Benefits of Robot Automation

Mike Wilson, 6 June 2017
UK manufacturing is alive…

UK is the world’s 9th largest manufacturing nation

Accounts for 11% of UK GDP, employing around 2.7 million people

Responsible for 45% of UK exports

UK car factories produced 1.72m vehicles in 2016 – 17 year high
Still room for improvement
The challenges

Growing competition from overseas
Employment is up but productivity is down
Rising costs (energy & materials)
Skills shortage – 257,000 vacancies in engineering practices by 2022

We cannot keep doing the same
Use resources effectively (apply lean engineering)
Use labour effectively
  - Not tied to machines
  - Use skills and attributes of staff
Benefits of robotic automation

Improved productivity
- Increased yield
- Improved utilisation of other equipment
- Better utilisation of space and energy
- Better utilisation of staff

Consistent high quality
- Minimised damage & breakages
- Less waste and rework
Benefits of robotic automation

Improved competitiveness and....

- Flexibility - quick changeovers, product redesign
- Extendable production hours
- Improved health and safety
- More rewarding jobs

Leading to:

- Growth
- More jobs

But.......
UK invests far less in robots

Robot density in non-automotive sectors
(Number of robots per 10,000 employees)

Source: IFR World Robotics report – 2016
The productivity puzzle

UK economic growth continues to be hampered by low productivity.

Productivity has grown by just 0.6% a year from 2010 – 2015.

Growth has been achieved by employing more people rather than investing in capital assets.

Two possible solutions:

- Either we all work longer hours; OR
- We work smarter, not harder, to produce more with the same level of input.

GDP per hour worked, G7 countries, 2014 and 2015

Working smarter – how automation could help

Productivity has grown in 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
Not just for big companies
Providing the proof

Growing number of UK automation success stories

- Strong management with long term strategy
- Not just automotive industry

Well-executed projects
Providing excellent performance
Users gaining competitive advantage
Good financial returns
Leading to growth (and more jobs)
CHX Products, Cornwall

Application – handling and cutting
Materials handling and sprue cutting of plastic injection moulded parts including badges, pendants, pencil toppers and fridge magnets

Key benefits
✓ Lights out operation
✓ Significant reduction in waste
✓ Lower production costs improved competitiveness
✓ 33,000 pieces produced per day
✓ Estimated ROI of 18 months

“It’s a bit like the elves and the shoemaker – we arrive in the morning and the work has been done.”

Andy Knight, Director, CHX Products
Industry 4.0 – The vision

Need for robots and automation

Seamless connectivity
Leveraging information through intelligence
Smart factories
• Robots & automation

Source: The Manufacturing Technology Centre
How productive could we really be?
Copenhagen Business School

Productivity change if automation implemented as in the most automated country

<table>
<thead>
<tr>
<th>Industry</th>
<th>Best</th>
<th>Worst</th>
<th>UK position</th>
<th>UK</th>
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<tr>
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<td>FIN</td>
<td>JPN, UK</td>
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<tr>
<td>Textile, Leather</td>
<td>DNK</td>
<td>JPN, UK, SWE</td>
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<tr>
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<tr>
<td>All other</td>
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<td>UK</td>
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- UK productivity would increase by 22.3% if it was as automated as the world’s most automated country
- Projected change in employment:
  - Short term decrease
  - Longer term increase = 7.4%
Robotics: The next great leap in manufacturing
Sirkin, Zinser & Rose – Sept 2015

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
Cost of automation
Look beyond the short term

“If you need a machine and don't buy it, then you will ultimately find that you have paid for it, but don't have it.”  
Henry Ford

Significant upfront costs but…

- Operates reliably every hour and every day
- Provides opportunity for unmanned operations
- Maximises utilisation of other machines
- Allows staff to be utilised where their skills and attributes are more effective
  - Manual operations often do not add value to product
- Produces high quality for many years (often >10 years)
Conclusion

Manufacturing must be competitive

3 Pillars for success

- Product & process innovation
- Effective organisation (lean engineering)
- Capital investment (flexible automation-robotics)

Success requires investment in equipment – “sweat the assets not the people”

Robotic automation has the potential to transform the UK’s manufacturing competitiveness and productivity
Power and productivity for a better world™