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Three-Dimensional Perspective of Organization's Process Maturity Towards Company`s Exploration and Exploitation: A Research Study*

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Abstract:

Purpose: *The main goal of this paper is to present research results of organization's process maturity in terms of shaping of exploration and exploitation activities. Survey covers 400 Polish medium and large companies functioning during period of 2015-2017.*
Design/Methodology/Approach: *In literature there are numerous propositions of organizational process maturity. Major part of them based on attributes-oriented models like CMM, CMMI, PEMM, D.M. Fisher or Gartner.*
Findings: *Based on this framework and carried out research some conclusions can be formulated. Surveyed companies have an average value of process maturity of 5.82 (on a scale of 3-15), which ultimately translated into achievement of the second of the five levels of process maturity, i.e. "process definition". The values achieved by respective dimensions can be considered relatively low, although similar to each other the strategic dimension of maturity was estimated at 2.03, the operational dimension of maturity at 1.86, and the process maturity effects at 1.93 (on a scale of 1-5). All of the dimensions have positive correlation on both exploration and exploitation activities with exception of the strategic dimension.*
Practical Implications: *This paper is intended for researchers and managers dealing with concept of operationalization of business process maturity, especially in managerial perspective, that set a new challenge as well as unfold new opportunities of utilization for this phenomenon.*
Originality/Value: *The article explores an original concept based on managerial approach of implementing organization's process maturity. It consists of three logical bonded aspects characterizing this phenomenon strategic dimension, operational dimension, and effects.*

Keywords: *Process maturity, process, business process orientation, process management*.

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1. Introduction

Planning, implementing, and controlling of activities consisting of specialized tasks divided into organizational functions allowed, achieving of expected results in a stable environment. Along with an increase in the pace and significance of changes, manifested by shortening product life cycles, increasing customer expectations, pressure from competition and dynamic development of technology. It became necessary to designate a different approach to management, that would ensure the possibility of achieving economic surplus through a different form of work organization (Mielcarek, 2019). One of the answers meeting this requirement is a business process orientation (BPO).

The assumption of a process orientation is that the optimization of organization`s activities should focus on the process, i.e. the main and natural factor determining its efficiency (Grajewski, 2007). The development towards process orientation includes internal organizational changes that enable an organization to transition from being functional, through a process-based phase, to finally being an oriented organization (Cieślińsk, 2009). Obtaining benefits from the process approach, however, requires not only changes in the organizational structure, but also all significant elements of the management system, such as the style of management, delegation of powers, information exchange, motivation system, human resources development, and organizational culture (Grajewski, 2007) as well as relationship management (Ratajczak-Mrozek, Mielcarek, Herbeć, and Nowacki 2014).

Therefore, it is crucial to support decision makers in transition from traditional, functional, and hierarchy-based organization to organization based on processes with horizontal orientation, focusing on creating value added for business (exploitation) and for customers (exploration). The outline of organizational development can be divided into three phases of change (Perechuda, 2005): 1) From organizations with functional orientation to process orientation. 2) Covering the development and improvement of process-oriented structures and management systems. 3) Leading to the implementation of the company's orientation to the event. Process maturity is a concept that describes the level of implementation of business process orientation (BPO) in an organization. Therefore, it is assumed that the higher the process maturity, the more benefits from BPO will occur in a given organization.

Based on above considerations, the main goal of this paper is to present research results of organization's process maturity in terms of shaping of exploration and exploitation activities. Survey covers 400 Polish medium and large companies functioning during period of 2015-2017.

2. Literature Review

Process maturity is the ability of the organization, including its processes, to systematically improve the delivered results as part of its operations (Kalinowski, 2011). In particular, it is perceived as the extent to which processes are formally defined, managed, flexed, measured, and affected (Grajewski, 2007). Depending on the stage of development of an organization and requirements, the process maturity assessment may perform the following functions (De Bruin, Rosemann, Freeze, and Kulkarni, 2005):

- descriptive – used for ongoing assessment of processes taking into account given criteria (as-is assessment); these activities can be carried out by an internal unit (performed by an organization) or external (by an independent entity) and their results communicated to both internal and external stakeholders;
- prescriptive[2] – allowing for identification of the target level of process maturity (to-be assessment), including the formulation of a road map containing required improvement activities;
- comparative – leading to a comparison of own changes in different time series and changes compared to other organizations based on reference models; using historical data on processes, it is possible to conduct a comparative analysis of the maturity level of specified organizational units, as well as the whole entity (assumptions of this approach refer to benchmarking).

