



2021 DIGITAL TRANSFORMATION ASSESSMENT

COVID-19: A CATALYST FOR CHANGE

Researched and produced by:

THE MANUFACTURER

Commissioned by:

IBM®

EXECUTIVE SUMMARY

The findings discussed within this report reveal the digital transformation of industry across two time horizons.

IMMEDIATE PRIORITIES

The first is the short-term actions manufacturers have had to take in response to a highly volatile, unpredictable trading environment. Businesses have faced disruption at every turn and the vast majority have demonstrated an incredible capacity to embrace change at speed.

In order to do so, manufacturers have prioritised three interconnected factors:

- The human impact
- Data gathering to support decision making
- Acting swiftly yet shrewdly

As the report makes clear, the immediate focus has been on improving operational efficiency and resilience in order to achieve maximum output with minimum outlay – ultimately, to keep factory doors open.

For many, this heightened need for accurate, real-time information has been somewhat hindered by industrial IT environments, which often consist of increasingly outdated hardware and software from multiple vendors.

Additionally, almost all of the senior decision makers interviewed for this report noted that manual reporting and data collection was still prevalent in their organisation.

It's logical, therefore, to see rising numbers of operations adopting digital tools to perform data gathering exercises or to fulfil simple HR and finance transactions. A large proportion are also upgrading their production systems, particularly those involved with overall equipment effectiveness (OEE), and manufacturing/enterprise resource planning (M/ERP).

It's also encouraging to see cybersecurity and cloud computing as the most widely adopted technology use cases. This 'Process Transformation' represents the critical first step in a digital journey that enables 'Business Model Transformation'.

Which brings us to the second time horizon...

LONGER-TERM GROWTH STRATEGIES

If process transformation focuses on specific areas of an operation, business model transformation fundamentally reimagines how an organisation operates, how it engages with its environment and how it delivers value.

Examples of this form of widespread transformation can be seen in a variety of sectors, all of which have been enabled by digital tools, and manufacturers are looking to undergo a similar evolution.

This is clearly evident in their customer growth plans, with better serving existing clients and winning new work a significant business imperative for 87% and 69% of respondents, respectively – particularly those who have witnessed a dramatic and rapid decline in their core markets.

In order to achieve this, manufacturers are increasingly taking the data and insights they've unlocked to maximise operational efficiency and using it to innovate their offerings and transition from selling products to offering experiences.

If 2020 was the year for internal digital transformation, 2021 is when attention will turn to the external, customer-facing areas of an operation. That may present greater challenges for businesses, but equally it will provide greater rewards for those who get it right.

KEY REPORT FINDINGS:

67% have accelerated digital projects as a result of COVID-19

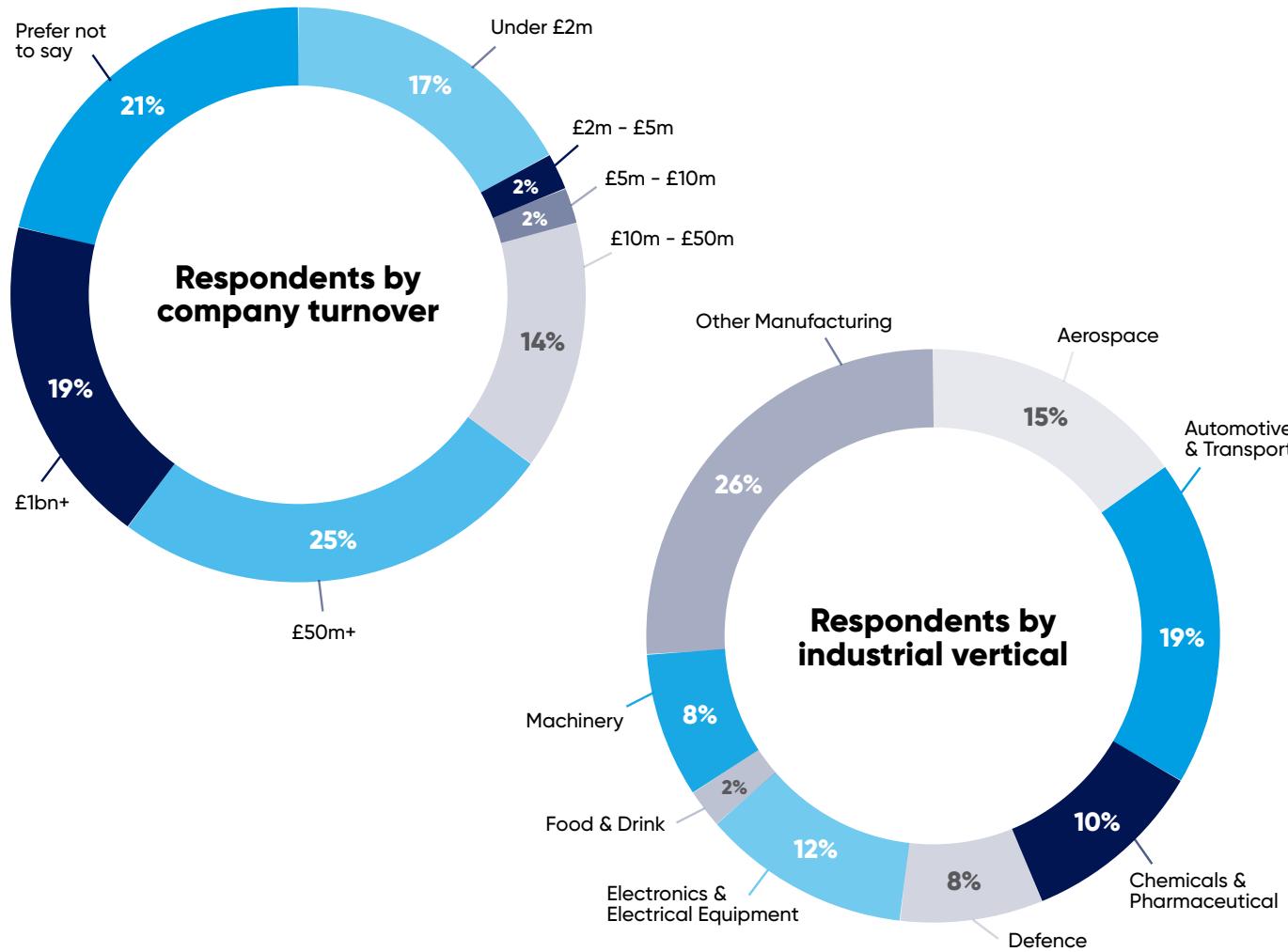
92% rank 'Improving operational efficiency' as their greatest priority

TIME the primary factor impeding digital adoption

METHODOLOGY

This report is based on a survey of senior manufacturing professionals conducted in November and December 2020 by *The Manufacturer*, the premier industry publication providing insights, events and research, and commissioned by IBM. This Digital Transformation Assessment sought to understand the current business imperatives, how the Coronavirus pandemic has affected priorities, and the strategic role adopting digital technologies will play for manufacturing businesses and their supply chains.

