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DO THE MANAGEMENT TOOLS CARE FOR HEALTH ORGANIZATIONS?

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Abstract
Despite the fact that management methods have an increasing popularity in the business and academic environments, their use in healthcare organizations is not as well known. This paper provides empirical evidences to support the theoretical approaches, revealing that the use of most management tools within Romanian health organizations significantly and positively influence their performances and level of competitiveness.
Keywords:competitiveness, healthcare, management tools, performance

1.INTRODUCTION

Increasing the performances (e.g. economic, managerial) and competitiveness is the goal of any organization. In case of public institutions, especially the health organizations, there are also other categories of results that justify their existence, or through which their efficiency and effectiveness may be assessed (meeting the needs of the community, enhancing the quality of life, and/or the patients' health status, etc.). Health care organizations face new challenges since, instead of a certain given direction to follow, they have to make informed choices in terms of range of health services provided, groups of clients/patients addressed to, resources allocation and stakeholders' expectations (van Wijngaarden, Scholten, & van Wijk, 2012). Therefore, in order to obtain the expected results, besides designing and operating the basic, auxiliary and supporting processes, an important role (or perhaps the most important role) is that of the management processes, including the design / choice, implementation and judicious combination the modern managerial tools.Management tools were developed mainly within the business sector, their efficiency and effectiveness being supported by theoretical and empirical evidences (Cullen, Mangan & Dwyer, 2002 cited by Cullen, O'Connor and Mangan, 2004; Nedelko & Potočan, 2016; Nedelko, Potocan, & Dabic, 2015; Pawliczek, Meixnerova & Navratilova, 2015; Popa, Ștefan, & Popescu, 2015; Potocan, Nedelko, & Mulej, 2012; Rigby & Bilodeau, 2018; Rigby & Bilodeau, 2013; Rigby & Bilodeau, 2015; Ștefan, Popa, Dobrin, & Popescu, 2017).For instance, the 16 surveys conducted by Bain and Company (2018) over the last 25 years provided as many snapshots on the history of management tools around the globe, which, combined, provided a motion picture of the long-term shifts (Rigby & Bilodeau, 2018). Table 1 presents the most popular 10 tools, as they were indicated by the executives participating to the surveys.

TABLE 1 - RIGBY'S TOP 10 MANAGEMENT TOOLS 1993-1017

Rank	1	2	3	4	5	6	7	8	9	10
1993	Vision Statement	Customer Satisfaction	TQM	Competitor Profiling	Benchmarking	Pay – for - Performance	BPR	Strategic Alliances	Cycle Time Reduction	Self-Directed Teams
1996	Strategic Planning	Mission and Vision Statement	Benchmarking	Customer Satisfaction	Core Competencies	TQM	BPR	Pay-for-Performance	Strategic Alliances	Growth Strategies
2000	Strategic Planning	Mission and Vision Statement	Benchmarking	Outsourcing	Customer Satisfaction	Growth Strategies	Strategic Alliances	Pay-for-Performance	Customer Segmentation	Core Competencies
2004	Strategic Planning	CRM	Benchmarking	Outsourcing	Customer Segmentation	Mission and Vision Statement	Core Competencies	Strategic Alliances	Growth Strategies	BPR
2006	Strategic Planning	CRM	Customer Segmentation	Benchmarking	Mission and Vision Statement	Core Competencies	Outsourcing	BPR	Scenario Planning	KM
2008	Benchmarking	Strategic Planning	Mission and Vision Statement	CRM	Outsourcing	BSC	Customer Segmentation	BPR	Scenario and Contingency Planning	Mergers and Acquisitions
2010	Benchmarking	Strategic Planning	Mission and Vision Statement	CRM	Outsourcing	BSC	Core Competencies	Change Management Programs	Core Competencies	Customer Segmentation
2012	Strategic Planning	CRM	Employee Engagement Surveys	Benchmarking	BSC	Core Competencies	Outsourcing	Change Management Programs	Supply Chain Management	Mission and Vision Statements
2014	CRM	Benchmarking	Employee Engagement Surveys	Strategic Planning	Outsourcing	BSC	Mission and Vision Statements	Supply Chain Management	Change Management Programs	Customer Segmentation
2017	Strategic Planning	CRM	Benchmarking	Advanced Analytics	Supply Chain Management	Customer Satisfaction	Change Management Programs	TQM	Digital transformation	Mission and Vision Statements

