

COMPETENCIES CHANGE WITHIN THE PROJECT MANAGERS PROFESSION IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT

✉ **Ekaterina KHALIMON**, State University of Management, Project Management Department, Ryazanski Prospect 99, 109542 Moscow, Russian Federation, guu.konf@yandex.ru; ✉ **Hanna SOROKA-POTRZEBNA**, University of Szczecin, Faculty of Economics, Finance and Management, Aleja Papieża Jana Pawła II 22A, 70-453 Szczecin, Poland, haniatoroka@gmail.com; ✉ **Mohammad MAHOUD**, MehrAlborz University, Department of Project and Construction Management, No. 36, Salehi St., Danesh Sani Crossroad, North Kargar Ave., Tehran, Iran, m.mahoud@mehralborz.ac.ir; ✉ **Roberto BRUNI**, University of Cassino and Southern Lazio, Department of Economics and Law, Via Sant'Angelo Loc. Folcara, 03043 Cassino, Italy, r.bruni@unicas.it

ABSTRACT

In this paper, the analysis of the sources of scientific literature, international, and national standards in the field of project management was carried out in order to form a list of requirements for knowledge, skills and personality qualities of a project manager. Modern scientific literature focuses on product, project sustainability and sustainable processes, but there is a noticeable lack of research on the changes taking place in the competencies of project managers in the context of sustainable development. The scientific hypothesis tested in this study is based on the assumption that the requirements for the competencies of the project managers have changed due to the inclusion of sustainability. In the second part of the study, this hypothesis was confirmed by the results of a survey conducted among Russian project managers of various economic spheres of activity. The survey also contributed to identify the most important knowledge, skills and personality traits needed by project managers for successful sustainable project management.

KEYWORDS

Competency, Knowledge, Personal ability, Project Manager, Skills, Sustainability

Corresponding author: Ekaterina KHALIMON, guu.konf@yandex.ru

Copyright © 2022, The Authors. Published by IPMA Serbia.

This is an open access article under the CC BY-NC 4.0 license

(<https://creativecommons.org/licenses/bync/4.0/>)

DOI 1056889/mpqr1024

PAGE 295–307

1. INTRODUCTION

Considering sustainability requires changing the mindset of project managers, obtaining new knowledge, mastering competencies and developing personal and professional qualities necessary for successful project management. Corporations around the world are actively including the concept of sustainable development: they are increasingly thinking about the impact of their activities on the world and are striving to take responsibility for the results of their projects, including aspects of the sustainability of this result.

The introduction of the concept of sustainable development has changed not only the general approach to project management but also the profession of a project manager itself. To achieve sustainable goals, project managers are required to develop new, diverse skills related to sustainable project management.

Researchers confirm that the project manager takes a central and influential position in sustainable project management. It is project managers who are essential agents of change and catalysts in ensuring the sustainability of the project and the success of project management depends on the development of their competencies.

Current trends and ongoing changes have caused great interest in the scientific community in these topics. In the period from 2015 to 2019, 73% of scientific articles were published at the junction of sustainable development and project management [22].

2. METHODOLOGY OF RESEARCH

2.1. Research design (qualitative research)

In the research there was adopted a qualitative research method was a way to make a more efficient study of the topic of sustainable project management, to better understand its influence on the profession of project managers and serve as a basis for future research. To answer the research question of whether the requirements for the professional competencies of specialists in the field of project management have changed in the conditions of sustainability or not, in-depth research of literature sources and international and national standards in the field of project management was conducted. When choosing literature to use, it was very important to make sure of the author's knowledge and experience in this field, also the rating of journals played an important role in choosing literature. Materials, such as articles, conference papers, and some books on the subject of sustainability and professional competencies of specialists in the field of project management, have been carefully analyzed. Some notes have been made during analysis for the future comparison and collation of the thoughts on the theme of sustainability and project management competencies. Several phrases have been explained for a better understanding of the final decision to combine either of the chosen statements.

As a result of the analysis of literature and standards in the field of project management, it was possible to form a list of knowledge, skills, abilities and personality qualities that specialists in the field of project management should possess. Also, based on the analysis of scientific literature, hypotheses have been put forward regarding the impact of sustainability on the requirements for the professional competence of project managers. The results presented in table 2 of the Literature Analysis section laid the foundation for the formation of an expert survey for further research on the topic.

