
Communication in Project Team Management - Identification of Research Gaps and Direction for Future Research

Submitted 08/09/24, 1st revision 20/10/24, 2nd revision 06/11/24, accepted 15/12/24

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Abstract:

Purpose: Project management is an increasingly common way of organising work in organisations around the world. One of its key elements remains effective communication, which determines the success of implemented projects. The aim of this article is to explore key aspects of communication in project team management to identify research gaps in this area and directions for future research. The definition of a project and a project team is presented, emphasising the importance of temporality and the complementary competencies of team members. The role and competencies of the leader in the project management process is highlighted, and the importance of human capital in the project team is discussed. It is pointed out that the project managers competencies in the context of communication should be developed in terms of their interpersonal communication skills and their skills related to managing the communication process in the project. The article also explores patterns of managing communication in projects, pointing out their application in different contexts. Particular attention is given to the challenges in managing communication in virtual teams. The importance of appropriate communication tools is also highlighted.

Design/Methodology/Approach: The article is based on a literature review and findings from empirical research on communication best practices. The study employs a literature review methodology, analysing sources from Scopus, Web of Science, Google Scholar and the catalogue of the Wrocław University of Economics and Business's Main Library to identify research gaps and synthesize insights on communication tools, leadership skills, and practices in diverse project settings.

Findings: Key findings highlight the limited exploration of communication dynamics in industry-specific and virtual teams, as well as the potential of artificial intelligence to transform project communication processes.

Practical Implications: This research contributes to the field by proposing actionable strategies for improving communication management in project teams, emphasizing the dual importance of interpersonal and organizational communication competencies for project leaders. The study's practical implications provide a foundation for both academic inquiry and professional practice, offering pathways for future research and enhanced project success.

Originality/Value: As a result of the literature review carried out as part of the article, it can be pointed out that effective communication not only promotes the achievement of project

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goals, but also influences the satisfaction and commitment of team members. Although one of the studies indicated limited implementation of communication practices into the projects studied, the projects were successful. This suggests an opportunity to further explore the issue related to optimising communication management in project teams. The article contributes to project management theory and practice by offering both an overview of existing knowledge and directions for future research on the effectiveness of communication tools in project teams.

Keywords: Project management, project manager, project management competencies, virtual teams, distributed teams.

Jel Codes: D83, D43, M17.

Paper type: Review article.

Acknowledgement: This research was co-financed by the Minister of Science under the “Regional Excellence Initiative”.



1. Introduction

In a turbulent business environment, where projects are becoming a key component of organisational strategies, effective communication in project team management plays a fundamental role. The success of ongoing projects largely depends on the project manager's ability to communicate effectively (Albuali, 2021), manage stakeholder expectations and build a consistent understanding among team members (Pollack and Matous, 2019).

Communication becomes not only a tool for information exchange, but also the basis for cooperation, trust and commitment within the team (Morgan *et al.*, 2021). In the literature, communication competence is often identified as one of the key determinants of team effectiveness, minimising conflicts and achieving project goals (Varhelahti and Turnquist, 2021). At the same time, its importance goes beyond the technical aspects of management to include soft skills such as active listening, problem solving or managing people from different backgrounds (Kopacka, 2015).

The purpose of this article is to identify research gaps and develop directions for future possible research on the role of communication in project teams managing. The analysis of the role of communication in project team management, with a particular focus on project managers' communication competencies was the tool to reach the goal. In addition, challenges and practices in building effective communication in project teams had been discussed.

These enabled a more thorough exploration and understanding of a topic that plays an important role in the field of management science. The study adopts a comprehensive literature review methodology, synthesizing findings from key databases such as Scopus and Web of Science to draw theoretical and practical conclusions.

The value of this research lies in its dual focus: highlighting the importance of both interpersonal and organizational communication skills for project leaders and examining the application of communication tools in various contexts. By combining theoretical analysis with practical recommendations, this article contributes to bridging the gap between academic knowledge and professional practice in project team communication management.