Note: CRM - Customer Relationship Management; BSC - Balanced Scorecard; BPR - Business Process Reengineering; TQM – Total Quality Management; KM – Knowledge Management.
Source: adapted from Rigby & Bilodeau (2001, 2005, 2007, 2009, 20011) cited by Kádárová & Durkácová (2012); Rigby & Bilodeau (2013, 2015, 2018)

Based on their 25 years research findings, Rigby and Bilodeau (2015) offer a set of four suggestions designed to help managers to exploit the full potential of the management tools they use (Rigby & Bilodeau, 2015):

- Documentation. To be successful, managers need to fully understand the effects of each instrument, its strengths and weaknesses (especially since they can undergo changes over time), choosing the right ones, combining them judiciously and operationalize them at the right time. Therefore, they should avoid simplistic solutions, thoroughly document and collect information from other managers using each specific tool.
- Sustainable strategies, not fleeting whims. Managers should promote realistic strategic action directions and consider managerial tools only as means of those actions, not as universal panaceas.
- "The right tool for the right job". Managers should have a rational approach in selecting and implementing managerial tools as they are able to contribute to improved performances only insofar they identify unsatisfied customer needs, exploit competitors' vulnerabilities, build distinctive capabilities and develop innovative strategies.

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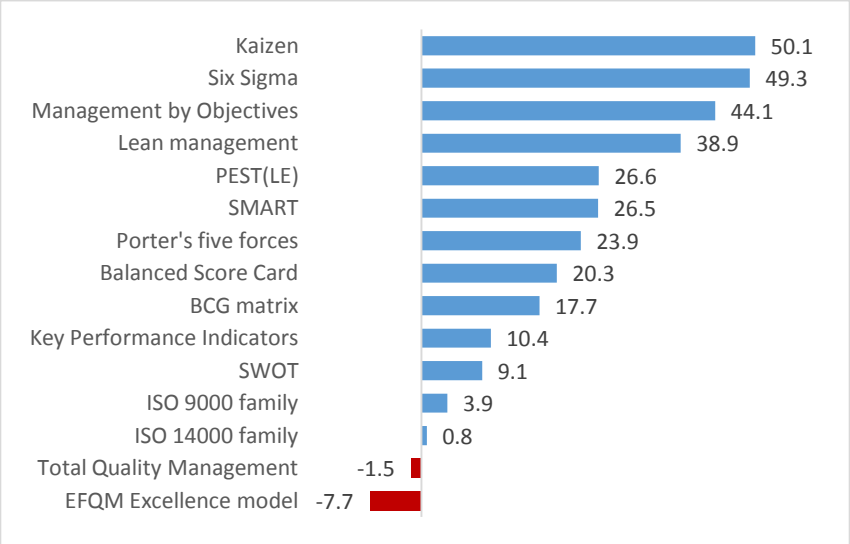
- Management tools should be adapted to the overall management system. Rigby & Bilodeau (2015) research results indicated that the effectiveness of the same management tools differs according to firms' characteristics (e.g. size) and region.

There are also authors interested in investigating whether management tools usage have any impact on firm level performances. For instance, in the Czech and Slovakian context, Pawliczek, Meixnerova and Navratilova (2015) organized a survey between 2009 and 2011, involving entrepreneurs, senior managers and senior executives from 722 firms in both countries. They tried to determine whether the use of 15 selected management tools may positively influence the economic value added (EVA). Their results (presented in Figure 1) should be interpreted as the difference between the percentage of firms with increases and those with decreases in value added, from those using each of the managerial tools analyzed. As can be seen, the best results reported companies employing Kaizen and Six Sigma, while the Lean method seems to be the fourth performer. It should also be noted that management by objectives (MBO) ranks only in the third position, the SWOT analysis on the eleventh position and Total Quality Management (TQM) on the penultimate position (with a negative difference of -1.5 pp.). The authors (Pawliczek, Meixnerova, & Navratilova, 2015) conclude that managerial tools of Japanese origin enjoy an increased interest among managers in the two countries, influencing their thinking and behavior.



