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## Article

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## Research on the Impact of the Project Team on Selected Areas of Project Management

Artur Biskupek

### Abstract

**Purpose of the article:** The following article consists of two parts. The basis of the first one is a literature study in the field of project team management. The paper presents cumulative information about the project team. Among other things, it provides the basic information, such as the definition of a project team, the composition of the project team and the most popular structures of the project team's operation in the implemented projects. The second part of the article presents the results of the research carried out on a sample of 73 respondents (who sent back a correctly completed questionnaire) in terms of the impact of the project team on the success of the implemented project. The survey consists of 23 questions. The first three were cafeteria questions, the next two were about the meaning of the project team and the rest was about the survey topic. The analysis was made using descriptive statistics and the whole article is concluded with a summary.

**Methodology/methods:** The only criterion for taking part in the study was project management. The research tool was a questionnaire sent to the respondents by e-mail, following the earlier information contact carried out by telephone or e-mail. The entire research process began with pilot studies. The whole process was divided into three stages.

**Scientific aim:** The aim of the study was to analyse the impact of the project team on the project's course.

**Findings:** The conclusion that can be drawn after the study is that the project team is one of the most relevant success factors in the whole project management process.

**Conclusions:** The obtained results of the research in the process of analysis and interpretation allow stating that the project team has a significant impact on the entire project. The project team is characterised by such a large impact on the course of the entire undertaking that it can be successfully called the decisive. This means that it can decide about the success or failure of the entire project.

**Keywords:** project management, project team, project team management, research, survey

**JEL Classification:** M15, M19

## Introduction

The dynamically changing environment forces organizations and decision-makers to implement modern, different from permanently implemented organizational structures, such as the structure of the project team, which enables the implementation of unique tasks such as projects (Lichtarski, 2007). Today, a significant increase in the importance and universality of projects in organizations is perceived (Kerzner, 2006; Lock, 2007).

Projects are undertakings implemented everywhere. It does not matter whether they concern the organization of a small social event, building a house, or they are a million infrastructure projects, such as the construction of an ICT infrastructure (Biskupek, Spałek, 2016). Wysocki (2013) defines the project as: “a sequence of unique, complex and related tasks, having a common goal, to be carried out within a given deadline without exceeding the budget set, in accordance with the assumed requirements.”

One of the features of the project is uncertainty, which arises as a result of the relationship between the venture and uncontrollable elements surrounding it (Youker, 1992). One of the roles of the project team is to limit this uncertainty (Aaltonen, 2011). According to Kutzenbach, Smith (2004), the team is a small group of people, among whom there are specific relationships regarding the implementation of the assumed goal.

Project management and teamwork concepts (Michalczyk, 2013), as well as the way these teams operate, form the basis for the functioning of companies in the fields of IT, construction or consulting (Wirkus, Wilczewski, 2008). Therefore, the aim of this article is to present the impact of the project team on its success. For this purpose, surveys were carried out, the results of which are presented below. Also, the theoretical introduction to the article was presented on the basis of the study of literature.

## 1. The project team

One of the significant elements of project management is the project team. Members of the project team perform one of the most important roles in order to achieve the success of a given undertaking (Słonec, 2015). According to Lichtarski (2007), the project team is a temporary team of employees and / or people from outside, appointed for the implementation of specific projects or tasks, after which the team is dissolved. According to PMI (2013), the project team consists of the project manager and a group of people who undertake joint activities, implementing the project and achieving its goal. The project team includes the project manager, project management personnel and other team members who perform the work, but do not necessarily deal with project management. The team includes people from different groups who have the knowledge of a specific topic or specific skills needed to do the work in a team (Biskupek, 2016). Project teams can have very different structures and features, but the project manager's role as a team leader is a constant element, regardless of the powers that he or she has with the team members. Trocki *et al.* (2009) believe that human resources management not only in the project, but also in enterprises, serves to achieve the following three goals:

- Creation of a system for personnel management;
- Maintaining the functioning of this system;
- Work on improving this system.

Projects are much more complicated than the basic operational activity of the company (for example, the implementation of processes), therefore employees taking part in the project work as members of a project team have to meet higher requirements than employees of repetitive activities. That is why the stage of appointing, creating and managing a project team is so crucial (Skalik, 2009). Project managers are aware that

in order to realize the entrusted project successfully, it becomes necessary to transform permanent, traditional organizational structures into structures that are characterized by a smooth division of work, the overall nature of tasks, transitivity of decision-making powers, as well as a low degree of standardization and formalization (Piotrowicz, 2004). Numerous concepts and models of organizational structures are known in the literature, as well as from practice, which are based on project teams characterized by the instability of members of any such team, impermanence of relationships and with many centres of power (Robbins, DeCenzo, 2005).

At the moment when the organizational structure of the enterprise is changing, changes are also implicated in all other subordinate structures, including projects ones (Lichtarski, 2007). The participants of the teams of a given undertaking may be specialists in one field, as well as in many fields. Members of the project team can be members of the project organization or external representatives (for example, employees of a consulting company). The composition is then unstable, and the borders of such a temporary organization are difficult to determine. Each time a team is appointed to carry out a given undertaking, its structure, responsibilities and hierarchy in the team must be determined anew. As a result of the creation of a temporary organizational structure set up to achieve a specific goal, each time new relationships arise between people within the team and between the team and the organization. According to Lichtarski (2007), the state of affairs in which many project teams are present in the organization is also called heterarchy. As part of this concept, many hierarchical systems that depend on each other co-exist, the purpose of which was to establish a specific goal to achieve (Rutka, 2001).

At the moment when there are teams with permanent hierarchical systems in the organization, the transparency of the hierarchical structure may be disturbed. In hierarchical

structures, there are permanently separate managerial positions. At the moment of the appearance of project structures, the task manager, *i.e.* the project manager, comes to this (for the time of implementation). The consequences of this are the occurrence of several decision centres at the same time, which are located at different levels of the organization. A feature of this type of structures is the involvement of a specific employee in many projects in different roles. It means that a particular person in one project can be a contractor, in another manager, and yet another one to perform an advisory function. In task structures, employees (project team members) are required to provide much more knowledge, skills and experience than in traditional hierarchical structures. According to Bruns, Stalker (1961), project teams are much more suited to changing and uncertain situations.

