

Microelectronics: A UK Perspective

*Partners in Innovation, Research, Design and
Technology Development*



**Together
We're Better**

John Moor

VP, Design Innovation

NMI Purpose



NMI is *the* Semiconductor Trade Association of the UK and Represents the Interests of Members and the Industry.

“leading the development of a world-class sustainable UK-based Microelectronics Manufacturing, Device & Systems Design community providing a compelling value-proposition for our members”

- ❑ A Not-for-Profit Private Organisation
 - ❑ Funded by Members and Activities
- ❑ 2 UK Offices
 - ❑ Edinburgh (HQ)
 - ❑ Bath
- ❑ Over 200 Members and Growing...



UK Electronics Industry Heritage



□ 130 Years in the Making!

- Ferranti 1882 -1993
- STC (Standard Telephone and Cable) – 1883 -1991
- GEC (Marconi) 1886 - 2001
- Plessey 1917 - 1998
- Mullard (Radio Valve Co. Ltd) 1920 -
- ICL 1968 -2002 (Fujitsu from 1981-2002)
- Inmos 1978 – 1994 (acquired SGS-Thompson 1989)
 - Memories, Transputers and Graphics

...What does this mean today?

- The legacy of the historic “National Champions” is sizable and recognised strengths in electronic Research, Design and Development
 - Computing, Embedded Systems, Defence, Telecommunications, Digital Media Applications (e.g. Radio and Television), Power Devices, High Value Manufacturing, EDA etc.



UK in Transformation: Emergent Base of New World-Class Champions

□ Examples:

□ Cambridge: ARM, CSR, Imagination Technologies

□ Edinburgh: Wolfson Microelectronics, Elonics

□ Bristol: Icera Semiconductor, picoChip Designs

□ DisplayLink, Dialog Semiconductor, SSSL, Cyan Technology, Frontier Silicon, Jennic, Nanotech Semiconductor, Phyworks, Toumaz Technology, Innovision, Aspex Semiconductor etc.

□ One's to watch

□ Audium, BluWireless, Cascoda, eoSemi, Gnodal, Gigle, Mirics, NanoGaN, Nujira, PowerVation, Xmos etc.

UK Leads Europe in IC Design



Design & IP News

UK maintains Euro lead in IC design activity

[John Walko](#)
[EE Times Europe](#)
10/29/2007 6:32 PM



LONDON — The U.K. is continuing to lead in the number of chipless and fabless design houses in Europe, with France and Germany lagging behind, according to the latest report from Future Horizons into the sector.

The report suggests Britain is home to almost a third of all independent chip design houses on the continent, with the numbers increasing, according to Future Horizons

The UK Technology sector is also the largest and fastest-growing in Europe (Source: UKTI)

...And is the European Location of Choice for Technology Investment

The **UK has been ranked as first in Europe**, and third in the world, for providing a supportive environment for its local IT businesses (Economist Intelligence Unit – Benchmarking IT Industry Competitiveness 2008 report)

The UK's **strong history of innovation** means many companies are keen to establish their European HQs in the UK, for example Japanese NTT DoCoMo and all the Chinese telecom operators. (Gartner Communications Sector Report)

Electronics R&D attracts over £800m pa investment from businesses such as Invensys, Siemens, Philips, Spectris, Agilent, Samsung, Renishaw, Panasonic and Alstom, each investing more than £30 m pa in UK R&D. (Gartner Consumer Electronics Sector Report)

In an assessment of 178 countries, the World Bank ranked the UK sixth globally for “**ease of doing business**”, a factor which covered several legal issues, including: ability to enforce contracts and regulations to start a business. The only other European country to rank higher is Denmark. (World Bank)



From the 2008 top 25* Semiconductor Companies 17 Have Research / Design and Development Bases in the UK :

- ❑ Intel
- ❑ Samsung
- ❑ ST Microelectronics
- ❑ Toshiba
- ❑ Renesas
- ❑ Freescale
- ❑ NXP
- ❑ Sony
- ❑ MediaTek
- ❑ Infineon
- ❑ Qualcomm
- ❑ IBM
- ❑ Fujitsu
- ❑ Panasonic
- ❑ Broadcom
- ❑ Sharp
- ❑ Texas Instruments
- ❑ *Plus...* A great many other Japanese, US and European organisations reside in the UK too.

