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INFORMATION MODELING OF BEHAVIORAL PROJECT MANAGEMENT COMPETENCIES

Abstract. The application of project management practices in contemporary business is continuously increasing with the aim of delivering the work packages in a more cost-conscious and controlled way while making the best use of limited human resources to meet customer requirements and create competitive advantage. In order to be considered competent, individuals working in the field should demonstrate a certain level of knowledge, skills, and abilities – assessed, developed or improved through a certification system. Taking into account the importance of information modeling and technology in the domain of project management as a set of practices that determine structure, lifecycle and accessibility requirements of information and the emphasis placed on the behavioral competencies of project, program and portfolio managers, the authors of the paper focused on exploring the challenges and specificities of the project management profession in Croatia. Empirical research was conducted in two steps. Firstly, a qualitative research was done using in-depth interviews with a member of the editorial board of a new project management international certification standard and two representatives of the certification body in Croatia: the director and the assessor. The collected data were analyzed using grounded theory approach and results in four main areas were obtained: project management and certification challenges, addressing certification body needs, the missing link between educational institutions and project management in practice and key project management competencies. In the next step, a quantitative research with a questionnaire as a research instrument was conducted among 53 certified project, program and portfolio managers in Croatia regarding their perception of the importance of the behavioral project management competencies. The results show that the majority of the certified experts in the field consider "leadership" to be the most important behavioral project management competency, closely followed by teamwork and self-management, while relations and engagement, conflict and crisis as well as negotiation and resourcefulness are considered to be of the least importance for conducting the project, program, and portfolio successfully. Statistically significant differences in assigning importance to various project management competencies were revealed with regard to several respondents' independent characteristics.

Keywords: competency; information modeling; behavioral competencies; certification; project management; program management; portfolio management.

1. INTRODUCTION

General statement of the problem. Numerous contemporary companies adopt project management practices in order to integrate, plan and control schedule-intensive, unique endeavors and to make the best use of their limited human resources to meet the customer needs faster and better than the competition [1]. However, project-based organizations are characterized by short-term interactions and this context appears to be particularly challenging for the individuals responsible for managing performance as they should be able to “get things done” through a large and diverse set of people, despite having little direct control over most of them [2]. Therefore, in order to be considered competent in the field, the individual has to demonstrate a certain level of knowledge (information and experience), skills (technical capabilities to perform a task) and ability

(effective delivery of knowledge and skills within a certain context) in three different areas: perspective, people and practice [3]. Also, since the excessively rapid environment requires constant interaction between various stakeholders for the delivery of successful projects, the focus of this paper will be on behavioral competencies including both personal and societal aspects.

Analysis of recent researches and publications. The last four to five decades have seen a rise in the use of project management in various industries as a reaction to increasing modes of employment flexibility and accountability [4]. And while project and organizational variables are important, individual factors are still critical [5] in achieving project success and those primarily refer to project managers, i.e. their knowledge, skills, and abilities.

The project manager's role is one of the most challenging jobs in any organization because it requires a broad understanding of the various areas that must be coordinated and therefore a project manager has to possess a wide specter of competencies [5] [6]. While many conceptualizations do exist in literature, competencies can more narrowly be understood as having components that include knowledge, skills, and abilities (KSA model) used to improve performance [3] [7] [8].

The skill sets required for success in the workplace have changed dramatically in the past few years [9]. Today's competitive global market and changing work environment demand that engineers possess "soft skills" in addition to technical skills, and they must be able to understand project goals and have the ability to accomplish them with available resources [10]. Overall, the role of the project manager evolves from being the administrator of the project towards a much more managerial and leadership position, to fulfilling an organizational strategic need [5] [11].

Most employers expect their employees to demonstrate a mixture of skills, including technical project management competencies, business domain knowledge, team management, communication, interpersonal skills, cognitive aptitude and leadership behaviors supported by project management education [8] [12] [13]. El-Sabaa [14] adds that the human skills of project managers have the greatest influence on project management practices and technical skills the least. This is due to the fact that people deliver successful projects using their knowledge and creativity, not through the mere use of techniques or hardware. Therefore, one of the biggest challenges for project managers is to manage people which requires intense use of relationship management skills [9]. Surprisingly, up until the end of the 20th century, most of the literature on project management competencies was reported to be relevant to the developed countries. However, a recent study has shown that project management practices differ across geographical regions and application areas [15]. For that reason, we were interested in exploring project management competencies in Croatia, as a relatively young democracy and market economy. Such research could be useful for a variety of purposes. For example, applications range from the hiring of a new project manager for an organization to continued training for current employees [16].