Wachowiak *et al.* (2004) believe that the process of creating and managing project teams takes on a key meaning, that is why it is so important that members have appropriate competences, knowledge and skills, and that the relationships between them are arranged in a suitable temporarily separated structure. He indicates the occurrence of four classic structures that can be used in any project (Słonec, 2015):

- Surgical structure,
- Expert structure,
- Isomorphic structure,
- A collective structure.

The surgical structure is based on the assumption that the centre of the entire structure is the so-called surgeon whose operation is related to the essence of the design work. He is freed from all administrative and technical work and duties (Frame, 1995). A surgeon should be a person with above-average skills and leadership. The success of the whole undertaking depends largely on his success. This model works most often in IT projects related to application development (Trocki *et al.*, 2009) (Figure 1).

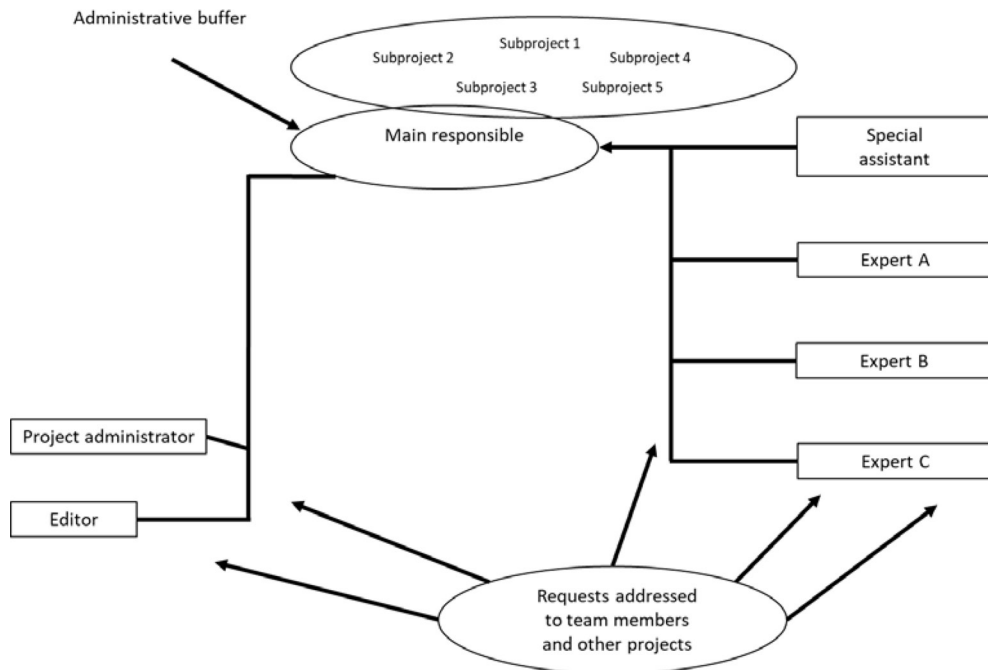


Figure 1. The surgical structure of the design team. Source: Trocki et al. (2009).

According to Trzeciak, Spałek (2017), the expert structure should be treated as the equivalent of the matrix structure in the organization. At the moment when the decision about the organization of the project team in the form of an expert structure is made,

the members of the project team, so-called experts, will deal with the work related to the particular specialization during the implementation of the enterprise. The project manager acts as the coordinator of the whole work (Słonieć, 2015). One of the advantages

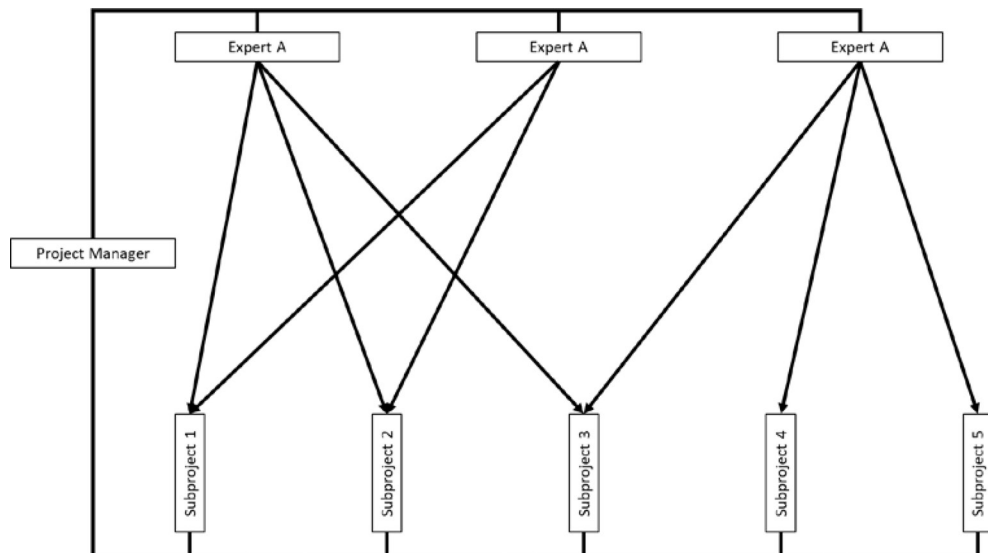


Figure 2. Expert structure of the project team (AAA expert). Source: Trocki et al. (2009).

