

A new strategic approach for the machinery
and component supply chain

eama
Engineering and
Machinery Alliance

GROWING YOUR BUSINESS

INFLUENCING POLICY

SPOTTING NEW MARKET OPPORTUNITIES

ACCESSING INNOVATION SUPPORT

Mobilisation workshop output 3rd February 2016

Summary

Objective and approach

What success looks like

KPIs

Regional and sectoral interest

Commentary

Next steps

Annex

- Attendees
- Syndicate template outputs

Summary – Objectives and attendance

The objective of this programme is to examine and assess the capability and capacity gaps in the supply chain for the machinery and components sector, map out the available innovation support and develop an action plan for best exploitation

This mobilisation workshop 3rd February was held to build support and identify a suitable pilot study area (regional focus and associated key sectors) to be addressed in a workshop on 15th March 2016

A wide range of participants were engaged:

- Industry: *BAE Systems, Bosch Rexroth, GE Aviation (Part time), KEB (UK) Ltd, Omron Industrial Automation, Phoenix Contact Ltd,*
- *Schneider Electric, Siemens plc, SMC Pneumatics (UK) Ltd*
- Government /Institutional: *BIS, InnovateUK, TWI*
- Trade associations: *EAMA, GAMBICA*

The workshop was facilitated by the University of Cambridge IfM ECS with support from Aston University

Summary – Approach to 15th March workshop

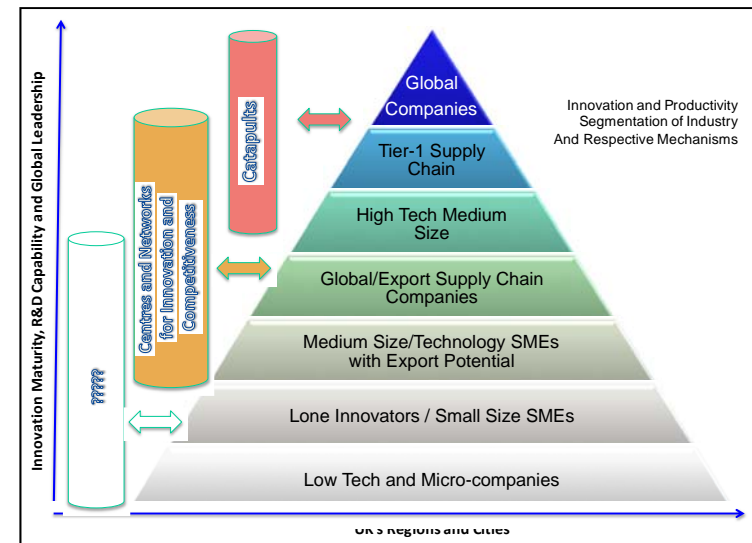
Objective

To examine and assess the capability and capacity gaps in the selected pilot area, map out the best available innovation support and develop an action plan for best exploitation, using an innovation segmentation model to target support based on innovation maturity

Draft Agenda

- Introductions and objectives
- Innovation case study (1)
- Target area (region and associated key sectors) and ‘what good looks like’ as regards output
- Review of straw man sector strategy, key competences required, available and significant gaps/opportunities for the sector
- Innovation case study (2)
- Business opportunities and company priorities for innovation competence development
- Targeting of national and local innovation initiatives
- Review and implications for wider roll out
- Next steps

Innovation Segmentation model



Summary – Selected focus areas

There was strong support for the pilot to focus on the East Midlands, with Coventry and Warwickshire and Nottingham, Nottinghamshire and Derby LEPs to be invited to the workshop 15th March

A wide range of end use industrial sectors are of interest, with value propositions concerning Robotics and Automation and Flexible Manufacturing

Manufacturing Competences potentially of interest for future innovation include (but not exclusively):

*Advanced and autonomous robotic technologies; Control systems;
Electronics, Photonics and Power Electronics; Internet of things;
Measurement, metrology, assurance and standards;
Novel cutting, shaping and machining processes;
Additive Manufacturing/3D printing; Advanced assembly; Tooling and fixtures;
Process engineering, capability and efficiency development;
Integrated/Hybrid technologies; Integrated design and manufacture;
Systems modeling & simulation; Human machine interface*

Summary - Defining success

Success for the programme would entail:

