Delivering Impact

How Made Smarter inspires digital transformation

MADE SMARTER

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Foreword

Executive summary

It is approaching five years since I stood shoulder to shoulder with Made Smarter architect and industrialist Juergen Maier to launch the first Made Smarter adoption programme.

The bold and ambitious plan was to equip North West SME manufacturers with the know-how and confidence to fully embrace the next industrial revolution, offering them access to a package of support which could boost growth, productivity, efficiency, decarbonise and create high value, well paid jobs of the future.

The reaction was phenomenal. We were swamped with interest, tempered by others claiming technology would lose people their jobs. It was a frenetic start.

Little did we know the challenges waiting around the corner for us. Covid-19, Brexit, Ukraine and the subsequent supply chain disruption and labour shortages, rising energy prices and a cost of living crisis pummelled the UK economy.

But despite these competing crosswinds, and the urge to batten down the hatches, the appetite for adopting technology and digital skills grew, and is continuing to do so.

What the North West adoption programme has achieved is breathtaking. More than 2,500 manufacturers have engaged with our specialised support.

Hundreds have reaped the rewards of intensive support including expert, impartial technology advice and digital transformation workshops to help them take their first steps to identify practical solutions to overcome business challenges.

More than 150 have embedded new digital skills into their operations through our leadership programmes, internships and other training opportunities.

We have funded 334 technology projects with companies and we're starting to see the economic benefit with the North West forecast to see an increase of £242M in GVA in the coming years. What is more, is that these investments are creating 1,300 new jobs and upskilling 2,500 existing roles. We've proved the naysayers wrong!

Our achievement can be put down to a well designed model which puts people at the centre of the adoption of technology, and a flexible approach to delivering what SMEs need as new challenges and opportunities emerge. Crucially, we listen to feedback from companies we have and are working with to ensure that the support remains relevant and practical.

The relentless work of the team has created a rich and varied network of manufacturers, who talk to each other, demonstrate what works and doesn't, and keep the narrative real.

Our achievement also comes down to trust. Change is not easy. I would like to thank all those SMEs who have engaged with the programme for trusting the team to work with you to make those changes in a sustainable, impactful way.

This blueprint of success has so far been replicated in the North East, Yorkshire and the Humber, the West Midlands, East Midlands, and West of England. It is now poised to be rolled out to the whole of the UK from 2025.

While we can pat ourselves on the back for a job well done over the last four years, our mission is by no way over. We've got some really good evidence now to try and encourage those that haven't started to adopt to do so.

We are not doing this alone. There is a real local, regional and national approach to Made Smarter which enables organisations, large and small, at each stage of the supply chain network, to work together.

The National Commission continues to make the case to invest more in Made Smarter, not just in terms of productivity and growth, but also the positive impact on decarbonisation and net zero. Made Smarter is joining up different agendas for the government. And then there is our North West steering board, which now includes SMEs who have benefited from the programme, ensuring the programme remains relevant and forward-thinking.

As we approach the fifth anniversary, we've put together a white paper to reflect on why Made Smarter was started, the impact it has already had in the North West, and our vision for the future.

Donna Edwards,
Director of Made Smarter's North West Adoption Programme

Setting the Scene

The productivity puzzle

In 2016 manufacturing contributed £177bn to the UK economy, accounting for over 50% of UK exports 204 and over 70% of R&D[1]. But like all sectors of the economy, it was struggling to recover from the financial crisis.

UK labour productivity at the time was 20% below the USA, France and Germany[2]. In other words, UK workers needed five days to produce what German or French workers could produce in just four.

Economists and industrialists who previously accepted the cyclical nature of a boom and bust UK economy were left scratching their heads at the growth flatline which was seeing the UK fall behind global competition[3].

Industry's failure to embrace advanced technologies and its continued reliance on human workers to do repetitive unskilled tasks was blamed for the lag.

The winds of change

In 2017 the UK Government published its Industrial Strategy[4] with the aim of solving the productivity puzzle, backing businesses to create good jobs and increase the earning power of people throughout the UK through investing in skills, industries and infrastructure.

