

## ANALYSIS OF METHODS FOR CONSTRUCTING R&D PROJECT TEAMS – RESULTS OF QUALITATIVE STUDIES

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**Purpose:** The aim of the article is to present results of qualitative research about constructing teams involved in research and development (R&D) projects and to formulate recommendations regarding their formation.

**Design/methodology/approach:** The paper utilizes research conducted as part of a master's thesis awarded by IPMA Poland. This is also a continuation of another article published in this journal<sup>1</sup>. In general, the whole research was based on a mixed-methods approach, combining quantitative and qualitative methods. A sequential explanatory strategy was employed, allowing for the collection of quantitative data, followed by enrichment with qualitative data for a more in-depth interpretation. This article is about the description of qualitative research, recommendations are written on the basis of full mixed research.

**Findings:** For constructing teams in R&D projects, recommendations were made: 1) Strive for gender balance in the team, 2) Create teams with a small number of members, 3) Pay attention to the subject matter expertise and experience of the potential leader when forming the team, 4) Introduce a selection process for team members in which the project leader, the project initiator and the group of project initiators have a stake, 5) Value the work of team members and their contributions, regardless of their role in the project, 6) Focus on motivating team members through career development, research curiosity, and the opportunity to collaborate with other scientists, 7) Provide clear rules for project collaboration and accountability, 8) Ensure integration and adequate communication of the team, 9) Support effective management of R&D projects, 10) Monitor and resolve problems within the team. Avoid the occurrence of negative roles and create an environment where team members feel supported and valued.

**Research limitations/implications:** The article's limitation lies in the potential omission of advanced dependencies from related management fields - from psychology, sociology, or administration.

**Practical implications:** The research indicates recommendations for the practice of managing research and development projects. Implementing these recommendations may contribute to improving the results of R&D teams.

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<sup>1</sup> Dewor, Klaus-Rosińska, 2024.

**Originality/value:** Filling a research gap on the construction of contemporary research and development teams. Discoveries regarding leader selection, researcher motivation, and the impact of various factors on team performance have significant implications for the practice of managing R&D projects. They are addressed to all individuals involved in research and development activities.

**Keywords:** research and development projects, team construction, research and development, R&D projects.

**Category of the paper:** research article.

## 1. Introduction

The results of the literature review conducted for the research presented in this article were written up in (Dewor, Klaus-Rosinska, 2024), their summary is as follows: (Hackman, Vidmar, 1970; Lencioni, 2002; Kossowska, Soltysinska, 2006; Pawlak, 2006; Chen, Chang, Hung, 2008; Feng et al., 2010; Omar et al., 2011; Krawczyk-Bryłka, 2012; Wirkus, Lis, 2012; Liu, Schuler, Zhang, 2013; Twardochleb, 2014; hrpolska, 2015; Khedhaouria, Montani, Thurik, 2017; Hosseini, Akhavan, Abbasi, 2017; McShane, Von Glinow, 2017; Kisielnicki, 2018; Czahajda, 2019; Kim, Song, 2021; Belbin Poland, 2023).

- R&D projects belong to the category of projects that are both the most challenging and the most significant for the development;
- project managers identifying "the selection of team members for a project and subsequently allocating tasks among them" as an important aspect, and research project participants considering it as a crucial duty;
- various methods for building project teams are available, one of the most popular models describing is the B. Tuckman model;
- regarding the general rules of teams construction (i.e. according to B. Tuckman model), the literature lacks detailed information on the formation of research and development teams;
- among identified motivating factors for engagement in scientific and development projects were: the opportunity for international travel, official orders, financial motivation, the chance to meet other scholars, the opportunity to work on a project led by a renowned scientist, the development of a scientific career, the desire to do meaningful work, and research curiosity;
- research curiosity and the desire to do meaningful work were considered the most important sources of motivation;
- career development in the scientific field was considered a significant issue, like financial motivation.

The aim of the research was an attempt to increase scientific knowledge regarding the construction of teams involved in research and development projects.

