OPM3® Portugal Project – Information Systems and Technologies Organizations – Outcome Analysis

David Silva[1], Anabela Tereso[1], Gabriela Fernandes[1],
Isabel Loureiro[1], and José Ângelo Pinto[2]

[1] Department of Production and Systems Engineering,
Algoritmi Centre, University of Minho, 4800-058 Guimarães, Portugal
[2] Ambithus, 1600-546 Lisboa, Portugal
davidrenatosilva@gmail.com,
{anabelat,g.fernandes,ifloureiro}@dps.uminho.pt,
jose.pinto@ambithus.com

Abstract. Increasing the maturity in Project Management (PM) has become a goal for many organizations, leading them to adopt maturity models to assess the current state of its PM practices and compare them with the best practices in the industry where the organization is inserted. One of the main PM maturity models is the Organizational Project Management Maturity Model (OPM3®), developed by the Project Management Institute. This paper presents the Information Systems and Technologies organizations outcome analysis, of the assesses made by the OPM3® Portugal Project, identifying the PM processes that are "best" implemented in this particular industry and those in which it is urgent to improve. Additionally, a comparison between the different organizations' size analyzed is presented.

Keywords: Project Management, OPM3®, Maturity Models, Best Practices, Processes.

1   Introduction

Over the years, all kinds of organizations have attempted to define with precision their goals and objectives for short and long term and at the same time project strategies to achieve them. However, very often the strategies outlined do not allow to reach the results for which they were designed [1]. In order to address this problem, Project Management (PM) emerged as a powerful management solution, which is increasingly popular in several industries [2], as the Information Systems and Technologies (IST) industry.

The concept of maturity, when applied to organizations, might refer to a state where organizations are in a perfect condition to achieve their objectives. Project maturity would then mean that organizations are perfectly conditioned to deal with their projects [3]. To improve their PM maturity, organizations need to obtain a total control and measurability of their PM processes, using maturity models to test and compare their current performance against Best Practices (BP) [4, 5]. One of these

models is the Organizational Project Management Maturity Model (OPM3®), proposed by the Project Management Institute (PMI), that joins together not only the standards for managing projects, programs and portfolios, but also the necessary organizational conditions that enable organizational PM to function efficiently and effectively [6].

The main goal of this paper is to perform an analysis of the state of IST Portuguese organizations maturity in the adoption of project management practices, and present PM and Portfolio Management processes, and Organizational Enablers (OE) areas that are "best" implemented by these organizations, identifying for each process and area if there are statistically significant differences between different organizations' size. First the main characteristics of the OPM3® model are explained. Next the OPM3® Portugal Project and the research methodology used are presented. Then the results obtained for the IST organizations are exhibited and discussed. Finally, the main findings that emerged from this study are presented, as well as suggestions for future research.

2   OPM3® Model

OPM3® is a model that helps organizations to develop capabilities that underpin the management processes of all their projects, connecting them with the corporate strategy. PMI released the first edition of OPM3® in 2003 [7]. In 2008, the model has been updated with the publication of the second edition [8] and in 2013 the third and latest edition was published [9].

One of the main characteristics of OPM3® is the assessment of PM maturity, through the existence of a standardized set of BP [10]. According to PMI [9 p.238], BP *"refer to the methods, currently recognized within a given industry or discipline, to achieve a stated goal or objective"*. In OPM3® context, each BP is dependent on a set of Capabilities (specific competency that must exist in an organization to perform PM processes and deliver PM products and services) that need to be developed for a BP to be recognized as implemented [9, 10]. The existence of a Capability is demonstrated by the existence of one or more Outcomes, which are tangible or intangible results of performing a Capability [9, 10].

