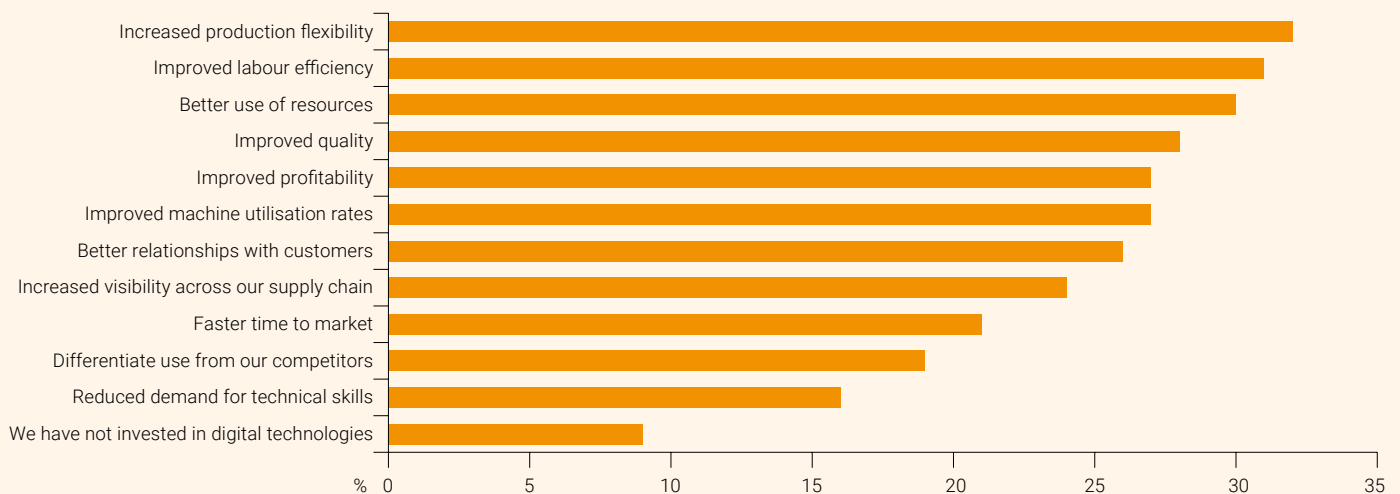
Increased product flexibility where manufacturers are gaining that agility and ability to change the product design at lower cost to the production or no cost at all – 47% of manufacturers are hoping for this benefit while adopting new

digital technologies. It is high on the manufacturers’ agenda because of the increasing cost of running a business. Over half (51%) of manufacturers are hoping for improved labour efficiency and better use of resources, which are also top benefits experienced by those manufacturers who already invested in digital tools. The main challenges that are being discussed by manufacturers are energy prices and labour shortages. Labour efficiency is a top benefit of digitalisation, accompanied by reduced demand for technical skills seen by 16% of manufacturers. Perhaps this is an impact of machine learning and predictive maintenance that is run by AI and data. They are investing in technologies that are helping them to manage that better, with fewer resources and more efficiency.

Improved machine utilisation rate (27%), profitability (27%) and quality (28%): all of those benefits help manage energy efficiency and running cost of business.

Faster time to markets (21%) and improved visibility of the supply chain (24%) are especially important benefits with the increasing number of suppliers among UK manufacturers. Businesses want to create resilient supply chains and visibility is a top number. Faster time to market, better quality, and better relationships with customers (26%) are improving competitiveness – it is very important for businesses in the current economic climate to stay ahead of their competitors.

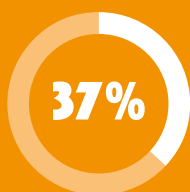
Chart 6: Benefits digital technologies brought to the businesses that already invested in them



Source: Make UK/Infor, Innovation Survey (2022)

ROBOTS AND COBOTS CAN CREATE MORE HIGHLY SKILLED (AND HIGHLY PAID) JOBS

There is often the assumption that investment in automation, technology and data connectivity can lead to significant job losses. However, our research suggests that this is not quite the case. While a quarter (25%) of companies said that such investment has decreased the number of job opportunities within their business, almost two in five (37%) say said that job opportunities have increased, with the remaining 28% saying this remained the same.



of manufacturers said the number of job opportunities within their business has increased as a result of automation

In addition, manufacturers investment in technology and automation will pay dividends in the form of higher-skilled jobs, which means higher-wages. Almost half (49%) of companies said that they will need more higher-level skills and 46% said they will need more mid-level skills. Only 8% said the drive towards further digital adoption will result in a need for more low-level skills.



