



An Investigation of Business Process Maturity: Report on Croatian Companies

Ljubica Milanović Glavan

University of Zagreb, Faculty of Economics and Business, Croatia

Abstract

Background: Nowadays, organizations try to improve their performance by focusing on the business process orientation (BPO) perspective. This perspective views companies as a mixture of unified business processes. A few methodologies can be used for analysing BPO maturity state. The maturity model shows the level of acceptance of the process-oriented approach in the business practice of a certain company. Recognizing different BPO levels can help companies execute, improve and manage their processes. **Objectives:** The primary aim of this research is to give a report on BPO maturity of Croatian companies and to stress the importance of key turning points. **Methods/Approach:** The cluster analysis method was used to analyse the survey results. **Results:** Croatian companies are currently evolving from the Defined level to the Linked level of BPO maturity. **Conclusions:** The results of the cluster analysis have shown that companies in Croatia have to improve all key turning points, with a special emphasis on the strategic view.

Keywords: process management, business maturity, cluster analysis, Croatian companies, turning points.

JEL classification: M15, M21

Paper type: Research article

Received: Jan 28, 2020

Accepted: Jul 6, 2020

Citation: Milanović Glavan, Lj. (2020), "An Investigation of Business Process Maturity: Case of Croatian Companies", *Business Systems Research*, Vol. 11 No. 2, pp. 159-165.

DOI: 10.2478/bsrj-2020-0022

Introduction

Business process management literature review shows that BPO has a positive effect on business performance (Hernaus et al., 2012; McCormack & Johnson, 2001; Milanović Glavan & Bosilj Vukšić, 2017). The absolute definition of BPO was provided by McCormack (2001) and it says that BPO presents the position in which an organization is focused on its business processes.

Process maturity is a more extensive version of business orientation which implicates that reaching higher stages of maturity means higher levels of process skills for the company. In every maturity level, it is of crucial importance to recognize and improve key turning points or maturity components that lead companies to the next level. The literature reveals that empirical research regarding key turning points

is not frequent. Some research was done before in Croatia by using decision tree method and it proved that in order to reach all BPO maturity levels companies have to focus on: "Human resources", "Supplier orientation", "Process measurement", and "Computer technology" (Milanović Glavan et al., 2015). The research conducted by McCormack et al. (2009), identified key turning points by using different statistical methods. One of the approaches used in that study was cluster analysis and it was elaborated that it is the best method to detect key turning points. So, according to the cognition, that cluster analysis method can detect important maturity components, previous research in Croatian companies was extended and the data were analysed by using the cluster approach. The prime plan of the new research is to reply to the research question: *RQ: Which maturity components are the most critical for each maturity level?*

By answering this, it is expected to accomplish the specified scientific objectives: first, investigate the level of maturity in Croatia; second, to address key turning points by using cluster analysis method; third, to procure potential future research in this field.

This research provides a scientific contribution since it detects key turning points of maturity in Croatian companies in a quantitative way and since it identifies more maturity components than earlier research (McCormack et al., 2009; Milanović et al., 2015). These new findings enrich the current body of knowledge on BPO and also provide practical implications that can be helpful for managers.

The paper is organized into five sections. After the introduction, BPO construct and BPO maturity model is presented. After that, the methodology of the survey conducted in Croatian companies is given. Results and fundamental discovery are described in the fourth chapter. Lastly, results are discussed and advice for new analysis are outlined.

Maturity Model of Business Process Orientation

BPO contains nine factors: Strategic perspective; Documentation of business processes; Process measurement; Process organizational structure; Employees management; Process culture; Market perspective; Supplier orientation; Computer technology (Škrinjar et al., 2010). These factors are more or less important depending on BPO maturity level.

The work in this paper was based on McCormack's BPO maturity model (2001) which states that there are four stages in reaching BPO maturity.

The first stage is called *AdHoc level*, which indicates that processes in the company are ill-defined, business processes are not measured, organizational structures are functional, performance is not manageable and supplier and customer perspectives are poor.

The second maturity stage or the *Defined level* means that only basic work and business processes are described and registered and that customer satisfaction is higher than in the first stage, but still low when compared to competitors.

Linked level or the third maturity stage means that the structure of the company is more horizontally based and performance management is improved.

The fourth, highest maturity stage or the *Integrated level*, means that the organization works in cooperation with its clients and suppliers. Organizational structure is process-based, business processes are measured and managed on regular basis, the performance is extremely improved, costs are decreased and customer satisfaction turns into an advantage.