2.2. Choosing the methodology for further research

In the second stage, scientific sources were reviewed in order to determine which methodologies the authors used in their research and which one suits the best for the research. As a result, the survey of experts was chosen.

The survey of experts refers to expert methods of development and decision-making since the main participants in this method are experts. Experts can be: heads of enterprises of different industries and spheres of activity; middle managers (heads of the marketing department, production department, planning and financial management, etc.); specialists (economists, engineers, technologists, marketers, etc.). In our case, the experts were from the Russian Federation, selected specialists in the field of project management from different areas who have more than two years of experience in project management, as well as have specialized education and/or certification in project management (international or national).

The application of the survey of experts has significant advantages: the method of expert evaluation through the processing of individual expert assessments allows obtaining a general opinion based on independent assessments with a sufficient degree of validity and reliability. Also, thanks to independent surveys, the method allows avoiding social pressure on experts due to their different statuses, bandwagon effect, group thinking that leads to mistakes and getting a consensus of experts. An additional advantage of the method is that the survey of experts can be implemented anywhere, regardless of the location of the participants which is important for involving experts from different countries.

Since the origin of sustainable development has its roots in foreign history, sustainable project management is growing rapidly around the world, international companies are actively implementing the principles of sustainable development in project management, and it was decided not to limit the research to domestic experts, but involve foreign experts to the focus group as well. The results of this practice confirm its positive impact on the development of scientific activity and increase its effectiveness.

To form an expert group, the authors have established strict selection criteria: experts must be functioning project managers, be certified specialists and have professional experience in the field of project management, not less than 5 years. These requirements allowed us to identify and consider changes in the competencies of project managers under the influence of sustainable development. Further stages of using the survey of experts are presented in **Table 1**.

Table 1. The stages of using the survey of experts

Stage	Characteristic
Formation of the group of participants	<ul style="list-style-type: none"> • Search for potential experts from the professional community of the Project Management according to the requirements put forward. • Verification of candidates for compliance with the requirements. As a result, a list of experts has been formed who are ready to take part in the survey using the Survey method. It included representatives of 6 professional areas: IT, education, real estate, construction, public administration, and ecology, with a total number of 91 respondents.
Preparation of the survey	A questionnaire is being formed, which contains 23 questions. Questions are closed and have the maximum number of answers to them. The questionnaire was prepared in the Russian language and has been entered into the docs.google system and links have been sent to experts to complete the survey. The deadline for providing feedback was up to 7 calendar days.
Conducting the survey	Experts click on the links to access the survey and mark the answers to the questions. Based on the results of the answers to all the questions, they complete the testing and send the results.
Processing of results	The survey results are processed by the authors of this study and checked for answers to all questions. Discussions, collective meetings, explanations or comments are not provided. Experts got acquainted with the results.

The presence of specialists with different experiences and distinct points of view allowed to get a meaningful assessment and reflected the actual national situation and, in general, increased the reliability of scientific research.

3. LITERATURE REVIEW

1. In the first phase of the exploratory research the analysis of scientific literature was conducted through the world's largest scientific publishing house Elsevier.com and the international platform Researchgate.net. The search for suitable scientific literature sources was conducted in the leading journals in the field of project management, using such keywords as sustainability, sustainable development, sustainable project management, and project manager competencies.

A systematic review of the literature revealed that there is a small number of research papers that address the key competencies of project managers in the field of sustainable project management. As a result of the review of the research topic, 25 scientific sources were selected. Based on a thorough analysis of the literature, the competencies that are put forward to project managers under the influence of sustainable development were identified (Table 2).

Table 2. Literature analysis

N	Name of the article	Reference link to the source	Year of publication	Key competencies (knowledge, skills and personal abilities)	The methodology used in the source
1	Managing project sustainability in the extractive industries: Towards a reciprocity framework for community engagement	[3]	2021	Effective and efficient in terms of sustainability; take into account the needs of stakeholders; knowledge of the concept of capacity building.	Capability approach developed by philosophers Marta Nussbaum and Amartya Sen [18; 19; 23; 24]
2	Exploring a variety of factors that stimulate project managers to address sustainability issues	[27]	2020	Pragmatic, internally motivated and task-oriented. A supportive attitude toward stakeholders, knowledge of standards and tools, the ability to deal with uncertainty, and success-oriented. Certain competencies in the field of sustainable development and normative values. The behavior of the project manager in relation to sustainability is a personal trait.	Q-methodology is based on the factors provided by the Theory of Planned Behavior (TPA). Based on the factor analysis of 49 Q-varieties.
3	25 years of 'sustainable projects'. What we know and what the literature says	[22]	2019	System thinking competencies, proactive competencies, normative competencies, strategic competencies, and interpersonal competencies. Internally motivated to work on a sustainable project and achieve sustainable results. Certain competencies and skills in the field of sustainability, are not traditionally taught in the process of training project managers.	An extensive systematic review of the literature from 770 publications of that period from 1993 to 2017
4	Project management knowledge and skills for green construction: Overcoming challenges	[11]	2013	Communication management knowledge, transparency in communication, greater coordination with various stakeholders and dealing with unexpected circumstances.	Literature review, surveys and interviews with project managers

