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CONTROLLING AND OTHER METHODS OF MANAGEMENT – THE RESULTS OF THE EMPIRICAL STUDY IN THE ENTERPRISES FUNCTIONING IN POLAND

Summary: The objective of this article is to present and interpret the results of the empirical research concerning the use of controlling along with other modern methods of management in the enterprises functioning in Poland. It is considered that the comprehensiveness of controlling leads to the fact that this concept is *de facto* made to coexist with other management methods. The results of empirical studies concerning the coexistence of controlling with 12 other methods of management in pairs are presented. For the analysis of the coexistence of controlling in pairs with other methods of management, we used the value of average percentage. The methods with which controlling coexists significantly more often than it exists without those methods and than these methods exist without controlling are: CRM, ERP, KM, outsourcing, BPM.

Keywords: management methods, controlling, coexistence.

1. Introduction

The research shows that the management of modern organisations requires applying various concepts and methods of management [for example: Lichtarski, Węgrzyn 2000; Lichtarski, Czura 2002; Jagoda, Lichtarski 2003; Sułkowski 2004; Lichtarski 2005; Szpitter 2011]. According to Lichtarski and Czura [2002], as a result of implementing two or more concepts at the same time, it is possible to achieve such benefits which would not be achieved if the concepts were used separately. The coexistence of management methods seems to be a significant issue in the management of modern organizations.

At the same time, it should be emphasised that the very issue of the coexistence of controlling with other management methods is not often touched upon in the literature on the subject. An exception is Nowak [2003], who discusses this issue from the theoretical perspective. However, what is noticed in the literature is that there is a need to integrate controlling with management concepts. For example, Weißenberger

and Angelkort [2011] note the increased level of integration in the accounting system design. Furthermore, Kawalak [2009] is of the opinion that benchmarking is essential during controlling implementation as well as in the course of its use in an enterprise; while Davis and Albright [2004] consider the effectiveness of BSC in improving financial performance. The relations between BSC and controlling are characterised by Weber and Schäffer [2000]. Bhimani and Roberts [2004] justify the need of integrating management accounting and knowledge management. Moreover, controlling, as it seems, should coexist with other methods of management. This is, first of all, because modern controlling is considered a comprehensive method which - in a holistic way – supports the management system of an organisation [Kuc 2011, p. 26]. Moreover, controlling solutions are more frequently referred to the majority of management functions [Bieńkowska, Kral, Zabłocka-Kluczka 2003, pp. 75-88]. The specialisation of controlling brings about the creation of such varieties of controlling [Nowak (Ed.) 2011]. It is also worth noticing that – if the character of tasks is taken into consideration – controlling in an organisation can be divided into strategic and operational [Marciniak 2008, p. 134].

In view of the foregoing, the objective of this paper is to present and interpret the results of the empirical study conducted in the enterprises functioning in Poland. On the one hand, this study concerns the application of controlling. On the other hand, this study is related to the coexistence of controlling and other management methods and therefore it presents the scope and character of the relations between them.

2. Research methodology

The results of the study presented in this paper are part of the empirical research regarding modern methods of management carried out by the Section of Management and Marketing Systems of the Institute of Organisation and Management of Wrocław University of Technology in 2009 [Hopej, Kral (Eds.) 2011]. The empirical study concentrated on 13 selected modern methods of management. These are: Balanced Scorecard (BSC), benchmarking, business process management (BPM), business process reengineering (BPR), competency-based management, controlling, customer relationship management (CRM), enterprise resource planning (ERP), knowledge management (KM), lean management (LM), outsourcing, six sigma and total quality management (TQM).

A research tool was a survey questionnaire which was addressed to the enterprises functioning in Poland. The construction of the survey questionnaire is presented in Bieńkowska, Zgrzywa-Ziemak [2011, pp. 211–252]. Only one survey was conducted in each company. All efforts were made to assure that the questionnaire was filled out by employees who have a broad look at the whole enterprise. As a result of the research activities, 173 questionnaires were returned to the authors. However, for the final analysis, a sample containing 167 correctly filled out questionnaires was

accepted [Bieńkowska, Zgrzywa-Ziemak 2011, pp. 211–252]. The structure of the studied enterprises in terms of their selected characteristics was presented in Table 1.