Since project management competencies are very complex and require acquiring a variety of elements, in order to develop, improve or assess them, a system of assessment was developed and levels of competencies were defined within a certification system. Based on the evidence provided by the candidate within the IPMA Individual Competence Baseline (ICB4 – frame of reference for competences) and International Certification Regulations (IPMA ICR – regulatory framework for certification assessment), a candidate's level of competence is evaluated within the globally recognized and accepted IPMA 4-L-C System by trained assessors. ICB4 consists of 29 competencies divided into three areas: People (10), Practice (13 for projects and 14 for programs and portfolios) and Perspective (five), each of which is further described with 3-7 key competency indicators (KCIs) to support the assessment [3][17].

The IPMA 4-L-C System operates within three domains (project, program and portfolio) and defines four levels: IPMA level A (Certified Project/Program/Portfolio Director), IPMA level B (Certified Senior Project/Program/Portfolio Manager), IPMA level C (Certified Project Manager) and IPMA level D (Certified Project Management Associate). The international specification prescribes (for each level and domain) the required components of the certification process, combinations of competencies from ICB4 that need to be assessed, assessment methods that should be applied, the required extent and nature of the evidence needed from the candidate and threshold

values for achieving the certification. This is where information modeling comes into place. To achieve: (a) level A, the candidate has to demonstrate sufficient evidence of 80% of the domain competencies applied in a very complex environment, (b) level B, the candidate has to demonstrate sufficient evidence of 80% of the domain competencies applied in a complex environment, (c) level C, the candidate has to demonstrate sufficient evidence of 80% of the domain competencies applied in a moderately complex environment and d) level D, the candidate has to demonstrate knowledge of 80% of the domain competencies (theoretical exam). Moreover, to demonstrate sufficient evidence against specific competency, the candidate is expected to demonstrate at least 50% of the KCIs. Evaluation for Levels A, B and C consists of several paths (e.g. written exam, project/program/portfolio report, extended interview and/or practical task…) and evaluation methods, while, in order to be evaluated, each competency is assessed several times from different points of view and by different assessors. The assessors are marking the achievement of the candidates in an electronic form for each competency and KCI during the assessment period ensuring it to be a valuable source of information for the indicator in regard to the chosen path, as well as to calculate the final percentage of success for the candidate and make the final decision whether or not to grant a certificate to a candidate [17].

The **article's goal** is to examine the context of competence-based certification, as well as attitude regarding behavioral competencies among certified project, program and portfolio managers in Croatia with the goal to assess the specially designed measuring instrument. The findings in this paper are based on the data gathered by in-depth interviews with a member of the editorial board of the current certification standard, the representatives of the national project management certification body and on the data provided by the certified project, program and portfolio managers in Croatia through an online questionnaire, therefore representing a valid basis for further research in the field and promoting the competence-based project, program and portfolio management.

2. RESEARCH METHODS

In order to explore various competencies previously defined by IPMA Guidelines [3] an empirical research among Croatian project managers was conducted. More specifically, both qualitative and quantitative researches have been undertaken and the details are given in the following sections.

2.1. Study 1 – qualitative study

The qualitative research conducted for this paper aimed at understanding the challenges of project management and certification system in Croatia, as well as competencies necessary for implementing project, program and portfolio, and educational needs in the field. For the aforementioned purpose, during 2017, in-depth interviews were conducted with:

1. a member of the editorial board of the new competence baseline to get an insight into the processes of its development,
2. the director of the Croatian certification body[1] responsible for defining, implementing and developing of the certification system, as well as monitoring of quality and development enhancements of the certification system,
3. an assessor working in Croatia responsible for preparing the exams and making the data base of the questions, assessing and examining the candidates (written tests and interviewing of the candidates).[2]

[1] The certification body in Croatia, although a part of IPMA Member Association, is functionally separated from the basic organizational structure of the Member Association.