Source: adapted from Pawliczek, Meixnerova & Navratilova (2015)

Globally, could be identified several trends in approaching management tools (Nicolescu & Verboncu, 2008): (1) proliferation of management tools, both in terms of number and diversity of methods and techniques and the number of managers/organizations employing them, (2) increased sophistication and complexity, (3) digitalization, by integrating certain software into the very structure of management tools, as well as in their operationalization process, (4) participative dimension, (5) ascendance of management tools denoting a strong motivational component, (6) a systemic vision of the process of design, integration and implementation of management tools, (7) the spread of successful management tools between countries and organizations and (8)

professionalization of management and managers, including the use of management systems, methods and techniques.

In spite of their growing diversity and popularity within the business sector and the equal interest granted by academics, not equally is known on the use of management tools within the health care organizations, and mainly from a theoretical perspective (Bisbe & Barrubés, 2012; Casebeer, 1993; Swayne, Duncan, & Ginter, 2006; van Wijngaarden, Scholten, & van Wijk, 2012). There are also few studies approaching the particular aspects of management tools employed within the health sector from an empirical perspective, considering mostly only one specific tool, while an integrated perspective was not yet considered. Moreover, management tools' efficiency, effectiveness and potential impact they may have on health care organizations' performances and competitiveness have been approached to a small extent.Therefore, this paper aims to be the keystone of a broader research effort bringing together the two plans in which the research process was carried out in the previous stages (analysis of the particularities of the managerial tools (Popa, Ștefan, & Popescu, 2015; Ștefan, Popa, Dobrin, & Popescu, 2017) and the competitiveness (Ștefan, Popa, & Dobrin, 2016) of the health organizations), making the following step by investigating possible causal relationships between them.

Considering the above, we also assume that:

The use of managerial tools has a positive impact on health organizations' performance and level of competitiveness.

Complying with rigorous design and implementation methodologies enhance the positive impact of using managerial tools on the health organizations' performance and level of competitiveness.

2. METHODOLOGY

2.1. Research method and tool

From reasons related to the resources involved and geographical distribution of the study population, I have selected the online survey as method of data collection.

The questionnaire was designed to provide the amount, structure and quality of data required to reach the research objectives and test the research hypotheses. From the three sections, for the purpose of this paper were analyzed: (1) two questions designed to measure on a five Likert scale the intensity of usage and compliance with specific methodologies of 18 selected management tools, (2) three questions measuring respondents' perceptions on their organizations' (economic and managerial) performances and level of competitiveness and (3) demographic questions.The questionnaire was pilot-tested (Popa, Ștefan, & Popescu, 2015; Ștefan, Popa, Dobrin, & Popescu, 2017) on a sample including respondents from different fields of activity, the results obtained and feedback provided by respondents being useful insides for the final form design.

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2.2. Sampling and procedure

The sample selected for this research may be considered as representative at national level, both in terms of size, sampling method and structure, thus allowing the research results to be extrapolated. Moreover, the sample size calculation considered also the ratio of 5:1 or preferably 10:1 (Hair, Black, Babin, & Anderson, 2010) between the number of cases and variables involved, recommended for most of the multivariate procedures (i.e. Factor Analysis and Regression Analysis). Around 2850 invitations were sent via e-mail between March and April 2016, followed by a reminder after approximately six weeks. Considering the 654 returned questioners, the response rate of 22.947% was in the estimated range (Nulty, 2008). After importing the data into the SPSS database and preliminary data screening, it was found that 75 questionnaires contained a large amount of missing data. Therefore, the further analyses were based on 581 cases.The sample included both respondents with medical and non-medical professions, with a mean tenure of 10.023 years within organization and 9.304 years in managerial position. The sample's territorial distribution within the eight development regions follows the distribution of the research population ($\chi 2 = 10.713$, $p = 0.152$).