- Making the UK 'sticky' for manufacturing growth and innovation investment compared to global competition:
- Sharing a simple clear message that transforms the definition of manufacturing, as a respected activity with strong links to the creative industries, spanning design, manufacture and end of life
- Building appreciation of and relevant skills in manufacturing throughout the education system

Relevant KPIs would include:

- Productivity
- Industry investment in growth and innovation
- Specific educational inputs from trade apprenticeships to degree level

Summary - Feedback and next steps

Delegate feedback was positive with the scope and process seen as innovative

Workshop attendance on 15th March should involve technical and non technical people and be approximately in the following ratios:

- Industry* 65%
- Academia and government (incl. LEPs, catapults) 25%
- Trade Associations 10%

Note() Split 50:50 End users and suppliers*

It will be important to reflect both the sector and the LEP priorities for growth and innovation as well as those of Government

Promotion and reporting messages need to be simple and clear

Next steps include engagement with the Coventry and Derby and Nottingham LEPs and attraction of more industrial input, including through ‘inviting a supply chain partner’

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Workshop objectives and agenda

Objective	Agenda
<p>Workshop one – This workshop</p> <ul style="list-style-type: none">•To build support and identify a suitable pilot area (regional focus and associated key sectors) for the second workshop, showing good potential for participant companies to grow their business <p>Workshop two – to follow 15th March</p> <ul style="list-style-type: none">•To examine and assess the capability and capacity gaps in the selected pilot area, map out the best available innovation support and develop an action plan for best exploitation	<p>Introductions and objectives</p> <p>‘Why we are here’</p> <p>Selection of target sector(s) and region</p> <ul style="list-style-type: none">•March 15th workshop outline•Criteria for selection of target sector and region•Generation and review of target sector and region options•Finalisation of preferred focus area and confirmation of what success looks like <p>Potential implications for wider application of the process</p> <p>Next steps</p>

The output from the full process will be a documented, continuing process of improvement split between Industry (via Trade Associations) and Government. linked to National Priorities for High Value Manufacturing, with related performance measures, supported by the relevant end use sector Council(s), Innovate UK and the HVM Catapult.

