

## ASSESSING THE ROLE OF PROJECT MANAGER IN AGILE ENVIRONMENTS

Cătălin TUDOSE<sup>1</sup>, Costin Anton BOIANGIU<sup>2</sup>, Iulia Bianca BĂDOI<sup>3</sup>,  
Elena Alexandra IORDACHE<sup>3</sup>

*Agile methodology does not formally define the role of a project manager, and the Scrum methodology distributes this role among team members. However, the success of software development projects often depends heavily on this role, so typically, one person assumes the responsibility of a project manager in Agile environments. Project managers must adapt their strategies to address the various challenges of this constantly evolving market as more companies embrace Agile approaches to improve their flexibility and responsiveness. The objective of this article is to evaluate project managers' roles in Agile environments by examining various aspects of their responsibilities and contributions. Project managers play crucial roles in planning, organizing, and guiding teams, with a primary focus on enhancing communication, managing resources, mitigating risks, and fostering collaboration. Key insights into the role of project managers in Agile software teams will be explored through a systematic review of the literature. The paper will also investigate how project managers balance internal and external dynamics, embrace change, and promote innovation to lead successful relationship management in Agile environments.*

**Keywords:** Agile Methodology, Project Manager Role, Scrum Framework, Software Development, Team Collaboration, Resource Management, Risk Mitigation, Innovation in Agile

### 1. Introduction

Agile project management has become increasingly influential in the software industry due to its iterative development process and ability to adapt to changing requirements [1]. This methodology is well-suited for intricate and dynamic projects, as it emphasizes client feedback, flexibility, and teamwork [2].

Despite the inherent flexibility of Agile and its lack of a formal definition for a dedicated project manager, this role remains crucial for guiding projects

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<sup>1</sup> Lecturer, PhD, Computer Science and Engineering Department, National University of Science and Technology POLITEHNICA Bucharest, Romania, e-mail: catalin.tudose@gmail.com

<sup>2</sup> Prof., PhD, Computer Science and Engineering Department, National University of Science and Technology POLITEHNICA Bucharest, Romania, e-mail: costin.boiangiu@cs.pub.ro

<sup>3</sup> Student, Computer Science and Engineering Department, National University of Science and Technology POLITEHNICA Bucharest, Romania, e-mail: iuliabianca.badoi@stud.acs.upb.ro, elena.iordache1207@stud.acs.upb.ro

toward their goals, managing resources effectively, and ensuring the successful application of Agile principles [3]. Project managers in Agile environments are responsible for meeting project milestones on time and fostering a culture of openness, flexibility, and continuous improvement. To manage such complex projects, project managers must possess excellent leadership, communication, and problem-solving skills.

The evolution of project management represents a significant transformation driven by the adoption of Agile methods in the conventional technology industry. Key Agile practices, such as short-frequency iterations, daily Scrum meetings, retrospectives, Sprint planning, Sprint reviews, and backlogs, have been successfully extended across various domains [4]. Studies have demonstrated the potential of Agile project management within unexplored IT-related fields, highlighting opportunities for further research and active application to support its global expansion [5].

## **2. Project management in an Agile environment**

The Agile methodology has gained a lot of influence in the industry due to its ability to adapt to change and deliver value in a dynamic environment. This section will dig into the core principles, roles, and characteristics of project managers in Agile environments.

### ***2.1. Definition and core principles of the Agile methodology***

Agile is a methodology that lays the accent on flexibility, collaboration, feedback from clients, and incremental delivery. The Agile Manifesto [1] stands up for continuous software delivery to meet customer needs [6]. The process is structured to meet the customer's needs, using them to ensure that the end product offers an advantage in the marketplace.

The Agile framework also focuses on delivering functional software on short notice, encouraging daily communication between engineers and business analysts. The key to success is to organize projects around determined individuals, provide them with the support they need, and have confidence in their ability to complete assignments. Self-organizing teams are thought to provide the best outcomes, and frequent reviews allow the team to modify practices to increase performance.

### ***2.2. Characteristics of Agile Projects***

There are numerous significant ways in which Agile projects differ from conventional project management techniques [7]:

- Accepting change: Agile projects are adaptive enough to adjust to changes in requirements, scope, or priorities as they arise.

- Cross-functional teams: Agile team members have various skills that allow them to work on different tasks.
- Iterative development: Rather than delivering a complete product at the end of the project, Agile focuses on delivering increments of value in short iterations known as sprints.
- Customer-centered approach: Customer feedback is integrated into every stage of development, ensuring that the delivered product meets or exceeds customer expectations.

### ***2.3. Iterative, Incremental, and Adaptive Approach in Agile***

The iterative method in Agile implies breaking down the development process into smaller cycles called sprints. Each iteration results in a potential shippable product that will bring value to the whole solution. This iterative approach enables continuous improvement, adaptability to changing requirements, and early delivery of valuable features [8].