2.3.Data analysis

For the purpose of data analysis and test the research hypotheses, a three-step approach was considered:

- The first step - data screening, ensures the accuracy of the data, such that they may be appropriately used within subsequent statistical analyzes. In this respect, Tabachnick & Fidell (2001) recommend to be consider: accuracy of data entry in SPSS, missing data, outliers and testing the assumptions of the most multivariate analyzes.
- In the second step, by means of Principal Components Analysis (PCA), the variables to be used in the following step were defined: (1) dependent variables (Economic Performance, Managerial Performance and Competitiveness and (2) two sets of 18 independent variables corresponding to the extent to which the management systems, methods and techniques are used, and the extent to which they are used in accordance with specific methodologies. To minimize the unwanted multicollinearity effect, in the next step (both for dependent and independent variables) the scores resulted from PCA were considered.
- In the final step, to validate the research hypotheses, hierarchical multiple regression models were estimated by means of the least squares' method. Multiple regression may be defined as a statistical technique used to analyze the relationship between a dependent (explained, endogenous, predicted) variable and several independent variables (explanatory, exogenous, predictors). The linear multiple regression model may be estimated with the following equation (Hair, Black, Babin, & Anderson, 2010):

$$y_i = b_0 + b_1 x_{1i} + b_2 x_{2i} + \cdots + b_k x_{ki} + e_i \quad (1)$$

where: y_i is the dependent variable, b_0 denote the intercept, b_1, b_2, ..., b_k are each variable's coefficient to be estimated, x_1, x_2, ..., x_k denote the independent (exogenous) variables and e_i is the error term. The hierarchical multiple regression was chosen for its ability to control for the variability associated with factors not of main interest for the research (controls), but potentially influencing the dependent variables. Within this research, three controls were considered: (1) the type of health organization, namely hospitals in contrast to other types of organizations, (2) organizations' age and (3) organizations' size.

3. RESEARCH RESULTS

3.1. Descriptive statistics

In table 2 there are presented the mean values and standard deviations of the 18 variables measuring (on a 5-point Likert scale) the usage of considered management tools within Romanian health organizations. As one can see, the most popular tools are management by objectives (M = 3.2702, SD = 1.20672), the meeting (M = 3.1721, SD = 1.09291) and management by budgets (M = 2.8761, SD = 1.31508), while management by exceptions, benchmarking and Common Assessment Framework (CAF) seems to be considered in a very small extent. It also may be noticed that all tools are less used within hospitals compared with other types of health organizations.

TABLE 2 - MANAGEMENT TOOLS EMPLOYED WITHIN ROMANIAN HEALTH ORGANIZATIONS – DESCRIPTIVE STATISTICS

Management tools' usage	Type of health organizations				Total	
	Hospital		Others			
	M	SD	M	SD	M	SD
Management by objectives	2.9875	1.14482	3.8950	1.10304	3.2702	1.20672
Project management	2.2300	1.24538	2.3591	1.32005	2.2702	1.26938
Management by budgets	2.7125	1.29578	3.2376	1.28838	2.8761	1.31508
. Managementul by exceptions	1.3650	0.80523	1.5138	0.82736	1.4114	0.81440
Participative management	1.7525	1.13555	2.8066	1.41859	2.0809	1.32300
Delegation	2.5775	1.16722	3.0166	1.24041	2.7143	1.20671
Diagnostic analysis	2.1400	1.27651	3.1602	1.44982	2.4578	1.41313
SWOT analysis	2.1900	1.31080	2.9503	1.52489	2.4269	1.42402
Meeting	3.1450	1.07324	3.2320	1.13591	3.1721	1.09291
Dashboard	1.5025	1.01369	2.6188	1.49944	1.8503	1.29320
Benchmarking	1.1875	0.59433	1.4917	0.94056	1.2823	0.73309
Brainstorming	1.6300	1.06815	2.5746	1.50230	1.9243	1.29500
Business plan	1.8300	1.17454	3.1823	1.42006	2.2513	1.40278
Carrier plan	1.4250	0.92005	2.1105	1.33706	1.6386	1.11270
Job rotation	1.5050	0.98101	1.7845	1.07134	1.5921	1.01737
Total quality management	1.8750	1.22602	3.3702	1.51327	2.3408	1.49166
Lean Six Sigma	1.2300	0.69880	2.1878	1.36547	1.5284	1.05437
Common Assessment Framework	1.1000	0.42480	1.5193	0.91646	1.2306	0.65006

