SOME RESULTS OF MAPPING OF MASS CUSTOMIZATION ACTIVITIES IN SE EUROPE

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Abstract
The paper presents results of mapping different activities and subjects in the field of mass customization and personalization (MCP) in Central and Southeast Europe. The results of mapping are presented in Google Maps, devided into four main groups: research institutions, companies, national websites and dedicated conferences. The map is open to everyone, accessible through the Internet, displaying information about the relevant people and institutions. It can be concluded that mass customization business model was first adapted by national universities and then successfully transferred to SME`s and entrepreneurs. The aim is to set up a network of knowledge to help researchers and companies to implement their ideas smoothly.
Keywords
Mass Customization and Personalization, Central and Southeast Europe, Google Maps, Mapping, Network of Knowledge

1. Introduction

The idea of mass customization is based on the observation that there is a customer interest in products that are adapted to his/her individual needs and preferences, since the adaptation will increase perceived performance. As the standard of living has increased in the last 50 years, individualization has received increased focus, since customization has come within reach of the average consumer. At the same time there has been a massive development of technologies [1].

The concept of mass customization was first identified in "Future shock" by Toffler [2] and was later described in "Future perfect" by Davis [3].

Stan Davis, who coined the term in 1987, refers to mass customization when "the same large number of customers can be reached as in mass markets of the industrial economy, and simultaneously they can be treated individually as in the customized markets of pre-industrial economies" [3]. In order to address the implementation issues of mass customization, Tseng and Jiao [4] provide a working definition of mass customization that is very useful. The objective of mass customization is "to deliver goods and services that meet individual customers´ needs with near mass production efficiency" [5].

Doing so, mass customization is performed on four levels. While the differentiation level of mass customization is based on the additional utility (value) customers gain from a product or service that corresponds better to their needs, the cost level demands that this can be done at total costs that will not lead to such a price increase that the customization process implies a switch of market segments. The information collected in the course of individualization serves to build up a lasting individual relationship with each customer and, thus, to increase customer loyalty (relationship level). While the first three levels have a customer centric perspective, a fourth level takes an internal view and relates to the fulfillment system of a mass customizing firm: Mass customization operations are performed in a fixed solution space that represents [5] "the pre-existing capability and degrees of freedom built into a given manufacturer's production system" [6].

Personalization should therefore be clearly distinguished from customization. Both customization and personalization are based on the assumption that a homogeneous offering is not

sufficient in meeting the customers needs (…). As defined by the Webster dictionary [7], personalize means "to make something personal or individual; specifically: to mark as the property of a particular person" [8]. The definitions of mass customization and of personalization implies that the goal is to detect customers needs and then to fulfill these needs with an efficiency that almost equals that of mass production.

For more than two decades, mass customization has been the future of manufacturing – and for some manufacturers it will probably always be. On the face of it, mass customization is remarkably attractive proposition for customers and producers alike. Consumers get reasonably priced tailor-made product reflecting their personal selection of colors, features, functions and styles. Producers for their part get to reduce their inventories and manufacturing overhead costs, to eliminate waste in their supply chains, and to obtain more accurate information about demand. In short, a win-win position. Today's manufacturing systems have the potential to build a large variety of end products at costs comparable to mass-produced items. However, this potential is just the beginning to be realized based on the complexity of the product, manufacturing, and supply chain. Therefore, different manufacturing sectors have different business drivers and are at varying degrees of readiness to adopt MC methodologies.

Two relatively recent developments have given the prospects for mass customization a boost: first success enjoyed by Dell Computers and other high-tech companies that build products to order, and second the emergence of the Internet, giving the manufactures a platform for taking orders from mass audience for customized products, such as bicycles, clothes, cosmetics, shoes and vitamins, at almost no cost. In the past, customization of this kind was handled by skilled but expensive salespeople closely interacting with customers. With these trends, many issues arise in the product development and production cycle.

These issues are being addressed by capabilities in computational, communicational, and informational areas creating innovations in flexible automation, networks, and electronic product design. An increasing number of companies are adopting mass customization strategies at different levels in their product development cycles (Figure.1).

Having in mind the aim of the research, it was very interesting to find out what kind of Mass Customization and Personalization is present in the region of Central and Southeast Europe, in which economy sectors, what is the depth of involving customers into the process and finally how can companies from the region benefit from implementation of the named strategy. After three successfully organized MCP Conferences (Poland 2004, Poland 2006 and Serbia 2008), Mass Customization and Open Innovation (MC-OI) Network was established from researchers and institutions that initiated and organized previous conferences.