## 2. Methodology of the conducted research

The research on "analysis of methods for constructing R&D project teams" included a mixed methods research. Mixed methods research involves using more than one research method, usually combining quantitative and qualitative methods. It was decided to include both quantitative and qualitative research. Quantitative because of the goal of obtaining discernment with respect to the topic under study among a large number of projects, while qualitative research to obtain detailed, complex answers regarding projects implemented in different types of units. Mixed research, also known as mixed-methods research, opens up new possibilities in the social sciences and health by enabling the integration of different methods and perspectives. The applicability of mixed-methods research lies in the combination of quantitative and qualitative data, which allows for a more complete understanding of the phenomena under study and more comprehensive results. In the social sciences, mixed research can involve the use of survey techniques, field observations, document analysis and statistical data analysis, allowing in-depth analysis and interpretation of various aspects of the society under study. The use of mixed-methods research also allows for verification of results and triangulation of data, which increases the reliability and quality of research, and opens up the possibility of interdisciplinary research that brings together different fields to better understand the problems under study. (Creswell, 2013) In choosing a particular mixed strategy, the need was identified to obtain answers from respondents from a significant number of R&D projects, and at the same time, to obtain comprehensive detailed, complex responses on a specific type of project. The choice was made keeping in mind also the usability of the chosen model, when the quantitative survey yields unexpected results, a sequential exploratory strategy was decided upon. After the quantitative study was completed, a qualitative study was created based on the surprising results of the quantitative study. Both the quantitative and qualitative study were of similar weight.

A sequential exploratory strategy is a popular method of mixed-methods research that involves collecting and analyzing quantitative data in the first phase, followed by qualitative data in the second phase, using the earlier quantitative results. Quantitative data takes priority as the main source of information, mixing with qualitative data. This strategy is particularly useful for interpreting quantitative results through qualitative data analysis. The sequential exploratory scheme is simple to implement and describe, but requires data collection in two phases, which can be time-consuming, especially when the two phases are of equal importance (Creswell, 2013)

This article is about the description of qualitative research only, recommendations regarding formation of R&D teams are written on the basis of full mixed research.

### 3. Description of qualitative research

Qualitative research is one of the research approaches that focuses on exploring complex phenomena, interpreting their meaning and understanding the social, cultural or psychological context in which they occur. It is characterized by a number of distinctive features. First, qualitative research is descriptive, focusing on detailed description and understanding of the phenomena, processes or experiences under study. It offers a deeper understanding of the topics under study than quantitative research, allowing subtle nuances and contextual aspects to be brought out. Second, qualitative research is holistic in nature, seeking to address multiple aspects and contexts of the phenomena under study. It does not focus only on single variables, but seeks to understand the totality and complexity of the topics under study. Third, qualitative research is flexible, allowing the researcher to adjust research strategies during the research process in response to emerging questions and findings. Researchers often use methods such as interviews, participant observation and document analysis to collect rich, detailed data. As a result, qualitative research provides insightful, contextual interpretations and findings that can serve to build theory, deepen understanding of the human experience and inspire further research.

This study employs a case study research strategy by interviewing the respondent. A case study is a research strategy that involves the in-depth study of a specific case or small group of cases in order to understand a phenomenon in the context of a real-world environment. The method involves collecting a variety of data, such as interviews, observations and documents, to obtain insightful and contextual information. The case study has applications in the social sciences, medicine, business and education. It is used to study social and cultural phenomena, the behavior of individuals, social groups or organizations. A case study offers in-depth analysis, enables theory generation, contextual exploration and inference, although the results cannot be generalized to the entire population.

The sampling strategy and sites were purposive, and each project was selected from area in which they operate: academic work at a university, a research and development institution, an enterprise, a research circle at a university, cooperation between an enterprise and a university, a local government unit. Within these categories, the projects that can be considered the most successful and ambitious, based on publicly available information, were selected. The surveys took place in the interviewee's office or in coffee shops if the interviewee was out of office hours. Quiet places where the person felt comfortable were chosen. All persons were informed of the purpose of the study, how the answers would be disseminated, the number of questions their general scope and the anonymity of the interview. Measures were taken to protect anonymity (e.g., giving a wider age range; omitting information about one situation). No objection was raised to the inconvenience of the interview. The interview was conducted face-to-face (including via instant messenger), had a small

number of questions and a structured format. The procedure for documenting the data was implemented using a protocol for each interview. Interviewees were informed verbally of the instructions for the interview. A non-committal interview was introduced before the interview. Questions that might cause more difficulty were placed at the end. The answers given were noted down manually or with the help of a laptop. Data analysis and interpretation was carried out by continuously considering incoming data, posing analytical questions and taking notes. Analysis of qualitative data took place in parallel with collecting the data, interpreting it and editing reports. During the interview period, earlier interviews were analyzed by annotating the most relevant content that should be included in the final report and systematically organizing its structure. The process followed the model of John W. Creswell (Creswell, 2013).