Source: computed by author with IBM SPSS Statistics 25.0. (IBM Corp., 2017)

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3.2. Testing research hypotheses

With respect to the first hypothesis, three regression models were estimated, introducing simultaneously all the independent variables into the model ("entry" method). As one may see in Table 3, the F-tests values and their associated probabilities are all significant at 0.001 level, demonstrating that at least one of the independent variables is significantly associated with the dependent variables.

That means that all the three models may be considered as valid ones. Moreover, the R2 coefficients' values denote that a consistent part of the variability of the predicted variables may be explained by the models. As explained above, the hierarchical regression approach allowed us to determine for each model the F-value change and their associated probabilities and the amount of variability explained by the interest variables (denoted by R2 change), beyond of that of controls.

In particular, considering the Economic performances, 28.8% of its variability may be explained by the usage of all the 18 management tools ($R^2_{v13\_PE}$ change $= 0.288$). Among them, project management, management by objectives, carrier plan, TQM, the meeting and business plan have a positive and significant influence, other three management tools have also a significant but negative influence, while nine of the considered management tools have no impact on the economic performances of health organizations within they are used.

For the second model, the R2 coefficient' value may be interpreted as meaning that approximately 30.00% of the variability of the dependent (Managerial performances) can be explained by the variability of the 18 independent variables measuring the usage of managerial tools ($R^2_{v14\_PM}$ change $= 0.300$). Of these, nine significantly and positively influence managerial performance: Management by objectives, Carrier plan, TQM, SWOT analysis, Meeting, Brainstorming, Lean Six Sigma, Diagnostic analysis and Business plan, tree have a significant influence but in the negative sense, while six of the managerial tools analyzed have no significant influence on health organizations managerial performances.

Within the third model, 28.3% of the variability of the Competitiveness can be explained by the variability of the usage intensity of all the 18 management tools.

Of these, project management, management by budgets, management by objectives, carrier plan, TQM, meeting, CAF, Lean Six Sigma, diagnostic analysis and business plan significantly and positively influence the level of competitiveness, one tool has a significant but negative impact, while six of the managerial tools analyzed have no significant influence on competitiveness of health organizations.

