DIGITALISING MANUFACTURING CONFERENCE 2018

GRASPING THE OPPORTUNITY
LEADING CHANGE AND CAPITALISING ON THE BENEFITS ACROSS INDUSTRY

29 - 30th OCTOBER

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Welcome

Dr Clive Hickman

Chief Executive, Manufacturing Technology Centre
Keynote: Made Smarter – one year on

Prof. Juergen Maier

Chief Executive, Siemens UK
Progress in Digital Manufacturing: The UK national perspective

Chair: Prof. Juergen Maier

Marcus Burton, Vice President, MTA & Director, Yamazaki Mazak
Stephen Phipson, Chief Executive, EEF ‘The Manufacturers’ Organisation
Clare Porter, Head of Manufacturing, Department for Business, Energy and Industrial Strategy
Prof. Sam Turner, Chief Technology Officer, High Value Manufacturing Catapult
Keynote: The international industry perspective

Marcus Burton
Vice President, MTA & Director, Yamazaki Mazak
Digitalising Manufacturing 2018

International Industry Perspective:
Manufacturing Transformation

Marcus Burton

- Yamazaki Mazak
- Manufacturing Technologies Association (VP)
- CECIMO (Chairman Economic Committee)
Yamazaki Mazak Corporation

- **Family owned business**
  - Founded in 1919

- **Turnover:**
  - More than $2.6 billion US

- **No of Employees:** > 7,000
  - >1,200 in Europe

- **11 Production Plants:**
  - 6 Japan, USA, Singapore, Europe (UK), 2 China
  - European facility established in 1987 – 29,000m²
  - Manufacturing for the European Market

- **78 Technology Centres in 22 Countries**

- **Installed base in excess of 195,000 Machines**
  - More than 55,000 in Europe – 50% manufactured in Europe

- **Over 250 different models produced**

- **Serving industries that touch our daily lives.**
Development of Manufacturing Systems

1970’s

- Long throughput (measured in “weeks per operation”)
- Complex production planning
- High work in progress inventory
- High supervision – Progress chasing - Poor quality

“Spaghetti Work flow”
Development of Manufacturing Systems

1980’s 3rd Ind. Rev

Manufacturing Environment
- Increased competition
- Increased labor costs
- Higher quality producers (Japan)
- Microprocessor revolution

Manufacturing Philosophy
- Group Technology (Cellular Manufacture)
- Total Quality Management
- Just in Time

Machine Tool Requirements
- CNC machine tools
- CNC lathes with milling
- Flexible Manufacturing Systems
### Development of Manufacturing Systems

**Manufacturing Environment**
- Increase in competition
- Increase in labor costs
  - Fall of “Iron Curtain”
  - Free trade agreements
  - European single market
  - Technology revolution
  - M&A

**Globalisation**
- Skill shortage
- Migration

**Manufacturing Philosophy**
- Six sigma (Motorola)
- Business Process Re-Engineering
- Outsourcing and transfer to Low Cost Countries

**Lean**
- Multi-tasking
- Cyber Factory and flexible automation
- Wide variety of parts in small batch sizes

**Machine Tool Requirements**
- High Quality / Reliability
- Minimum Set-up Change-over time
- Some Automation
- Proprietary Low data, some connectivity
- Easy to use Skill shortage Some “Intelligence”
Innovation in Manufacturing Systems – Transformation

2020.....

Manufacturing Environment
- Societal benefits – Re-shoring – Meaningful employment
- Sustainability
- “Smart Generation” New business models

Manufacturing Philosophy
- Customisation at zero incremental cost
- Digital Manufacturing
- Digital Twin

Machine Tool Requirements for Future Manufacturing
- Advanced Multi-tasking
- Flexible Automation
- High Quality / Reliability
- Connectivity Wireless/Cloud Open High data
- Intelligence Advanced sensors
1. Robotics and automation
2. Additive manufacturing
3. The Industrial Internet of Things (IIoT)
4. Virtual reality and augmented reality
5. Artificial intelligence machine learning and data analytics
IDT Drives New Business Models – not “stand alone”

iSmart Factory
- Control of manufacturing
- Productivity improvement
- iSmart solutions for customers

New Business Models
- Software and Data Analytics
- Augmented reality technology support
- Predictive Maintenance through AI
- Servitisation
Major UK Issue: Productivity since 2009

Manufacturing Productivity 2009-2017

Productivity Gap
- Skills
- Investment
Major UK Issue: Productivity since 2009

- Digitisation
- People
  - Education and Skills
- Technology
  - Equipment Automation