PART 3

PRODUCTIVITY,

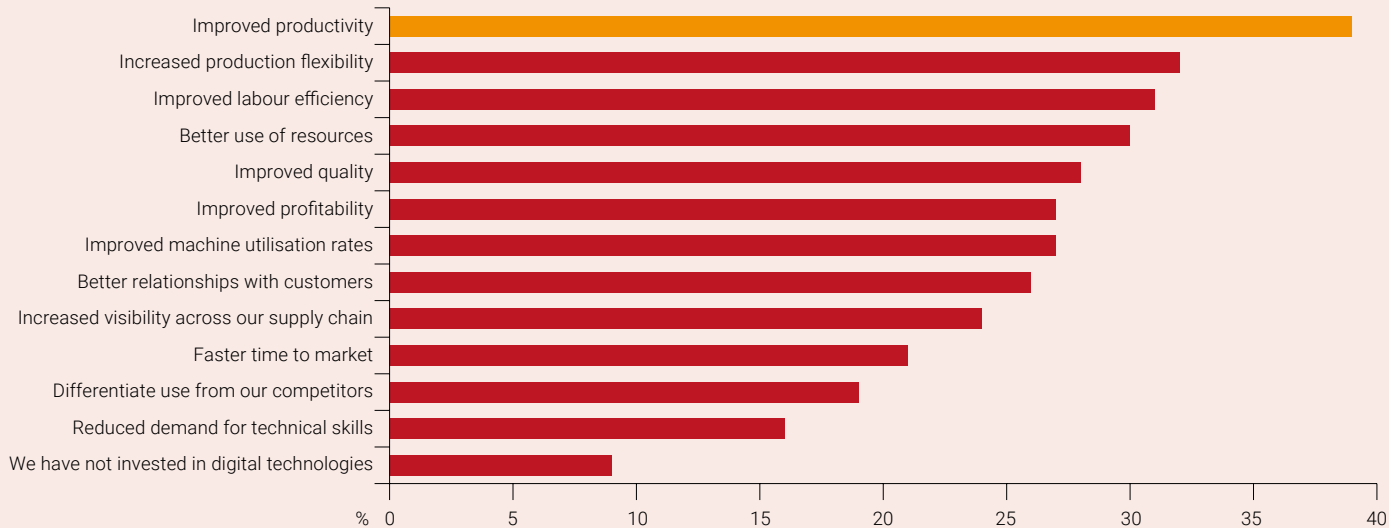
PRODUCTIVITY,

PRODUCTIVITY

ALMOST **TWO-FIFTHS** (39%)
OF MANUFACTURERS
THAT HAVE INTRODUCED **DIGITAL TECHNOLOGY**
IN THE PAST HAVE SEEN
PRODUCTIVITY IMPROVE

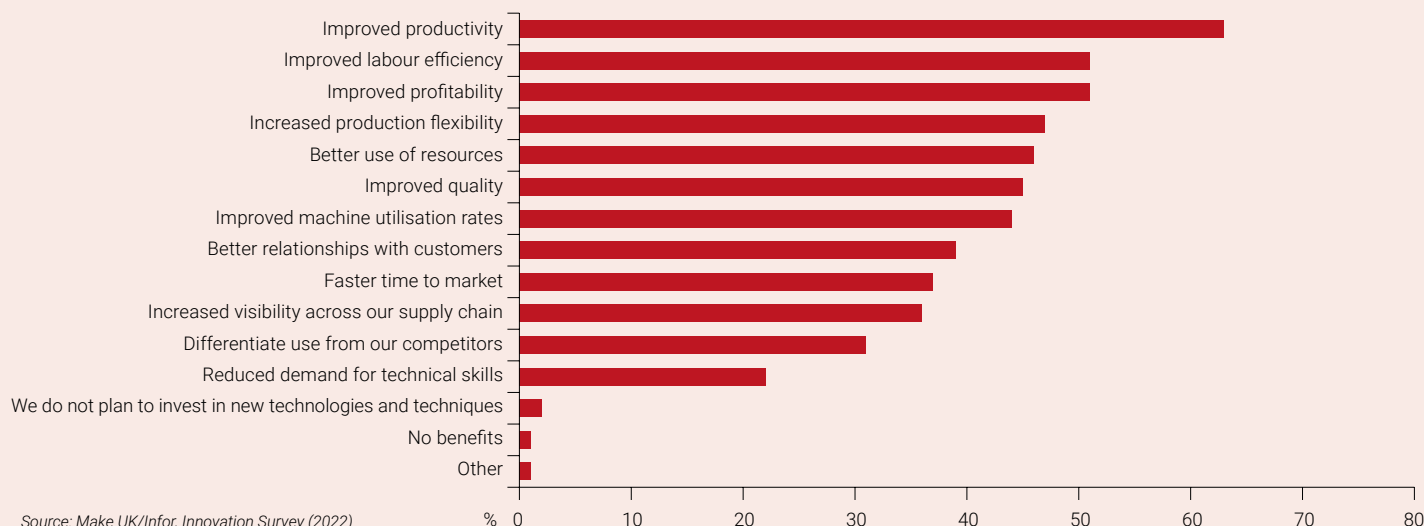
- 1 in 2 manufacturers measure productivity across the whole organisation
- 36% measure productivity only on the production line
- 6% don't currently measure productivity but plan to do so
- 7% currently don't measure productivity and have no plans to do so
- Of the relatively small number that do not the main reasons cited were 'don't know how to' or 'don't need.'

Chart 7: Productivity tops the benefits charts, benefits already seen by manufacturers



Source: Make UK/Infor, Innovation Survey (2022)

Chart 8: Going forward, manufacturers hope that digital adoption will improve profitability too



1 IN 6 MANUFACTURERS AGREED THAT **GREATER INVESTMENT** IN DIGITAL TECHNOLOGIES WOULD HAVE HELPED **THEIR BUSINESS** TO BE **MORE PRODUCTIVE**

Business critical or making a difference?

