MASS PERSONALIZATION VS. MASS CUSTOMIZATION: FINDING VARIANCE IN SEMANTICAL MEANING AND PRACTICAL IMPLEMENTATION BETWEEN SECTORS

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Abstract

During last 3 decades, Mass Personalization and Mass Customization as research domains have been advancedly overlooked and currently are overcoming theoretical boundaries. Ongoing digital transformation, rapidly increasing orientation to customer centric approach, demand-driven supply and value creation via online environment, platforms or tools undoubtedly influence content and development of these two paradigms too (Rungtusanatham and Salvador, 2008; Gandhi et al., 2013; Hu, 2013; KMPG, 2016; Tiihonen and Felfernig, 2017). On the other hand, a number of academic research as well as organization practices still show variances in the semantical meaning of those mentioned concepts, implementation logic and limited interaction with digitalization and value co-creation. Therefore, the research type of scoping review is based on literature analysis. It is followed throughout this article for a quality evaluation of a current standpoint and practical tendencies in the field of understanding Mass Personalization and Mass Customization, as well as defining possibilities in adapting approaches of value co-creation and technology-based attitude.

Purpose – article aims to conceptualize an existing semantical gap between concepts of Mass Personalization and Mass Customization by analyzing recent scientific literature and trends in their practical implementation.

Design / methodology / approach – in this research the author followed a mixed type of quantitative and qualitative methodologies. The first one is related to the method of scoping review, which is used to collect and categorize data of semantical meaning in Mass Personalization and Mass Customization concepts. The qualitative one follows methods of general and comparative scientific literature review and conceptualization of new insights later. Therefore, the design of research is described as a systematic literature review and information systemization.

Finding – results of the present evaluation of the research subject suggest that mismatches in semantical understanding of analyzed concepts as well as their adoption are very common. In addition, it is noticed that approaches of value co-creation and technology-based attitude and their combination are evaluated separately or partly from the research subject.

Research limitations / implications – the present article has limitations both in theoretical and practical fields. From the perspective of scientific research, it is noticed that in different periods, the focus has been switched exclusively on process standardization or Mass Customization, without conducting a multi-dimensional research. In addition, there are also limited research carried out in the field of finding content differences between Mass Personalization and Mass Customization concepts as well as their possible combination for different sectors, with a focus on non-manufacturing organizations, digitalization and data analytics.

Practical implications – results of the research may be applied in practice in different sectors and different type of organizations: a) as a multi-dimensional framework and basis for conducting an internal evaluation of ongoing process status as well as a content of service in relation to Mass Customization or Mass personalization; b) as a theoretical background to set up a direction and

content of changes to reach a more customized or personalized service and create an overall more customer-centric approach in an organization; c) as a summary of key points for a better understanding on main differences, requirements, trends of each concept and their practical adoption.

Originality / Value – theoretical analysis created following holistic and multidimensional standpoints not only confirms existing differences between semantical meanings but also reveals possible areas of misunderstanding when applied in practical implementation. In parallel, at this point, a combined approach of value co-creation and technology-based attitude produces valuable insights for future research and might serve as a basis for ongoing process evaluation in practice.

Keywords: Mass Customization, Mass Personalization, Digitalization, Co-creation

Research type: literature review.

Introduction

In recent decades, terms, concepts and practical cases of mass service customization or personalization as well as a technology-based attitude to organizational management processes and systems have been combined and used widely both in development of private and public sectors (Jitpaiboon et al., 2013; Deloitte, 2015; Chatzopoulos, 2017; OECD, 2018). Actually, it has become a multidisciplinary management concept with a focus on applying combined methods and wide-spreading effect to different type of organizations and sectors. To be more specific, it became a dominant element within the content of management at organizations of different levels: a) as a strategic orientation to gain a competitive advantage and a higher level of process excellence in a long term run; b) as a key performance index to evaluate a level of customer satisfaction and value co-creation in a mid term run; c) as a standard to follow in daily management of process, system and employees at operational level (Welborn, 2009; Moon and Lee, 2015; Schlager, 2018). In addition, influence of external factors is also worth mentioning: new ways of correlation among sectors, a raise of global and dynamic tendencies of services and product line automation and digitalization, rapid social changes in the society take a notoriously significant place here (Jitpaiboon et al., 2013; OECD, 2018). All these factors naturally demand a continuous scientific research to discover new ways of aligning best practices and solving both new and old type of problems in the field.

