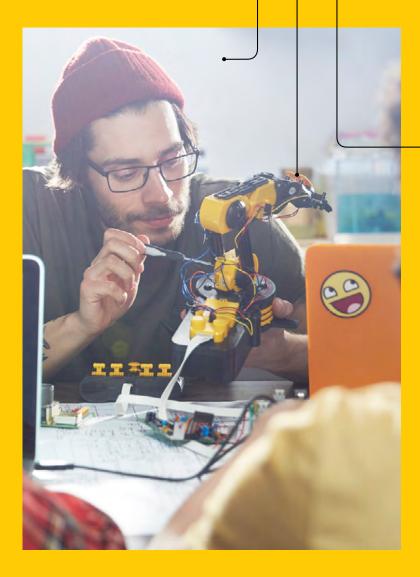


Programme highlights 2021

Designed for industry. Made real by innovators.





Contents

2

Made Smarter Technology Accelerator is the largest accelerator programme of its kind in the UK.

It supports innovative startups using advanced technologies to add value to the industrial and manufacturing sectors.

Made Smarter Technology Accelerator is a programme delivered by Digital Catapult, funded by UKRI through the Industrial Strategy Challenge Fund, as part of the wider Made Smarter national movement.





madesmartertech.uk

Made Smarter Technology Accelerator

Driving innovation and the acceleration of advanced digital technologies in the industrial and manufacturing sectors.

Made Smarter Technology Accelerator connects leading UK manufacturers with pioneering technology startups to develop innovative technology solutions for some of the UK's most relevant industry challenges.

With funding and support, startups can develop their ideas into prototypes and minimum viable products (MVP) in less than 12 months. In return for their valued support and match-funded financial contributions, our Industry Challenge Owners (ICOs) benefit from outputs and learnings, as well as seeing proofs of concept developed in response to the challenges they set.

We're proud to be sharing the outcomes of the 2021 Made Smarter Technology Accelerator programme with you.

Creating opportunities for collaborative change

Advanced digital technologies are powering the fourth industrial revolution in the UK manufacturing sector: driving productivity, digitalisation and innovation.

From a recent Digital Catapult survey of 100 UK manufacturing leaders:

77%

say the pandemic has made their business more open to change and innovation. 82%

recognise that working with startups will help them accelerate digital transformation, giving them access to creativity and skills they do not currently possess in-house. **74**%

see collaborating with startups as part of their long-term business strategy. "In tumultuous times, it can be tempting for businesses to cut costs rather than invest. Yet, for the UK manufacturing sector to thrive and become a world leader, we need to find ways to encourage innovation and the adoption of digital technologies.

The Made Smarter Technology Accelerator – and the wider Made Smarter national movement – is designed to do just that by fostering relationships between technology innovators and manufacturers to solve genuine industry challenges."

Juergen Maier, Chair of Digital Catapult and Co-Chair of Made Smarter

MADE SMARTER

TECHNOLOGY ACCELERATOR

"Although COVID-19 may have made manufacturers more open to innovation, our survey suggests there is still a danger that UK companies will miss out on the opportunity to be early adopters of new technologies.

Many manufacturing heavyweights are not yet prioritising collaboration with innovative early stage companies, despite recognising the potential benefits.

Made Smarter Technology Accelerator provides hard evidence of what can be achieved by open innovation programmes: successful, real-world solutions delivered against the clock to drive real change for manufacturing giants."

