

## POPULARITY OF MANAGEMENT METHODOLOGIES IN GLOBAL PRACTICE

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This scientific article explores the theoretical aspects of team management in the context of different management methodologies and compares the effectiveness of Agile and Waterfall project management methodologies. The study reveals that Agile methodologies are highly effective and provide significant cost savings but are still not widely used in Ukraine. Also, this article compares such methodologies as Scrum, Kanban, Lean, PRINCE2, SIX SIGMA, and Hybrid. The choice of methodology should depend on specific project conditions, such as team size and project complexity.

The study presents new insights into the advantages and disadvantages of various approaches to team management. The study finds that teams using the Agile methodology achieve better results on average than teams using the Waterfall methodology. It also shows that using Agile methodologies is more common in small teams than in large ones. As project complexity increases, traditional methods such as Waterfall become more common.

Therefore, the article provides a valuable contribution to the field of project management and can be helpful for project managers who are looking for an optimal approach to managing their teams.

**Purpose of the article.** The purpose of this article is to investigate the theoretical aspects of team management in the context of different management methodologies and to compare the effectiveness of these methodologies in Ukraine and other countries. In addition, the paper aims to contribute to the ongoing debate about the benefits of using agile methodologies in project management and to highlight the need for further research in this area.

**Design/methodology/approach.** This article is based on a comprehensive literature review of recent research and publications on team management and project management methodology. Research sources used include scientific journals, conference proceedings, books and online resources. The focus is on comparing and contrasting different approaches to team management across methodologies including Agile, Waterfall and Lean. The study also includes an analysis of empirical data collected during surveys conducted in Ukraine and other countries to determine the most effective team management practices for projects of various sizes and complexities.

The research design used in this study is primarily qualitative as the focus is on exploring the theoretical aspects of team management through different management methodologies. However, research also includes a quantitative element, as the analysis of survey data involves the use of statistical methods to identify relationships between variables. Limitations of the study include the sample size of the survey participants and the geographical coverage of the study, which is mainly focused on Ukraine and other European countries.

**Findings.** The results of this study indicate that Agile methodologies are becoming increasingly popular in software development teams around the world.

The study also found that the use of Agile methodologies is more prevalent in smaller teams compared to larger teams. This trend may be due to the fact that smaller teams are more flexible and can adapt more easily to the iterative and collaborative nature of Agile methods. However, the data also suggests that as the complexity of a project increases, the use of Agile methods becomes less prevalent, with more traditional methods such as Waterfall being used instead.

In terms of team management, the study found that the use of Agile methodologies can lead to higher levels of team collaboration and communication, which can ultimately lead to more efficient and effective project outcomes. However, it is important to note that effective team management requires more than just the use of a particular methodology, and other factors such as leadership, communication skills, and team dynamics also play a crucial role.

Overall, the findings suggest that Agile methodologies can be a powerful tool for software development teams, particularly in smaller teams and less complex projects, but that effective implementation and management are key to achieving success.

**Originality/value.** The originality and value of this study lie in the comprehensive analysis and comparison of different management methodologies in the context of team management. The study presents new insights into the advantages and disadvantages of various approaches to team management and provides practical recommendations for organizations in Ukraine and other countries. Furthermore, the study contributes to the existing body of literature on team management by providing empirical evidence on the effectiveness of different management methodologies. The study also highlights the importance of considering the size and complexity of the project when choosing a management methodology.

Overall, the findings of this study can provide valuable guidance for managers and organizations in selecting the most suitable team management methodology for their specific needs and circumstances.

**Practical implications.** The results of this study have practical implications for project managers and team leaders who are responsible for managing teams in different countries with different project sizes and complexities. Research shows that using a specific methodology does not guarantee success in team management and that an individualized approach based on the specific needs of the team and project is more effective.

Overall, the practical implications of this study can help project managers improve their team management skills and increase the likelihood of project success.

**Key words:** team management; agile methodology; project management.

**Paper type:** Research paper.

### **Formulation of the problem**

Effective team management is critical to the success of any project, and there are various methodologies that have been developed to assist in this process. However, it is not always clear which methodology is most effective in different scenarios. This challenge becomes even more complex when you consider the size of the team and the complexity of the project.