A number of respondents were interviewed to add qualitative content to our quantitative research. We offered them the option to be quoted anonymously in order to speak their minds on the record without their comments being diluted or influenced by corporate communication teams.



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THE HUNT IS ON FOR EFFICIENCY & GROWTH

Given the far-reaching and wide-ranging disruption as a result of the COVID-19 pandemic, it won't surprise you to see operational efficiency as the most significant business imperative for almost all manufacturers, regardless of size, sector or location.

As one participant noted; "*COVID-19 has illuminated the weaknesses in our business and our focus is on patching those holes, over and above anything else.*"

Speaking to these senior decision makers, it's clear that the immediate priority is on achieving maximum productivity with minimum time, cost and resource. In a world where "every penny is a prisoner", any long-term goals or nice-to-haves have taken a backseat to getting money flowing again.

That means finding efficiencies, making every penny count and increasing work with existing clients. It also means going out and finding new customers, either in markets already being served or entering new ones. →

HIGH ON THE AGENDA

Manufacturing decision makers say their most significant business imperatives are:



92%

Improving operational efficiency



87%

Customer growth



85%

Customer retention



81%

Supply chain integrity



81%

Operational resilience



75%

Cost savings rationalisation



74%

Wellbeing



69%

Customer acquisition



63%

Production workforce reskilling



60%

Supply chain visibility



59%

Environmental sustainability



52%

Non-production workforce



21%

Sourcing new suppliers

More than two-thirds of participants identified customer acquisition as a significant priority and many said that diversifying into other sectors had risen up their to-do list, particularly those who've seen the bottom fall out of their core market/s – *"The biggest struggle we face at the moment is the massive collapse of demand in aerospace."*

For organisations unable to diversify or who are tied into long-term projects, the emphasis is on delivering existing commitments while identifying meaningful cost savings in procurement, manufacturing, logistics and service. By no means an easy task, and one which many expect digital tools will make easier.

What's important is not to view these priorities in isolation. Greater operational efficiency and resilience help generate cost savings and aid customer growth, retention and acquisition. Equally, workers who know that their wellbeing and development are highly regarded tend to be more engaged and productive.

Indeed, COVID-19 has seen worker wellbeing catapulted to the forefront of executive decision-making. ☺



"We run an integrated, bespoke production control system that we developed in-house. It's great for a lot of things, but it's fallen behind in some areas relative to off-the-shelf systems."

Technology Lead at a critical precision component engineering company

IMPACT OF A PANDEMIC

Pre-2020, the majority of manufacturers were focused on a handful of core strategic imperatives: improving operational efficiency and resilience, identifying cost savings, customer growth and strengthening supply chain integrity/visibility. Those priorities have largely stayed the same post-COVID, with the addition of worker wellbeing.

Due to the nature of industrial workplaces, health and safety is a keystone of any manufacturing operation. COVID-19 has brought that importance to new heights. On top of concerns for themselves, their family members and livelihoods, workers have had to swiftly adapt to being furloughed, remote-working, new procedures to remain onsite or all three.

Many of those surveyed acknowledged the significantly greater emphasis their organisation now places on employee wellbeing and the work environment compared to 12 months previously. As one participant commented; "*Working from home has come fairly easily for some; others haven't been so lucky and have struggled with the massive cultural change.*"

It's clear that digital communication tools have proved invaluable in keeping workers engaged, motivated and up-to-speed, →

PANDEMIC PRIORITIES

COVID-19 has meant greater emphasis is being placed on:



88%

Operational resilience



83%

Wellbeing/working environment



75%

Supply chain integrity & resilience



71%

Supply chain visibility



65%

Improving operational efficiency



63%

Existing customer account growth



62%

Cost savings, rationalisation



62%

Customer retention



52%

Customer acquisition



50%

Production workforce retention/atraction/reskilling



44%

Non-production workforce



42%

Sourcing new suppliers



38%

Environmental sustainability

as well as assisting organisations in maintaining and managing the mental health of their employees.

Alongside helping to increase the wellbeing of individuals, digital tools are also supporting the creation of safer working environments. Having real-time access to information (both image-led and numeric) via any smart device is enabling supervisors to proactively manage situations and act before worker health and safety is at risk.

In a post-COVID world, examples range from conducting temperature checks and limiting occupancy in a particular area, to face mask detection and assistance with social distancing.

Several participants noted how their organisations were looking to embrace digitalisation over the coming 12 months, particularly in relation to time-consuming manual back-office processes and generating reports.

By digitising their information and processes, organisations aim to become far more efficient in almost every function they perform; sales and customer management, configuration and quoting, manufacture and quality control, distribution and service support. In turn, those efficiencies help to secure cost savings, customer growth and retention, supply chain visibility and a host of other factors that were once important but are now imperative. ☀



"We still spend more time making the report than we spend doing something with it,"

Senior Manager at a global automotive manufacturer



"Finance and HR are two areas we're questioning whether we need them permanently in the office... COVID-19 has absolutely accelerated flexible working and given us lots of questions to answer in the process."

Managing Director of a construction equipment manufacturer



"Our company has done an outstanding job in managing worker wellbeing thanks to initiatives like our 'Connect' programme where large groups of employees are randomly thrown together for open, non-work related conversation. It could be around what's working and what's not, who's struggling with working from home, who's not or how people are coping more generally. These sessions have proven to be invaluable."

