IMS
Support for international collaboration

What is IMS ?

"Intelligent Manufacturing Systems" (IMS) is an international research and development collaboration scheme to address manufacturing challenges in the 21st century. IMS provides a framework for industry and academia to identify RTD subjects and partners world-wide and to establish networks, collaborative projects and broad-based technology trials.

A unique feature of IMS is its provision of a proven, effective and efficient framework for the protection of intellectual property, which offers a safe environment in global collaboration. A world-wide user community can also be involved ensuring general applicability of the technology developed and facilitating a better understanding of global markets.

To respond to the drastic changes in manufacturing industry through globalisation of manufacturing activities, changes in market demand and rising environmental concerns, the idea of international collaborative research in manufacturing was conceived about 10 years ago. The vision was to increase the intellectual asset on manufacturing, to avoid duplication of research investment, to reproduce better insight and to remove cultural barriers.
Australia, Canada, Japan, Switzerland and the USA agreed on IMS as a multilateral collaborative RTD scheme in 1995. The European Community and Norway joined in April 1997 and Korea in 2000.

Since 1995, an IMS project portfolio including about 20 active projects has been built. These projects represent an international commitment level of around €250 million and involve about 250 companies and 200 research institutes.

The IMS research focus

IMS is responsive to the rapid changes the world is undergoing. It takes into account the challenges for new manufacturing of the next 10 to 20 years as the rapid advancement of information and communication technologies and the process of globalisation force traditional manufacturing to evolve. The co-ordination of research, production, marketing and after-sales services requires intensive use of electronic networks and virtual and geographical clusters of expertise. The importance of products' intangible elements have increased considerably, e.g. software, built-in service capabilities, on-line maintainability etc.

Consequently the focus will be on e-business platforms to enable the electronic integration of supply chains, supporting a holistic life cycle management of the product. Virtual enterprise concepts and architectures, involving system synthesis, modelling and simulation of all manufacturing and logistics operations are further examples of relevant strategic research areas for IMS. In this context, knowledge management becomes crucial to new manufacturing. IMS is a vehicle for dissemination of knowledge and has a role to develop a recognised international manufacturing engineering curriculum.

Nano- and micro-technologies are also addressed by IMS, as these are technologies which will have a revolutionary impact on manufacturing.

Another challenge facing manufacturing relates to the emergence of newly industrialised countries. The old economic pattern built up by the industrialised world is no longer sustainable and a new global pattern, combining ecological and economic efficiency, is required.

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The IMS project portfolio

Internationally endorsed IMS projects (July 2000)

- **GLOBEMAN-21** - Enterprise Integration for Global Manuf. in the 21st Century - finished
- **GNOSIS** - The Virtual Factory - finished
- **MMHS** - Metamorphic Material Handling Systems - finished
- **GLOBEMEN** - Global Engineering and Manufacturing in Enterprise Networks
- **HMS** - Holonic Manufacturing Systems
- **RPD** - Rapid Product Development
- **IF7** - Research on Innovative and Intelligent Field Factory
- **INCOMPRO** - Intelligent Composite Products
- **HARMONY** - Coping with the complexity of Business Innovation
- **SIMON** - Sensor Fused Intelligent Monitoring Systems of Optimising Machining Process
- **MISSION** - Modelling and Stimulation Environments for Design, Planning and Operation of Globally Distributed Enterprises
- **INTELLIWOOD** - Intelligent manufacturing of wood products using colour, x-ray and computer tomograph-based quality control
- **IRMA** - A configurable Virtual Reality System for Multipurpose Industrial Manufacturing
- **3DS** - Die Digital Design
- **HUMACS** - Organisational Aspects of Human-Machine Co-existing Systems
- **HIPARMS** - Highly Productive and Re-configurable Manufacturing System
- **GLOBAL CAPE OPEN** - Deliver the Power of Component Software in Computer-aided Process Engineering
- **NGMS** - Next Generation Manufacturing Systems
- **HUTOP** - Human Sensory Factor for Total Products Life-Cycle
- **ROBUST** - Systematisation of Quality Engineering & Development of Software for its application
- **TES** - Recycling for Composite Material Waste by Thermal Elutriation System

Scientific and technical themes covered by the project portfolio

Total product life cycle issues including: intelligent communication network systems for information processes in manufacturing; environment protection, minimum use of energy and materials, recyclability and refurbishment; economic justification methods.