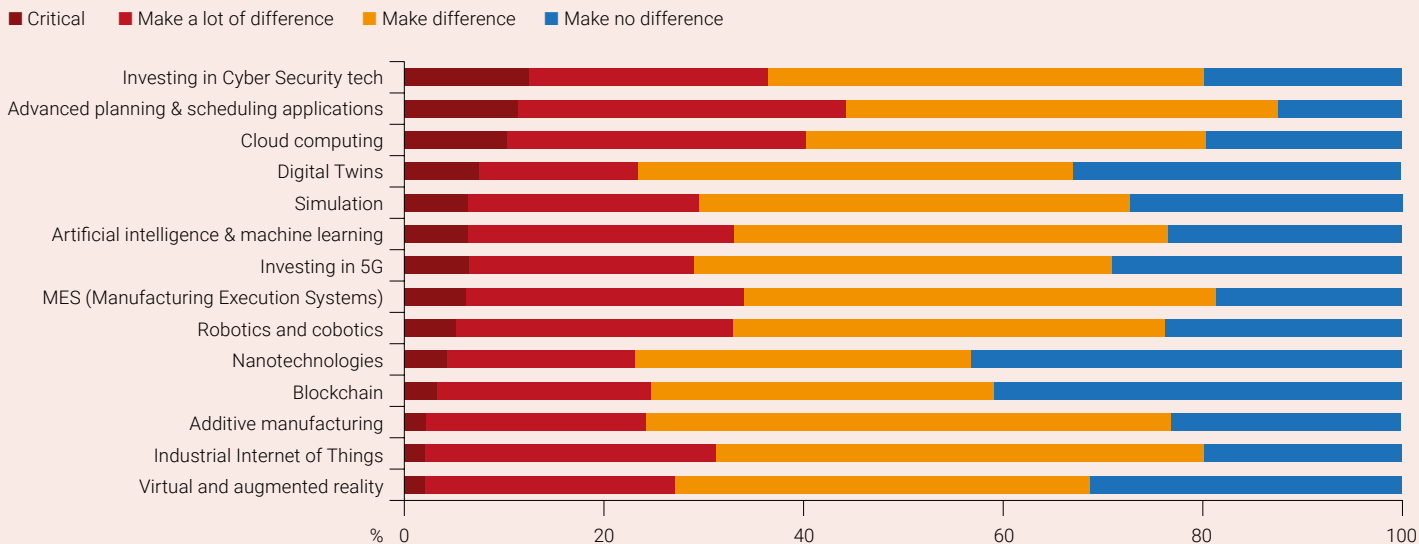
Advanced planning and scheduling applications are seen by 85% of manufacturers as either critical, making a lot or some difference in increasing manufacturers' productivity. This is followed by Cloud Computing, MES and Cyber tech seen by almost 80% of manufacturers as impactful. Very closely behind are technologies such as IoT and robotics at 70%.

Make UK survey from 2021, "Cyber Security the last line of defence", has shown figures that just under half of manufacturers have been the victim of cyber-crime in the last 12 months. Of those companies that experienced an attack, 63% said it cost them up to £5,000 while

almost a quarter (22%) revealed a cost to their business of between £5,000-25,000. It is not surprising to see 1 in 8 manufacturers agree Cyber Attacks are deterring them from digital adoption.

Behind these numbers, we can see manufacturers understand that investing in manufacturing infrastructure impacts their productivity. Software such as MES gathers all the data from the production operation that manufacturers did not have a chance to see because this knowledge was not accessible to them. Live stream data on products, quality, timings – all of this knowledge has a huge impact on efficiency and productivity. Cloud computing is creating the capacity for all these data to be stored securely.

Chart 9: What digital technologies and tools make the biggest difference in improving productivity



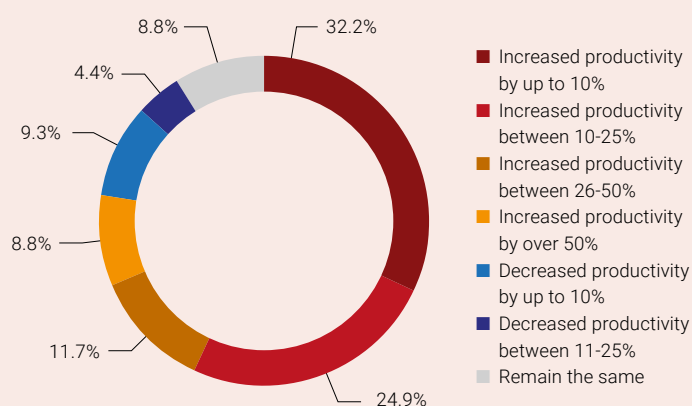
Source: Make UK/Infor, Innovation Survey (2022)

Robotics, IoT and additive manufacturing (3D printing) improve efficiency. These tools are faster and smarter; they can run on the live data that is fed into their software. In Make UK's Innovation Monitor, Bouncing back smarter, one member admitted: "The robot is over two times faster on high volume production than a manual welder, so it was crucial that directors spoke with staff about the investment and its positive impact on their business."

The productivity picture in manufacturing

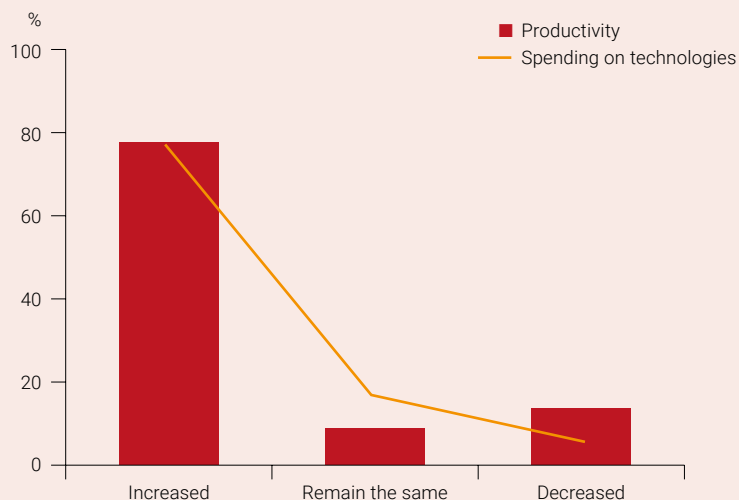
The past 24 months have been extremely challenging for UK businesses that had to adjust to a post-Brexit, post-pandemic world. Yet, despite these challenges productivity has (with a little help from the increased investment in digital technology) overall increased. Around eight in ten (78 %) manufacturers said productivity has increased in the past two years, a handful (9%) expect it to remain the same, and 14% reported a decrease in productivity. When we look specifically at SMEs, 35% saw an increase in their productivity by between 10%-25%.

Chart 10: Productivity has increased over the past 24 months



Source: Make UK/Infor, Innovation Survey (2022)

Chart 11: Investment in digital technologies and productivity gains



Source: Make UK/Infor, Innovation Survey (2022)

When we look closer at the relationship between spending and increasing productivity, we can see there is a correlation between the increase in spending on digital technologies and improved productivity.