TABLE 3 – THE INFLUENCE OF MANAGERIAL TOOLS' USAGE ON HEALTH ORGANIZATIONS PERFORMANCES' AND COMPETITIVENESS

	Model 1		Model 2		Model 3	
Independent variables	**Dependent variables**					
	Economic performances		**Managerial performances**		**Competitiveness**	
	b	t	*b*	t	*b*	t
Controls						
Intercept	0.019	0.260	-0.329	-4.240	-0.017	-0.221
Hospital	**0.426*** **	**4.602**	**0.546*** **	**5.626**	**0.397*** **	**4.200**
Organization's age	**-0.009*** **	**-6.464**	0.001	0.618	**-0.007*** **	**-4.859**
Organization's size	-0.000	-.295	0.000	0.316	0.000	0.035
Management tools' usage						
Project management	**0.153*** **	**4.118**	0.012	0.313	**0.147*** **	**3.884**
Management by budgets	0.047	1.164	0.012	0.279	**0.095***	**2.293**
Management by exceptions	**-0.242*** **	**-5.973**	**-0.086***	**-2.023**	0.027	0.656
Participative management	**-0.150** **	**-2.927**	**-0.147***	**-2.726**	-0.099	-1.880
Management by objectives	**0.165*** **	**3.808**	**0.184*** **	**4.059**	**0.209*** **	**4.724**
Carrier plan	**0.100*** **	**2.839**	**0.128** **	**3.468**	**0.081***	**2.271**
TQM	**0.201*** **	**4.839**	**0.289*** **	**6.648**	**0.206*** **	**4.853**
Delegation	**-0.124*** **	**-3.647**	**-0.136*** **	**-3.824**	-0.063	-1.807
SWOT analysis	0.058	1.617	**0.107** **	**2.846**	0.033	0.893
Meeting	**0.156*** **	**4.349**	**0.094***	**2.501**	**0.204*** **	**5.540**
Job rotation	0.073	1.799	0.100*	2.356	0.056	1.350
Benchmarking	0.017	0.501	-0.056	-1.586	-0.062	-1.802
CAF	0.045	1.328	0.058	1.648	**0.110** **	**3.175**
Brainstorming	-0.012	-.300	**0.126** **	**3.072**	0.050	1.241
Lean Six Sigma	-0.011	-.286	**0.128** **	**3.239**	**0.111** **	**2.864**
Diagnostic analysis	0.045	1.207	**0.178*** **	**4.506**	**0.081***	**2.110**
Business plan	**0.129*** **	**3.215**	**0.269*** **	**6.423**	**0.198*** **	**4.838**
Dashboard	0.032	0.850	0.011	0.289	**-0.101** **	**-2.632**
R^2	0.446		0.335		0.407	
R^2 change	0.288		0.300		0.283	
F-value	19.919***		12.429***		18.645***	
F – value change	15.018***		13.012***		14.306***	

* p < 0.05, ** p < 0.01, *** p < 0.001.

Source: computed by author with IBM SPSS Statistics 25.0. (IBM Corp., 2017)

Synthesizing those presented above, we can state that: (1) the three regression models are valid and (2) most of the independent variables measuring the usage of managerial systems, methods and techniques have positively and statistically significant effects on the dependent variables. Therefore, the first hypothesis is partially validated in the sense that: the use of the most managerial tools within health organizations has a positive impact on their performances and level of competitiveness. Among them, employment of management by objectives, carrier plan, TQM, meeting and business plan within health organizations positively impact both on their performances and competitiveness. These results partly confirm those obtained during the pilot study (Popa, Ștefan, & Popescu, 2015; Ștefan, Popa, Dobrin, & Popescu, 2017) on a sample representing all areas of activity and employing a partially different methodology. On that occasion, a significant positive correlation could only be determined between the extent to which management by objectives is used and managerial performances (τb = 0.290, rs = 0.387), while all the other correlations were found statistically insignificant.

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There are also some unexpected results, consisting in the negative impact of some of the management tools on both health organizations' economic and managerial performances, respectively management by exceptions, participative management and delegation. These results are more surprisingly since both tools involve a significant participative component, meant to value the potential of organization's human capital in the decision-making process.

Although not covered by this paper, it is also worth mentioning the effect of control variables within each model. Thus, one can find (1) a significant and positive effect of the type of health organization, namely hospitals in contrast to other types of organizations, (2) a negative effect of organizations' age, in the sense that the younger organizations have higher levels of economic performances and competitiveness, while (3) the size of organizations seems to have no significant impact.

In order to determine which are the significant combinations of independent variables (predictors) to explain the variability of the three dependent variables, three Stepwise regression models have been estimated. This method of selecting variables implies that at each iteration the SPSS algorithm introduces / eliminates the variables in the model based on the contribution of each of them to explain the variability of the dependent variable. The statistical criterion for a variable to enter the model is that the probability associated with $F \leq 0.050$ and the criterion of removing a variable is the probability associated with $F \geq 0.100$. The algorithm ends when there are no other variables eligible for inclusion or removal (IBM, 2017).