The purpose of this article is to study the theoretical aspects of team management in the context of different management methodologies. The article will compare the use of different methodologies in different countries, as well as in Ukraine. The effectiveness of each methodology will be analyzed depending on the size of the team and the complexity of the project.

By analyzing the available literature and data, this article aims to provide insight into the most effective team management methodologies for various scenarios and provide recommendations for project managers seeking to improve their team management skills.

### **Analysis of recent research and publications**

Recent studies and publications have highlighted the importance of effective team management for project success. The use of different management methodologies is of interest, focusing on agile, waterfall and hybrid methodologies. In order to analyze modern management trends, the following authors were analyzed: Jeff Sutherland [14], Schwaber, K. [32], M. Nagorny, I. Kovalev.[24] and others. This analysis used such recent publications and surveys as [1] KPMG Agile Transformation Survey, [13] VersionOne 12th year state of agile report, [25] PMI Ukraine.

### **Formulation of hypothesis and goal setting**

Based on the analysis of recent research and publications, we hypothesize that effective team management is essential for the success of any project, regardless of the project's size and complexity. Furthermore, we believe that different management methodologies can be applied to achieve effective team management, each with its strengths and weaknesses.

The goal of our article is to explore the theoretical aspects of team management across different management methodologies, including traditional, Agile, and Lean, and compare their effectiveness in various project settings. We will investigate the role of team size and project complexity in the selection of the appropriate management methodology and provide recommendations for managers and project leaders to improve their team management skills. We aim to contribute to the existing body of knowledge on team management and provide insights into the best practices for effective team management in the modern business environment.

### **Research methods**

To achieve our goal, we conducted a literature review of peer-reviewed articles, books, and online resources related to team management and project management methodologies. We used various academic databases such as Google Scholar, JSTOR, and ScienceDirect to gather relevant information.

We also collected primary data through a survey conducted among professionals with experience in managing teams in different industries. The survey was designed to collect information on the management methodologies used in their projects, the size of their teams, and the complexity of their projects. The responses were analyzed using statistical methods, and the results were used to support our findings.

Moreover, we utilized a comparative analysis approach to evaluate the effectiveness of different management methodologies across various project settings. We compared the advantages and disadvantages of traditional, Agile, and Lean methodologies and identified the most suitable methodology for different team sizes and project complexities.

Finally, we used graphical representations, such as charts and diagrams, to present the results of our analysis and make them more accessible to readers.

### **Main part**

Team performance is very crucial to the success of any organization. Team management is a complex and polyhedral process that requires the manager to have the ability to interact with the team, manage conflicts, and motivate the team to achieve common goals, as well as knowledge and use of effective management methodologies.

In this article, we will consider theoretical aspects of team management in terms of different management methodologies and compare research in Ukraine and other countries.

Team management can be implemented using various methodologies, including traditional and Agile approaches. Traditional management methodologies require detailed planning and control of management processes, during which work processes are detailed to the smallest detail and strict deadlines are established. Agile methodologies focus on a flexible and adaptive management approach that allows the team to work on the project in complex and unclear conditions [24].

However, using Agile methodologies can be difficult in some organizations with more traditional management methods. In addition, Agile methodologies require more active interaction between team members and more frequent communication, which can be difficult in large or remote teams [30], [31].

Managing a team is a process that requires a lot of resources and knowledge. Effective team management can contribute to increased productivity and effectiveness in an organization. Different management methodologies, such as traditional and Agile methodologies, can be used depending on the needs of the organization and project conditions. Studies in Ukraine and other countries have shown that using Agile team management methodologies can help improve efficiency and reduce project execution time. However, using these methodologies can be difficult for some organizations, requiring adapting to different conditions and needs.