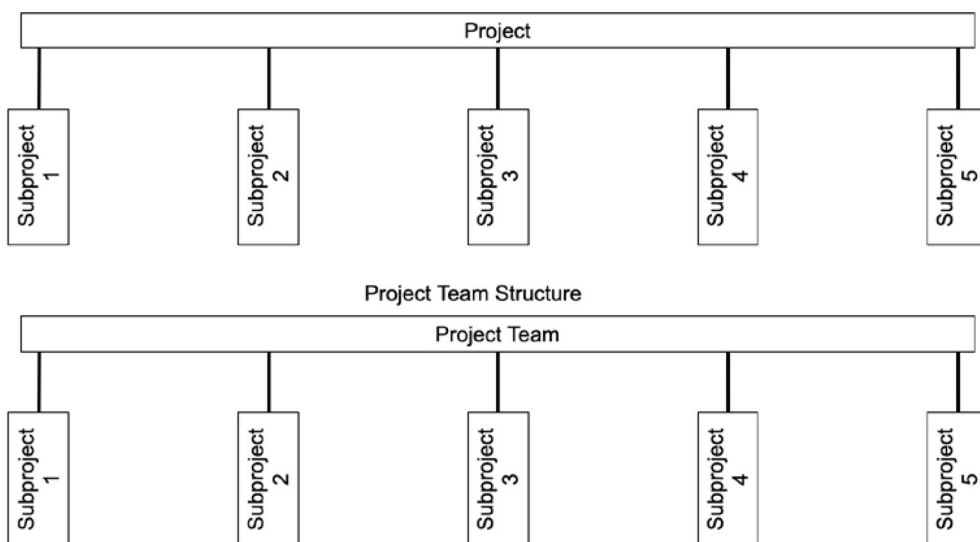


Figure 3. Isomorphic structure of the project team. Source: Sloniec (2015).

of using the expert structure is the effective and purposeful use of members who are part of the project team and their competences and skills. The work of such people is characterized by great independence. This structure, like any other, also has its drawbacks, such as the unclear division of tasks and responsibilities. Generally, it can be concluded that this structure shows defects similar to the defects of matrix structures (Trocki *et al.*, 2009) (Figure 2).

The isomorphic structure reflects the structure of the product, which should be perceived as the final element of the undertaking being implemented. According to Frame (1995), the application efficiency of isomorphic structures is extremely high in projects where the stages of the final product are independent of each other. This structure is characterized by a clear division of tasks and responsibilities. The role of the project manager in this structure is to coordinate the

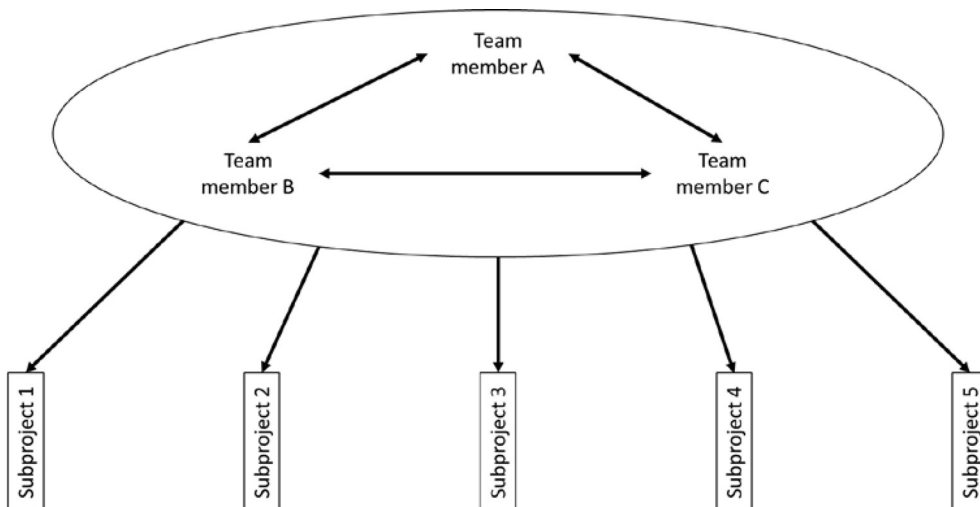


Figure 4. The collective structure of the project team. Source: Trzeciak, Spatek (2017).

work of the teams so that the components of the project make up the final result. According to Słonieć (2015), these structures are most often used in small projects (of small size) (Figure 3).

The collective structure is devoid of the project manager. This situation means that members of the project team are forced to communicate intensively and cooperate with each other. Decisions in the project are not taken by one person, but collectively, which is why it is so important that project members are in intense contact all the time. The use of this structure is indicated when team members with very strong personality types take part in the project (Trzeciak, Spałek, 2017) (Figure 4).

## 2. Empirical research

The surveys were conducted among project managers employed in southern Poland and included the Lower Silesian, Opole, Silesian and Świętokrzyskie Voivodships. This area is inhabited by approximately 9,763,891 people, which is 25.37% of the total population of Poland, which amounted to 38,483,957 in 2015 (MRS, 2015). In the area where the empirical research on the impact of the project team on the project was carried out, important economic centres are located, such as Wrocław, Opole, GOP (with Katowice in the lead) or Kielce. In these metropolises, there are also important research and development centres, as well as universities (of national and international importance). In the areas of the aforementioned voivodships, large international and domestic companies from various industries have the headquarters or branches, including the IT industry, such as WASKO S.A or AIUT Sp. z o. o. These institutions carry out hundreds of various projects annually with budgets of several thousand zlotys and sometimes several hundred millions, covering not only the territory of Poland, but also abroad. One of the exam-

ples of a several hundred millions project covering the entire province is a project to build a Lower Silesian backbone network (Biskupek, Spałek, 2016), construction of other regional broadband networks or implementation of CMMS asset management software.

### 2.1 Research method

The research was carried out among project managers who are employed in enterprises located in southern Poland. The project managers were invited to participate in the study. The respondents, though employed on a daily basis in the aforementioned research area, very often carry out projects throughout the country and even abroad. The only criterion for taking part in the study was project management. The research tool was a questionnaire sent to the respondents by e-mail, after an earlier information contact carried out by telephone or e-mail. The entire research process began with pilot studies. The aim of this stage was to check the correctness of the survey structure and to exclude the misunderstanding of questions, as well as to check the correctness of its general structure.

The whole research process was divided into three stages:

1. Pilot studies, which were conducted among 10 respondents, to verify the correctness of the survey.
2. Telephone or e-mail contact with respondents to discuss their participation in the study, *e.g.* how to submit the survey.

The research itself, which consisted of sending via e-mail (to the indicated address) a survey questionnaire to people who at an earlier stage indicated their readiness to take part in the research. As already indicated above, the only criterion for participation in the study was managing projects, excluding the job title on which the respondent worked.