Agile projects embrace adaptive planning, which involves making decisions based on current information and feedback rather than trying to predict the future accurately [9]. The planning process is flexible, allowing for changes as new information emerges during the project's execution. This adaptability enables teams to respond effectively to evolving market conditions or customer needs, but the practice of Agile project management implementation requires more research [10]. Applying the Agile methodology provides even more challenges in particular economic and political contexts [11] or in particular disruptive periods [12].

### ***2.4. Role of Project Manager in Agile Projects***

In an Agile environment, the role of a project manager evolves to focus more on facilitation, collaboration, and servant leadership rather than traditional command-and-control management [13]. The responsibilities of a project manager often overlap with the ones of the Agile-defined roles of Scrum Master and Product Owner: facilitating communication within the team and with stakeholders, removing obstacles hindering team progress, supporting team members in self-organization and decision-making, and ensuring alignment with organizational goals while empowering teams to make decisions.

By adapting their approach to align with Agile values and principles, project managers play a crucial role in fostering an environment conducive to iterative development, continuous improvement, and customer satisfaction [14].

By understanding these fundamental aspects of Agile project management, organizations can effectively leverage its principles to drive successful project outcomes in dynamic and rapidly evolving environments.

### **3. Methodology**

For a deep examination of project managers' activities in Agile environments, we combined a comprehensive analysis of the current literature and a detailed empirical study. We will present an overview of the approached research, data collection methods, and data analysis techniques.

#### ***3.1. Overview of Previous Research***

Among the studies investigating the work of project managers in Agile contexts, we distinguish the comparison between the accomplishments of different roles, as mentor, coordinator, negotiator, and process adapter, and the analysis of their boundaries [15]. The golden triangle in project management (scope, cost, time) generates particular problems for teams working in short iterations, requiring critical decisions [16].

Project managers are crucial for helping the team communicate, coordinating everyone's efforts, and handling what stakeholders expect. However, there's no agreement on exactly what project managers should do and what skills they need in Agile projects. The classical view on project management, a long time before the introduction of the Agile methodology, is represented by the work of Wilemon and Cicero [17]. The Agile framework and the complexity of contemporary projects provide the challenge of adapting this approach. The difficulties that project managers face in Agile include adjusting to changing needs, managing how the team works together, and juggling what stakeholders want.

Effectiveness, as one of the grounds for using the Agile framework, may be examined using expert survey and comparative analysis [18]. The resulting values of performance indicators may be determined by applying the iterative formulation of a fuzzy cognitive map [19]. Organizational structure, project groups, support from the top management, communication barriers, user experience, resource and knowledge constraints remain open issues, despite the long-time implementation of the methodology [20].

The project manager's role is crucial in mitigating the project risk. Exploring different cultural attitudes towards risk constitutes an important element of Agile risk management [21][22], but Agile development does not include specific risk management practices [23]. Consequently, the companies and the project managers need to enable the creation of action plans to handle the risks [24]. The traditional and Agile methodologies need to be adapted and updated to clearly divide the responsibilities of the project manager, product owner, scrum master, and team [25].

#### ***3.2. Addressing Research Gaps***

This quantitative study aims to fill in the missing parts from other works. It plans to collect data from project team members working on various Agile projects

and analyze it using appropriate statistical methods. The plan is to examine the experience of people in project teams using Agile and then analyze the statistical results. The study will focus on these key areas:

- **Leadership:** How project managers demonstrate leadership in Agile teams and how it affects team performance.
- **Facilitation:** The role project managers play in assuring effective communication and collaboration among team members.
- **Stakeholder Management:** How project managers handle what stakeholders expect and ensure they align with project goals.
- **Team Collaboration:** The ways project managers encourage teamwork and create a positive team atmosphere.

Through this quantitative study, the researchers aim to gain valuable insights into the particular methods and approaches project managers use in Agile environments. The results will contribute to our understanding of their role in Agile projects, assisting organizations in improving their practices.

### ***3.3. Data Collection and Analysis***

We gathered information through surveys from project teams using Agile in their practice. The questions were designed to explore different aspects of the project manager's responsibilities, challenges encountered, and methodologies approached. The survey collected responses from a diverse group of 179 participants, all involved in 16 Agile projects, in different positions. The participants in the study are active in three large IT multinational companies. We originally addressed the Bucharest/Romania branch of each company, which helped the quiz to be forwarded to other branches, from Poland, Germany, Bulgaria, Italy, Serbia, Switzerland, and Turkey. We were also interested in the practical experience of the managers in conducting Agile and non-Agile projects, and Table 1 illustrates this information.

*Table 1*

**Experience of managers conducting projects**

Career experience in an Agile environment	Number of managers
Less than 25%	3
25-50%	4
50-75%	5
More than 75%	4

Based on the responses received in the survey, we have made various statistics, which we will illustrate in the following figures.