Process issues including: clean manufacturing processes; adaptable, integrated equipment and reconfigurable production systems, innovative manufacturing systems for new material and components e.g. nanotechnologies and biotechnologies.

Strategy / planning / design tools including: methods and tools to support process re-engineering; modelling and simulation tools to support the analysis and development of manufacturing strategies; design tools to support planning in an extended enterprise environment; knowledge engineering and management of production systems.

Human / organisation / social issues including: promotion projects for improved image of manufacturing; improved capability of manufacturing workforce through education, and training; new educational and training methods for rapid assimilation of knowledge, corporate technical memory - keeping, developing, accessing.

Virtual / extended enterprise issues including: methodologies to determine and support information processes and logistics in the extended enterprise; architecture (business, functional and technical) to support engineering co-operation, e.g. concurrent engineering across the extended enterprise; methods and approaches to assign cost/liability/risk and reward to the elements of the extended enterprise; team working across individual units.

Benefits from IMS collaboration

IMS facilitates international partnerships and provides a platform to learn from other regions about research strategies to cope with the challenges for new manufacturing mentioned above. It allows an exchange on leading edge technologies. This can be done through building up and/or joining networks of projects or through carrying out international RTD projects. The value added for carrying out RTD at international level is widely recognised by the current international IMS project participants:

- shared and reduced RTD costs, burdens and risks;
- creation of common global platforms for benchmarking of different methods;
- technology trials on a large scale basis involving a global user community and ensuring general applicability of technology developed;
- technological and market complementarity;
- improved customer-supplier links;
- means to address market access barriers;
- development based on global participation in the standards process which is a crucial issue for global manufacturing.

The IMS IPR Intellectual Property Rights framework allows in particular small and medium sized firms (SMEs) to collaborate in a proven and fair framework on a global scale with large enterprises. Through IMS SMEs have access to complementary skills and economies of scale and benefit of technology leading edge developments in global diffusion of manufacturing.

How to participate in IMS

There are two major ways to international collaboration:

- through networking of existing initiatives and projects in the IMS regions;
- through joining an existing or establishing a new RTD project in a particular field.

A European IMS Secretariat was set up within the European Commission to help European industry and research to participate in IMS.

The European participation in the IMS projects and IMS networks can be financially supported by the Community through the 5th Framework Programme (FP5), helping to create synergies and to build international consortia for joint RTD activities.[1]

[1] ***Joint Call of IST & GROWTH Programmes on IMS***
A call is published jointly by the programme for the "User-friendly Information Society" (IST) and the programme on "Competitive and Sustainable Growth" (GROWTH) to invite IMS RTD proposals. IMS is supported by both programmes with community funding up to a ceiling of 70M€ for the whole FP5.

How to write an IMS proposal

Prospective IMS participants are encouraged to join either existing project teams for developing a new project or a network of projects (abstracts of the new projects have been circulated), in the relevant domain, or even initiate a new IMS project with other organisations in the IMS regions (either directly or with the help of the IMS web pages and regional secretariats).
Each IMS region has its own system to fund the participation of the respective consortia in IMS consortia.

IMS proposals have two distinct parts; the European part, which must fit into the IST - or the GROWTH - work programmes, and the international part, which should include partners from at least two other IMS regions (e.g. Japan and USA). The European part of an international IMS project can be funded according to the common FP5 rules. The other international partners have to turn to their respective IMS Secretariats to find out their modalities for financial support. These regional secretariats will also help to find appropriate partners in their region if so required. The addresses of the IMS regional secretariats are listed below.

Information on IMS

If you are interested in learning more about IMS, please visit the IMS international home page: http://www.ims.org and the European IMS homepage: http://www.cordis.eu/src/ims/home.html[2].
A specific IMS guide for proposers can also be found at the same address.

For direct request of information, please contact the:

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[2] Information on the subjects tackled in the international project portfolio and the benefits expected or derived can be found in a separate publication (First assessment of the IMS Scheme and IMS Projects Overview and Results) available for down-loading or available at the European IMS Secretariat.

Addresses of IMS Inter-Regional and Regional Secretariats

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