The subject areas were interconnected to achieve a higher level of analysis and abstraction. Data coding was applied, during which special attention was paid to materials containing:

- codes of topics that the reader can expect based on previous literature and his own thoughts,
- codes that are surprising and unpredictable at the beginning of the study,
- codes that are unusual as one of a kind can arouse the interest of readers,
- codes to open a broader theoretical perspective in the study (Creswell, 2013).

The reliability of the results was checked by stopping appropriate procedures and the reliability of the qualitative research in the dimension of consistency of inclusion with other studies of our own and other authors. Triangulation of data sources was used, consisting of comparing information from different sources, in order to establish a basis for consistent justification of the content provided. Participant testing took place, allowing the reliability of qualitative research to be assessed on the basis of the opinions of participants, who are provided with final reports or specific descriptions or characteristics for evaluation.

The basis for interpreting the results of the analysis was the literature on the subject. It was intended to achieve in the qualitative information on topics that gave surprising results in the quantitative survey, e.g., as many as 55% of respondents reported administrative and economic problems, definitely more than in a similar survey in 2008, this theme was developed during the qualitative research by asking to indicate the problems discussed and then comparing them between projects conducted in different units. The quantitative survey found that only 35% did not have negative roles for their team. The qualitative survey asked about the impact that a person with a negative role had on the team, what the treatment of that person was, or what effects it had. The quantitative survey showed that the main motivation for participating in projects was research curiosity, this was developed further by asking about the observed increase or decrease in it during participation in the project, the events that influenced the change in the level, or the conduct of activities to stimulate the research curiosity of team members. The first, quantitative, research found that for 84% of respondents, research curiosity was the motivation for participating in the project. This theme was developed further in the second, qualitative, research, asking whether it also occurred in the interviewees, whether they

observed an increase or decrease in its level during their participation in the project, if so, what events influenced this change and the activities carried out to stimulate research curiosity in team members. They also asked for a detailed description of the selection of members to the team. There were questions about the person responsible for selecting team members, the selection process, to condemn the issues highlighted in future project participants and to cite the team building method used.

The same set of questions (Appendix) was asked to six people, each from a different unit within which R&D projects are carried out. Interviews were conducted in May and June 2023 stationary in Wroclaw or via instant messenger. After the qualitative research, 6 reports were prepared (each on a separate case).

#### 4. Discussion of the results from the qualitative study

The interviewees were between 24 and 60 years old and male. All of the interviewed groups shared a common goal, values and a sense of responsibility, so they could be considered teams. The size of the teams they came from varied and ranged from 4 to 35 people. The basis on which the project manager was selected also varied in this survey and was consistent with the results of the quantitative survey. Among the answers were: managerial predisposition, substantive knowledge in the area covered by the project, the manager was the originator of the project, the project manager was selected on the basis of experience in acquiring and implementing projects subsidized from external sources (the project was implemented with NCBiR funds), the project manager was the originator of the project and edited the project proposal (the project was implemented with NCBiR funds), substantive experience. In the questions devoted to the selection of members to the team, some relationships were recognized. When the company was responsible for selecting people - this was the case of a company or a consortium (in which the company was the leader) the selection was made mainly on the basis of hard skills. In most of the cases studied, soft competencies were overlooked and team building methods were not applied (Table 1).