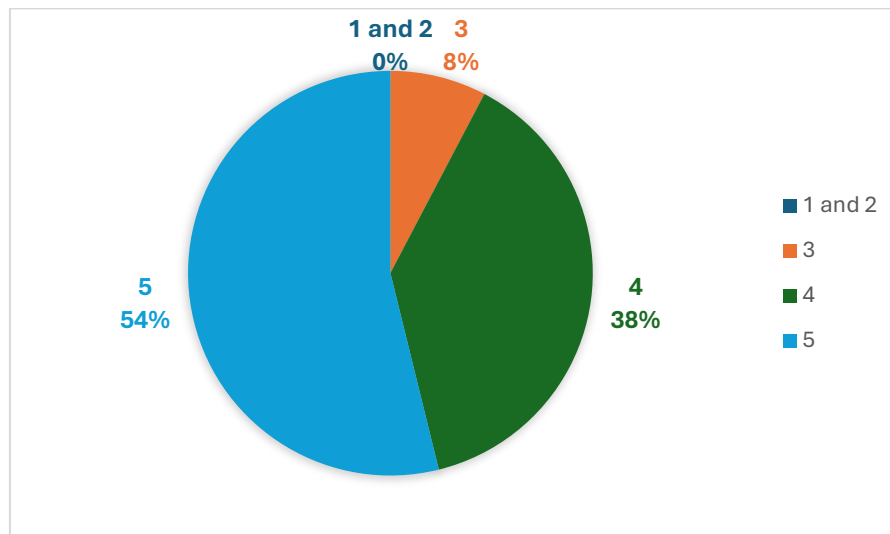


Fig. 1: PM's ability to effectively communicate Agile principles and methodologies

Fig. 1 indicates that 92% of participants rated the project manager's proficiency in conveying Agile principles and methodologies as either 4 or 5, emphasizing the project manager's communication skills. The effectiveness of the communication of Agile principles and methodologies influences the team's application of these principles, with an important role in the Agile project's success.

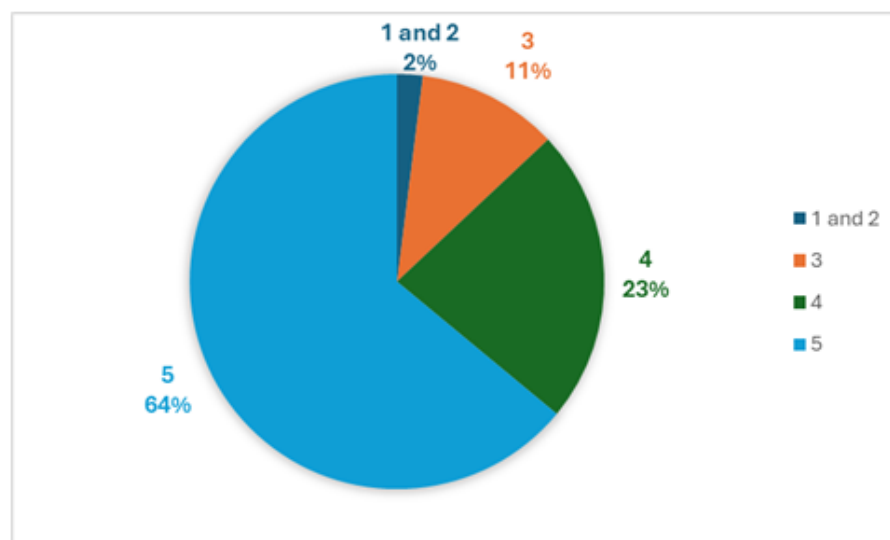


Fig. 2: PM's ability to encourage and facilitate collaboration among team members

Fig. 2 shows that 87% of the respondents rate as 4 or 5 the project manager's ability to encourage and facilitate collaboration among team members, indicating a

pretty high efficiency. This plays a key part in the success, as working together must bring the team to achieve the shared goal.

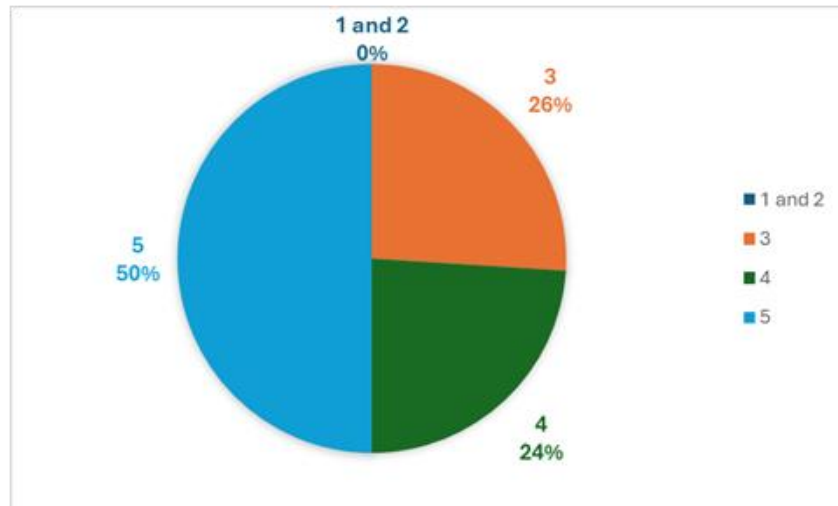


Fig. 3: PM's ability to ensure the team's understanding of project goals and priorities