Methodology

Research instrument

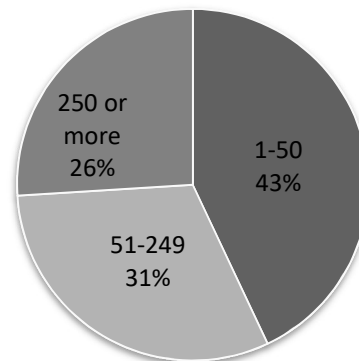
The goal of the empirical research was to determine the BPO maturity level in Croatia and to detect key turning points for advancing to higher maturity levels. The initial version of the research instrument developed by McCormack and Johnson (2001) incorporated only 3 BPO factors and that is why the questionnaire in this research was enlarged. It contained 58 questions that were assigned across to 9 factors mentioned in the previous chapter. Every question represents an individual characteristic of process orientation that is specific for each factor. The extent of these characteristics in an organization was validated by 7 points Likert scale.

Data

The survey was sent to 1200 Croatian companies. 127 CEOs filled out the survey, so the response rate was 10.58%. Considering the total of employees, the final research set included 26% of big, 31% of middle-sized and 43% of small Croatian companies (Figure 1).

Figure 1

Frequency of companies



Source: Author's calculation and illustration

Organizations from all sort of business are involved in the data sample. Financial and insurance services (16.53%) was the leading trade, followed by the Production (15.75%), Commerce (11.81%) and Information and communication services (11.09%). Other sorts of business represented 44.82% of the companies in the research.

Statistical methods

Before all, the questionnaire was checked for validity, using Cronbach's alpha indicators. After that, the cluster analysis was used as an intent for detecting BPO levels of maturity. In the end, k-means clustering was conducted to detect maturity components for every BPO level.

Validity

First, exploratory factor analysis was carried out by applying SPSS 18.0. Factor Analysis Technique and the 0.5 cut-off loading value (Comrey & Lee, 1992) showed that the fourth question for Process organizational structure, the seventh questions for Process measurement and Process organizational structure, the sixth question for Business

process documentation, fifth and ninth questions for Strategic perspective have not hit the loading value and were consequently removed from analysis; (2) Ninth question for Employees management has also not reached the 0.50 value, but it was not removed from further analysis since it had very close value (0.495).

Table 1
Operationalization of BPO construct

FACTORS	QUESTIONS
1. Strategic perspective	<p>Process improvements are monitored by top management.</p> <p>Organizational strategy is the source for deriving process aims.</p> <p>Business process improvement is one of the main strategic goals.</p> <p>Policy and strategy are always explained to all employees.</p> <p>Business process improvement arises from customer needs and organizational strategy.</p>
2. Documentation of business processes	<p>In our organization business processes are identified and explained.</p> <p>Our organization documents core processes.</p> <p>Every process of responsibility is identified and documented.</p> <p>Most of the employees know how every process work.</p> <p>Models of business processes are available to everyone in the company.</p> <p>Business processes in our organization are analysed with methodology.</p> <p>Every business process has its process measures.</p> <p>If something changes in a business process it must be formally documented.</p> <p>Every stakeholder of our organization knows if something in core business process changes.</p> <p>Employees learn how to deal with new processes.</p> <p>Business process goals are the responsibility of the people in the organization.</p>
3. Process measurement	<p>Our organization measures business performance.</p> <p>Every business process has performance targets.</p> <p>Every process has its indicators of performance.</p> <p>Organizational goals are the base for process performance goals.</p> <p>Performance indicators are collected continuously.</p> <p>Performance indicators are always known.</p> <p>By analysing the results of the performance new performance aims are defined.</p>
4. Process organizational structure	<p>Business processes are executed throughout the organization.</p> <p>We have a team of employees from different units that work together.</p> <p>Employees are stimulated for their ideas and talents.</p>
5. Employees management	<p>Employees are held accountable for providing business process performance.</p> <p>Employees are trained to use IT systems.</p>
6. Process culture	<p>Executive managers regularly have consultations.</p> <p>Employees from separate organizational units consult each other.</p>
7. Market perspective	<p>Competition in our industry is monitored.</p> <p>Every action our competitor does reacts our side.</p>
8. Supplier orientation	<p>Our organization is partnering with our main dealers.</p> <p>Our organization collaborates with its key suppliers.</p> <p>If something changes in our business processes, we inform our suppliers about it.</p>
9. Computer technology	<p>Our organization is connected with its suppliers by different types of SCM.</p> <p>Our organization uses business process modelling tools.</p> <p>Our organization uses business process management tools.</p> <p>Business process management system is embedded in our company.</p>

Source: Milanović Glavan et al. (2015)

