

# Future of Medicines Manufacturing Work – Consultation Webinar

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**MADE  
SMARTER**  
INNOVATION



**DM<sup>2</sup>**  
Digital Medicines  
Manufacturing



**CMAC**

**INTERACT**  
Pioneering human insight for industry

A MADE SMARTER INITIATIVE

# Aims of this session

- Engage in discussion around the future of medicines manufacturing work
- Capture our hopes (“the future we want”) and fears (our concerns)
- Articulate actions we should be taking now

# Agenda

1. Background to Made Smarter, DM<sup>2</sup> & InterAct
2. A few words to provoke discussion
3. Over to you:
  1. “the future we want”
  2. our fears and concerns
  3. actions

# 1. Background to Made Smarter, DM<sup>2</sup> and InterAct

<https://www.madesmarter.uk/>



# Made Smarter Innovation

- EPSRC Research Centres
- Made Smarter Hubs
- Collaborative R&D
- Digital Accelerators
- InterAct

<https://www.madesmarter.uk/made-smarter-innovation/>

We are a digital innovation ecosystem transforming UK manufacturing.

**We're investing £147 million to develop digital manufacturing ideas more quickly.**

# MADE SMARTER INNOVATION



## STANDARDS

Addressing interoperability challenges through standardisation



## RESEARCH CENTRES

### £30m Research Programme

- 5 Multidisciplinary centres launched - looking at digital innovations
- Further programme shaping future of digital manufacturing using Economic and Sciences



## COLLABORATIVE R&D

### £60m Collaborative R&D

- Industry Lead consortia
- 1 - Fast Start (£20M) - nearing completion
- 2 - Digital Supply Chain (£20M)
- 3 - Smart Factory (opens in Nov)



## INNOVATION HUBS

### £30m Innovation Hubs

- Digital Supply Chain hub lead by Digital Catapult launched
- Smart Factory Hub competition ongoing - will launch Jan 2022



## DIGITAL ACCELERATORS

### £6m Investment

- Tech Start-up/SME focussed
- £1M programme nearing completion
- £5M to be launched early 2022



## GLOBAL

### £10m Investment

- First programme launched in Taiwan
- Work ongoing with focus on Singapore and India



