Making the shift to digital.

High value collaboration – the international opportunity for the UK

Ben Sheridan, BSI

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BSI: shaping standards for business, consumers and society

What is BSI?

- The UK's National Standards Body (NSB)
- Private sector organization with NSB operations in public interest
  - Royal Charter company (no shareholders)
  - Appointed by Government as the NSB
- Stakeholder involvement: understand needs
  - Committee-led standards-making
  - Principle of public consultation
  - Consumer network and British Standards Society
  - Duty to engage with all relevant stakeholders, including Government
- International perspective: ISO, IEC, CEN, CENELEC
- Global certification business and owner of Kitemark

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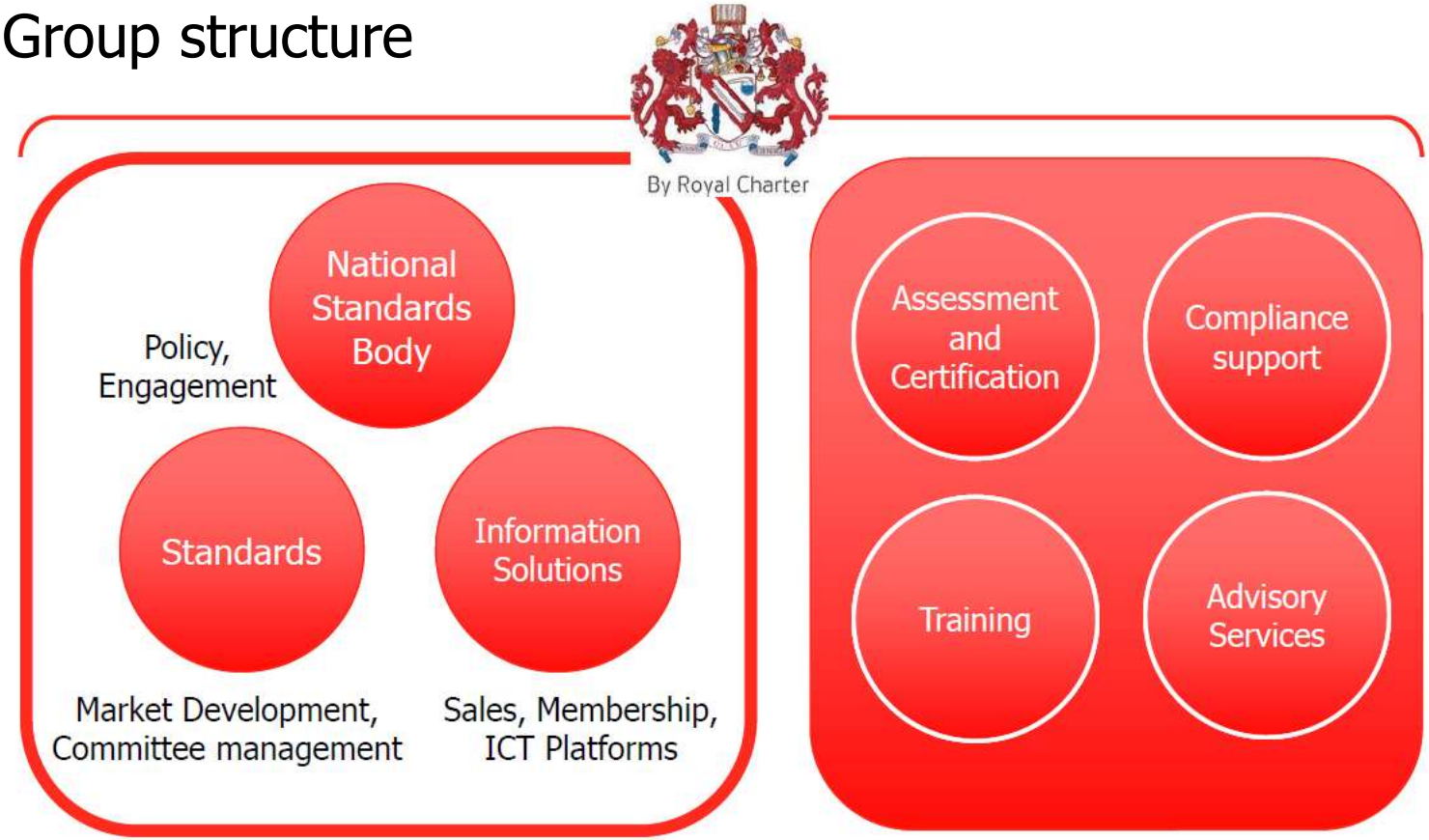
BSI Group structure