One of the main differences of the OPM3® compared to other maturity models is the fact that it is a multidimensional model, being possible to determine the maturity of an organization under different perspectives [11]. One of these perspectives is the exhibition of BP and respective Capabilities through the progression in four stages of processes maturity: Standardize, Measure, Control and continuously Improve (SMCI). Another perspective is associated with the progression of the BP and respective Capabilities within three domains: PM, Program Management (set of projects with common goal) and Portfolio Management (group of projects and/or programs and operational activities which share common resources). In addition to these two dimensions, OPM3® incorporates the five PM process groups (Initiating, Planning, Executing, Monitoring and Controlling, and Closing), designated by the PMBoK

Guide®, and identifies the Capabilities and the BP regarding its association with these five processes [9, 11, 12].

There is also another BP category in OPM3®, the OE. The OE are *"practices that can be leveraged to support the implementation of Best Practices in portfolios, programs, and projects in support of strategic goals"* [9 p.240]. The presence of an OE indicates that an organization has matured to the point of establishing a stable organizational PM practice environment and has adopted the disciplines of project, program and portfolio management, to achieve this [9].

In summary, OPM3® was created for organizations of any size, geographical location or sector of activity, which aim to identify the maturity in the management of their projects, programs, portfolios, and the practices established by their project managers, possessing a set of BP as a basis of comparison, recognized and accepted throughout the world [11].

3   OPM3® Portugal Project and Research Methodology

Ambithus, a Portuguese organization of PM consulting, training, research and development, settled the OPM3® Portugal Project. This project seeks to perform a comprehensive analysis of the state of Portuguese industry with regard to the degree of maturity in the adoption of project, program, and portfolio management methodology. The project was chartered because of the need felt by the organization and other project initiators and mentors to improve the way Portuguese industries initiate, choose, manage, control and close their projects. The understanding of this need was very helpful to taking the proper actions and taking advantage of an established funding system for research incentives for these kinds of projects, supported by the European Union Government but managed by the state authorities. The main objective of the project is to evaluate 100 organizations, from various sectors of activity, and perform an analysis of organizational PM maturity, presenting an improvement plan for each sector of activity.

The project started in 2011, was financed by European Union research founding, which means that the individual results for each participating organization – the assessment of PM maturity and the Improvement Plan – did not represent a cost for the participating organizations [13].

OPM3® Portugal Project is based on the second edition of the OPM3® model, which is aligned with the fourth edition of PMBoK Guide® and with the second edition of The Standard of Program Management and The Standard for Portfolio Management, because at the OPM3® Portugal Project starting date, these were the latest versions of the standards.

This project is following an approach divided into four steps: Planning and Organizing, Company Assessment, Sectorial Assessment and Country Level Assessment. In the first step, all generic procedures, management structures and control processes were defined for the project, as well as more detailed planning activities and processes [14]. In addition, it was created a management information system, designed by Ambithus researchers with the contribution of the academic

partners, for the organizations' assessment work and data analysis. This information system is complementary with PMI's OPM3® ProductSuite (the information system certified by PMI) and overcomes some of its limitations, such as, it can be only used by OPM3® certified consultants, or only allowing the introduction of the overall result of the organization for each OPM3® question, instead of the response of each person interviewed [14].

The second step begins with the signing of a cooperation protocol, between the organization that will be assessed and Ambithus. The initial process of intervention includes meetings and a series of interviews with different people from different roles within the organization. Being concluded this phase, data gathering was accomplished to assess the current maturity of organizations in PM. Two documents are produced: the Assessment Report and the Improvement Plan. In the first one, the organization maturity results in PM are expressed in several ways, such as the overall maturity or the relative maturity by BP category (Project, Program, and Portfolio Management and OE) and SMCI stages. The Improvement Plan intends to give the organizations an indication of the path to increase their maturity.

The third step is related to the Sectorial Assessment. The results of the various assessments performed in the organizations are summarized to create measures of sectorial capacity in PM. After the analysis and validation of the obtained results, an Improvement Plan for the industry sector will be presented and discussed [14].

In the final step, the results of the sectorial assessments will be compared, to identify areas of strengths and weaknesses, and the final result in each sector will be used to create general indicators on the Portugal's country capacity in PM [14].

In summary, this project will create several benefits for the Portuguese organizations, such as identify the BP that can support the organizational strategy for the implementation of projects with success and identify specific Capabilities that can give rise to BP for the organization [14].

