

ADAPTATION A METHOD OF MEASURING NEW PRODUCT DEVELOPMENT PROCESS MATURITY IN SERVICE DESIGN

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ABSTRACT	The article discussed possibilities of adaptation a measuring method of maturity of new product development process in service design – method referred to herein as a matrix of product innovation process maturity and intelligent grid of relationships. It is assumed that the service enterprise should lead new service product development process at the highest level of maturity and the highest level of grid/network of relationships maturity. This should work with various stakeholder groups in areas of matrix most attractive to improve process less mature and attractive in terms of business. The company should also focus on investing available resources and expertise in service design with a strong competitive position and withdraw from these projects of new service products whose competitive position is weak. In the article are therefore proposed normative strategies resulting from assessment of the situation in matrix.

Introduction

The purpose of this paper is to discuss the possibilities of adaptation a method of measuring new service innovation process maturity in the service design domain, propose and examine the implications of implementation this method in service company's strategic perspective, classifying service innovations on the basis of their potential impact on productivity from the company's innovation process maturity and smart grid relationships perspectives.

There has been a lot of focus on product innovation over the years, but very little discussion or thought in service innovation process, despite the vast growth of that part of our economy not only in Poland. The publication sets out to propose a new research approach – one that could significantly improve maturity measurement of service product innovation processes in businesses. As detailed here, concept for measuring maturity of the innovation and new services product marketing process reflects a specific research attitude towards service design and new service product development. The article has been structured to reflect the logic inherent in the development of different research approaches. Importantly, too, the concept sees those approaches as guiding and directing the studies into the matrix- and grid-based methods which are developed using new analytical tools (Rikke Dam, Teo Siang, 2017; Gierszewska, Romanowska, 2009; Jeston, Nelis, 2006). There is an ongoing development of theories relating the practice of design for service to design in general as well as to other relevant areas (Holmlid, 2012; Sangiorgi, Clark, 2004; Blomkvist, Rankin, Anundi, Holmlid, 2010), and studies on the designer in relationship to other areas of competence (Kimbell, 2009; Pacenti, Sangiorgi, 2010; Blomkvist, Holmlid, Segelström, 2010; Holmlid, Evenson, 2008). What is presented here is an overview of methodology with its relevant techniques and procedural algorithms (methodology in a pragmatic sense).

The approach is functional – descriptive: it is based on diagnostic activities (factual appraisals) and involves formulation of models. These models then used to deliver functional solutions to be used in service product innovation process and its maturity measurements (Paulk, Curtis, Chrissis, Weber, 2011; SGMM, 2011). Generally, a research approach, it is a way to obtain information and create a body of knowledge about service product innovation and marketing processes. We can analyse it in different dimensions, with the type and model of research forming the most basic criteria for classifying a research process (Parasuraman, 2010; Grajewski, 2012; Orr, 2007). Regardless of the area of research or choice of methodology, the research process involves similar activities. The process is an expression of the basic scientific method. Research processes can also be classified in terms of their methods, techniques, and research tools.

Maturity of new product development process in service design

The proposed method is comprehensive adaptation and provides a multi-dimensional set of instruments for precise measurements of the maturity of innovation and new product marketing processes which organisations use in business and project management or in strategic marketing (including new product strategies/service product strategies). The new service product strategies should accommodate a number of factors, including highly dynamic and unpredictable technological and legal developments, on the one hand, and demand, competition and competence, on the other. When businesses operate in such conditions, it is reasonable to try and identify potential sources for the success of a new product on the market as the most important condition for the success of an organisation as a whole.

Therefore, the following issues need to be resolved:

1. What factors affect a maturity of service design and new service product innovation process and marketing relationships?
2. Are there any relationships/correlations between what makes the innovation and new service product marketing process mature and the market success of new service products?
3. What methods and tools are there to measure the product innovation maturity accurately?
4. How to examine, measure and evaluate maturity of those processes?

It is particularly important to identify determinants of maturity of innovation and new service product marketing process, and then determine relationships between those determinants and qualitative and quantitative measures of the new product's market success. Finally, it is important to formulate the rules to describe any such relationships, correlations or interdependencies.

In the last decade, companies have invested huge sums of money in order to identify and standardize introduction of new products on market. Despite these investment research indicators of success of new products have shown little or no improvement (Rutkowski, 2016; Rutkowski, 2007).

The assumption is that the organisation should maintain its product innovation process at the highest maturity and smart grid level. It should cooperate with different stakeholder groups on the most attractive matrix areas, improving those of its process areas which are less mature and less attractive in business terms. The service organisation should also focus on investing its available resources and competences in the development of new products with strong competitive position, and phase out development projects for new products which are competitively weak.

As shown below, the matrix describes two variables: innovation and new product marketing maturity, and smart grid relationships maturity. Both have been measured over a long time span (at least dozen or so months). For these variables evaluation is provided – from 0 up to 5, so the matrix consists of 25 areas. The intersection between evaluation vectors for the innovation and new product marketing maturity and the smart grid maturity shows where the analysed case is in terms of the integrated service product innovation maturity. To measure and determine the positions of aggregated variables within the matrix, any factors/conditions affecting the innovation and new product marketing maturity and the smart grid maturity should be identified and evaluated (ranked). This could be done based on the key factors described in two survey questionnaires.