[2] Only one assessor was interviewed because all of them have the same responsibilities and oblige the same rules within the certification body.

The data were analyzed by using grounded theory approach [18] and four major codes were constructed:

1. project management and certification challenges,
2. addressing certification body needs,
3. the missing link between educational institutions and project management in practice and
4. key project management competencies.

2.2. Study 2 – quantitative methods

This section is organized as follows: firstly, research methodology is explained in detail. Different parts of the research instrument were explained, as well as the sampling procedure and sample characteristics. Secondly, research results were presented in different sections, i.e. general findings about ranking of different project management competencies, as well as specific findings about the importance of competencies with regard to the sample characteristics.

Research instrument. A questionnaire that was designed for the purpose of conducting the empirical research consisted of eight questions related to the research problem, as well as additional questions related to respondents' demographic and professional background. Most of the questions were close-ended and referred to different project competencies that respondents were asked to rank from 1 to 10 (1 being the most important competency, 10 being the least important one), or to certification details (e.g. level of certification, country of certification). Competencies were adapted from IPMA competencies inventory and include: self-management (SM), personal integrity (PI), personal communication (PC), relations and engagement (RE), leadership (L), teamwork (T), conflict and crisis (CC), resourcefulness (R), negotiation (N) and orientation towards results (RO). Majority of other variables were of nominal character while the variable of central interest was treated as rank variable.

Several questions were open-ended and consisted of questions about expressing opinions (e.g. why was the selected competency ranked as the most important). Other parts of the questionnaire included different questions about respondents' background and those were either close-ended questions (e.g. gender, education level), or open-ended (e.g. age, years of working experience). The estimated time for completing the questionnaire was approximately 5 to 10 minutes.

Sample, data collection and analysis. The first step in designing the research was to select research participants. The authors aimed at certified project, program and portfolio managers in Croatia (levels C, B, and A according to IPMA 4-L-C System). Participants were selected and contacted with the help of the Croatian Member Association of IPMA which distributed questionnaires electronically in 2017. A total of 53 questionnaires were gathered and a statistical analysis of the primary data with SPSS 18.0 followed. The independent characteristics of the companies in the sample are given in a summary table above (Table I).

Table 1.

Sample characteristics

Level	Variable	Data distribution
Individual	Gender	Men – 66,7%, Women – 33,3%
	Age	Born before 1970 – 44,9%; born between 1970-1979 – 42,9%, born after 1980 – 12,2%
	Education level	Graduate degree – 64%, postgraduate degree – 36%
	Education area	Technical – 76,5%, other – 23,5%
Professional	Work experience	Up to 15 years – 25,5%, 16-25 years – 52,5%%, more than 25 years – 21,6%
	Work experience in PM	Up to 10 years – 47,1%; 11-20 years – 47,1%, more than 21 years – 5,9%
	Certification level	A – 5,9%, B – 23,5%, C – 70,6%
	Reason for	Job or law requirement – 22%

	certification	Skill acquisition, lifelong learning, growth and development – 36% Future prospect of working in project management, knowledge formalization – 42%
	Employer recognizes certification	Yes – 60%, no – 22%, other – 18%

Noted in Table I, two thirds of the sample are represented by men. There are 44,9% of project managers born before 1970, as well as 42.9% of those born between 1970 and 1979, while the youngest generation of employees (namely, generation Y) is represented by only 12.2%. Again, two thirds of the project managers obtained graduate education level, while additional 36% of sampled managers hold a postgraduate degree. Project managers from technical area of education (e.g. construction, electrical engineering, architecture) are over-represented in the sample, while the minor part of the sample covers other areas such as social, humanistic or natural sciences. As for the work experience, more than half of respondents have between 16 and 25 years in total, although not an entire career in project management. The majority of them hold level C of project management certification (70,6%), a quarter of them hold level B, while level A is under-represented (less than 6%). However, it should be mentioned that a total number of A-certified project managers in Croatia is 9, while other two categories have more than 100 managers in both cases. The most frequently cited reason for obtaining the certificate (42%) was the formalization of knowledge already acquired through practice or the future prospects and possibilities of leading projects. Additional 36% of project managers stated that gaining new knowledge and skills as well as personal growth and development was the primary reason to obtain the certificate. The minority (i.e. 22%) obtained the certificate because it was a job requirement. All of them were certified in Croatia, except for one project manager who was certified in Austria.