Having embedded culture of resilience and competitiveness in the past couple of years, manufacturers are staying confident and positive about productivity over the next 24 months. The majority (84%) expect productivity will increase, 4% expect it to stay the same and only 11% expect it to decrease.

Size and spending matter when it comes to productivity improvements:

When we look at the connection between productivity and the value of an investment in digital technologies it clearly shows that almost half (44%) of manufacturers who invested between £100k – £500k experienced productivity increase by 50%. At the same time, 22% of manufacturers who invested over £1m have experienced a decrease in productivity by 11-25% in the last 24 months. This possibly means that making a large investment and transforming the business on a grander scale might take time to see the benefits.

PART 4

UNLOCKING DIGITAL TRANSFORMATION POTENTIAL

Our report has found that the digital transformation of UK manufacturing is well underway, with adoption occurring across the manufacturing business and many firms now reaping the benefits. There is a clear intention to spend more on digital adoption to take advantage of improved productivity, and labour efficiency and to build long-term resilience.

But there remains unlocked potential. In a typical manufacturing business, manufacturers have replaced up to 10% of their manufacturing processes with technology, automation and data connectivity. Others are further ahead, reporting that between 11-50% of their processes are now digitalised. Moreover, firms plan to accelerate this in the next 24 months, with a higher number of companies reporting plans to replace up to 75% of their processes through digitalisation.

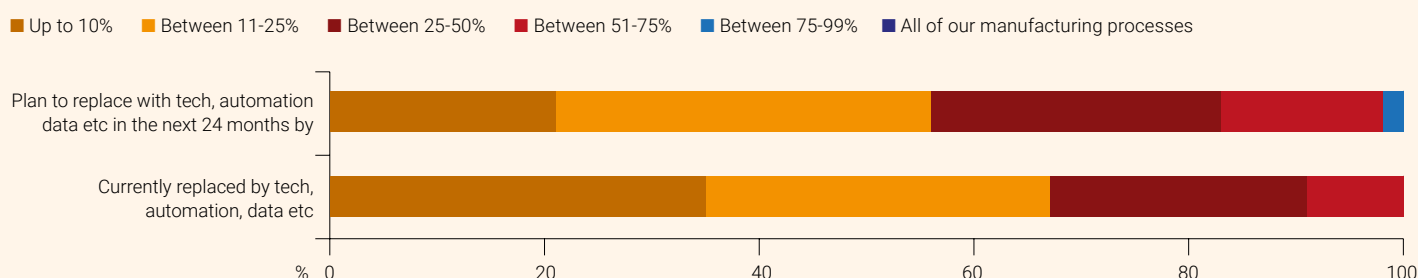
But how do we ensure these ambitions turn into reality? And what is holding companies back?

The top barrier holding manufacturers back is a lack of skills within the business for successful implementation. The age-old, and yet-to-be-resolved, issue of skills has returned and is one that clearly needs to be addressed.

To take advantage of digital technologies, manufacturers need to continue to adjust their skills strategies to reflect the need for digital skills to be obtained and refreshed throughout an employee's career. This may range from basic digital literacy and the ability to use information and communication technology across different workforce roles as part of day-to-day operations, to more advanced technical skills that are needed as automation increases and for the deployment of major new technology as part of the production. More than 7 in 10 manufacturers are prioritising digital skills for investment both now and over the coming years, with areas such as IT and software management, cyber security and data analysis identified as related areas where demand is expected to increase between now and 2030.

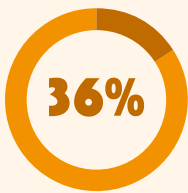
This also extends beyond technical skills. Three-quarters of manufacturers see demand for complex cognitive skills

Chart 12: Automation and digitalisation across the manufacturing sector, past and future.



Source: Make UK/Infor, Innovation Survey (2022)

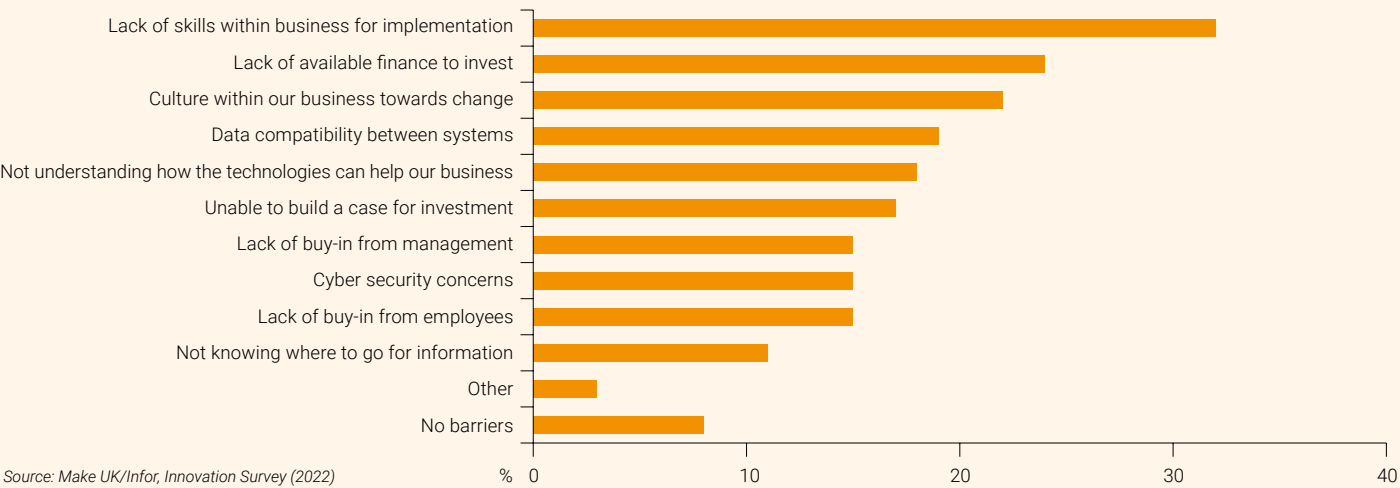
increasing between now and 2030 as demand for more traditional, manual skills begin to decline over the longer term, driven by the desire for greater innovation and the need to engage with more tech-enabled approaches to production. The growing demand for leadership and management skills over the coming years also reflects the importance of effective leadership in firms as they transition to different ways of working with digital technology, especially in communicating with the wider workforce and the efficient implementation of potentially complex changes to the workplace.