Dr Jeremy Silver, CEO, Digital Catapult

- Backed by industry
- → Solving real-world challenges
- Shared technology and industry expertise
- Collaboration and peer-to-peer learning
- Mentorship and focused workshops
- Prototype and minimum viable product matched funding
- Access to potential partners
- → Showcase and recognition

The programme drives innovation across four technology layers





5G and the internet of things. including low-powered wide area networks (LPWAN), sensors, mobile and edge devices



IMMERSIVE TECHNOLOGIES

Virtual, augmented, mixed reality and haptics



ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Natural language processing, machine vision, deep learning

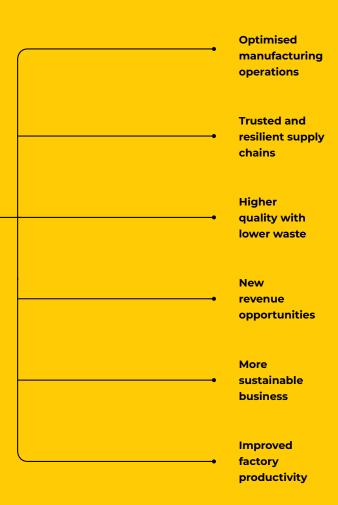


DISTRIBUTED SYSTEMS

Including blockchain, ethereum, smart contracts and distributed ledger technologies PROGRAMME THEMES AND TECHNOLOGY INDUSTRY IMPACTS

To deliver impact for industry, Made Smarter Technology Accelerator focuses on five themes

- Intelligent factory/site management and control
- Intelligent product verification and validation
- Transparent and data-driven procurement
- Digitally enabled factory workforce
- Resource measurement and analytics



Accelerating innovation

October 2020

PROGRAMME AND CHALLENGE DESIGN

Open invitation to UK industry and tech partners to join as programme partners.

Industry Challenge
Owners and Tech Sponsors
are onboarded.

All partners work together to define the programme.

Industry challenges are set.

March 2021

ONBOARDING STARTUPS

Open invitation to UK innovative startups to apply and respond to industry challenges.

Funding of £20,000 each goes to the fourteen with the strongest ideas, to produce prototype proof of concept.

June 2021

PROTOTYPE SPRINTS AND SHOWCASE

Prototype design supported by partners and tech sponsors.

Solutions presented at the prototype showcase.

Four cohort members are selected and each funded with £100,000 to produce their minimum viable product (MVP).

July 2021

MVP DEVELOPMENT

Selected MVP startups develop minimum viable products from concepts.

Digital Catapult technologists and tech sponsors host workshops to support with pitching, commissioning and technical skills

December 2021

MARKETPLACE AND SHOWCASE EVENT

MVP startups Jetsoft,
Machine Intelligence,
Riscon Solutions &
Inventia UK, and Total
Control Pro pitch their
solutions direct to an
audience of UK
manufacturing
heavyweights and
decision makers, and
we share insights and
learnings for industry.

14

Industry challenge

2

Tech sponsors

14

Challenges and innovative businesses

Who's involved

The Made Smarter Technology Accelerator programme is made possible thanks to the valuable support, expertise and resources from our industry and technology partners.

2021 INDUSTRY CHALLENGE OWNERS

babcock













2021 TECH SPONSORS

§ software∗

verizon /



Industry Challenge Owners & Tech Sponsors

babcock

Babcock International Group

Babcock is an international aerospace, defence and security company, with a leading naval business, providing value add services across a range of countries, including the UK, France, Canada, Australia and South Africa.

Babcock helps customers in the UK and around the world to improve the capability, reliability and availability of their most critical assets.

Challenge One: Warrior base overhaul

To deliver a digital twin solution that measures, assesses, visualises and tracks data to inform the Warrior Armoured Fighting Vehicles Overhaul and ensure the integrity of the vehicle hull.

Challenge Two: Digital shipbuilding

To feed complex 3D design data from a ship design model to the point of use, making it accessible where typical handheld devices are unsuitable; and to look at new ways of managing data access, version control and change management.



babcockinternational.com



Babcock International Group



BAE Systems

BAE Systems provides some of the world's most advanced, technology-led defence, aerospace and security solutions. It employs a skilled workforce of 85,800 people in more than 40 countries.

From state-of-the-art cyber threat detection to flight control systems that enable pilots to make better decisions, BAE never stops innovating to ensure that customers can maintain their advantage.