5	Project Management and Sustainability: Playing Trick or Treat with the Planet	[28]	2020	Responsibility and result-oriented, ethically correct and taking fair decisions, and excellent communication skills with stakeholders. Flexibility, leadership.	An empirical survey in project-oriented organizations of both public and private sectors
6	New Approach for Managing Sustainability in Projects	[15]	2021	Three areas of competence: perspective, contextual or ecological - include methods, tools and techniques of interaction with the environment. Personal competencies: 1. The ability to introspect and self-management; 2. Personal honesty: to act in accordance with their values and ethical and moral principles; 3. Interpersonal communication skills; 4. The ability to have interpersonal relationships, participate in project activities and encourage the participation of others; 5. Leadership qualities; 6. Teamwork opportunities; 7. Conflict and crisis resolution skills; 8. Inventiveness, imagination, creativity; 9. Negotiation skills; 10. Results orientation. Professional practical competencies – related to areas: scope management, time management, cost management, etc.	Delphi analysis conducted to confirm these assumptions. Opinions and assessments were received from 17 people with (minimum, average, maximum) professional or academic experience (7, 25, 50) years in the field of design and project management. A discussion during which the interviewees expressed various opinions and ideas.
7	Revisiting the relationship between sustainable project management and project success: The moderating role of stakeholder engagement and team-building	[25]	2021	Encouraging interaction with stakeholders, team building skills, and decision-making from the point of view of sustainability.	A structured survey method and 323 responses were received from project management specialists in Pakistan
8	Sustainability in Project Management Competencies: Analyzing the Competence Gap of Project Managers	[26]	2014	System thinking, a holistic view and interpersonal, normative, proactive and strategic competencies. It is necessary to understand the types of life cycles of the project (product) results, to involve stakeholders in active participation. System thinking competencies, strategic competencies, normative competencies, proactive competencies and interpersonal competencies.	Literature-based analysis
9	Exploring Patterns of Sustainability Stimuli of Project Managers	[16]	2019	The inclusion of sustainability is a personal trait. internally motivated project managers, task-oriented project managers, and pragmatic project managers stimulated by practical knowledge, tools and results.	Quantitative pair comparison. Twelve statements were used in a paired comparison, resulting in a combination of 66 questions. A sample of 101 project managers was analyzed to determine incentive models. A quantitative approach using a survey-based strategy.
10	The Impact of Project Manager Soft Competences on Project Sustainability	[30]	2020	Promoting solutions and actions in the field of sustainable development. The project manager must have a long-term and comprehensive view of the project, and be fully responsible for the consequences of the project, including sustainability-related outcomes. Innovation is directly related to the sustainable development of the project. The results demonstrate the positive impact of the soft competencies of the project manager on the sustainability of the project.	A deductive approach was adopted. The sample size of the study was 242 respondents, and data were collected from software houses. The collected data were then analyzed by doing the structural equation modeling in PLS-SEM in order to examine the relationships.