Fig. 3 shows that 74% of the respondents evaluate as 4 or 5 the project manager's ability to ensure the team's understanding of project goals and priorities, also a pretty high efficiency. Focusing on goals and prioritizing them is very important in Agile projects. The remaining percentage for the evaluation with 3 indicates some challenges of integrating this specific Agile way of working with the regular duties of the project managers.

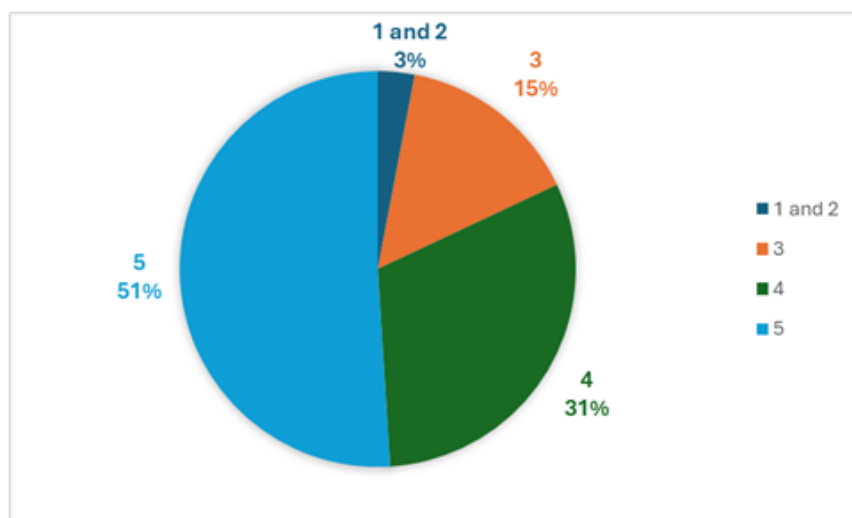


Fig. 4: PM's capacity to adapt to changes in project scope or to requirements within Agile sprints

Fig. 4 shows that 82% of the respondents evaluate as 4 or 5 the project manager's capacity to adapt to changes in project scope or to requirements within Agile sprints. This is essential in an Agile environment, as quick adaptation to change is fundamental. Fig. 5 indicates a generally positive perception of the project manager's contribution to creating an environment for ongoing development in Agile methodology, but at a lower level for other abilities, so we decided to detail the research.

