



REPLANET NEWSLETTER

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Editorial

Prepare your business for the 21st century: Mass Customization

Mass production was the predominant industrial paradigm in the 20th century. It builds on the idea of “one size fits all”, meaning that many people have similar needs and thus all of them can be addressed with the same product. Subsequently, one product can be produced in larger quantities and, exploiting economies of scale and economies of scope, for much lower cost. This production system became so successful in the 20th century, because the technological and social premises during many decades offered an ideal foundation for its success.

However, in the last decade technological and social changes have created a globalized world with very different premises than those that boosted mass production earlier: Technological change happens increasingly faster and thus product life cycles become shorter. Today customers can access much more information than ever before and they can compare much more alternative products as the markets have become global. Subsequently their customer needs are more diverse and differentiated than they used to be in the mass production era. Customers are now looking for products that better fit their individual needs than standardized, off-the-shelf products.





Mass customization addresses exactly this opportunity by leveraging complexity to drive rather than break innovation. We define mass customization as the development, production, marketing and delivery of affordable goods and services with enough variety that nearly everyone finds exactly what they want. But while companies such as Dell, BMW or MyMuesli appear to have cracked the code, reality has been harsh for other organizations. Indeed, few firms are actually deploying mass customization beyond experimentation, and in many cases it has simply failed to deliver on its promises.

Our research found that mass customization can be broadly applied to most businesses. The key to profiting from it is to see it not as a stand-alone business strategy that replaces today's production and distribution systems, but as a set of organizational capabilities that can supplement and enrich an existing system. It is necessary to try to understand what it takes to mass customize. While specific answers are clearly industry or product-dependent, a decade of studying mass customization has led us to three fundamental strategic capabilities needed for a firm to mass customize: solution space development, robust value chain design and choice simplification.

Frank Piller

Chair professor of management and the director of the Technology & Innovation Management Group at RWTH Aachen University, Germany, one of Europe's leading institutes of technology. He also is a founding faculty member and co-director of the MIT Smart Customization Group at the Massachusetts Institute of Technology, USA.

His recent research focuses on value co-creation between businesses and customers/users, customer-centric value creation, strategies to increase the productivity of technical problem solving, and models to cope with contingencies of the innovation process. Frequently quoted in The Financial Times, The Economist, and Business Week, amongst others, he is regarded as one of Europe's leading experts in the fields of mass customization, customer-centric value creation and open innovation.



3rd REPLANET Newsletter
April 2010



News



REPLANET in a joint IMS MTP Initiative.

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The Intelligent Manufacturing Systems (IMS) program is an industry-led, global, collaborative research and development program established to develop the next generation of manufacturing and processing technologies. IMS activities include providing a framework for global cooperative research, assisting project consortium formation, networking people on a global basis, conducting forums to understand current and future manufacturing requirements, and disseminating information resulting from these activities. In so doing, it enhances the quality of life of the world community.

REPLANET has participated in the IMS Manufacturing Technology Platform and Roadmap Meeting, 9-10 November, Geneva.

The 4 NMP-2008-3.3-1 Projects (REPLANET, Net-Challenge, CONVERGE and inTime) celebrated a meeting the first day of the event in order to prepare a joint IMS MTP Initiative. The result of this meeting was a proposal titled iNet-IMS "Intelligent Non-Hierarchical Manufacturing Networks". The objective of this initiative is the extension of scope of the EC-FP7 funded projects REPLANET, CONVERGE, Net-challenge and inTime, with respect to IMS-specific tasks and results.

iNet-IMS "Intelligent Non-Hierarchical Manufacturing Networks"

The four projects are under the Call "FP7-NMP-2008-SMALL-2" Activity code "NMP-2008-3.3-1: Supply chain integration and real-time decision making in non-hierarchical manufacturing networks", and started between May and September 2009.

The objectives of the iNet-IMS initiative are:

- To analyse the needs that arise from the interactions and relationships between SMEs belonging to Non-Hierarchical Manufacturing Networks.
- To analyse recent technological innovation trends (mainly in terms of IS and IT) to support Decentralised Decision Making.
- To analyse existing standards for information exchange to support Collaborative Processes.
- To define a Framework for Collaboration in Non-Hierarchical Manufacturing Network context.
 - Strategic Model
 - Tactical Model
 - Operational Model

Participating Regions, Projects involved and Partners

The partners involved in the iNet-IMS proposal are the following ones:

PROJECT	PARTNER	COUNTRY	REGION
CONVERGE	BIBA - BREMER INSTITUT FUER PRODUKTION UND LOGISTIK GMBH	GERMANY	EU
	CAS SOFTWARE AG	GERMANY	EU
	SINGULARLOGIC INFORMATION SYSTEMS AND APPLICATIONS	GREECE	EU
	UNIVERSITY OF BORDEAUX	FRANCE	EU
INTIME	AFM	SPAIN	EU
	DIN E.V.	GERMANY	EU
	ESTARTA S. COOP	SPAIN	EU
	FIDIA S.P.A.	ITALY	EU
	FIR E.V.	GERMANY	EU
	FUJITSU	GERMANY	EU
	IDEKO R&D CENTRE	SPAIN	EU
	OTTO JUNKER GROUP	GERMANY	EU
	POLITECNICO DI MILANO	ITALY	EU
	RWTH AACHEN UNIVERSITY, WZL	GERMANY	EU
	SAP RESEARCH	SWITZERLAND	Switzerland
	UCIMU	ITALY	EU
NET-CHALLENGE	ITIA CNR	ITALY	EU
	INESC PORTO	PORTUGAL	EU
	SYNESIS	ITALY	EU
	TIE NEDERLAND B.V.	NETHERLANDS	EU
	UNIVERSITY OF VASSA	FINLAND	EU
	WAPICE OY	FINLAND	EU
REMPPLANET	BIMATEC-SORALUCE FRASTECHNOLOGIE	GERMANY	EU
	CENTRO DI RICERCA E INNOVAZIONE TECNOLOGICA SRL	ITALY	EU
	FESTO AG & CO KG	GERMANY	EU
	IKERLAN S.COOP.	SPAIN	EU
	INSTITUTO TECNOLOGICO DE INFORMATICA	SPAIN	EU
	RHEINISCH-WESTFAELISCHE TECHNISCHE HOCHSCHULE AACHEN	GERMANY	EU
	SCUOLA UNIVERSITARIA PROFESSIONALE DELLA SVIZZERA ITALIANA (SUPSI)	SWITZERLAND	Switzerland
	THE UNIVERSITY OF LIVERPOOL	UNITED KINGDOM	EU
	UNIVERSIDAD POLITECNICA DE VALENCIA	SPAIN	EU

Liverpool Workshop

The REPLANET Workshop at Liverpool took place the 27th and 28th of April 2010. In this workshop the WP leaders presented the current status of each work package. Moreover, the Intellectual Right Support Group, Executive Board and General Assembly celebrated meetings in the workshop.

This meeting also included a visit to the facilities of KING & FOWLER in Liverpool.



CRIT - Research Workshop

The following REPLANET Workshop will be held in Bologna (Italy) the 22th and 23th of September 2010 and it will be organized by the CRIT – Research partner.



Exploitation Strategy Seminar

A day before of the CRIT-Research meeting, the 21st of September 2010, it will take place in Bologna the Exploitation Strategy Seminar for the REPLANET project.

In this seminar a senior expert will present the results of the study of potential obstacles to the exploitation of the project's results. In this interactive working seminar, animated by the same expert, the participants in the project will be aware of the risks identified and initiate a discussion for developing an exploitation strategy which takes these factors into account



Strategic REPLANET Model



Mass customization - fulfilling each customer's individual needs

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"People don't want choice. They just want what they want," Joseph B. Pine has stated in his 1993 book. Generally, customers buy products based upon a combination of preferred product characteristics. Each customer has an individual combination of product characteristics in mind that defines an "ideal product" for this one customer. Whether the buyer prefers the offered product over another depends upon the divergence between the offered product's real properties and the product properties preferred by the customer. In other words, the shorter the distance between the customer's "ideal point" and the offered product, the higher the product is rated and respectively, more likely to be purchased - and repurchased - by the customer.

It is clear, that fulfilling all customers' wishes is a challenging task for every company. Although individual products create additional benefit for customers, integrating customers in individualization processes for purposes of mass customization also burdens the manufacturer with extra costs. Made-to-order production costs more and the interactive sales process induces higher transaction costs as well. But what one has to see is that customer integration is not only a cause for additional expense, but is a potential source for cost reduction and revenue at the same time. This is due to the buyer's perception of increased benefit achieved through higher product quality and through the interaction process of co-design as a positive experience (process quality). Both factors allow potential for price policies that reflect the competitive advantages of interactive value creation.

Still, mass customization can only be successful when the additional benefit exceeds additional expense. Research has shown that firms can achieve this by pursuing three fundamental capabilities: solution space development, robust value chain design and choice simplification.

Solution space development: Companies need to understand the needs of their customers. A mass customizer needs to identify those product attributes, along which customer needs diverge the most. Once this is understood, a solution space needs to be defined: What products will the company offer and what are the dimensions along which the offering can be configured to meet individual customer needs.