11	Benefits Formulation in Construction Projects: An Exploratory Study through a Social Sustainability Perspective	[7]	2020	Identifying at the early stages of the project the intended beneficiaries and the corresponding benefits, as well as the timing and responsibility for the implementation of benefits.	SS-centric analysis of project benefits management (PBM) plans for 80 construction projects using content analysis has been conducted. Impact assessment reports on 80 projects in India were analyzed.
12	The Paradoxical Profession: Project Management and the Contradictory Nature of Sustainable Project Objectives	[21]	2021	To simultaneously solve many desirable, but contradictory economic, environmental and social tasks at the level of the firm and society, which operate in different time frames and follow a different logic. To make compromise decisions in order to align various sustainable development goals with economic business goals and conflicting requirements of multiple stakeholders.	Adopting the paradox theory lens, the authors adopted a qualitative methodology based on semi-structured interviews with 14 respondents holding key positions within six different professional project management associations and communities of practice.
13	Achieving Sustainability in Railway Projects: Major Stakeholder Concerns	[31]	2017	To involve stakeholders, to create stakeholder groups who can share their diverse views on understanding the sustainability of the project, as well as how to achieve sustainability.	A triangulated methodology was adopted, including a literature review, a questionnaire survey, and interviews to obtain data from project stakeholders.
14	Core capabilities for achieving sustainable construction project management	[6]	2021	Sustainability principles in planning, design, construction, and management of projects, social responsibility. Execution-oriented and product-oriented capabilities.	A systematic literature review on the topic of sustainable management of construction projects. Scopus and Web of Science were searched as the two main databases for scientific publications, and preferred reporting elements for systematic reviews and meta-analyses (PRISMA) were selected for the selection and selection process.
15	The concept of sustainable construction project management in international practice	[29]	2021	Understanding of potential benefits, cooperation between practitioners, research institutes and environmental organizations; a systematic approach to achieving sustainable development goals.	The author used the Delphi method to assess the importance of sustainability criteria in China for LEED and BREEAM certification through an anonymous survey of 30 experts from interested parties
16	Can project sustainability management impact project success? An empirical study applying a contingent approach	[5]	2017	Project management (PM) process and knowledge areas focus on sustainability, green procurement and partnership, design for the environment, environmental technologies, and social responsibility in a project context.	Survey-based research
17	Governing public-private partnerships for sustainability an analysis of procurement and governance practices of PPP infrastructure projects	[10]	2017	Knowledge of sustainability considerations, differences between the projects, output specifications and award criteria, sustainability criteria and the influence sustainability criteria have in the final bid evaluation.	Survey-based research

18	Interestingly it's innovation: Reviewing sustainability performance management at the base of the pyramid (BoP)	[3]	2022	The findings show that the BoP literature discusses only the subcategories of the PM tools and instruments. Moreover, the presence of relational performance measures, such as social capital and trust, indicates their importance and suggests that they should be incorporated into the PM instruments.	Structured literature review
19	Key factors of sustainability in project management context: A survey exploring the project managers' perspective	[17]	2016	Knowledge of sustainable innovation business management, stakeholders management, Economics and competitive advantages, environmental policies and resources saving.	Systematic literature review and the survey-based research
20	Project benefits co-creation: Shaping sustainable development benefits	[13]	2017	A long-term view of change, innovation and the creation of benefits. Knowledge of how projects are structured and the composition of project teams.	The research is based on a literature review
21	Projects to create the future: Managing projects meets sustainable development	[9]	2017	Balancing of economic, social and environmental orientation in the understanding of sustainability. The proactive orientation on stakeholder interests is a defining element of sustainable project management. Emphasizing the values as the basis for considering sustainability in project management, discussing stakeholder co-creation in benefits realization management.	The research is based on Q- methodology
22	Project sustainability strategies: A systematic literature review	[2]	2016	Knowledge of how sustainability challenges are managed in projects. A more holistic and thorough understanding of the versatility of sustainability.	The research is based on a systematic literature review
23	Revolutionize value management: A mode towards sustainability	[32]	2006	The knowledge of integration of sustainability into value management. The integration of sustainability required participation from all players of value management to ensure effective integration.	The research is based on a literature review
24	Sustainable project management through project control in infrastructure projects	[14]	2017	Evaluation of environmentally and socially sensitive context, the influence on various stakeholders. A more holistic control package in sustainable project management, different control mechanisms for the different dimensions of sustainability, sustainability control needs to be integrated as part of general project management, and internal project control to be complemented with effective project sustainability governance.	The research is based on a case study methodology
25	The integration of ideation and project portfolio management — A key factor for sustainable success	[8]	2012	Not only the execution stages of new products and service innovations but also the early and evolutionary stages, where new opportunities are discovered and new options are developed, require a professional portfolio management system.	The research is based on a sound review of the literature

In a large number of studies, the authors draw attention to the fact that considering sustainability requires a change in the thinking of project managers. According to Luca Sabini and Neil Alderman, there is a misconception that sustainability is expensive. The benefits of sustainable project management that it can bring in the medium and long term are ignored.

