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BUSINESS PROCESS MANAGEMENT AND CORPORATE PERFORMANCE MANAGEMENT: DOES THEIR ALIGNMENT IMPACT ORGANIZATIONAL PERFORMANCE

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ABSTRACT

Both business process management (BPM) and corporate performance management (CPM) are receiving much attention in academic circles, as well as in business practice. One of the main reasons behind their adoption within organizations is enhancing overall organizational performance (OP). Therefore, this article aims to explore the link between BPM and CPM and how their maturities affect their alignment. Moreover, the article deals with the impact of BPM-CPM alignment to OP. Although there are some studies dealing with empirical confirmation that either BPM or CPM increases OP, to the best of authors' knowledge, none of the studies tries to investigate their combined impact in terms of an alignment empirically. Hence, this article focuses on shedding some light on the importance of BPM-CPM alignment and its connection to OP. A survey has been conducted in medium sized and large organizations operating in Slovenia and Croatia resulting in a total of 159 answers. Observed organizations have been segmented in two clusters, using k-means algorithm: low-performers and high-performers, revealing statistically significant differences between them for all observed variables. Results also indicate that the BPM-CPM alignment increases when both BPM and CPM maturities are higher. Furthermore, OP of the observed organizations has been examined through named two clusters. The Mann-Whitney U test revealed there are statistically significant differences between OP variables among low-performers and high-performance clusters, indicating the relationship of BPM-CPM alignment with OP.

KEY WORDS

business process management, business process orientation, corporate performance management, organizational performance, BPM-CPM alignment

CLASSIFICATION

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INTRODUCTION

The competitive global market of the new millennium has raised awareness of business processes as the most important management paradigm. Organizations are no longer viewed as a collection of functional areas, but as a combination of highly integrated processes [1]. Additionally, processes are now viewed as assets requiring investment and development as they mature. Thus, business process management (BPM) is becoming increasingly important. The extensive literature on BPM suggests that organizations can enhance their overall performance by adopting a process view of business [2].

While BPM represents a more operational management approach by which organizations maintain good performance on a daily basis, corporate performance management (CPM) is a typical approach with a strong strategic emphasis. By using CPM, organizations can obtain many benefits also and improve organizational performance (OP) [3].

Recent studies showed that there is a need for BPM and CPM alignment as it reflects the aspects of connecting strategy with operations [4-5]. Based on that assumption, the following research questions have been formed: *(RQ1) How BPM and CPM maturity levels effect their alignment? (RQ2) Does BPM-CPM alignment impacts OP?*

Having in mind the presented research questions, the objective of this article is to examine the impact of BPM-CPM alignment on OP. Therefore, the structure of the article, after this introduction is as follows. First, the theoretical background has been given to examining the definitions of BPM and CPM and its linkages to OP, as well to describe the benefits of BPM and CPM adoption. Also, past studies on this topic have been discussed. Next, a methodology description has been given, presenting empirical research in the form of a survey, which has been conducted among large and medium sized Croatian and Slovenian organizations. Finally, before the conclusion, the findings are presented, summarized and discussed. In the end, the plans for further research are identified, together with the limitations of this study.

LITERATURE REVIEW

BUSINESS PROCESS MANAGEMENT

Organizations are continually under competitive pressures and forced to re-evaluate their business models and underline business processes [6]. Zairi defines a process as an approach for converting inputs into outputs [7]. It is the way in which all the resources of an organization are used in a reliable, repeatable and consistent way to achieve its goals. A business process is a coordinated chain of activities intended to produce a business result or a repeating cycle that reaches a business goal [8]. Business processes represent a core of the functioning of an organization because it primarily consists of processes, not products or services. In other words, managing a business means managing its processes [9].

Over the past two decades, definitions of BPM have ranged from IT-focused to BPM as a holistic discipline [10-12]. According to Elzinga et al., BPM refers to a systematic approach to managing processes with the aim of improving the quality of products and services [13]. Zairi describes BPM as a structured approach to analyse and continually improve fundamental activities such as marketing, manufacturing, communications and other major elements of organizations' operations [7]. BPM relies on measurement activity to assess the performance of each individual process, set targets and deliver output levels which can meet corporate objectives. Siriam proposed an integrated "soft" and "hard" approach to BPM, where a "soft" approach is related to the human activity dimension, and a "hard" approach is concerned with the use of IT to improve business processes [12]. Since most business problems have both, the technical and human activity dimensions, a hybrid BPM definition

gives the best solution [14, 15]. So, BPM is a set of methods, techniques, and tools that can support the design, performance, management, and analysis of business processes [16].