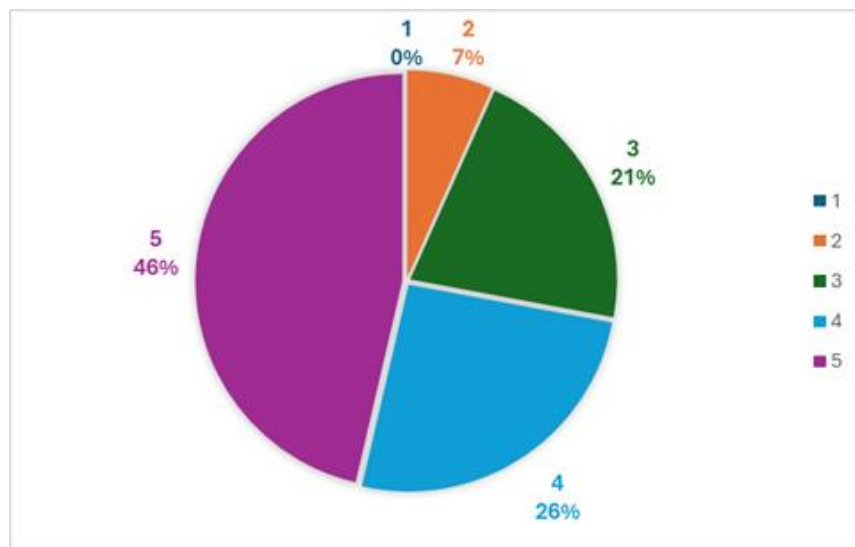


Fig. 5: PM's ability to promote a culture of continuous improvement

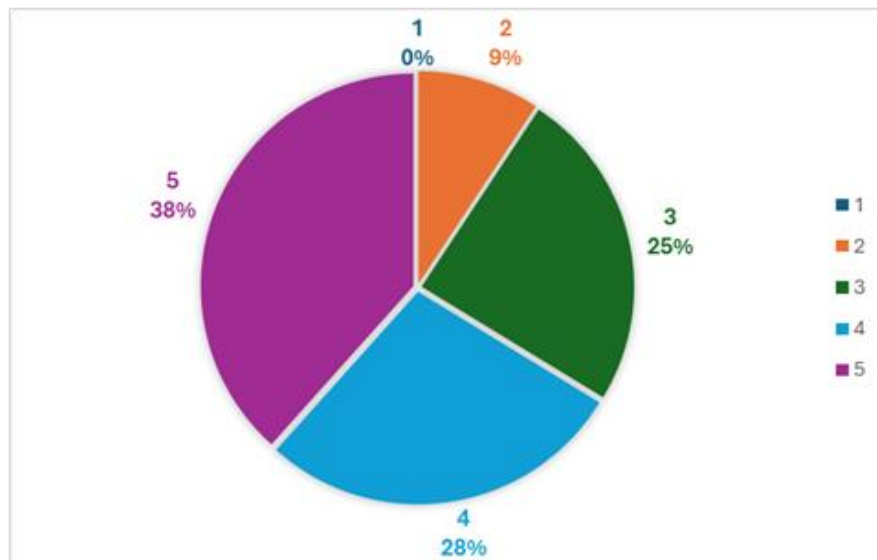


Fig. 6: Ability of PMs with less than 50% practice in Agile to promote a culture of continuous improvement



Studying the impact of the manager's experience in Agile and non-Agile environments on this ability, we separated the evaluation into two pieces: managers with less and with more than 50% of practice in Agile projects.

Fig. 6 shows that, for the ability to promote a culture of continuous improvement for managers with less than 50% of practice in an Agile environment, the 5 evaluations lower from the overall 46% to 38%, while the 2 and 3 evaluations raise from 28% to 34%.

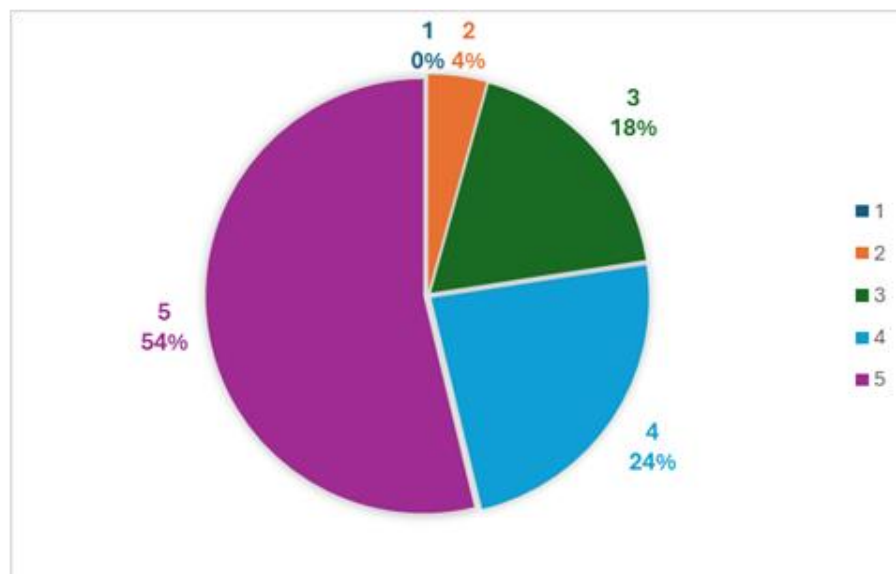


Fig. 7: Ability of PMs with more than 50% of practice in Agile to promote a culture of continuous improvement

Fig. 7 shows that, for the ability to promote a culture of continuous improvement for managers with more than 50% of practice in an Agile environment, the 5 evaluations rise from the overall 46% to 54%, while the 2 and 3 evaluations lower from 28% to 22%.

Fig. 8 shows that 68% of the participants evaluate as 4 or 5 the project manager's ability to empower and support the Agile team to self-organize. However, the evaluation with 2 and 3 has 32%, a pretty high percentage. The challenges of the self-organized teams, as characteristic of Agile projects, raise problems for almost one-third of the project managers, so we decided to detail the research. As previously done, we separated the evaluation into two pieces: managers with less and with more than 50% practice in Agile projects.