In their study, Gilbert Silvius and Ron Schipper argue that the behavior of the project manager in relation to sustainability is, first of all, a personal trait. They believe that a project manager should be internally motivated to work on a sustainable project and achieve sustainable results.

Also, many authors emphasize that it is the project manager who makes the greatest contribution to the implementation of sustainable development goals in projects and is personally responsible for the sustainable development of the project.

Scientific sources say that in order to achieve sustainability, the project manager needs to develop: system thinking competencies, proactive competencies, normative competencies, strategic competencies, and interpersonal competencies.

Maria Pilar de la Cruz Lopez, Alfredo del Cano Gochi, Juan Jose Cartel Barros and Manuel Lara identified such sustainable competencies as 1. personal honesty, 2. the ability to interpersonal relationships, participate in project activities and encourage the participation of others, 3. ingenuity, imagination, creativity and 4. focus on results as the most important of personal competencies.

Luca Sabini, Daniel Muzio and Neil Alderman highlighted that the implementation of the sustainable development goals requires certain competencies and skills that are not traditionally taught in the process of training project managers, so they must be achieved at the local level (with experience) or in the learning process (for example, at the university level or with certifications).

Many scientific publications emphasize that the inclusion of sustainable development issues in projects increases the burden on project managers, and excellent communication skills are needed to communicate with a significant number of stakeholders. Thus, communication management becomes vital for the success of the project.

Competencies that are put forward to project managers under the influence of sustainable development are presented in the last row of Table 3 called "Additional requirements from project management standards".

2. At the second stage of the study, in order to identify the actual competencies of the project manager, three standards in the field of project management were reviewed and analyzed: The International Standard ICB 4.0 IPMA, the American standard PMBoK and the Japanese standard P2M PMAJ. Based on the analysis of the standards, a table of competencies of the project manager was compiled (Table 3). Competencies were divided into three groups: knowledge; skills and abilities; personal qualities.

The analysis of project management standards showed that the standards do not take into account the role of project managers in the implementation of sustainable development projects and programs.

Also, the competencies that the authors of research articles put forward to project managers under the influence of sustainability from the previously compiled Table 2 were added to Table 3, in a line called "*Additional requirements from project management standards*". These competencies were also divided into three groups: knowledge; skills and abilities; personal qualities.

