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EU manufacturing network adds value to research

Globalisation of markets for manufactured products, with increasing competition from low-wage economies, poses a growing threat to EU industry. Business success will depend on an ability to absorb the latest technology and respond rapidly to the demand for increasingly customised products and solutions at highly competitive prices. The Commission-funded MANTYS¹ network is promoting cross-sectoral information exchange to boost innovation in manufacturing technology by EU enterprises and institutions, and optimise the return on EU research investment in production equipment.

Over the past two decades, average product lifetimes have halved every five years. The increasing pace of technological change, coupled with growing consumer expectations, is forcing rapid evolution. Manufacturers must react ever more quickly to satisfy the demand for more features and higher performance, while spreading their costs over shorter runs with reduced time-to-market.

Agile manufacturing

The ability to compete depends on using more economic and efficient production systems, plus the flexibility to accommodate unpredictable changes. These are the underlying principles of 'agile' manufacturing, outlined by US business guru Rick Dove.

¹ Thematic Network on manufacturing technologies (G1RT-CT-2001-05032)



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Companies across many industries are considering various strategies to achieve agility; some could have enormous implications for the nature of manufacturing enterprises and the responses required of equipment suppliers. Radical options include: creation of virtual enterprises; moves towards modular products permitting mass customisation; adoption of reconfigurable machinery systems; and leasing productive capacity rather than outright purchases.

Of particular concern to Europe is the effect this will have on the machine tool sector. Key to an enormous range of production processes, it is a field in which European suppliers lead the world, currently meeting 52% of global demand. The objective of the MANTYS thematic network is to strengthen this leadership position by coordinating research across the EU to maximise efficiency and ensure results are exploited as fully as possible.

Large-scale network

MANTYS is a four-year initiative, coordinated by the European committee for co-operation in the machine tool industries (CECIMO) and launched in September 2001 under the EU Fifth Framework Programme (FP5) Competitive and Sustainable Growth programme. It provides a forum for participants to share knowledge relating to technology, socio-economic issues, sustainability and quality-of-life aspects of manufacturing.

“Some 85% of machine tool enterprises are SMEs,” points out René Groothedde, Secretary General of CECIMO. “Important considerations for us are to ensure effective information dissemination and technology transfer to such companies in today’s fast-changing environment. We need to assist them in identifying the most promising avenues for exploration, and to prevent wasteful duplication of effort. Fortunately, we have a good understanding of how to attain these goals. The present network is a follow-up to the FP4 Brite-Euram thematic network on advanced manufacturing systems (TEAMS). From that



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background, we gained valuable experience in organising an effective support structure, and were able to enlist the co-operation of an extensive group of established contacts.”

The core MANTYS network consortium comprises 30 prominent European institutes, research laboratories and industry associations. More organisations, including several from EU accession countries, have subsequently joined in an associate capacity.

MANTYS links more than 80 individual Commission-funded and other research projects, with their members acting as interfaces with the network. They communicate non-confidential details of their own activities and objectives, while channelling back information generated by other collaborating groups. Cluster coordinators monitor project progress, offer advice on how targets can best be reached, and maintain continuous contact with the Commission. Potential synergies are highlighted and co-operation promoted through a shared extranet website and nine-monthly meetings.

Interacting committees

A technology watch committee publishes reports on exploitable aspects of specific projects and on broader overall trends, as well as looking for additional application areas. Its work focuses principally on reliability and control, agility and flexibility, process eco-efficiency, virtual manufacturing and precision/miniaturisation – all of which are considered to have sector-crossing technical and socio-economic impacts.

In addition, a focused socio-economic task force composed of experts from universities, private companies and machine tool builders' associations is gaining insight into the mechanisms that relate technological innovation to socio-economic factors – such as employment, education, business cycles and sustainable growth.



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Building on this input and the technology trend reports, a foresight committee is formulating realistic scenarios based on likely impending developments, such as:

- Introduction of 42-V electrical systems, auxiliary fuel cell power and new materials in the automotive industry;
- Advanced materials and new forms of construction for aerospace vehicles;
- Closer integration of computer modelling and virtual manufacturing with production; and
- Emergence of reconfigurable machinery and virtual enterprises.

An industrial advisory committee will use the findings of the technology watch and foresight committees to assess the strategic priorities that will shape tomorrow's enterprises and coming generations of machine tools. Technology road maps will then be produced, preparing decision-makers to orient their activities and to adapt to change.

Valuable resource

“The format of the network is proving very successful,” says Groothedde. “An important achievement has been to bring together many of the key people in the R&D, tool manufacturing and end-user communities – although we would welcome even more industrial participation. We assisted the Commission in preparing the ground for the initial round of expressions of interest under FP6, and can serve as a valuable resource to the proposers of new integrated projects and networks of excellence relating to our sphere of activity.”



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FhG-IPK Berlin: Institute for Production Systems and Design Technology, Fraunhofer Society, Germany

FUNDACION TEKNIKER, Spain

HSG – University of St Gallen, Switzerland

IFW Hannover Institute for Production Engineering and Machine Tools, Germany

IRCCyN, Cybernetic and Communication Research Institute of Nantes, France

IRES, UCL The Institute of Economic and Social Research, Belgium

ISTEC-ILM, Institute of Science and Technology of Ceramics - National Research Council, Italy

ISW Stuttgart: Institute for Control Engineering of Machine Tools and Manufacturing Units, Germany

ITIA-CNR Italy: Institute of Industrial Technologies and Automation, Italy

IWT (ECO-Center) Bremen: Institute for Metal Working Technologies, Germany

LFM Bremen, Laboratory for MicroMachining, Germany



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UPV-EHU: University of the Basque Country, Spain

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WTCM/CRIF: Belgian Research Centre for Manufacturing Technologies, Belgium