Despite significant research in this area, we have identified several gaps, which can be used to indicate paths for future research. Existing studies often focus on general communication frameworks or specific contexts, leaving unexplored areas such as the nuances of communication in industry-specific project teams or the impact of artificial intelligence on team communication.

Moreover, while the competencies of project leaders are well-theorized, empirical insights into their application in diverse professional settings remain limited.

This article is structured as follows: the next section presents the methodology, detailing the systematic literature review process. The subsequent sections provide a synthesis of relevant literature, discuss the identified research gaps, and explore potential future research directions. That is followed by conclusions with a summary of key findings and implications for practice.

2. Research Methodology

This article is based on literature review methodology to identify research gaps and directions of future research in communication in the management of project teams. The research process was carried out in several stages, involving the selection, analysis and synthesis of available scholarly sources which led to the identification of areas requiring further research.

As a first step, a literature review was conducted using scientific databases, including Scopus, Web of Science, Google Scholar catalogue of the Wrocław

University of Economics and Business's Main Library. The selected articles and publications focused on the topics of communication, project team management and project leader competencies. Key search terms included: "project team management", "project leader role", "project team communication", "project leader competencies", and "role of communication in projects".

Basing on this research selected papers were then analysed. It resulted in identifying the main theoretical concepts, results of empirical research and their practical applications. Different perspectives were considered, such as the role of the project team leader and its necessary competences, the impact of communication on the effectiveness of teams.

In the following section, the focus is on finding research gaps by identifying topics that have received limited or incomplete coverage in the literature but are worthwhile and crucial to the analysis of the issue. Special attention was given to aspects such as the differences in communication in distributed and virtual teams, the role of different tools in communication processes or the importance of soft skills in team management.

The literature review was complemented by an analysis of the available research findings, allowing conclusions to be drawn regarding best practice in communication management in project teams and identifying potential directions for further research. This way, the article's methodology allows for a comprehensive view of the problem at hand, providing both theoretical and practical insights.

3. Literature Review

3.1 Functioning of a Project Team

According to the International Project Management Association Individual Competence Baseline, a project is defined as "a unique, temporary, multidisciplinary and structured venture to deliver agreed deliverables within pre-specified requirements and constraints" (IPMA, 2015).

The Project Management Institute, on the other hand, defines a project from a different angle, as *"a temporal ventures/organizations, with a unique content and scope, that are created to support the strategy and business objectives of a firm"* (Pavez et al., 2022). Unlike the previously mentioned definition, constraints that may arise are not included here unfortunately (Strojny and Szmigiel, 2015).

The unifying element of these definitions is the temporariness of the project, which makes it clear that an important characteristic of a project is a definite beginning and end. However, none of these definitions mention the human factor, which we consider of key importance in the process of the effectiveness of project team's functioning.

Human resource management is about using the potential of employees and their skills to achieve the organisation's objectives. The work teams that have been created to deliver a project are expected to provide faster and more efficient work results compared to those achieved by individual efforts (Stankiewicz and Birr, 2014). A key challenge in project management is to manage the project team so that the goal is achieved in the most efficient way (Kopacka, 2015).

Based on the previously mentioned definitions, the following definition of a project has been formulated for the purpose of this article. A project is a temporary, structured and multidisciplinary venture carried out by a group of people whose collaboration aims to deliver a unique product, service or outcome. These activities take place within a defined time frame, according to clearly defined requirements, objectives, budget and division of tasks, considering constraints and the team's commitment to achieving agreed outcomes.

A project team is defined in the literature as a deliberately formed group of people who work together to carry out a given task. Pavez, et al. (2022) identify it as a group of specialized and highly interdependent individuals who work collaboratively to generate identifiable products or services within a specific timeframe.

A feature of a project team is that it is small in terms of a size but is composed in such a way that the skills of the individual team members complement each other (Stolarska, 2016).

It is said that the project management team plays a key role in the success of a project by ensuring the engagement of all parties which are involved in the project. It provides the basis for an effective exchange of information among stakeholders and enables a clear definition of roles, tasks, competences and responsibilities. This division avoids problems related to decision-making and the implementation of management activities.