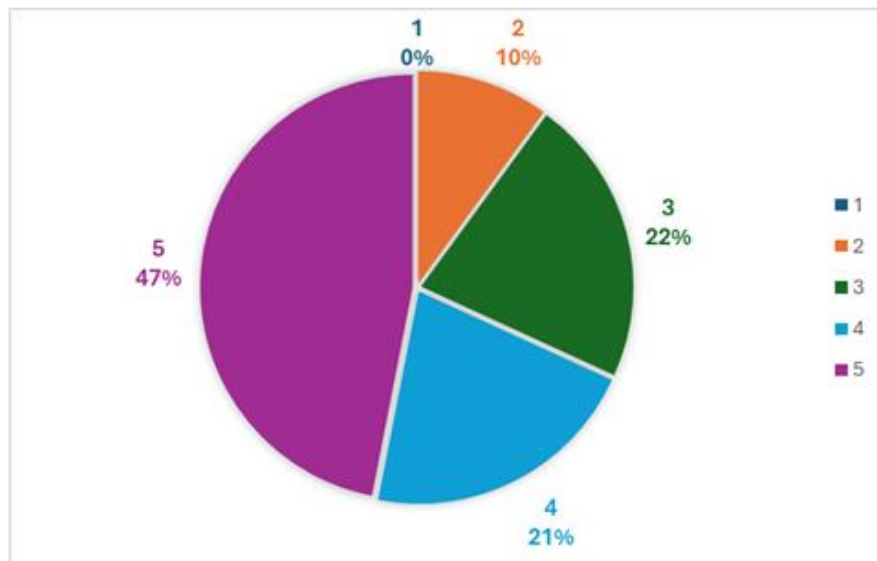


Fig. 8: PM's ability to empower and support the Agile team to self-organize

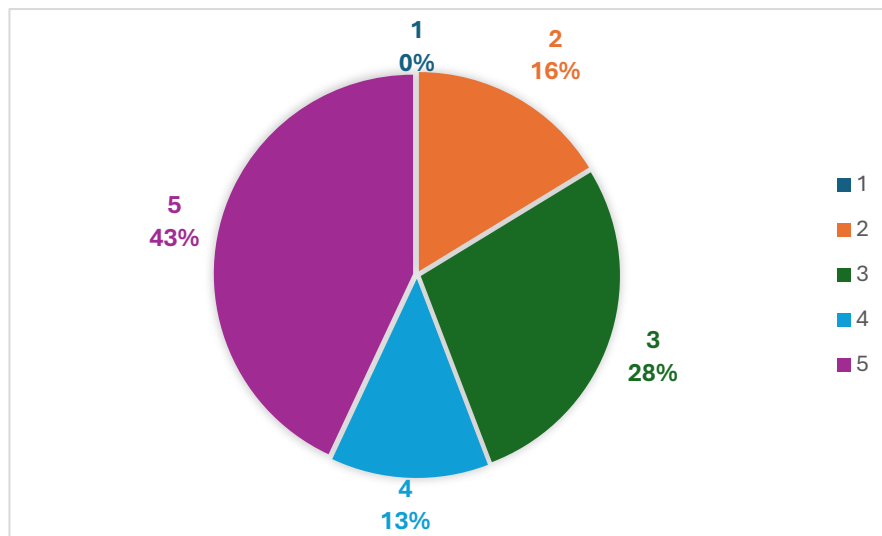


Fig. 9: Ability of PMs with less than 50% of practice in Agile to empower and support the Agile team to self-organize

Fig. 9 shows that, for the ability to empower and support teams to self-organize for managers with less than 50% of practice in an Agile environment, the 5 evaluations lower from the overall 47% to 43%, while the 2 and 3 evaluations raise from 32% to 44%.

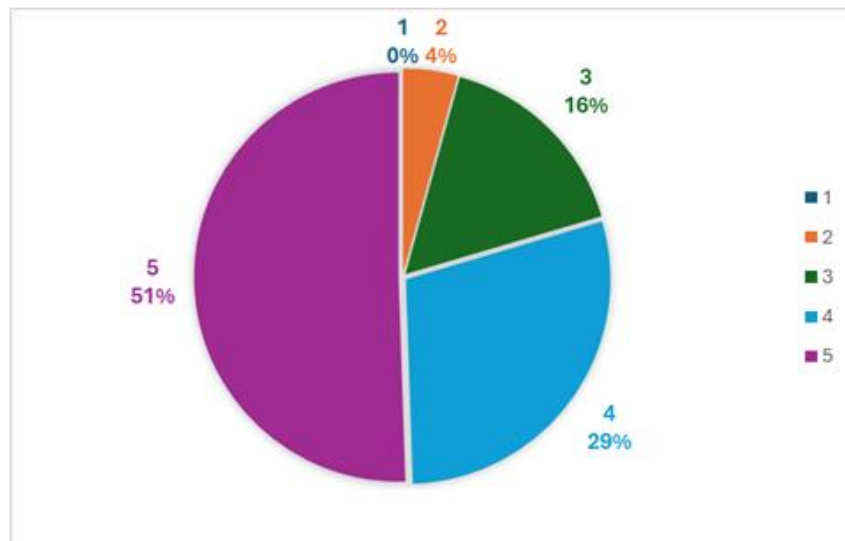


Fig. 10: Ability of PMs with more than 50% of practice in Agile to empower and support the Agile team to self-organize

Fig. 10 shows that, for the ability to empower and support teams to self-organize for managers with less than 50% of practice in an Agile environment, the 5 evaluations rise from the overall 47% to 51%, while the 2 and 3 evaluations lower from 32% to 20%.