**Table 1.**

*Selection of people for R&D project teams – results of qualitative research*

	Criteria for selecting people	Omission of candidate competence	Application of team building methods	Person(s) responsible for selection of members	Other
research circle at the university	commitment	knowledge, experience, soft skills	not	three-member board of directors and a specialist of a particular department	eliminated were those focused only on benefits, recruiting for many places at the same time

Cont. table 1.

university research papers	time availability	technical competence, soft skills	not	team leader	paying little attention to selecting the right people
consortium	expertise, scientific achievements	soft skills	not	project manager and scientific director	"were selected such people for whom it was known that you would get high points when evaluating the whole project"; narrow range of specialists - no choice.
company	experience, research sense, willingness to grow in research projects	soft skills	fitting in with the team	manager and the person with the most seniority	-
research and development institutions	hard skills, soft skills, personal culture, administrative skills	-	not	institute's board of directors	searching for candidates on the Internet based on competencies, then inviting them for an interview
administrative unit	substantive knowledge, the cell to which one belongs	soft skills	not	project manager	-

Source: own work.

When asked about the administrative and economic difficulties their teams faced in the initial stages of the work, interviewees identified a variety of problems:

- research circle at the university: - accounting - qualifying costs for tasks, the framework was not fully explained; - the need to specify a specific month (falling in a few/many months) for the performance of an activity when applying for grants; - the requirement to obtain a number of formal approvals on trivial issues; - the lack of support/help initiative by some decision-makers at the university; - some supply chains were broken; - the lack of availability of specialized products several weeks before the competition;
- scientific work at the university: - extensive, variable requirements for documents (internal and external); - administrative and economic staff disproportionate to the needs of the project; - diluted responsibility for the formal issue and the quality of the services provided; - lack of willingness and stepping out of the comfort zone on crisis issues of back-office people and team members; - the project was carried out with public money, the specifics of whose spending did not take into account many internal regulations, leading to extended chains of correspondence and deepening the dilution of responsibility;
- consortium: - the procedure of contracts between the entities of the whole consortium - the length of the procedure, in one technical university, it took three months; - the transfer of property rights - the negotiation of who can and who has the right at all, and what percentage will have intellectual property;

- enterprise: - in order to extend the study by, for example, a week, a huge number of applications had to be filled out, which later had to be accepted by NCBIr; - R&D institution: - long period of document processing by companies with which the institute cooperated; - time-consuming circulation of documentation (internally and externally);
- administrative unit: - failure to meet deadlines on the part of those who were matched.

Analyzing the administrative and economic problems that arose, one can see a correlation, if the team in question worked within or with a university, they noted problems with obtaining formal approval on not necessarily important matters, a long procedural process, lack of support or initiative from that unit. The theme of excessive documentation required of the unit was mentioned in almost all interviews. Other instances of problems varied depending on where the representative came from. The most common negative role of qualitative research turned out to be Passive (withdraws from the assigned part of the task, mars the work, exposes a lack of interest in the team and the work), in every place where this role occurred it resulted in squandering the time of others, hidden or overt conflict, feeling by the remaining people the behavior of passive as disrespectful to them. When the project had a rigid time frame in the last phase, it was necessary to increase the amount of attention and persuasion towards the people in question. Only in some cases did this have an effect. In most cases, the task entrusted to the passive person was passed on to another person. In a team where mainly commitment was taken into account and checked, the person with the cited role during the trial month gave the impression of being interested and active. After qualifying for the group, there was stagnation. It is conjectured that this may have been related to being accepted into the team and therefore not feeling the need for this person to perform his task. An interesting result from the cited research in the context of the discussed people with a negative role, is one of them (Interview 1 - Blocker: stops the activity of others, does not contribute anything to the team on his own), who responded to the attention and no longer negatively influenced the rest of the team. By inference, not all people with a negative role are resistant to changing their behavior.

Summarizing the information available on the factors affecting the change of negative behavior, and what conditions must be met for this to occur, among others, can be distinguished:

- The person in question must be aware of his negative behavior and understand that it is problematic for himself or for other people.
- The person in question must be sufficiently motivated to make an effort and change his behavior. Motivation can come from a desire to improve relationships with others, to improve one's own well-being, or to improve social perceptions.
- Social support is important because it can encourage a person to change - friends, family, a therapist or a support group.
- The person in question must have the right skills to change his or her behavior. This may include the ability to deal with emotions, communication, conflict resolution,



etc. In some cases, the help of a specialist, such as a psychologist or therapist, may be necessary.