Lee and Dale state that BPM is intended to align the business processes with strategic objectives and customers' needs, but requires a change in an organizations' emphasis from functional to process orientation [17]. DeToro and McCabe say that BPM solves many of the problems of the traditional hierarchical structure because it focuses on customer, manages hands-off between functions and employees have a stake in the final results [18]. The functional approach creates barriers to achieving customer satisfaction [7], and that is why today's organizations, in order to stay competitive, become more and more process oriented [19, 20].

CORPORATE PERFORMANCE MANAGEMENT

Performance management aims at the systematic generation and control of an organization's performance [21]. Every progressive organization needs "something" that enables it to formulate the strategy, implement processes that support operations, provide performance evaluation and operational control, and to learn and change [22]. In order to express that "something", the term "corporate performance management" has been coined by analyst group Gartner. It is much broader term than "corporate performance measurement" which deals specifically with performance measures or indicators that organizations put in place to track the progress against their strategy. CPM describes the metrics, but it also describes the methodologies, processes, and systems used to monitor and manage the business performance of an organization.

According to Melchert, Winter and Klesse [21], CPM comprises four major dimensions: (i) goals and metrics orientation, (ii) methodology support, (iii) IT support and (iv) process orientation. Goal and metrics orientation refers to enabling the measurement and management of process oriented organization. For that purpose, clear objectives have to be derived from the strategy and transformed into metrics. Methodology support explains that CPM delivers the process and IT infrastructure that is utilized to implement a methodology that best suits an individual organization [21]. IT support dimension means that CPM is supported by a set of software tools for integrating and analysing performance-relevant data, for supporting decision making and for facilitating the communication of decision [21]. Process orientation dimension refers to the understanding that CPM is based on a business-process-oriented view of the organization. McCormack and Johnson state that organizations' BPO is the level at which organizations pays attention to their essential business processes [9]. BPO can slim down operational costs, promote customer relations through satisfying customer needs better, increase employee satisfaction through harnessing the benefits available in organizational knowledge and improve OP. As this is a complex process done over a long period of time, organizations can attain various degrees of BPO acceptance through adjustments of their business processes.

Similar, Aho [23] presents a CPM maturity model based on following components: (i) management and organization, (ii) technology, (iii) people and culture and (iv) processes. Management and organization component refers to an organization's strategic goals and decisions, defining the management, organization, and contribution of CPM [23]. Technology component refers to the support which IT can provide to CPM in order to ensure reliable and quality information across the organization [23]. Component of people and culture deals with employees' training, communication, and understanding of CPM, while process component refers to the process orientation of the organization, as explained above [23].

CPM ensures that an organization's strategy is defined. It implements the strategy into business processes, analyses the execution of the processes and business environment and then takes appropriate actions to modify the strategy or processes according to the results [21]. CPM is

assumed to provide a wide variety of strategic and operational benefits. Examples of strategic benefits include following: all parts of an organization can focus on the same corporate goals; staff can understand how their choices, when combined with those of other business units, will better achieve organizational goals; interests of all stakeholders are aligned; an organization can better allocate resources [22]. Examples of operational benefits include following: organizations can have standard, defined, repeatable processes around the management of financial data, which ensures the data's accuracy, believability, relevance, and timeliness; employees are more satisfied as they become more involved; organizations have better control of operations; organizations increase their efficiency and adaptability [22].

BPM-CPM ALIGMENT AND ORGANIZATIONAL PERFORMANCE

The concept of OP is the comparison of an organization's goals and objectives with its actual performance in three distinct areas: financial performance, market performance, and shareholder value. As previously stated, nowadays, organizations became more process oriented in order to improve their OP. Regardless, rare authors have empirically investigated the relationship between BPM and OP. For example, McCormack et al. and Škrinjar, by using structural equation modelling in their researches, showed that BPO has a positive impact on OP and they proved that higher levels of BPO lead to better financial and non-financial performance [1, 24]. Milanović Glavan and Bosilj Vukšić revealed that there is a strong direct impact of BPO on non-financial performance [2]. On the other hand, no such impact has been found between BPO and financial performance. This does not mean that there is no connection whatsoever, but that BPO has a strong indirect impact on financial performance through non-financial performance [2, 25].

The theory assumes that CPM also positively impacts OP [21]. Based on a brief literature overview that has been conducted for the purpose of this study, it can be concluded that there is a lack of empirical evidence for that assumption. Listiani and Kartini proved that CPM directly affects the performance of the organization, but the effect is not strong [4]. Kamasak showed that different resource sets and capabilities of CPM effect OP [26].