3. THE RESULTS AND DISCUSSION

In study 1 all the results were organized around constructed codes and the quotes adequately depict the developing of a new standard, as well as challenges and situations the Croatian certification body is currently facing.

Project management and certification challenges. At the moment, the main project management and certification challenges in the field of project management in Croatia are:

- developing experts in the field and recognizing the competent individuals by the companies

"I think the key challenge is to create a critical mass of experts (certified project managers) because somebody has to represent the profession."

"Identifying the level of competence of a project leader in everyday work is a challenge, both for large and small organizations operating in Croatia."

- finding tools that would be best for context-specific situations inside the country, and could ease computerization:

"Given the contextual conditions in which project managers are, I believe that today's challenge is to find the right, optimal tools that will give the best results in the given circumstances and for the specific needs."

"Managing a multitude of existing information and knowledge, and decision-making processes, are today a key challenge."

Also, there are two main challenges to be expected in the future:

- understanding the importance of the project management profession and aligning with the European Union context

"I think nothing more important awaits us than creating quality, that is, delivering the most complex projects and raising awareness of the importance of the project manager's profession."

"The open market and the gradual equalization of conditions at EU level will bring new, until recently unknown conditions of work and development of projects."

- context of rapid changes and risks

"Climate changes and appearance of extremism (with the consequences as fires, natural catastrophes, terrorism, etc.) and which appearance is inspired by both natural phenomena and the human factor, as well as rapid dissemination of information whose mechanisms we will be difficult to control, represent the most important challenges in the future. Events that seem almost impossible and have a big impact are becoming more and more common. Project management should therefore focus on the tools and support for projects that are able to cope with such risks."

Addressing certification body needs. Both the director of the certification body and assessor agreed that the certification body already started preparing for the future challenges, while at the same time dealing with the current ones. Since the certification system is coming to a transitional phase towards the new standard implementation, many challenges still await them in the nearest future and joint efforts are going to be crucial at this point in time to overcome them:

„We already started increasing the activity within the certification body by employing the new, competent, young assessors. As far as ICB4 is concerned, the system is changing and it will be necessary to carry out a transition phase that can last from one to two years. It is necessary to further increase the number of assessors and to create a new database, which implies a complete change of documentation."

„From my perspective we are progressing. I'm not happy with the pace at which we are doing so, but that is the result of a set of competencies and conditions with which and in which we are operating. It's good, but it can always be better. If everyone would focus exclusively on their positive contribution and productivity, with the will to achieve common goals, we would be doing an awesome job. The competition would look at it and it would also strengthen them... this is what we should strive for. Every day should be a little better."

The missing link between educational institutions and project management in practice. The missing link between what is expected in practice in the field of project management and what the educational institutions can offer became evident in the interviews. It is considered that education institutions do not pay enough attention to teaching project management, giving the insight to the practical skills needed:

„Generally, there is a lack of teaching all professions generic management skills. Also, already in the elementary school, children should do projects together, rather than individual assignments."

„At the faculties there is too little taught about projects and these courses should be brought up to the level of obligatory courses. The biggest drawback is the preparation of the courses since the courses are not customized to the needs of the companies and the teaching should not be ex cathedra."

„The missing link exists and I don't believe that this issue will be resolved completely. Institutions have no tools, motivation, or finances to keep track of all events in the real world. If we talk about Croatia, then we must look at the historical and development context. We are a relatively young country. We only discovered the right project management. We do not have the financial capability to track the latest technology. Lack of money causes multitasking of individuals, or overcapacity, in which conditions it is difficult to talk about the possibility of greater progress. Educational institutions should be more oriented towards open markets. Personally, I always strive

to connect the market with students and educational institution. To such co-operations I always look forward to. They show good results for all participants. Unfortunately, the system of work and education in some segments not only does not motivate such co-operations, but even spurs them.“

Key project management competencies. In total, 29 key competencies are defined in the new competence baseline and grouped into three main categories – people, practice and perspective. According to the editorial board member, the list of competencies was designed as a result of knowledge and practical experience gathered during four years from experts working in 60 IPMA countries. It was made by consensus between the countries, and strengthened with additional interviews with experts in the field and detailed secondary research. According to the editorial board member, all 29 competencies are of equal importance, however, in different points in the career relative value between them vary. Also, since the new standard is focused entirely on the key competencies and does not define processes or activities, methodologies or approaches, it should be universal and applicable in all project, program and portfolio contexts, regardless of the generation using it, and while a 360-degree way of assessing is proposed, recognizing the competent experts in the field should be completely objective.