95 project managers from the above-mentioned research area were invited to the survey, of which 73 respondents returned the completed questionnaire (the achieved

success rate amounted to 76.8%) by electronic means. The questionnaire was composed of cafeteria questions and proper questions.

The aim of the study was to analyse the impact of the project team on the project's course.

Due to the small size of the research sample, the research was of qualitative character and the analysis was carried out with the use of descriptive statistics tools.

### 2.2 Survey questionnaire

The questionnaire included two pages and was divided into three parts. The first part was an imprint, which consisted of three questions. The second part consisted of five questions about defining the project team. The third part was the proper part concerning the subject of the research and consisted of fifteen questions. The questionnaire included twenty-three questions in total. By building a questionnaire, the author put a number of questions in it to ensure the reliable fulfilment and the concentration of the respondent on completing the first to the last question. Such, and not more, questions were also intended to motivate rather than discourage the respondents from participating in the research.

In the questionnaire, the author asked the experts to answer questions about the impact of the project team on the individual stages and elements of the project.

The survey was constructed on the basis of a five-point Likert scale, where the impact force was defined as: (5) very high impact, (4) high impact, (3) limited impact, (2) low impact, (1) no impact.

### 2.3 Survey results

In the first of the twenty-two questions, which as the next two served as cafeteria questions, the respondents were asked to answer the question about experience in project management. The results showed that 16% of the respondents answered that they had managed projects less than two years, whereas 26% answered that they had managed them between 2–5 years. The range of 5–10 years was chosen by 47% of respondents, while 11% of respondents have managed projects for more than 10 years (Figure 5).

In the next question, the respondents were asked to provide the number of completed projects. The results here were as follows: 3% of the respondents have completed up to three projects and 19% have completed from

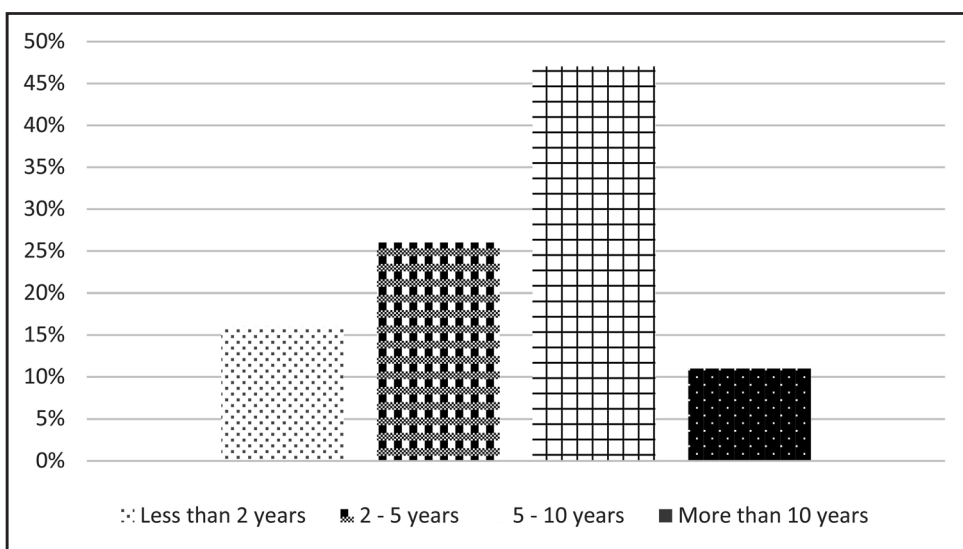


Figure 5. Experience in project management. Source: Author's own study.



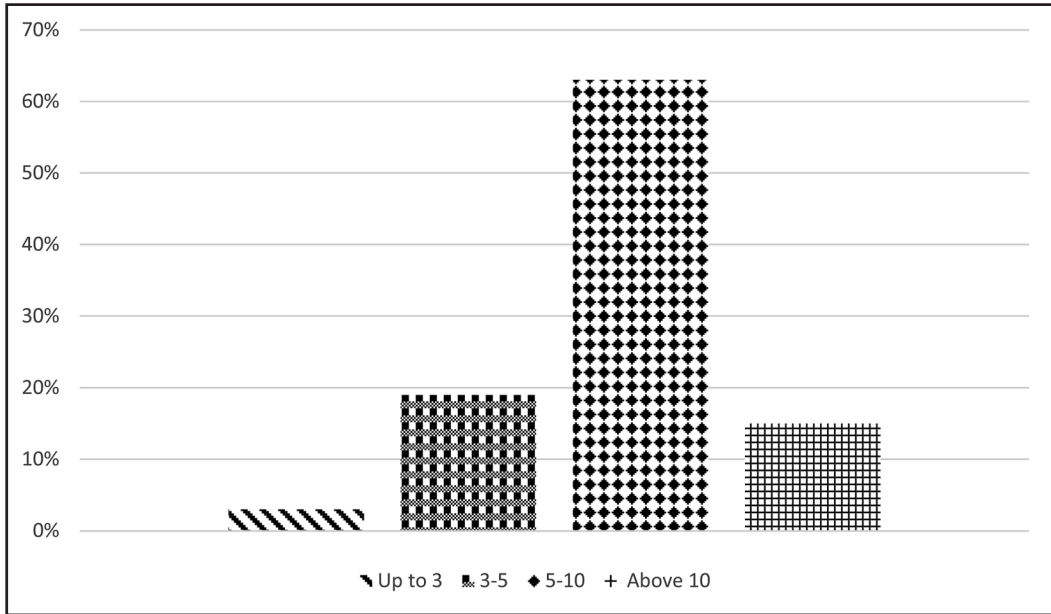


Figure 6. Number of completed projects. Source: Author's own study.

3 to 5 projects. The largest group (63%) was the one that carried out 5 to 10 projects. 15% of the respondents completed above 10 projects (Figure 6).

The last question from the group of cafeteria questions related to the type of projects

implemented. Here, 37% of the respondents have implemented IT projects, 26% choose the answer of infrastructure projects, 14% construction projects, 8% organizational projects. Other projects were selected 15% of the respondents (Figure 7).