BAE Systems

Challenge One: Scalable artificial intelligence for visual inspection systems

To deliver an assistive artificial intelligence (AI) vision inspection system to assist with testing and quality checks across various assembly, manufacturing and build stages that can operate on a vastly reduced training data set.

Challenge Two: Dynamic workflow management

To develop a manufacturing scheduling and workflow management capability that can dynamically react to disruptions and changes, aiding future planning across the supply chain through automatic updates to different variables



GAF

GAF is North America's largest roofing and waterproofing manufacturer and a part of Standard Industries, a global company that has protected homes, businesses, families, and communities for over 130 years.

The company's success is driven by a commitment to empowering its people to deliver advanced quality and purposeful innovation.







Challenge One: Asphalt material characterisation

To develop a solution that will characterise, identify and understand the critical-to-quality (CTQ) results and parameters associated with asphalt materials, helping to inform downstream manufacturing procedures for a more dynamic process.

Challenge Two: Machine vision systems for product conformance and machine condition

To use machine vision and sensor technology to assess product conformity, characterise surface anomalies and identify when they occur, and evaluate the condition of critical machine components.



Northumbrian Water Group

Northumbrian Water provides water and sewerage services to 2.7 million people in the north east of England.

In 2019, Northumbrian Water Group was named the world's most ethical water company for the eighth time and was awarded 19th Best Place to Work in the Sunday Times Best Big Companies to Work For. It was also named the number one place to work in the North East.

Challenge One: A smart 'Porcupine' for sewer blockages To develop a smart version of Northumbrian Water's

To develop a smart version of Northumbrian Water's 'Porcupine' - a device used in sewers to trap unflushables - that can react to issues before any blockage or flooding is caused.

Challenge Two: Water network monitoring and real-time analysis

To develop a workable sensoring regime within a designated district meter area (DMA) to help monitor and manage water quality in near real-time.



nwt.co.uk



@NorthumbrianH2O



Northumbrian Water Group

oneills

O'Neills

O'Neills International Sports Company is the largest sportswear manufacturer in Ireland, employing over 800 staff across the island. The brand is synonymous with quality, combining cutting edge leading sportswear design and customer service excellence.

Its business is based on over one hundred years of innovative thinking, entrepreneurial spirit and empowering athletes to achieve their best. O'Neills is constantly innovating, thinking ahead, responding and improving.



oneills.com



@ONeills1918



O'Neills Irish International Sports Co.

Challenge One: Product customisation - intelligent verification

To develop solutions that can be embedded into key stages of the custom garment production line to identify any errors or requirements for adjustment, reducing delays and bottlenecks.

Challenge Two: Automation of production in the sewing environment

To develop an automation solution for customised jerseys that will enable the business to scale up production, deliver sustainability and put the UK at the forefront of excellence in worldwide garment manufacturing.



Safran Landing Systems

Safran Landing Systems is the world leader in aircraft landing and braking systems, and a partner to 30 leading commercial, military, business and regional airframers.

Safran supports more than 27,000 aircraft making over 60,000 landings every day. The company covers the full product lifecycle, from design and manufacture to in-service support, testing, repair and overhaul.

Challenge One: Adaptive scheduling and performance monitoring

To develop an intelligent rules-based scheduling system that can react to changing customer demand, increasing efficiency while reducing planning complexity.

Challenge Two: Implementation of SPC on all test rigs in the assembly shop

To develop a system that can anticipate test rig equipment failures and identify root causes for test failures through better visibility, supporting first time pass rates and predictive maintenance that will reduce equipment failures.



safran-landing-systems.com/landing-gears



@SafranLandingS



Safran – Equipment



Sainsbury's

Offering delicious great quality food at competitive prices has been at the heart of what Sainsbury's does since John James and Mary Ann Sainsbury opened the first store in 1869.

Sainsbury's has over 600 supermarkets and over 800 convenience stores. Their focus on great value food and convenient shopping is supported by their other brands: Argos, Tu Clothing, Habitat, Sainsbury's Bank and Nectar.