See appendix for attendees

Outline 15th March workshop

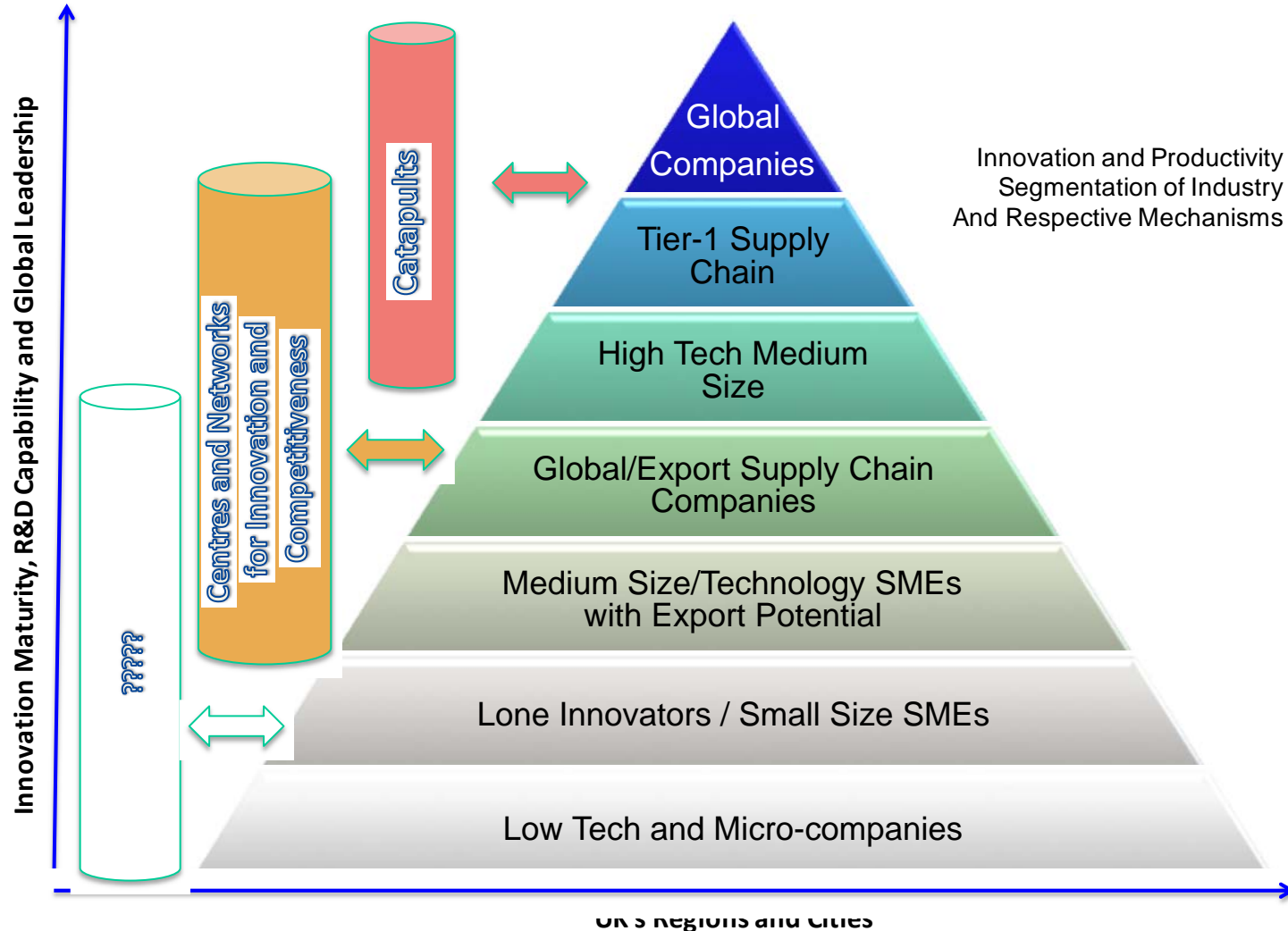
Objective

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Segmentation model to direct support based on innovation maturity



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What success looks like

Making the UK ‘sticky’ for manufacturing growth and innovation investment compared to global competition:

- Enhancing UK productivity through investment in automation throughout the value chain, particularly SMEs
- Exploiting national public infrastructure investment
- Moving up the value chain to build base in high value manufacturing
- Responding to increasingly demanding customer requirements through exploitation of digital manufacturing across the supply chain
- Promotion of best practice transfer in innovation

Sharing a simple clear message that transforms the definition of manufacturing, as a respected activity with strong links to the creative industries, spanning design, manufacture and end of life

Building appreciation of and relevant skills in manufacturing throughout the education system

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Productivity

Moving up the value chain

Skills and education

- Apprenticeships and graduates, number of modules, continuous learning
- Partnerships between Universities and Manufacturing (tomorrow's engineer)

Investment by the sector in:

- Automation Solutions
- Digital manufacturing
- Supply chain
- Research
- Utilities, transportation and other national infrastructure priorities
- Consultancy support

Transfer of best practice

Influencing government and wider society with a simple message

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Draft selection criteria

Significant actual or potential international business opportunities

Perception of gaps today which limit ability to exploit and invest in new product opportunities:

- Capability and capacity
- Innovation support

Multiple sectors active with opportunity for cross sector learning and practice transfer

High level review is feasible and can deliver credible output in a one day workshop

LEP has relevant smart specialisation strategy

Of interest to participant companies

Sectors and regions of interest to participants

Strong support for the pilot to focus on East Midlands, with Coventry and Warwickshire and D2N2 (Derby and Derbyshire, Nottingham and Nottinghamshire) LEPs to be invited to the workshop 15th March

A wide range of end use industrial sectors are of interest – to be compared with LEP sectoral interests



Regions of interest in competence development	
East Midlands	10
Scotland	9
North West	9
Yorkshire and Humber	9
Noth East	8
West Midlands	8
London	8
South East	8

'Vertical' sectors of interest in sales and marketing	
Automotive	13
Food	11
Aerospace	10
Energy	9
Electronics and ICT	8
Pharma/BioPharma	7
Rail	7
Medtech	6

Robotics and Automation (19) and Flexible Manufacturing (12) additional to the above, are the primary value propositions of the Machinery and Components Sector

Note: Other LEPs considered: Leeds; Sheffield; Northamptonshire; Greater Peterborough Greater Cambridge