Head of Industrial Capability and Offload Activity at a world-leading defence systems manufacturer

DIGITAL BOOM

Manufacturing decision makers say they are focusing investment on four key areas:

IT & DATA SYSTEMS:

- Implement a new digital design, manufacturing and services system
- Automation of various production processes and digitalisation, including a tier 1 ERP application
- A new integrated ERP/PLM system and a wider focus on data services as a business opportunity
- A more detailed road map to digitalisation that includes closer working between IT and operations and one site taking the lead to develop the 'Factory of the Future'
- Better use of MRP system including training
- Understanding how Industry 4.0 can contribute to the Sustainable Development Goals
- Greater software integration

COLLABORATION TOOLS:

- Accelerate our adoption and use of remote working and collaboration tools, but this will delay our plans for major IT infrastructure and software changes
- Enhanced remote working and remote collaboration
- Augmented reality training and remote assistance technologies

PRODUCT / CUSTOMER GROWTH:

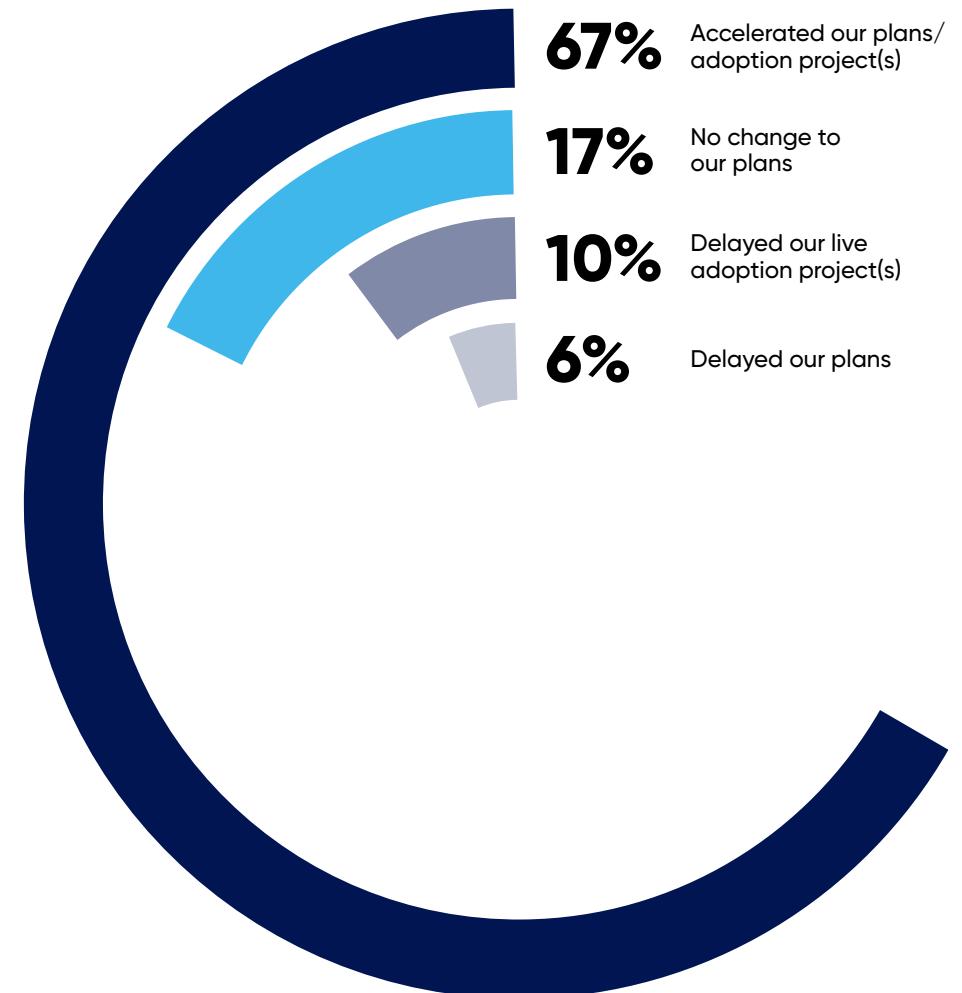
- Diversify into additional sectors
- New product introduction
- Development of IoT products
- Customer facing apps/portals

EFFICIENCY IMPROVEMENTS:

- New technologies to improve process efficiency
- Automation to help reduce or eliminate inefficient tasks due to substandard systems
- Remote monitoring of assets

DIGITAL BOOM

As a result of the Coronavirus pandemic, manufacturing decision makers say their adoption of digital technologies has:



SMART TECH TO FUTUREPROOF

As you can see from this question and the next, cybersecurity is the technology use-case that manufacturers view as the most important (92%) and the one that most organisations have deployed (88%).

That represents a strong increase in both awareness and implementation in the 12 months since *The Manufacturer's Annual Manufacturing Report 2020* found that 82% of businesses had "*a clearly defined, articulated and enacted cybersecurity strategy.*"