However, both the director of the certification body and the assessor think a periodical upgrade of the competencies will be needed regardless of their universality. Also, taking into account different approaches towards implementing projects, in order to keep objectivity in assessing the competencies, it is very important to follow the procedures described in the International Certification Regulations, a document closely connected to the Individual Certification Baseline standard. The assessment should always be done by at least two assessors having the knowledge about the industry the candidate for the certificate is from, and supplemented by an in-depth interview for higher level of certification to assess competencies more complex for assessment. In addition, recertification is necessary every five years in order to ensure the expert is still up to date with the changes:

„Yes, the accelerated time in which we live will bring rapid changes at all levels. Change is the only constant and managing changes is very much about competencies. And although certification is not a necessary prerequisite for project managers to successfully run projects, it is a confirmation that the project manager, according to IPMA rules and procedures, fulfilled certain conditions.“

Finally, the opinion of both the director of the certification body and the assessor is that the most important set of competencies is the behavioral competencies because of their complexity and learning difficulties:

„I consider behavioral competencies as the key ones. However, what the future will bring depends on the impact of the rapid development of technology.“

„The key competencies are the behavioral ones because it is much easier to learn the technical and the part of contextual competencies. A person should work on his/her behavioral competencies, but it is more difficult to do it with those related to "personality" such as determination. Some can be learned without problems, such as communicating. Key behavioral competencies are therefore those associated with human traits - respecting communication, leadership (emotional intelligence), etc.“

Therefore, based on these insights, the authors of the paper decided to focus only on the importance of the behavioral competencies among project (level C), program (level B) and portfolio (level A) managers in Croatia. For the purpose of the second study these were selected and coded: self-management (SM), personal integrity (PI), personal communication (PC), relations and engagement (RE), leadership (L), teamwork (T), conflict and crisis (CC), resourcefulness (R), negotiation (N) and orientation towards results (RO).

In study 2, the first step in analyzing the data was exploring the frequency of assigning different levels of importance to 10 project management competencies in general. Results are shown in Table II.

Table 2.

Project management competencies importance ranking

MC	Approximate frequency of assigned rank (% of respondents)									
	1	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***	***10***
SM	25	10	10	0	12	4	12	6	12	8
PI	13	15	13	10	0	11	10	11	4	11
PC	11	17	10	4	13	13	6	13	4	8
RE	10	8	19	8	8	10	4	13	11	10
L	36	21	11	6	4	4	6	6	2	4
T	10	23	45	8	8	8	8	10	14	0
CC	9	6	6	11	15	9	13	11	9	9
R	6	19	13	4	7	13	11	7	2	17
N	9	7	7	23	9	6	9	7	17	4
RO	17	11	15	21	7	4	7	4	4	9

Several conclusions can be drawn from Table II. Firstly, one third of project managers agree that leadership is the most important competency of all offered in the questionnaire. More precisely, 36% of them ranked leadership first, while an additional 33% of them ranked leadership either second or third most important. It can be said that the significance of leadership is strongly followed by teamwork. Although it was ranked first by only 11% of managers, it was ranked second by 23% of them, and third by 45% of all project managers. Interestingly, none of them ranked teamwork last or least important. One quarter of the respondents ranked self-management as the most important competency, closely followed by orientation towards results, while other competencies do not particularly stand out.

As for the least important competencies, four of them should be emphasized. It seems that relations and engagement, conflict and crisis, resourcefulness as well as negotiation skills are not crucial for project management success, according to the respondents. Some of the reasons stated by respondents for ranking those competencies as least important are, for example, the fact that, „*if the conflict escalates it implies that some of the more important competencies such as leadership or teamwork were not sufficiently developed*“ or due to the fact that „*if other more important competencies were not present, engagement/negotiation will not make a difference*“.