- The individual in question must see the benefits of changing his negative behavior. This may include improvements in quality of life, relationships with others, mental and emotional health, etc. Authors of various texts on the topic under discussion emphasize that changing behavior takes time, effort and perseverance. A person must be determined to work on himself and be willing to overcome difficulties and habits.

R&D teams that did not note negative roles in their team, unlike the other groups, showed support and respect for each other and treated problems as common, trying to solve them together. During the interviews, they also noted an attitude toward knowledge sharing and selfless help. Every team that had at least one person with a negative role felt stress and irritation directly or indirectly because of this. In one team (Interviewee 6) where there was shouting at other people that caused this partial breakup - *The shouting caused the team not to be such a community*. By inference, such a practice has a destructive effect on the team. The elimination of people with negative roles from the team can be controversial. During one interview, such a case was discussed (Interview 1). The person in question had a negative role - Recognition Seeker (realizes the need for applause and approval by pulling team members away from the task). The content of the answer was as follows: *The person participated only as there was an opportunity to "show off." When someone asked her about something she spoke in the form of "we" - we built, we did - despite her lack of contribution to the activities described. The rest of the people were angry with this person, asking her to move to the workshop and not "collect the cream". After several incidents over several months and not responding to criticism, she was thrown out. Posing in this circle was stigmatized, she did not respond to anything, jokes about her became the norm. After she was thrown out, a great calm was felt among the group and there was less "anger in the head," in general "it became calm," the atmosphere improved a lot. The ejected person was surprised, but did not react with anger, the circle meant little to this person, he cared about "showing off". There were never any such people in this circle.* In the body of the statement, the interviewer stressed twice that the person eliminated later did not react to criticism. It is also known that she aroused anger in the other people. The situation lasted for several months, and at a similar time another person from the same organization (discussed earlier - Blocker - Interviewee 1) ceased his negative role. After the person discussed in this section left the team, peace was felt, the atmosphere improved. Based on the analysis of the case, it can be concluded, (not without a subjective element) that in the case where, despite the expression of numerous criticisms taking place over a long period of time, a person with a negative role does not respond by improving his behavior, it is necessary to consider eliminating him from the team. Each case is different, so it should be treated on a case-by-case basis, also taking into account other factors unrelated to the negative role only to the work of the team.

All interviewees indicated that research curiosity was one of the factors that motivated them to work, although the qualitative study showed that its intensity differed between individuals. The way it was felt or the factors that were associated with it differed from one representative to another. Statements were quoted about research curiosity, the most common motivating factor for researchers. Researchers told whether they observed an increase or decrease in its level in themselves during their participation in the project, what events affected the change in the level, and whether they conducted activities to stimulate research curiosity in team members:

- research circle at a university: asking "why?" questions, stimulating fascination with the project, emphasizing the opportunity to learn construction skills, soft skills, doing something a few times better in relation to practice. Highlighting opportunities for development. The impact on changing the level of curiosity of the interviewee was the realization in his knowledge and very rapid development which was also supported by rapid promotion in the wheel and winning awards. Activities to stimulate research curiosity were aimed at younger members who had not gone far in their studies. This involved showing that theory is different from practice, instilling industry and curiosity, going to places related to activities, soliciting articles and conferences;
- scientific work at a university: the motivation of the interviewee was research motivation, and no change in its level was noticed during the project (despite numerous adversities). The interviewee carried out activities aimed at stimulating research curiosity and initiative skills (encouraged by the nature of the project) in team members, but did not receive any response or understanding. The formal leader made no such attempts;
- consortium: *Research curiosity yes, but my task was, so to speak, more of a curiosity to manage people from different fabrics, to make it work at all [...] For me, the research curiosity was not so much about content as it was more about coordination and management.* For the rest of the team, the main motivation was to achieve the goal of the grant. There were no activities to stimulate the research curiosity of the team members. No change in the level of research curiosity was noticed over the course of the project.
- the company: *I think my motivation for participating in the project was, among other things, research curiosity. During the course, I saw an increase in research curiosity due to the fact that the project is quite heavily research-based, and here the entire 3/4 of the project time is focused solely on research and on developing a solution that must work. At the beginning of the project I had much less skills than I currently have. Over the course of the project, I developed intensively and increased my skills in terms of research, interpretation of results, or research "skill" in general. The main events that influenced the change in the level of inferential curiosity, it seems to me, were the challenges posed to me during the project, due to the fact that research projects are characterized by the fact that a lot of tasks require identifying a problem, making some kind of thesis/hypothesis and verifying or rejecting it. Here there is no clear-cut solution*