# Funding

Co-funded by the Made Smarter Innovation challenge at UK Research and Innovation

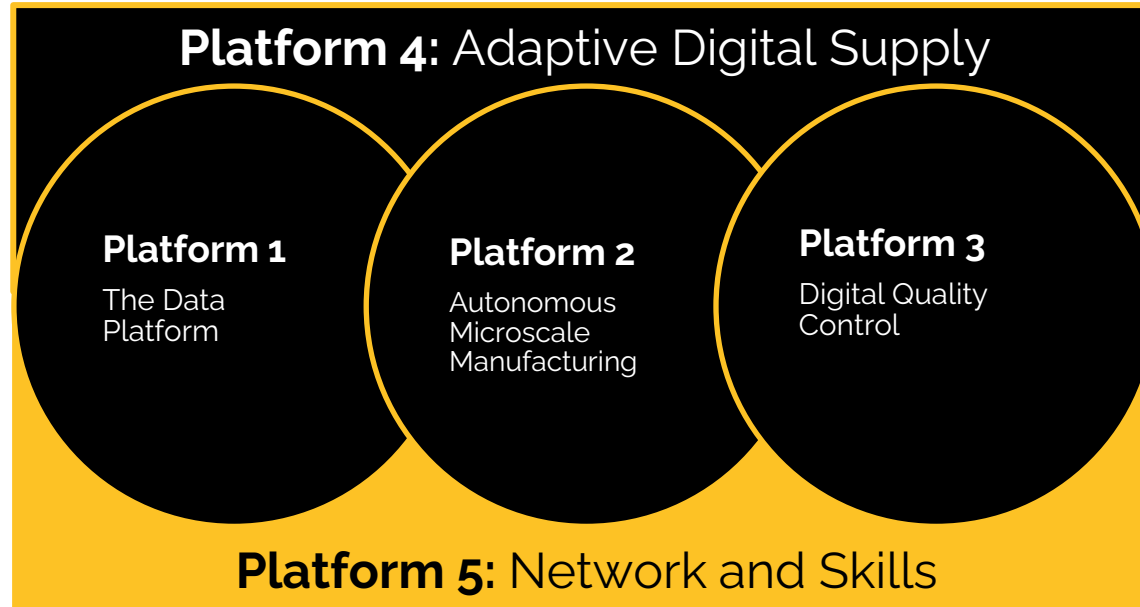
# £5m



# £2.9m



5 integrated research delivery Platforms



## Goals

- Deliver foundational data platform
- Enable the workforce of the future & embed digital culture
- Transform medicines development, manufacturing & QC productivity & speed
- Accelerate IDT adoption
- Drive adaptive, patient-centric supply

# Benefits

## Reduce:



Lead time (95%)



QC costs (50%)



Waste (30%)

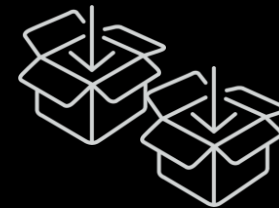


Medicine shortages



Write offs

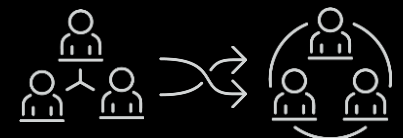
## Increase:



Productivity (25%)



Patient healthcare outcomes



Skilled workers & new business models

# DM<sup>2</sup> Key IDT areas

## Industrial Digital Technologies (IDTs)



Big data



Artificial Intelligence



Robotics



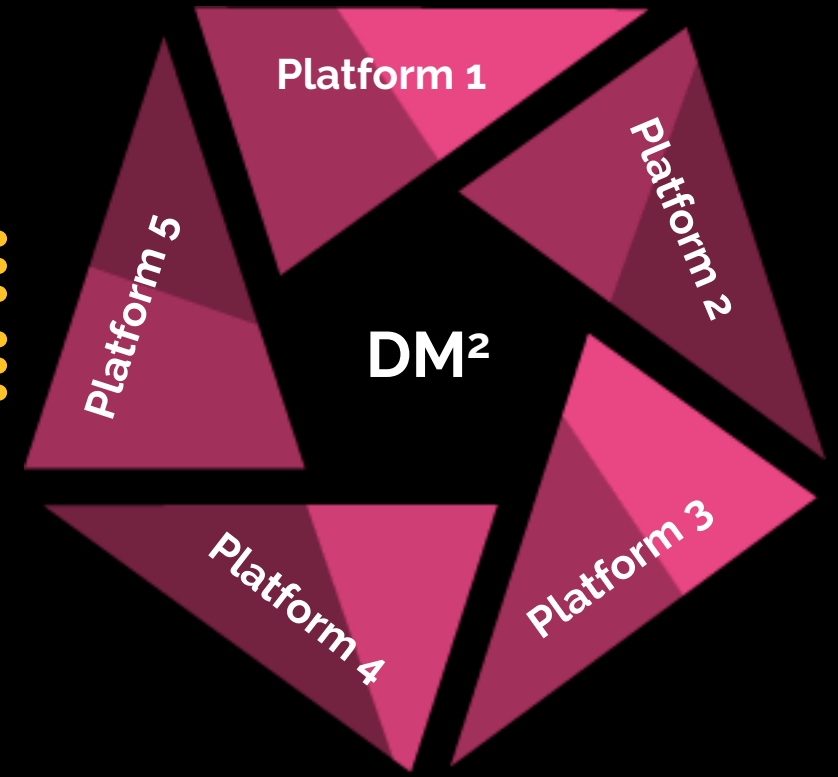
Digital Manufacturing



Digital Twins



Digital Upskilling & Socialisation





# Enabling the lab of the future



## Co-created Solutions

- Demonstrated IDT tools that address needs
- Users involved in all stages



## Digital Leaders

- Champion IDT goals
- Explain the value of data & IDTs
- Encourage risk taking and innovation