Considering the three above models, after 11and respectively 12 iterations, beside the controls, most of the considered predictors were selected by the SPSS algorithm to be included into the stepwise regression models. Thus, the regression equations may be written as follows:

Economic performances = 0.021 + 0.422 * Hospital - 0.009 * Age + 0.178 * TQM + 0.179 * Project management + 0.207 * MBO - 0.219 * Management by exceptions - 0.145 * Delegation + 0.088 * Management by budgets + 0.140 * Meeting + 0.093 * Carrier plan - 0.100 * Participative management + 0.092 * Business plan (2)

Managerial performances = - 0.318 + 0.540 * Hospital + 0.196 * MBO + 0.279 * TQM + 0.223 * Business plan - 0.162 * Delegation + 0.151 * Diagnostic analysis + 0.13 * Carrier plan + 0.089 * SWOT analysis + 0.090 * Lean Six Sigma + 0.089 * Meeting - 0.077 * Benchmarking (3)

Competitiveness = - 0.002 + 0.368 * Hospital - 0.007 * Age + 0.251 * MBO + 0.179 * Project management + 0.147 * Management by budgets + 0.181 * Meeting + 0.164 * Business plan + 0.155 * TQM - 0.128 * Dashboard + 0.101 * CAF - 0.081 * Delegation - 0.078 * Benchmarking + 0.082 * Lean Six Sigma (4)

To determine which of the independent variables included in the models have the greatest importance in predicting the dependent variables, the standardized regression coefficients (β) were analyzed.

Although there are variables with negative influences in the model, we have only considered the highest positive ones since we want to identify the managerial tools through the operation of which might be determined positive outcomes in terms of health organizations' competitiveness and performance. Thus, for the three models, the best performing management tools are as follows (see table 4):

TABLE 4 – BEST PERFORMING MANAGEMENT TOOLS

	Model 1*	Model 2*	Model 3*
Rank	Dependent variables		
	Economic performances	Managerial performances	Competitiveness
1	MBO (β = 0.214)	TQM (β = 0.299)	MBO (β = 0.257)
2	Project management (β = 0.187)	Business plan (β = 0.235)	Project management (β = 0.185)
3	TQM (β = 0.183)	MBO (β = 0.211)	Meeting (β = 0.181)
4	Meeting (β = 0.142)	Diagnostic analysis (β = 0.163)	Business plan (β = 0.164)
5	Carrier plan (β = 0.95)	Carrier plan (β = 0.142)	TQM (β = 0.158)
6	Business plan (β = 0.092)	SWOT analysis (β = 0.097)	CAF (β = 0.102)
7	Management by budgets (β = 0.091)	Lean Six Sigma (β = 0.096)	Lean Six Sigma (β = 0.084)
8	-	Meeting (β = 0.094)	-

Source: computed by author with IBM SPSS Statistics 25.0. (IBM Corp., 2017)

As one can see in Eq. 2-4 and table 4, MBO, TQM, meeting and business plan may be considered as the best performing management tool since they positively influence both health organizations' performances and competitiveness, delegation have a negative impact, while the effect of the other management tools is different for each considered outcome.

To test for the second hypothesis, three sets of 18 separate hierarchical models were build and on each of them, the significance of interaction effects was tested.

As suggested by Hitt et al. (2000), a significant interaction effect indicates that the impact of usage of that particular managerial tool on organizations' performances and competitiveness is moderated by the compliance with their specific methodologies. In table 5 there are presented the t-statistics for each of the considered management tools, denoting the significant interaction effects of complying with rigorous design and implementation methodologies on the relationships of the usage of each managerial tool on the health organizations' performance and level of competitiveness.