Characteristics of SERVMIGR matrix method

The number of factors is not strictly defined and can be increased to include other so-called best practices if they are properly identified by managers, relevant in terms of performance, efficiency and, most importantly, the service product innovation and grid maturity. Generally, factors included in questionnaires are used and ranked. Adapted factors are ranked on scale, for example of 0 to 10 points or 0 to 100%.¹ After that, scores are determined for each matrix dimension. The vectors are plotted in matrix.

The SERVMIGR matrix consist of five process and new service product security zones and determines basic strategies for service product innovation, grid and new service product marketing process improvements (Figure 1):

- a) four green boxes in the top right corner with number "5" only include strong and very strong process areas and show maturity level 4 and 5 – numerical values [4; 5]; management should invest in those areas and maintain/develop them; growth strategies – new service product development projects are highly safe (even in a high-risk environment);
- b) five blue boxes with number "4" only include process areas with average or high maturity, maturity level 3, 4 or even 5 – numerical values [3; 4]; service product innovation strategies which are focused on grid strength and high process maturity are very safe;

¹ See the website <http://nowyprodukt.ue.poznan.pl> – list of factors to choose is available here or in Rutkowski I.P., 2016, chapter VIII.

- c) six brown boxes with number “3” only include process areas with low, average or high maturity, innovation and grid maturity levels can be high or low; service product innovation strategies are characterized by medium safety (high-risk projects should be avoided);
- d) six yellow boxes with number “2” show process areas with low and average maturity, maturity level 2 or 3 – numerical values [1; 2]; the firm should improve them selectively and focus on the protection of new service product development projects; limit and hold strategies which are characterised by low new service product development project safety;
- e) four boxes in the bottom left corner include process areas with low maturity and attractiveness and low grid maturity, maturity level 0 or 1 – numerical values [0; 1]; these areas should be rapidly improved or stopped/divested; defend strategy – new service product development project safety is low, risk can be taken relating to new service product purchases.

The five zones for service product innovation, grid and marketing process improvements are different in nature and are used to accomplish different new service product objectives at any given innovation and grid maturity level. A strategic view of business management processes and structures involves the need to focus on important market areas and entities. This makes it necessary to examine and analyse the market structure and competitor, supplier and customer behaviours, and to respond to current or forecast changes in the marketing environment, including through service product innovation process improvements in design service. Specific strategies assigned to each of the 25 areas are shown in Table 1.

Level of maturity of smart grid of relationships	3	3	4	5	5
	2	3	4	5	5
	2	2	4	4	4
	1	1	2	3	3
	1	1	2	2	3
Level of maturity of the process of service product innovation					

Figure 1. Process and new service product project safety zones – SERVMIGR matrix

Source: own elaboration.

Certain concepts have been adapted here for strategic management and planning purposes. These concepts are used to analyse the situation of new service products in the innovation process and to manage changes within a business, especially the long-term ones. The grid- and matrix-based analyses are useful to different business organisations, but are most often applied by firms with diversified products, markets, and technologies. These analyses are helpful in selecting optimum processes, services, markets, and technologies in a given regulatory environment. They are among methods used to take allocation decisions and rationalise strategic choice process, including in the new product management and development areas.

The purpose of the grid-and-matrix analysis in strategic management is to support decision-making that ensures sustainable and long-term business growth and resource development in a changeable environment. To achieve this purpose, a business organisation is looked at as a whole, strategic success factors are selected and focused on, relatively autonomous strategic units are identified, and methodological approaches are used in which

both internal and external-focused management processes are examined. The different service product innovation measurement models used here combine these methodological approaches.

Table 1. Strategies of action following SERVMIGR matrix evaluation

Smart grid relationships maturity levels	5	Improve competences and rapidly increase process maturity	Protect grid and defend new service product projects selectively	Create new service products selectively and protect grid	Invest in continuous improvements to innovation and grid processes	Invest in service product innovations at a sustainably fast pace
	4	Defend projects on a limited basis or selectively	Improve innovation process fast and protect grid	Defend projects selectively based on grid strength	Manage with a view to achieving new service product goals	Strengthen market position of new service product
	3	Divest if long-term growth is not possible	Focus on investment in processes with high returns and relatively low risks	Create new service products selectively and strengthen grid	Defend existing new service product projects	Create new service products selectively based on high process maturity
	2	Reduce fixed costs, and avoid investment in risky projects	Improve process or grid with strength or divest	Manage with a view to achieving service product goals, improve grid	Focus on investment in processes with satisfying returns and low risks	Protect main areas of action and strengthen grid
	1	Divest new service product projects or use new product purchase strategies	Minimise investments in risky projects and improve grid and process	Manage process in terms of current outcomes, improve grid	Defend position for potentially most profitable new service product projects	Change main areas of action and improve grid with strength
	0	1	2	3	4	5
	Service product innovation process maturity levels					

0 – Default; 1 – Initiating; 2 – Enabling; 3 – Integrating; 4 – Optimising; 5 – Pioneering.