The members of the project team should be suitably qualified to ensure that they can carry out their tasks reliably and conscientiously. The team acts as an integrated group in which the members support each other while being fully aware of their duties and responsibilities. It operates within a specific time frame, such as the project timeframe, and is disbanded upon completion (Kruk, 2018).

On this basis, the following definition of a project team was formulated. It is a purposefully formed, small group of people with complementary competencies working together to complete a specific task within a project. It ensures stakeholder involvement, effective communication and eliminates decision-making difficulties through clearly defined roles and responsibilities. The team operates within a defined timeframe and disbands at the end of the project.

The human capital that makes up a project team includes the knowledge, skills and competences of the employees, which can be used effectively through appropriate management within the organisation. It is an important competitive differentiator for companies, especially in the face of globalisation and rapid technology transfer. It is well-qualified employees who contribute to a competitive advantage.

The basis of human capital is knowledge, which affects both the employee's position in the labour market and his or her value within the organisation. In the context of project teams' human capital is defined as the combination of physical and mental predispositions, supported by specialised knowledge, skills and experience, that enable effective participation in project delivery (Wyrzykowska, 2024).

Human capital is a valuable resource for any organisation because it is its foundation (Gerhart and Feng, 2021). Without people, no organization can work and, importantly, implement projects. It is considered a key success factor during project implementation. The study on the role of human capital in project implementation was conducted which aimed to investigate the prevalence of human resource dysfunctions and their impact on project success.

The main findings of the research indicate that 88% of the companies did not report any human capital issues, while dysfunctions were noted in 12% of the cases, but did not significantly affect project implementation. The main difficulties related to the low commitment of team members (55% of indications), problems with the rapid acquisition of specialists (33%) and the inappropriate selection of a project manager (22%).

It was also observed that lack of team cooperation, staff turnover and high task load were often due to inadequate management (Goździewska-Nowicka *et al.*, 2018). An important aspect of the project team is that every project team must have a designated leader, a person who will oversee the activities being carried out (Majeed, *et al.*, 2023; Kopacka, 2015). This is an important element that should be included in the adopted definition of a project team.

On this basis, the crucial importance of a competent team and an effective manager for project success can be confirmed. The human factor is fundamental when working on a project, but it is also important to address the question of what makes a team work in a way that enables this success.

3.2 The Role of the Project Team Leader

As mentioned earlier in the article, an important role in a project team is the role of a leader. To be able to define this concept it is first necessary to focus on the concept of leadership, which is closely associated with being a leader. Griffin (2004) stresses that leadership is one of the management functions of leading human resources by

matching an individual to an appropriate job, assigning tasks to be completed and motivating them to work towards the organisation's goals.

It focuses on the interaction between the employee and the organisation, considering what each party can contribute and receive in return. Leadership is a narrower concept than management and is associated with managerial or leadership roles (Griffin, 2004).

A manager or project leader is a person who influences decision-making without giving direct orders. The person acts as the leader of a particular team, managing its work and taking responsibility for its results (Stolarska, 2016). The role of the leader includes the role of the leader of a particular team.

The study by Avenca *et al.* (2024) shows that the leadership skills of a project manager are crucial for effective knowledge sharing in a project team. It was indicated that leaders with strong leadership skills positively influence both explicit and tacit knowledge sharing by fostering team members' activity and interaction, which is desirable when implementing a project.

The study highlights the need for leadership training for project managers to effectively support a culture of knowledge sharing. Additionally, it was pointed out that organisations should integrate knowledge sharing processes into the overall knowledge management system, where the manager's role in leadership is crucial.

The findings suggest that organisations that meet difficulties in knowledge sharing should implement a comprehensive strategy, with a focus on leadership, to effectively support knowledge transfer within the team (Avenca *et al.*, 2024). Similarly, Rafiq *et al.* (2022) prove that there exist a positive relation between leadership and employee engagement, knowledge sharing, and trust.

A team needs a leader who is strong and confident in their leadership functions, such as designing, coordinating, supervising and reviewing the work of the team. The leader manages human resources, and, above all, it is his/her task to create the team by selecting from the available staff the most suitable for the task. They then organise the work by assigning tasks to individual team members and identifying a creative leader who brings innovative ideas to the project.