Hence, practice, theory and all conducted researches agree that there is a positive impact of BPM on OP and that there is a positive effect of CPM on OP. On the other hand, recent studies claim that integration or alignment of BPM and CPM has many benefits. Various authors have discussed the important role of BPM and CPM alignment in OP [4, 5, 27]. However, to the best of authors' knowledge, there has not been any research conducted in order to investigate the combined impact of both BPM and CPM on OP. In that sense, since no empirical evidence has been found on the importance of BPM-CPM alignment in OP, this article addresses the question of BPM-CPM alignment and its effect on OP.

PREVIOUS RESEARCH EMPLOYING CLUSTER ANALYSIS

Cluster analysis is a data analysis technique that is often used in the field of economics and business. It is commonly used in marketing research for profiling customers or determining patterns of purchase intensions [28], as well as for the purpose of customer segmentation, e.g., in the financial industry with the aim of performing risk assessments [29].

Cluster analysis is also used for investigating BPM and CPM. Soni and Kodali [30] investigated supply chain performance in manufacturing, using a cluster analysis approach. They discovered that higher levels of business performance lead to higher levels of supply chain excellence [30]. Another example indicates that specific combinations of organizational characteristics can be linked with the organizational ability to create a virtual supply chain strategy [31]. Similarly, Marodini et al. [32] describe how particular combinations of contextual

factors influence the adoption of lean manufacturing. Some authors report using cluster analysis in terms of examining the moderation roles in the context of CPM. For instance, Pejić Bach et al. [33] demonstrate the impact of organizational culture on the relationship between business intelligence and organizational performance.

METHODOLOGY

DATA

The focus of this research is medium and large organizations. Due to their size, it is expected that it is more likely that they implemented BPM and CPM systems. The criteria for the size of organizations was the number of employees. Organizations having between 50 and 250 employees are considered to be medium organizations. Large organizations are employing at least 250 people. Therefore, only organizations with more than 50 employees have been taken into consideration.

The sample included organizations from Croatia and Slovenia. These two countries are geographically close, both are members of the European Union, and share similar past and economic history, which is being considered as solid justification for research analysis on combined data sample [34, 35].

Data analysed in this article has been collected in a period of March until December 2016 as a part of the research conducted under the PROSPER project (Process and Business Intelligence for Business Performance – IP-2014-09-3729), fully supported by Croatian Science Foundation.

A random sample has been used, and the data has been collected using an online survey tool as well as the questionnaires in paper format sent by mail. In both countries, the list of medium and large organizations has been drawn out from the business entities repository that is publicly available (the Registry of business entities in Croatia and business directory bizi.si in Slovenia). The informants have been top level managers having insights into the BPM and CPM in their organizations. In Slovenia, out of 1394 questionnaires that have been sent, 171 responses have been received, which makes a response rate of 12,27 %. In Croatia, out of 500 distributed questionnaires, 101 responses have been received, which makes a response rate of 20,20 %. After the overall collected data has been checked for irregularities, missing values and illogicality, the final sample for this research included 159 responses to questionnaires.

Out of 159 responses within a sample, 37,74 % came from Croatia, whereas 62,26 % came from Slovenia. Table 1 presents the sample features with the regards to the number of employees, turnover and industry sector for the total sample, as well as with the regards to the country.

In Croatia, 40 % of the informants work in a medium sized organization. This share is somewhat higher for Slovenia, accounting for 60,61 % of the Slovenian responses. Contrarily, large organizations employ 60 % of Croatian informants, and 39,39 % of Slovenian informants.

16,67 % of the Croatian responses and 19,19 % of the Slovenian responses came from organizations having a yearly turnover of 10 million euros or less. Percentage of organizations having a yearly turover larger than 49 million euros is 43,33 % for Croatia, and 27,27 % for Slovenia. Consequently, the percentage of organizations having moderate turnover, between 10 and 50 million euros is bigger for Slovenia (48,48 %). For Croatia, this percentage is 21,67 %.

Industries have been classified into sectors using the classification scheme proposed by Gelo and Družić [36]. The smallest share of organizations belongs to the primary sector with 2,52 % share, followed by quinary (11,95 %) and quaternary sector (15,09 %). The terciary

Table 1. Sample features.