A key pillar to the strategy was the ambitious industry-led Made Smarter Review[5] into industrial digitalisation.

The Review

Led by Professor Juergen Maier, the then CEO of Siemens UK, the report demonstrated how the application of digital technologies - such as artificial intelligence and robotics, data analytics and additive manufacturing - had made transformational improvements to productivity to early adopter businesses who had already exploited their potential.

It then set out the significant opportunities to be gained by the faster development and adoption of these technologies across all UK manufacturing sectors over a decade, including:

- Increasing productivity by at least 25%, output by £455bn and manufacturing sector growth by up to 3% per year
- Raising exports through international competitiveness
- Strengthening UK supply chains and creating new value streams
- Addressing regional economic disparities;
- Creating 175,000 jobs
- Upskilling 1M industrial workers
- Reducing CO_2 emissions by 4.5%

In a rallying call to recapture the UK's industrial spirit as a nation of 'creators and makers', the Review laid out a bold and ambitious plan to equip the UK with the means to fully embrace the next industrial revolution with four priorities: innovation, adoption, leadership and skills. And at the centre of each of these was a focus on SMEs, the lifeblood of the UK economy.

The proposal called for a National Adoption Pilot programme focused on offering SME manufacturers access to a support package, which could boost growth, productivity, efficiency, decarbonise and create high value, well paid jobs of the future.

Why the North West?

As the birthplace of the first industrial revolution and with a rich enduring heritage, the North West region showcased compelling qualifications for its selection for the pilot.

In 2017 there were around 14,500 manufacturing SMEs[6] in the North West, 5.5% of all SMEs compared to 5.1% nationally, supporting 318,000 jobs or 9% of the region's total workforce.

Manufacturing accounted for 16% of the region's total output – the third highest of any UK region - and 10% of the UK's manufactured exports, half of which went to Europe.

But it also suffered from productivity levels which were 10% below the UK average, and a higher proportion of workers in low paid employment than the national average.

Testing an adoption programme in the North West also aligned with pan-Northern and regional priorities.

The Northern Powerhouse Independent Economic Review[7], published in 2016, found the main factors driving this productivity gap were insufficient high-skilled workers and too many low-skilled workers, not enough exploitation of innovation and technology, and lower levels of investment and enterprise.

The report also highlighted 'digital' and 'advanced manufacturing' as two of four prime capabilities alongside 'energy' and 'health innovation' to drive growth across the region.

It forecast that by 2050, realisation of these capabilities could increase the region's GVA by 15% higher, productivity by 4% and create 850,000 additional jobs.

Paul McLaren, Chair of Made Smarter North West's Steering Group

Navigating the challenge

A new approach

The pilot was an opportunity to design a new kind of business support service for manufacturers that tackled the key barriers preventing them from adopting technology: time, knowledge and capital.

Naturally, offering funded access to expertise around digital strategy, technology and skills were a big draw for manufacturers. But establishing that genuine buy-in from digital transformation was achievable meant sewing a golden thread through the programme that support was quick, simple and high impact.

This meant creating a set of short, focussed interventions to help time-poor SME leaders. It also meant showing rather than telling people how technology adoption is done properly and simplifying the jargon and hubris around terms like 'Industry 4.0' to ensure it was attractive and accessible to businesses of all sizes and digital maturity.

But crucially it established the core principle that people are at the centre of adoption, and technologies are valuable tools.

Adapting to customer need and necessity

The delivery of the pilot came at a time of unprecedented disruption caused by Covid-19, Brexit and the subsequent supply chain disruption and labour shortages, rising energy prices and a cost of living crisis.

With an experimental and continuous improvement mindset embedded in the pilot, when the needs of manufacturers changed, so did the programme.

For instance, very early on in delivery, it emerged that the digital readiness of SME manufacturers was lower than anticipated. The hope of rolling out robotics gave way for something more pragmatic and something businesses needed, promoting data and systems integration as a stepping-stone to more sophisticated, boundary-pushing technologies.