* Source iSuppli

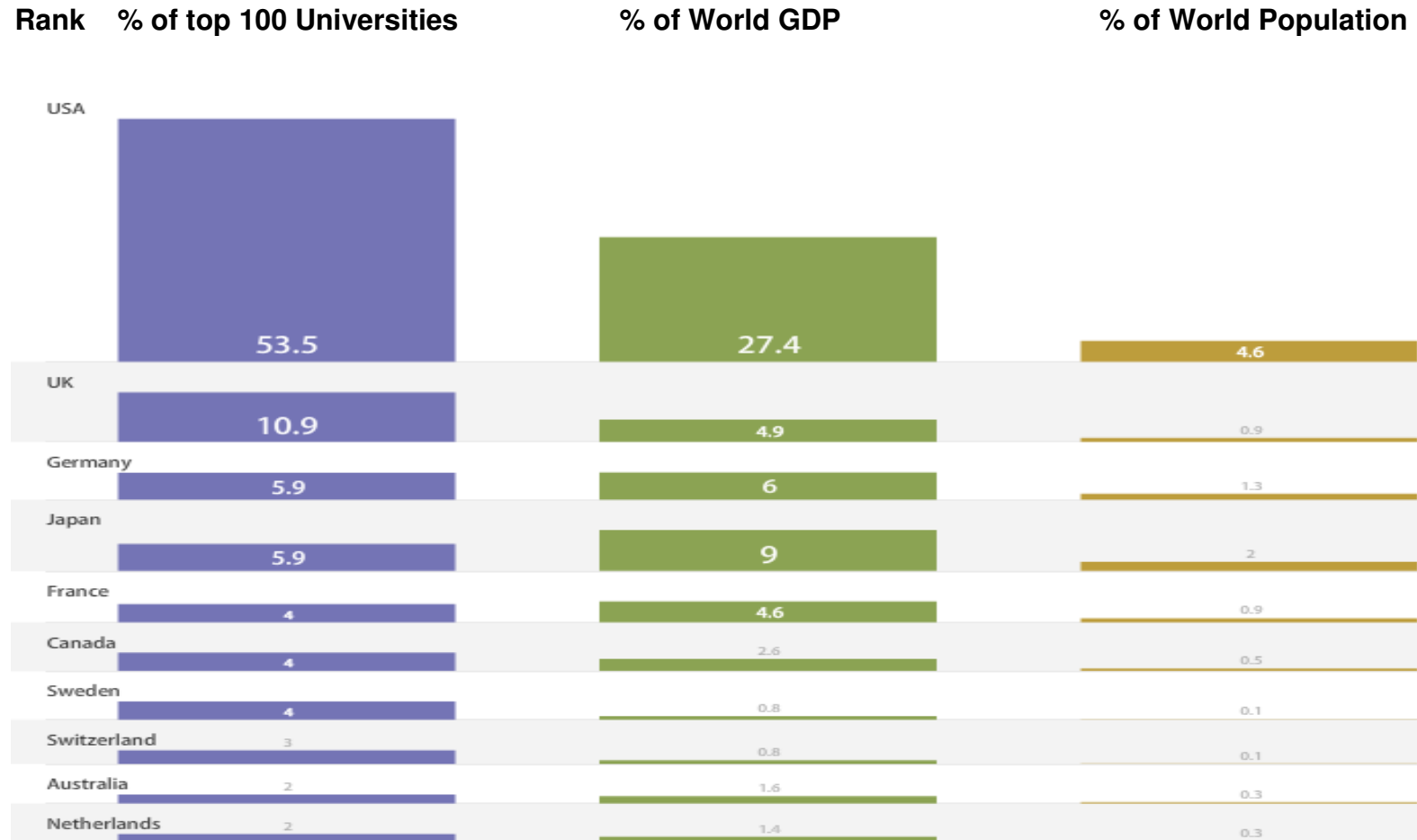
UK Public Research Investment



- “Our vision is for the UK to be the best place in the world in which to engage in research and innovation”
 - EPSRC* Overarching Vision
- “UK is the Number 1 Leader in Plastic Electronics, Solid State Lighting & Fibre Optics”
- “Number 2 in a great many other areas...”