Possible relevant manufacturing competences

Manufacturing Competence (1)
<i>Advanced and autonomous robotic technologies</i>
<i>Control systems</i>
<i>Electronics, Photonics and Power Electronics</i>
<i>Internet of things</i>
<i>Measurement, metrology, assurance and standards</i>
<i>Other novel cutting, shaping and machining processes</i>
<i>Additive Manufacturing/3D printing</i>
<i>Advanced assembly</i>
<i>Tooling and fixtures</i>
<i>Process engineering, capability and efficiency development</i>
<i>Integrated/Hybrid technologies</i>
<i>Integrated design and manufacture</i>
<i>Systems modeling & simulation</i>
<i>Human Machine Interface</i>
<i>Packaging</i>

Note: Listed in approximate order of priority based on delegate selection from HVM Interim report listing November 2015

Manufacturing Competence (2)
<i>New composites</i>
<i>Lightweight materials</i>
<i>Supply chain and business model innovation</i>
<i>Big data management and analytics</i>
<i>Autonomy</i>
<i>Joining</i>
<i>Powder metallurgy</i>
<i>Product and Service integration</i>
<i>Sensor technologies</i>
<i>Energy storage Technologies</i>
<i>Cyber Security</i>
<i>Graphene</i>
<i>Other new materials and materials science</i>
<i>Software development and management</i>
<i>Cloud computing</i>
<i>Mobile internet</i>
<i>Primary processes (Casting, Forging, incl alloying)</i>
<i>Laser processing</i>

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General feedback

What Went Well..	Even Better If...
<p>This work is novel in both scope and approach</p> <p>A lot of common ground and consensus has been demonstrated on the issues and priorities</p>	<p>Show the objectives at the start, rather than relying on common ground emerging</p> <p>Develop a case for action based on global competitiveness for critical KPIs identified such as productivity and investment innovation</p>

Factors to consider in the 15th March workshop and wider roll out

Workshop attendance should involve technical and non technical people and be approximately in the following ratios:

- | | | |
|---|-----|-----|
| •Industry* | 65% | |
| •Academia and government (incl. LEPs and catapults) | | 25% |
| •Trade Associations | | 10% |

Note() split 50:50 End users and suppliers*

It will be important to reflect both the sector and the LEP priorities for growth and innovation as well as those of Government:

- Existing supply chain gaps were not discussed: this study needs to focus on potential future gaps and opportunities in new the exploitation of new technologies
- Non Engineering/mechanical input must be sought also to the study to ensure full coverage of the supply chain
- It will be important to pick up LEP priorities as part of this work, and involve relevant learning and innovation institutions
- Automotive and aerospace have a lot of attention already many other sectors are of interest to SMEs, as evidenced by the output from this workshop

Promotion and reporting messages need to be simple and clear:

- Show the outputs and benefits most clearly in the promotional material
- Keep the messages and approach simple and focussed
- Include successful innovation case studies from the relevant LEPs or beyond (e.g. Brompton Cycles)
- A regards report formats the 'Circular Economy Scotland' report may be a good example

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Next steps

Review of workshop outputs

Engagement with Sector Councils/representatives

Engagement with Coventry and D2N2 LEPs

Promotion to additional industrial contributors, including supply chain partners

15th March workshop

Stakeholder review and recommendations development

Report publication and socialisation

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Mobilisation workshop Output 3rd February 2016 - Annex

Attendees

Paul Maropoulos	Aston University (Facilitator)
Damian Adams	BAE Systems
Adrian Barker	BIS
Alan Conn	Bosch Rexroth
Andrew Gill	Cambridge IfM ECS (Facilitator)
Rupert Hodges	EAMA
Steven Brambley	GAMBICA
Martin Kirkham	GE Aviation (Part time)
Merlin Goldman	InnovateUK
Tom Skelton	KEB (UK) Ltd
Roger Etchell	Omron Industrial Automation
Scott Mulholland	Phoenix Contact Ltd
Philip Moulden	Schneider Electric
Sue Bagguley	Siemens plc
John Turner	SMC Pneumatics (UK) Ltd
Chris Beck	TWI

Table group outputs – Sector and regional interests summary

Sectors of interest in sales and marketing	Importance	Region of interest in competence development	Importance
Robotics and Automation	19	East Midlands	10
Automotive	13	Scotland	9
Flexible Manufacturing	12	North West	9
Food	11	Yorkshire and Humber	9
Aerospace	10	Noth East	8
Energy	9	West Midlands	8
Electronics and ICT	8	London	8
Pharma/BioPharma	7	South East	8
Rail	7	South West	7
Medtech	6	Wales	6
Defence and Security	6	East of England	6
Nuclear	5	Northern Ireland	4
Oil & Gas	5		
Industrial BioTech	5		
Design	5		
Marine	3		
Chemicals	3		
Textiles	3		
Materials	3		
Other	3		
Agritech and Agriscience	2		
Space	2		
Built environment	2		
Printing/converting	1		
Packing	1		
Logistics	1		
Utilities	0		