Feature	Category	Croatia (n = 60)		Slovenia (n = 99)		Total (n = 159)	
		No.	**Percentage**	**No.**	**Percentage**	**Sum**	**Sum (%)**
No. of employees	51-249	24	40,00 %	60	60,61 %	84	52,83%
	> 249	36	60,00 %	39	39,39 %	75	47,17%
	Sum	60	100,00 %	99	100,00 %	159	100,00%
Turnover (mil EUR)	0-10	10	16,67 %	19	19,19 %	29	18,24%
	10-50	13	21,67 %	48	48,48 %	61	38,64%
	>50	26	43,33 %	27	27,27 %	53	33,33%
	N.A.	11	18,33 %	5	5,05 %	16	10,06%
Industry sector	Primary	3	5,00 %	1	1,01 %	4	2,52%
	Secondary	10	16,67 %	50	50,51 %	60	37,74%
	Tertiary	22	36,67 %	24	24,24 %	46	28,93%
	Quaternary	10	16,67 %	14	14,14 %	24	15,09%
	Quinary	13	21,67 %	6	6,06 %	18	11,95%
	N.A.	2	3,33 %	4	4,04 %	6	3,77%

sector is the second biggest in organizations' share, taking 28,93 % of the sample. The majority of organizations belong to the secondary sector (37,74 %).

RESEARCH INSTRUMENT

Research instrument consists from following constructs: (i) BPM maturity assessment (BPM1 – BPM10); (ii) CPM maturity assessment (CPM1 – CPM10); (iii) BPM-CPM alignment assessment (PPA1 – PPA 7); and, (iv) OP assessment (OP1 – OP5). In total, 32 variables have been taken into consideration. All variables have been measured using a 1-5 Likert scale (1 – strong disagreement, …, 5 – strong agreement).

BPM maturity construct has been based on the Process Performance Index (PPI), originally designed by Rummler-Brache group, encompassing critical success factors of BPM [37]. Similarly, CPM maturity construct has been formed by following the Performance Management Index (PMI) which has been established by Aho [3, 23]. OP construct has been designed based on the research conducted by Law and Ngai [38]. BPM-CPM alignment (PPA construct) has been developed in cooperation with researches from the School of Economics and Business, University of Ljubljana, Slovenia. It is based on several research papers, indicating that CPM in organizations is directly linked with the BPM on the organizational and project level, which indicates that BPM-CPM alignment can be discussed [27, 39, 40]. PPA construct measures the following issues: (i) collaboration of BPM and CPM between departments and on projects; (ii) strategic process orientation; (iii) rewarding system based on process Key Performance Indicators (KPIs); (iv) process ownership actions based on performance indicators; (v) end-to-end business process measurement; (vi) CPM system supporting performance indicators creation; and, (vii) expertise in creation of KPIs.

STATISTICAL METHODS

In order to explore the research questions of this article, a three-step statistical procedure has been employed. In the first step, a cluster analysis has been used in order to answer the first research question regarding relations of BPM and CPM maturity with the BPM-CPM alignment (PPA). The second step included ANOVA analysis aiming to corroborate the differences between discovered clusters [33]. In the third step, a Mann-Whitney U test has been used for investigating the existence of statistically significant differences in OP between clusters. Data analysis has been conducted with the assistance of IBM SPSS and StatSoft Statistica software.

Cluster analysis is an unsupervised learning method seeking to group data records into meaningful groups or clusters, based on the similarity of internal features [41]. This means that unique patterns in data behaviour can be identified, resulting in the identification of clusters with distinctive features. Two main fractions of cluster analysis are hierarchical clustering and non-hierarchical or partitioning clustering. Clustering procedures differ in terms of how they determine the number of clusters and afterwards, how they assign data to a certain cluster. One of the most utilized clustering methods is a non-hierarchical k-means cluster analysis [42].

The number of clusters (that is indicated as *k*) is set prior to the cluster analysis in k-means, rather than after which is the case in hierarchical clustering. The method seeks to divide data instances into *k* groups that differ one from another in a greatest plausible manner. Differentiation is made with regards to groups' geometric mean values, that are called centres or centroids. Data instances are assigned to a cluster which has the closest mean, with the purpose of minimizing the variations within the clusters so that coherent groups of data could be identified. However, the allocation of data to a cluster in k-means is not made on a one-time base, rather iteratively. Hence, the k-means algorithm firstly assorts data according to the initial cluster centres. Afterwards, the cluster means are being recalculated, and data reassigned until the convergence point is reached [41]. The algorithm behind the cluster analysis in Statistica is said to be quite efficient, thus enabling the convergence to be achieved in less than eleven iterations [43]. After that, the clustering results of the final cluster solution can be interpreted, with respect to the underlying theory and research topic.