* Engineering and Physical Sciences Research Council

R&D: UK has an Exceptional University Base



Top 10 Countries

Source: <http://manyeyes.alphaworks.ibm.com/manyeyes/visualizations/percentage-distribution-of-top-unive>

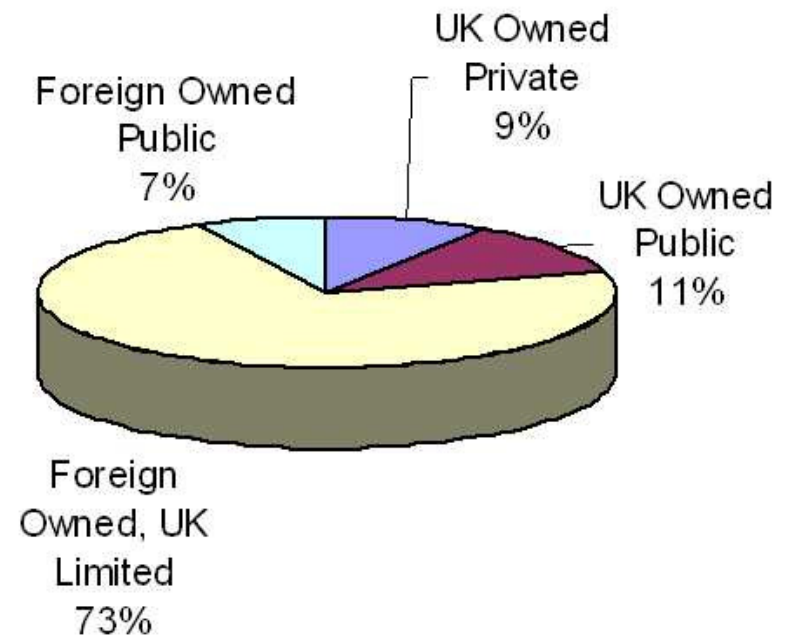
Electronics: Sample of Top UK Groups



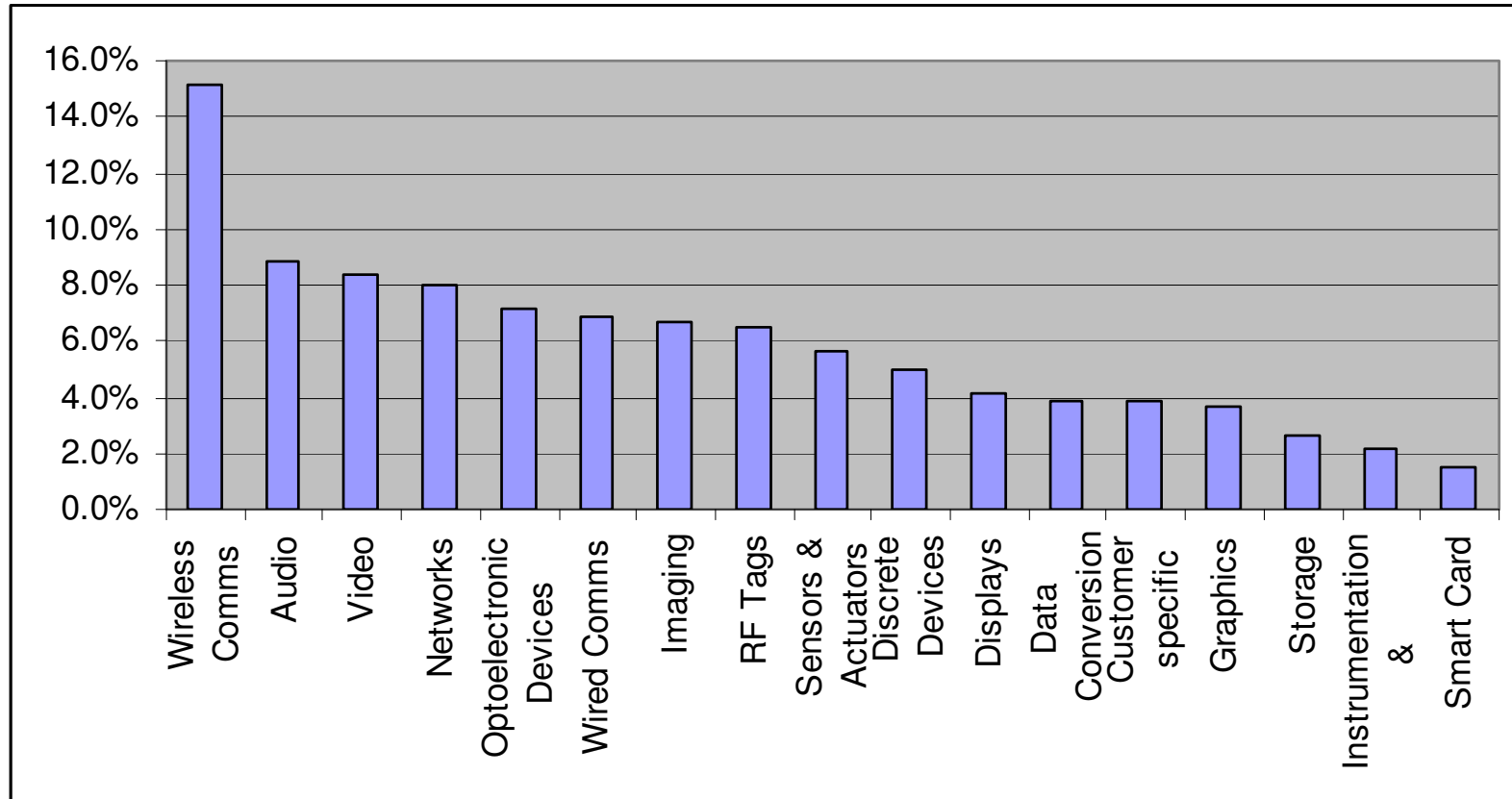
Institution	Researcher	Expertise of Groups
University of Manchester	<p>Steve Furber http://gow.epsrc.ac.uk/ViewPerson.aspx?PersonId=5628</p> <p>Bruce Hamilton http://gow.epsrc.ac.uk/ViewPerson.aspx?PersonId=6674</p>	<p>Novel Computer Architectures, Systems on a chip, VLSI</p> <p>Semiconductor materials and device physics</p>
University of Glasgow	<p>Ian Thayne http://gow.epsrc.ac.uk/ViewPerson.aspx?PersonId=42432</p> <p>Asen Asenov http://gow.epsrc.ac.uk/ViewPerson.aspx?PersonId=491</p>	<p>III-V MOSFET devices, RF & Microwave Devices and Circuits</p> <p>Device Modelling, CMOS Variability Modelling, CMOS Devices, III-V Devices, Germanium Technology</p>