The joint research work through the network started with mapping of MCP subjects in to Google Maps and the obtained results are given bellow.
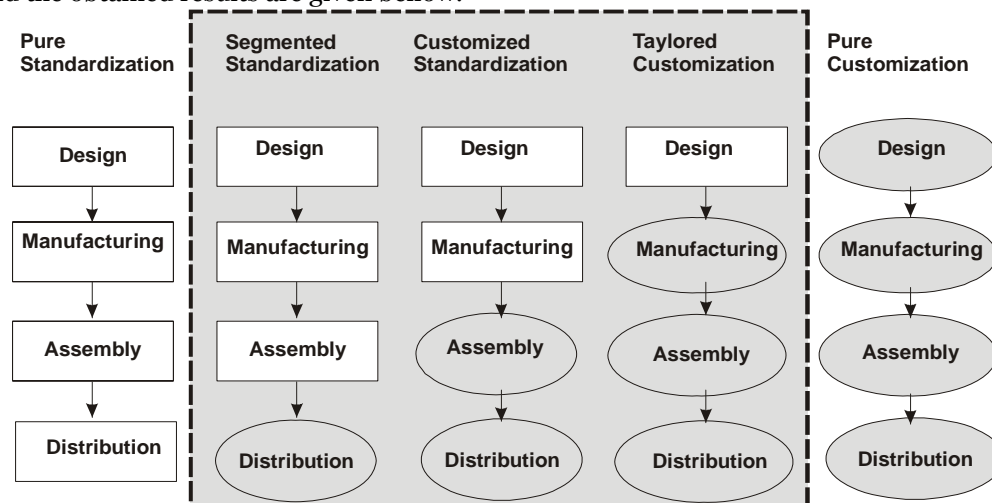

Figure 1 Level and depth of involving customers

2. Implementation of MCP Strategy in the Region – Results of Mapping presented in Google Maps

The future of mass customization seems to depend highly on the interest of customers in buying customized products. In the last decades that's just the customers forced manufacturers to increase constantly the quality of products and to offer more and more diverse range of products. In developed societies, like in Western European countries and in the US a pressure is put on manufacturers to offer

products better matching individual and diverse customers' preferences and expectations. Introduction of mass customization seems to be the best solution to changes happening on markets" [9].

Identifying present subjects in the field of MCP as a part of the larger research activities was carried out for the following countries of Central and Southeast Europe: Poland, Czech Republic, Slovakia, Austria, Hungary, Croatia, Bosnia & Herzegovina, Serbia, Montenegro, Romania, Moldova, Albania, FYR of Macedonia, Bulgaria and Hellenic Republic (Greece). For the referent sources are used proceedings from MCP Conferences, as well as other dedicated conferences like, IMCM - International Mass Customization Meetings, MCPC - World Congresses, academic or education websites and different company websites.

All subjects: researchers, institutes, professors, doctors, experts, companies, etc. are divided into four groups of tags:

- Blue: Universities/Researchers (42 items),
- Green: Companies (14 items),
- Red: national websites (1 items),
- Yellow: Conferences (3 items).

Table 1 Results of Mapping MCP Activities in Central and Southeast Europe

Mass Customization & Open Innovation in Central Europe	Universities/ Researchers Blue colour	Companies Green colour	Conferences Yellow colour	National Websites Red colour
Austria	5 / 17	4	-	-
Albania	-	-	-	-
Bosnia & Herzegovina	-	-	-	-
Bulgaria	1 / 8	-	-	-
Chech Republic	-	-	-	-
Croatia	1 / 1	-	-	-
FYROM	1 / 3	1	-	-
Hellenic Republic (Greece)	6 / 10	1	-	-
Hungary	1 / 1	-	-	-
Lithuania	-	1	-	-
Moldova	-	-	-	-
Poland	15 / 30	3	2	1
Romania,	2 / 2	3	-	-
Serbia	6 / 17	1	1	-
Slovenia	2 / 4	-	-	-
Slovakia	-	-	-	-
Ukraine	2 / 3	-	-	-
Total	**42 / 87**	**14**	**3**	**1**