As already mentioned, in k-means cluster analysis, the number of clusters should be selected by the researcher [41], who can use various approaches for that purpose [44, 45]. However, a common method for deciding upon the number of clusters is an expert conclusion [46, 47]. According to Staw et al. [48], organizational attributes can be benchmarked between low-performing and high-performing organizations, as attributes' levels can be related to OP as the outcome. This study's exploration aims at investigating specific levels of BPM, CPM and BPM-CPM alignment and their relationship with OP. Based on the analysis of various cluster solutions (with 2, 3 and 4 clusters), the authors have decided to use the two-cluster solution, that is focused on the examination of low-performing and high-performing organizations [49, 50].

RESULTS

K-MEANS CLUSTER ANALYSIS

Cluster analysis has been conducted using the constructs BPM, CPM, and PPA for the organizations included in the sample.

In k-means cluster analysis, data instances are repeatedly assigned to a certain cluster. This means that organizations' affiliation with a certain cluster will change over time. Affiliation depends on the calculated distance from clusters' centroid. Organizations are assigned to the cluster with the nearest centroid.

In the beginning, the initial set of centroids is calculated. The maximum average distance has been used for this purpose. Afterwards, centroids are iteratively computed [42] with the goal of "minimizing the within-cluster variability, while maximizing the between-cluster variability" [43]. This process was repeated two times, and the Euclidean distance measure was applied for this purpose. The repetitive process, of determining in which cluster the data will be assigned to, is one of the main advantages of k-means clustering. In this way, higher reliability of clustering results can be achieved [44].

Cluster means regarding all the variables are displayed in Table 4, whereas a graphical representation is made in Figure 3. Cluster means across all the variables are bigger for the second cluster, in comparison to the first cluster. This suggests that the organizations from the second cluster are high-performers, whereas first-cluster organizations can be regarded as low-performers. 91 organization belongs to the high-performing cluster, which accounts for 57,23 % of the sample. Low-performing cluster counts for 42,77 %, i.e., 68 organizations can be found in this group.

The biggest absolute difference between variable means between clusters can be detected for CPM variables, while the smallest differences are detected for BPM variables. For the low-performing organizations, the lowest results in terms of mean values are detected for CPM

Table 2. Mean values of two clusters for observed variables of BPM, PPM, and PPA variables measured on Likert scale (1-5).

Variable	Low-performers (Cluster 1; n = 68)		High-performers (Cluster 2; n = 91)	
	Mean	Standard Deviation	Mean	Standard Deviation
BPM1	4,000	0,993	4,527	0,603
BPM2	3,794	1,241	4,462	0,735
BPM3	3,471	0,969	4,352	0,656
BPM4	3,750	0,952	4,253	0,811
BPM5	3,176	1,050	3,912	0,852
BPM6	3,029	1,065	4,066	0,772
BPM7	3,721	0,912	4,297	0,707
BPM8	3,324	1,126	4,055	0,794
BPM9	3,059	1,131	4,044	0,868
BPM10	3,147	0,996	4,055	0,751
CPM1	2,309	0,902	3,978	0,760
CPM2	1,765	0,948	3,813	1,095
CPM3	1,765	0,948	3,901	0,895
CPM4	2,559	1,028	4,088	0,740
CPM5	2,412	0,934	3,736	0,712
CPM6	3,176	1,092	4,352	0,689
CPM7	2,765	1,223	4,088	0,865
CPM8	2,000	0,829	3,637	0,782
CPM9	2,588	0,918	4,055	0,751
CPM10	2,515	1,165	3,769	0,955
PPA1	2,206	1,001	3,571	0,791
PPA2	2,750	0,936	3,934	0,827
PPA3	2,265	1,141	3,703	1,027
PPA4	2,559	1,042	3,934	0,800
PPA5	2,382	0,898	3,615	0,840
PPA6	2,603	0,949	3,912	0,755
PPA7	2,941	1,183	4,143	0,783

construct. In particular, the lowest results are shown for the CPM2 and CPM3 variables that are having the same mean values of 1,765. These variables represent defined responsibility for CPM activities and adoption of CPM methodologies in support of decision making. The highest results in low-performing organizations cluster have variable BPM1 with a mean value of 4,000. High results of BPM1 variable indicate that business processes have a strategic orientation in these companies. Similarly, high-performing cluster organizations also exceed in the strategic orientation of business processes. Although, BPM1 value of 4,527 is higher in comparison to the low-performing cluster. On the other hand, the lowest results for the high-performers are detected for the variables CPM8 and PPA5. CPM8 variable presents employee awareness about the importance and role of the CPM. PPA5 variable presents end-to-end business process measurement.

According to the results, the high-performing cluster is more stable in terms of variability in levels of the variables. Smaller mean variabilities across the variables are present in the high-performing cluster, whereas the low-performing cluster has bigger variability between variables, as presented in Figure 3.