Two aspects determine the process maturity of an organization. The first is the level of advancement of applied methods and techniques of process management (Bitkowska, 2009). The second is the degree of awareness and knowledge about the functioning of processes in an organization used in decision-making by management (Krukowski, 2016). The consequence of the functional approach to the description of process maturity is the adoption of a deterministic paradigm, in which the decision-maker will indicate an adequate level of maturity for a given situation and stage of the organization's development.

Those two perspectives are the main views as to how process maturity is described in the literature. However, according to the Association of Business Process Management Professionals, there are over 150 different models of process maturity (Spanyi, 2004). The first of the models of process maturity proposed in the literature is the Capability Maturity Model (CMM) developed by Software Engineering Institute / Carnegie Mellon University (Humphrey, 1995). It has been assumed that managers' understanding of the principles of the process approach will allow for the systematic management of processes in such a way as to respond to the changing needs of clients, and to effectively and quickly achieve the goals set by the organization. As part of this model, selected areas of an organization's operation are assessed. Different approach was applied in the Process and Enterprise Maturity

[2] *Also translated as arbitrary (Becker, Knackstedt, Pöppelbuß, 2009, pp. 213–222).*

Model proposed by Hammer (2007) in which process maturity is determined for each process separately.

However, majority of models focus on the assessment of process maturity of a whole organization (Fisher, 2004; Harmon, 2003; Kerremans, 2008). From this group, some of the models are designed based on a matrix framework, in which a particular level of process maturity is defined by different criteria. For instance, in Fisher's concept, strategy, control, process, employees and ICT, are all indicated (2004). Another proposition come from Gartner Group in which there are two-dimensional matrix covering five maturity levels and criteria of maturity such as: methods and tools, organizational behavior, human resources, leadership, and Information technology (Gartner Group, 2008).

Those models see achieving process maturity more as a disruptive phase, focusing on distinguishing features of the given maturity level. There are understandable and easy to follow, however this perspective barley helps the manager's in decision making process and follow the pace of organizational learning and changes. Therefore, an author`s concept of process maturity is proposed. It is based on an iterative approach and see business process transformation as the results of interdependencies of the environment`s conditions, the organization's goals, and the estimation of the incurred efforts to the obtained effects.

Another issue that is crucial in this research is a context of results achieved by process-oriented organization, mainly in terms of exploration and exploitation. March (1991) considered exploration as the search for new development opportunities through research, changes, experimentation, and discovery, as well as flexibility, innovation and risk-taking. Perceived in this way, exploration requires incurring costs related to the search for new solutions and their testing, whereas the return on developed and commercialized innovations is deferred. Therefore, an organization must provide adequate resources, including financial resources, which will enable implementation of opportunities in the area of creating new markets, products, technology development, and in a broader perspective – creating new knowledge (Karpacz, 2011). These activities should ensure a high level of innovation, which is conditioned by the introduction of organic, flexible organizational structures, visionary leadership, and organizational culture conducive to learning and creative thinking (Zakrzewska-Bielawska, 2016).

In contrast, exploitation is aimed at maintaining current efficiency, control, improvement, implementation and realization, increasing certainty and reducing diversity, and in a broader sense – generating profit in the short term (March, 1991). This goal boils down to maintaining a competitive advantage on the market in terms of existing products and technologies by reducing costs and achieving economies of scale. These activities are based on explicit knowledge, standardizing work, and maintaining high efficiency as part of cyclically implemented commercial,

production, financial processes, etc. Exploitation often adopts solutions based on the leadership of autocratic, formalized, and bureaucratic organizational structures, and organizational culture focused on maintaining the status quo (Zakrzewska-Bielawska, 2016).