To ensure the effectiveness of the team, the leader motivates the group members, for example by using a system of rewards and punishments. They give a reward, such as a bonus, for a well-done job, and may apply a punishment, such as extra working hours, if the task is not performed properly (Kopacka, 2015).

Other authors emphasise the decisiveness that the leader must have (Kruk, 2018). The leader is defined as the key person responsible for the proper management of the project implementation, who constantly monitors progress in terms of schedule,

budget and substantive performance. For leader to be able to lead the team effectively, knowledge of human resource management and psychology, leadership skills, empathy and other personal qualities, such as consistency, are required to enhance management effectiveness (Kruk, 2018).

This shows that leadership skills are crucial for a leader. A project team needs a person who demonstrates skills and attitude showing that the leader can lead the team to the goal. The leader is responsible for each individual member as well as the whole team together, in terms of the people and in terms of the tasks they perform. Without a leader to carry out the designated leadership tasks, the team will function in a great deal of chaos, which may result in the failure of the project.

3.3 Project Team Leader Competencies

In addition to leadership skills, a project team leader should have the right competencies to enhance the success of the project. An effective leader should use their knowledge and experience already at the team-building stage, taking care to select the right candidates (Kopacka, 2015).

Leadership requires charisma, i.e., the ability to influence the group and build authority so that the team willingly follows orders. The leader must be able to solve problems, such as conflicts within the team, while remaining calm and composed. An important element is to gain the trust and acceptance of subordinates, so they can count on his or her support in difficult times. A good leader inspires optimism, motivates action and believes in success, which translates into team commitment.

At work, they demonstrate discipline and consistency in achieving project goals, as well as respect for the diverse opinions of team members. An effective leader is characterised by tolerance, emotional and mental maturity and the ability to build relationships based on mutual trust, without the need to dominate. With these qualities, they can integrate the team and achieve better results (Kopacka, 2015).

An interesting approach to leader's competencies was proposed by Ruben (2019). He identified communication competencies as one of five key areas of competencies each leader should have. These include:

- (1) analytic competencies, which relate to the knowledge and skills needed for being reflective, self-aware, and thoughtful and attentive to others' feelings and purposes;
- (2) personal competencies, like cognitive capability, energy, conviction, character, values – factors that allow leaders to be admired and be a role model by others;
- (3) organizational competencies, including vision creation, strategy development, knowledge management, collaboration and empowerment or crisis management;

(4) positional competencies, including context, job, or sector specific education, background experience or professional development;

(5) communication competencies including knowledge and skills necessary for effective interaction in interpersonal, group, organizational, and public settings.

Siddiqui *et al.* (2024) also shows that an important competency of a leader is communication skills. These play a key role in the success of project management, as they include the ability to effectively communicate information, expectations and ideas. They include both verbal, written and non-verbal communication, as well as the ability to adapt to different cultural and interpersonal contexts. Active listening and building a common understanding among stakeholders are also an important component.

These competencies are not limited to technical language proficiency, but also include the ability to motivate a team, resolve conflicts and create a positive working atmosphere. They help leaders to align project activities with the expectations of different groups, such as customers, sponsors or end-users.

In addition, they support the management of challenges, the communication of the project vision and effective decision-making, which is important for minimising risks and maintaining team cohesion. Communication competencies promote transparency, trust and collaboration, minimising the risk of misunderstandings and helping to mediate conflicts.

They enable the project leader to effectively link various elements of management, resulting in smooth progress and the achievement of project objectives. These are dynamic and fundamental capabilities that contribute significantly to project management success (Siddiqui *et al.*, 2024). The IPMA ICB is an international standard that defines a set of competencies necessary for individuals working in the field of project, programme and portfolio management.

It also serves as a key benchmark for assessing individual competencies within the International Project Management Association's four-level certification system (IPMA, 2015). Communication-related skills are included in two competencies of the IPMA ICB standard. The first competency 6.4.3 Interpersonal communication is located in the People area and the second 6.5.5 Organisation and communication in the Practice area.