One can also notice that differences in BPM and CPM maturity levels between clusters are related to differences between levels of BPM-CPM alignment. In other words, if the organization has both BPM and CPM maturity at a higher level, their alignment is also going to be higher. On the other hand, if one of the two observed maturity levels is lower, their alignment is also going to be lower. This result could be reasonable if taking into consideration that PPA construct reinforces BPM and CPM and their orchestration in organizations.

ANOVA analysis has been performed in order to test the significance of variable differences between clusters. Results of the ANOVA analysis (available in Table 8. in Appendix) show that at 1 % significance level, there are statistically significant differences between clusters. All of the above implies that the chosen two-cluster solution is justified in this example [51].

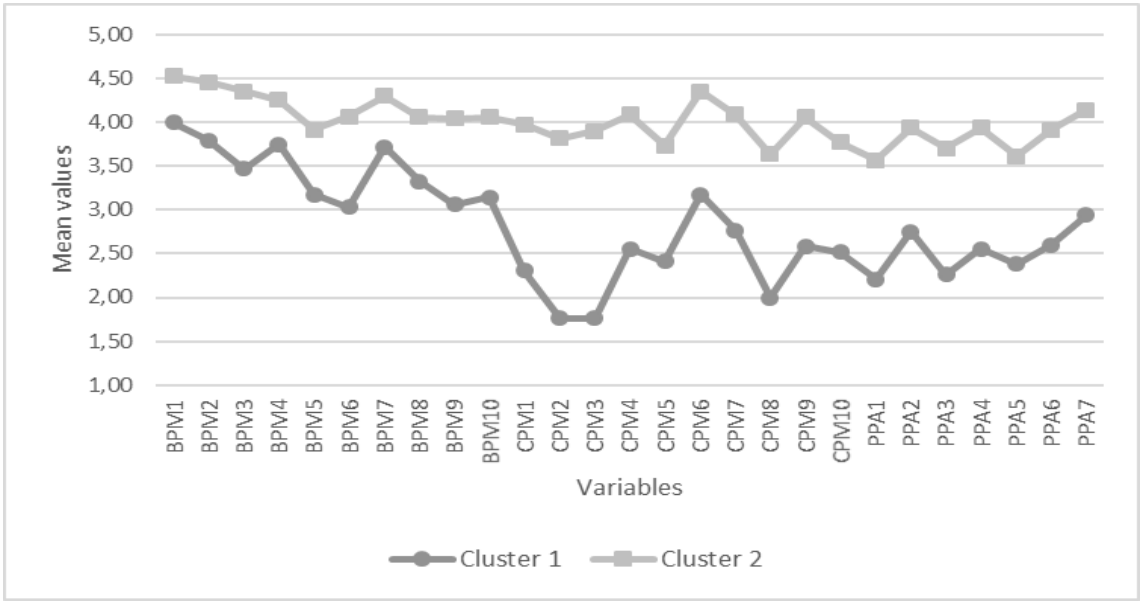

Figure 1. Plot of means for each cluster.

IMPACT OF BPM-CPM ALINGNMENT ON ORGANIZATIONAL PERFORMANCE

Two groups of organizations having internally similar characteristics in terms of BPM and CPM maturity have been identified. On top of that, levels of BPM and CPM maturity have

been brought in relationship with BPM-CPM alignment of organizations. In this study, organizations are regarded as high-performers or low-performers, depending on their performance in BPM, CPM, and PPA.

Additionally, the goal of this article has been to investigate the impact of cluster characteristics on the OP. In order to analyse that impact, descriptive statistics have been performed and inspected in relation to the OP construct. Cluster descriptive statistics for OP variables are visible in Table 7. Graphical presentation of cluster means with respect to OP variables can be seen in Figure 4.

Overall, variables OP1 and OP2 have been revealed to have higher mean values in comparison to the three remaining construct variables. Variables OP1 and OP2 represent customers' perception about organization; and, customer retention rate, in relation to industry competitors. One possible explanation for higher grades of customer related issues could lie in data collection method bias. Since the grades have been delivered by informants, they could incorporate individual perceptions. On the other hand, OP3, OP4, and OP5 variables embody performance measures that are regularity quantified such as profitability and sales growth and are having overall lower mean values.

Inspection of cluster means for each of the OP variables reveals that the second cluster, i.e., high-performing, yields superior results in terms of OP, while the first cluster, i.e., low-performing, has been falling behind. The second cluster also has better scores on BPM and CPM maturity, and their alignment, and organizations in this cluster are regarded as high-performers. Hence, we can infer that higher levels of OP are influenced by organizations'

Table 5. Cluster descriptive statistics for OP variables.