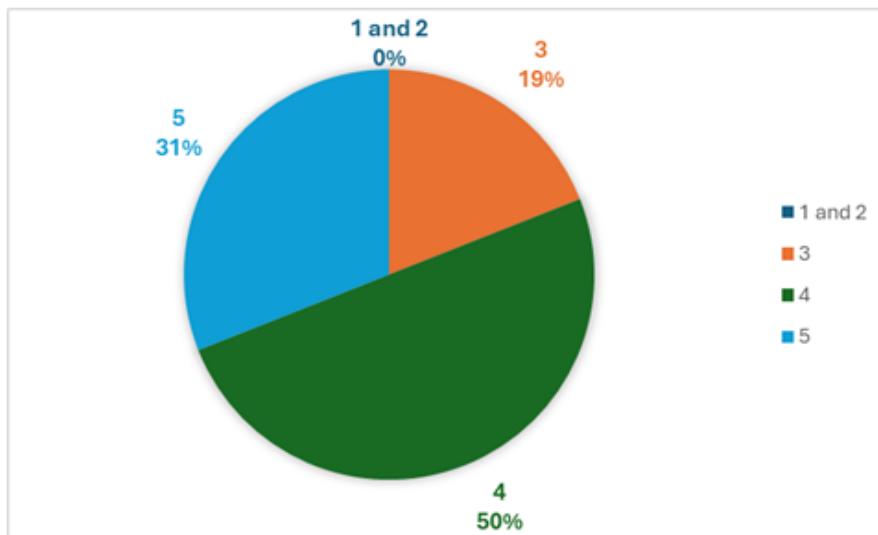


Fig. 11: Overall satisfaction with the PM's performance in leading Agile projects

Fig. 11 shows a highly dominant percentage of 50% for the 4 evaluations regarding the overall satisfaction with the PM's performance in leading Agile projects. More than this, it is the only question of the survey where the 5 responses

do not gather most of the votes. The overall satisfaction is influenced by the challenges that many project managers face while working with particular Agile characteristics that they do not fully master, as our survey demonstrated: promoting a culture of continuous improvement, and empowering and supporting the Agile team to self-organize.

#### **4. Key findings**

The study intended to address the previously identified research gaps and focused on the specific areas of Agile.

While there is a generally positive perception of the abilities and activities of the project managers, we also identified the key areas for improvement and where the previous Agile experience is decisive. Promoting a culture of continuous improvement, one of the characteristics of Agile, is well appreciated by 78% of the managers with dominant Agile practice (evaluations of 4 and 5) and only 66% of the managers with less Agile practice.

Also, the ability to empower and support the teams to self-organize is well perceived for 80% of the dominant Agile practitioners (evaluations of 4 and 5) and only 56% of the managers with less Agile practice. The key findings of this study emphasize the importance of the Agile practice for implementing the ideas of continuous improvement and self-organization, which require soft skills and experience to work in a real environment.

#### **5. Conclusions**

The literature establishes a theoretical foundation, presenting topics such as effective project management in Agile, the evolution of Agile practices, and the distinct characteristics of Agile projects: acceptance of change, cross-functional teams, iterative development, and a customer-centered approach. Previous studies have focused on the role of the project manager as a mentor, coordinator, negotiator, and process adapter in managing risk. Our research complements this by evaluating project managers' abilities through surveys and data analysis, concentrating on key Agile characteristics and the overall practical experience of the managers. Additionally, we detailed the analysis in areas where the results appeared weaker, exploring the root causes.

One important factor contributing to these results is the particular challenges posed by Agile methodologies, which not all managers could fully embrace, especially after extensive experience with other development frameworks. The results underscore the crucial role of project managers in Agile environments. Their effective communication of Agile principles, facilitation of collaboration, and problem-solving skills significantly contribute to project success. While generally positive, there are necessary improvements in project managers' abilities to

promote a culture of continuous improvement and to empower and support Agile teams to self-organize. These abilities are heavily impacted by the overall management experience in both Agile and non-Agile environments. Additionally, the lack of these skills has been shown to affect overall satisfaction with the project manager's performance in leading Agile projects.

It is essential to study the long-term impact of Agile practices on projects and teams. Future research may focus on a more detailed analysis of the factors that influence a positive perception of Agile concepts and tools. This includes in-depth research on the challenges and successes of project managers across various industries and project types, offering a broader understanding of their role beyond Agile. Exploring innovative training programs to enhance project managers' adaptability and leadership in dynamic projects could further advance project management practices. Future research should aim to provide practical insights to help organizations improve their project management across different project scenarios.