This trend has continued through the programme where to date more than 50% of grant funded technology projects have been focussed on data and systems integration. The varying levels of digital-readiness, technology needs and the variety of the industrial base across the North West also demanded a more streamlined, personalised approach.

Trust

This is where pairing technology and Organisational Workforce Development (OWD) specialists with a business, to give them access to expert and impartial advice, came into its own.

The approach developed trusting relationships with companies looking for advice, recommendations, and a critique of their investment and digital adoption plans.

Agility

The programme also responded quickly to the feedback from manufacturers.

The process of assessing a manufacturer's product, processes and people changed to gather more views from across the factory, rather than just one individual's perspective. A two-day digital transformation workshop allowed technology and skills experts to develop a road map to address business challenges and priorities.

Additional feedback from businesses for a more time-efficient process and to broaden the input from across an organisation, and prompted a further redesign of the service. The two-day workshop was streamlined to a few hours, enabling an effective, tailored 'package' of services in a fraction of the time.

These changes also enabled the programme to pivot quickly during the pandemic and lockdown. Having to move to virtual workshops for a period enabled more employees from each business to attend the shorter workshops, increasing engagement within the companies.

But face to face workshops were resumed quickly to ensure valuable line walks of production processes and a complete understanding of the challenges and opportunities were captured.

A robust model

Listening, learning and adapting to the needs of manufacturers has ensured the programme remains relevant and practical. It has established a robust delivery model that has helped businesses weather the challenges presented over the last few years.

Mark Bayley-Smyth, Non Executive Director of Qualkem and Deyrick Allen, Managing Director of IoT Horizon

The Impact

Made Smarter has been on an incredible journey over the last four years helping businesses navigate the pandemic and recover, negotiate supply chain disruption, and labour shortages, as well as focus on solutions to mitigate the energy crisis.

Despite a crosswind of challenges the programme has been an unparalleled success, offering impactful funded support to manufacturers across all sectors.

ACTUAL

75 Digital internships placed with businesses / 44% offered permanent job

2500 Manufacturers engaged

334 Technology projects supported

357 Digital roadmaps created

£6.4M Of Made Smarter funding

128 Businesses given skills or leadership training

£22.4M Of investment by manufacturers

FORECAST

£242M Increase in gross GVA

£8 For every £1 of government investment

1,550 New jobs will be created

2,772 Roles will be upskilled

“Made Smarter has demonstrated that targeted support can be a catalyst for growth and a real enabler for change.

“UK manufacturing is moving into a phase where resilience is as important as it has ever been. Made Smarter is helping SMEs create robust plans to deliver impactful results.”

Paul McLaren,
Chair of Made Smarter North West’s Steering Group

Digital transformation workshops (DTW)

Made Smarter advisers have taken 357 companies through the fully-funded digital transformation workshops to date. This process with a technology adviser and supported by the Organisational Development team, cuts through the jargon to identify the most effective technologies to overcome their operational challenges and any skills gaps.

These two short, focussed sessions: a two-hour diagnostic of the business' products, services, processes and people; and a one-hour 'findings' presentation with recommendations and a digital adoption roadmap, a live document intended to help a business digitalise, one step at a time, in their own time.

Case study - Joshua Greaves

The manufacturer of industrial mixing equipment used its experience of the digital transformation workshop to identify opportunities to invest in new technology. Working with Made Smarter, Greaves found it was being hampered by a reliance on the use of manual recording and spreadsheets for logging of batches through each stage of production, stock control, purchasing and scheduling.

This meant it had no effective way of measuring rates of production, no visibility, and no way of implementing efficiency improvements.

The DTW process showed that a software solution could integrate business functions including sales, design, purchasing, planning, manufacturing and assembly.

The impact of real-time access to key data has been extensive. It has improved accuracy, scheduling and resource planning, cut lead times from four weeks to 48 hours, increased capacity and productivity, improved product costing accuracy, boosted sales, as well as reduced waste and carbon emissions.

Read the full Case Study here

Skills and leadership

Made Smarter's OD team has supported 262 businesses with workforce, skills and leadership needs.