Currently OPM3® Portugal Project is in the second step, Company Assessment. This paper analyses the interim results of this project. In July 2014, thirty three organizations have already fully concluded their assessment in OPM3® Portugal Project, which means that a presentation and validation of their Improvement Plans were already presented to each organization assessed [15]. From these thirty three organizations, eighteen are from IST, and this paper focus on the results obtained from these eighteen IST organizations.

In step two of the OPM3® Portugal Project execution, the OPM3® consultants collected information about the organizations namely, the Industry Type, the Annual Turnover and the Number of Employees. In order to classify the eighteen organizations according to their organizational size, European Commission criteria were used [16]. The organizations can be classified as Micro, Small, Medium and Large. This classification takes into account the framework of each organization within the limits of the following criteria:

- Number of permanent Employees of the organization.
- Annual Turnover or Annual Balance Sheet Total.

Table 1 shows the limits for the organizations size classification.

Table 1. European Commission recommendations for the size of organizations

Organization Category	Number of Organizations Assessed	Number of Employees	Annual Turnover	Annual Balance Sheet Total
Large	4	≥ 250	> €50 million	or > €43 million
Medium	8	< 250	≤ €50 million	or ≤ €43 million
Small	6	< 50	≤ €10 million	or ≤ €10 million
Micro	0	< 10	≤ €2 million	or ≤ €2 million

In the OPM3® Portugal Project assessments, the organization's annual balance sheet was not collected. This lack of information was not a limitation to classify the organizations, since the analysis of the number of employees and the annual turnover was consensual to categorize the eighteen organizations.

A descriptive analysis was performed with the Statistical Product and Service Solutions (SPSS) [17] in order to categorize the organizations according to their size. Afterwards, an identification of the PM and Portfolio Management processes, and OE areas that are "best" implemented and those that are urgent to improve, regarding organizations' size, was made. Finally, to test whether there was a relation between the organization size and the use of the identified processes, a non-parametric analysis was conducted.

4   Results Analysis

Tables 2, 3 and 4 present, for the IST organizations assessed in the OPM3® Portugal Project, the average percentage and ranking of PM and Portfolio Management processes and OE areas, organized by size. The Program Management processes were excluded from the data analysis as the organizations under study did not present processes for programs different than those they have for projects. Results of the top five processes or areas per organization size are highlighted in bold and grey in the three tables.

Table 2 shows that on average, *Process Ownership* is the process with the higher percentage of implementation. Notice that it appears in first position in the Large and Small size organizations and in second position in Medium size. The processes *Monitor and Control Project Work, Conduct Procurements, Collect Requirements* and *Define Activities*, are also present in the overall top five. In addition, the other processes that appear in the top five should also be stressed: *Perform Integrated Change Control* and *Report Performance* in Large organizations, *Distribute Information* and *Control Schedule* in Medium organizations and *Develop Project Management Plan* and *Define Scope* in Small organizations.

The five PM processes with lower average percentage of implementation are related to Risk Management. Furthermore, it should be noted that for Small IST organizations, the five processes with a lower average of implementation present the value zero, which means that these processes are not simply implemented in any Small organization!

Comparing the three different organizations size, clearly Large organizations were those who obtained better results in PM processes, with averages above 87% in the

five processes with higher average of implementation, and above 7% in the five processes with lower average of implementation. On the contrary, Small organizations obtained the lowest results for PM processes, with only three processes with averages above 50% and with six processes with average of 0%.