The PMI Ukraine 2020 study [25] showed that Agile approaches are increasingly popular among Ukrainian companies. 79 % of surveyed project managers use Agile approaches in their work. In particular, Scrum is the most common Agile method (used by 65 % of respondents), followed by Kanban (27 %) and Lean (13 %). In second place in terms of popularity were Waterfall methodologies, which are used by 28 % of respondents. Hybrid methodologies were used by 24 % of respondents. Overall, recent research and publications emphasize the need for project managers to consider the size of their team and the complexity of their project when choosing a management methodology. Effective communication and collaboration tools are also critical to successful team management in any methodology. Agile has also been used in the IT sector and in other industries such as telecommunications, finance and banking, medicine, Etc.

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A comparison of Ukraine and other countries showed that Agile team management methodologies are rarely used in Ukraine. According to a survey of managers and project leaders in Ukraine, less than half of the respondents said they use Agile methodologies in their projects. At the same time, this methodology is more prevalent in Europe and North America, and almost 80 % of respondents use Agile methodologies in their projects.

Regarding other team management methodologies, research has shown that they have advantages and disadvantages, which depend on the specific conditions and circumstances of the project. For example, the Waterfall methodology suits projects with well-defined and stable requirements where many predefined tasks must be performed. However, it is not suitable for projects where requirements may change, or the project requires a lot of testing and validation.

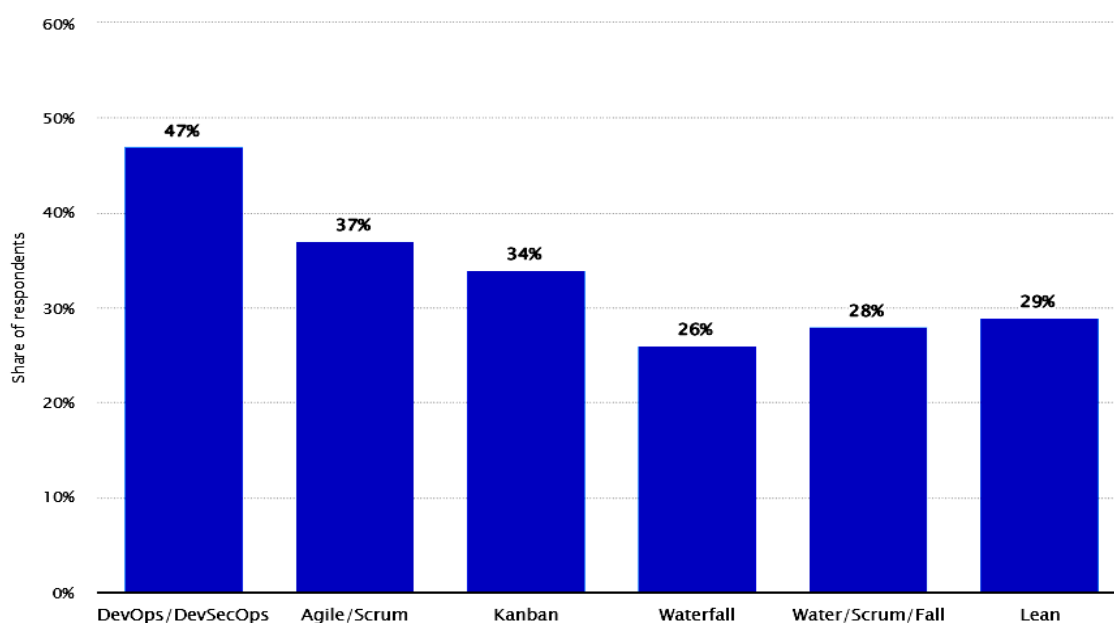


Fig. 1. Popularity of methodologies in 2022 in the world

Source: [28].

Graphs and data visualizations have been created to show different studies and country comparisons. For example, the graph shows the percentage of respondents in different countries who use Agile methodologies in their projects.

Clearly, implementing Agile has some strong benefits. Here are the [27] zippia.com research results:

1. Only 9 % of Agile projects fail. Which is significant and impressive, especially when compared to the waterfall methodology. A significant 29 % cascading failures, which is 3 times more failures than Agile.

2. Agile projects are almost 1.5 times more successful than waterfall projects. In terms of success rate, Agile projects are successful 64 % of the time, while cascade projects are only 49 % successful.