Table group outputs - details

	Sectors of interest in sales and marketing																				Region of interest in competence development												Comments											
	Food	Pharma/Biopharma	AgriTech and Agriscience	Meditech	Defence and Security	Aerospace	Space	Automotive	Rail	Marine	Energy	Nuclear	Oil & Gas	Built environment	Chemicals	Industrial	Biotech	Textiles	Electronics and ICT	Materials	Robotics and Automation	Flexible Manufacturing	Design	Logistics	Utilities	Printing/conveying	Packing	Other	Scotland	Northern Ireland	Wales	North East		North West	Yorkshire and Humber	West Midlands	East Midlands	East of England	London	South East	South West			
Phoenix							1	1*		1		1							2		2	2								1								1	1*		Hot Spots -Flexible Manufacturing - (SE) -Oil and Gas - (NE & Scotland) -others broad region-			
Siemens PLC	1	1				1	1	2*		2		1	1								2	1		1													1	1*	1		1	1*	1	Hot Spots -Wind turbines (Y & H) -rail Grants is logistics centre
KEB	1	1	1	2	1				1	1			1				1	1			2	2															1	1	1	1	1			
G & E Aviation						2					1											1	2																		1			
BIS																2						2																	2	1				
Omron	2						2											1				2	2															1	1	1	1			
Schneider	2				1		2			2	1											2																	1	1	1	1		
SMC	2	2	1	1		1	2	1							1	1		1			1	1	1														1	1	1	1	1			
TWI	1			2	2	2	1	1	2	1	2	2	2	1	1		1	1	1	2	2	1																						
Bosh Rexroth	1	1			1	1		2			1								1			2																						
BAE Systems					1	1	1				1										1	1	1	1																1				
HVMC	1	2		1		2	2	1			2				1	2		1			1	1	1																		1			
Total	11	7	2	6	6	10	2	13	7	3	9	5	5	2	3	5	3	8	3	19	12	5	1	0	1	1	1	3	9	4	6	8	9	9	8	10	6	8	8	7				

Table Groups – Manufacturing Competence interest, Coventry, Derby and Nottingham LEP areas

Manufacturing Competence	Table 1	Table 2	Table 3	Table 4	Total
<i>Electronics, Photonics and Power Electronics</i>	1		1	1	3
<i>Sensor technologies</i>		1			1
<i>Advanced and autonomous robotic technologies</i>	1	1	1	1	4
<i>Energy storage Technologies</i>			1		1
<i>Packaging</i>	1			1	2
<i>Cyber Security</i>		1			1
<i>New composites</i>		1		1	2
<i>Graphene</i>			1		1
<i>Lightweight materials</i>	1	1			2
<i>Other new materials and materials science</i>		1			1
<i>Supply chain and business model innovation</i>		1		1	2
<i>Software development and management</i>			1		1
<i>Big data management and analytics</i>			1	1	2
<i>Autonomy</i>			1	1	2
<i>Internet of things</i>		1	1	1	3
<i>Cloud computing</i>			1		1
<i>Mobile internet</i>			1		1
<i>Measurement, metrology, assurance and standards</i>	1	1		1	3
<i>Primary processes (Casting, Forging, incl alloying)</i>				1	1
<i>Joining</i>	1	1			2
<i>Laser processing</i>			1		1
<i>Other novel cutting, shaping and machining processes</i>	1		1	1	3
<i>Net shape manufacturing:</i>				1	1
<i>Powder metallurgy</i>	1			1	2
<i>Additive Manufacturing/3D printing</i>	1		1	1	3
<i>Advanced assembly</i>	1	1		1	3
<i>Tooling and fixtures</i>	1	1		1	3
<i>Process engineering, capability and efficiency development</i>		1	1	1	3
<i>Control systems</i>	1	1	1	1	4
<i>Integrated/Hybrid technologies</i>		1	1	1	3
<i>Integrated design and manufacture</i>	1	1		1	3
<i>Systems modeling & simulation</i>	1		1	1	3
<i>Human Machine Interface</i>	1		1	1	3
<i>Product and Service integration</i>		1	1		2