Source: own elaboration.

What is common to these methods of analysing product innovation is that two or more aggregated variables are distinguished which characterise overall strategic success factors for new products. One variable or group of variables is closely linked to the business environment, and especially the grid maturity; the other variable or group of variables addresses product innovation and organisational structure maturity. When those variables are shown in a measurable format and represented graphically in a matrix with a certain (even large) number of boxes, one can identify and determine the current and future (expected) strategic position of new products and the firm (or its strategic unit) as a whole.

Conclusions

Analysis and discussion of the proposed method lead to the overarching conclusion that strategies to improve new service productivity, enhance new service quality or implement service innovations, are likely to be suboptimal if pursued in isolation. As such, it is important for companies to consider the inter-linkages among service productivity, quality and innovation when formulating and implementing new services strategies pertaining to any of them. As presented above, the service product innovation measurement models have as their purpose:

- to show how balanced the new service product offering is,
- to provide conditions for determining type and nature of new service strategies,
- to reduce complexity and differentiation of new service product management process in firm,
- to help make structural changes in diversified businesses through appropriate resource and competence allocations,

- to focus on strengths and take advantage of external opportunities,
- to mitigate service product innovation and marketing process risks in strategic decision-making,
- to use early warning systems to recognise development threats early and with large likelihood,
- to support new service product strategy formulation and implementation processes.

Certain priorities in the new service product innovation process may require that selected aspects of integrated service design and marketing relationships are used. First of all, management level in company should determine and have an understanding of strategy, and then move on to estimate their competencies. The diffusion process of factor groups which determine the market success of new service products (in other words, best practices which describe new service product innovation and marketing maturity levels) is observable both within enterprises and across organisations. The resulting expanded new service methodological framework and proposed typology of service innovation strategies have important managerial implications and also offer several potentially fruitful avenues for further research.

References

- Blomkvist, J., Rankin, A., Anundi, D., Holmlid, S. (2010). *Barrier analysis as a design tool in complex safety critical systems*. In Proceedings of Design Research Society International Conference. Canada, Montréal.
- Holmlid, S. (2012). *The first case experience of designing for service*. In Proceedings of ServDes 2012. Espoo, Finland.
- Gierszewska, G., Romanowska, M. (2009). *Analiza strategiczna przedsiębiorstwa*. Warszawa: PWE.
- Grajewski, P. (2012). *Procesowe zarządzanie organizacją*. Warszawa: PWE.
- Jeston, J., Nelis, J. (2006). *Business Process Management. Practical Guidelines to Successful Implementations*. Burlington: Butterworth-Heinemann.
- Kimbell, L. (2009). *Insights from Service Design Practice*. 8th European Academy of Design Conference (pp. 249–253). Aberdeen, UK.
- Orr, K. (2007). Business Process Modeling Fundamentals. *Cutter Business Technology Council*, 7 (10).
- Pacenti, E., Sangiorgi, D. (2010). Service Design research pioneers: An overview of Service Design research developed in Italy since the '90s. *Design Research Journal*, 1, 26–33.
- Parasuraman, A. (2010). Service productivity, quality and innovation: Implications for service-design practice and research. *International Journal of Quality and Service Sciences*, 2 (3), 277–286, DOI: 10.1108/17566691011090026.
- Rosen, M., Lublinsky, B., Smith, K.T., Balcer, M.J. (2012). *Applied SOA: service-oriented architecture and design strategies*. Indianapolis: Wiley Publishing, Inc.
- Paulk, M.C., Curtis, B., Christis, M.B., Weber, C.C. (2011). *Capability maturity model for software*. Software Engineering Institute Technical Report no. CMU/SEI-1993-TR-24, sec. 2.3. Pittsburgh, PA: Software Engineering Institute, Carnegie Mellon University, April.
- Rikke Dam, Teo Siang (2017). *5 Stages in the Design Thinking Process*. Retrieved from: <https://www.interaction-design.org/literature/article/5-stages-in-the-design-thinking-process> (June, 2017).
- Rutkowski, I.P. (2007). *Rozwój nowego produktu. Metody i uwarunkowania*. Warszawa: PWE.
- Rutkowski, I.P. (2016). *Metody innowacji produktu. Macierzowo-sieciowe metody pomiaru dojrzałości procesu innowacji produktu*. Poznań: Wydawnictwo Uniwersytetu Ekonomicznego w Poznaniu.
- Sangiorgi, D., Clark, B. (2004). *Toward a participatory design approach to service design*. Participatory Design Conference, PDC 2004. Toronto. Canada.
- SGMM Model Definition (2011). *A framework for smart grid transformation*. Authors: The SGMM Team, Version 1.2, Carnegie Mellon USA, September.

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