Challenge One: Microbial control in ready-to-eat foods

To identify and potentially inactivate bacteria on raw and cooked foods without altering appearance, taste or nutritional properties.

Challenge Two: Increasing shelf life and sell- through of products while reducing waste

To understand and react to the impact of events (such as delays or temperature changes) on a product as it moves along the supply chain, combining real-time data collection and interrogation with data-based automated feedback and control.



sainsburys.co.uk



@sainsburysnews

9 softmare[№]

Software AG

Software AG connects the world to keep it living and thriving. The company began its journey in 1969, and today its infrastructure products - covering integration and API management, IoT and analytics, and business transformation - make a world of living connections possible.

By connecting applications on the ground and in the cloud, businesses, governments and people can instantly see opportunities, make decisions and take action.

"We will always need new ideas, new ways of looking at challenges and new solutions to keep businesses moving in the right direction.

The work of digital transformation is never done, which is why we're committed to the Made Smarter Technology Accelerator programme, to help make sure that new ideas are given every opportunity to become reality."

Nadeem Malik, Head of UK & Ireland Software AG



softwareag.com



@SoftwareAG



Software AG

verizon /

Verizon Business

Verizon Business is one of the largest telecommunication technology companies in the world. Thousands of businesses, organisations and agencies rely on Verizon's network leadership and deep understanding of technology.

The company offers voice, data and video services and solutions on its award-winning networks and platforms, delivering on customers' demand for mobility, reliable network connectivity, security and control.

"We have seen tremendous interest from manufacturing customers in using new technologies to innovate their business for the future. The Made Smarter Technology Accelerator provides us with an opportunity to showcase how next-generation private 5G solutions can take this innovation to the next level by opening up new areas of creativity, partner ecosystems and operating models."

Mehdi Quraishi, General Manager International, Enterprise Innovation and 5G & MEC Solutions, Verizon Business



@VerizonBusiness



Verizon Business

375+

registrations of interest

96

applications received

14

startups selected for prototype design, from which

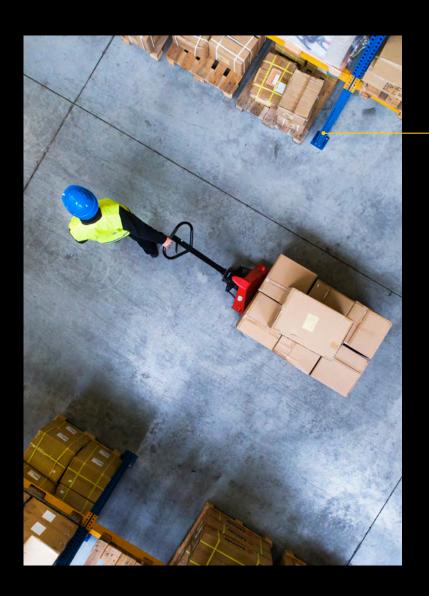
4

selected for minimum viable product development (MVP)

Programme criteria

We evaluated applications from innovative startups against the following selection criteria:

- Appropriate team experience
- Strength of the idea
- Originality of the idea
- Environmental impact
- Technology suitability/relevance
- Value proposition
- Feasibility of prototype delivery
- Technology readiness level
- Potential to answer the set challenge
- Growth potential



Prototype and minimum viable product development



JetSoft

JetSoft's innovative systems unlock the extraordinary value in inspection data for manufacturers, enabling them to drive operations, reduce waste, maximise quality and increase productivity.

JetSoft Limited works with some of the world's largest companies and has a proven track record of delivering solutions that produce significant commercial benefits.

Working with Babcock International Group on the Warrior base overhaul challenge, JetSoft has developed a solution using existing equipment and combined data output to create an automatic 3D dataset that eases the hull inspection process. "Working with Babcock has been amazing. The team has really bought into the project, devoted their time to it and backed it; their input has been a large contributor in enabling us to get to this stage."