Table 3. Competencies of the project manager from different sources

	Knowledge	Skills and abilities	Personal qualities
ICB 4.0 IPMA [12]	<p>Strategic PM. Fundamentals of PM. Standards and norms of PM. Sources of interest and power. Green (“sustainable”) PM [Managing project sustainability]. Theories of culture. Techniques for managing stress, time, and setting goals.</p> <p>The Code of Ethics. Principles of ensuring sustainable development.</p> <p>Knowledge about various techniques and means of communication.</p> <p>Theory of motivation. Leadership models. Coaching. Models of roles in the team and the housing and communal services.</p> <p>Techniques for settling conflicts and crises. Negotiation theories and techniques. Theories of efficiency, effectiveness and productivity. Knowledge about the content, and “boundaries” of the project. Methods of calendar planning. Document management systems. Quality management tools. Techniques for identifying and assessing risks and opportunities, implementing and monitoring risk management plans. Interests</p>	<p>Implementation of the organization’s mission and its sustainable development.</p> <p>Adaptation of standards for a specific organization.</p> <p>Management of power and interests to meet the needs of project stakeholders and obtain mutually beneficial results in time and budget constraints.</p> <p>The values and culture of the organization and the external environment. Control the behavior. Create an atmosphere of trust. Excellent interpersonal communication, various means of communication.</p> <p>To inspire people to achieve common goals. The ability to overcome resistance. Staff selection and recruitment skills.</p> <p>Facilitation skills. Diplomatic skills, negotiation, discussion and compromise skills, and analytical skills. Creative approach. Delegation. The ability to determine the approach of project implementation. Project content management. Determine the sequence, optimize, monitor and control the duration and timing of the project work.</p> <p>Working with the project</p>	<p>Strategic thinking. Critical thinking. System thinking. Leadership. Sociability. Focus on ensuring sustainable development.</p> <p>Respect for different cultures. Self-awareness. Self-organization. Personal integrity. Reliability. Empathy. Openness. Sincerity. Enthusiasm. Intuition.</p> <p>Sense of humor. Emotional stability. Organization of teamwork. Persuasiveness. Stress resistance. Non-standard, creative thinking. Resourcefulness. Ingenuity. Persistence. Enterprise. Self-confidence, patience. Result orientation. Introspection.</p>
P2M PMAJ [20]	<p>General principles of management, business management, strategic planning. Project management life cycle. Competently use project resources: vital financial, information and intellectual.</p>	<p>Competent negotiation. The ability to focus the team’s efforts on innovation and breakthroughs. Task structuring and performance monitoring.</p> <p>Planning ability. Execution ability. Strategic thinking (strategic perception, the ability to perceive the strategic elements of the program/project and arrange them according to priorities for proper application).</p> <p>Integral thinking (continuous striving to achieve the results of the project/program, the ability to prevent, evaluate and work with changes in the project environment to achieve its results). Holistic thinking (focus on a holistic mission, ability to identify problems, and their sources and develop solutions to overcome them).</p>	<p>Innovator. Leadership (leadership to increase added value and introduce innovations). Result-oriented [Focus on achieving results]. Self-realization [Self-discipline]. Harmonization of diverse actions [Ability to balance between different working groups and stakeholders]. Getting rid of tension and competition. High standards of ethics. Foresight. Responsibility. Continuous capacity building, and development. Initiative supports enthusiasm to achieve results through teamwork.</p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">PMBOK [1]</p>	<p>Project integration management. Project scope management. Project schedule management. Project cost management. Project quality management. Project resource management. Communication management in the project. Project risk management. Project procurement management. Project stakeholders management.</p>	<p>Project team management skills. Project lifecycle management skills. Project plan creation skills. Project progress management skills. Skills of dealing with uncertainty. Skills of delivering results and creating value. Skills for evaluating the effectiveness of project implementation. The skill to strive to understand the interests and expectations of stakeholders and involve them in the process of creating value. The skill of being focused on maximizing value for the customer and the organization. The skill to perceive a project as an element of a larger system. Take into account the relationships in the middle of the system when implementing the project. The skill of embedding quality in the process of creating results. The skill to minimize threats and maximize opportunities. The skill of being able to act on a situation while maintaining a focus on creating value.</p>	<p>Sense of humor, optimism, respectfulness, politeness, friendliness, kindness, honesty, ethics, initiative, leadership, confidence, persuasiveness, fluency of speech, responsibility, emotional intelligence</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Additional requirements from sources of literature</p>	<p>Education in the field of sustainability management that meets 5 requirements for competencies: systems thinking, interpersonal, normative, proactive and strategic competencies.</p>	<p>Take into account the needs of stakeholders throughout the entire housing project, and not only at the beginning of the project. The ability to find a compromise between the goals of sustainability and the triangle of constraints. The competencies and skills required to achieve sustainable goals. Transparency in communication. To determine the intended beneficiaries and the corresponding benefits, the timing and responsibility for the implementation of these benefits. To involve the general public in the early stages of the project assessment.</p>	<p>The behavior of the project manager is primarily a personal trait. Internal motivation is needed to switch on sustainability in the project. Personal honesty. Promotion of solutions and actions in the field of sustainable development. Individual responsibility. Soft competencies have a positive effect on the sustainability of the project.</p>

3. After compelling **Table 3**, a comparative analysis was conducted between the project managers' competencies prescribed in three standards and the competencies found in scientific sources. The competencies that were put forward to project managers under the influence of sustainability were added to the group "Additional requirements from literature sources".

A comparative analysis was conducted to establish the coincidences and identify existing differences in the competencies in knowledge, skills and abilities, and personal qualities of the project manager.

4. RESULTS

Here are some of the main results of the survey:

1. The respondents rated 3.66 points answering the question: “It is noted that the introduction of sustainability principles into project management is accompanied by an increase in the number of stakeholders. Evaluate on a 5-point scale how much more communication (interaction with stakeholders) has become in project management in the context of sustainability, where 1-has remained at the same level, 5-has increased markedly.”

2. More than 80% of respondents agreed that “the requirements for the project manager have changed over the past 5 years (requires the development of new hard and soft skills, and abilities)” and that “project management in the context of sustainability requires a project manager to develop new competencies, knowledge, skills”.

3. The respondents evaluated on 6 points the importance of adhering to the principles of sustainable development in project management (on a scale from 1 to 10, where 1 is unimportant, reduces the quality of the project, 10 is very important, improves the quality of projects).