According to competency guideline 6.4.3, the certificated should have the ability to speak effectively during a variety of situations, adapting means and styles of communication to the needs of the audience, while focusing on their delivery of information in a clear and understandable manner.

They should have skills such as active listening, questioning, use of presentation and moderation techniques, as well as the ability to build an atmosphere of trust and free exchange of ideas within a team. All this with the use of humour as a tool capable of relieving tension in stressful situations. Additionally, the competency also highlights the challenges of leading a virtual team (IPMA, 2015).

Competency 6.5.5 deals with the design, implementation and management of the temporary organisation which is the project team. Complementary to all these processes is the development by the project manager of an effective information flow system within the team.

This involves identifying information needs, establishing communication processes and selecting an appropriate communication infrastructure. It is crucial to provide only the necessary information in the best suited form and at the right time, to avoid information overload for employees and to monitor formal and informal communication channels (IPMA, 2015).

The IPMA competencies therefore divide communication skills into interpersonal and organisational communication. The project manager must be able to talk to their employees but, on the other hand, also be able to skilfully organise communication within the project team.

This is in line with the division of communication areas into interpersonal communication and organisational communication indicated by J. Burdlak and M. Łuźniak-Piecha (2022). These areas interpenetrate each other, as their internal recipients in the organisation are colleagues.

3.4 Interpersonal Communication

Interpersonal communication mainly refers to the exchange of information between sender and receiver or in a small group of people who are in the direct contact with each other. At the same time, communication is a fundamental social process that forms the basis for other forms of human activity in society (Frączek, 2012). Several important elements of the communication process can be distinguished. Context refers to the conditions in which the communication process takes place.

The participants in communication are the sender and the receiver, who may play roles interchangeably. In formalised processes, roles are usually clearly defined and asymmetrical, as in a superior-subordinate relationship. In contrast, the key element of the process is the message, the *communiqué* at the centre of the information exchange.

The message is transmitted through a channel, i.e., the path by which the information reaches from the sender to the receiver. During communication, however, noise, or interference, of an external, internal or semantic nature, may

occur. The final element is feedback, which is the recipient's reaction to the received message after it has been decoded (Frączek, 2012).

Interpersonal communication is divided into verbal and non-verbal. Verbal communication is based on the use of language and its main forms are oral and written communication. The former involves the direct exchange of information through words, such as in conversation.

Written communication, on the other hand, involves the transfer of information through text, for example in the form of emails or memos. On the other hand, non-verbal communication is related to body language and is a key element of human interaction (Frączek, 2012).

According to the Mehrabian rule, when sensing an internal contradiction in the sender's message, the receiver perceives information 7% through words, 38% through tone of voice and 55% through body language (Burdak, Luźniak-Piecha, 2022).

In the context of interpersonal communication in organisations, we can identify selected communication functions. These are the information function, focused on informing and transmitting information, the integration function aimed at creating bonds between individuals, and the mobilisation function aimed at stimulating specific actions among participants in the communication process (Frączek, 2012).

3.5 Organizational Communication

All aspects of interpersonal communication are applicable in organisations. R. V. Lesikar (1977) identified four key factors that influence the effectiveness of communication in organisations. One of these conditions is the effective operation of formal communication channels. Formal communication in an organisation is primarily vertical, top-down or bottom-up.

Upward communication refers to the transfer of information from employees to superiors, including reporting on tasks, problems and passing on requests for help. The quality of this communication depends on the openness of the supervisor. Downward communication, on the other hand, involves the transmission of orders, instructions and feedback from the supervisor. In addition to vertical communication, there is also horizontal communication between employees at the same level, which is often less formal (Sypniewska, 2013).

Informal communication on the other hand, develops when official information is incomplete or inaccurate for the recipients. This is because the flow of information in the case of informal communication is faster and more efficient. Although it is difficult to control, informal communication channels, including gossip, should be noticed and monitored by managers.

Research by B. Sypniewska (2013) confirms that, in fact, employees who obtain information directly from their superiors are more satisfied with their jobs, salaries and interpersonal relations, while those who use informal sources of information express dissatisfaction in these areas. The source of an employee's information acquisition therefore has a significant impact on job satisfaction, relationships within the company and earnings (Sypniewska, 2013).