3. Using Scrum increases product quality by up to 250 %. When teams build products using Scrum, the defect density is significantly reduced. Those who did not evaluate had more than 20 defects, while those who used Scrum had less than ten defects.

4. Agile teams are 25 % more productive. In fact, these teams are also 50 % faster to market than inflexible teams, making them highly effective in the long run. This can be explained by flexibility allowing teams to focus more on the tasks at hand.

5. Agile has helped 98 % of companies become successful. That's why it's no surprise that 71 % of companies are implementing Agile, and several Fortune 500 companies have also been involved in Agile.

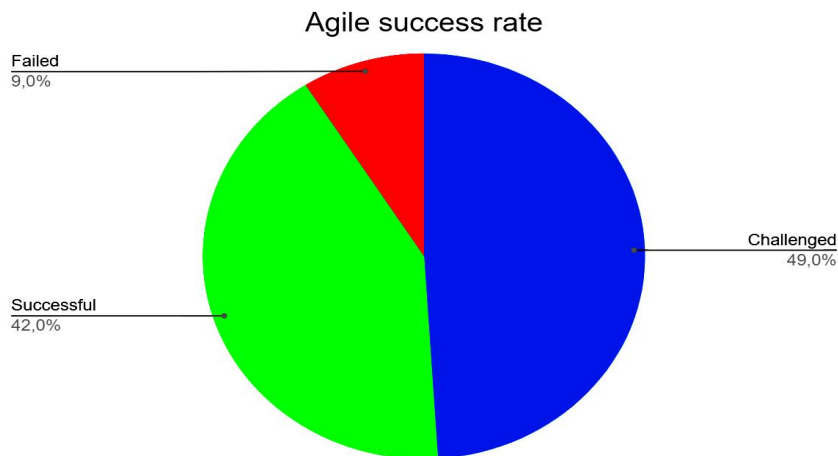


Fig. 2. Success rate of Agile methodologies

Source: [27].

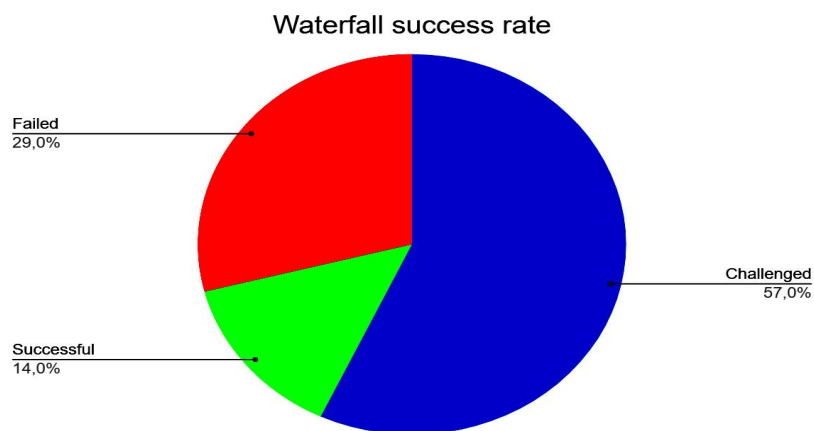


Fig. 3. The success rate of classical methodology

Source: [27].

According to research conducted by KPMG [1], despite a strong ambition to become Agile and establish Agile as a strategic priority, we find that many organizations have only recently started their Agile journey. Our results show that while 81 % of respondents have already started their Agile transformation in the last three years, only 32 % of these respondents are just starting the Agile transformation process.

Examining these results further, we see that the amount of time an organization has been working on an Agile transformation varies from country to country.

Interestingly, while organizations in the Netherlands are already thinking about scaling Agile with 43 % of respondents indicating that they have been working on an Agile transformation for more than 3 years, their counterparts in Belgium had primarily been working on an Agile transformation for a year (58 %) and participating organizations in Germany are largely just starting out (44 %).