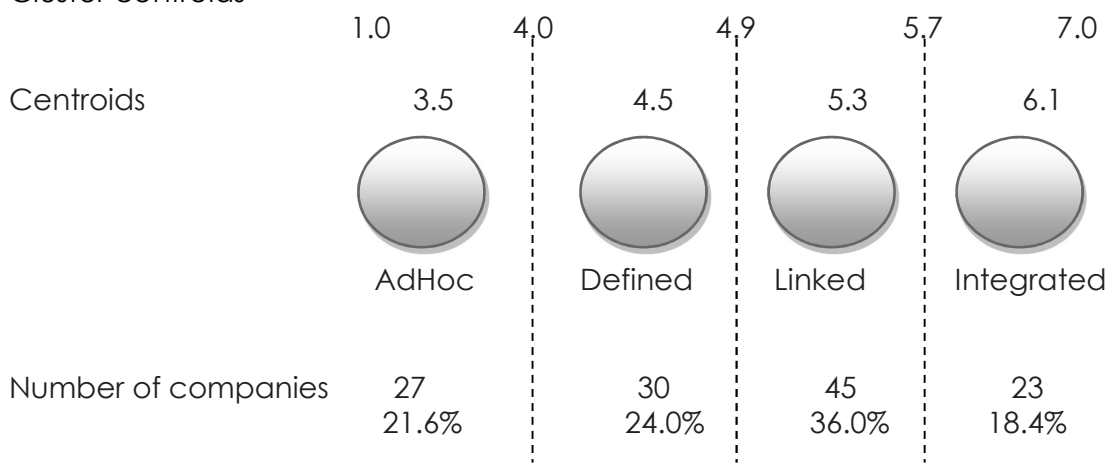
The route of operationalization of the BPO construct done by McCormack and Johnson (2001) and Škrinjar and Trkman (2013) was followed and the cleared data were used to make the new BPO construct (Table 1). Operationalized BPO construct consists of the following factors: Process documentation; Process measurement; Computer technology; Strategic perspective; Process organizational structure; Supplier orientation; Employees management; Market perspective and Process culture.

New construct was then subjected to reliability analysis. All calculated values of Cronbach’s alpha coefficients outgrew the number 0.70 which represents the cut-off rate according to Feldt and Kim (2008). That means that item scales were consistent. Furthermore, the Comparative Fit Index was determined (0.906) and also, the Normed Fit Index was calculated (0.872). The Root Mean Square Error recorded a 0.080 value. Subsequently, it can be stated that this model satisfied all methodological imperatives.

Results

Primarily, the overall value of BPO in Croatian companies was examined and it scored 4.84. Then, by applying Statistical Package for Social Sciences TwoStep cluster analysis procedures were operated. The 127 sample cases were distributed into four different centroids, each representing one maturity level and maturity scores were identified (Figure 2).

Figure 2
Cluster centroids



Note: SPSS software

Source: Author’s calculation and illustration

With the 4.84 BPO value, Croatian companies fall in the middle of the Defined and Linked maturity stage. It means that their processes are defined, but business processes are not connected. Also, jobs and organizational structure have a process aspect but are still functional.

Finally, to identify key turning point k-means algorithm was used (Table 2). It is proposed that when the score at the centroid of each level goes above 50%, that factor is then established and it is regarded as a maturity component or key turning point (Vlahović et al., 2010). Table 2 shows all key turning points for all maturity levels. Turning points for proceeding to the "Defined" BPO maturity are: "Strategic perspective", "Process documentation", "Process measurement", "Process organizational structure", "Employees management", "Process culture", "Market

perspective" and "Supplier orientation". It can be seen that the leading factors for advancing to the Defined level are "Market perspective" and "Supplier orientation". Key turning points for reaching the Linked BPO maturity include all factors, but the leading one is "Strategic perspective". Advancing to the highest, Integrated level of BPO maturity also involves all factors with a special emphasis on "Market perspective".

Table 2
Maturity scores by domains

	Percentage of maturity scores			
	AdHoc	Defined	Linked	Integrated
Strategic perspective	52%	69%	83%	89%
Documentation of business processes	46%	63%	79%	91%
Process measurement	42%	60%	77%	91%
Process organizational structure	51%	70%	80%	90%
Employees management	42%	62%	72%	89%
Process culture	46%	58%	65%	75%
Market perspective	57%	71%	79%	91%
Supplier orientation	63%	71%	77%	85%
Computer technology	44%	47%	68%	80%

Source: Author's calculation

Discussion and conclusion

Relations to previous findings and concluding remarks

Earlier research on BPO maturity levels in Croatia was conducted by using a decision tree model (Milanović Glavan et al., 2015). As stated in the introduction part of the paper the developed model detected few turning points. To identify more maturity components, cluster analysis approach was used, as it was recommended by McCormack et al. (2009). This approach has led to the discovery of 8 new maturity components that are necessary for advancing to the Defined BPO maturity and it included all 9 factors for advancing to Linked and Integrated maturity levels, which is in accordance to theoretical assumptions (McCormack et al., 2009). When advancing on Defined level emphasis must be on "Market perspective" and "Supplier orientation". When reaching the Linked level of BPO maturity the leading component must be "Strategic perspective". Advancing to the highest, integrated level of BPO maturity requests a special accent on "Market perspective" factor.