This mutual opposing development goals set a new context for business process orientation of organization as a coping strategy in dynamic and uncertain conditions. Therefore, the purpose of the article is to present the author`s concept of process maturity of the organization, in terms of shaping of exploration and exploitation activities. Survey covers 400 Polish medium and large companies functioning during period of 2015-2017.

3. Methodology

The subjective scope of empirical research covers 400 medium and large enterprises, operating in the territory of the Republic of Poland. 87% were medium-sized enterprises and 13% large enterprises. The time scope of quantitative research is 2015-2017. The selection of enterprises for the study was proportional in layers. The test results are representative. The primary data was collected using the CATI method by an external company. Then the data was coded and analyzed.

Another issue is the operationalization of individual research constructs. First construct is process maturity. Its final level is estimated on the basis of the responses according to the three dimensions of this phenomena: 1) strategic (covering areas: strategy; culture; structure), 2) operational (areas: initiating and integrating; measurement system; methods and tools) and 3) effects (areas: process improvement; value creation; change capability)[3]. Each of the areas includes five lines corresponding to the organization's maturity levels (on a scale from 1 to 5). In the case of obtaining different scores for individual areas, the entire dimension has the grade corresponding to the lowest value among the three components. The final level of the process maturity of whole organization is the sum of means of these three dimensions, i.e. it ranges from 3 to 15 and in case of single process assessment, only operational dimension is assess, and therefore the results are on scale 1-5 (see Table 1).

Second construct is exploration and exploitation. They were determined as the sum of measures (in the following areas: goal, product, market, and competitive advantage) applicable to exploration and exploitation activities. Questions regarding respective measures of ambidexterity constitute a modified version of the proposition presented by Zakrzewska-Bielawska (2018) (see Table 2).

[3] Detailed information about each of process maturity model areas can be found in Mielcarek, 2018.

Table 1. *Process maturity levels – assessment scale*

Maturity levels	**For a single process**	**For the entire organization**
Level 1. Lack of process maturity	1 point	3 points
Level 2. Process definition	2 points	4–6 points
Level 3. Process implementation	3 points	7–9 points
Level 4. Level of process embedding and improvement	4 points	10–12 points
Level 5. Level of process (system of processes) maturity	5 points	13–15 points

Table 2. *Operationalization of exploration and exploitation*

Construct	Areas	Operational measurement of the construct
Exploration activities	Goal	A company was developed from the long-term profit perspective
		New market opportunities were exploited
	Product	New products were made
		Product range was expanded
	Market	New markets were entered
		New, unique utility values for customers were offered
	Competitive advantage	Company's competences were developed
		A new competitive advantage was created
Exploitation activities	Goal	Short term profits were secured and generated
		Continuous improvement was carried out and an increase in efficiency was achieved
	Product	Existing products were improved
		Production costs were lowered
	Market	Economies of scale in the existing markets were increased
		Satisfaction of existing customers was surveyed systematically
	Competitive advantage	Existing competences were improved
		Existing competitive advantage was protected and maintained

Source: *Based on the work of: Zakrzewska-Bielawska, 2018, pp. 116-117.*

Each question in above table were rated by respondents on a scale from 1 to 7. Then the arithmetic mean was calculated separately for exploration and exploitation in terms of the goal, product, market, and competitive advantage (for each two questions in the area). The last step in determining result was to calculate means from all four areas of exploration and exploitation. As a result, exploration and exploitation level may range from 1 to 7.

4. Research Results and Discussion

The average value of the process maturity of the surveyed companies is 5.82 (on a scale of 3–15), which is less than the average value of the set (9). Standard deviation in the case of process maturity is 2.65. This means that Polish medium- and large-

sized businesses belong to the upper part of level 2, namely "process definition" (nearly 40% of respondents choose this answer). This results of process maturity is rather typical for other research, where also second level of process maturity were obtained (Bitkowska, 2013;) or third level (Gębczyńska and Bujak, 2017; Bosilij-Vukšic, Indihar-Štemberger, and Vugec, 2017). If the sample would be divided into two parts – above and below level 3 – then there are 13.25% of companies belonging to level 4 and 5, and 63.25% to level 1 and 2 (see Table 3).