of manufacturers said that digital technologies are not for their (SME) business because they are too expensive and complex

Access to finance is the next challenge. Overall, banks tend not to see adopting digital technologies as an investment, although, as our report has found, there are both short payback periods and also significant gains to be had, including increased profitability.

Chart 13: Barriers that prevent manufacturers to adopt new digital technologies.



Source: Make UK/Infor, Innovation Survey (2022)

DIGITALISED RESEARCH & DEVELOPMENT (R&D): SPEND AND AMBITIONS

Digitalised Research & Development (R&D) can bring about noticeable benefits to a manufacturing business. Importantly, at a time where firms are facing significant cost pressures, it can lead to cost savings and minimise the risk of unsuccessful R&D projects. Understanding the value that digitalised R&D brings to a business; manufacturers are on average spending between 2-5% of their annual turnover on R&D:

% of turnover spent on R&D	% of manufacturing firms
Less than 1%	3.4
1% - 2%	20.0
2% - 5%	43.9
Above 5%	27.8
Don't know	4.9

The Government has aimed for the UK to spend 2.4% of GDP on R&D by 2025. This will require the private sector to double its' spend over the current levels. We asked manufacturers whether they thought this was realistic. Almost 6 in 10 (58%) said yes, 27% said no and 15% said they were unsure.

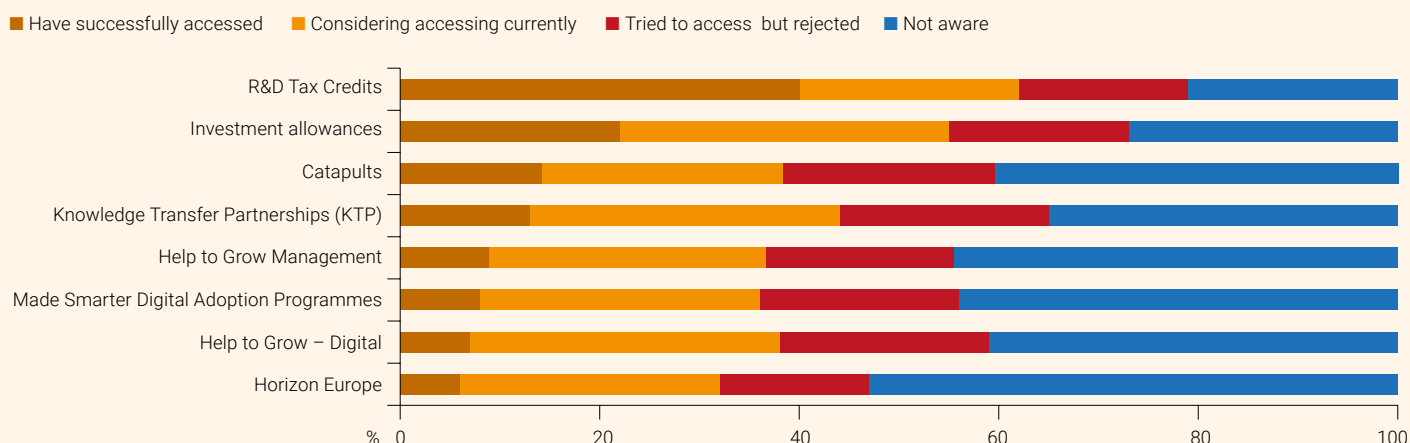
Manufacturers themselves are clear on how Government can help step up the pace when it comes to increasing private investment in R&D, with a strong focus on making it easier to access the reliefs and funds available as well as increasing what is available to them:

- 54% said extending the R&D tax credit to include capital (plant and machinery)
- 50% said increase grant funding (for example via Innovate UK) and 49% said make grant fund processes simpler
- 48% said increase the annual investment allowance
- 48% said increase the R&D tax credits limit
- 45% said simplify the R&D tax credit system

While there are support measures in place to help companies fund digital adoption, these can be limited. For example, funding provided for SMEs by the Made Smarter adoption programme is not accessible for manufacturers across the country, as it operates fully in the Northwest with little rollout across other regions.

The main schemes that manufacturers use in terms of financial incentives are R&D tax credits and the annual investment allowance. 40% of firms have successfully used the R&D tax credit scheme with a further one in five currently considering doing so.

Chart 14: Government support – funding schemes for UK manufacturers



Source: Make UK/Infor, Innovation Survey (2022)

Tax cuts and tax relief type schemes are clearly the preferred option with 22% of companies citing that they have taken advantage of investment allowances and a third (33%) considering doing so.

The Government's flagship Help to Grow programme, which focuses on digital adoption, was accessed by only 7% of manufacturers, and the scheme's management equivalent has been used by just 9% of businesses.

While there is some work to do around awareness of

such schemes, it has been clear upon speaking directly to manufacturers that some of these schemes simply are not accessible and the criteria needs to be broadened to allow more manufacturers to take the opportunity of them.

Followed by the culture within the business, manufacturers also mention data compatibility between different machines and systems. A lack of vision is one of the main break points in achieving the full potential. Understanding data and the process that sits behind data is crucial to deliver digitalisation in a factory successfully.