Authors were also interested in finding out whether some of those 10 competencies were related to each other. After performing Spearman rank correlation analysis several significant correlation coefficients were found, as shown in Table II.

Table 3.

Significant correlation coefficients among project management competencies ranking

Relationship	Correlation coefficient	Sig. level
Teamwork & Leadership	0.441	0.01
Teamwork & Result orientation	0.394	0.01
Conflict and crisis & Personal communication	0,385	0.01
Conflict and crisis & Relations and engagement	0.371	0.01
Negotiation & Resourcefulness	0.367	0.01
Personal integrity & Self management	0.364	0.05
Leadership & Self management	-0.324	0.05
Teamwork & Self management	- 0.319	0.05

Correlation analysis revealed eight moderately strong relationships and several weak correlations which are not reported in this paper. The strongest and positive relationship was found between teamwork and leadership (rho=0,441) which were also found to be most frequently ranked among first three competencies (as shown in Table III). In addition to six positive correlations, two

negative relationships were found as well. Specifically, it seems that as leadership and teamwork were ranked more positively, the importance of self-management was decreasing (rho = – 0,324 and – 0,319, respectively).

Finally, the authors were interested in finding out whether there were differences in assigning rankings with regard to independent characteristics of the sample. Results of the non-parametric test are shown in Table IV.

Table 4.

Non-parametric tests results on differences in ranking competencies with regard to sample characteristics

Characteristic	Statistically significant differences	p-value
Certification level (B,C)	Orientation towards results	0,039
Certification reason (business, personal)	Personal communication Conflict and crisis	0,019 0,012
Employer recognition (yes, no)	Relations and engagement	0,013
Education level	Relations and engagement Self-management	0,048 0,013
Education area	*No differences found*	
Work experience	Personal integrity	0,045
Work experience in PM	Teamwork	0,049
Age	Self-management	0,017
Gender	*No differences found*	

According to this research, level B respondents seem to place importance on orientation towards results higher compared to level C respondents. The respondents who applied for certification for personal growth and development rank personal communication and conflict and crisis management higher compared to those whose reasons are strictly business-related. Where the employer recognizes the certificate, respondents seem to place more importance on relations and engagement. As for the education level, respondents with postgraduate level rank relations and engagement, as well as self-management higher compared to those with graduate degree. Work experience seems to be related to personal integrity where importance assigned by respondents decreases as the years of working experience increase. In case of working experience in project management specifically, respondents with less experience, i.e. those with 10 years or less seem to place more importance on teamwork than their more experienced colleagues. Finally, self-management seems to be age-related, or in this case, the respondents born between 1970 and 1979 ranked it higher compared to senior ones (the youngest generation was excluded from this analysis). It is interesting to note that education area (technical vs. other) and gender revealed no statistically significant differences in assigning importance to different project management competencies.

4. CONCLUSION AND PROSPECTS FOR FUTURE RESEARCH

In order for contemporary companies to be able to integrate, plan and control schedule-intensive, unique endeavors to make the best use of their limited human resources to meet the customer needs faster and better than the competition, they should employ competent project, program and portfolio managers. However, the research conducted in this paper shows that there are, and will be, many challenges on this road in Croatia. First of all, the profession of project management expert still has to be recognized by the companies and tools should be adopted not only to be used within the borders of the country, but also aligned with the context of the European Union, and rapidly changing and risky environment. In order to do so, educational institutions and the certification body have to keep up with the newest trends from the market, and the standard has to be continually revised and updated.

Furthermore, the excessively rapid environment requires constant interaction between various stakeholders for delivery of successful projects, and behavioral competencies are recognized not only as the ones hardest to be assessed, but also to be developed by the individual. Among the Croatian certified experts in the field, leadership, teamwork and self-management are considered to be, in general, the most important competence elements, and if they are developed and used right, all the others are just there as a useful addition.

However, since the main limitation of this research is the capability of cross-sectioning of data gathered in just one country, the authors of the paper consider broadening it by gathering longitudinal data in the countries which are conducting project management certification based on the internationally accepted standard, in order to establish causal relations among different variables and pair them with the independent data such as financial indicators from the public reports which would add more strength to the findings and enable generalization of the obtained results.

REFERENCES

[1] C. W. Ibbs and Y. H. Kwak, “Assessing Project Management Maturity”, Project Management Institute, vol. 31, pp. 32-43, 2000.