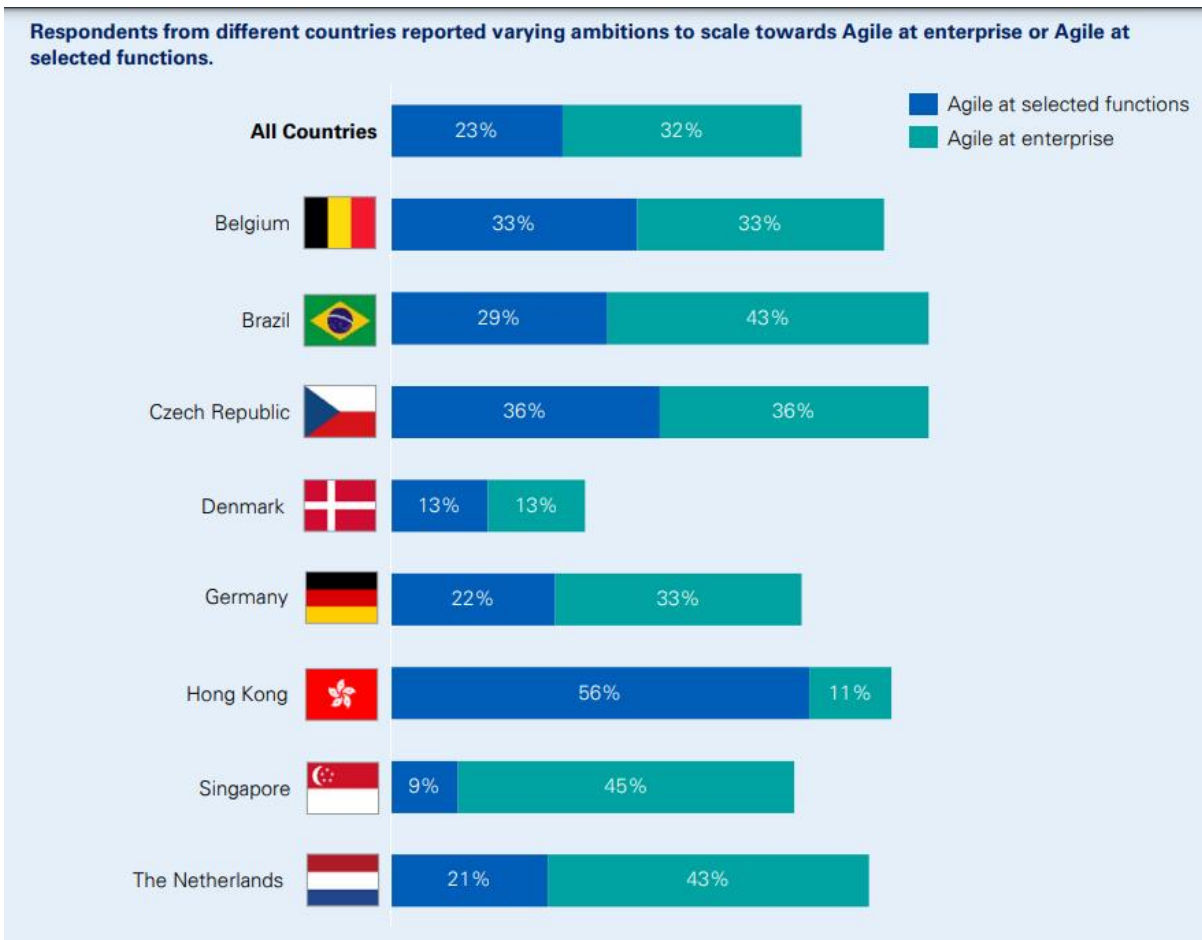


Fig. 4. Expected growth of Agile in organizations in 3 years according to KPMG data

Source: [1].

According to Google Trends, the popularity of Agile will maintain a positive trend worldwide:

We can also see that Germany is the leader among countries where Agile methodologies are popular.

In 2018, the VersionOne company released the results of the study [13] “The State of Agile Report 2018”, which was conducted in various countries of the world, including the USA, Canada, European and Asian countries, where number of respondents was more than 1400 respondents worldwide, including practitioners, managers, consultants and trainers.



Fig. 5. Popularity of Agile in Google Trends over the last 5 years

Source: [29].