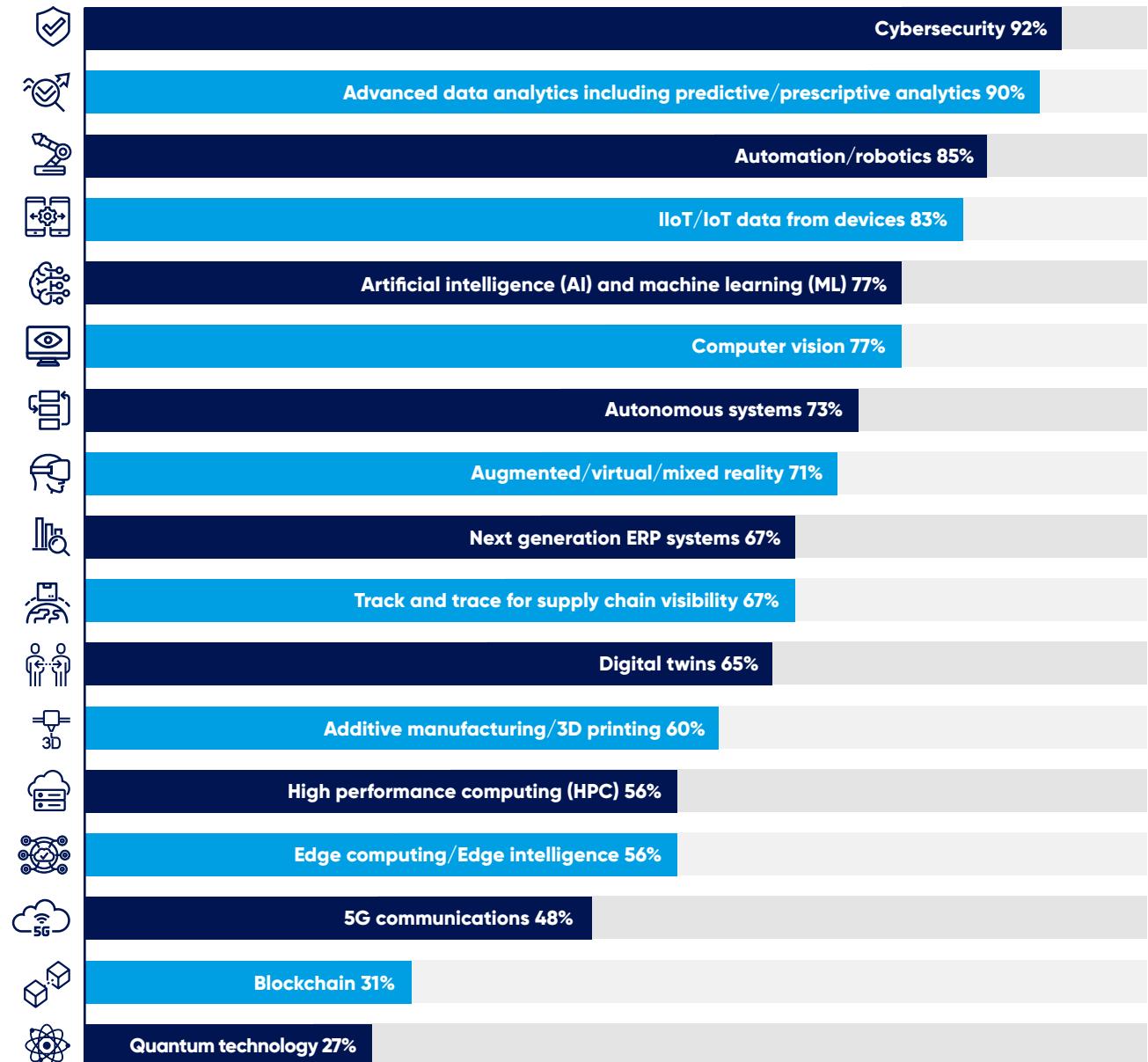
Increasingly, manufacturers are also looking to use digital tools and data insights to extend their existing continuous improvement activities, with momentum building around what has been termed 'Digital Lean'.

The concept of 'lean' has been around for decades and almost every manufacturing operation now has some form of lean programme, whether bespoke or a more widely adopted methodology. These programmes have been consistently delivering strong, double-digit gains around productivity, waste reduction and cost savings.

However, these gains are becoming harder and harder to identify. As one participant →

GOAL-ORIENTED

The technologies helping manufacturers meet their business goals include:

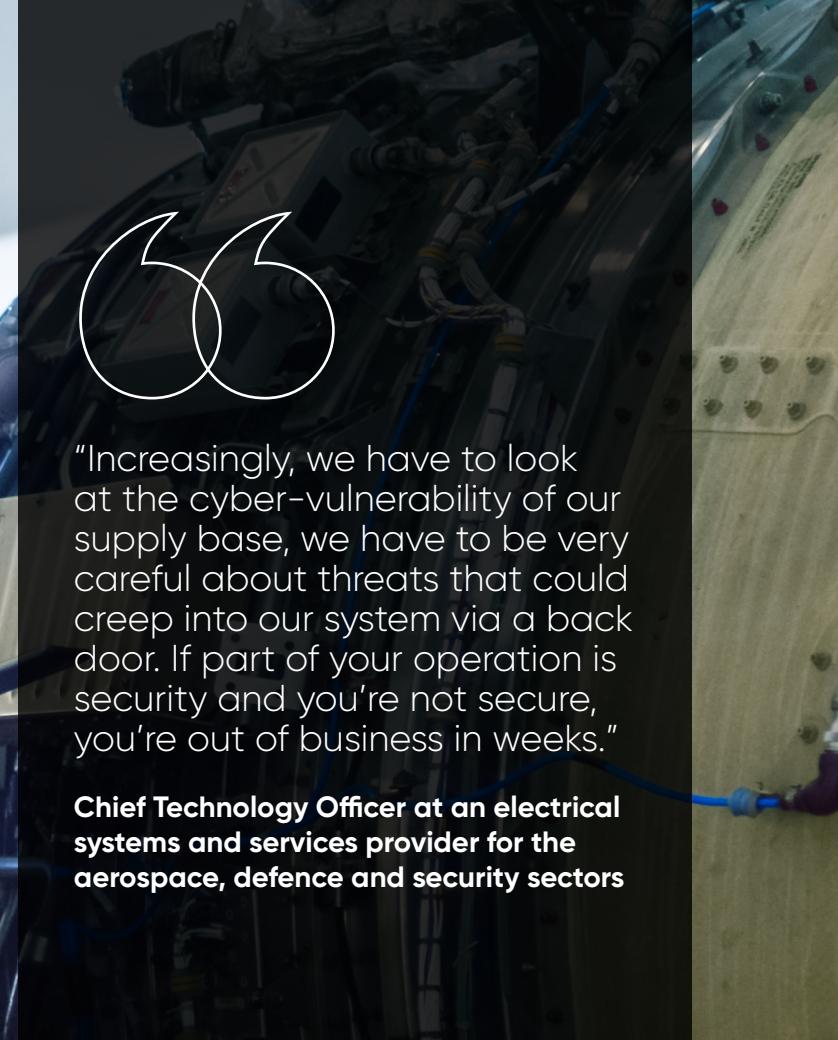


noted; "We've picked all the low hanging fruit and from a process perspective, we're coming to saturation point now. Digitalisation is helping us uncover missed and new efficiency improvements."

Several manufacturers noted how data analytics were assisting their operational modelling from a production perspective, removing the guesswork from modifications to the assembly workflow or layout and helping to streamline changeovers.

It's therefore surprising to see where digital twins and edge computing are placed, particularly given the need to move from information gathering to appropriate action being taken as swiftly as possible.

Though ranked lowest overall – possibly because of their relative immaturity – blockchain, quantum technology and 5G were ranked highly by manufacturers involved in more complex, safety critical sectors including aerospace and defence, medical and pharmaceutical, mining and oil & gas, and food & drink.



