

Technology trends in robotics

April, 2023



What is a robot?

Robot

- ▶ Defined by International Standards Organisation
- ▶ Two types:
 - ▶ Industrial
 - ▶ Service

Not robot

- ▶ Software (Robot Process Automation, AI, “bots”)
- ▶ Remote controlled drones
- ▶ Autonomous cars & trucks
- ▶ ATMs, smart washing machines etc



Market growth – Industrial Robots

Half a million limit broken in 2021

Annual installations of industrial robots - World

1,000 units



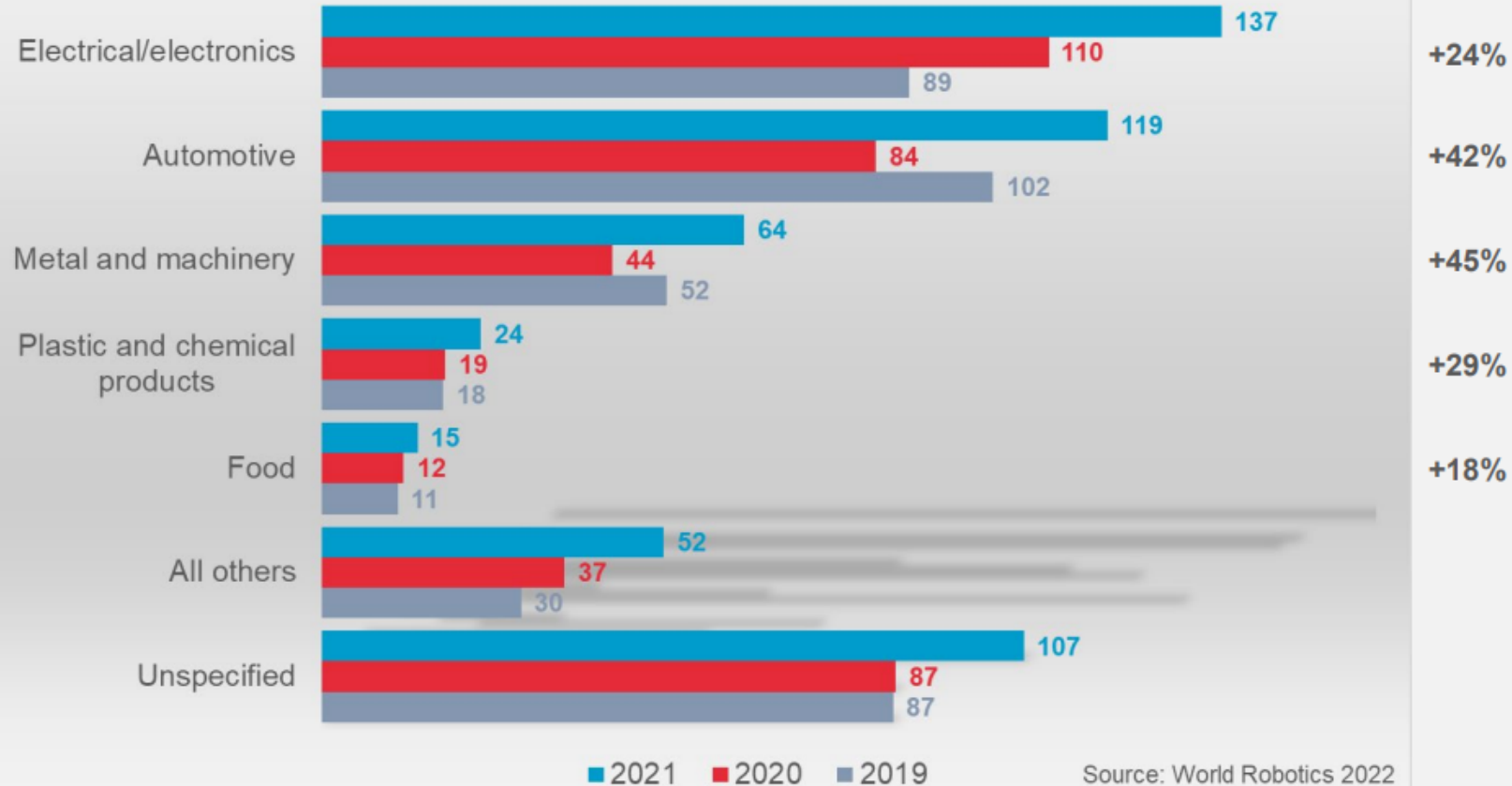
Source: World Robotics 2022

Growth by sector – Industrial Robots