Tom Martin, CEO, JetSoft Ltd

BIGGEST LEARNING:

"To listen, and be agile and dynamic. We went into this process with preconceived ideas that were challenged early on. We were able to use this to adapt, pivot slightly and ultimately develop a better solution."



jetsoft.co.uk



jetsoft-ltd



Machine Intelligence

Machine Intelligence Limited specialises in developing computer vision and machine learning techniques for both industry and academia, and offers expertise in systems integration, software development and artificial intelligence (AI).

The Machine Intelligence prototype for BAE Systems uses a custom, novel machine learning technique to identify defects within X-ray images during routine inspection.

machineintelligence.co.uk machine-intelligence-ltd Detecting issues quickly and reliably improves the quality of the end product, reduces waste and results in a more economical production process.

"The prototype phase gave BAE Systems and Machine Intelligence a taste of what is possible. The minimum viable product phase allowed us to create something amazing that not only works for BAE Systems, but moves Machine Intelligence's technology and solution forward."

Simon Harding, Director, Machine Intelligence Ltd

BIGGEST LEARNING:

"That giant companies can be excited to work with micro-businesses... there is real enthusiasm around leveraging the skills and technology that exist outside the world of tech giants and multinationals."





Riscon Solutions & Inventia UK

Riscon Solutions Ltd partnered with Inventia UK to work with Northumbrian Water on the water network monitoring challenge. The ITERATION project delivers a cloud-enabled remote water quality monitoring solution.

Riscon Solutions brings together specialists in physical engineering applications and digital expertise to develop information system solutions for the engineering sector. Inventia

UK blends knowledge and expertise in telecoms, big data mobility analytics, and geospatial intelligence - it delivered the first SIM-based track and trace solution.



@RogerSingleton3 riscon-solutions-ltd



@Inventia UK



inventia-uk

"It's been absolutely fantastic working with Northumbrian Water Group. The team's commitment to the project has been amazing."

Roger Singleton, Managing Director, Riscon Solutions Ltd

"Made Smarter Technology Accelerator is not only a great funded entry into the water supply market for us, but also a big opportunity to strengthen our existing smart city offerings."

Amir Kotb, Head of Technology & Founder, Inventia UK

BIGGEST LEARNING:

"Learning about how to take a product to market. Taking a solution from seed to shelf is not something everyone will get to do in their lifetime, and it's a really exciting time for us."



Total Control Pro

TotalControlPro™ is an affordable and accessible SME manufacturing platform that enables control of varied production facilities.

The company's dynamic, data-driven planning scheduling and resource optimisation solution for Safran tackles the challenges facing industry for complex planning and resource management.

It identifies best possible planning options and makes recommendations for scheduling, and as learning occurs, these become more accurate and responsive to manufacturing conditions.

totalcontrolpro.com



totalcontrolpro

"Working with Safran Landing Systems and the Made Smarter Technology Accelerator programme will enable Total Control Pro to build dynamic planning that's available to all manufacturers, large and small."

Dolores Smellie, CEO, Total Control Pro Ltd.

BIGGEST LEARNING:

"The challenges of working with legacy systems in a regulated environment, and the opportunity for agile solutions to solve problems. Basically, there's lots of room for innovation in partnership with established systems."



Prototype development

PHASE 1: PROTOTYPE DEVELOPMENT





Ascalia

Sainsbury's challenge: Microbial control in ready-to-eat foods

Manufacturing technology company Ascalia used high-tech cameras and artificial intelligence (AI) to automatically analyse all fresh food items to ensure they were free from bacteria and would not spoil before arriving on the shelves.



ascalia.io



ascalia

"We are thrilled to be working with Sainsbury's, helping them ensure food is as fresh as it gets, and in turn learning from a reputable industry partner."

Marin Bek, CEO, Ascalia

CAE Tech

Babcock International Group challenge: Digital shipbuilding

CAE Tech paired cutting-edge technologies from the gaming and music sector with a cloud-based application to enable Babcock engineers to connect with their CAD and bill of materials (BoM) data sources, for real-time data sharing and updates.



cae.tech



@cae_tech

in CAE-Tech-Limited

"We are extremely proud to have been selected by Babcock International Group and Digital Catapult for the Made Smarter Technology Accelerator."

