

Growth Programme – Key Action 1 – TRA 1.7

“ ” *Extended Enterprise - the knowledge based extended manufacturing enterprise* ”

The “Extended Enterprise” in a sustainable society

The New Economy has shifted the economic development paradigm from a capital driven economy to knowledge driven economy, in particular through the development of networked industrial and services enterprises. These services are strongly linked with engineering, manufacturing, logistics, use, and end of life, thus generating the extended enterprise, which is at the very heart of “tomorrow’s production systems”.

The need for efficient networked enterprises at European level requires not only technology innovation but also careful attention to industrial organisation. It needs in particular better logistics inside and outside the industrial facility and the optimisation of Value Chain Management systems.

... towards “tomorrow’s production systems”



- ➔ **Ensure effectiveness of supply chains, production, distribution and service networks**
- ➔ **with multi-skilled and knowledge intensive enterprises**

The objective should be to maintain control all over the lifecycle, ensure consistent product quality throughout the production and service supply, reduce communications lines between all actors, and create a suitable environment based on reliable data from heterogeneous sources. Improved management systems should also contribute to an efficient Customer Relationship Management, deal with the classical (cost, quality, delay, liability, end of life) constraints, and finally allow measure and benchmarking. Optimisation of the value chain requires efficient supply chains as well as production and service networks, based on a reinforced European industrial base, integration of competencies as well as technologies.



Towards “knowledge based extended manufacturing enterprise”: an EU RTD approach

Co-ordinated research efforts are needed in Europe to help its industry to adapt to change, notably considering:

- *new lifecycle approaches, smaller production batches and increased product variety*
- *need for codified knowledge on products, production processes, services, socio-economic impacts (for consumer information, (eco-)taxation, decision making process etc.)*
- *increased number of organisations participating in the overall production process, and frequent organisational changes (outsourcing, mergers, splits, changing customer-supplier relationships, etc.)*
- *increased product liability and responsibility (End of Life responsibility, extended warranty, traceability)*

To this end, European research initiatives (RTD and Thematic Networks), through the effective integration and application of lifecycle-oriented organisational tools as well as dedicated information society technologies, should aim at:

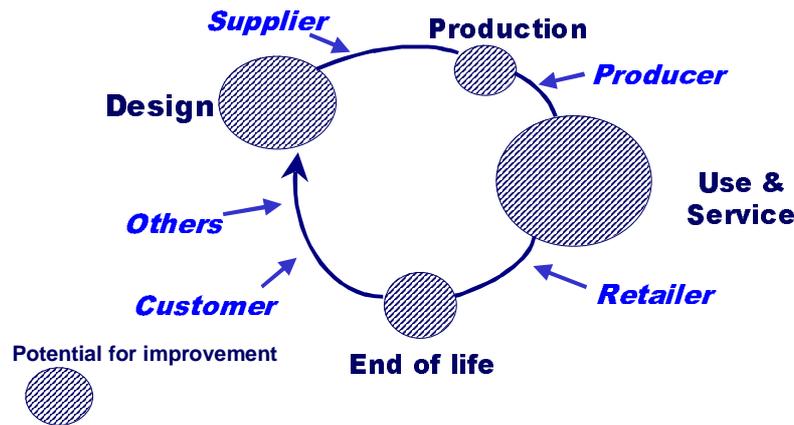
- (a) facilitating integration of design and production activities and improving logistics across the value chain, taking into account product life cycle as well as transport requirements,
 - **Lifecycle based design of extended enterprise concepts**
 - **Management tools, including e-systems for improved organisation and logistics**
- (b) enhanced management of human resources, of customers and society needs and of knowledge in the extended manufacturing enterprise.
 - **Data retrieval, shared knowledge management and system monitoring**
 - **Learning organisations for management of change**

To achieve this, RTD actions should be carried out at a global level, considering social factors, the economy, processes, technologies and organisation in a holistic manner. This research might be accompanied by specific socio-economic and benchmarking studies.

Research underpinning the “Extended Enterprise” should address all important life cycle aspects and should look at the integration of networked production activities with optimised logistics inside and outside the industrial facilities.

Sustainable competitiveness ...