4. Among the key knowledge that a project manager should have, the respondents selected those that were most in demand among project managers 5 years ago: knowledge about project scope management (83% of respondents), knowledge about project cost management (87%), knowledge about calendar planning methods (67%), knowledge about the project management lifecycle (66%).

In comparison, among the key knowledge that a project manager should have, the respondents selected those that are most in demand among project managers today: knowledge about various techniques and means of communication (84%), knowledge about project cost management (67%), knowledge about managing the interests and influence of project stakeholders (61%), knowledge about the project management lifecycle (52%), knowledge about conflict and crisis management techniques (51%), knowledge about time management, goal setting (50%).

5. Among the key skills and abilities that a project manager should have, the respondents selected those that were most in demand among project managers 5 years ago: skills of determining the sequence of work (network planning) (69%), ability to evaluate the effectiveness of the project (67%), implementation skills of achieving results and goals (67%), ability to optimize, track and control the duration and timing of project work (55%), ability to systematically manage projects as a set of interrelated processes (54%), the skill of achieving the expectations of stakeholders and involving them in the process of creating value (54%), negotiation skills (52%).

In comparison, among the key skills and abilities that a project manager should have, the respondents selected those that are most in demand among project managers today: interpersonal communication skills, the use of various means of communication (83%), the skill of achieving the expectations of stakeholders and involving them in the process of creating value (65%), negotiation skills (63%), the ability to act on the situation, while maintaining a focus on creating value (59%), the skills of achieving results and goals (58%), the ability to create and evaluate the value of a product/project (56%), the ability to systematically manage projects as a set of interrelated processes (53%).

6. Among the key personal qualities that a project manager should have, the respondents selected those that were most in demand among project managers 5 years ago: responsibility (100%), leadership (88%), confidence (64%), system thinking (55%), organization (54%), sociability (51%).

In comparison, among the key personal qualities that a project manager should have, the respondents selected those that are most in demand among project managers today: communication skills (83%), leadership (65%), focus on results (64%), emotional stability (58%), confidence (57%), creativity (53%).

5. CONCLUSION

According to the scientific literature research, it became clear that the world scientific standards put forward similar requirements for sustainability project managers. The main criteria of leading international standards: extensive knowledge of project management sustainability, possession of management tools, diplomacy skills to achieve mutual goals, a proper definition of optimization and control of project implementation, as well as project lifecycle management skills. Personality qualities that sustainability project managers should have are also highlighted, such as leadership, sincerity, enterprise, responsibility and initiative. Of course, this is a small part of the knowledge, skills and personal qualities that project managers should have, but they are basic. In our research, we analyzed in detail the skills and personal qualities written in the standards and scientific literature, and also tried to find new ones that can help managers successfully implement sustainability projects.

The analysis of the sources of scientific literature and international, and national standards in the field of project management was carried out in order to form a list of requirements for knowledge, skills and personality qualities that a project manager should possess. In the second part of the study, the survey was conducted among Russian project managers of various economic spheres of activity to identify the most important knowledge, skills and personality traits needed by project managers for successful sustainable project management. The results showed that the requirements for the competencies of the project manager have changed over the past 5 years due to the inclusion of sustainability. It was proved that sustainability requires changing the mindset of project managers, obtaining new knowledge, mastering competencies and developing personal and professional qualities necessary for successful project management.

REFERENCES

1. A Guide to the Project Management Body of Knowledge (PMBOK® Guide)—Sixth Edition. Project Management Institute [PMI] 579 p. (2017)
2. Aarseth, W., Ahola, T., Aaltonen, K., Økland, A., Andersen, B.: Project sustainability strategies: A systematic literature review. *International Journal of Project Management*. 35 (2016)
3. Aman, S., Seuring, S.: Interestingly it's innovation: Reviewing sustainability performance management in the base of the pyramid (BoP). *Technovation*. 102394 (2021)
4. Baba, S., Mohammad, Sh., Young, C.: Managing project sustainability in the extractive industries: Towards a reciprocity framework for community engagement. *International Journal of Project Management*. (in press) (2021).
5. Carvalho, M., Rabechini, R.: Can project sustainability management impact project success? An empirical study applying a contingent approach. *International Journal of Project Management*. 35 (2017)
6. Ershadi, M., Goodarzi, F.: Core capabilities for achieving sustainable construction project management. *Sustainable Production and Consumption*. 28 (2021)
7. Goel, A., Ganesh, L.S., Kaur, A.: Benefits Formulation in Construction Projects: An Exploratory Study through a Social Sustainability Perspective. *IIM Kozhikode Society & Management Review*. 9 (2020)
8. Heising, W.: The Integration of Ideation and Project Portfolio Management – A Key Factor for Sustainable Success. *International Journal of Project Management*. 30, 582–595 (2012)
9. Huemann, M., Silvius, A.J.G.: Projects to create the future: Managing projects meets sustainable development. *International Journal of Project Management*. 35 (2017)
10. Hueskes, M., Verhoest, K., Block, T.: Governing public–private partnerships for sustainability. *International Journal of Project Management* (2017)
11. Hwang, B.-G., Ng, W.: Project management knowledge and skills for green construction: Overcoming challenges. *International Journal of Project Management*. 31, 272–284 (2013)