	The number of organisations	The percentage of organisations		The number of organisations	The percentage of organisations
In ter	ms of activity typ	es	In term	s of organisation	size
production	63	38	up to 50 people	44	26
service	54	33	51–250 people	53	32
production-service	37	22	251-500 people	33	20
commercial	13	7	above 500 people	37	22
In	terms of location				
in Poland	139	83	Total	167	100
abroad	28	17			

Table 1. The structure of the studied enterprises in terms of their selected characteristics

Source: own elaboration.

3. Research results

The number of the enterprises that have implemented the particular methods of management is presented in Figure 1.



Figure 1. The number of the enterprises which have implemented the particular methods of management Source: own elaboration.

The use of controlling was declared in as many as 80 enterprises under analysis, which amounted to almost 49% of the respondents. Controlling was the most frequently used method in the studied organisations. In the light of the analyses of the obtained results, it can be initially stated that in small enterprises the use of controlling is declared by only 25.0% of the organisations under study. In medium-sized organisations – 41% of the respondents. In large and very large organisations, controlling is used by over 60% of the analysed companies. The statistical analysis confirmed that along with the increase in the enterprise size, there was an increase in the use of controlling in the researched organisations.

The results of the study also indicate that controlling is most frequently used in production companies and its implementation is declared by 55.6% of the analysed enterprises. The use of controlling is also popular in service enterprises (50% of the respondents). The simultaneous use of controlling in production-service organisations and commercial organisations is less common (37.8% and 33.3% of the companies, respectively).

Taking into account the location of the headquarters of the enterprise, it may be observed that controlling was significantly more frequently indicated by the enterprises located outside the territory of Poland (71.4% of the organisations located abroad). The organisations located Poland indicated this method slightly less commonly (43.6% of the enterprises having located in Poland).

In the enterprises under study, controlling occurred only three times as an independent method of management. So, in the majority of cases, it coexisted with other methods. In the group of enterprises using controlling, on average the use of five methods was declared; however, 28 enterprises declared using from 1 to 3 management methods.

In the analysis of the results, the authors studied the coexistence of controlling with other methods in pairs, trying to answer the question whether there are methods with which controlling coexists significantly more often than it exists without such methods. For the analysis of the coexistence of controlling with particular methods in comparison to non-existence of these pairs (i.e. the use of only one method or no use of both methods), the cross tabulations and chi-squared statistics were used as the statistical methods, with the adopted critical statistical significance being 0.05). The number of coexistences of controlling with particular methods along with the calculated values of chi-squared statistics is presented in Table 2.

From the results presented in Table 2, it emerges that for each pair the most numerous group in particular pairs is the situations when neither of the methods is used. The results of the statistical analyses (the cross tabulations, chi-squared test) show that the differences in the groups for almost all pairs (with the exception of the pairs: controlling – six sigma, competency-based management and TQM) are statistically significant. The values calculated from the cross tabulations are under a great influence of the number of the coexistences of particular methods.¹ Therefore,

¹ The authors realise that the major difficulty which occurred in the course of the study was the different numbers of the existence of particular methods in the organisations under study.

Table 2. The number of the coexistences of controlling with particular methods along with the calculated values of chi-squared statistics

	BSC	Benchmarking	BPR	CRM	ERP	KM	LM	Outsourcing	BPM	Six sigma	Competency-based management	TQM
The number of the use of the methods	17	31	15	68	49	48	43	55	76	16	32	71
(1, 1) controlling YES, second method YES	13	23	12	39	32	33	28	38	46	11	19	39
(1, 0) controlling YES, second method NO	67	57	68	41	48	47	52	42	34	69	61	41
(0, 1) controlling NO, second method YES	4	8	3	29	17	15	15	17	30	5	13	32
(0, 0) controlling NO, second method NO	83	79	83	58	70	72	72	70	57	82	74	55
Pearson chi-square	6.189	10.542	6.803	4.104	8.415	11.729	6.875	14.751	8.904	3.081	2.087	2.443
Asymp. Sig. (two-sided)	0.013	0.001	0.009	0.043	0.004	0.001	0.009	0.000	0.003	0.079	0.149	0.118

Source: own elaboration.

in the course of reasoning, the average percentage ratio was used. It relativizes the results to the average percentage value of the frequency of the use of the methods in the analysed pair. The value of the average percentage was calculated on the basis of the following formula:

$$\dot{sr}_p rel(Con, A) = \frac{\frac{rel(Con, A)}{w_1(Con)} + \frac{rel(Con, A)}{w_1(A)}}{2} \times 100\%,$$

where: \dot{sr}_p rel(Con,A) – average percentage concerning the relation between controlling and method A,

rel(Con,A)	- the number of the existence of a particular relation
	between the methods, controlling and A ((0,0), (0,1),
	(1,0),(1,1)),
$w_l(Con)$	- the number of the uses, or no use (depending on the
	studied relation) of controlling,
$W_{l}(A)$	- the number of the uses, or no use (depending on the

studied relation) of the method A.