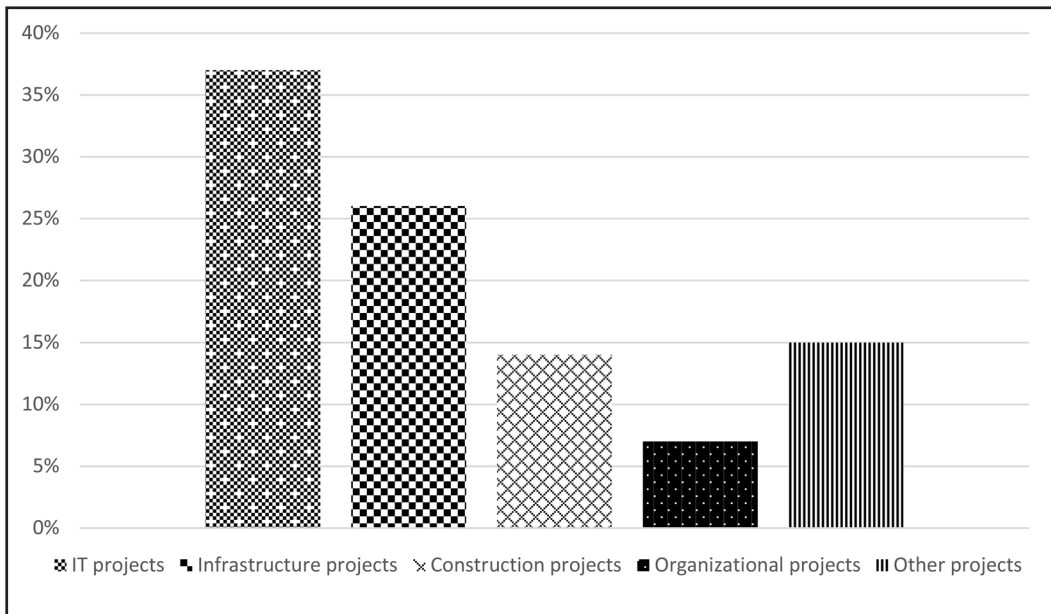


Figure 7. Types of implemented projects. Source: Author's own study.

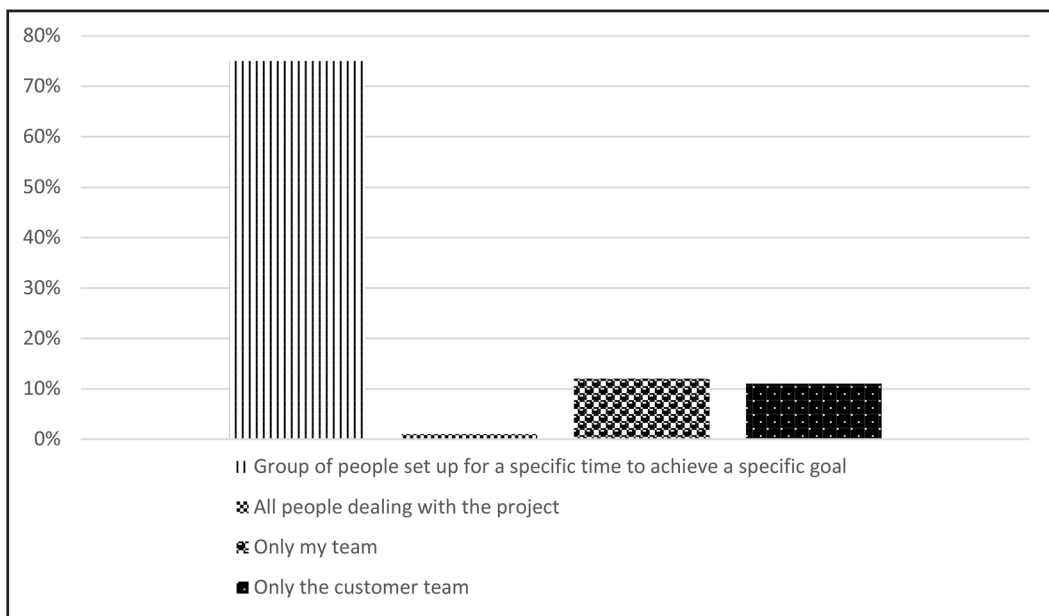


Figure 8. Who is in the project team? Source: Author's own study.

The first question from the second group concerned the identification of the project team. 75% of the respondents chose the answer that the project team is a group of people set up for a specific time to achieve a specific goal. 12% think that the project

team is only “my team”. Only the customer team was selected by 11% of the respondents. Only 1% of the respondents chose the answer saying that the project team is all people dealing with the project (Figure 8).

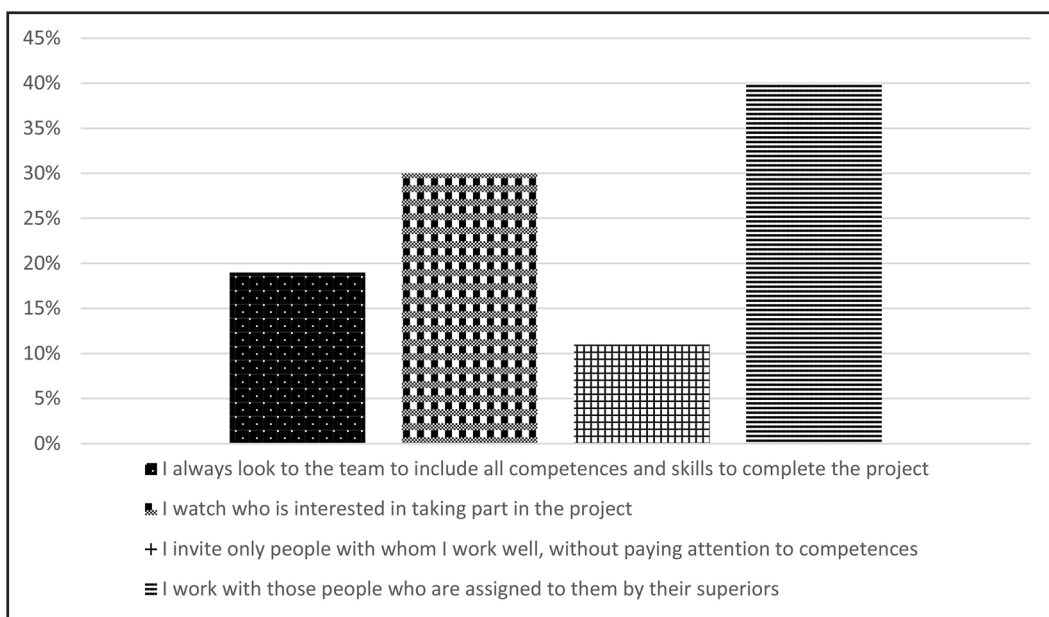


Figure 9. The method of establishing a project team. Source: Author's own study.