Electronics is major customer of industrial robots

Annual installations of industrial robots by customer industry - World

1,000 units



Service Robotics

Strong growth

- ▶ Professional service robots - 121,000 units (+37%)
- ▶ Consumer service robots - 19 million units (+6%)

Key markets for professional service robots

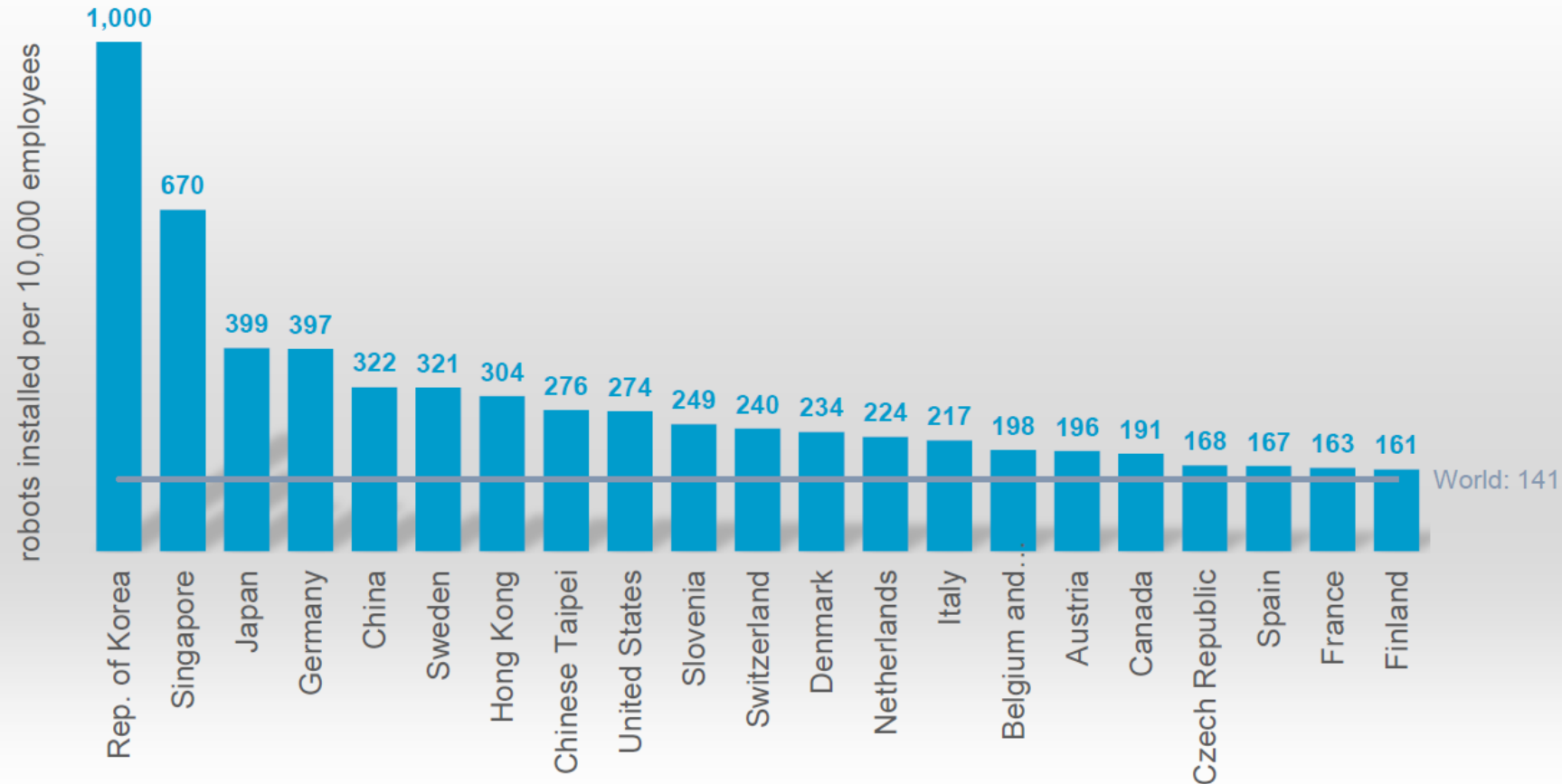
- ▶ Transportation & logistics – 49.5k units
- ▶ Hospitality – 20k units
- ▶ Medical & healthcare – 14.8k units
- ▶ Professional cleaning – 12.6k units
- ▶ Agriculture – 8k units
- ▶ Maintenance & inspection – 5.5k units