## REFERENCES

- [1]. *Agile Manifesto*, <https://agilemanifesto.org/>
- [2]. E. Fisher, What Practitioners Consider to Be the Skills and Behaviours of an Effective People Project Manager. *International Journal of Project Management* Vol. 29, Issue 8, pp. 994–1002, 2011.
- [3]. I. Noguera, A.E. Guerrero-Roldán, R. Masó, Collaborative Agile Learning in Online Environments: Strategies for Improving Team Regulation and Project Management. *Computers & Education* 116, pp. 110–129.
- [4]. Y.H. Kwak, A Brief History of Project Management. *The Story of Managing Projects*, Quorum Books, 2005
- [5]. D. Dalcher, *The Evolution of Project Management Practice: From Programmes and Contracts to Benefits and Change*. Routledge, 2017
- [6]. A. Abbasi, A. Jaafari, Evolution of Project Management as a Scientific Discipline. *Data and Information Management* Vol. 2, Issue 2, pp. 91–102, 2018.
- [7]. G.G. Miller, The Characteristics of Agile Software Processes, *International Conference on Technology of Object-Oriented Languages*, IEEE Computer Society, 2001.
- [8]. A. Whiteley, J. Pollack, P. Matous, 2021. The Origins of Agile and Iterative Methods. *The Journal of Modern Project Management*, pp. 20-29, 2021.
- [9]. C.G. Cobb, *The Project Manager's Guide to Mastering Agile: Principles and Practices for an Adaptive Approach*. John Wiley & Sons, 2023
- [10]. S. Suetin, E. Vikhodtseva, S. Nikitin, A. Lyalin, I. Brikoshina, Results of Agile Project Management Implementation in Software Engineering Companies, *ITM Web of Conferences* 6, 03016, 2016
- [11]. A. Alhroub, A.A.M. Jaaron, Assessing Agile Project Management Practices: The Case of Palestinian Software Development Companies, *Middle East Journal of Management* Vol. 6, No. 1, pp. 95-120, 2019
- [12]. M. Sharma, S. Luthra, S. Joshi, J. Himanshu, Challenges to Agile Project Management during COVID-19 Pandemic: an Emerging Economy Perspective, Vol. 15, pp. 461-474, 2022.

- [13]. *J. McAvoy, T. Butler*, The Role of Project Management in Ineffective Decision Making within Agile Software Development Projects. *European Journal of Information Systems*, Vol. 18, pp. 372–383, 2009.
- [14]. *T.J. Gandomani, Z. Tavokali, H. Zulzalil, H.K. Farsani*, The Role of Project Manager in Agile Software Teams: A Systematic Literature Review, *IEEE Access* Vol. 8, pp. 117109–117121, 2020.
- [15]. *Y. Shastri, R. Hoda, R. Amor*, Understanding the Roles of the Manager in Agile Project Management. *Proceedings of the 10th Innovations in Software Engineering Conference*, 2017.
- [16]. *M.L. Drury-Grogan*, Performance on Agile Teams: Relating Iteration Objectives and Critical Decisions to Project Management Success Factors. *Information and Software Technology* Vol. 56, Issue 5, pp. 506–515, 2014.
- [17]. *D.L. Wilemon, J.P. Cicero*, The Project Manager — Anomalies and Ambiguities. *Academy of Management Journal*, Vol. 13, Issue 3, pp. 269–282, 1970.
- [18]. *S. Y. Ozornin, N. G. Terlyga, D. B. Shulgin*, Method for Evaluating the Agile Project Management Effectiveness in Information Technology Enterprises, *AIP Conf. Proc.* 2174, 020151, 2019.
- [19]. *M. Dursun, N. Goker, H. Mutlu*, A Fuzzy Decision Aid for Evaluating Agile Project Management Performance Indicators, *AIP Conf. Proc.* 2116, 450031, 2019.
- [20]. *M.F. bin Ismail, Z. Mansor*, Agile Project Management: Review, Challenges and Open Issues, *Advanced Science Letters*, Vol. 24, Number 7, pp. 5216-5219(4), 2018.
- [21]. *A. Moran*, Project Risk Management, in *Agile Risk Management*. SpringerBriefs in Computer Science. Springer, Cham, 2014.
- [22]. *A. Moran*, Agile Risk Management, in: *Agile Risk Management*. SpringerBriefs in Computer Science. Springer, Cham, 2014.
- [23]. *B.G. Tavares, C.E.S. da Silva, A. D. de Souza*, Practices to Improve Risk Management in Agile Projects, *International Journal of Software Engineering and Knowledge Engineering*, Vol. 29, No. 03, pp. 381-399, 2019.
- [24]. *J.C. dos Santos, V.P.A. Coelho, F.M. Fonseca, D.S. Mendonça*, Implementing a Simplified Risk Management Approach in Agile Software Development: An Experience Report, *SBQS '23: Proceedings of the XXII Brazilian Symposium on Software*, pp. 254-263, 2023.
- [25]. *G.J. Miller*, Project Management Tasks in Agile Projects: A Quantitative Study, 2019 *Federated Conference on Computer Science and Information Systems (FedCSIS)*, Leipzig, Germany, pp. 717-721, 2019.