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TABLE 5 – THE INTERACTION EFFECTS OF COMPLYING WITH SPECIFIC METHODOLOGIES

Independent variables	Dependent variables		
	Economic performances	Managerial performances	Competitiveness
Project management	0.452	0.227	0.242
Management by budgets	**2.205***	-0.161	1.405
Management by exceptions	-0.025	1.542	**2.654****
Participative management	-1.113	0.481	-1.734
Management by objectives	**6.101*****	**7.718*****	**5.898*****
Carrier plan	0.816	0.794	0.953
TQM	-0.970	-0.447	-1.958
Delegation	**3.457****	**5.501*****	**4.551*****
SWOT analysis	0.171	-1.527	-0.123
Meeting	**7.272*****	**7.331*****	**3.450*****
Job rotation	-0.405	0.026	1.384
Benchmarking	**1.973***	**2.000***	-0.721
CAF	1.800	0.152	1.206
Brainstorming	-0.053	0.522	**2.070***
Lean Six Sigma	**-2.383***	**-2.879***	-0.575
Diagnostic analysis	-1.469	0.638	**-2.175***
Business plan	-1.872	**-2.424***	-1.320
Dashboard	-1.192	**-2.757****	0.826

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Source: computed by author with IBM SPSS Statistics 25.0. (IBM Corp., 2017)

As one may notice, the strongest positive interaction effects are those of the compliance of the specific methodology of the most popular management tools (i.e. MBO, meeting and delegation), while the other interaction effects are different for each model. Considering that the compliance of the specific methodology was subjectively reported by respondents, it is reasonable to conclude that it depends on the managers' level of knowledge and experience, therefore, on the actual level of past and present usage of each management tool (Nedelko, Potocan, & Dabic, 2015).

Those results also confirm most of those of the pilot study (Popa, Ștefan, & Popescu, 2015) (Ștefan, Popa, Dobrin, & Popescu, 2017), respectively a significant positive correlation between the compliance with the specific methodologies of management by objectives ($\tau b = 0.427$, $p < 0.01$; $rs = 0.587$, $p < 0.01$), meeting ($\tau b = 0.401$, $p < 0.01$; $rs = 0.542$, $p < 0.01$) and diagnostic analysis ($\tau b = 0.238$, $p < 0.05$; $rs = 0.331$, $p < 0.05$) and managerial performances. As concern delegation, the correlation was also significant and positive ($\tau b = 0.166$, $p < 0.05$; $rs = 0.242$, $p < 0.05$) as opposed to the results of this study.

4.CONCLUSIONS

4.1. Main findings

In order to be able to use the management tools to their full potential, managers should equally consider their potential benefits and positive effects, but also be aware of the possible disadvantages and limitations. Furthermore, in selection of the most appropriate management tools to use, multiple factors are to be

considered: (1) personal and professional factors (e.g. managers' level of knowledge and experience with each specific tool), (2) situational factors (e.g. the concrete situation they facing, integration into the overall management system) and (3) organizational factors (e.g. type of organizational structure, organization's age and size, domain of activity). Moreover, once the most appropriate management tools were selected, their implementation methodologies may make the difference on their efficiency and potential impact on performances.

4.2. Theoretical and managerial implications

On a theoretical level there is a rich literature that argues the significant (direct and indirect) impact that the use of management tools exerts on the efficiency, effectiveness and performance of management and, consequently, on the efficiency, effectiveness, performance and competitiveness of the organization, as a whole. However, there is still an unmet need in terms of empirical research. Thus, the purpose of this paper is to provide empirical evidences to support the theoretical approaches on the influence of management tools on the health organizations' performance and competitiveness, thus contributed to the understanding of the analyzed phenomena, constituting the information support for knowledge development and support the process of methodologization and professionalization of Romanian organizations' management, in particular, health organizations.

At the same time, the results obtained may be the support for new research directions, e.g.: the causal relationship between: (1) the extent to which management systems, methods and techniques are effectively used in managerial practice, (2) the level of competitiveness of health organizations, (3) the extent to which their design and implementation methodologies are known by health care managers, and (4) the extent to which they are aware of the need to deepen their knowledge in this area.

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