The value of the average percentage of the coexistence of controlling with particular management methods is presented in Table 3.

The analysis of the values of the average percentage in particular pairs confirms the previous conclusion that the most common situation is the one when there is no use of both methods in each pair. Hence, the most probable situation is the one in which both methods have not been implemented in an organisation. At the same time, apart from the situation of no implementation of both methods and in relation to the particular pairs of the methods as well as in the light of the results of the research presented above, the following groups of methods can be distinguished:

A) the group of methods with which controlling coexists significantly more often (the situation (1, 1)) than it exists without those methods (the situation (1, 0)) and than the situation in which these methods exist without controlling (the situation (0, 1)). These methods are: CRM, ERP, KM, outsourcing, BPM;

B) the group of methods where controlling exists significantly more often without those methods (the situation (1, 0)) than it coexists with them (the situation (1, 1)) as well as than those methods exist without controlling (the situation (0, 1)). The following methods can be included here: BSC, benchmarking, BPR, LM. However, if we analyse the situation in which those methods exist, then all of them in the analysed group will coexist with controlling more often than they will without it;

C) the group of methods, for which there is no differences of the statistically significant relations between the existence of controlling and the use of those methods. These methods include the following: six sigma, competency-based management and TQM.

TQM	71	51.8	47.0	40.9	60.2
Competency-based management	32	41.5	60.7	27.8	6.69
Six sigma	16	41.2	66.0	18.5	74.3
BPM	76	59.0	39.9	37.0	64.1
Outsourcing	55	58.3	45.0	25.2	71.5
LM	43	50.0	53.5	26.1	70.4
KM	48	55.0	49.1	24.2	71.6
ERP	49	52.6	50.3	27.1	67.0
CRM	68	53.0	46.3	38.0	62.6
BPR	15	47.5	64.9	11.7	75.9
Benchmarking	31	51.5	56.6	17.5	74.4
BSC	17	46.3	64.2	14.1	75.4
	The number of the use of the methods	(1,1) controlling YES, second method YES	(1,0) controlling YES, second method NO	(0,1) controlling NO, second method YES	(0,0) controlling NO, second method NO

Table 3. The value of the average percentage of the coexistence of controlling with particular management methods

Source: own elaboration.

A detailed discussion of the character of the relations in particular pairs is presented in Table 4.

 Table 4. A discussion of the characteristics of the relation of controlling with particular methods of management

A pair of methods	The characteristics of the relation
1	2
	Group A
Controlling – CRM	The value of the average percentage for the pair controlling – CRM shows that CRM existed more often with controlling (the average percentage for the situation (1, 1) equals 53.0) than alone (the average percentage for the situation (0, 1) equals 38.0) and than controlling alone (the average percentage for the situation (1, 0) equals 46.3). 39 organisations used at the same time both controlling and CRM, which constitutes 48.8% of the organisations which implemented controlling and 57.4% of the organisations which have implemented CRM. The research results (there is no clear dominance of one of the relations) show that there is a "two-directional", mutual relation between both methods.
	In the case of the pair controlling $-$ ERP it should be stated that both methods existed relatively
Controlling – ERP	more often than each of them alone – despite the significant (although not so great as in the case of BSC or benchmarking) differences in the number of the enterprises making use of these methods. Attention should be directed to the fact that 32 organisations used simultaneously both controlling and ERP, which constitutes 40.0% of the organisations which implemented controlling and 65.3% of the organisations which implemented ERP. The average percentage of the existence of controlling with ERP for the situation (1, 1) equals 52.6 whereas for the situation (1, 0) – there is controlling and there is no ERP – 50.3. The values are thus similar. At the same time, from among 49 organisations which implemented ERP, as many as 17 used only ERP (without controlling), which constituted 44.3% of the organisations with ERP. The above, however, may show a relatively great "independence" of using ERP in comparison to controlling.
Controlling – KM	The value of the average percentage for the pair controlling – KM indicates that KM existed more often together with controlling than without it and than controlling alone. It should be however stressed that 33 organisations used at the same time both controlling and KM (the situation (1, 1)), which constitutes 41.3% of the organisations which implemented controlling and 68.8% of the organisations which implemented KM. Thus, what can be seen is a slight advantage of a one-directional relation, which means that if KM is implemented in an enterprise; this method is used most of all as a method accompanying controlling. Controlling does not necessarily require the implementation of KM.
Controlling – outsourcing	What is worth attention is the fact that despite the difference in the number of the enterprises using outsourcing and controlling, these methods exist together relatively more often (the average percentage for the situation (1, 1) equals 58.3) than each of these methods alone. This means that 38 organisations used at the same time both controlling and outsourcing, which is about 47.5% of the organisations which implemented controlling and 69.1% of the organisations which implemented outsourcing. The above fact, however, can indicate a "stronger" one-directional relation in the pair outsourcing – controlling. Outsourcing can be implemented in the organisations as a tool of controlling and therefore it is subordinate to controlling. It is thus difficult to assume that there is a situation when outsourcing needs controlling to its functioning so much that it is implemented mostly in the enterprises where at the same time there is controlling.
	The average percentage for the pair controlling – BPM shows that definitely more often these methods
Controlling BPM	coexisted than they were used separately. At the same time, it is worth stressing that 46 organisation used at the same time both controlling and BPM, which constitutes 57.5% of the organisations which implemented controlling and 60.5% of the organisations which implemented BPM. This confirms the "two-directionality" and "mutuality" of the relations between controlling and BPM.