## Skilled Workforce

- Data literacy, technological skills and creativity
- Enable Augmented Workforce
- Turn data into knowledge into actions



## Trust in Data & IDTs

- Disseminate & Share Data & Tools
- Explain User Stories & Use Cases
- Confidence from Translation

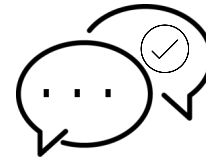
Encouraging a cultural shift through skills development and learning



Community driven



Co-creation & co-delivery



Drive acceptance & adoption

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# INTERACT

Pioneering human insight for industry

Co-Directors - Jill MacBryde (Strathclyde) and Jan Godsell (Loughborough)

1<sup>st</sup> November 2021 - 31<sup>st</sup> December 2024

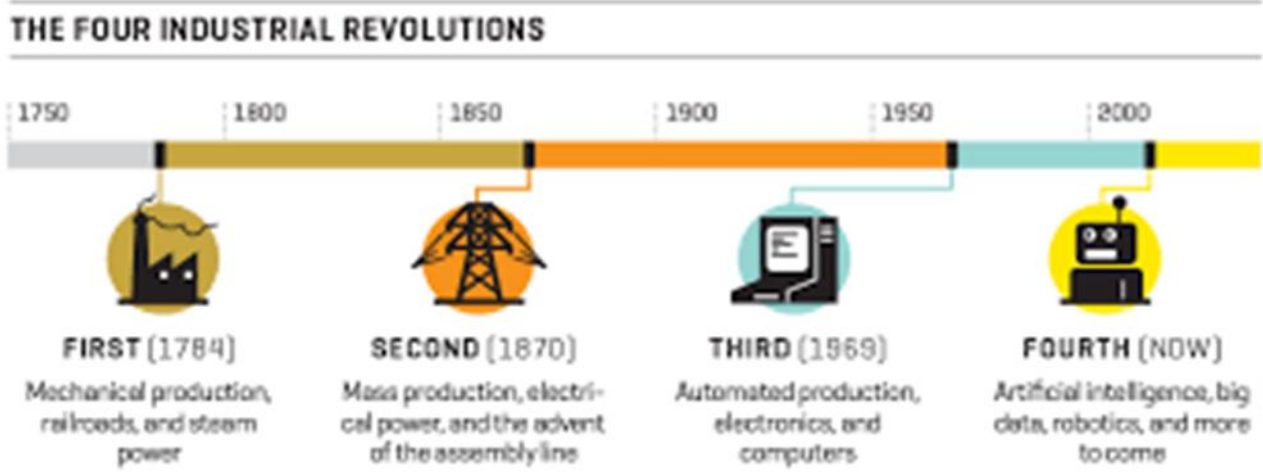
# Enabling 'the future we want'

Activity	<b>Core Research Programme</b>	<b>Commissioned Research</b>	<b>Impact Acceleration</b>
Purpose	<b>Direction Setting</b>	<b>Respond to industry needs</b>	<b>Actionable insights for industry</b>
Focus	<b>Future of Manufacturing Ecosystems</b> <ul style="list-style-type: none"><li>- Work</li><li>- Economy</li></ul>	<b>Meta-reviews</b> <b>Small projects</b> <b>Sandpit</b>	<b>Funding</b> <b>Workshops</b> <b>Storytelling</b>
Time Horizon	<b>2035</b>	<b>2024</b>	<b>2022+</b>
<b>Knowledge Exchange Programme</b>			

## 2. A few thoughts to provoke discussion around the future of manufacturing work....

- industrial revolutions - winners and losers
- attitudes to work are changing
- concerns around the environment and a sustainable future
- equality, diversity and wellbeing
- focus on resilience
- why do governments want to accelerate the digital journey?
- skills and leadership
- politics, economics, social factors and technology
- near future vs. longer term

# Industrial revolutions bring winners and losers



# The challenge for medicines manufacturing

Medicines manufacturing is a key sector for the UK, generating exports of over £25Bn with the highest GVA of any sector (£8.5Bn), investing over £4Bn p.a. on R&D in the UK<sup>1a</sup>.