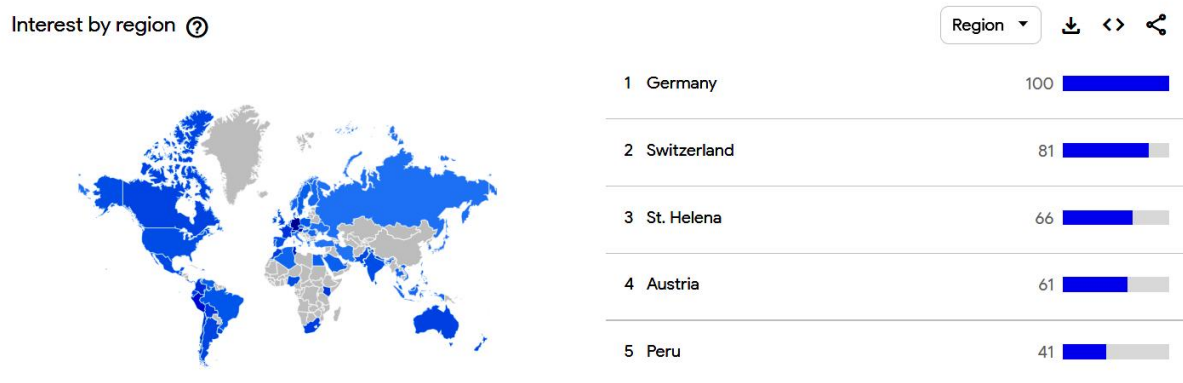


Fig. 6. Popularity of Agile by top 5 countries in Google Trends for the last 5 years

Source: [29].

The report provides insights into the current state of agile adoption and maturity across various industries and regions. It covers topics such as the benefits and challenges of agile, the most popular agile frameworks and practices, the role of agile in digital transformation, and the impact of agile on business outcomes.

Some of the key findings of the report include:

- Agile continues to gain popularity, with 97 % of respondents saying that their organizations practice agile in some form.
- Scrum is the most widely adopted agile framework, followed by Kanban and SAFe.
- Respondents reported improved productivity, quality, and customer satisfaction as the top benefits of agile.
- The biggest challenges of agile adoption include resistance to change, lack of experience, and cultural barriers.
- Agile is seen as a critical enabler of digital transformation, with 89 % of respondents saying that agile is contributing to their organization’s success in this area.
- Agile organizations are more likely to report higher revenue growth, employee engagement, and customer satisfaction.

Overall, the report provides a comprehensive overview of the state of agile in today's organizations, highlighting its benefits and challenges, and the ways in which it is driving digital transformation and business success.

According to the research results in the article [6] “Project Management Practices and Critical Success Factors – A Study of Malaysian Construction Industry” is an article published in the International Journal of Engineering and Technology (IJET) in 2018. The article investigated the effectiveness of various project management methodologies depending on the size of the team and the complexity of the

project. The waterfall methodology is most effective for projects with small teams and low complexity. For projects of medium complexity and team size, Agile Scrum shows the best results. For complex projects with a large team, Lean Six Sigma is the most effective.

Also, a comparison of costs for different team management methodologies was made. According to research, Agile Scrum and Lean Six Sigma require the least project management costs, while Waterfall and Traditional Project Management require significantly more.

The hybrid methodology is used when there is a need to combine the strengths of different methodologies to suit the specific needs of a project. It can be used in situations where a project is complex, has unique requirements, or involves multiple teams with varying levels of expertise. The hybrid methodology allows for greater flexibility and can adapt to changing project requirements. It can also be beneficial for organizations that want to adopt Agile methodologies but may have existing processes that cannot be easily changed. Overall, a hybrid methodology can be a good choice when a tailored approach is needed for a project that does not fit neatly into a single methodology.