This includes creating 110 digitally-empowered leaders through its Leading Digital Transformation programme, a fast-track three-month course to create digitally-informed, empowered leaders, armed with a bespoke digitalisation strategy.

Meanwhile, the Leading Change for Digital Champions programme offers support for those leading change operationally on the shopfloor and is creating a network of digital champions who support each other with shared learning and experience.

Another area of success was the digital internships programme which paired 75 tech-savvy university students with businesses who benefitted from the up-to-date knowledge and expertise of the interns.

Almost half of interns secured permanent jobs at the end of their placements. Others benefitted from gaining work experience, which enabled participants to gain employment elsewhere.

Case study - Beverston Engineering

The precision component manufacturer has been on a digital transformation journey with Made Smarter, creating a digital roadmap and investing in technology. But it has also benefited significantly from skills development. Oliver Miller joined Beverston in 2020 through the internship programme. A postgraduate studying Aerospace Engineering at the time he was tasked with developing a new quality management system. He has since been recruited as the company's Industry 4.0 Project Manager and has completed the Made Smarter Leading Digital Transformation programme.

Read the full Case Study here

"We have been on an incredible journey over the last few years, supported in part by Made Smarter, to create a smart factory and become an exemplar for other SMEs pursuing the same ambition.

"The digital internship initiative and Leading Digital Transformation programme are a great example of industry and academia working together to plug the skills gap and enabling businesses to take advantage of the opportunities Industry 4.0 offers."

Oliver Miller, Beverston Engineering
Industry 4.0 Project Manager

Technology adoption

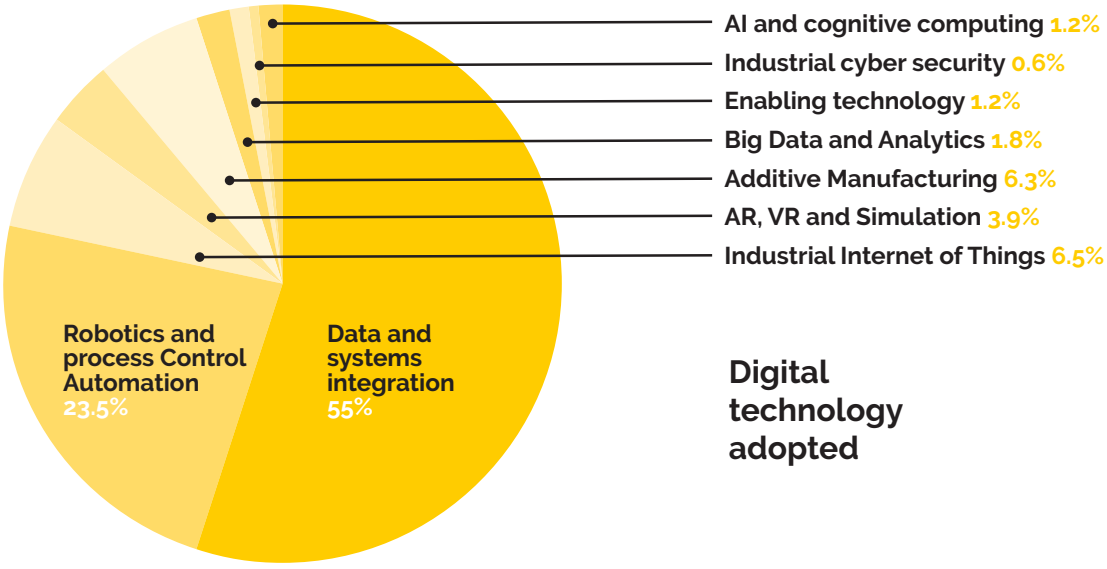
More than half (185) of the 334 technology projects supported by Made Smarter's North West adoption programme focus on introducing technologies related to data collection and software systems.

As a result of integrating systems and consolidating data sources, business leaders have achieved real-time visualisation of their processes, been able to spot trends in production and labour, correct maintenance and quality issues, and minimise safety, business risk and operational downtime throughout their production.