However, the industry faces:



Competition<sup>1b</sup>



Time consuming processes <sup>2</sup>



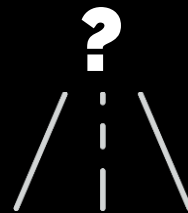
Increasing costs <sup>3</sup>



Disruptive practices



Increased personalisation



Changing regulatory landscape



Increased direct-to-patient demand



Focus on sustainability

<sup>1</sup> (a) [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/811347/life-sciences-competitivenessdata-2019.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/811347/life-sciences-competitivenessdata-2019.pdf) (b) <https://ukmfgreview.com/sectors/pharmaceuticals-2/>

<sup>2</sup> Paul et al., Nature Rev Drug Disc, 9, 203-214, 2010;

<sup>3</sup> Farid, S. et al, MABS, 12(1), e1754999, 2020; DOI: 10/1080/19420862.2020.1754999

# Attitudes to work are changing

- People looking for flexible working
- Concern over wellbeing
- The great resignation
- The 4 day week
- Work – life balance
- The cost of going to work
- Employers struggling to recruit and retain



# Sustainability

- UN SDGs and NetZero
- Near-shoring
- Profit, planet, people





# Equality, Diversity and wellbeing

- Manufacturing seen as poor on diversity and wellbeing
- Tamim Bayoumi deputy director IMF expects inequality to lessen with technology.
- The Kuznets model predicts that the rise in inequality will reverse. Indeed, a plateau in income inequality is already apparent in the UK data. Issues of place.



# Resilience

- Shift from lean to resilient
- Changing attitudes
- More local?