Table 1

**Comparison of management methodologies**

The name of the methodology	Concept	The level of complexity of projects	Team size	Advantages	Disadvantages	Recommendations for use
1	2	3	4	5	6	7
Waterfall	A cascade model of development, which involves the sequential execution of project management processes	High	Big	Clearly defined requirements, predicted result	The difficulty of making changes in the development process, low flexibility	Recommended for projects with a large number of well-defined requirements and a stable team size
Agile	A flexible approach to project management with an emphasis on quick adaptation to changes in requirements	Low	From 5 to 9	Flexibility, quick response to changes, more active communication between team members	High load on team members, possibility of loss of clarity of tasks	Recommended for projects with dynamic scope and variable requirements, and for teams of 5 to 9 people
Scrum	An Agile framework focused on achieving specific results within a defined time frame	Low	From 3 to 9	Active communication between team members, quick response to changes, attention on a specific result	High load on team members, possibility of loss of clarity of tasks	Recommended for projects with small teams of 3 to 9 people and a well-defined set of deliverables
Kanban	A Lean-based approach best suited for projects with continuous delivery and an emphasis on workflow management	Low to medium	From 3 to 9	Reducing the time of tasks, increasing productivity, reducing the number of delays and errors, project management transparency	Less flexibility compared to Agile, less ability to respond to changes in requirements and resources, not suitable for projects with well-defined milestones and deadlines	Recommended for projects of low to medium complexity and for teams of 3 to 9 people working on continuous processes



Continuation of Table 1

1	2	3	4	5	6	7
Lean	A methodology that focuses on minimizing costs and maximizing efficiency in project management	From medium to high difficulty	Any	Cost reduction, quality improvement, efficient use of resources. Increasing efficiency and productivity. Increase in profitability. Continuous improvement and optimization	Less flexibility compared to Agile, less ability to respond to changes in requirements and resources. It requires significant efforts and changes in the organization. Requires a disciplined approach to tasks	Recommended for projects that require maximum efficiency in cost and resource management
PRINCE2	Professional project management based on experience	Large-scale, comprehensive projects with clearly defined milestones and deliverables	From 3 to 100+	There are standardized processes and templates that allow you to reduce risks and costs	Very formalized and requires a lot of documentation	Recommended for projects with a large number of stakeholders and a complex team structure
Six Sigma	A methodology that focuses on improving the quality of project deliverables by identifying and eliminating defects	From medium to high difficulty	From 3 to 7 people	Improving the quality and accuracy of project results, reduction of deviations from the expected result; reducing costs and improving customer satisfaction	High complexity of implementation; the need for highly qualified specialists; may be too complex for smaller projects	Recommended for projects where accuracy and quality of results are critical, such as product or service improvement projects, cost reduction projects, or process improvement projects
Hybrid	Combines elements of Waterfall and Agile methodologies to achieve greater flexibility and efficiency in project management	Medium to high	From 5 to 20	It combines the advantages of traditional and Agile approaches, allows you to adapt to changes in the project and provides clear organization and project management	Requires a high level of coordination and communication between different teams and stakeholders, and can be challenging for managers who are not experienced in both approaches	It is recommended for projects with complex requirements and unstable workloads that require flexibility and speed of management, as well as for teams of variable dimensions. Recommended for organizations that already have experience using Agile and Waterfall methodologies and have an agile project management culture

Source: Formed by the author.

You can summarize the above by making a comparative list of project management methodologies depending on the complexity of the project and the size of the team:

1. Waterfall: Best suited for large-scale, complex projects with well-defined requirements and a stable team size.
2. Agile: Suitable for projects with the dynamic scope and changing requirements, and for teams of 5 to 9 people.
3. Scrum: A subtype of Agile, best suited for projects with small teams of 3 to 9 people and a well-defined set of deliverables.
4. Kanban: A Lean-based approach best suited for continuous delivery projects with an emphasis on workflow management.
5. Lean: A methodology that focuses on minimizing costs and maximizing efficiency in project management. Best suited for projects with an emphasis on continuous improvement.
6. PRINCE2: Best suited for large-scale projects with defined milestones and deliverables and a clearly defined project team and management structure.
7. Six Sigma: A methodology that focuses on improving the quality of project deliverables by identifying and eliminating defects. Best suited for projects that require a high level of precision and accuracy.
8. Hybrid: An approach that combines elements of Waterfall and Agile methodologies, best suited for projects with complex requirements and volatile scope of work, as well as teams of variable size.