University of Soton	<p>Bashir Al-Ashimi http://gow.epsrc.ac.uk/ViewPerson.aspx?PersonId=50450</p> <p>Peter Ashburn http://gow.epsrc.ac.uk/ViewPerson.aspx?PersonId=497</p>	<p>Systems on a chip, VLSI, Ultra Low Power Design</p> <p>Electronic devices, inorganic semiconductors</p>
University of L'borough	<p>Innovative Electronics Manufacturing Research Centre Paul Conway http://gow.epsrc.ac.uk/ViewPerson.aspx?PersonId=3262</p>	<p>Electronics Manufacturing; Agile Enterprises; Sustainable Manufacture, Products and Processes; Challenging Environments; Manufacturing Business Processes; Design for X; Materials, Manufacturing Processes and Technology</p>
Imperial College	<p>Wayne Luk http://gow.epsrc.ac.uk/ViewPerson.aspx?PersonId=40151</p> <p>George Constantides http://gow.epsrc.ac.uk/ViewPerson.aspx?PersonId=100961</p>	<p>Systems on a chip, VLSI, Low Power Design, Reconfigurable Hardware</p>

NMI's 2006 Design Survey: Key Findings

- *“Designed in the UK”* – A core strength & competency
 - IDM's, Fabless, IP, Design Services
- There are at least 452 design related organisations with circa 10,000 design related staff in the UK
- Global firms recognise the talents of the UK
- The UK is dominated by foreign investment
 - 80% of companies are foreign owned