*to a given problem, you have to find this solution yourself, develop and test it, and verify it at the end. Each task required a tremendous amount of work to complete it - to analyze everything and at the very end to verify the action. We have such a policy that we share research news in our topic (in our scope of work) a couple of times a week, and if someone finds a tidbit of information, they toss that information to the 147 team to check in our project or anywhere else to colleagues - whether they use it, for example, somewhere in another project where they also work.*

- *research and development institution: - Yes, the motivation for participating in the project was research curiosity. It was observed to increase after the positive reception of the project topic by the environment. I do not carry out activities aimed at stimulating research curiosity.*
- *administrative unit: - The motivator was the result. In short, the trigger for activity was that there was a foreseen goal and it was motivating, maybe less research curiosity. An advanced research and development project it was not, while the idea was to have this tool so that the province would have an advantage over others. There were no activities to stimulate the research curiosity of its team members, except perhaps in smaller subgroups.*

Analyzing the above statements, it can be seen that the research curiosity of those interviewed is the result of or co-occurs with passion in them. All the people talked about their work with excitement, boasted about the team's achievements, were proud of them and visibly enjoyed them. This is consistent with the opinions they express in other conversations - emphasizing the role of passion using the phrases "you need passion," "if you don't have passion, you know," or commenting on another person's outstanding achievements "you can see that he is passionate." Men who recalled well the project in which they participated spoke of a feeling of personal growth. It was noted that there was a directly proportional satisfaction in the men in relation to the evaluation of their development in the project. All of the people interviewed had achieved success within an R&D project and were characterized by a proactive attitude towards the environment (especially evident in the case of the institute's president, who himself searches the Internet for potential future staff), one can assume a relationship between these factors, however, it should be noted this is a small sample of observations. Being proactive means taking initiative, taking control of one's own life and taking action, rather than waiting for circumstances or other people's reactions.

As with the quantitative survey, the qualitative study also asked respondents if they would like to share additional thoughts related to the topic under study. A representative from a higher education research work environment (Interview 2), shared the following thoughts: *I see the problem primarily in the lack of willingness, in the case of many people currently working at the university, to engage in projects of a scientific and organizational nature that are not directly aimed at earning money (grassroots initiatives), while requiring them to get out of their broadly defined comfort zone. It is exacerbated by a general languor in terms of willingness to*

*expand one's horizons, placing the emoluments of scientific work above the needs of larger communities, poor organizational-scientific interdisciplinarity, broadly understood "shoddiness" and diluted responsibility in the case of social projects, often nurtured by people who, in theory, should counteract it. All this makes initiatives of this type depend almost exclusively on informal leaders, and when these lack the support of people with similar qualifications or willingness, and these, over time, are ready to abandon even the most valuable idea - not so much because of the inability to implement it, but because of the lack of understanding of it in their immediate environment. This can only be changed by strong and conscious managers, who bring to their surroundings - operating on similar patterns and value system as the leader himself - not only lucrative projects, but also cultivate a philosophical attitude to the modern academic world.*

## **5. Conclusions**

In the qualitative study, the interviewees were men between the ages of 24 and 60, belonging to teams of varying sizes (from 4 to 35 people). All teams shared a common goal of value and a sense of responsibility. The project manager was selected based on various criteria, according to the quantitative survey results. These criteria included managerial aptitude, subject matter expertise, project experience and ingenuity.

The process of selecting members for the teams differed depending on the person responsible for the process. In selections made by a company or consortium, hard skills were prioritized, and soft competencies were often overlooked. In other cases, such as academic circles, academic work at a university or research and development institutions, a wider range of competencies were considered. Teams encountered administrative and economic problems, such as lengthy document procedures, excessive paperwork, lack of support from individuals and extensive documentation requirements. In the case of teams associated with universities, problems often included obtaining formal approvals and a lengthy procedural process.