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"Increasingly, we have to look at the cyber-vulnerability of our supply base, we have to be very careful about threats that could creep into our system via a back door. If part of your operation is security and you're not secure, you're out of business in weeks."

Chief Technology Officer at an electrical systems and services provider for the aerospace, defence and security sectors

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"Our assembly line is heavily labour intensive involving around 168 visual inspections by the member, some of which are repeated. We currently have a project called 'Smart Inspection' which uses computer vision software and algorithms to make that process more capable, repeatable and improves the quality."

Senior Manager at a global automotive manufacturer

A WORK IN PROGRESS

Given the wide variety of technologies manufacturers view as important, it's encouraging to see so many have already been rolled out or shortly will be. From those who responded to this survey, the most common technology use cases include cybersecurity and cloud computing, providing a necessary foundation on which to deploy other applications such as advanced analytics, AI and the industrial internet of things.

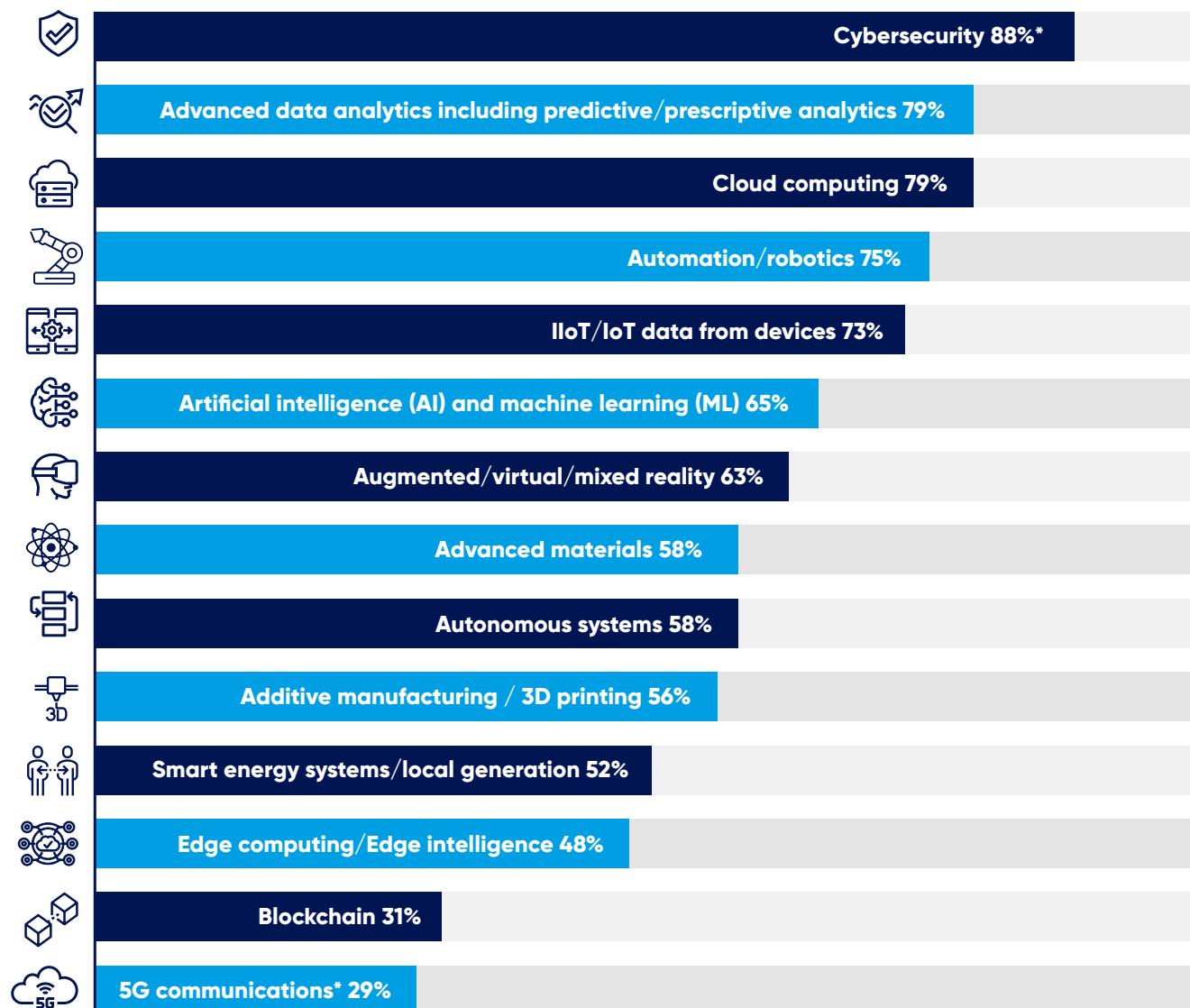
Also ranked highly were digitising and automating many of the process involved with overall equipment effectiveness (OEE) and manufacturing/enterprise resource planning (M/ERP). Alongside increased efficiency and visibility, this shift is being driven by businesses looking to free workers from time-consuming, monotonous tasks in order to focus on areas where they can add value.

As one participant noted; *"Previously, workers would have to write down everything they did during their shift and then calculate their OEE from that. Now, it's all done automatically. Data is collected in real-time from machines and fed through a database for immediate analysis and longer-term trendspotting to help our preventative maintenance programme."*

Several participants noted how their organisations were investigating alternatives →

TECH ADOPTION

To date, manufacturers have made strong headway with:



* ranked as 'Implemented and Rolled Out' or 'Work in Progress'

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"Sophisticated product links enable us to enter a machine number and know where it's working in the world, how many gear changes it made yesterday, what payload it's had on board, as well as predictive maintenance for factors such as tyre wear. It also allows us to ensure that certified parts go on our machines as inferior spares can cause damage; it gives us much-needed visibility and traceability."

Managing Director of a construction equipment manufacturer

to their current production software systems with their priorities including scalability, agility, flexibility, connectivity and security.

In terms of software, manufacturers look to be following the established digital transformation journey, using robotic process automation (RPA) to perform data gathering exercises or to fulfil simple HR and finance transactions. Not many, however, have progressed to the next stage and started to apply a digital mindset to customer-facing parts of their businesses. This is something that we may start to see happen over the coming 12 months.