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The international and European standards bodies

ISO
(International Organization for Standardization)
164 National Standards Body members globally

IEC
(International Electrotechnical Commission)
80 members (National Committees)
and 80 affiliates globally

ITU
(International Telecommunications Union)
Agency of the UN. Members are national governments and industry

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Department for Culture Media & Sport

(UK member)

CEN
(European Committee for Standardization)

CENELEC
(European Committee for Electrotechnical Standardization)

- CEN/CENELEC have 33 member countries (EU ×28, EFTA ×3, FYROM and Turkey)
- Like the UK, 24 countries have common members of both CEN and CENELEC

ETSI (European Telecommunications Standards Institute)
Industry, government and NSB members

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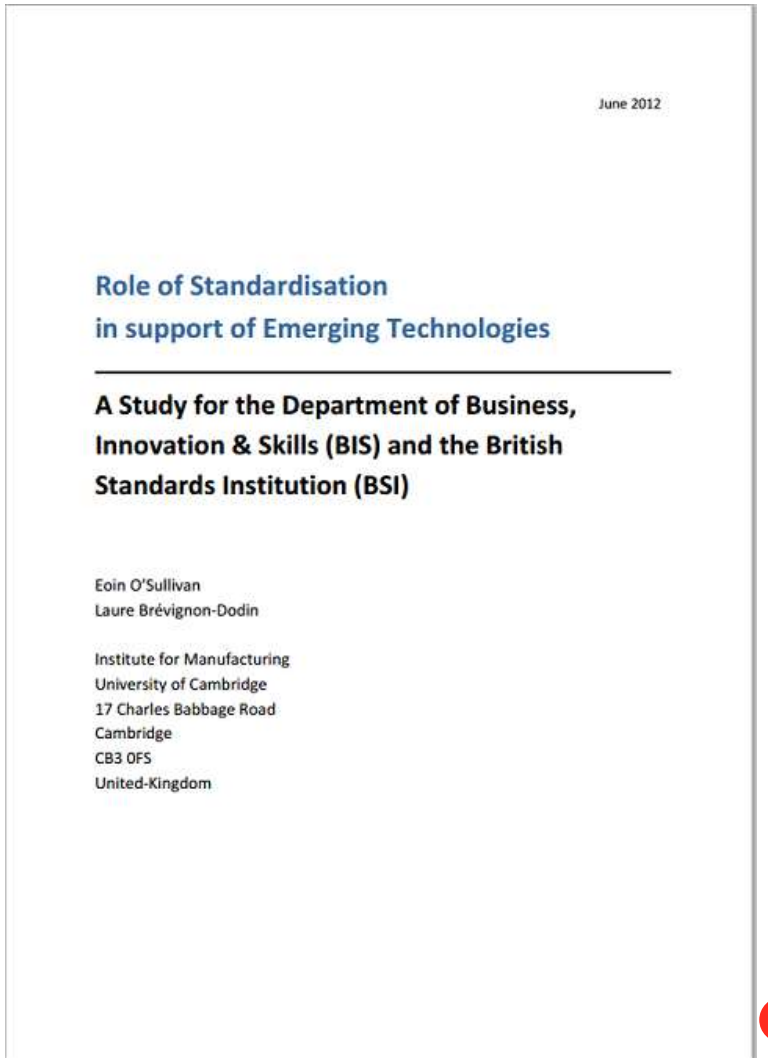
Role of standards in support of innovation

- Report by IfM identified how successful innovation systems (US & Germany) adopt strategic approach from an early stage.
- Technologies at different stages of emergence require different response from standards.
- Companies at difference stages of maturity also require different standards response.
- ***Critical to success of strategic approach is the partnership of standards development organisation with convening partner.***



June 2012

Role of Standardisation
in support of Emerging Technologies

A Study for the Department of Business, Innovation & Skills (BIS) and the British Standards Institution (BSI)