Table 3. *Levels of process maturity in Polish medium- and large-sized businesses in 2015–2017 (n = 400)*

Levels of process maturity	**Optimal value of process maturity**	**Value of process maturity**	**Number of entities**	**Share in the sample size (%)**
5 – maturity of the system of processes	13–15 points	13.00	2	0.50
4 – process embedding and improvement	10–12 points	10.75	51	12.75
3 – process implementation	7–9 points	7.67	94	23.50
2 – process definition	4–6 points	4.72	158	**39.50**
1 – lack of process maturity	3 points	3.00	95	23.75

Source*: Author's calculations.*

In case of individual dimensions, all were assessed below the set of average value of 2.5. The highest score was achieved by the strategic dimension of process maturity (2.03), followed by the process maturity effects (1.93), and the lowest score was obtained by the operational dimension (1.86). Although the differences between the individual variables are relatively small, it should be emphasized that the desired arrangement of values is based on the following relationship:

strategic dimension ≥ operational dimension ≥ process maturity effects of an organization

This logic of implementation, support building capabilities of process management and create foundation for long term transformation covering adjusting strategy, culture, and structure to the need of BPO. In other case, when focusing only on operational dimension (initiation and integration, measurement system, tools and methods) or effects (process improvement, value creation, change capability) various dysfunctions may occur, including sub-optimization or a regression of the obtained effects. That may be caused by achieving only temporary improvement without

sufficient and stable foundations covering balancing the strategic and operational dimensions.

Second analyzed research construct were exploration and exploitation activities. company goals, products, market, competitive advantage (see table 3). The average level of exploration is 4.26, while the average level of exploitation is 4.51 (within the adopted scale of 1 to 7). Both results take values above half the scale and are relatively like each other. A more detailed analysis of individual metrics allows, however, specifying factors that differentiate them.

In the case of exploration, "achieving company goals" is the most important measure (4.57), with the lowest score obtained by "market" (3.76) (see table 3). Such a situation can be interpreted as the occurrence of the inside-out approach in conducting exploration activities, which may mean an enhanced status of the planning approach and significance of internal conditions in the development of Polish medium- and large-sized businesses. As regards the implementation of exploitation activities, a slightly different result was recorded. The most important measure is to "maintain the existing competitive advantage" (4.92) with the lowest result again obtained for the "market" (4.16). The dominant role of maintaining the current competitive advantage can be interpreted as an activity aimed at securing current revenue streams and obtaining profit in the short term, which allows investment financing and development as well as ensuring current operating activities (Table 4).

Table 4. *Exploration and exploitation in Polish medium- and large-sized businesses in 2015–2017 (n = 400)*

Average level of exploration and exploitation activities	**Areas of exploration and exploitation**	**Mean value of measures**
Exploration (4.257)	Company goals	**4.571**
	Products	4.278
	Market	**3.760**
	Competitive advantage	4.420
Exploitation (4.505)	Company goals	4.673
	Products	4.270
	Market	**4.156**
	Competitive advantage	**4.924**

Finally, correlation between the studied variables was analyzed. A weak positive correlation was recorded between the level of process maturity and the indicators of

exploration and exploitation activities (see Table 5). ρ-Spearman's coefficient for the first of them was 0.159 and the corresponding p-value was 0.001. Coefficients for the level of exploitation and ambidexterity were 0.216 and p-value were <0.001 and therefore statistically significant for the entire population.