One technology that has come to the fore is augmented reality. This may be due to the widely-publicised role it played in assisting the VentilatorChallengeUK Consortium as both a training aid and helping to mitigate the need for experts to be physically present. Similarly, efforts to tackle COVID-19 have brought other technologies into the mainstream, including digital twins, additive manufacturing and remote commissioning/collaboration tools. An uptick in interest surrounding these technologies may also be a hallmark of 2021. ☀



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"I used to work for a global automotive manufacturer that had 15 plants across Europe alone. That enabled the business to benchmark performance from one plant to another on common topics like productivity, waste levels, output and customer service delivery, and use that as a lever to continuously improve performance. Those benchmarks don't really exist in our sector, there's only a handful of players in the world that do what we do, so we are looking to digital tools to help provide them."

Head of Industrial Capability and Offload Activity at a world-leading defence systems manufacturer

ON THE MONEY



"My favourite thing is to get out of our factory and into somebody else's. It's really interesting to look around, ask questions and see how they are tackling this issue or solving that problem. When looking to invest in a particular technology, one of the most powerful factors in decision-making is understanding what the current footprint is, who's using it and how they're using it. If I can see it in action, all the better."

Technology Lead at a critical precision component engineering company

ON THE MONEY

When considering investments, manufacturers say their most important support mechanisms are:



96%

Secure internal budget



90%

Seek internal advice, guidance



88%

Speak with existing suppliers



87%

Review previous business cases/ROI



85%

Speak with new suppliers



79%

Personal research



79%

Seek external peer advice and guidance



50%

Engage a consultant/expert



44%

Seek advice from external funders



"The Manufacturing Technology Centre [MTC] has proven very helpful, such as assisting us to build the business case around additive layer manufacturing, for example. We were also part of VentilatorChallengeUK and, to me, that's a perfect example of companies coming together who would normally not even talk to each other. One company was on our doorstep and we had never spoken with them before. It would be great if we could keep that going."

Chief Technology Officer at an electrical systems and services provider for the aerospace, defence and security sectors

FINDING THE TIME

One participant summed up the primary technology barrier facing almost six in 10 manufacturers; *"Time is our biggest problem. People are too focused on day to day activities and don't have – or aren't given – the time to think more strategically and explore more efficient ways of doing things."*

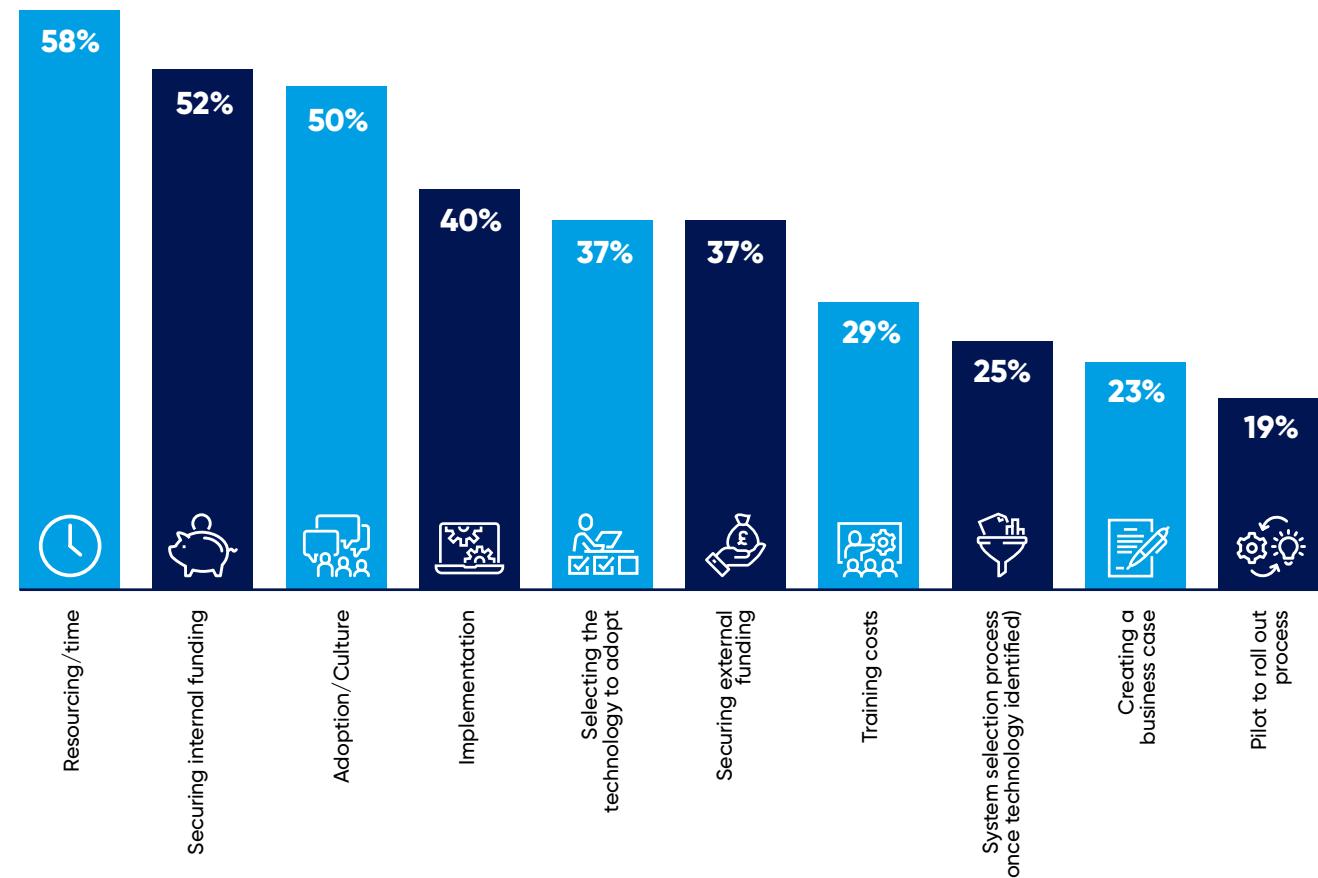
Indeed, none of the top three most significant obstacles are inherently technology-related. Rather, they are more aligned to organisational culture and entrenched working practices.

A major issue for many of those who responded to the survey is finding the right stakeholder or champion to support a project and push it through. This is a particular challenge for UK-based businesses who need sign-off from overseas, especially with international travel restrictions in place.