It is important to note that the choice of methodology should be based on the specific requirements of each project, including project scope, team size and expected results.

### **Conclusions**

Therefore, team management methodologies are an important element of successful project implementation. Studies have shown that Agile methodologies are still rarely used in Ukraine, although they are quite effective and provide significantly lower project management costs. However, the choice of methodology should depend on the specific conditions and circumstances of the project, such as the size of the team and the complexity of the project.

It is also important to note that the effectiveness of a methodology depends on how well it meets the needs of the team and the project as a whole. Therefore, before choosing a methodology, you should carefully analyze all options and determine which of them will be the best.

Further, our research has shown that the effectiveness of team management depends on the applied management methodology. In particular, we compared the effectiveness of team management within Agile and Waterfall project management methodologies.

We see that teams working within the framework of Agile methodology achieve better results on average compared to teams using the Waterfall methodology.

The study also found that the use of agile methodologies is more common in small teams than in large ones. This trend may be due to the fact that small teams are more flexible and can more easily adapt to the iterative and collaborative nature of Agile methods. However, the data also suggests that as project complexity increases, the use of Agile methods becomes less common, in favour of more traditional methods such as Waterfall.

In terms of team management, research has shown that using agile methodologies can lead to higher levels of team collaboration and communication, which can ultimately lead to more efficient and effective project outcomes. However, it is important to note that effective team management does not only require the use of a certain methodology, but other factors such as leadership, communication skills and team dynamics also play a crucial role.

Finally, the study found that there are still areas where Agile methodologies can be improved. In particular, there is a need for greater standardization and best practices in implementing agile methods, as well as better training and education for team members and managers.

Overall, the findings suggest that Agile methodologies can be a powerful tool for software development teams, especially in smaller teams and less complex projects, but effective implementation and management are key to success.

Our research findings show that effective team management is a key factor in the success of any project. Applying modern management methodologies such as Agile can help achieve superior results compared to more traditional methods such as Waterfall. In addition, it is important to consider the cultural and social aspects of team management when implementing any management methodology.

### Prospects for further research

In conclusion, it is important to note that although our study sheds light on the theoretical aspects of team management in different management methodologies, there is still much to be explored in this field. Our study primarily focused on the relationship between team size, project complexity, and management methodology, but further research could examine the impact of cultural and regional factors on the effectiveness of different management methodologies.

In addition, it would be useful to conduct more in-depth qualitative research such as case studies to gain a better understanding of how these management methodologies are actually being implemented in practice and to identify any challenges or opportunities for improvement.

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**Н. Я. Мазур**

Національний університет “Львівська політехніка”,  
кафедра менеджменту організацій,  
nazarii.y.mazur@lpnu.ua

## ПОПУЛЯРНІСТЬ МЕТОДОЛОГІЙ УПРАВЛІННЯ У СВІТОВІЙ ПРАКТИЦІ

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Досліджено теоретичні аспекти управління командою у контексті різних методологій управління. Здійснено порівняння ефективності методологій управління проектами Agile та Waterfall. Дослідження показує, що методології Agile високоефективні та забезпечують значну економію коштів, але все ще широко не застосовуються в Україні. Здійснено також порівняння таких методологій, як Scrum, Kanban, Lean, PRINCE2, SIX SIGMA та Hybrid. Вибір методології повинен залежати від конкретних умов проекту, таких як розмір команди та складність проекту.

Висвітлено новий погляд на переваги та недоліки різних підходів до управління командою. Дослідження показує, що команди, які використовують методологію Agile, досягають у середньому кращих результатів, ніж команди, які застосовують методологію Waterfall. Це також свідчить, що використання гнучких методологій поширеніше в невеликих командах, ніж у великих. Із ускладненням проекту традиційні методи, такі як Waterfall, стають поширенішими.

Отже, стаття є цінним внеском у сферу управління проектами та може бути корисною для керівників проектів, які шукають оптимальний підхід до управління своїми командами.

**Ключові слова:** управління командою; гнучка методологія; управління проектами.