[2] M. I. Cheng, A. Dainty and D. M. Moore, “What makes a good project manager?”, Human Resource Management Journal, vol. 15, pp. 25-37., 2005.

[3] IPMA, Individual Competence Baseline for Project, Programme & Portfolio Management - 4th Version, Nijkerk: International Project Management Association, 2015.

[4] D. Hodgson, “Project work: The legacy of bureaucratic control in the post-bureaucratic organization,” Organization, vol. 11, pp. 81-100, 2004.

[5] K. Ahsan, M. Ho and S. Khan,“Recruiting Project Managers: A Comparative Analysis of Competencies and Recruitment Signals From Job Advertisements,“ Project Management Journal, vol. 44, pp. 36–54, 2013.

[6] L. Geoghegan and V. Dulewicz, “Do project managers' leadership competencies contribute to project success?“ Project Management Journal, vol. 39, pp. 58–67, 2008.

[7] D. Ulrich, W. Brockbank, D. Johnson, K. Sandholtz and J. Younger, HR competencies: Mastery at the intersection of people and business. Alexandria, VA: Society of Human Resource Management, 2008.

[8] V.G. Lizunkov, V.I. Marchuk and E.A. Podzorova, „Identification of Criteria, Features of Development and Level of Economic and Managerial Competencies of Bachelors in Mechanical Engineering“, Procedia - Social and Behavioral Sciences, vol. 206, pp. 388-393, 2016.

[9] M. Alam, A. Gale, M. Brown and A.I. Khan, "The importance of human skills in project management professional development", International Journal of Managing Projects in Business, vol. 3, pp. 495-516, 2010.

[10] S. Kumar and J. K. Hsiao, “Engineers learn “soft skills the hard way: planting a seed of leadership in engineering classes”, Leadership and Management in Engineering, vol. 7, pp. 18-23, 2007.

[11] Bushuyev, S., Murzabekova, A., Murzabekova, S., Khusainova, M. Develop breakthrough competence of project managers based on entrepreneurship energy Proceedings of the 12th International Scientific and Technical Conference on Computer Sciences and Information Technologies, CSIT 2017

[12] M. Brown and T. Bowen, Project Steering Meeting, M. Alam, Manchester, 2009.

[13] C. C. Silva de Araújo, C. Drebes Pedron, „IT project manager competencies and IT project success: a qualitative study“, Organisational Project Management, vol. 2 pp. 53-75, 2015.

[14] S. El-Sabaa, “The skills and career path of an effective project manager”, International Journal of Project Management, vol. 19, pp. 1-7, 2001.

[15] R. Dogbegah, K. Omoteso and D. Owusu-Manu, "A Qual-Quant (q2) Method for Exploring and Appraising Project Management Competency Requirements for Managing Large Projects in Ghana," International Journal of Construction Project Management, vol. 5, pp. 135-158, 2013.

[16] K. McDermott, “A Mixed Methods Study: Evaluating the Relationship of Project Manager Competencies and IT Project Management Methodologies” Master of Science Thesis, Purdue University, 2016.

[17] IPMA, International Certification Regulations (Public) for the Assessment of Individuals in Project, Programme & Portfolio Management, Zurich: Advokaturbüro Maurer&Stäger, 2016.

[18] J. Corbin and A. Strauss, Basics of qualitative research: Techniques and procedures for developing Grounded Theory, Thousand Oak: Sage Publications, 2008.

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ИНФОРМАЦИОННОЕ МОДЕЛИРОВАНИЕ ПОВЕДЕНЧЕСКИХ КОМПЕТЕНТНОСТЕЙ УПРАВЛЕНИЯ ПРОЕКТАМИ