Table 2. Average percentage and ranking of PM processes

Project Management Processes	All		Large		Medium		Small	
	Average (%)	R.	Average (%)	R.	Average (%)	R.	Average (%)	R.
Process Ownership	82.50	1	98.75	1	73.75	2	83.33	1
Develop Project Charter	44.78	15	69.50	17	33.50	25	43.33	7
Identify Stakeholders	23.95	31	37.50	30	22.63	34	16.67	22
Develop Project Management Plan	46.61	13	47.75	27	44.25	19	49.00	4
Collect Requirements	57.56	4	88.75	3	48.75	14	48.50	6
Define Scope	56.33	7	73.75	11	50.63	12	52.33	3
Create Work Breakdown Structure	32.83	26	63.75	21	42.00	21	0.00	38
Define Activities	57.06	5	66.50	19	79.13	1	21.33	17
Sequence Activities	45.66	14	65.50	20	45.62	17	32.50	13
Estimate Activity Resources	52.17	10	72.50	14	59.13	6	29.33	14
Estimate Activity Durations	49.11	11	73.25	12	58.63	7	20.33	19
Develop Schedule	44.33	17	70.25	15	53.13	11	15.33	23
Estimate Costs	43.00	18	54.25	24	43.75	20	34.50	12
Determine Budget	31.50	27	56.75	23	31.50	27	14.67	26
Plan Quality	18.44	37	40.50	29	21.25	37	0.00	39
Develop Human Resource Plan	25.17	30	7.25	43	37.50	23	20.67	18
Plan Communications	26.94	28	35.75	31	31.37	28	15.17	24
Plan Risk Management	14.56	39	28.00	34	14.88	39	5.17	33
Identify Risks	18.89	36	30.50	33	22.50	35	6.33	31
Perform Qualitative Risk Analysis	9.95	40	28.00	35	8.38	41	0.00	40
Perform Quantitative Risk Analysis	9.11	41	25.00	36	8.00	43	0.00	41
Plan Risk Responses	8.44	43	10.50	42	13.75	40	0.00	42
Plan Procurements	40.61	20	72.75	13	35.75	24	25.67	15
Direct and Manage Project Execution	40.45	21	82.25	6	30.63	29	25.67	16
Perform Quality Assurance	19.11	35	32.75	32	22.75	33	5.17	34
Acquire Project Team	33.17	25	22.50	39	50.50	13	17.17	21
Develop Project Team	16.67	38	19.75	41	20.50	38	9.50	29
Manage Project Team	21.33	32	22.00	40	25.75	31	15.00	25
Distribute Information	56.72	6	68.00	18	61.50	5	42.83	8
Manage Stakeholder Expectations	19.61	34	24.25	37	27.25	30	6.33	32
Conduct Procurements	58.22	3	78.50	7	55.25	8	48.67	5
Monitor and Control Project Work	68.95	2	91.25	2	63.38	4	61.50	2
Perform Integrated Change Control	47.50	12	88.75	4	47.38	16	20.17	20
Verify Scope	33.89	24	59.50	22	39.00	22	10.00	28
Control Scope	26.56	29	50.75	26	32.88	26	2.00	37
Control Schedule	44.61	16	52.50	25	69.13	3	6.67	30
Control Costs	42.50	19	77.50	8	48.00	15	11.83	27
Perform Quality Control	21.17	33	44.00	28	23.25	32	3.17	35
Report Performance	40.06	22	87.50	5	44.63	18	2.33	36
Monitor and Control Risks	9.11	42	24.25	38	8.38	42	0.00	43
Administer Procurements	55.11	8	76.75	10	54.13	9	42.00	9
Close Project or Phase	38.39	23	70.25	16	22.13	36	38.83	10
Close Procurements	52.89	9	77.50	9	54.13	10	34.83	11
Number of organizations assessed =	18		4		8		6	

Table 3 shows the results for Portfolio Management per organization size. *Process Ownership*, as in PM processes, is the process that most stands out because it occupies the first position for all types of organization sizes. It should also be stressed that the processes involving the components of portfolios (projects and programs) namely *Authorize Components*, *Identify Components*, *Categorize Components*, *Prioritize Components*, *Evaluate Components* and *Select Components*, in one way or another are presented in the top five of the three organization sizes, although their overall averages are low (below 18%).

Again, the lower results of the portfolio processes are related to Risk Management, which is consistent with the results observed in projects, and all organization sizes have their five processes with average of implementation equal or very close to zero.

Comparing the organizations size, once again, Large organizations are the ones that appear to have greater maturity in Portfolio Management, because they present a set of processes with averages of implementation relatively high (if compared with Medium and Small organizations) and very close to each other.