Almost a quarter of the technology projects the programme has funded are for process control automation and robotics. Manufacturers are realising a raft of benefits including an increase in productivity, improved precision, consistency and quality, as well as opportunities to reduce operational costs by allowing machines to take on the burden of repetitive, low-value and sometimes dangerous work.

Around seven percent of projects have focussed on Industrial Internet of Things (IIoT), using sensors to collect critical production data to gain valuable insights about the efficiency of operations. A similar number are adopting additive manufacturing to reduce waste and fast track prototyping, in order to create new products.

Meanwhile, early adopters who have already captured data and linked systems are using that activity as a platform for the next step, to focus on analytics and artificial intelligence to get more insight and value from their manufacturing operations.



Digital technology adopted

Sub-regional impact: Cumbria

Across Cumbria almost 200 manufacturers have engaged in the programme. Of these 50 businesses have engaged in technology projects which are forecast to create 125 jobs, upskill more than 200 roles and boost the Cumbrian economy by £24m.

Case study 1 - Bells of Lazonby

The baked goods maker adopted two programmable ultrasonic cutting robots replacing a manual process. It is capable of slicing cake in an infinite number of sizes and shapes, and links to its ERP system to take into account customer orders, resources, and the fluctuation of the price of the ingredients.

The integrated solution increased productivity by 25%, improved accuracy and reduced wastage, and boosted profitability.

Read the full Case Study here

Case study 2 - Ratio Technology

A manufacturer of bike components invested in 3-axis CNC machining technology with a twin pallet setup or non-stop production. By bringing production in-house from subcontractors, the business has increased opportunities for customisation and innovation, and reduced costly delays and mistakes. The business is now doubling its manufacturing workforce and focusing on developing and marketing its own new bicycle drivetrain technology.

Read the full Case Study here

Sub-regional impact: Cheshire & Warrington

Made Smarter has successfully engaged with 250 manufacturers in every corner of Cheshire and Warrington. Of these 30 businesses have engaged in technology projects which are forecast to create 85 jobs, upskill more than 200 roles and boost the sub-regional economy by £15m.

Case study 1 - Precision Card Services (PCS)

A plastic card manufacturer invested in digital printing technology which integrates with a bespoke software solution to read a card, check against a data file in real time, and then encode it. The new ability to process up to 10,000 cards a day secured PCS a £1.5M identity card contract, increased turnover by 8% and created eight new jobs. It also opened up new opportunities for photo ID cards.

Read the full Case Study here

Case study 2 - Qualkem

The eco-friendly cleaning product manufacturer adopted new automated tube labelling and filling machinery for short production runs for its direct-to-consumer market. It has enabled the business to increase the rate of new product lines from 2 over an 18 month period to 22. This has driven a 25% growth increase and created two new jobs, while upskilling several existing roles.

Read the full Case Study here

Sub-regional impact: Greater Manchester

More than 700 manufacturers in Greater Manchester have engaged in the programme with 92 adopting new technology. These investments are forecast to create 425 jobs, upskill almost 800 roles and add £64m to the economy.

Case study 1 - Firstplay Dietary Foods

The low protein food manufacturer replaced a manual process with an automated powder packaging machine, which includes an automated multi-head weigher and powder filler. This increases productivity 10-fold, reduces human error and waste, and is forecast to increase turnover by 30%. In addition, two operators are now focussed on more value-add activities such as sales and complex packing tasks.

Read the full Case Study here

Case study 2 - Mackinnon & Saunders

The puppet–maker adopted a world-first ability to 3D print stainless steel for the puppets used for the Oscar-winning stop-motion animation, Pinocchio. The innovation has paved the way for the use of 3D printed metal and cemented their position as leaders in their sector.

Read the full Case Study here

Case study 3 - Crystal Doors

A manufacturer of bespoke vinyl wrapped furniture tapped into Made Smarter's digital technology internship programme to implement a network of sensors that will give the business full visualisation to gain insights into how its machines are performing and identify potential efficiencies. This helped the business achieve carbon neutrality in 2022.