Businesses also face difficulties around successfully scaling pilot projects, taking something that has proven value in a particular workflow or cell and rolling that initiative out across the organisation. It may be that project leaders are struggling to secure the larger budgets enterprise-wide transformations require, an issue not made easier by budget holders having to juggle a growing number of seemingly competing priorities. →

BARRIERS TO ADOPTION

Manufacturing decision makers say that currently their most significant barriers to adopting new technologies are:



"Very few people leave our business, we have workers who have been here 30, 40, even 50 years. Other companies and industries are fast moving, people come and go and bring in new ideas and ways of thinking or working. That's something we're missing."

Head of Industrial Capability and Offload Activity at a world-leading defence systems manufacturer

However, it may be less to do with individuals and more to do with the dynamics of certain industries. Within fast-moving consumer goods manufacturers, for example, there is immense pressure for continuous improvement. As one participant put it; *"The goal for today is always to outperform yesterday because there are competitors looking to sell the goods you're manufacturing from under you."*

That intensity isn't necessarily present in industries such as aerospace, space and defence, where the capital-intensive and long lead-time nature of the work makes it unlikely a serious challenger will emerge in six months' time.

So, if not to stay ahead of the competition, where does that drive to improve come from?

"We now have employees with experience of that FMCG intensity who appreciate our industry doesn't have the same rate of technological change but are cognisant of the potential longer-term threat to our business and are working to convince the right people of the need for change."

COVID-19 has unquestionably made it more challenging to secure funding for tech explorations and pilot projects, something which seems to reinforce the need for robust business cases. Yet, given less than a quarter of participants said that creating a business case was challenging, it would appear that strong justification alone isn't enough.



Questions over payback periods may be one reason why businesses are reluctant to sign off on investments. One participant noted; *"Every potential improvement or cost saving is multiplied by how many of something we make over the next 12 to 24 months. And that's fundamentally outside of our control. Say, we make a 10% improvement on a particular process, but customer demand drops by 50%, then production volume drops by 50% and that 10% improvement is now half as valuable as it was, doubling the payback period."*

More so now than ever, the key equation for businesses appears to be **BENEFIT x MULTIPLIER = VALUE OF INVESTMENT**. Any uncertainty regarding the left-hand side is no doubt going to affect the figure on the right. ☀

"It's relatively easy to secure funding for something that will deliver an obvious benefit within a relatively short timeframe. The barrier is more infrastructure related – the network, connectivity, and systems that allow us to gather information. We are moving forward but as an older plant, our operating systems aren't where they should be. It's probably not too costly to upgrade and the improvements will have an impact site-wide and across the wider organisation, but it's getting the right people to support it. Something like a robot or a computer vision quality system has a clear project owner; who does infrastructure sit with?"

Senior Manager at a global automotive manufacturer

ON THE HORIZON

If the previous question ranked the traditional obstacles to adopting technologies, this question explored whether COVID-19 had removed or bolstered those barriers. From the responses given, that doesn't seem to be the case. The four most significant obstacles are largely the same, as are the bottom four.

Given that 'Adoption/Culture' ranked as the most significant obstacle to adopting new technologies over the coming 18 months, participants expressed a mixed response in terms of their workforce's capacity for change.

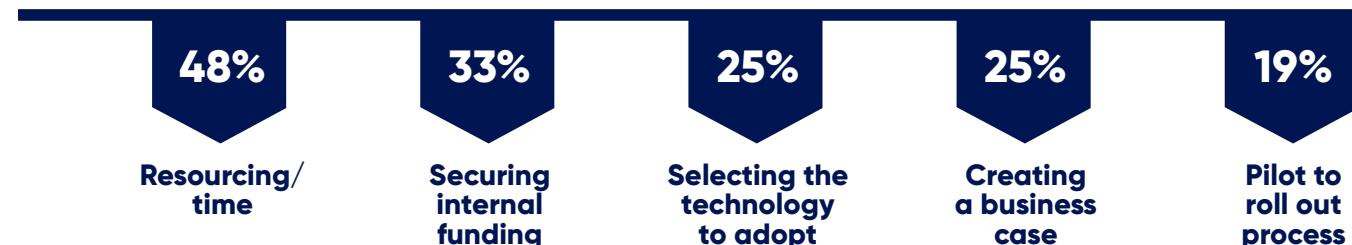
On the one hand, the resistance to change may be stronger now than previously. Workers may have already experienced pay cuts, reduced hours, being furloughed and lost bonuses or benefits that may negatively affect their motivation to engage with new initiatives.

As one participant noted; *"It's a lot easier to encourage somebody to buy into your new technology or project if they're happy, satisfied and pleased with the way things are going. If they're feeling the pressure personally that the industry is under, and everyone is to be honest, then you've already got barriers, even if they're subconscious."*



CULTURE SHOCK

Over the next 18 months, manufacturing decision makers say their most significant obstacles to technology adoption will be:



With backs against the wall, project leaders are having to work that much harder to convince workers that their next pay cheques are being spent on something that not only helps makes their lives easier but safeguards the future of the business.

However, several participants noted that constant change is built into the DNA of their organisations because of the nature of the goods they manufacture; *"We're always looking at ways of pulling through technologies from one domain into another, and how to organise ourselves more efficiently,"* noted one.

For these manufacturers, the challenge isn't necessarily encouraging people to buy-in to a specific technology or way of working; it's opening their eyes to what's possible in the first place.

One participant said; *"Some of our assemblies require the precise placement of thousands of small components on a grid, each of which are placed by hand. Automating that process would be a lot more efficient because a robot knows how to place a simple object in a very precise spot and do it very quickly, whereas human beings become bored after a while and could make mistakes. That illustrates the debate you tend to have around robots making mistakes, yet there's never any acceptance that human beings make mistakes."* ☀



"We're probably more advanced in design and engineering than we are in manufacturing. We know how to hand build a Rolls-Royce, but we wouldn't know how to automate it. We've only recently started to integrate robotics into some of our modern factory facilities when we should have been doing that years ago."