Qualitative research revealed the presence of negative roles in teams, such as Passive or Blocker, which caused problems and conflicts. However, some people with negative roles were open to criticism and were able to change their behavior. Factors were also identified that could influence a change in negative behavior, such as awareness of the problem, motivation, social support and having the right skills. Research and development teams that did not have negative roles were characterized by cooperation, mutual support and respect.

Passion and research curiosity are key motivating factors for R&D project participants. Those who engage passionately show greater satisfaction, satisfaction within the project. A proactive approach is common among participants in the projects surveyed. These individuals take control of their own lives, take initiative and engage actively with their surroundings,

which can contribute to their success. A lack of willingness to get involved among some people working in the higher education environment presents challenges for scientific and organizational projects. Low motivation to broaden horizons, a focus on remuneration over community needs, and a lack of accountability can negatively affect initiatives of this type. It is worth noting that the above conclusions are based on a limited dataset and do not necessarily reflect all cases. Additional research and analysis may provide a more comprehensive picture regarding R&D teams.

## **6. Recommendations for building teams in research and development projects**

Based on the research, the following recommendations can be made for building teams in R&D projects: 1. Strive for gender balance in the team or a similar percentage of men and women. 2. Create teams with a small number of members, the preferred number is seven or less. Larger teams may encounter a greater number of problems and negative roles, which may affect the team's performance evaluation. 3. When forming a team, pay attention to the subject matter expertise and experience of the potential leader. The leader should be knowledgeable in the project area. The study showed that when he or she is also the originator of the project he or she usually receives higher ratings. 4. Introduce a selection process for team members in which the project leader, the project initiator and the group of project initiators have input. Such a selection process can contribute to higher grades for the team. 5. Value the work of team members and their contributions, regardless of their role in the project. The team leader's evaluation should be objective and independent of his/her function in the project. 6. Focus on team members' motivation through career development, research curiosity and the opportunity to collaborate with other scientists. Motivation of team members affects the effectiveness of teamwork. 7. Provide clear rules for cooperation and responsibility for the project. Team members should share a common goal, values and a sense of responsibility for the project. 8. Ensure integration and adequate communication of the team by organizing meetings, talks, trips, conferences and seminars. Integration activities can influence positive evaluations of team performance. 9. Promote effective management of research and development projects. The role of the management of the scientific institution, the skills of team members, clearly defined goals and expectations are key to achieving positive results. 10. Monitor and resolve problems within the team. Avoid the occurrence of negative roles and create an environment where team members feel supported and valued.

The above recommendations are based on scientific research and can be tailored to the specific needs of R&D projects. It should be noted that the recommendations presented are based on a limited set of data and do not necessarily reflect all cases. Additional research and analysis can contribute to a more comprehensive view of R&D teams.

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## Appendix

### Attachment Interview form

1. The project is/was conducted under:
2. Age:
3. Gender:
4. Does your group have a common purpose, values and sense of responsibility?
5. Team size:
6. On what basis was the project manager selected? (e.g., subject matter expertise in the area covered by the project; managerial aptitude; the manager was the originator of the project)
7. Who was responsible for selecting team members? What did the selection process look like? What issues were paid attention to in future project participants? What methods of team building were used?
8. What administrative and economic problems did you face during the implementation of the R&D project in the initial stage of work?
9. Which negative role did the person play in the team? What impact did the person have on the team? What was/is your behavior toward the person in question? What effects did/does your behavior have?
 

Dominant: consistently, also by deception pursues power, neglects team interests and tasks.

Blocker: stops the activity of others, by himself does not contribute anything to the team.

Recognition-seeking: realizes the need for applause and approval by pulling away team members from the task.

Playboy: attracts group attention through extravagant, controversial, behaviors.

Victim: constantly in trouble, requires support from others, uses their energy at the expense of the group's work.

Advocate for others: without authority, speaks on behalf of others taking care of mainly safeguard one's interests.

Passive: withdraws from the assigned part of the task, mars the work, exposes lack of interest in the team and work.

Aggressor: builds relationships using aggression, attack, resentment directed at the address of selected individuals, spoils the atmosphere of cooperation, generates conflicts.
10. Is/were your motivation for participating in the project, among other things, research curiosity? Did you observe an increase or decrease in its level during your participation in the project? What events influenced the change in level? Do you conduct activities to stimulate research curiosity among team members?