Read the full Case Study here

Sub-regional impact: Lancashire

More than 500 manufacturers from Lancashire have engaged in the programme with 98 securing support for new technology projects. These are forecast to create almost 500 jobs, upskill more than 1,000 roles and boost the economy by £79m.

Case study 1 - Nutree Life

The manufacturer of vegan and free-from protein bars introduced bespoke automation solutions to enable high volume, high speed and accurate production, and integrate its systems, end to end from warehouse to despatch, enabling real-time visibility of its processes.

Nutree Life improved the accuracy and consistency of the product, quadrupled turnover and doubled its workforce.

Read the full Case Study here

Case study 2 - ELE Advanced Technologies

The manufacturer of specialist components for aerospace, power and automotive sectors adopted a bespoke machine condition monitoring solution which uses data collection and analysis to predict issues. This is helping ELE improve machine uptime and productivity by 10%, reduce maintenance spend by 10%, and improve accuracy and reliability by 10%. It also created an additional new role in the maintenance team and upskilled four existing staff.

Read the full Case Study here

Sub-regional impact: Liverpool City Region

300 manufacturers from across the Liverpool City Region have engaged with Made Smarter. The programme has supported 60 technology projects which are forecast to create 385 jobs, upskill more than 375 roles and boost the economy by £52m.

Case study 1 - Organica

The eco-friendly cleaning product maker invested in Industrial Internet of Things (IIoT) sensors to capture vital data about its blending, filling, labelling and packaging processes, before adopting a bespoke, cloud-based ERP solution to improve how it keeps track of orders, production and stock.

It enabled the business to meet increasing demand production capacity, and improve how it manages resources.

By introducing real-time monitoring and analytics Organica was able to make data-driven decisions and increase productivity by 20%, make processes 25% more efficient, reduce energy consumption by 10% per ton of product and reduce waste by up to 20%.

Read the full Case Study here

Case study 2 - Door and Window Systems

The door and window manufacturer invested in a software solution to manage customer interactions and sales, and secondary software to integrate with production and dispatch.

As a result it increased back office productivity by 50% and freed up staff to focus on more high value tasks and sales opportunities. The business is now on track to double its turnover, contribute an extra £1M to the region's GVA over the next three years and create 15 new jobs.

Read the full Case Study here

“As a startup developing digital technologies, securing funding was actually very difficult. Grant funding can also be a lottery and when time is money for an SME if you’re not successful, it’s money wasted. What was nice about Made Smarter is that it is delivered on the edge. Digital transformation comes at a cost. We need more funding.”

Deyrick Allen,
MD of IoT Horizon

Other Impacts

UK rollout

The North West programme has proved the value technology can bring to the manufacturing sector and become the blueprint of success, which now reaches other areas. Other programmes in the North East, Yorkshire and the Humber, the West Midlands, the East Midlands, and the West of England are also underway and starting to show positive results. This has prompted the Government to commit to rolling out the adoption programme to all remaining English regions from 2025, and then potentially to Scotland, Wales and Northern Ireland from 2026, meaning all UK SME manufacturers will have access to the support they need to digitalise, decarbonise, and drive growth[8].

"Even though we're part of a large company, we're effectively a large SME and face the same challenges SMEs do. SMEs need to invest in digitalisation and leadership in order to make our companies more productive and competitive going forward. A lot of SMEs are still in Industry 3.0, but there's a definite imperative to move to the next phase of digitalisation. Programmes like Made Smarter are giving businesses the confidence and the funding to make those first steps on that journey towards industry 4.0 and then hopefully industry 5.0."

Rob Matthews,
Head of Supply Chain Management, Siemens

Network

One of the legacy impacts of the programme has been the emergence of a network of SMEs to demonstrate how they have adopted technology.

"The biggest challenge for starting on the digital adoption journey is that people don't know what they don't know.