Scientific research of Mass Personalization and Mass Customization: main statistical data, content and trends

In the field of business management, the last decade, especially last 5 years, stand for remarkable changes both on scientific research level and organization practices. Fast Information and Communication Technologies (ICT) development, a rise of Big Data and Big Data Analytics (BDA) as well as new combinations of methods in process management lead to distinctive attitude and evolution of concepts of Mass Personalization and Mass Customization (Risdiyono, 2016; Tiihonen and Felfernig, 2017). It is possible to outline a strong reflection of these concepts revealed in the scientific research field, and this can be illustrated by indicators of research frequency, main research areas, researcher origin (country), etc. (see in Table no. 1).

**Table 1. Main data of scientific research on Mass Personalization
and Mass Customization in 2015-2019**

Topic	Frequency	Area	Origin
Mass Personalization	204 (total): 2019 – 8 2018 – 50 2017 – 68 2016 – 39 2015 – 39	1) Engineering (68) 2) Computer Science (61) 3) Business Economics (42) 4) Communication (30) 5) Science Technology other topic (27)	1) USA (44) 2) People's Republic of China (PRC) (25) 3) Germany (16) 4) Italy (15) 5) England (12)
Mass Customization	1127 (total): 2019 – 54 2018 – 259 2017 – 284 2016 – 271 2015 – 258	1) Engineering (763) 2) Business Economics (516) 3) Computer Science (485) 4) Operations Research Management Science (189) 5) Mathematics (189)	1) People's Republic of China (PRC) (221) 2) USA (212) 3) Republic of China (ROC) (147) 4) Germany (119) 5) England (87)

Source: Composed by the researcher and based on resources in the Web of Science (WoS) search tool (accessed 2019-05-02)

In reference to the table above, summarized results of the search in Web of Science (WoS) database are exposed under the following conditions: a) Search was implemented in 4 databases in the WoS platform: Web of Science Core Collection, KCI-Korean Journal Database (KJD), Russian Science Citation Index (RSCI), SciELO Citation index. Moreover, none restrictions by languages and document types were made; b) In evaluation categories "Area" and "Origin" results are provided in classification by relevance. Only first 5 data rows are provided under both categories "Area" and "Origin" as they take the biggest part of all findings proportionally, and these subjects are considered as most analyzable in the context of Mass Personalization and Mass Customization respectively. For instance, Engineering appears to be the most analyzable area in terms of Mass Personalization as it covers 33 % of the scope, and Science Technology other topic covers 13 % of the scope. Therefore, this dispersion of research domains ranges between 33 % - 13 % in relation to all identified research domains, in case of Mass Personalization. While in case of Mass Customization, this range deploys from 68 % to 17 % with Engineering and Mathematics respectively. In the category „Origin", 58 % of all researches in Mass Personalization topic and 70 % of all researches in Mass Customization topic are represented.

Coming back to data in table above, main insights of scientific research content and trends during last 5 years period are clarified as follows. First, it is noticed that the amount of research in Mass Customization overrides the amount of research of Mass Personalization by five times. Evaluating average numbers, first topic (during the period 2015 - 2018 as full year period) has 268 researches while second topic – approximately 49 researches per year. Comparing to the overall period (1990 - 2019), the difference between topics reach a proportion of 1 : 10 (418 : 3 586 researches). The main feature in the statistics should be outlined – 2017 is the peak period for both topics. In general, the selected period of 2015 – 2019 is also the most intensive: 49 % of all Mass Personalization and 31 % of all Mass Customization domains related scientific research are completed during the last 5 year period. Furthermore, 3 repetitive domains in two topics are identified: Engineering, Computer Science, and Business Economics. This point confirms the assumption that these topics currently are living through a transition into business management field. In addition, main differences are noted: Mass Personalization is strongly related to a specific research area of

Communication and Health Care Sciences Service (under domain Science Technology other topic) while Mass Customization is related to a more general research area Operations Management and Mathematics. At this point, an additional content-based overview confirmed assumption that Mass Personalization is used more in Public Sector organizations and their related activities: 40 % (17) of studies in the period 1990 - 2019 in the domain of Health Care Sciences Service belongs to a subdomain of Public Environmental Occupational Health.