Source: International Federation of Robotics



Robot Adoption in the UK

Robot density in the manufacturing industry 2021



UK Ranks 24th
with a density of 111 units

Benefits of Robot Adoption to UK

The key challenges that robotics and automation could overcome are:



Solving the UK's productivity puzzle: UK productivity is **16%** behind the G7 average, ahead of only Italy in the rankings.



Labour shortages post-EU Exit: a need to replace lost labour due to the end of freedom of movement between the EU and UK.



Increasing wages: the higher pay level pushes employers to consider automation of routine tasks.



Post - COVID working practices: automation can support a more resilient, scalable, and adaptable business operating model.



Reshoring: in some instances, robotics and automation has the scope to bring some manufacturing back to the UK.



Need for manufacturing to maintain a competitive advantage: for existing manufacturers harnessing the technologies is a key element of UK industry remaining competitive.

Made Smarter - robotics & automation over next 10 years = £184BN

Copenhagen Business School – UK productivity increase by 22.3%

Top 5 Trends

Ease of use

- ▶ Icon driven programming & manual guidance
- ▶ Visualisation
- ▶ Easy set & installation
 - ▶ No code programming
 - ▶ Out-of-the-box solutions
- ▶ Machine vision
 - ▶ Greater integration
- ▶ AI



Top 5 Trends

Up skilling

- ▶ Drive for interesting, rewarding jobs
 - ▶ Expectations of Generation Z etc
 - ▶ Lack of labour
- ▶ Replace dull, dirty & dangerous tasks
- ▶ Robotics in schools, daily life
 - ▶ Greater technology acceptance



Top 5 Trends

Re- and near shoring

- ▶ Supply chain issues
 - ▶ COVID-19
 - ▶ Trade tensions
 - ▶ Transport - increasing costs & net zero
- ▶ Manufacturing closer to the customer



Top 5 Trends

Supporting digitalisation

- ▶ Smart factories
 - ▶ Exploitation of data
 - ▶ Intelligent & agile automation
- ▶ Greater use of AI



Top 5 Trends

Growth & new industries

Consumer behaviour

- ▶ E-commerce revolution
- ▶ Personalisation of products & delivery
 - ▶ Trend to high mix – low volume

Labour shortages

- ▶ Logistics
- ▶ Agriculture
- ▶ Hospitality & food service
- ▶ Professional cleaning



Image: Starship Technologies



Image: Bluebotics

The Future

- ▶ Major growth
 - ▶ SMEs
 - ▶ Non-manufacturing
- ▶ Industrial & service robots – boundaries blur
- ▶ Robots in our daily lives



Thank You

Mike Wilson

Chief Engineer – Robotics & Automation
High Value Manufacturing Catapult

mike.wilson@hvm.catapult.org.uk