Made Smarter has a blend of passionate skilled people who know what good looks like and demonstrates how achievable it is through case studies and its network of SMEs who have been through the programme. There's nothing better than meeting other manufacturers who have your battle scars and share your pain and who can say, "I've been there and done that, and you can do it too."

Mark Bayley-Smyth,
Non-Executive Director, Qualkem

Pioneering the future: what's next for Made Smarter

In the six years since the Made Smarter Review, manufacturing has demonstrated a staggering resilience, innovation and agility in the face of unparalleled challenges. The sector has truly weathered the storm, emerged stronger and continues to play a lead role in strengthening a bruised and battered economy.

Make UK's analysis of 2022's performance revealed a huge leap in output to £224bn, lifting the UK from 9th to 8th place in the global manufacturing rankings. That same analysis revealed that the North West remains the UK's biggest manufacturing area, worth £28.2bn in output and employing 314,000 people.

Made Smarter has surely played a part in enabling that remarkable resilience and offers the government to empower SME manufacturers to realise national ambitions for growth, levelling up and net zero.

This means embracing what has been proven to work, pursuing an experimental mindset to continuously improve and refine the adoption programme, and possibly expand it.

For instance, a feeder programme would help bring less digitally mature SMEs up to speed and lay the groundwork for digital transformation with interventions that embed lean manufacturing processes and low-level data capture and systems integration.

Similarly, for businesses graduating the adoption programme with digital leadership skills and positive experiences of technology adoption, there is a golden opportunity to accelerate investment in more advanced, leading-edge technologies.

The wrap-around model enables the core adoption programme to recapture the spirit of the 2017 Made Smarter Review and help SME manufactures realise that vision of a smart connected factory and Industry 4.0.

But ultimately, SMEs want to help themselves.

Any future iteration of the adoption programme must build on the success of the skills and leadership training already embedded. But there are clear opportunities to design short, high impact courses for all the key technologies. For instance, a 'data skills for manufacturers' programme could teach how to capture, integrate, analyse and visualise data to make informed decisions about the business.

Giving more manufacturers more access to skills will rely on being able to build on existing partnerships with demonstrators, and forging new ones.

For instance, the North West is developing into a powerhouse in additive manufacturing with PrintCity, Manchester Metropolitan University's advanced 3D printing hub, Lancaster University's Greater Innovation for Smarter Materials Optimisation (GISMO), the Advanced Manufacturing Research Centre (AMRC) in Lancashire, and Science and

Technology Facility Council (STFC) AM labs in Cheshire.

Similarly, Made Smarter supports companies to access robotics through partnerships with the North of England Robotics Innovation Centre (NERIC) at the University of Salford, ARMC North West in Lancashire and the recently opened Robotics Living Lab at Manchester Metropolitan University.

Keeping a finger on the pulse of developments in existing technologies is vital to the success of the programme moving forward.

As manufacturers become more digitally mature, the adoption of additive manufacturing and immersive technologies will undoubtedly accelerate.

The once 'sci-fi' vision of super intelligent machines is now within reach thanks to the proliferation of AI models like ChatGPT.

The job of Made Smarter should be to learn how manufacturers can collaborate with AI and simplify its application for maximise impact.

The programme has created a faster and simpler process for manufacturers to access what they need, the complex and confusing business support landscape that was first identified in the 2017 Made Smarter Review still remains a challenge today.

Fundamentally, what is needed moving forward is for joined-up thinking and a national approach to enable what works to be rolled out to every UK region in a consistent way, while taking advantage of regional technology and skills expertise. This approach would help UK manufacturing to move forward together.

Get in touch today to start your Made Smarter journey

DISCOVER VIDEO INTERVIEWS HERE	madesmarter.uk/formakers

Further reading

- Leading digital transformation
- Decarbonisation through digitalisation
- A manufacturer's journey to adopting digital technology
- Digital technology in practice

Sources

1 & 4 - Industrial Strategy
2 - Industrial Strategy Council
3 - ONS
5 - Made Smarter Review
6 - Make UK
7 - Northern Powerhouse Independent Economic Review
8 - HM Treasury, 2023

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www.madesmarter.uk