	Clusters	*N*	Mean	Std. Deviation	Std. Error Mean
OP1	1	68	3,735	0,874	0,106
	2	91	4,055	0,656	0,069
OP2	1	68	3,544	0,969	0,117
	2	91	4,055	0,705	0,074
OP3	1	68	2,809	0,981	0,119
	2	91	3,593	0,894	0,094
OP4	1	68	2,765	0,994	0,121
	2	91	3,615	0,928	0,097
OP5	1	68	2,926	0,982	0,119
	2	91	3,780	0,867	0,091

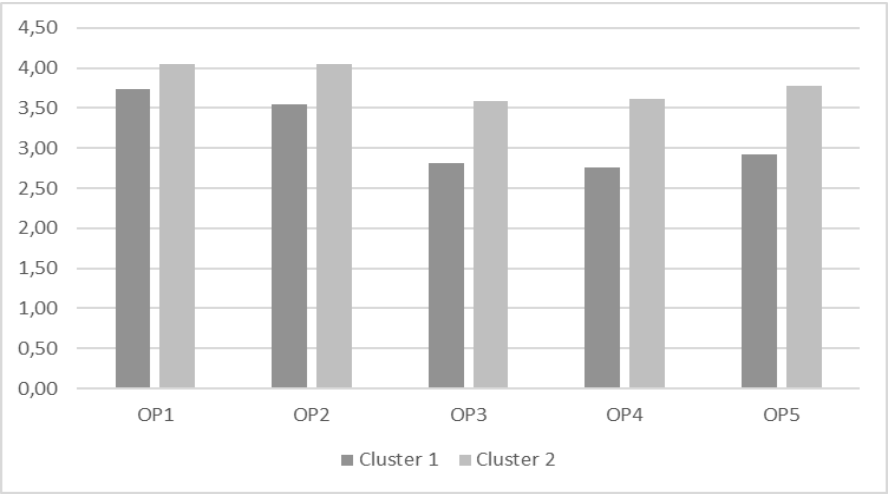

Figure 2. Mean values of OP variables across clusters.

exceeding in BPM and CPM maturity. These results are consistent with previous findings in the literature [25, 52]. A novelty in assuming the OP is its relationship with the BPM-CPM alignment as well.

A non-parametric Mann-Whitney U test, widely used for ordinal data [49], has been conducted in order to confirm clusters' impact on the OP. Firstly, paired ranks for the test have been calculated, as presented in Table 6. Table 7 presents the Mann-Whitney U test results.

The results indicate that there are significant differences between group characteristics regarding OP construct [53]. Statistically significant differences at a 5 % significance level are detected for the PO1 variable, which expresses customers' perception about the value they are receiving for their money when purchasing organizations' goods and services. This perception is more optimistic for the second cluster, i.e. for organizations that are high-performers Statistically significant differences between clusters at a 1 % significance level are discovered for OP2, OP3, OP4, and OP5 variables. Hence, statistically strong differences between clusters can be found regarding the rest of the OP variables. Again, high-performing cluster yields better results in terms of customers' retention rate; sales rate; profitability; and, overall positioning in the market, all in comparison to the competitors. Therefore, the test results confirmed that the organizations that are high-performing in BPM, CPM, as well as the alignment between BPM and CPM, are producing better in overall organizational performance. On the other hand, organizations with lower BPM, CPM, and BPM-CPM alignment, are also having inferior market positioning with respect to customers, other players in the niche and profitability scores.

As stated in the introduction, this article focused on two research questions, being: (i) How BPM and CPM maturity levels effect their alignment? and (ii) Does BPM-CPM alignment impacts OP? Having in mind the presented results, the answer to the first research question is that organizations having both BPM and CPM maturity at a higher level are most likely to

Table 6. Mann-Whitney test ranks.

	Cluster	N	Mean Rank	Sum of Ranks
OP1	1	68	71,32	4849,50
	2	91	86,49	7870,50
OP2	1	68	66,54	4524,50
	2	91	90,06	8195,50
OP3	1	68	59,81	4067,00
	2	91	95,09	8653,00
OP4	1	68	59,51	4047,00
	2	91	95,31	8673,00
OP5	1	68	58,38	3970,00
	2	91	96,15	8750,00

Table 7. Mann-Whitney test statistics.

	OP1	OP2	OP3	OP4	OP5
Mann-Whitney U	2503,500	2178,500	1721,000	1701,000	1624,000
Wilcoxon W	4849,500	4524,500	4067,000	4047,000	3970,000
Z	–2,269	–3,401	–5,044	–5,051	–5,349
Asymp. Sig. (2-tailed)	0,023**	0,001*	0,000*	0,000*	0,000*

*statistically significant at 1 %

**statistically significant at 5 %

have a higher level of BPM-CPM alignment. As for the second research question, based on the presented research results, it could be concluded that BPM-CPM alignment positively influences OP; i.e., organizations having the higher level of BPM-CPM alignment are most likely to have the higher overall OP.