Figure 2 presents results of mapping visible in the Google maps at the link given below:
http://maps.google.com/maps/ms?ie=UTF8&hl=en&msa=0&msid=11539400022501816 0781.00045f aaf54d785f4ec64&ll=47.872144,23.203125&spn=28.231113,79.101563&t=h&z=4
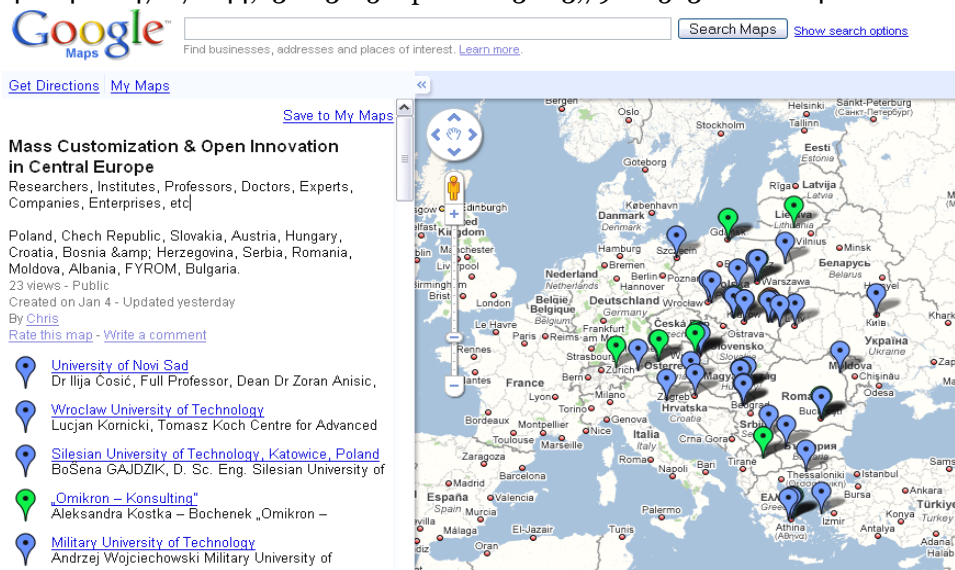

Figure 2 Mapping of the Mass Customization and Open Innovation activities in Central Europe

The sources of data are proceedings of conferences and a research process through the internet. The uploading process of the data imposes the user to create an account in Google's services (like the Gmail account). After that, the user should click on the option of the Google's Site named Google Maps. He has a plenty of choices to do "things", such as zooming in any region all over the world, accessing in geographical and political data, accessing also in data that other users before uploaded. Also there are options of viewing the map in Google Earth, printing user's map, send the map via an email and gain the specific internet link of the map to use it for websites, Blogs or other activities. There is also the capability of uploading photos, videos, Wikipedia options, traffic labels, and different options screen, like Map, Satellite and Terrain. The use of that kind of tool is mostly exchanging information in an open environment through the Internet for the continuous improvement of researches, projects, innovation and knowledge. Any researcher or company that want to participate in this network can create an account in Google and then they are free to open that map of Mass Customization & Open Innovation in Central and Southeast Europe and put information in their territory.

3. MCP as a possibility to increase competitiveness of the companies in the region

3.1 Customization of Produtcs

We focus on discussing Web – based product configurators, because they are very important means for the practical implementation of MCP. Online product configuration tools allow web users to personalize their products over the internet. Depending on the type of product, the configuration services can simplify the selection of product options, help enterprises in capturing customers' needs and bridge the gap between customers' desire and firms' competencies. On Fig.3 are given some examples of configurators for different products:

a) 3D cars demonstrators to display cars of different models and colors (example get from http://www.mercedes-benz.de);
b) Displaying of 3D virtual mobile phones of different models and colors (http://www.nokia.co.uk);
c) Configurator focused on furniture products (http://www.fwc3d.com);
d) A software tool for customization of computers, software, mobile accessories, etc. (http://demo.x-cart.com);
e) Configurator for clothes, gifts and etc. (http://www.earlyimpact.com);
f) Experimental 3D Web configurator [11] - it supports and maintains the development and marketing of modular positioning and handling systems called "DriveSets".
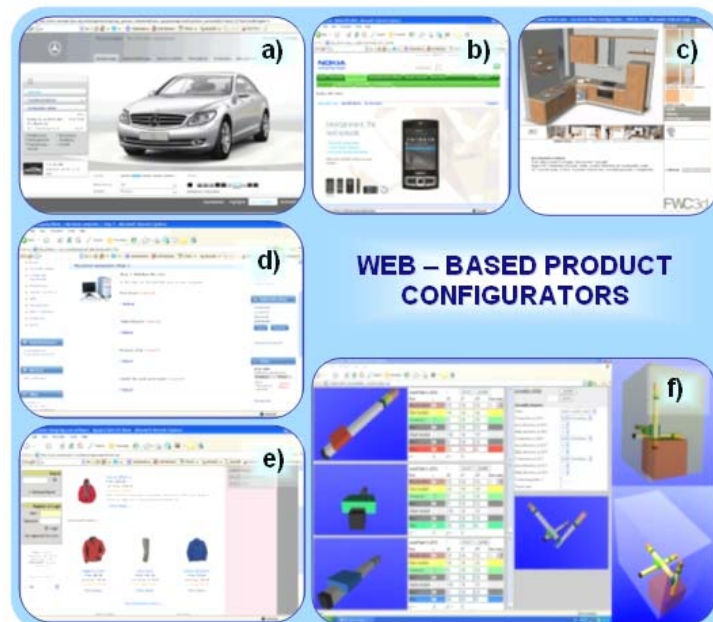