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Аннотация. Применение практики управления проектами в современном бизнесе постоянно возрастает для обеспечения более эффективных и контролируемых пакетов работ, при этом максимально используя ограниченные человеческие ресурсы для удовлетворения требований клиентов и создания конкурентных преимуществ. Для того чтобы считаться компетентными, люди, работающие на местах, должны продемонстрировать определенный уровень знаний, навыков и умений, оцененных, сформированных или улучшенных с помощью систем сертификации. Принимая во внимание важность информационного моделирования и технологий в области управления проектами как набора практик, определяющих требования к структуре, жизненному циклу и доступности информации, а также акцент на поведенческих компетентностях руководителей проектов, программ и портфолио, авторы статьи сосредоточились на изучении проблем и особенностей профессии управления проектами на примере Хорватии. Эмпирические исследования проводились в два этапа. Во-первых, качественное исследование проводилось с использованием углубленных интервью с членами редакционной коллегии международного стандарта сертификации по управлению проектами и двумя представителями органа по сертификации в Хорватии: директором и оценщиком. Собранные данные были проанализированы с использованием базового теоретического подхода, и были выделены четыре основные области: проблемы управления проектами и сертификации, решения задач органа сертификации, отсутствие связи между учебными заведениями и управлением проектами на практике и ключевыми компетентностями управления проектов. На следующем этапе среди 53 сертифицированных менеджеров проектов, программ и портфолио в Хорватии было проведено количественное исследование с помощью вопросника как инструмента исследования, в котором оценивалась важность компетентностей в группе поведенческих компетентностей управления. Результаты показывают, что большинство сертифицированных экспертов в этой области считают, что «лидерство» является самой важной поведенческой компетентностью управления проектами, за которой следуют командная работа и самоуправление, в то время как компетентность «отношения и взаимодействие», «конфликты и кризисы», а также «переговоры и находчивость» оказывают наименьшее влияние на успешность осуществления проекта, программы и портфолио. Статистически существенные различия в придании значения различным компетентностям управления проектами были выявлены в отношении независимых характеристик нескольких респондентов.

Ключевые слова: компетентность; информационная модель; поведенческие компетентности; сертификация; управление проектами; управление программами; управление портфолио.

ІНФОРМАЦІЙНЕ МОДУЛЮВАННЯ ПОВЕДІНКОВИХ КОМПЕТЕНТНОСТЕЙ УПРАВЛІННЯ ПРОЕКТАМИ

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Анотація. Застосування практики управління проектами в сучасному бізнесі постійно зростає для забезпечення більш ефективних і контрольованих пакетів робіт, при цьому максимально використовуючи обмежені людські ресурси, що повинні відповідати вимогам клієнтів і створювати конкурентні переваги. Для того щоб вважатися компетентними, люди, які працюють на місцях, повинні продемонструвати певний рівень знань, навичок і умінь, оцінених, сформованих або вдосконалених за допомогою систем сертифікації. Беручи до уваги важливість інформаційного моделювання і технологій в області управління проектами як набору практик, що визначають вимоги до структури, життєвого циклу і доступності інформації, а також акцент на поведінкових компетентностях керівників проектів, програм та портфоліо, автори статті зосередилися на вивченні проблем і особливостей професії управління проектами на прикладі Хорватії. Емпіричні дослідження проводилися в два етапи. По-перше, якісне дослідження проводилося з використанням поглиблених інтерв'ю з членами редакційної колегії міжнародного стандарту сертифікації з управління проектами і двома представниками органу з сертифікації в Хорватії: директором і оцінювачем. Зібрані дані були проаналізовані з використанням базового теоретичного підходу, і були виділені чотири основні області: проблеми управління проектами та сертифікації, вирішення завдань органу сертифікації, відсутність зв'язку між навчальними закладами та управлінням проектами на практиці і ключовими компетентностями управління проектами. На наступному етапі серед 53 сертифікованих менеджерів проектів, програм та портфоліо в Хорватії було проведено кількісне дослідження за допомогою опитувальника як інструменту дослідження, в якому оцінювалася важливість компетентностей в групі поведінкових компетентностей управління. Результати показують, що більшість сертифікованих експертів в галузі вважають, що «лідерство» є найважливішою поведінкової компетентністю управління проектами, за якою слідують командна робота і самоврядування, в той же час визначено, що компетентність «відносини і взаємодія», «конфлікти і кризи», а також «переговори і винахідливість» мають найменший вплив на успішність реалізації проекту, програми і портфоліо. Статистично вагомі відмінності у визначені значення різних компетентностей управління проектами були виявлені кількома респондентами під час незалежних характеристик.

Ключові слова: компетентність; інформаційна модель; поведінкові компетентності; сертифікація; управління проектами; управління програмами; управління портфоліо.