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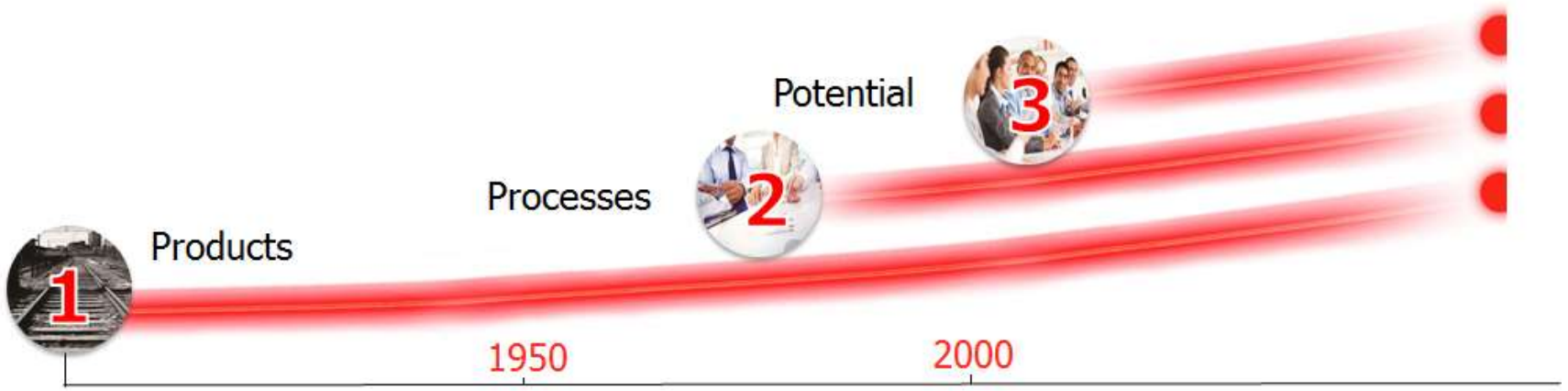
Organisations need all three types of Standards to deliver products and services for the rapidly changing world market



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Examples of different types of standards

Product

Technical interoperability – underpins efficiency and focusses innovation in areas that add value

- Interoperable components
- Materials specifications
- Test & verification methods
- Interoperability of data
    - Concept models
    - Discovery
    - Formats
    - Use of data

Process

Demonstration of quality – enables organisations to work together

Management Systems

- Quality Management Systems (ISO 9001, AS 9100, ISO/TS 16949)
- Environmental Management Systems (ISO 14001)
- Information Security (ISO 27001)

Process optimisation

- Design for Remanufacture (BS 8887)
- Asset Management (ISO 55000)

Framework

Values & Behaviour

- Better collaboration (BS 11000)
- Smart City decision making framework (PAS 181)
- Robot ethics (BS 8611)

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New approach to handling complex issues – Smart Cities

- Partnership between BSI and Future Cities Catapult – **Cities Standards Institute.**

- Builds on:
  - **PAS 180** smart cities terminology
  - **PAS 181** smart cities framework
  - **PAS 182** smart cities data concept model
  - **PD 8101** planning of future city developments
  - **PD 8100** Overview of smart cities

Future Cities

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27 October 2014

Catapult and BSI Launch Future Cities Standards Institute

This week saw the first working session of the Future Cities Standards Institute, a new partnership between the Future Cities Catapult and the British Standards Institute (BSI). The Future Cities Standards Institute, housed at the Future Cities Catapult, will drive the development of a coherent standardisation work programme to create the right condition and help future cities market to flourish.

The first session brought together over 25 experts from the private sector with representatives from government, cities and smaller companies to brainstorm areas where standards will help grow the market for future city solutions.

The Future Cities Standards Institute builds on work by BSI to develop 3 standards in this area: PAS 180 on smart cities terminology, PAS 181 a smart cities framework, and PAS 182 a smart cities data concept model, as well as PD 8101 around planning of future city developments and PD 8100 'Overview of smart cities' which will be published by end of the year. Please see the BSI website for regular updates on these.