In addition, relationships between individual dimensions of process maturity and ambidexterity including exploration and exploitation activities were assessed. On the basis of the calculated correlation coefficients, an observation was made that the strongest relationship occurs in the case of the process maturity effects, while the strategic dimension of process maturity (strategy, structure and culture) is negatively related to exploration and ambidexterity. This result differs from the intuitive perception of the studied relationships and requires further analyzes. When attempting to interpret the impact of the strategic dimension of process maturity, it should be remembered that it is not unambiguous. Exploitation activities related to the capture of value by business have a positive relationship, whereas exploration activities – negative, which may mean that the process of shaping the strategy, structure and culture is not properly implemented in terms of exploration, i.e. creating new value, implementing innovative activities, and providing long-term development of a company.

Table 5. *Rank correlation coefficients – dimensions of process maturity vs. exploration and exploitation in Polish medium- and large-sized businesses in 2015–2017 (n = 400)*

Dimensions of process maturity	**Exploration**	**Exploitation**
Process maturity	0.159 (p-value 0.001*)	0.216 (p-value< 0.001*)
Strategic dimension (strategy, structure, culture)	- 0.053	0.021
Operational dimension (initiation and integration, measurement system, methods and tools)	0.078	0.034
Process maturity effects (process improvement, value creation, change capability)	0.238	0.305

** value significant from the level <0.05*
Source*: Author's calculations.*

On the basis of the calculated correlation coefficients, an observation was made that the strongest relationship occurs in the case of the process maturity effects, while the strategic dimension of process maturity (strategy, structure and culture) is the weakest correlated with exploitation and negatively related to exploration. This result differs from the intuitive perception of the studied relationships and requires further analyzes. When attempting to interpret the impact of the strategic dimension

of process maturity, it should be remembered that it is not unambiguous. Exploitation activities (related to the capture of value by business, increase efficiency, cost reduction, improvement) have a positive relationship, whereas exploration activities – negative, which may mean that the process of shaping the strategy, structure and culture is not properly implemented in terms of exploration, i.e. creating new value, implementing innovative activities, and providing long-term development of a company.

5. Conclusions, Proposals, Recommendations

The main goal of this paper is to present research results of organization's process maturity in terms of shaping of exploration and exploitation activities. In general most common is second level of process maturity in Polish medium- and large-sized businesses (process definition) and average value is 5.82 on scale 3-15. Separate dimensions of process maturity (strategic, operational, effects) achieve similar values. Also, exploration (4.257) and exploitation (4.505) have quite similar results, but there are significant differences in terms of separate areas (goals, products, market, competitive advantage). There is low but positive correlation between process maturity and exploration and exploitation.

However, when analyzing dimensions of process maturity there are some interesting findings: (1) there is significant lack of coherency within dimensions process maturity of polish medium and large size companies, (2) strategic dimension have very weak positive relation with exploitation and very weak negative relation with exploration, (3) a level of development of process maturity dimension is opposite to the intuition and logical planning e.g. strategic dimension < operational dimension < effects of process maturity, (4) the most strongly related to exploration and exploitation are effects of process maturity (process improvement, value creation, change capability). Achieved results are partly surprising, and therefore need further explaining and studying, but in many areas support existing research of the phenomena.

When analyzing the literature, in general terms the relationship between the process maturity and results achieved by a company is confirmed, however this is the case when results are assessed using the managerial perception method (Kalinowski, 2018). This research also fit into this category due to basing on survey analysis and not a financial report or other official documents.

The process approach consisting in striving to increase the efficiency of companies translates into the improvement of competitiveness by ensuring flexibility of processes (Osbert-Pociecha, 2011). This relationship can be perceived in two perspectives: (1) quick and effective changes in core processes of an organization (logistics, marketing, sales) have impact on increase in the level of customer satisfaction and loyalty as well as company's reputation; (2) achievement of

operational excellence is associated with creating confidence and trustworthiness, which translates into durability of relationships with stakeholders other than customers (Sajdak, 2019). Above statement is supported by this research results in terms of process improvement, value creation and change capability of organization.

Other research confirmed the relationship between the improvement of process maturity and the efficiency and effectiveness of processes, cost reduction, improvement in product quality, and cooperation with suppliers and customers (Gębczyńska and Jagodziński, 2016), which largely corresponds to exploitation activities. This relation is also confirmed by conducted studies.

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