Practical implications

The findings of this paper can offer important implications for research and practice. These new findings enhance the field of BPO. The conducted research also provides practical implications since it can be helpful for leaders of Croatian companies. If wanting to reach the Defined maturity level Croatian managers have to increase the efforts in stimulating eight components of BPO and in nine of them if they want to advance to the third or fourth maturity level.

Research limitations and future studies

This research arises to several limitations. It must be pointed out that the study was done by using a questionnaire and that means concluding remarks can be subjective. The strength of cluster analysis methodology is in defining turning points. Nevertheless, sample size restrictions, need to be stressed out. Furthermore, the list of detected key turning points is valid only for Croatian companies.

The results of this article present support for further research. One way to raise the consistency of the research is to enlarge the number of companies that participated in this study. Also, the research was conducted only in Croatia and in the future, it can be done in other countries. Further investigation can also include a longitudinal study of maturity level changes in few companies.

References

1. Comrey, A. L., Lee, H. B. (1992), *A First Course in Factor Analysis* (2nd ed.), Lawrence Erlbaum Associates Publishers, Hillsdale.
2. Feldt, L. S., Kim, S. (2008), "A comparison of tests for equality of two or more independent alpha coefficients", *Journal of Educational Measurement*, Vol. 45, No. 2, pp. 179-193.
3. Hernaus, T., Pejić Bach, M., Bosilj Vukšić, V. (2012), "Influence of strategic approach to BPM on financial and non-financial performance", *Baltic Journal of Management*, Vol. 7, No. 4, pp. 376-396.
4. McCormack, K. (2001), "Business process orientation: do you have it?", *Quality Progress*, Vol. 34, No. 1, pp. 51-58.
5. McCormack, K., Johnson, W. C. (2001), *Business Process Orientation: Gaining the E-Business Competitive Advantage*, St. Lucie Press, New York.
6. McCormack, K., Willems, J., van den Bergh, J., Deschoolmeester, D., Willaert, P., Indihar Štemberger, M., Škrinjar, R., Trkman, P., Bronzo Ladeira, M., Paulo Valadares de Oliveira, M., Bosilj Vuksic, V., Vlahovic, N. (2009), "A global investigation of key turning points in business process maturity", *Business Process Management Journal*, Vol. 15, No. 5, pp. 792-815.
7. Milanović Glavan, Lj., Bosilj Vukšić, V. (2017), "Examining the impact of business process orientation on organizational performance: the case of Croatia", *Croatian Operational Research Review*, Vol. 8, No. 1, pp. 137-167.
8. Milanović Glavan, Lj., Bosilj Vukšić, V., Vlahović, N., (2015), "Decision tree learning for detecting turning points in business process orientation: a case of Croatian companies", *Croatian Operational Research Review*, Vol. 6, No. 1, pp. 207-224.
9. Škrinjar, R., Bosilj Vukšić, V., Indihar Štemberger, M. (2010), "Adoption of business process orientation practices: Slovenian and Croatian survey", *Business Systems Research*, Vol. 1, No. 1-2, pp. 5-20.
10. Škrinjar, R., Trkman, P. (2013), "Increasing process orientation with business process management: critical practices", *International Journal of Information Management*, Vol. 33, No. 1, pp. 48-60.
11. Vlahović, N., Milanović Glavan, Lj., Škrinjar, R. (2010), "Turning points in business process orientation maturity model: an East European survey", *WSEAS Transactions on Business and Economics*, Vol. 7, No. 1, pp. 22-32.

About the author

Ljubica Milanović Glavan, PhD is an Assistant Professor. She teaches at the Faculty of Economics and Business, University of Zagreb, Department of Information Technology. She has received a PhD in Informatics with the dissertation thesis "Conceptual model of Process Performance Measurement System". Her main research interests include business process management area and knowledge management, with a special emphasis on information technology. She is the author and co-author of many journal publications and she is engaged in numerous scientific projects. The author can be reached at ljmilanovic@efzg.hr