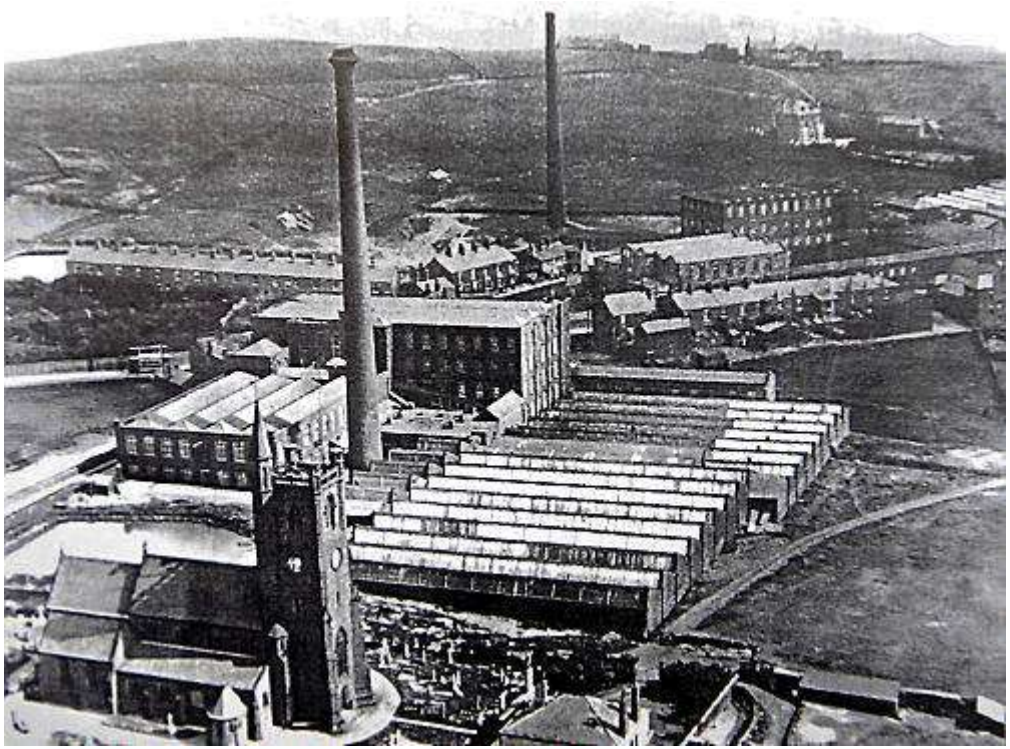
Building Information Modelling (BIM)

- HMG is committed to developing BIM Level 3. 2016 Budget stated:

"The government will develop the next digital standard for the construction sector – Building Information Modelling 3 – to save owners of built assets billions of pounds a year in unnecessary costs, and maintain the UK's global leadership in digital construction."

- This builds on success of BIM Level 2 based on BSI standards that:
  - Provide a framework for collaboration between architects, engineers, and construction professionals.
  - Specify how to manage information in both the capital/delivery and operational phases of a construction project
  - Describe how to manage facilities using BIM
  - Use BIM in a way that does not compromise information security

Industrie 1.0



- Originated in the UK
- Initial gains made in:
  - Productivity of textiles manufacture
  - Efficiency of steam power
  - Productivity and quality of iron products.
- Quickly led to global benefits e.g. rise of manufacturing and wealth creation in Germany and US.

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Definition of Digital Manufacturing: e-Enablement of value chain optimisation