In order to evaluate the development of content and new trends in areas in different periods, 3 periods of data were compared: from the start date of data collection in the WoS database to 2019; last 10 years (2009 - 2019) and last 3 years (2016 - 2019). In the case of Mass Personalization research areas, there are two periods where individual topics are investigated: a) first and second periods – Computer Science, Engineering, Business Economics Communication, and Health Care Sciences Service; b) in the third period same four mentioned areas are analyzed, additionally with an increased attention towards Science Technology (other topics) and Behavioral Sciences. In the case of Mass Customization, main research areas in all periods are Computer Science, Engineering, Business Economics, Mathematics, and Operations Research Management Science. Therefore, it can be stated that Mass Personalization represents customer oriented organizations better, those which focus to customer data, behavioral analysis and results application, communication flow management, while Mass Customization is more related to product driven and oriented organizations and product, process or systems improvements at operational management level.

New form of synergy between analyzed objects, which were recently identified in practice and academic researches should also be mentioned – a combination of concepts, which have evolved to the business model of Mass Customization and Personalization (MCP) (Risdiyono et al., 2016).

Variance in semantical meaning and practical implementation

As mentioned before, the period of recent 5 years features an increased attention to technology and combined (integrated) methods. This type of management has become dominant in organizations decision-making processes and an essential part of competitive advantage. Mentioned factors also have influenced current customer centric concepts of Mass Customization and Mass Personalization, Product-Service Systems (PSS) or value co-creation as well as their development to new individualization models: e-customization, Mass Customization and Personalization (MCP), Access-Based Product-Service Systems (AB-PSS), etc. (Park and Yoo, 2013; Risdiyono et al., 2016; Fels et al., 2017; Dreyer et al. 2019; Tunn et. al., 2019). It should be mentioned that user-driven product or service customization and digitalization, indicators of customer satisfaction and loyalty were strongly affected by recent trends of automation, data management and overall fourth industrial revolution (industry 4.0) (Forbes and Schaefer, 2017; Rødseth et al., 2017; Wang et al., 2017; Zhang et al. 2019). This phenomenon lead to the transformation of traditional production-inventory and business models (mass production and B2C (business-to-customer) model) to new models, which fully meet personalized needs of a customer as well as employees (mass customization and C2B (customer-to-business)) (Gross et al., 2018; Zhang et al. 2019). Although it is clear what crucial role in modern organization management these customer centric concepts of Mass Customization and Mass Personalization play, they still face numerous mismatches in semantical interpretations and later practical usage. Accordingly, main semantical meaning similarities and differences are provided in the table no. 2 (below).

Table 2. Variances in semantical meaning of Mass Customization and Mass Personalization

	Mass Customization	**Mass Personalization**
Definition	A customized service/product and acquisition of competitive advantage through the combinations of technological and management methods and their adaptation	A personalized experience based on co-creation, analysis of user behavior and organizational changes
Key elements	Data-driven foundation; limited customers impact and interaction with organization; harmonization between diversity, costs and quality; demand-driven supply chain	Data-driven foundation; strong customers impact and interaction with organization; demand-driven co-creation
Aim	Usage of combined methods; tailored product or service; orientation to competitive advantage	Provide a greater access to information; streamlining processes; tailored experience and target audience; orientation to customer needs and smart service

Source: Composed by the researcher and based on resources: Deloitte LLP, 2015; ; KMPG, 2016; Fels et al., 2017; Tiihonen and Felfernig, 2017; Dreyer et al. 2019

In addition to above provided data, it is important to note a suggestion of Delloite LLP (2015) regarding a 4 stage model of products and service individualization, which illustrates differences in the process logic. In this model, personalization is the first stage after standardization and the first of three individualization stages, while customization is a second or intermediary stage between personalized and bespoke products and services. Bespoke service here should be treated as a full customer engagement (by co-design and co-creation type of activities) in the individualization procedure with a clear purpose to create a unique result (Deloitte LLP, 2015). Coming back to semantical meaning variances, main similarities of concepts are identified: both have a data-driven foundation and use them for a tailored product/service or system creation and experience for the target audience by keeping costs level nearly to a mass production level. In other words, in both cases harmonization is kept with diversity, costs and quality (Skačkauskienė and Davidavičius, 2015; Dreyer et al., 2019; Tunn et al., 2019). Another common feature is a constant interaction and two-way communication with customers as well as employees. In this way relevant information input and evaluation during individualization procedure as well as building customer satisfaction and loyalty in the future are ensured (Fels et al., 2017; Schlager et al., 2018). At this point it is important to mention that communication is one of the main misleading features in semantical interpretation and practical implementation. Data analyses of scientific studies on the Mass Personalization topic show a close relation to the Communication domain. Scientific research of this concept also reveal an impact made by communication on co-design and co-creation approaches: it is based on a proper management of customer data input in the design phase as well as provision of a solid output, in form of timely and tailored information for users (Hu, 2013; Tiihonen and Felfernig, 2017; Gross et al., 2018). In comparison, the concept of Mass Customization has clear communication and interaction management limitations:

a) First, it is a basic internal production paradigm, which uses a configuration of processes or systems based on knowledge and new combined management methods, typically used in Mass Production concept. In most of cases, they are created via in house development

and have clear predeterminations by designers, which unnecessarily satisfy specific requirements of costumers (Tiihonen and Felfernig, 2017; Wang et al., 2017).

b) Second, transition from a standard service or product model (Mass Production concept) to a customization driven by user experience has not been widely discussed (in business management field) in terms of mass confusion taking a role as a side effect, as this solution requires personal assistance with communication of relevant information, constant support and feedback (Huffman and Kahn, 1998; Tiihonen and Felfernig, 2017).

c) Third, another type of approach to Mass Personalization, Mass Customization and Communication domains can be identified in organizations practice. According to Deloitte (2015), in the phase of personalization, organizations analyze existing customer purchase or profile (user model) data and later modify products or service according to results from a recommended system (Tiihonen and Felfernig, 2017). Thus, no active communication or other type of customer engagement is needed here. It should be noted that due to existing assumption of that a two-way communication and customer interaction management is costly and time consuming organizations prefer to implement this concept as a key tool in sales and marketing strategies (Gandhi et al., 2013; Deloitte LLP, 2015). Accordingly, in practice it is illustrated by implementing a different degree of personalized marketing. For instance, campaign personalization, geographical personalization, related content personalization, etc. Besides, modified C2B business model - C2B2M-MP (customer to business to manufactory based on mass personalization) is used (Deloitte LLP, 2015; Zhang et al. 2019). In the customization phase organizations face complex challenges to define a cost effective number of features and options for customizations as well as they properly deal with costumers engagement, experience and communication management. At this point, previously mentioned combinations of technological and management methods are adopted.

In addition, Deloitte (2015) research and analysis also show 2 possible categories of customization: a) Active participation in process. This type is typically related to a customer willingness to be actively involved into the whole customization procedure and noticed in category of a more expensive service or luxury products, for example, fashion accessories, clothing, jewelry, furniture, or holidays. It also might be called as an intermediary stage between Mass Customization and Bespoke service; b) Limited participation in process, which is related to a standard customization concept based on passive users' actions and their preferred low level of involvement. In this case, products or services are massively produced and customized by using data which organizations already operate or receive, while for costumer limited options for customization are offered. In practice, in this customization category, an account customization feature illustrate data collection and management when service or product content can be personalized after creating account and sharing personal data with organization (Deloitte LLP, 2015). Overall, Mass Customization in practice is defined under a general business model of C2B2M-MC (Customer to business to manufactory based on mass customization) and 5 specific operations models: Customers' personalized requirements (CPR) based on customization model; Product design (PD) based on customization model; Product manufacturing (PM) based on customization model; Supply chain (SC) based on customization model and Users' service (US) based on customization model (Zhang et al., 2019). Real examples of passive customization can be found in food and beverage market segments as well as in the field of entertainment relating books, music, etc.

Comparing practical implementation tendencies between sectors, first of all, common historical circumstances raised in 1990s should be mentioned. They feature innovative social and technical infrastructures as well as development of information and communication technologies (ITC) and their adaptation to organizations practice (Pieterson et al., 2007). Moreover, tendencies of the last decade in the private sector possess an application of mixed