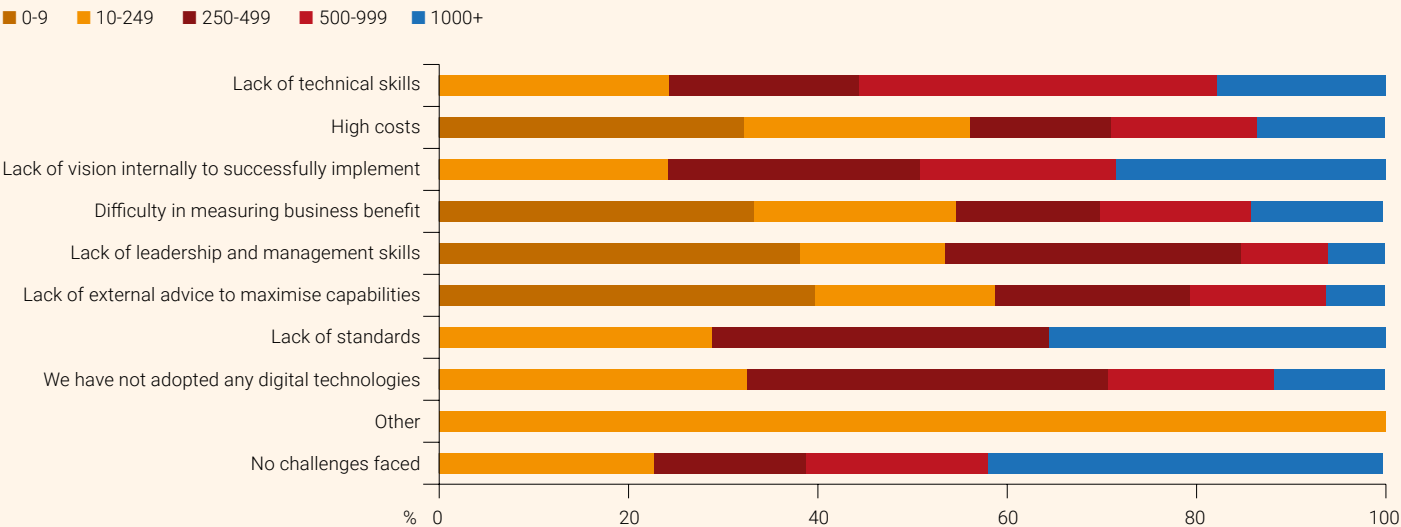
BARRIERS REMAIN POST-ADOPTION TOO

When we asked manufacturers what the challenges were after they implemented the need for digital technologies, and what were the main barriers to optimising the use of new investment, 33% said it was the lack of technical skills, followed by the high cost of introducing new technologies.

Unsurprisingly, skills shortages are affecting businesses' productivity gains. This challenge is affecting how manufacturers are using new technologies. Even after acquiring new tools, it is important to have the expertise internally to optimise its full functionality.

How challenges vary depending on company size:
or manufacturing SMEs, the main challenges were the high cost (37%) and lack of technical skills (34%) followed closely by the lack of vision internally (31%) and difficulty with measuring business benefits. For larger manufacturers lack of technical skills (75%) was a challenge they struggled with most followed by the lack of vision internally. It is important to note that the lack of leadership skills was seen as barrier in optimising digital adoption by over 60% of companies with 10 – 499 employees.

Chart 15: Challenges experienced by manufacturers during and after the digitalisation process



Source: Make UK/Infor, Innovation Survey (2022)

PART 5

LESSONS LEARNED

Before embarking on their digital journey businesses should investigate why they want to digitalise their process. What outcomes do they want to gain from it? What issues are they currently facing and what solutions are they looking to have by investing in the new digital tech? Sometimes it is worth improving simple processes that are not that costly and if they were not introduced before they might have a massive impact – starting by digitising their processes – from paper to digital instead of jumping into technologies that will not work with the rest of the areas.

Manufacturers that we surveyed shared the things they have learned during the lengthy process of their digital journey – these lessons focused on viability, feasibility, and capacity. These lessons and stages can be interchangeable and evaluated by the business on a regular basis.

Viability

The first step is to check what the business needs and what values existing technologies can bring to the business. What are the issues that the business is facing and what problems can these tools solve? What budget and skills does the business have or what will it need to acquire while bringing the change? Vision and leadership are crucial at this stage and throughout the entire process. When Make UK asked about the lessons learned, manufacturers answered that having a plan for transformation, and a clearly stated vision when

starting is particularly important to make this transformation successful.

Feasibility

Businesses need to create a project plan and a roadmap and see if they can practically deliver the change if they have the necessary skills, buy-in from the leadership team, and a budget that will accommodate necessary additional investments.

Capacity

Understanding of data, how will it all fit with other processes, and will all technologies and machinery be compatible? Do we have the expert knowledge in-house to manage the collected data efficiently?

Chart 16: Lessons learned from manufacturers who went through the digitalisation process



Source: Make UK/Infor, Innovation Survey (2022)

SPOTLIGHT: INTERNATIONAL COMPARISON: DO WE COMPETE ON THE GLOBAL DIGITALISATION STAGE?

Compared to other countries the UK is lagging in terms of both innovation and digital adoption.

For example, the UK currently spends 1.7% of the GDP on R&D compared to the OECD average of 2.5%. There is the ambition to reach the 2.4% target by 2027. While the UK Government promised to spend £22bn, the target date - which was recently extended to 2026-27 from the original date of 2024 – is moving the ambition's goalposts.

There was a perception among the consulted experts that, although the UK has started to offer R&D grants and other innovation incentives, the total UK budget for R&D grants remains lower than that of competitor countries.