Chief Technology Officer at an electrical systems and services provider for the aerospace, defence and security sectors

DRIVING UPTAKE

"It's important to understand what we can do with a technology and what we gain from it. Ultimately, for us, that means using it as tool. We've had a lot of companies come onsite and say that can provide us with all this information, but then it becomes more of a hindrance than a tool. You can have a control room with a wall full of flashing red lights and the engineering supervisor or maintenance team leader doesn't know what to do with that information or where to start. We're trying to break it down and simplify it as if it were one of our manual systems and give the information or warning at the right time to the right person."

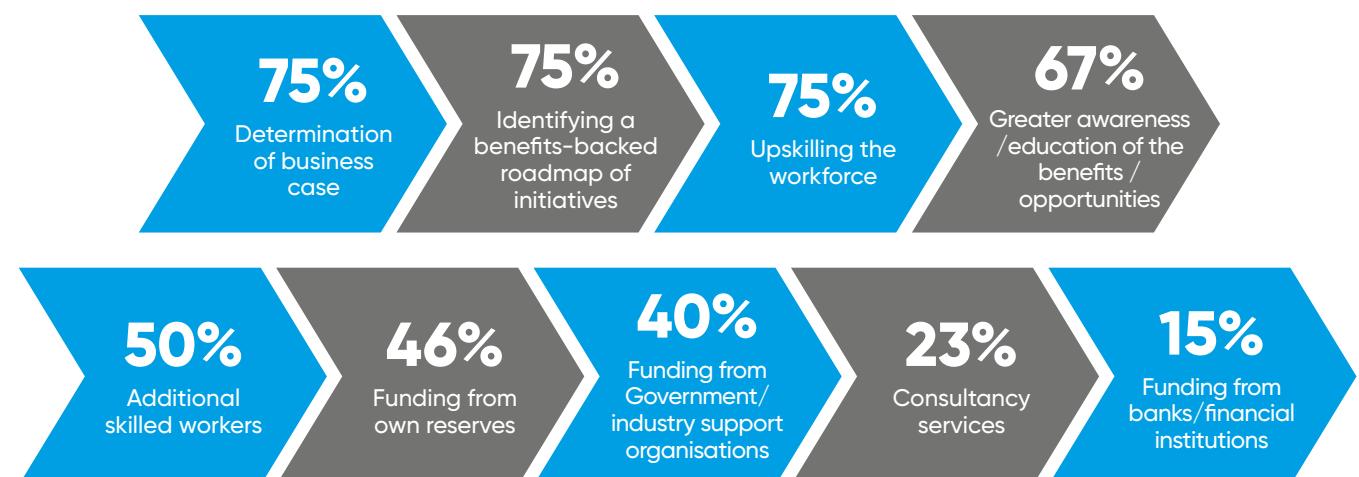
Senior Manager at a global automotive manufacturer



DRIVING UPTAKE



Manufacturing decision makers say these actions are needed to accelerate adoption of digital technologies:



IN 12 MONTHS' TIME...

"In 12 months, I would like to be implementing a new ERP system that moves us ahead of where we are today and taking live data from shopfloor machines and using it to inform operational decisions. I would like to be putting out more robust and efficient processes on the shopfloor and for our engineering workflow to be faster and slicker. I want a workflow that is able to react swiftly and intelligently to new customer inquiries and build changes.

"We're in the process of overhauling our factory IT system and I would like to use that momentum to start to implement improvements that really do make a difference. If you're putting all the work into the foundations, you need to build something on top that makes our business better. If a customer provides us with a 3D model and embedded geometrical data, it's on us to respond to that. Fundamentally, it's about providing the service that the customer needs, not the service that we've always provided."

Technology Lead at a critical precision component engineering company

Over the next 12 months, we will be looking at how digital tools and visual management can help make our shift changeovers more efficient. If someone takes over from someone else, how do they know what stage the build has reached? It may be they spend the first 15 minutes of their shift repeating several steps to ensure they've been done, such as tightening fittings. Relatively simple, inexpensive improvements like that can make all the difference."

Managing Director of a construction equipment manufacturer

"In many ways, COVID-19 has acted as a catalyst to change. What we've done this year, we probably weren't doing enough of in 2019 and we want to do more of in 2021. What we've achieved this year has been really good, but I'm struggling to know how much more of it we can do next year as we may have burnt ourselves out a bit. Maybe 2021 will be more about consolidation than acceleration."

Chief Technology Officer at an electrical systems and services provider for the aerospace, defence and security sectors



WHERE TO FROM HERE?

The pandemic was a wake-up call that disrupted the as-is more than anyone could have previously anticipated. For many, it has been a bitter reality: painful, costly, still unresolved. For a few lucky others, it has offered an unforeseen windfall.

Either way, executives must accept that pandemic-induced changes in strategy, management, operations and budgetary priorities are here to stay. As seen in this report, the pandemic has made executives more trusting of what technology can do, and they are pushing ahead with investments to digital transformation.



What the survey also highlights is that these digital investments will be deployed in three phases:

Doing things better
(the push for improving operational efficiency)

Doing better things
(deploying predictive/prescriptive actions for operations)

Doing new things
(drive new kinds of services for differentiated customer experience)

This presents an enticing opportunity for executives who can manage complexity and drive competitiveness by tying digital transformation to business priorities – while others are still waiting for things to “go back to normal”.

Organisational culture and complexity will be the biggest barrier to overcome, and building trust and confidence among employees will be critical. How they are treated now will have an outsize impact on perceptions and value in the future.



Rishabh Arora
Industry 4.0 Leader, IBM UK

TAKE ACTION NOW

imperative that organisations react in real time – that is, now – to navigate this new environment. UK manufacturers need to take action in three critical areas in order to survive and flourish:

1. Lead, engage and enable the workforce in new ways by providing support for more flexible work options, employees' wellbeing and skills development. All this can help in driving trust and build retention.
2. Apply AI, automation and other exponential technologies to make workflows more intelligent. Focus on supply chain resiliency, operational efficiency, cybersecurity and adoption of automation and AI.
3. Improve innovation scalability across operations by deploying the right architectural choices which allow your innovations and pilots to scale across your enterprise. Sometimes cloud is the answer, sometimes it's an evolving combination of cloud, on-premise and edge. Using the right toolset at the outset will afford the manufacturers absolute flexibility in these deployment models without undermining the business case.

This new world permits no time for complacency or nostalgia. Risks and opportunities are too great, the stakes too high. Executives need to prepare their businesses for ongoing uncertainty, inevitable disruption and never-ending change. ☺



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