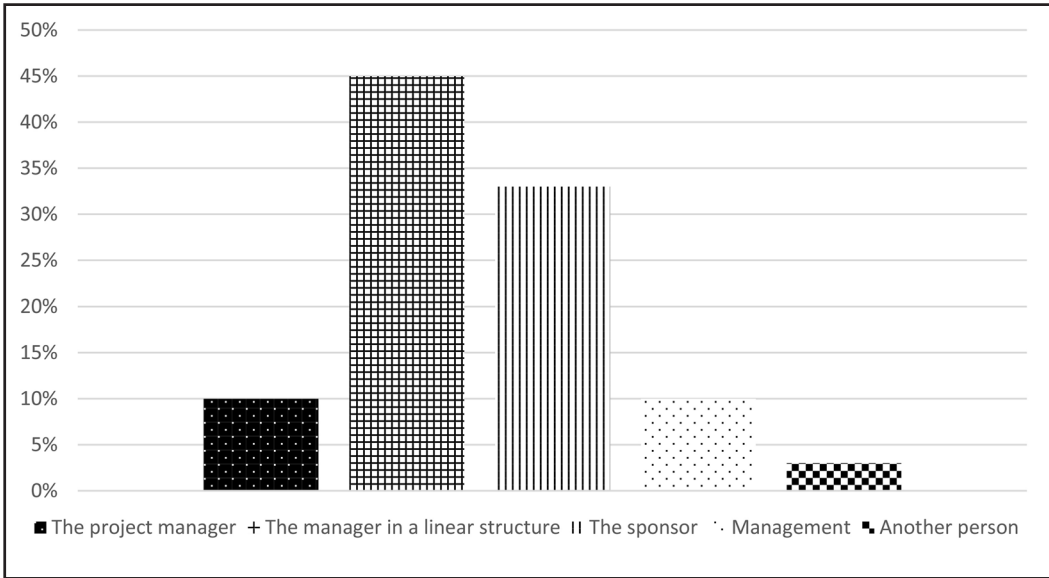


Figure 10. Who decides about the composition of the project team. Source: Author's own study.

The second question from the second group was related to the method of establishing a project team. 40% of the respondents chose the answer that they work with those people who are assigned to them by their superiors. 30% chose the answer saying they are watching who is interested in taking part in the project. 19%

of the respondents chose the answer that they always look to the team to include all competences and skills to complete the project. The least frequently chosen answer with the result of 11% was the answer that only people with whom they work well are invited, without paying attention to competences (Figure 9).

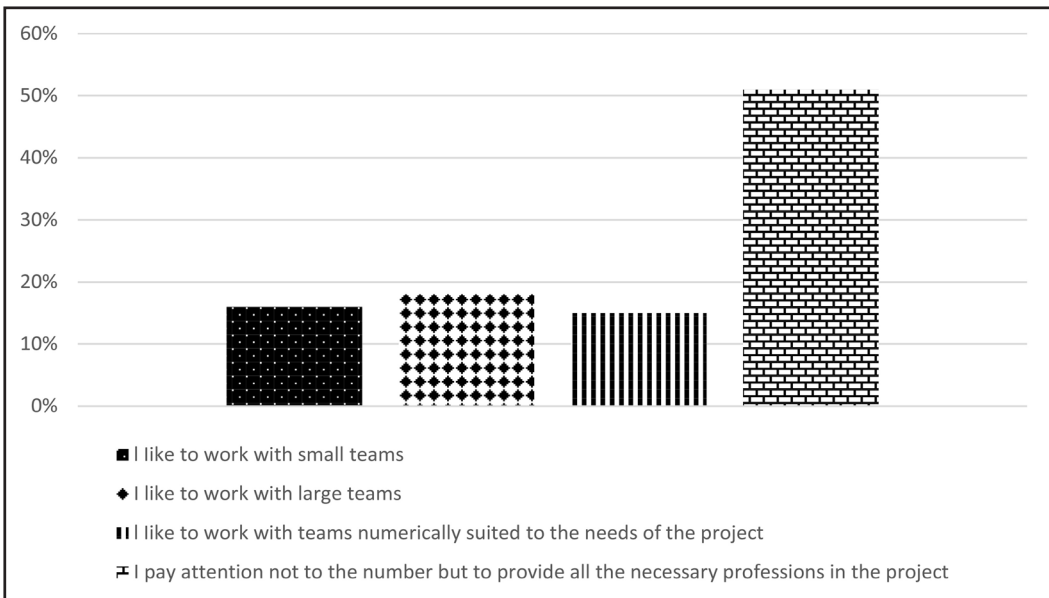


Figure 11. The size of project teams. Source: Author's own study.

In the next question, the respondents were asked to answer the question of who makes the decision on the composition of the project team. The largest number of respondents, as many as 45%, said that this decision is made by the manager in a linear structure. “The sponsor makes decision” was selected by 33% of the respondents. Then 10% answered the project manager and management. The least-elected answer with the score of 3% was the answer of another person (Figure 10).

The seventh question in the questionnaire concerned the size of the project team. The least number of respondents (15%) chose the answer that they like to work with teams numerically suited to the needs of the project. The second least-elected answer with a score of 16% concerned small numbers. 18% of respondents like to work with large teams. Most respondents (51%) chose the answer suggesting that they pay attention not to the number but to providing all the necessary professions in the project (Figure 11).