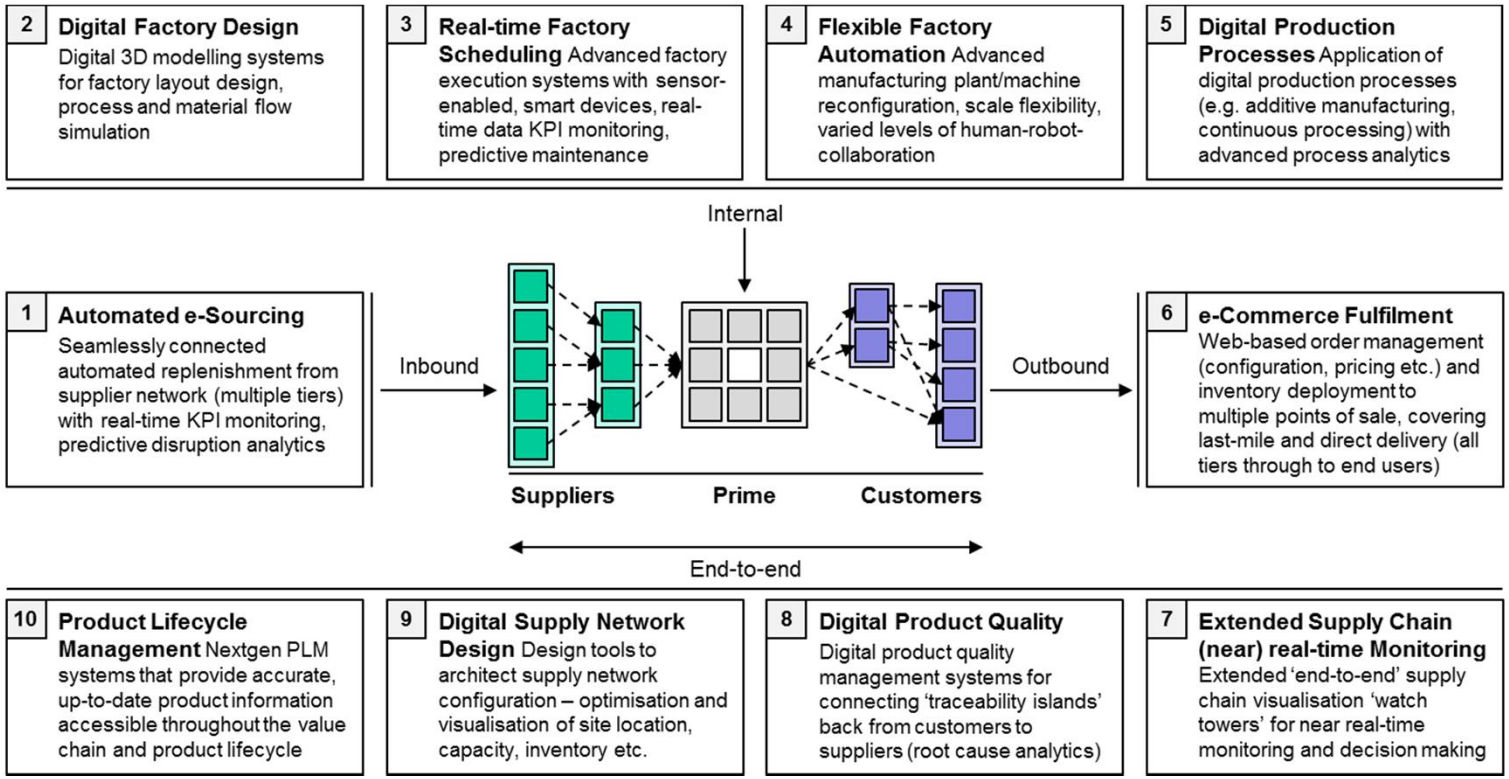
- Digital manufacturing is the **collaborative** transformation of manufacturing through the exploitation of advances in ICT

- Digital manufacturing transformation enables new supply chain and operations capabilities (scenarios) to emerge that exploit advances in digital technologies, devices, data analytics, data integration and management across the value chain in many sectors

- Digital manufacturing requires the development of new systems engineering competencies (systems modeling, simulation and interface design) and skills (attitudes) across the manufacturing value chain (R&D, design, supply, production, distribution, in service, disposal

- Digital manufacturing offers significant national and corporate competitive advantage through affordable flexibility, personalisation and product/service tailoring