1	2
	Group B
Controlling – BSC	The average percentage of the coexistence of BSC and controlling (the situation $(1, 1)$) equalled 46.3 and was lower than the average percentage for the situation $(1, 0)$ – there is controlling, there is no BSC (64.2). This means that the most likely situation is the one in which there is controlling and there is no BSC (leaving aside the situation $(0, 0)$). At the same time, attention should be drawn to the fact that the average percentage for the situation $(1, 1)$ was higher than the average percentage for the situation $(0, 1)$ – there is no controlling, there is BSC. This means that if BSC is already implemented in the enterprise, it coexists with controlling (the reverse statement is not true, that is, if there is controlling, it does not mean that BSC is also implemented). We deal here, like for example in the case of BPR, with a strong one-directional relation implying that controlling accompanies BSC and we can draw a conclusion that controlling does not necessarily have to make use of BSC.
g	We should pay attention to the difference in the number of the uses of both methods of management.
Controlling – benchmarki	The average percentage of the existence of controlling and benchmarking for the situation $(1, 1)$ equals 51.5, whereas for the situation $(1, 0)$ – there is controlling, there is no benchmarking – it equals 56.6. Attention should also be drawn to the fact that from among 31 enterprises which used benchmarking, as many as 23 also used controlling (which constituted 74.2% of the enterprises with benchmarking). At the same time, like in the case of BSC, the average percentage for the situation $(0, 1)$ is significantly lower (17.5) than the average percentage for the situation $(1, 1)$. This means that if there is benchmarking in an organisation, there is also controlling. The above statement would suggest – in a direct way – that if benchmarking is used, then it is used mostly as a tool which accompanies controlling.
	The average percentage of the coexistence of BPR and controlling (the situation $(1, 1)$) equalled 47.5 and was lower than the average percentage for the situation $(1, 0)$ – there is controlling there is no
Controlling – BPR	BPR. It was also higher than the average percentage for the situation (1, 0) – there is controlling, there is BPR. Attention should paid to the difference in the number of the use of both methods of management. Out of all the methods studied, BPR was the most rarely used one. Its implementation was declared only by 15 organisations. It also should be borne in mind that from among 15 organisations as many as 12 implemented simultaneously controlling (which constituted 80% of the enterprises with BPR). This might mean that in the practice of enterprise functioning, BPR is a tool of controlling (like in the case of BSC and benchmarking). Thus, we deal here were a similarly strong one-directional relation which implies that BPR is accompanied by controlling and we can draw
	a conclusion that controlling does not necessarily have to make use of BPR.
Controlling – LM	controlling – LM for the situation (1, 0) – there is controlling, there is no LM – equals 53.5 and for the situations (0, 1) – there is no controlling, there is LM – equals 36.1, which is essential because of the difference in the number of the use of both methods (the implementation of LM is declared by 43 studied organisation). At the same time, it is worth noting that from among 80 enterprises using controlling, only 28 used LM. This suggests rejecting the statement that controlling is implemented as a method which accompanies LM. However, there is no ground to confirm the
	relation of the subordination of controlling to LM.
	Uroup U Practice shows that there is no relation between the existence of controlling and the use of six signed
Controlling – six sigma	Having shows that there is no relation between the existence of controlling and the use of six sigma. However, it is worth noting the difference in the numbers of the existence of both methods. Six sigma was implemented only in 16 organisations. Therefore, it is possible to pay additional attention to the fact that from among these 16 organisations, 11 used at the same time both controlling and 68.8% of the organisations that implemented six sigma. The average percentage of the existence for the situation $(1, 1)$ equals 41.2 and is lower than the average percentage of the existence for the situation $(1, 0)$ – there is controlling, there is no six sigma and higher than for the situation $(0, 1)$ – there is no controlling, there is no six sigma, if it exists in an organisation, accompanies controlling. Can thus six sigma be considered a tool of controlling?