Robust process design: It is crucial that increased variability in customers' requirements does not lead to significant deterioration in the firm's operations and supply chain. This can be achieved through a robust value chain design in which customized solutions can be delivered with near mass production efficiency and reliability. Enablers of a robust value chain might be flexible automation and process modularity, for example.

Choice navigation: Firms must be able to support customers in identifying their own solutions, while minimizing complexity and burden of choice. When a customer is exposed to too many choices, the cognitive cost of evaluation can easily outweigh the increased utility of having more choices. This is the "paradox of choice". Therefore, choice simplification is vital to simplify the navigation of a company's product assortment. In this context it is important for a mass customizing company to offer configuration tools that support the customers' search processes.

However, with these requirements in mind, mass customization should not be perceived as an ideal, unachievable state, but as an ongoing process of continuous improvement. Pursuing a mass customization paradigm is akin to moving along a continuum whose limits are mass production and



mass customization. Small steps can produce big results, even if the organization remains far away from the “pure” ideal. As no firm can become a perfect mass customizer over night, the real question for most companies revolves around how solution space development, robust value chain design and choice navigation capabilities can be improved rather than perfectly achieved. Every company can do this, and add to strategic differentiation in the process.

Using open innovation to facilitate the process

To fulfill all three above named dimensions is the main challenge for every company that wants to be a successful mass customizer. It might be that a company is experienced in one of them, but is very unlikely that one firm is able to find answers to every question concerning the three dimensions by its own. Thus, it could be useful to facilitate the continuous improvement process with the help of open innovation methods.

The term “open innovation” defines a new strategy in innovation management today. Instead of relying solely on internal resources, a company is integrating external problem solvers into the innovation process as well. A large, undefined network of actors is called upon to solve a problem as opposed to traditional alliances in research and development. Customers play a very central role in open innovation as for many companies a tight-knit integration of customers has proved to be an essential factor in successful innovation management.

By using the methods of interactive value creation, the efficiency of development processes has increased to an impressive level. Previously, companies were limited by their own ideas, paradigms, and their unsuccessful attempts at finding solutions within these parameters. By openly announcing research problems, however, the problem of local search is solved. A community member, who recognizes the announced problem, applies his own method for solving problems and provides, in turn, a solution. Of course external problem solvers also fall back on “local” solutions. But since they often come from another background and have a different type of foreknowledge, their approach is often completely different and at the same time, highly innovative.

The REPLANET online platform

On the Internet, virtual communities have been discussed for a long. In general, a community is made up of its members and their relationships, whereas normally there is a focus on a common point of reference. Through the advancement of the Internet and with it, easier interaction between actors independent of their location, the old idea of the community in form of virtual communities has received a lot of attention. Virtual communities enable users to easily interact topic-specifically in multiple directions. In the REPLANET project we want to use this “community – effect” to give mass customizers the chance to interact with one another in order to learn from each other’s experience. That way the companies could improve their mass customization processes via an open innovation platform.

Therefore it is our idea to establish an online platform where different actors (practitioners, academics, service providers, scholars, etc.) can exchange knowledge, give feedback or find solutions for a common problem. Subsequently, the main task of the REPLANET platform will be the formation of a mass customization community and the facilitation of communication of its members via discussion forums, mailing lists, etc. Furthermore the platform will offer e-learning opportunities for those interested to get in touch with the topic of mass customization for the first time, as well as a broad knowledge repository of scientific articles and case studies for the more experienced users.



Scientific Publications

Up-to-date list of Scientific Publications

Until the moment, most of the scientific publications of REPLANET present the vision and goals of the project and different work packages and some basics and preliminary results.

Table 1: Resilience Multi-Plant Networks

Conference Name / ISBN	2009 World Conference on Mass Customization & Personalization (MCPC 2009)
Place	Helsinki, Finland
Date	4 th -8 th October 2009
Title	Resilience Multi-Plant Networks
Authors	Raul Poler
Type	Invited talk
Short description	Generic description of the REPLANET project
Keywords	Resilience, Strategic Resilience, Operational Resilience, Open Innovation, Mass Customization
WP	All
Partners involved	UPVLC