Increased Productivity requires Innovation & Investment in Digitisation = Productivity & New Business Models

- Business transformation
- Survival!
UK Industrial Strategy White Paper
Made Smarter – International Perspective

- **International Agenda**
  - Standards
  - Collaborative R&D
  - Digital Innovation Hubs (e.g. Catapults)
  - Digital Single Market

- **National Agenda**
  - Digital Infrastructure – e.g. 5G
  - Skills
  - Investment incentives
  - Start-ups and Innovation
  - **Adoption**: Digital Innovation Hubs for UK SME
Standardisation: Example: Connectivity for Machine Tools
Coordination of National Initiatives

Shared Action Plan

Industrie du Futur / Industrie 4.0 / Industria 4.0

in France – Germany – Italy

1. Standardisation and Reference Architectures
2. Engagement of SME’s and Test Beds
3. Policy – recommendations to European Commission
MadeSmarter – International Perspective

- International Agenda
  - Standards
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  - Digital Innovation Hubs (e.g. Catapults)
  - Digital Single Market

- National Agenda
  - Digital Infrastructure – e.g. 5G
  - Skills
  - Investment incentives
  - Start-ups and Innovation
  - Adoption: Digital Innovation Hubs for UK SME
National Agenda  Digital Economy and Society Index (DESI) - 2018

Digital Economy and Society Index

Legend
1 Connectivity
2 Human Capita
3 Use of Internet
4 Integration of Technology
5 Digital Public

European Commission
Adoption by SME’s

Adoption of digital technologies, EU, 2017 (% enterprises)

Source: Eurostat. *EU average based on 17 countries

DESI Report 2018 – Integration of Digital Technology
My Recommendations

- Support and implement “Made Smarter” recommendations
- Promote collaboration at international level
- More collaboration from technology providers for Systems Integration and standardisation
- DIH to demonstrate the application and integration of technologies usable by SME (Innovation in application)
  - As opposed to leading edge technology research
- Tackle the skills shortage – “digital apprentices” SME placements
- Ensure NEW funding supports ADOPTION by SME’s
Digitalising Manufacturing 2018

International Industry Perspective: Manufacturing Transformation

Marcus Burton

- Yamazaki Mazak
- Manufacturing Technologies Association (VP)
- CECIMO (Chairman Economic Committee)
Panel One:

Progress in Digital Manufacturing:
International collaboration and learning

Ennio Chiatante,
Head of Digital Transformation, Comau

Faouzi Grebici,
Senior Global Business Development, Omron

Valentina Ivanova,
‘Industrie du Future’

Alejandro Nieto,
Vice President Global Sales, Softtek

Ernst Stöckl-Pukall,
Head of Division – Unit IVA5 Digitisation, Industrie 4.0,
Federal Ministry of Economic Affairs & Energy, Germany

Chris White,
Director, Institute for Industrial Strategy, Kings College London
Keynote: Digitalising Manufacturing:
Grasping the opportunity by upskilling our talent

Christian Warden
Head of Skills Development, MTC Advanced Manufacturing Training Centre
Digitalising Manufacturing: Grasping the opportunity by upskilling our talent

Christian Warden – Head of Skills Development
Lina Huertas – Chief Technologist, Digital Manufacturing
Harald Egner – EU & Research Partnership Manager
Often, digitalisation is interpreted as a technology driven process, leaving people as an afterthought.
From an individual’s perspective, a perceived threat can become a reality.
Upskilling transforms the threat into an opportunity for reinforcing cycles of digital transformation that deliver sustained value.
The UK has already lost not just jobs, but whole industrial sectors, in previous technological revolutions.
We are already making the shift happen in additive manufacturing.

A wave of talent is gaining the right skills through novel and structured curricula at AMTC.
The UK must switch to a people centred approach, based on upskilling, to grasp the opportunity of digitalisation.
Panel Two: Progress in Digital Manufacturing: Skills and the work environment – individuals and society

Dominic Gorecky, Representative “Kanton Bern” and “Smart Factory”

Martin Kamp, “Work, education and Training”, Plattform Industrie 4.0, IG Metall

Anu Kull, Ministry of Economic Affairs and Communications

Odd Myklebust, Research Director, SINTEF Raufoss

Alejandro Nieto, Vice President Global Sales, Softtek

Stephen Phipson, Chief Executive, EEF
Summary

Prof. Juergen Maier
Chief Executive, Siemens UK

Dr. Lina Huertas
Chief Technologist – Technology Strategy, Manufacturing Technology Centre