Need for system and Life Cycle approaches



The Research Areas

The concept of a “Extended Enterprise” requires new RTD developments for the effective integration of tasks carried out by suppliers, manufacturers, services and logistics companies, etc, within a context of sustainable competitiveness. Activities to be supported, aiming at the above mentioned goals, should cover and integrate in particular the following research areas, which are detailed in the Growth Work Programme 2001:

- 1.1.1 Integrated product-service design
- 1.1.2 Advanced production and construction technologies
- 1.1.3 Safe and reliable extended life of products and industrial systems
- 1.2.1 Design of products and production-service systems
- 1.2.2 Intelligent manufacturing and processing
- 1.2.3 Monitoring and optimal use of industrial systems
- 1.3.1 Eco-efficient design of products and processes
- 1.3.3 Product recovery and waste recycling
- 1.4.1 New methods of organisation, work and human capital improvement
- 1.4.2 Adaptation of enterprises and human oriented production
- 1.4.3 Knowledge, learning and management

Large projects that function as an umbrella for smaller projects or integrating different workpackages are encouraged.



This TRA is suitable to large consortia based on a set of partners working on different sub processes (engineering, planning, procurement, logistics, **document management, financials, resource management**, data warehouse, Decision Support Systems (DSS), quality control, storage, traceability, recovery, etc) linked together in one large project or thematic network.

RTD activities should be carried out in close interaction between technology lead organisations and large user groups, assessing the eventual adoption of change by industrial organisations.

The work under this TRA is complementary with the activities carried out in the TRA 1.5 "Product-Services", KA2 "sustainable mobility and intermodality" and in KA2 of the IST programme concerning knowledge management and "smart" organisations.

Reminder

The call for proposals for the TRA "Extended Enterprise" is open from December 2000 until 15 May 2001.

Proposers should realise that this TRA is a topic within the KA1 "Products, processes, organisations". They should thus contribute to solving clear user problems through medium to long term technological research and they should keep in mind the KA1 objectives:

- ◆ **Contribution to modernisation of industry** and adaptation to change, through the combined effects of improved industrial capability and innovation capacity, while introducing more flexibility to respond in real time to customer needs.
- ◆ **Substantial improvement of overall quality** within the value chain and consequently reducing "inefficiencies" and life-cycle product costs is a key factor. Quality is intrinsically linked to customer-value and timely satisfaction of customer needs at the lowest costs.
- ◆ To **minimise resource consumption** (e.g. materials, energy, water) to reduce substantially the overall life cycle impact of Product-Service provision and use.

Potential applications and expected impact of proposals

Proposals may address all manufacturing and related service sectors ranging from consumer products, packaging, textile, food industry, **construction**, traditional industry, transport and industrial goods, including the application of the next generation of IST products for innovative **e-business-B2B** solutions.

Research proposals are expected to address the whole-extended industrial value chain that includes multi-client and/or multi-sites industrial infrastructures.



As research proposals should address issues such as the development of new manufacturing structures or new patterns of work organisation and practices (such as full lifecycle warranty), it is expected that their results will, in the *medium to long term*, stimulate a better integration of manufacturing, service and eco-industries.

Outputs of research should allow the intelligent management of information and its transformation into useable knowledge for design, prototyping, production, commercial or public purposes. Learning process, re-use of knowledge or continuous improvement are also essential. The profile of highly skilled workers, innovative organisation, and the flexibility and robustness of intelligent and re-configurable information and communication networks are some of the goals to be researched.

RTD activities on “Extended Enterprise” can be pivotal in enabling emergence of new organisational structures, new relationships between producers and users, new work practices and in facilitating social acceptance (impact of new working methods).

One may expect that results of Extended Enterprise RTD would lead to changed design/production/service/recovery patterns contributing to long-term changes in society, economy and manufacturing systems, making them more sustainable.

Summary

Through the Framework Programme, European activities stimulate and support international co-operation between academia, research organisations, industries and other relevant stakeholders for the development of “*tomorrow’s society*”. With the opening of the TRA “*Extended Enterprise*” in this call, the Community research action is directed towards long term changes in the production and organisational patterns towards the new economy based on knowledge, lifecycle approaches, innovation and teamwork. Furthermore, coordination and networking activities (also open in the call) support the achievement of strategic common objectives and contribute to the strengthening of a true European Research Area.

Proposals should demonstrate scientific and technical excellence, innovative character, a sound European dimension. They should ensure wide socio-economic impact at EU level and demonstrate the necessary critical mass. Clusters and large integrating proposals around a strategic issue are encouraged. Proposers should use the pre-proposal check whenever appropriate.

For further information please consult:

GROWTH help-line: growth@cec.eu.int

CORDIS: www.cordis.lu/growth/home.html