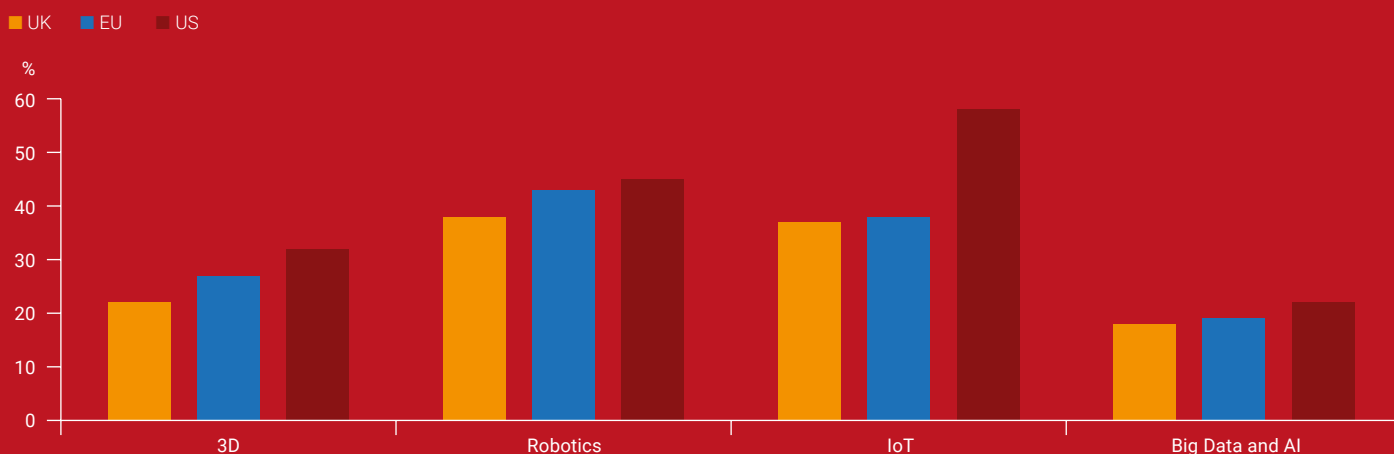
In the UK, the business sector funds around 55% of R&D – a lower proportion than in countries such as Germany, Korea and Japan. That said manufacturing, as a sector, punches above its weight in the UK contributing 65% of R&D investment.

Other countries have created a competitive market for companies to settle and perform R&D activities. For example, Germany has an attractive tax incentive and 25% R&D tax credit. Additionally, in the cases of Ireland and Singapore, which both have highly attractive business tax structures, we see better rates of return on investment, access to capital and other financial incentives.

Attractive tax systems, access to skills – both technical and leadership and management - and institutions that invite SMEs to de-risk their projects, to train their workers to get the knowledge of the advantages of new digital technologies, are all on the list of initiatives that our global competitors are using to their advantage.

Take for example the US, where many leading digital technology companies are based: The US is using existing

Chart 17: Adoption of different digital technologies in manufacturing by country



Source: EIBIS wave 2019. Note: IoT: Internet of Things. AI: Artificial intelligence. Firms are weighted using the value

institutions to deliver digital support nationally through its well-established Manufacturing Extension Partnership, MEP, with a focus on supporting SMEs. Likewise, Japan is driving change through its prefectural advisory centres and Germany through Steinbeis Foundation and Fraunhofer Institutes regional bases.

That is not to say that the UK is not following the same pattern of support network - the Catapult Network is a great system of exceptional knowledge, expertise, and support for many businesses. We would need a wider regional reach and easier access to SMEs.

But when we look at results, we see we are lagging. A study by the European Investment on digitalisation comparing the EU and the US found that the EU is lagging behind the US in terms of digital adoption (at least one new digital technology adopted). However, there are countries such as Denmark, the Czech Republic, the Netherlands, and Finland that are frontrunners in digitalisation. Unfortunately, the UK is in the

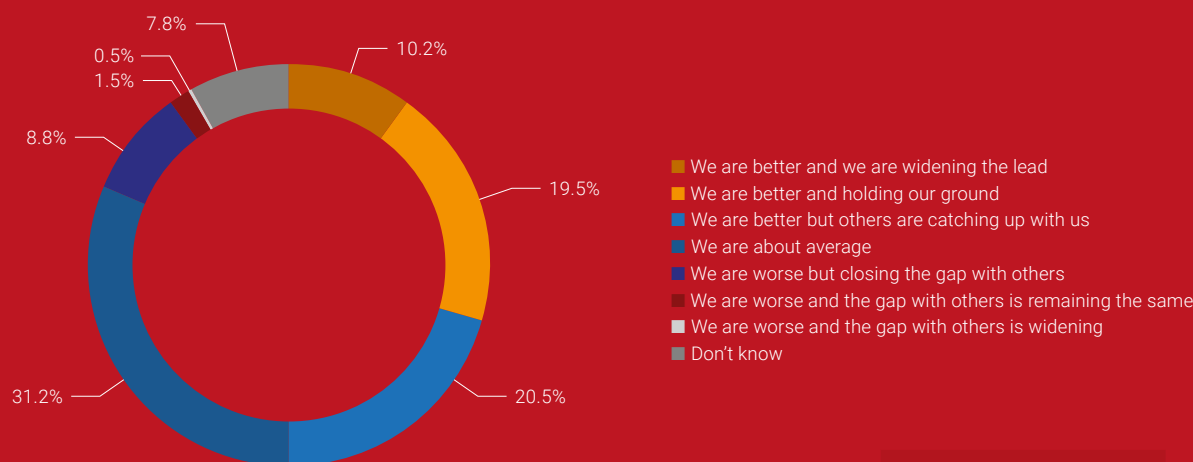
bottom group – countries, in the modest group which is the slowest digital adopter.

Even UK manufacturers themselves are not convinced that we are ahead of the game when it comes to comparing ourselves to our international counterparts. Typically speaking, they see themselves as ‘about average.’ That said, there is a growing number that sees the UK as better and widening the lead, and some that fear that while they may be better the competition is hot on their heels.

