

PILLAR III - Business model

To design and develop a proper business model for the addressed supply chains, in order to allow an effective exploitation of S-MC-S project results. This novel business model will be aiming at translating into economic outputs the supply chain resources, capabilities and developed innovations. The S-MC-S project outcomes are expected to result into tangible benefits for a wide range of stakeholders all over the supply chain. Defining a coherent and consistent business model will guarantee a well-balanced distribution of such benefits among the involved actors.

PILLAR IV - New specific MC technology

The previous PILLARS address a complete supply chain design and assessment model, empowered by a new business model. But those tools alone are not enough to guarantee industrial success. Also core industrial technologies must evolve towards on-demand manufacturing capability, flexibility, fast response. While the S-MC-S paradigm has a wide scope and impact on several industrial sectors, the project is also intended to research and develop specific manufacturing technologies for MC, so providing the ground for a more conscious validation both for complete supply chains and specific technologies in three different sectors:

1. Leather goods sector: development of a continuous-flow tanning system of leather in lot size one, avoiding the current long, wasteful and polluting processing of large

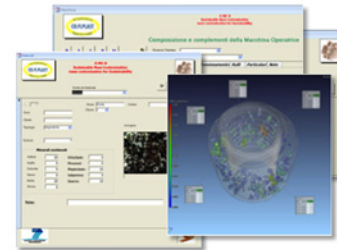
Mass-Customization: the concept of MC emerged in the late 80's and can be defined as "producing goods and services to meet individual customer's needs with near mass production efficiency" (Tseng & Jiao, 2001). In general, MC is seen as reducing the trade off between variety and productivity, thanks to new manufacturing technologies and management strategies. Several authors (Lampel & Mintzberg, 1996; Gilmore, 1997; Pine, 1993) propose a continuum framework that ranges from the simple adaptation of delivered products by customers themselves to the total customization of product, sale, design, fabrication, assembly and delivery. (Piller, 2001).

INFO BOX 1

batches. This is based on the development of a new chemical-free intermediate commodity product, the Dried Collagenic Biomaterial ("BCD"), which, due to its dehydration and spongy fibrous structure allows the instantaneous penetration of auxiliary tanning chemical products, with immediate effect.



2. Stone cutting sector: development of advanced custom made diamond wire-rod tools meant also to introduce significant improvement of tool expected life. The process will address the implementation of new SMA (Shape Memory Alloys) rod to customize tool specifications.



3. Furniture sector: Development of Technologies for fast production of customized kitchen furniture. Flexible production technologies for this sector are available, and thus the scenario will focus on the sustainable supply chain definition to be empowered by the techs available.



More information: www.mckn.net/SMCS

S-MC-S

Sustainable Mass Customization
Mass Customization for Sustainability

S-MC-S aims at supporting European manufacturing enterprises to adapt to global competitive pressure by developing methods and innovative enabling technologies towards a personalized, customer oriented and eco-efficient manufacturing



The S-MC-S project aims at supporting European manufacturing to adapt to global competitive pressures by developing methods and innovative enabling technologies towards a customer oriented and eco-efficient manufacturing. To this end, S-MC-S vision is to define and research a new production paradigm, Sustainable Mass-Customization, while also presenting Customization as one of the main driving forces behind the future success of Sustainability. Nowadays, companies still fail to profit from mass-customization because there is no real networked environment, and because the evaluation of Mass Customization implementation fails to move beyond the mere assessment of economic aspects. S-MC-S addresses these issues by promoting 4 RTD Pillars:

1. **Design Tools:** defining methodologies and tools capable to manage growing complexity of product, production and supply chain configurations imposed by MC implementation in a networked environment.
2. **Assessment model:** defining the assessment model needed to evaluate the impact of production systems and different supply chain configurations.
3. **Business Model:** defining the framework and strategies for creating economic, social and ecological value through the systematic implementation of S-MC-S paradigm.
4. **New specific MC technology:** researching pilot MC enabling technology in 3 different sectors, to support manufacturing transition towards sustainable MC (leather; furniture; stone)

PILLAR I - Design tools

It is widely accepted [Da Silveira-2001] that three enabler to implement MC are agile supply chain management, customer-driven lean manufacturing, and customer driven product design. Thus, the S-MC-S integrated design concept for sustainable supply chains is based on three interrelated topics:

1. Design of Sustainable MC Products: addressing the development of product design tools responsible for setting the criteria to be taken into account when designing customizable sustainable products. Small series and customization cannot be successful unless products are designed for that [Krishnapillai and Zeid, 2006].
2. Design of Sustainable Manufacturing Systems: to address the development of design tools responsible for setting the methods and best practices to implement sustainable manufacturing systems for mass customized goods, which include lean and green principles, by defining clear goals, approaches and performance indicators derived from the assessment model developed in the following S-MC-S pillar.
3. Design of Sustainable Supply Chain/Networks: to address the development of design tools responsible for creating sustainable individualized manufacturing and distribution solutions based on the particular customers and manufacturing needs.

PILLAR II - Assessment model

A comprehensive MC assessment model requires the identification of suitable Key Performance Indicators (KPIs) providing an overall picture of the requirements to be fulfilled by a specific Sustainable Solution according to the three sustainability pillars (ECO-ECO-SOC) (see info-box2).

Sustainability is often depicted as the intersection of three Sets (symbolized by ellipses), representing solutions coping with environmental, social and economical constraints, known as the "three pillars" (Adams, 2006).



The implication of the Social pillar KPIs will be analysed deep into detail, due to the impact of these performances measures both at the overall society and at the single customer/user level. In fact, MC implies a stronger and more complex interaction between some members of the Sustainable Supply Network and the end user. These relationships as well as the corresponding set of KPIs will be identified, analysed and integrated into the proposed SMC assessment model.

The SMC assessment model, in order to provide valuable input to the design tools developed by PILLAR I, must clearly describe at various granularity levels the relationships among the identified KPIs and the characteristics of the envisaged Sustainable Supply Network. The developed qualitative and quantitative models will allow to measure, on the basis of the identified SMC KPIs, the impact of various Sustainable Manufacturing Systems and Sustainable Supply Networks configurations.