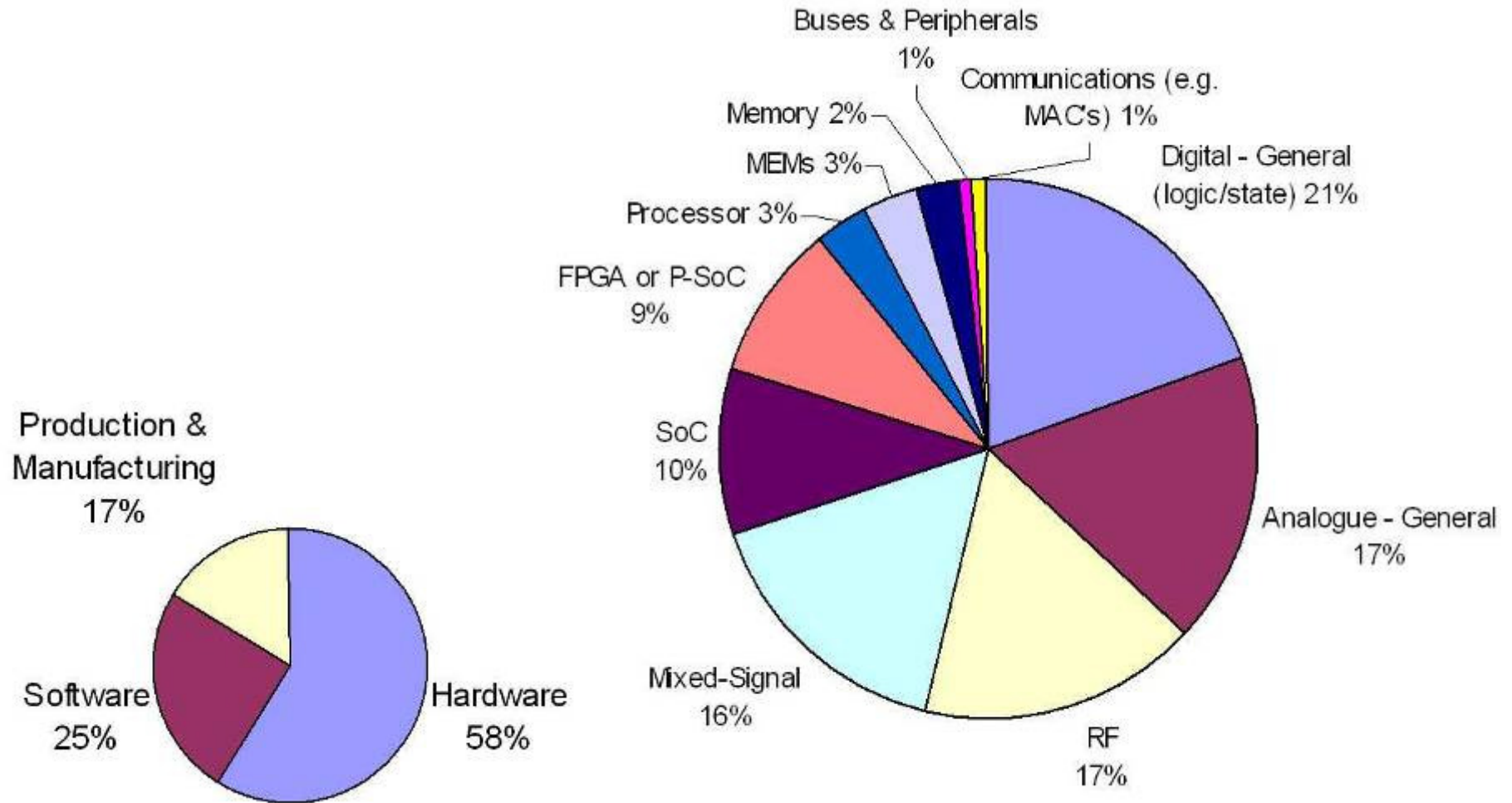


End Products and Applications



- Strongest application space identified is telecommunications (22%) and within this wireless communications stands out as the area of most activity (15.1%)

Split of design skills



□ Analogue, RF and mixed signal representing some 50% of the total

Summary



- Industry Context: Globalisation Drives Change
- UK's Electronics Industry has Transformed Significantly (and continues to)
- UK's Heritage – *"Hotbed of Innovation"*
 - Especially in Wireless, Communications, Embedded Systems, IP and Microprocessor Based technologies
 - Leader in Plastic Electronics
- UK is a Good Trade and Technology Partner
 - UK has a Very Supportive Environment for Collaborative Research and Businesses
 - UK is a Good Market for Electronics Products and Gateway to European Markets
 - UK has Demonstrable Track Record for Providing Leading Edge Electronics Solutions for Global Organisations



What Does NMI Do?