If we want to compete on the global stage, we need to take action that helps manufacturers:

- Make the first step out of pre-conception and into the conception
- Move from thinking to doing and switch from conception to evolution
- And finally reap the benefits by transitioning from evolution to revolution

Chart 18: Manufacturers in the UK remain quietly confident they are ahead of the game



Source: Make UK/Infor, Innovation Monitor (2022)

PART 6

UK MANUFACTURING – SMART, AGILE AND GLOBALLY EXPANSIVE

Our economy is undergoing a profound digital transformation, powered by a new source of energy: data. Industrial Digital Technologies and new digital solutions have the potential to transform our lives and our economy, making it more productive, resilient, and sustainable. This sort of resilience will play a role in future manufacturing, powering them through challenges that lay ahead.

Digitalisation can revolutionise a manufacturing business. From production to power, from equipment to e-commerce, manufacturers are automating, adopting, and diffusing. The benefits are evident – one-third experienced an increase in productivity. As with many long-established sectors, this transformation produces specific challenges for manufacturers and profound change is required.

Unlocking the potential to introduce technology, automation and digital connectivity will be key if we want to invest and grow. Manufacturers are natural-born problem-solvers, but they need Government support to face the future as strong and resilient businesses not scared of international competitors.

POLICY RECOMMENDATIONS TO GOVERNMENT:

- 1. Roll out Made Smarter across all regions:** Government should commit to the full roll-out of Made Smarter and expand the scheme to include industrial decarbonisation as digital and green increasingly go hand-in-hand with digitising to decarbonise - a key focus for many manufacturers.
- 2. Expand the R&D tax credit to include capital expenditure:** The R&D tax credit should be expanded to include capital equipment within qualifying expenditure to spur further digitalised R&D.
- 3. Expand Help to Grow Digital:** To include ERP/MRP (Enterprise Resource Planning), MES (Manufacturing Execution System) and PLM (Product Lifecycle Management) software or allow at least packaging solutions that may also include CRM and accounting as part of the product. In addition, introduce higher tiers of the voucher scheme with greater subsidies for manufacturers that may be willing to adopt a complete package of systems (CRM/Accounting/supply-chain etc.). For these larger investments, the funding available should grow alongside it and be more than £5k.
- 4. Establish a regional SME advisory service for digital adoption:** Accept that the main delivery focus should be regional and appoint a lead delivery partner in each region, to create consistency and level up.

CALLS TO ACTION FOR INDUSTRY:

- 1. Commit to upskilling leaders and managers to embrace technological change:** Decision makers and policymakers need to accelerate upskilling their leaders with appropriate management skills, empower them on how to best embrace the technological change and how to create a vision for a digital future and Smart Factory.
- 2. Peer to peer networks and sharing of best practices should continue to be encouraged:** Even more, manufacturers are leading the charge in adopting digital technologies. Some of the barriers remain around culture and awareness which could be overcome with peer-to-peer learning. Make UK commits to supporting a sharing of best practices to overcome some of these challenges.



VIEWPOINT



As Manufacturers plan their recovery from recent disruptions, many are pursuing a digitisation strategy and recognising the limitations of legacy platforms in responding rapidly to global shocks or new opportunities. This well-timed survey and analysis provide valuable insights on the benefits of digitisation from those well down the path and explore the inhibitors for those yet to start.

Given the importance of digitisation in the 20s - whilst it's positive that half of the companies surveyed are benefiting from their digital investments, an alarming finding is that 43% of companies are still in the 'pre-conception' or 'conception' stage. Whilst every company's digital journey is different - it's a path all manufacturers must take if they are to survive and compete in the global economy. Infor echo's a key recommendation in this report that manufacturers should *"make the first step out of 'pre-conception' into 'conception' and move from thinking to doing"*.

For those who have invested, the returns are positive with over two-thirds (67%) of respondents reporting that their past investment in digital technologies has paid off and they were better prepared to weather the storm. Increased production flexibility, labour efficiency and better use of resources are the top three areas benefiting from digitisation with 63% reporting it helped their business to be more productive. There is also strong recognition (73%) that failure to invest would risk 'falling behind competitors in the race for growth.

Another area where digital technologies are making a huge difference in cyber security. Make UK report *Cyber Resilience: The last line of defence* found out that *'just under half of manufacturers have been the victim of cyber-crime in the last 12 months* at a cost of between £5,000 and £25,000

to the business. Whilst there remain 1 in 8 companies that view security as an inhibitor to cloud adoption, this new report shows far more manufacturers understand that the multiple millions invested in security by the market-leading hyper scalers, affords far more security than any individual company could manage by itself.

What holds companies back from modernising faster? Skills and costs are reported as the top reasons, with a clear distinction here between SMEs who cite cost as the primary constraint versus enterprise businesses more limited by skills. Infor supports the MakeUK policy recommendations for the Government to expand the 'Help to Grow Digital' scheme to include software solutions that deliver digitisation and to continue the roll-out of Made Smarter across all regions to unite people with the digital tools, innovation & skills to make a difference.

Overall, the report shows that UK manufacturers have much to gain from digitalisation across a range of business processes, including production, supply chain, product engineering and customer experience. As smart products, automation and robotics are increasingly adopted, the data these technologies drive out will yield yet further competitive advantage for manufacturers who have put the digital foundations in place.



Make UK is backing manufacturing – helping our sector to engineer a digital, global and green future. From the First Industrial Revolution to the emergence of the Fourth, the manufacturing sector has been the UK's economic engine and the world's workshop. The 20,000 manufacturers we represent have created the new technologies of today and are designing the innovations of tomorrow. By investing in their people, they continue to compete on a global stage, providing the solutions to the world's biggest challenges. Together, manufacturing is changing, adapting and transforming to meet the future needs of the UK economy. A forward-thinking, bold and versatile sector, manufacturers are engineering their own future.

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