Table 4 shows the seventeen OE areas that best facilitate the implementation of PM practices. It is possible to observe that *Sponsorship* received the best global ranking and the first position in the top five for Medium and Small organizations. *Strategic Alignment, Organizational Project Management Policy & Vision, Project Management Training* and *Organizational Project Management Practices* are also present in the overall top five. *Organizational Project Management Communities, Benchmarking* and *Project Management Metrics* obtained the lower results.

Table 3. Average percentage and ranking of Portfolio Management processes

Portfolio Management Processes	All		Large		Medium		Small	
	Average (%)	R.	Average (%)	R.	Average (%)	R.	Average (%)	R.
Process Ownership	53.50	1	60.50	1	36.83	1	75.00	1
Identify Components	10.75	5	51.50	3	2.83	8	2.25	4
Categorize Components	9.92	6	49.00	4	3.50	7	0.00	8
Evaluate Components	6.17	7	12.00	8	8.00	5	0.50	6
Select Components	2.42	10	8.50	10	2.00	9	0.00	9
Prioritize Components	15.08	4	41.50	6	16.33	4	0.00	10
Balance Portfolio	4.33	8	6.00	11	4.33	6	3.50	2
Communicate Portfolio Adjustment	2.42	11	12.00	9	0.00	11	1.25	5
Authorize Components	18.00	2	53.50	2	17.83	2	0.50	7
Identify Portfolio Risks	0.17	12	1.00	12	0.00	12	0.00	11
Analyse Portfolio Risks	0.17	13	1.00	13	0.00	13	0.00	12
Develop Portfolio Risk Responses	0.00	15	0.00	15	0.00	14	0.00	13
Review and Report Portfolio Performance	16.50	3	49.00	5	16.67	3	0.00	14
Monitor Business Strategy Changes	4.17	9	15.50	7	1.17	10	3.00	3
Monitor and Control Portfolio Risks	0.17	14	1.00	14	0.00	15	0.00	15
Number of organizations assessed =	12		2		6		4	

Globally the Large IST organizations obtained the "best" results in OE areas, which was expected because it was the organization size with "best" results in PM and Portfolio Management processes.

Table 4. Average percentage and ranking of OE areas

Organizational Enablers Areas	All		Large		Medium		Small	
	Average (%)	R.	Average (%)	R.	Average (%)	R.	Average (%)	R.
Organizational Project Management Policy & Vision	54.28	**3**	68.50	**4**	57.13	**4**	41.00	**5**
Strategic Alignment	61.00	**2**	82.25	**1**	64.63	**3**	42.00	**3**
Resource Allocation	51.22	6	56.75	13	55.50	6	41.83	**4**
Management Systems	46.83	9	67.25	6	44.25	12	36.67	7
Sponsorship	67.89	**1**	67.50	**5**	68.38	**1**	67.50	**1**
Organizational Structures	47.94	7	71.25	**3**	55.00	7	23.00	10
Competency Management	41.83	10	62.75	8	40.25	13	30.00	8
Individual Performance Appraisals	39.33	13	48.00	15	48.88	8	20.83	11
Project Management Training	53.39	**4**	76.75	**2**	67.13	**2**	19.50	12
Organizational Project Management Communities	25.50	17	40.50	17	34.63	14	3.33	17
Organizational Project Management Practices	51.83	**5**	61.50	9	56.87	**5**	38.67	6
Organizational Project Management Methodology	39.95	11	66.75	7	44.88	11	15.50	15
Organizational Project Management Techniques	47.67	8	57.25	12	47.00	9	42.17	**2**
Project Management Metrics	26.89	15	59.75	11	22.87	16	10.33	16
Project Success Criteria	32.28	14	54.00	14	32.13	15	18.00	13
Benchmarking	26.89	16	60.75	10	17.63	17	16.67	14
Knowledge Management and PMIS	39.50	12	47.50	16	46.75	10	24.50	9
Number of organizations assessed =	18		4		8		6	

In order to test if the organization size has influence on the implementation of processes, the non-parametric Kruskal-Wallis test was used. A pairwise comparison was made. When the null hypothesis of Kruskal-Wallis was rejected ($p < 0.05$) [18] the LSD (Least Significant Difference) Fisher was used to identify the sample which had the stochastically dominate size (Table 5). Positive differences were identified with a (+), meaning that a certain size has an average significantly higher than other size. Negative differences were identified with a (-), meaning the opposite. When no statistically significant differences were observed then the cells were left in blank.