The next question concerned the location of the project team. 53% of the respondents replied that while managing projects, they usually work with locally dispersed teams.

The second most frequently chosen answer concerned the location of the team in one place (30%). The least common answer (16%) was that the decision is made depending on the project specification (Figure 12).

Table 1 presents the most frequently chosen answers by the respondents in the third part of the questionnaire, in other words, in the part concerning the impact of the project team on the success of the project.

From the above table, it can be concluded that the impact of the project team on the course of the project is significant, as in seven cases the impact was described as big (B), in three cases it was referred to as limited (L), in four as very big (VB), however, only in one case the most common response in the study was the low impact response (S). In general, “no impact” (N) did not occur among the most common responses. Also in the question regarding the general estimation of the impact of the project team on the entire project, the most frequently chosen answer was the very big impact (VB).

The above statement is also confirmed by the table below (Table 2), in which the least rarely selected responses by the respondents were presented.

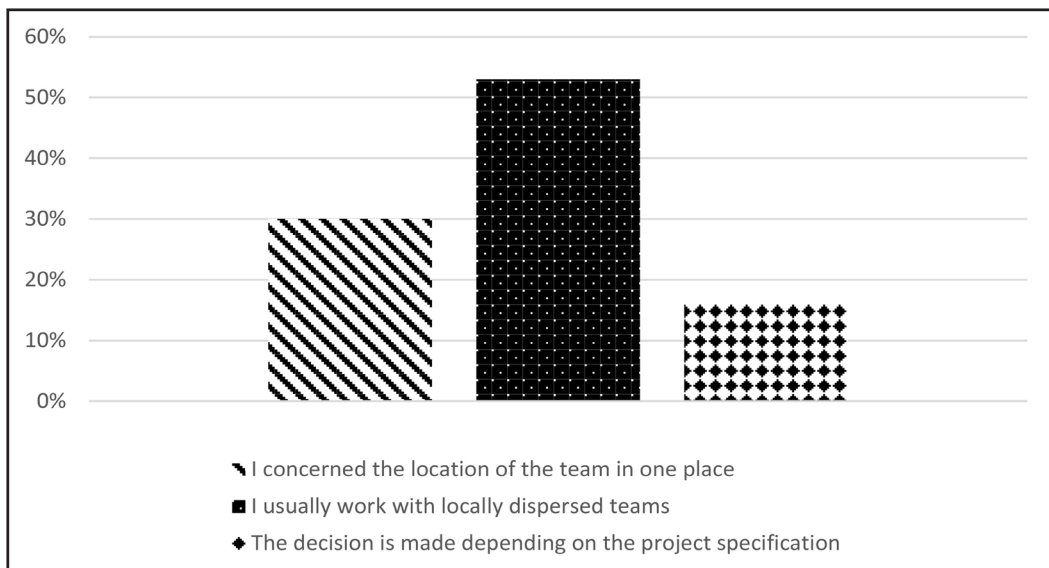


Figure 12. Location of the project team. Source: Author’s own study.

*Table 1. Most frequently chosen responses by respondents specifying the impact of the project team on selected areas of project management, where VB means very big, B – big, L – limited, S – small.*

No.	Area of impact of the project team	The maximum value in the responses
1	At the stage of defining the project	VB
2	On the project planning stage	B
3	On the scope of the project	L
4	For planning deadlines in the project	L
5	On the project budget	S
6	For orders (among other materials used)	L
7	At the stage of project implementation	VB
8	At risk (increasing risk, appearance of additional factors)	B
9	At the end of the project with success	B
10	For providing information to project team members about the situation in the project	B
11	For stakeholders	B
12	For efficient communication	B
13	On the project closure phase	VB
14	On the test phase of the project result	B
15	On the course of the entire project	VB

*Source: Author's own study.*

*Table 2. The least selected answers by respondents, the impact of the project team on selected areas of project management, where VB stands for very big, and N – no influence.*

No.	Area of impact of the project team	The minimum value in the responses
1	At the stage of defining the project	N
2	On the project planning stage	N
3	On the scope of the project	N
4	For planning deadlines in the project	VB
5	On the project budget	VB
6	For orders (among other materials used)	VB
7	At the stage of project implementation	N
8	At risk (increasing risk, appearance of additional factors)	N
9	At the end of the project with success	N
10	For providing information to project team members about the situation in the project	N
11	For stakeholders	N
12	For efficient communication	N
13	On the project closure phase	N
14	On the test phase of the project result	N
15	On the course of the entire project	N

*Source: Author's own study.*

As the results from the analysis of the questionnaire outcome suggested, among others, in the form of the above table, the

lack of influence (N) was expressed with the lowest frequency, *i.e.* in twelve questions. The second rarest response was the very big

*Table 3. Interpretation of the results of research on the impact of the project team on selected areas of project management, where VB stands for very B, B – big, L – limited, S – small impact.*

No.	Area of impact of the project team	The median value in the responses
1	At the stage of defining the project	6 (L)
2	On the project planning stage	12 (VB)
3	On the scope of the project	12 (S)
4	For planning deadlines in the project	16 (B)
5	On the project budget	9 (L)
6	For orders (among other materials used)	14 (B)
7	At the stage of project implementation	3 (S)
8	At risk (increasing risk, appearance of additional factors)	14 (L)
9	At the end of the project with success	5 (S)
10	For providing information to project team members about the situation in the project	11 (L)
11	For stakeholders	15 (VB)
12	For efficient communication	9 (L/S)
13	On the project closure phase	19 (L)
14	On the test phase of the project result	13 (VB)
15	On the course of the entire project	4 (L)

*Source: Author's own study.*

response (VB), which was provided only in the case of three questions. Also, here in the last question, which referred to the impact of stakeholders on the entire project, the response most rarely chosen by the respondents was the lack of impact (N).

The author also interpreted the results of the tests carried out using the median and standard deviation. The following table (Table 3) shows the results of the conducted studies using the median.