Table 2: Customised Order Fulfillment in a Machine Tool Supply Network

Conference Name / ISBN	2009 World Conference on Mass Customization & Personalization (MCPC 2009)
Place	Helsinki, Finland
Date	4 th -8 th October 2009
Title	Customised Order Fulfillment in a Machine Tool Supply Network
Authors	Eduardo Saiz, Eduardo Castellano, Juan Manuel Besga, Jone Uribetxeberria
Type	Peer reviewed paper
Short description	The research presented in the paper attempts to help globalised organisations to identify alternative supply network configurations and management strategies, to respond to different customised order fulfillment demand scenarios within existing cost and time restrictions. A case study of a machine tool manufacturer is presented. The company has a global multi-plant network and imperative requirements for introducing flexibility in a market demanding products with a high degree of customisation. Machine tools have a total production lead time longer than the market time. Therefore, the machine manufacturing process has to start before customers orders arrive. When an order arrives, a machine that is in process must be allocated to it. Some relevant information is collected and reviewed to carry out this allocation. The path across the manufacturing network that the allocated machine is going to follow is generated, the point where customisation will be executed to reconfigure the machine to the specific order requirements is identified and the delivery time is communicated to the customer. The research shows how this information is managed to make the allocation and how a simulation tool is used as a decisional support system to identify better network design alternatives for the location of new plants, warehouses, or logistics platforms, under mass customisation scenarios.
Keywords	Mass Customisation, Order Fulfillment, Network Design, Decision Support Systems, Simulation
WP	WP2
Partners involved	Ikerlan

Table 3: Managing customer interaction in innovation processes with value creation networks

Conference Name / ISBN	2009 World Conference on Mass Customization & Personalization (MCPC 2009)
Place	Helsinki, Finland
Date	4 th -8 th October 2009
Title	Managing customer interaction in innovation processes with value creation networks
Authors	Ditmar Ihlenburg
Type	Invited talk
Short description	The article focuses on the following questions: How can the mechanical and plant engineering industry provide targeted application and solution knowledge on an electronic platform? What role do web services play in intelligent searching for application and solution knowledge and in efficient communication and interaction between providers and consumers of this knowledge? Draft results and experiences of prototypical use will be presented as a electronic platform for solution knowledge exchange for solutions in the mechanical engineering industry in the early stage of the innovation process.
Keywords	Customer interaction, Innovation processes
WP	WP1
Partners involved	FESTO

Table 4: Integration of a new product catalogue process generation and resilient supply network configurations for several customised demand scenarios

Conference Name / ISBN	2009 World Conference on Mass Customization & Personalization (MCPC 2009)
Place	Helsinki, Finland
Date	4 th -8 th October 2009
Title	Integration of a new product catalogue process generation and resilient supply network configurations for several customised demand scenarios
Authors	Eduardo Saiz
Type	Invited talk
Short description	Generic description of the REPLANET Pilot 3 Bimatec-Soraluce
Keywords	Remplanet, Supply Network Configuration, Mass Customization
WP	WP2, WP6
Partners involved	Ikerlan, Bimatec-Soraluce

Table 5: SOP4EBPM: Generating Executable Business Services from Business Models

Workshop Name / ISBN	2nd IFIP WG5.8 Workshop on Enterprise Interoperability (IWEI'2009) Lecture Notes Business Information Processing, vol. 38, pgs. 107-112, Springer, ISSN 1865-1348
Place	Valencia, Spain
Date	13 th and 14 th October 2009
Title	SOP4EBPM: Generating Executable Business Services from Business Models
Authors	R. de Juan-Marín, R. Darío Franco
Type	Peer reviewed paper
Short description	This paper presents the vision considered by the REPLANET project for providing a platform for the discovery, design, deployment, execution, interaction, operation, optimization and analysis of extended business processes with the objective of supporting the collaborative decision processes in the con-text of Resilient Multi-Plant Networks in the manufacturing sector.
Keywords	Business Process Management (BPM), Software Oriented Architectures (SOA), Collaborative Processes, Workflows
WP	WP5
Partners involved	UPVLC and ITI

Table 6: An Ontology Proposal for Resilient Multi-Plant Networks

Conference Name / ISBN	The international conference on Interoperability for Enterprise Software and Applications (IESA 2010) Accepted for publication
Place	Coventry, United Kingdom
Date	12 th to 16 th april 2010
Title	An Ontology Proposal for Resilient Multi-Plant Networks
Authors	Rubén Darío Franco, Guillermo Prats, and Rubén de Juan-Marín
Type	Peer reviewed paper
Short description	This paper presents an ontology proposal for the REPLANET FP7 project which aims at developing methods, guidelines and tools for the implementation of the Resilient Multi-Plant Networks in non-hierarchical manufacturing networks, characterized by non-centralized decision making. Due to structural heterogeneity of REPLANET integration scenarios, an ontological approach seems to be a first key challenge to be addressed. Consequently, one of the main contributions of this paper is to provide an initial ontological approach, intended to harmonize domain concepts and their relationships.
Keywords	Ontology engineering, Resilient multi-plant networks, Interoperability
WP	WP5
Partners involved	UPVLC and ITI