Results showed that Large organizations have positive differences compared to Small organizations in all PM processes. When compared to the Medium organizations, only three of the seven processes have positive differences. Medium organizations show positive differences compared to Small organizations in five of the seven processes. The results suggest that the maturity of the implementation of the processes signalled in Table 5 is dependent of the IST organizations' size.

Regarding the analysis of the Portfolio Management processes, and based on the results presented on Table 5, Large organizations show positive differences compared to Medium and Small organizations. Thus, it seems that as in PM processes, the Large organizations are the ones that present a greater maturity in the implementation of Portfolio Management processes.

In OE areas, Large organizations show positive differences in the five areas when compared to Small organizations. Medium organizations show positive differences only in the *Organizational Structures* when compared to Small organizations. Curiously, for OE areas, there are no statistically significant differences between Large and Medium organizations, unlike PM and Portfolio Management processes.

Table 5. Summary of statistically significant differences, between organization sizes, for PM and Portfolio Management processes and OE areas

Project Management Processes		Large	Medium	Small
Create Work Breakdown Structure	Large			+
	Medium			+
	Small	-	-	
Develop Schedule	Large			+
	Medium			+
	Small	-	-	
Direct and Manage Project Execution	Large		+	+
	Medium	-		
	Small	-		
Perform Integrated Change Control	Large		+	+
	Medium	-		
	Small	-		
Control Schedule	Large			+
	Medium			+
	Small	-	-	
Control Costs	Large			+
	Medium			+
	Small	-	-	
Report Performance	Large		+	+
	Medium	-		+
	Small	-	-	
Portfolio Management Processes		**Large**	**Medium**	**Small**
Categorize Components	Large		+	+
	Medium	-		
	Small	-		
Communicate Portfolio Adjustment	Large		+	+
	Medium	-		
	Small	-		
Organizational Enablers Areas		**Large**	**Medium**	**Small**
Organizational Project Management Policy & Vision	Large			+
	Medium			
	Small	-		
Strategic Alignment	Large			+
	Medium			
	Small	-		
Organizational Structures	Large			+
	Medium			+
	Small	-	-	
Competency Management	Large			+
	Medium			
	Small	-		
Organizational Project Management Methodology	Large			+
	Medium			
	Small	-		

5   Conclusions and Future Research

The main objectives of this study were to examine the state of PM maturity of IST Portuguese organizations, and also to identify and compare the PM and Portfolio Management processes and OE areas, for different organization sizes.

An important limitation of this study was the sample size. Indeed, only eighteen organizations were analysed making hard the discussion of the results and not allowing the generalization to other IST organizations. However, results may be used as a guide, for the IST organizations. That is, according to their size, organizations can have an idea of which of the PM and Portfolio Management processes and OE areas are mostly implemented. This knowledge can help organizations to improve their PM maturity.

Large IST organizations stand out from Medium and Small organizations, since they globally presented the best results. Deepening in the results, there are positive differences for Small organizations in 7 PM processes (*Create Work Breakdown Structure, Develop Schedule, Direct and Manage Project Execution, Perform Integrated Change Control, Control Schedule, Control Costs* and *Report Performance*), 2 Portfolio Management processes (*Categorize Components* and *Communicate Portfolio Adjustment*) and 5 OE areas (*Organizational Project Management Policy & Vision, Strategic Alignment, Organizational Structures, Competency Management* and *Organizational Project Management Methodology*). Regarding the Medium organizations, the differences observed are related to 3 PM processes (*Direct and Manage Project Execution, Perform Integrated Change Control* and *Report Performance*) and 2 Portfolio Management processes (*Categorize Components* and *Communicate Portfolio Adjustment*). Therefore, the referred processes are those that effectively differentiate the Large IST organizations, from Medium and Small sizes. Despite these processes and areas are not the most implemented in the eighteen organizations, they allow Large organizations to be more mature than the others.