features, however, customization appears to become dominant. In opposition, strong preferences to Mass Personalization concept are recognized in the pubic sector (Needham, 2011; Dvoriak and Savickaitė, 2018). In addition, it should to be mentioned that the selection of Mass Personalization is based not only on the role of the Communication domain in the public administration context, but on two side needs too. To be more specific, public organizations aim to adapt good practices in digital and tailored customer experience management so as to improve service quality and a cost ratio (Homburg and Dijkshoorn, 2013). On the other side, looking from the customer perspective, a clear need for this type of service model as well as an increasingly raising expectation to receive a high level of interaction possibilities, service content transparency and digital environment simplicity from government is identified. A personalized e-government service delivery in public health, safety, communication and tax administration fields is defined as a good practical example where this concept implication helps to manage such public sector service management issues as reducing information overload and asymmetry, improving waiting time, decentralizing service provider network by delivering an equitable access to public goods without any specific time and location limitations (Homburg and Dijkshoorn, 2013; Christensen and Pilling, 2014; Kant, 2014, Schwarz, 2016). Examples of personalized e-government service are found in cases of Canada, Netherlands, England (Homburg and Dijkshoorn, 2013; Dvoriak and Savickaitė, 2018). At this point, relevant insights from Deloitte LLP research are outlined as bringing an importance where it is stated that there are general obstacles in environment which are affecting customized product orientated private sector organizations, but also influence customer engagement and preferences in the public service area. Rapidly evolving technologies, economic uncertainty defined by low growth and margin compression numbers, customers demographic shifts are identified as impacting organizations by a significant scope (Deloitte LLP, 2016).

Conclusions

In summarizing semantic meaning and practical implementation of analyzed concepts, main points are clarified: a) In scientific research, Mass Personalization is evaluated as a pre-stage of Mass Customization, while in practice it is understood as a stage coming after or combined with Mass Customization; the main mismatch area is a role of Communication domain; b) When increasing digitalization and development of Information and Communication Technologies (ICT), new forms of customers engagement in product or service individualization procedure is revealed as well as a set of new requirements for value co-creation and co-design activities and systems are outlined. Therefore, organizations should focus to an application of combined, technology and management synergy based methods, qualitative and quantitative process measurement indicators; c) Practical implementation between sectors features differences and tendencies – private sector organizations are tended to adapt combined Mass Customization and Personalization (MCP) concept or base their strategy on process oriented customization methods while the public sector prefers Mass Personalization concept more (Gandhi et al., 2013; Fels et al., 2017; Risdiyono et al., 2016).

Discussions

The scoping review and systematic literature review have confirmed following positions and assumptions in the field of semantical interpretation and practical interpretation of Mass Personalization and Mass Customization:

a) Mass Personalization paradigm has a strong content relation to the Communication domain. It is based on management of customer engagement, experience and satisfaction; also it features in building customer loyalty as well as ensuring a streamlined information flow and access to smart service. Due to mentioned elements of content, Mass Personalization is more acceptable to adapt to Public Service as this is confirmed by numerous researches under the Public Heath Care subdomain of the analyzed period. But at this point an open question has been left unanswered on how properly in time and location aspects and in which framework personalization technologies should be switched from the product oriented Mass Customization based C2B2M-MC business model to the customer orientated C2B2M-MP (customer to business to manufactory based on mass personalization) model?

b) Mass Customization paradigm is defined as an operational technology oriented to product manufacturing. This approach is mostly influenced by historical reasons and overall practical implementation tendencies: a misleading correlation to the Mass Production paradigm and application via advanced manufacturing operations technology. It is illustrated by dominant scientific research origin countries USA, Germany, United Kingdom, and this correlates with statistics of product configurators offered by companies based on country of origin: leading countries are Germany, USA, Austria, United Kingdom and Switzerland (Risdiyono, 2016). In practice, it is also evaluated as a multidimensional, intermediary procedure stage between Mass Personalization and Bespoke service. In this case, both practical and theoretical type of questions for future research arise: how organizations should transit from personal marketing to personal experience and find a right proportion between a level of involvement and customization? How to incorporate a value co-creation approach and tools into already customized systems, services or products?

c) As recommended guidelines for practical analysis in both sectors organizations can be adapted and combined: 1) At operational level, for AS-IS type, multidimensional status identification – Customization index (Welborn, 2009), classification of 5 customization models (Zhang et al., 2019) and a matrix of workers competencies and skills evaluation (Gross et al., 2018). 2) At strategic level, to define TO-BE situation and future actions direction – 3-level matrix of goals (of the manufacturing paradigms) (Hu, 2013), evolution and characteristics of C2B model diagram (Zhang et al., 2019) and an extension to Mass Customization and Personalization (MCP) concept. It is important to notice – comparative analysis and research about combination of these methods and their application possibilities in organizations of different types and sectors are missing.

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