Figure 3 Web – based product configurators

It can be given many examples of products configurators but here our goal is to analyze their repeatable elements and represent their possibilities and functions in common. The features of the products configurators are very well summarized on the site http://www.technicon.com. These features include:

- Providing appropriate queries and generating of order-ready quotes, including by accessing the latest product and pricing information.
- Flagging incompatible options and highlighting prior options that are incompatible with the current option.
- Supporting the import of external and legacy configuration data and rules into Custom Commerce configuration models.
- Supporting complex pricing models that allow multiple price lists to be associated with any product option.
- Providing context-appropriate help messages and selling suggestions.
- Providing graphics and animations to aid in the configuration process, including 2D drawings and 3D models.
- Supporting the use of spatial relationships and rules for configurations, allowing layout and assembly of multiple products to arrive at integrated solutions.

We pay attention to the functionality, because the quality of the reconciling customers' interests and features of products depends on technical functionality of the configurators. So it is very important to implement new ideas and technologies for their development. For example for the assurance of the appropriate to the design by the customer process functionality, the experimental 3D Web configurator given on Fig.3 f) was developed by the use of the relatively new X3D (eXtensible 3D) language for the description of product (we have used virtual product model of the DriveSets-family brought to the market by Systec E+S GmbH, Germany - http://www.drivesets.de). The 3D Web configurator provides as feedback in the web-browser of the customer not only the appropriate graphical representation of the newly developed system, but the model of the systems installation and operational area, animation of the systems action and dynamical change of the model parameters such as dimensions of form, dimensions of dispositions and etc.

By using of Web configurators it become possible users to customize (even in some cases to design) their products over the internet. The direct customer participation in the personalization of product or in the design of it saves time and money, reduces the engineering efforts in respect to the solving of the design problem, improves the quality, changes the attitude of the customers towards the product and on this way facilitates the product market realization.

3.2 Customization of Services

The "decades of the middle", with a more educated and discerning population, have led to a higher level of expectation for personalized services. Allied to that, service providers themselves need to differentiate their offering in some way to sustain market share and profitability. An increasingly common method of service differentiation these days is to introduce options and choices (often associated with premium charges) that give the customer some customization and control over service content and availability. Increasingly, an extremely cost-efficient way of deploying a service to many customers is transforming it into software, that is, automating it and bundling it in some way within the product package. The customer must still be the focus, whether the service is manual or automated; therefore, the product package and the service parts of the package have to treat different customers differently. We're not putting service automation in question; rather, we're stressing that any new or enhanced service must be at least as customized as the previous one – manual or semi-manual – to make sense in the context of Mass Customization, for both simple and complex services.

Figure 4 Some examples of customized services

Customization of services, according to the conducted research follows the situation in Western Europe or North America. Possibilities of customization were expanded from typical e-commerce applications in the following areas [12, 13]:

- Transportation services (tickets),
- Financial services (assurance, leasing, etc.),
- Tourism (accommodation, restaurants, etc.)
- Other (arranging celebrations, education, etc.).

Customization of services offers much potentials of implementing MCP concept (quicker and easier building of business model) instead of customization of products, due to the technological level, strength of companies and economies of the stated countries. On the other hand there are many possibilities to develop services, especially in tourism, culture or education in order to integrate, present and promote values of the specific regions to world market through the global net.

4. Conclusions

The economies of the Central and Southeast European countries currently move through very different developmental stages, ranging from the highly industrialized economies of the EU full member states to those transitional and economically unstable systems.

Bearing in mind such a complex state of affairs, the introduction of the Mass Customization and Personalization concept has a very special value and represents a unique challenge.

The results of mapping showed, that there are many mass customization activities in south east European region. Starting at Universities as knowledge transfer centers, more and more companies/entrepreneurs realize, that mass customization business model can help to strengthen their competitiveness. Keeping in mind special cultural aspects of southeast European region, universities should include mass customization business model in their curriculum, build transfer centers for sme and build up stronger networks.

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