# Skills & Leadership

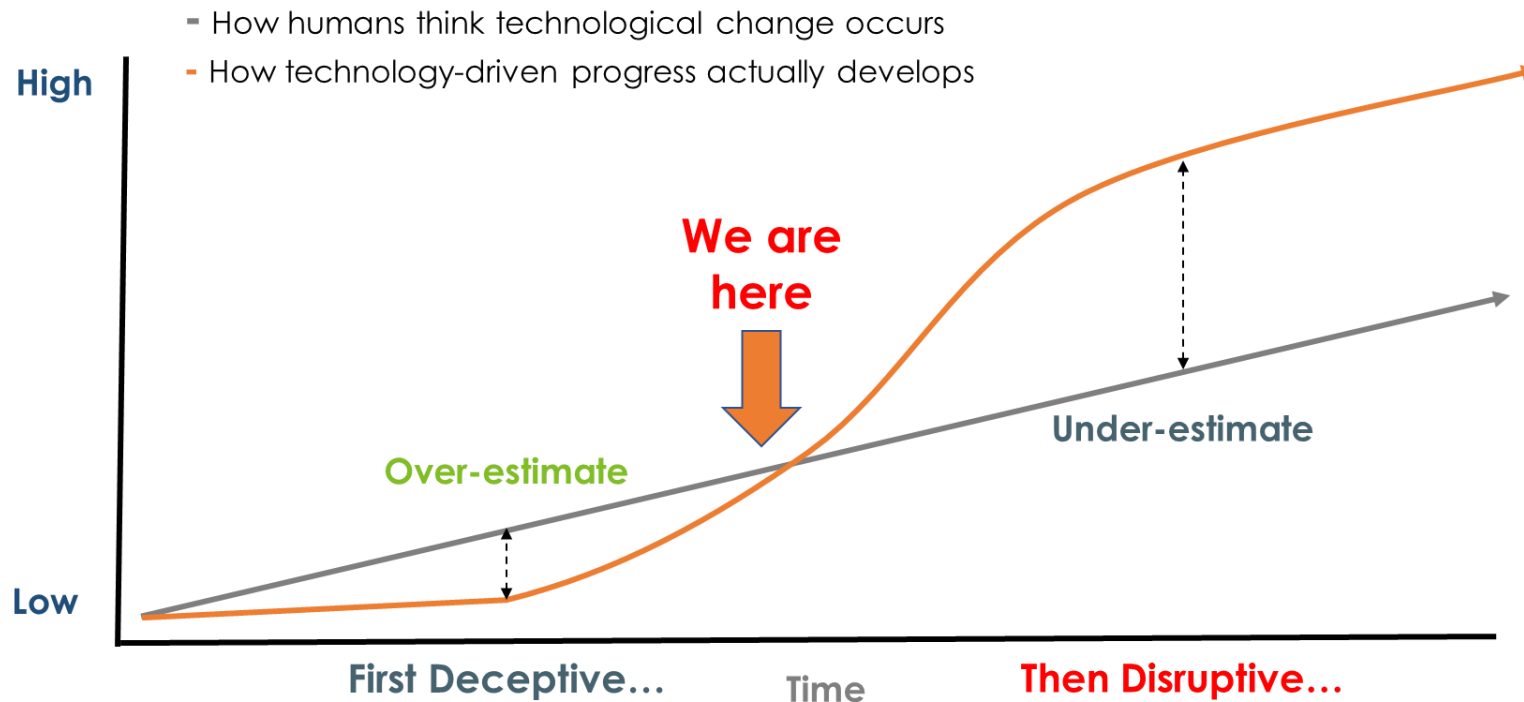
- 2021 report – “Unlocking the Skills Needed for a Digital and Green Future”  
Make UK in partnership with Sage
- Recent Make UK report, released September 2022 – “2030 Skills: Closing the Skills Gap in UK Manufacturing” (in partnership with Sage)
- Upcoming report on Leadership & Management (in partnership with Rockwell Automation)
- “Life Sciences Skills Strategy 2030”, [www.scienceindustrypartnership.com](http://www.scienceindustrypartnership.com)
- “Bridging the Skills Gap in the Biopharmaceutical Industry” ABPI, Jan 2022

# What do governments want to achieve?

- Competitiveness for manufacturers
- Good jobs, happy workforce
- Attracting people into well paid manufacturing jobs
- Improved productivity
- More sustainable future
- Resilient economy

# Near future vs. longer term

Amara's Law: "We tend to over-estimate the impact of technology in the short-term, and under-estimate it in the long-term."



# Politics, economics, society and technology

- Countries investing in people and skills
- Taxation
- Brain drain
- Incentives
- Apprenticeships
- Partnerships

# 3. Let's hear from you....



## 3.1 What is your vision of “the future we want”

- might want to think about 5 years out, 10 years out and 20 years out





## 3.2 What are your fears for manufacturing work in the future

- might want to think about 5 years out, 10 years out and 20 years out



## 3.3 To bring about “the future we want” what do we need to act on now?

- this might be about policy, academia, within companies....

# Connect and start interacting

Follow us on Twitter: @InterActNetwork  
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Visit our website: [www.interact-hub.org](http://www.interact-hub.org)

**UK  
RI**

Economic  
and Social  
Research Council

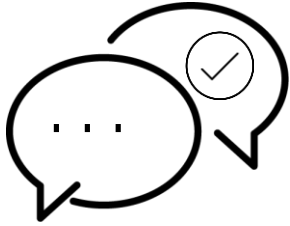


# Ways to get involved

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 Contribute to our  
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forum



 Follow us online



 Take part in our events  
and networking  
activities



 Become a  
partner



Visit [cmac.co.uk/dm2-home](https://cmac.co.uk/dm2-home) for  
details and links, or



Get in touch if you wish to discuss

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# Contact us


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## Interested in becoming a partner:



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