The definition of the median reads as follows: "In a given ordered series, the number that is in the middle of the row in the case of an odd number of elements. For an even number of elements – the arithmetic average of the two middle numbers" (Krysicki *et al.*, 2006). The above presented data, where the numerical result is assigned to the next of the five-level scale level of impact of the project team on a particular project stage, confirms the above results presented in the form of the most frequently chosen answer and the least chosen answer. The author also interpreted

the results obtained using the standard deviation (Table 4).

To facilitate the results obtained using a standard deviation, a column showing the result of the arithmetic mean was added. As 73 completed surveys were analysed, the average in each question was the same and was equal to 14.60. Some of the results of the standard deviation are close to the average, which means that the data can be treated as reliable. This state of affairs presents, for example, questions regarding the impact on the project definition stage (No. 1), the impact on the project scope (No. 3), the impact on the project budget (No. 5), the impact on efficient communication (No.12), and the impact on the project closure (No.13). Partially, this group can include the question regarding the impact on providing information to members of the project team on the situation in the project (No. 10) and the impact on the completion of the project with success (No. 9). The standard deviations in the remaining questions are smaller or larger

Table 4. Interpretation of the results of research on the impact of the project team on selected areas of project management, where VB stands for very big, B – big, L – limited, S – small, N – no effect.

No.	Area of impact of the project team	Average	Standard deviation value in responses
1	At the stage of defining the project	14,60	16,01 (B)
2	On the project planning stage	14,60	9,40 (S)
3	On the scope of the project	14,60	12,48 (S)
4	For planning deadlines in the project	14,60	6,80 (VB)
5	On the project budget	14,60	15,34 (L)
6	For orders (among other materials used)	14,60	8,32 (N)
7	At the stage of project implementation	14,60	18,09 (B)
8	At risk (increasing risk, appearance of additional factors)	14,60	7,70 (N)
9	At the end of the project with success	14,60	16,86 (VB)
10	For providing information to project team members about the situation in the project	14,60	12,76 (L)
11	For stakeholders	14,60	9,61 (B)
12	For efficient communication	14,60	12,52 (L/S)
13	On the project closure phase	14,60	12,30 (L)
14	On the test phase of the project result	14,60	11,80 (VB)
15	On the course of the entire project	14,60	17,49 (B)

Source: Author's own study.

than the average value, so it can be, or even should be assumed, that the data is scattered, which may result in the data being unreliable. In such situations, the research should be considerably deepened to confirm the result obtained.

### 3. Discussion

The research carried out by the author shows that the impact of the project team on the project is large or even very large. As an opportunity to extend or deepen the above research, it is possible to identify critical success factors important for guaranteeing the good work of the team or risk factors that significantly hinder the work of the whole team. According to Ilkka (2017), such success factors include: a good and open atmosphere, a leader perfectly matched to the adopted opinion, defined quality of work carried out, a properly selected team according

to the required competences and also personality. Wirkus, Tubielewicz (2018) indicate the following:

1. Properly defining the real project strategy in advance, covering the issues such as the project goal, key measures of project success evaluation, final result, as well as a general outline of the project scope.
2. Proper project planning including, inter alia, the division of the project into the main areas of activities and the possible division of areas into smaller scopes, e.g. facilities and their allocation to enterprises in the network in accordance with the competences of the specific enterprise. In addition, a well-prepared overall project implementation plan containing the main activities, the overall project schedule and the allocation of persons responsible for each of the cardinal activities at the network level.
3. Developing and building appropriate organizational solutions for the project, ta-

king into account, *inter alia*, the structure of the scope of work in the project. The appointment of a project manager with appropriate competencies and leadership qualities and the creation of a responsible unit in the form of a Project Management Office, which will be created, among others, by leaders responsible for the implementation of separate, main areas of project activities. Settled within the Bureau, among others, issues and problems at the so-called intersections of areas, that is, among others, agreeing on both the scope of work and the order of engagement of individual contractors.

4. Carrying out work in accordance with the plan and possible efficient introduction of necessary changes in the project implementation – control over the changes at the level of the Project Management Office.
5. Project monitoring and control procedures, immediate resolution of problems appearing in the project at the level of the Project Management Office and timely and reliable informing of the main stakeholders about the progress of work under the project.
6. Establishment of well-functioning quality procedures with a particular emphasis on technical and performance quality as well as emphasis on the safety of conducting work in the project.
7. Regular monitoring and analysis of risk at the level of the Project Management Office, taking into account project threats, the immediate environment of the project, as well as global events.

Looking at the above, it is worth confirming that the above factors are essential or proving by extended research that they are not crucial. Continuing research in this respect would certainly allow the answer to the question concerning the factors determining success and which determine the failure, since the project team has a great impact on the success or failure of the project.

## 4. Conclusion

According to PMI (2013), the project team is the project manager and a group of people who undertake joint activities, implementing the project and achieving its goal. The project team includes the project manager, project management personnel and other team members who carry out the work but do not necessarily deal with project management. The team includes people from different groups who have knowledge of a specific topic or specific skills needed to do the work in a team. Project teams may have very different structure and features, but a permanent element is the role of the project manager as a team leader, regardless of the powers that he or she has with the team members. The project team without the project manager is deprived of the decision-making power and the ability to efficiently implement the project. You can compare a project team without a project manager to a ship without a captain. If the project team is incorrectly appointed, contains inappropriate competences, is too small or too large, it may result in negative consequences for the entire project. That is why it is so important to manage the team throughout the entire duration of the project in a skilful and active manner.

The obtained results of the research in the process of analysis and interpretation allow stating that the project team has a significant impact on the entire project. The project team is characterized by such a large impact on the course of the entire undertaking that it can be successfully called the decisive. This means that it can decide about the success or failure of the entire project. The respondents indicated that the project team mostly affected all the indicated areas to a large or very large extent, which is confirmed by Table 1, which presents the most frequently chosen answers. However, after the analysis with the use of standard deviation, large dispersed results are visible, which results in deeper research.



The surveys carried out were limited by a small sample size and territorially to southern Poland. Therefore, it would be justified to conduct further, more extensive studies

involving a larger number of respondents that would allow generalization of research results.

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