Champion the Industry!
Provide a Gateway to UK Activity

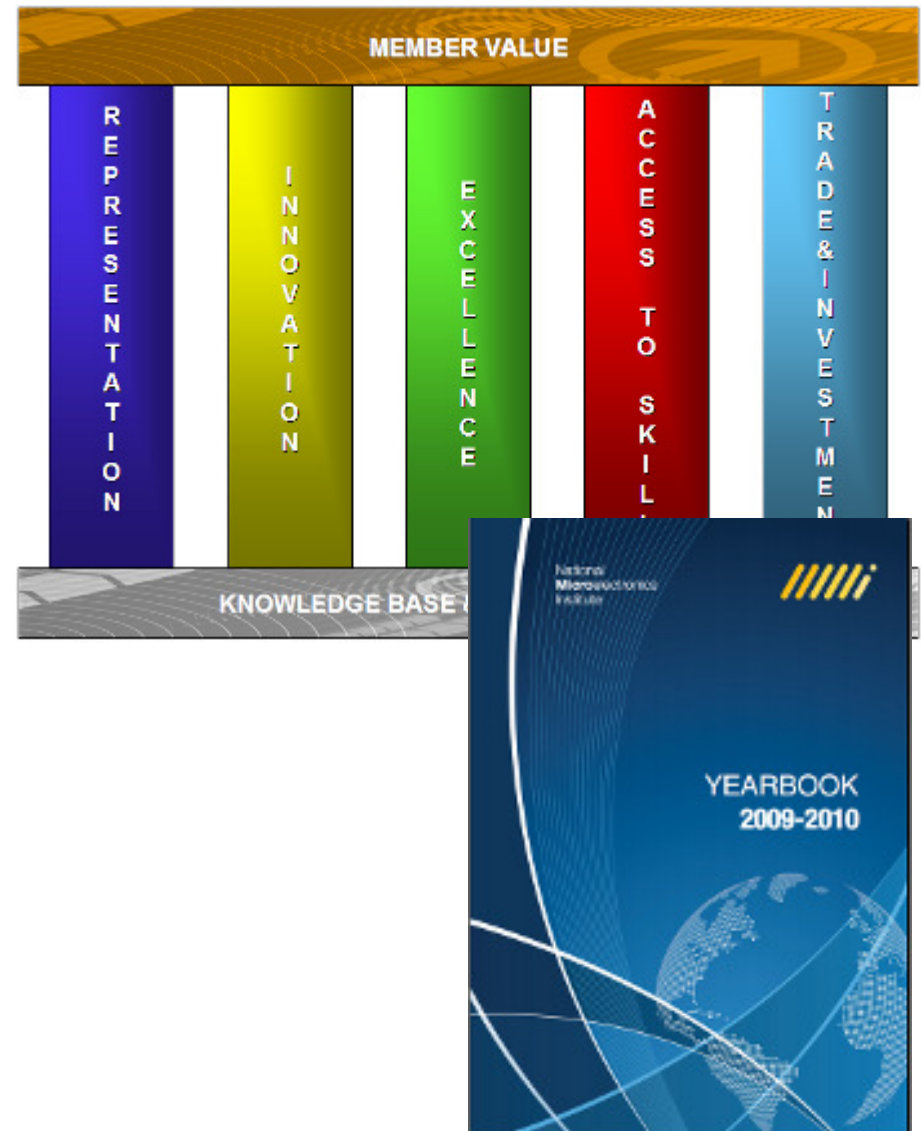
Key Programmes for 2009/10:

- 10 Knowledge & Business Networks
 - Low Carbon
 - Design, Design to Manufacture etc.
- Industry Voice and Representation
- Skills Needs and Capacity
- Outreach to International Partners and Regions

For more details see our website

www.nmi.org.uk

Download Our Free Year Book





Thank You for Your Time



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