12. Individual Competence Baseline for Project Management (Ebook) International Project Management Association [IPMA]. Version 4.0.1 – Project Management. 212 p. (2015)
13. Keays, L., Huemann, M.: Project benefits co-creation: Shaping sustainable development benefits. *International Journal of Project Management* (2017)
14. Kivilä, J., Martinsuo, M., Vuorinen, L.: Sustainable project management through project control in infrastructure projects. *International Journal of Project Management*. 35 (2017)
15. López, M., Cartelle Barros, J.J., del Caño Gochi, A., Lara, M.: New Approach for Managing Sustainability in Projects. *Sustainability*. 13. 7037 (2021)
16. Marnewick, C., Silviu, A.J.G., Schipper, R.P.J.: Exploring Patterns of Sustainability Stimuli of Project Managers. *Sustainability*. 11. 5016 (2019)
17. Martens, M., Carvalho, M.: Key factors of sustainability in project management context: A survey exploring the project managers' perspective. *International Journal of Project Management*. 35 (2016)
18. Nussbaum, M.: Women's capabilities and social justice. *Journal of human development*, 1(2), 219–245 (2000)
19. Nussbaum, M.: *Creating capabilities*. Harvard University Press (2011)
20. P2M. A Guidebook of Program & Project Management for Enterprise Innovation [International Edition] Project Management Association of Japan [PMAJ]. Third Edition. 428 p. (2017)
21. Sabini, L., Alderman, N.: The Paradoxical Profession: Project Management and the Contradictory Nature of Sustainable Project Objectives. *Project Management Journal*. 52 (2021)
22. Sabini, L., Muzio, D., Alderman, N.: 25 years of 'sustainable projects'. What we know and what the literature says. *International Journal of Project Management*. 37, (2019)
23. Sen, A.: Equality of what? In S. M. McMurrin (Ed.), *Tanner Lectures on Human Values* (pp. 197–220). Cambridge: Cambridge University Press. Vol. 1 (1980)
24. Sen, A. (2009). *The idea of justice*. Harvard University Press.
25. Shaukat, M., Latif, F., Sajjad, A., Eweje, G.: Revisiting the relationship between sustainable project management and project success: The moderating role of stakeholder engagement and team building. *Sustainable Development* (2021)
26. Silviu, A.J.G., Schipper, R.P.J.: Sustainability in Project Management Competencies: Analyzing the Competence Gap of Project Managers. *Journal of Human Resource and Sustainability Studies*. 2, 40–58 (2014)
27. Silviu, A.J.G., Schipper, R.P.J.: Exploring variety in factors that stimulate project managers to address sustainability issues. *International Journal of Project Management*. 38 (2020)
28. Toljaga-Nikolic, D., Todorovic, M., Dobrota, M., Obradovic, T., Obradović, V.: Project Management and Sustainability: Playing Trick or Treat with the Planet. *Sustainability*. 12, 8619 (2020)
29. Wang, W.: The concept of sustainable construction project management in international practice. *Environment, Development and Sustainability*. 23 (2021)
30. Xue, J., Rasool, Z., Gillani, A., Khan, A.: The Impact of Project Manager Soft Competences on Project Sustainability. *Sustainability*. 12. 6537 (2020)
31. Yuan, H.: Achieving Sustainability in Railway Projects: Major Stakeholder Concerns. *Project Management Journal*. 48, 115–132 (2017)
32. Zainul Abidin, N., Pasquire, C.: Revolutionize value management: A mode towards sustainability. *International Journal of Project Management*. 25, 275–282 (2007)