Peter Harman, Founder & CTO, CAE Tech Ltd

DIEMinnovations



DIEM Innovations

BAE Systems challenge: Dynamic workflow management

Using AI, the manufacturing scheduling and workflow management solution designed by DIEM Innovations can dynamically react to disruptions and changes. The integrated system enables targeted measures to be used to improve supply chain performance.



dieminnovations.co.uk



"We're excited to continue working with BAE Systems on the complex logistical challenge of understanding and improving the supply chain."

Alexander Howard, MD, DIEM Innovations

Innvotek

Northumbrian Water challenge: A smart 'Porcupine' for sewer blockages

From the sewage stream, Innvotek's Smart Porcupine provides remote observation and tracking of potential blockages. Operating continuously, it harnesses artificial intelligence to provide users with data and alerts using wireless connectivity.



innvotek com



@innvotek innvotek

"We look forward to seeing Northumbrian Water reduce the risk of sewer flooding through deployment of our smart sensor technology."

Dr Michael Corsar, CTO, Innvotek Ltd

PHASE 1: PROTOTYPE DEVELOPMENT



Metis Automation

O'Neills challenge: Product customisation - intelligent verification

The solution from Metis Automation converts customer order data into simple, easy to follow manufacturing steps and checks. The system automatically updates work processes for customised products, and enables the user to easily make bespoke and mass-produced clothing at the same cost.

metisautomation.co.uk

@metisautomation
metis-automation

"Reduction of material waste and conserving energy usage is a key goal of our Made Smarter prototype."

Martin Griffiths, CEO, Metis Automation



Pentiot

O'Neills challenge: Automated production in the sewing environment

Pentiot's robotic solution uses existing methodologies and practices to achieve consistent results, leveraging artificial intelligence to dynamically alter the feed rate of material through sewing machines.

pentiot.com

@pentiot1

n pentiot

"We can locate manufacturing at the business edge, for example, delivering PPE and fashion on demand with the lowest possible carbon footprint."

Nic Stirk, CEO, Pentiot Ltd

PHASE 1: PROTOTYPE DEVELOPMENT PHASE 1: PROTOTYPE DEVELOPMENT





Singular Intelligence Ltd

Sainsbury's challenge: Increasing shelf life and sell-through of products while reducing waste

Using an Al-based decision-making system, the solution from Singular Intelligence predicts food product shelf-life at every stage of the supply chain, and the automated control system makes optimal corrective actions.

singularintelligence.com

@singularinsight

in singular-intelligence-limited

"This gives us the opportunity to take a leap towards realising our vision of building technologies for both commercial and social impact."

Sarvesh Kumar, CEO, Singular Intelligence Ltd

Volatile Technologies

GAF challenge: Asphalt material characterisation

Volatile Technologies designed a solution for rapid, portable chemical testing for asphalt variations. This is based on its Scout-2 chemical and olfactory testing instrument, and delivers non-invasive, batch-on-batch asphalt profiling without specialist lab equipment.

volatile.ai

n volatile-ai

"This should allow much broader and more affordable chemical testing, ultimately guaranteeing the highest quality final product."

Adomas Malaiska, CEO, Volatile Technologies Ltd

PHASE 1: PROTOTYPE DEVELOPMENT

PHASE 1: PROTOTYPE DEVELOPMENT





Zeta Motion & Dakota

GAF challenge: Machine vision systems for product conformance and machine condition

The solution from Zeta Motion and Dakota is fast, accurate, affordable and scalable. It uses smart cameras and advanced AI for continuous quality controls - there is no need to stop the production line.

zetamotion.com

@zetamotionltd zetamotion

(11)

daksys.com

• •---

@daksys

dakotasystems

"This challenge represents an ideal opportunity for us to showcase our innovative technology and products."