Digital Manufacturing scenarios



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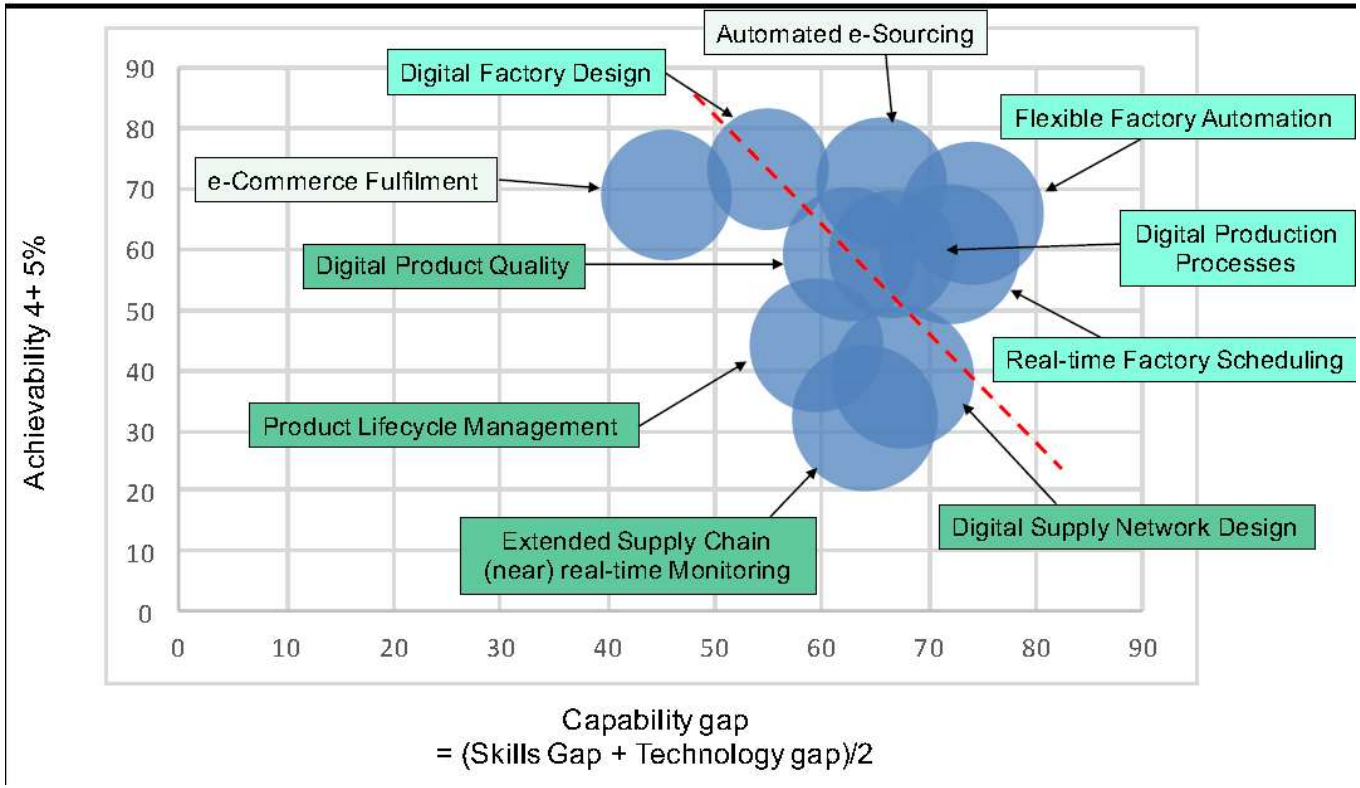
There is a clear need for initiatives and standards to encourage collaboration as key to UK success in digital manufacturing



- Overcoming the skills and technological gaps for intra company digital scenarios is easier than for inter company scenarios
- The greater relative difficulty for intercompany scenarios is evidence of the need for initiatives and standards to encourage collaboration and sharing

Initial view of standards to accelerate innovation in digital manufacturing

- **Interoperability of data and machines.** Establish what data are recorded and in what format (e.g. RAMI4.0, ISO Smart Manufacturing SAG, IEC SG8)
- **Using data in a manufacturing context.** Engineering decisions (relating to e.g. product quality, supply chain optimisation & resilience, asset maintenance, design) will be made based on wide range of fast-moving data. Each actor in the supply chain needs to be aware of how these data are being used, and for what purpose, and therefore what needs to be done.
- **Governance in a digital environment.** How do we make decisions based on others data? Are the data secure enough and reliable, and is ownership clear? What does the company need to do to manage risks from using data? May require a common 'decision making framework' across supply chains.
- **Performance assurance of 'digital' twins.** Real, physical systems will be made using virtual modelling capabilities. For these to be widely adopted and exploited there needs to be confidence in their results – assurance.
- **Collaboration.** Digital innovation in manufacturing is driving behaviour away from transactional relationships towards more collaboration. All actors need to understand the basis of the collaboration, have common expectations, and what their obligations are in the partnership (e.g. BS 11000).
- **Others.** Obsolescence management, design for 'X', management systems in a flexible manufacturing context.

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