Table 4, cont.

1	2
Controlling – competency- based management	Practice confirms that there are no differences in the statistically significant relations between the existence of controlling and the use of competency-based management. It should also be noted that 19 organisations used at the same time both controlling and competency-based management, which is about 23.7% of the organisations which implemented controlling and – at the same time – 59.4% of the organisations which implemented competency-based management. The average percentage of the existence for the situation $(1, 0)$ – there is controlling, there is no competency-based management – and higher for the situation $(0, 1)$ – there is no controlling and there is competency-based management. It seems, however, that these methods are not clearly related.
Controlling – TQM	In the case of the pair controlling $-TQM$, there were no differences in the statistically significant relations between the existence of controlling and the use of TQM. However, attention should be paid to the fact that 39 organisations at the same time used both controlling an TQM, which is 48.8% of the organisations which implemented controlling and 54.9% of the organisations which implemented TQM. The average percentage of the existence for the situation (1, 1) amounts to 51.8 and is higher than the average percentage of the existence for the situation (1, 0) – there is controlling, there is no TQM – and for the situation (0, 1) – there is no controlling and there is TQM. This might indirectly suggest the existence of a two-directional relation between these methods.

Source: own elaboration.

4. Conclusions

This research concerned the relation of the coexistence of controlling with other modern methods of management. It was thus found that in the practice of the studied enterprises, controlling coexists significantly more often with CRM, ERP, KM, outsourcing, BPM (from the theoretical point of view, only in relation to the pair controlling – KM and possibly controlling – CRM it is difficult to talk about a clear connection of both pairs of the methods). Additionally, the research has shown that controlling exists significantly more frequently without BSC, benchmarking, BPR and LM. At the same time, in the case of BSC and benchmarking, it is possible to talk about the primacy of controlling over the indicated methods and to qualify them as tools, of which controlling may (but does not have to) make use (both of the indicated methods significantly more frequently accompany controlling than they exist without this method). The situation is ambiguous in the case of the pairs controlling - BPR and controlling - LM. Finally, the study has shown the group of methods (six sigma, competency-based management and TQM), in which there are no statistically significant relations between the existence of controlling and the use of other methods. While it is understandable that there is no connection between controlling and competency-based management, it is difficult to agree with the lack of connection in the pairs controlling - six sigma and controlling - TQM. Especially in the last case, there should be great complementarity in the use of both of these management methods.

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CONTROLLING I INNE METODY ZARZĄDZANIA – WYNIKI BADAŃ EMPIRYCZNYCH W PRZEDSIĘBIORSTWACH FUNKCJONUJĄCYCH W POLSCE

Streszczenie: Celem niniejszego artykułu jest przedstawienie oraz interpretacja wyników badań empirycznych dotyczących współwystępowania controllingu z innymi metodami zarządzania w przedsiębiorstwach funkcjonujących w Polsce. Uznano, że kompleksowość

controllingu powoduje, że koncepcja ta *de facto* skazana jest na częste współwystępowanie z innymi metodami zarządzania. Przedstawiono wyniki badań empirycznych dotyczące współwystępowania controllingu z 12 innymi metodami zarządzania w parach. Do pomiaru częstości współwystępowania controllingu w parach z innymi metodami posłużono się wartością wskaźnika średniego procenta. Metody, z którymi controlling współwystępuje istotnie częściej, aniżeli występuje bez nich oraz aniżeli te metody występują bez controllingu stanowiły CRM, ERP, KM, outsourcing i BPM.

Słowa kluczowe: metody zarządzania, controlling, współwystępowanie.