CONCLUSION

This article aimed to examine the effect of BPM and CPM maturity on their alignment as well as to investigate the role of BPM-CPM alignment and its impact on achieving higher levels of OP. In order to be able to provide answers to the stated research questions, an empirical study has been conducted. Data has been gathered through online and paper questionnaires after which the gathered data has been analysed employing k-means cluster analysis and tested using the Mann-Whitney U test. To summarize the findings, k-means cluster analysis resulted in two clusters (high-performers and low-performers) and revealed that higher levels of BPM and CPM maturity indicate higher levels of BPM-CPM alignment. Moreover, this study showed that organizations that have higher BPM-CPM alignment also have at the same time the higher OP.

Since cluster analysis approach results in the grouping of cases, the exact numbers for the unique organization in terms of identifying the level of OP based on the BPM-CPM alignment results cannot be predicted. Nevertheless, it has been noticed that the differences between clusters are statistically significant and have relatively small volatility across alignment variables. Hence, one could, with strong plausibility, infer that organizations characterized as high-performers in process performance alignment will also have better organizational outcomes in terms of both financial, as well as customer related indicators. On the contrary, organizations failing to deploy process performance alignment successfully are given to have inferior OP in general. Indeed, the main omissions in BPM in organizations are associated with strategical aspects and process performance measurement [25, 34]. This article reveals that this governance gap can be overcome by BPM-CPM alignment that is reinforcing the overall OP.

However, although this study yields some interesting findings, one should be aware of its limitations as well. As already indicated, one cannot predict the OP of the organization based only on the BPM-CPM alignment. Moreover, the article has been focused only on organizations operating in two neighbouring countries, Slovenia and Croatia, and therefore findings of the research should be further examined and tested in order to make the findings more generalizable. With that purpose, one of the directions for further research could include expansion of the research to other countries and investigating the results by a cross-country analysis. Additionally, further research of this topic could include a more detailed analysis of the gathered data, e.g., structural equation modelling in order to increase the generalisation and the strength of the findings.

APPENDIX

Table 8. ANOVA table for 2-means clustering, $n = 159$ (continued on p.380).

Variable	Analysis of Variance					
	Between SS	df	Within SS	df	*F*	signif. *p*
BPM1	10,8281	1	98,6813	157	17,2273	0,000054
BPM2	17,3362	1	151,7330	157	17,9379	0,000039
BPM3	30,2109	1	101,6884	157	46,6436	0,000000
BPM4	9,8368	1	119,9368	157	12,8766	0,000444

Table 8. ANOVA table for 2-means clustering, n = 159 (continuation from p.379).

BPM5	21,0599	1	139,1791	157	23,7565	0,000003
BPM6	41,8129	1	129,5456	157	50,6743	0,000000
BPM7	12,9173	1	100,6802	157	20,1431	0,000014
BPM8	20,8201	1	141,6076	157	23,0831	0,000004
BPM9	37,7696	1	153,5889	157	38,6085	0,000000
BPM10	32,0787	1	117,2547	157	42,9522	0,000000
CPM1	108,4349	1	106,4708	157	159,8963	0,000000
CPM2	163,3116	1	168,0595	157	152,5646	0,000000
CPM3	177,6297	1	132,3452	157	210,7206	0,000000
CPM4	90,9952	1	120,0614	157	118,9911	0,000000
CPM5	68,2742	1	104,1409	157	102,9283	0,000000
CPM6	53,7478	1	122,6296	157	68,8121	0,000000
CPM7	68,1410	1	167,5320	157	63,8572	0,000000
CPM8	104,3381	1	101,0330	157	162,1360	0,000000
CPM9	83,7224	1	107,1959	157	122,6205	0,000000
CPM10	61,2508	1	173,1391	157	55,5413	0,000000
PPA1	72,5715	1	123,4034	157	92,3291	0,000000
PPA2	54,5638	1	120,3544	157	71,1775	0,000000
PPA3	80,5430	1	182,2243	157	69,3939	0,000000
PPA4	73,6057	1	130,3691	157	88,6414	0,000000
PPA5	59,1700	1	117,5973	157	78,9958	0,000000
PPA6	66,7006	1	111,5761	157	93,8552	0,000000
PPA7	56,1994	1	148,9076	157	59,2535	0,000000

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