Being a pioneer study in this area in the world, it is not possible to compare the results and conclude whether these Portuguese organizations present a good or bad PM maturity. Taking into account the results, we can only conclude that there is a significant opportunity to improve the implementation of PM practices in IST Portuguese organizations. For future work, it would be interesting, in parallel with a more representative study of the population, i.e., using a larger sample, to create a model that would simplify the selection of priority PM practices to be implemented by the different types of organization, serving as a benchmarking tool.

References

1. Demir, C., Kocabas, I.: Project Management Maturity Model (PMMM) in educational organizations. In: World Conference on Learning, Teaching and Administration Papers, vol. 9 (2010)
2. Shi, Q.: Rethinking the implementation of project management: A Value Adding Path Map approach. International Journal of Project Managemen 29(3), 295–302 (2011)

3. Andersen, E.S., Jessen, S.A.: Project maturity in organisations. International Journal of Project Management 21(6), 457–461 (2003)
4. Jugdev, K., Thomas, J.: Project management maturity models: The silver bullets of competitive advantage. Project Management Journal (2002)
5. Pazderka, M., Grechenig, T.: Project Management Maturity Models: Towards Best Practices for Virtual Teams. In: 2007 IEEE International Engineering Management Conference, Lost Pines, TX, pp. 83–88 (2007)
6. Schlichter, J., Tamimi, A., Cooke-Davies, T.J.: Linking Project Management Practice to Organizational Strategy in a Saudi Arabian Government Department. In: PMI Global Congress Proceedings, Orlando, Florida (2009)
7. Cooke-Davies, T.J., Schlichter, J., Bredillet, C.: Beyond the PMBOK guide. In: Proceedings of the 32nd Annual Project Management Institute 2001 Seminars and Symposium, Nashville, TN (2001)
8. Berssaneti, F.T., Carvalho, M.M.: Impacto dos modelos de referência e maturidade no gerenciamento de projetos: estudo exploratório em projetos de tecnologia da informação. Production 22(3), 404–435 (2012)
9. PMI: Organizational Project Management Maturity Model (OPM3) - Third Edition. Knowledge Foundation. Project Management Institute, Inc. Pennsylvania - USA (2013)
10. Lima, R.R., Anselmo, J.L.: Gerenciamento de Projetos com OPM3™: O caso Promon. In: PMI Global Congress Proceedings, Buenos Aires, Argentina (2004)
11. Jia, G., Cao, L., Chen, J., Zhou, S., Wang, J.: Application of Organizational Project Management Maturity Model (OPM3) to Construction in China: An Empirical Study. In: Proceedings of the International Conference on Information Management, Innovation Management and Industrial Engineering, Taiwan (2008)
12. Zaguir, N.A., Martins, M.R.: Revisão Critica do OPM3: um estudo de redundâncias. Revista Gestão Industrial 3(1) (2007)
13. Pinto, J.A.: 100 Organizational Improvements using OPM3®. In: 2013 PMI Global Congress Proceedings, New Orleans, Louisiana – USA (2013)
14. Pinto, J.A., Williams, N.: Country Project Management Maturity. In: 2013 PMI Global Congress Proceedings, Istanbul, Turkey (2013)
15. Silva, D., Tereso, A., Fernandes, G., Pinto, J.A.: OPM3® Portugal Project: Analysis of Preliminary Results. Procedia Technology 16, 1027–1036 (2014)
16. EC: Annual Report on European SMEs 2012/2013 (2013)
17. IBM: IBM SPSS Statistics for Windows. IBM Corp. Armonk, NY (2013)
18. Field, A.: Discovering statistics using SPSS. SAGE, Los Angeles (2009)