Dr. Wilhelm Klein, Co-Founder & CEO, Zeta Motion Ltd

Zizo Software

Safran Landing Systems challenge: Implementation of SPC on all test rigs in the assembly shop

The Zizo solution creates an end-to-end repository and platform to manage data from across teams and functions, combining device management and analytics without the need to implement a factory-wide network. As it can be connected to any protocol, mobile engineers don't have to rely on an internet connection or cloud-based database.

#

zizo.co.uk

y

zizo

"We can't wait to demonstrate the power of edge analytics and what it is possible to do with data."

Peter Ruffley, CEO, Zizo Software



Delivery partners

Made Smarter Technology Accelerator is part of the national Made Smarter movement.

It is delivered by Digital Catapult, and funded by UKRI through the Industrial Strategy Challenge Fund.

MADE SMARTER

Made Smarter

Made Smarter is a national movement to drive growth amongst UK makers and advance the UK economy.

Backed by world-renowned businesses and the UK government, Made Smarter works to improve the development and adoption of emerging technologies making a real, everyday difference to people from the boardroom to the factory floor.



The Made Smarter Review found that the positive impact of adopting industrial digital technologies (IDT) could be as much as £455 billion for UK manufacturing over the next decade:

- Increasing manufacturing sector growth by 1.5-3% per annum
- Improving industrial productivity by 25%
- Reducing greenhouse gas emissions by 4.5%



madesmarter.uk



@MadeSmarterUK



Made Smarter UK





Digital Catapult is the UK authority on advanced digital technology. Through collaboration and innovation, we accelerate industry adoption to drive growth and opportunity across the economy.

We bring together an expert and enterprising community of researchers, startups, scaleups and industry leaders to discover new ways to solve big challenges to unlock the UK's future potential.

digicatapult.org.uk

@DigiCatapult

n Digital Catapult

Through our specialist programmes and experimental facilities, we make sure that innovation thrives and the right solutions make it to the real world.



Our goal is to accelerate new possibilities in everything we do and for every business we partner with: breaking down barriers, de-risking innovation, opening up markets and responsibly shaping the products, services and experiences of the future.

- Supporting virtualisation and cyber-physical systems
- Developing digital and resilient supply chains
- Driving openness and interoperability of digital infrastructure



UK Research and Innovation

UK Research and Innovation (UKRI) is the largest public funder of research and innovation in the UK, with a budget of over £8 billion.

Composed of seven disciplinary research councils. Innovate UK and Research England, it works with partners in higher education, research, businesses, government and charities.

The UKRI's Industrial Strategy Challenge Fund aims to bring together business and the UK's world-leading research to meet the major industrial and societal challenges of our time.





@UKRI News

UK Research and Innovation



UKRI works to build a thriving, inclusive research and innovation system that connects discovery to prosperity and public good.

- The fund provides funding and support to UK businesses and researchers, part of the government's £4.7 billion increase in research and development over the next four years.
- It ensures that research and innovation takes centre stage in the government's modern Industrial Strategy.



Thank you

Our thanks go to all the organisations mentioned in this guide, and to the Made Smarter Technology Accelerator Community Partners that have helped to deliver a bigger impact and build a stronger manufacturing community,





















Get set for the fourth industrial revolution

Technological advancements in the manufacturing and industrial sectors are key to strengthening the UK economy, creating many new, exciting and well-paid jobs.

The advancement and adoption of technology holds huge potential for manufacturers and the industrial sector, yet this can feel like a lengthy and costly process.

Made Smarter Technology Accelerator is growing a community of manufacturers and innovators, speeding up innovation, and unlocking the significant benefits that the adoption of advanced digital technology brings to the UK economy.

Get set for the future. Now.

madesmartertech.uk



72

TECHNOLOGY ACCELERATOR

© Digital Catapult 2021 Digital Catapult 101 Euston Road London NW1 2RA digicatapult.org.uk