Digitalisation in Manufacturing

Industry 4.0 and Robotics

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Industry 4.0

1\textsuperscript{st} Industrial Revolution
- Machines;
- Water power;
- Steam power.

2\textsuperscript{nd} Industrial Revolution
- Electrical power;
- Division of labour;
- Mass production.

3\textsuperscript{rd} Industrial Revolution
- Automation;
- Robotics;
- PLC.

4\textsuperscript{th} Industrial Revolution
- Information and Communication Technology (ICT)

Source: The Manufacturing Technology Centre
Industry 4.0 – The vision

Seamless connectivity
Leveraging information through intelligence
Smart factories
Robots & automation

Source: The Manufacturing Technology Centre
What is a robot?

Industrial verses service robots
The challenges for UK manufacturing today

Growing competition from overseas
Rising costs (energy & materials)
Skills shortage
  • 257,000 vacancies in engineering practices by 2022
Brexit?
  • Competition
  • Tarrifs?
  • Labour availability
Productivity
  • UK economic growth continues to be hampered by low productivity
  • GDP per hour worked is lower than in 2007 (employment is higher)

GDP per hour worked, G7 countries, 2014 and 2015

Source: Organisation for Economic Co-operation and Development, Eurostat and Office for National Statistics calculations
Solving the productivity puzzle

Working smarter – learning from automotive

Productivity has grown in the UK transport manufacturing sector

Companies now produce 56% more per hour than in 2009

Car manufacturers now producing 11.5 vehicles per employee per year compared to 9.3 in 2009

Investment in new technology has been a major factor

Introduction of new technology has also created thousands of jobs

Work smarter, not harder

• Give staff the tools to do their jobs more efficiently

But …..
The UK invests far less in robots

Robot density in non-automotive sectors

(Number of robots per 10,000 employees)

Three major trends behind growth of advanced industrial robots:

- Greater cost-effectiveness when compared with human labour
- Technological advances are wiping out barriers to adoption
- Arrival of systems that smaller manufacturers can afford and easily use

By 2025, the share of tasks performed by robots will rise from a global average of around 10 percent to about 25 percent across all manufacturing industries.

Wider robotics adoption will boost manufacturing productivity by up to 30 percent.

When costs are sufficiently low, robot installation rates likely to accelerate rapidly, creating a substantial competitive advantage.
Unlocking the ABB potential in digital

ABB Ability™: industry-leading digital solutions built on a common set of standard technologies

- Open access, intelligent cloud
- New end-to-end digital solutions
- Systems to master process control
- Closing the loop with connected devices
ABB Ability™ solutions & platform

180+ ABB Ability™ solutions

What

Utilities solutions
Industry solutions
Transport & Infrastructure solutions

Delivers customer benefit (uptime, speed, yield…)

How

Platform
(common technologies for device, edge, and cloud)

Provides ABB with efficiency and scale
### ABB Ability in Industry

Improved productivity (+200%), reduced energy (-30%), & longer product life (+30%)

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Increasing Uptime, Reliability and Efficiency throughout the Life Cycle

ABB Ability and digital development in our portfolio

Yesterday
- Pioneers in Remote Services
- Service Intelligence Unit

Today
- Remote Access and Assistance
- Condition Monitoring
- Robots controlled locally, connected
- API services
- Fleet management
- Virtual Robot Technology
- Customized Applications

Tomorrow
- Production Optimization
- Fleets of robots with shared, distributed control
- Virtual Commissioning
- Digital Twin
- Connected Services
- Robot Controller
- Robot Studio

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UK Government Industrial Strategy

Boost the economy, build on the country’s strengths and embrace the opportunities of technological change

Industrial Strategy Sector Deals
- Life Sciences
- Automotive
- Construction
- Artificial Intelligence

Industrial Digitalisation Review
- Becoming a global leader in Industrial Digitisation by 2030
- Worth £455B over next 10 years
- 175,000 new jobs
- Upskill 1M industrial workers
Knowing where to begin can be difficult

Most F&B producers are struggling when it comes to implementing digital technologies

70% of the survey respondents believe his/her company is **not yet well prepared**

- **“We do NOT have the right talent for industry 4.0.”**
- **“We have NOT established the right performance management.”**
- **“There is NO necessary IT infrastructure.”**
- **“We do NOT have a clearly defined strategy on Industry 4.0.”**

Source: ABB Digital in F&B Global Survey
Digital Solutions for F&B

From individual plant assets to new business models

- Typically focused on a particular value step or equipment
- Often, off-the-shelf solution with little or no customization available
- Hardware know-how
- Impact limited

«Quick-Wins»

Larger Projects

Process Know-How Required

- Across value chain (end-to-end)
- Integrating a variety of legacy systems & equipment
- Typically no off-the-shelf solution readily available
- Process know-how critical
- Large impact

Level of Complexity / Customization

Simpler
Standardized Solutions

Complex
Customized Solutions

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Conclusion

Manufacturing must be competitive

3 Pillars for success

– Product and process innovation
– Effective organisation (lean engineering)
– Capital investment (robots & digitalisation)

Success requires:

– Investment “Sweat the assets, not the people”
– Skills to implement, operate & maintain
– Management with vision