3.6 Communication Within the Project Team

The increasing demand for specific employee skills is leading to the growing popularity of project teams. As mentioned before the success of a team depends both on the competence and experience of its members and on the individual ability to work together. A project team is formed for the duration of a specific project, which ends with its completion. The duration of the team depends on the complexity of the project and can range from a few months to several years.

According to most methodologies, the optimum number of project team members is between 3 to 5 people, although in practice teams often have many more employees (Winkler, 2013). This raises the challenge that there are many potential channels of information in which information can potentially be transformed.

In a project team of n members, the number of potential communication channels equals: $(n^2-n) \div 2$. In a team of five, there are ten internal channels of information flow to deal with. It is therefore the role of the project leader to develop effective communication within the project team (Winkler, 2013).

Communication management is a key knowledge area in project management (Albuali, 2021). It affects most tasks performed, as every part of a project requires communication both within the team and with external stakeholders. Research shows that the communication environment has a direct impact on project outcomes, and that communication skills and collaboration are the foundation of effective leadership (Morgan *et al.*, 2021).

Awareness of the importance of effective communication is also essential to business success. This is why it is so important for both the project manager and their team members to continuously promote and seek out good communication practices (Muszyńska, 2017). Ineffective communication can, in turn, undermine efforts in attitude formation, interpersonal relations, training and professional development, leading to the perpetuation of inappropriate thinking and behavioural patterns in employees (Winkler, 2013).

Effective communication management in a team requires integrating members and building mutual trust moreover identifying communication needs unique to the team. It is the role of the leader to determine who needs what information, what the level of detail should be, when it should reach the addressees and through which channel

it should be delivered. It is also important to select appropriate communication techniques, depending on the specifics of the team.

A lack of appropriate communication competence can affect the relationship between the manager and the team and the perceived credibility of the leader. Effective communication management therefore requires both the right skills and thoughtful organisation of communication activities (Winkler, 2013). A two-pronged approach to the project manager's competencies related to team communication is therefore emerging again in the literature.

Teams can either work in one place and time or be spatially dispersed (Winkler, 2013). However, effective communication is a key factor influencing team effectiveness, whether the team is traditional or virtual (Muszyńska, 2017). In the project team management literature, the area of virtual team management is now an extremely frequently discussed topic. Numerous studies are devoted to this issue (Verhelahti *et al.*, 2021; Greimel *et al.*, 2023).

This is because, as Nowakowska (2023) states, in times of digitalisation and globalisation, the management of virtual teams is becoming an essential part of the functioning of many organisations. Such teams bring together members from different locations, often separated by cities, countries or continents, who communicate through information-communication technology.

Their virtuality can range from working completely remotely to a hybrid model combining remote and office-based working. A particular challenge for managing virtual teams is building a sense of belonging among its members.

This is a key aspect influencing the subsequent level of motivation within the team. At the level of the individual employee, the way to build such belonging is through effective communication. It improves job satisfaction, fosters commitment and increases productivity (Nowakowska, 2023).

Nowakowska (2023) states that the management of virtual teams necessitates specific strategies to meet the challenges of remote working. One of them is the effective leadership of the project leader, who should foster innovation, independence and involve team members in decision-making processes (Greimel, 2023). This, of course, will not be possible without the effective communication.

A culture of open and regular exchange of information, both formal and informal, should be promoted within the team to keep the team engaged and monitor the progress of the work. It is extremely important to build trust among your employees.

Moreover, creating an atmosphere of openness and honesty through transparent communication and fostering collaboration is the key. In all of this, technology to support communication plays a fundamental role. It is the role of the project

manager to select the right tools, such as project management, communication or document sharing platforms. The tools must, of course, be tailored to the needs of the team and the specifics of the project (Nowakowska, 2023).

3.7 Communication Tools in the Project Team

Tools that can be applied to project team communication are a separate area of consideration. Tworzydło (2023) divides internal communication tools into two groups: traditional tools and modern tools. In the first group, he classifies the company's radio and television, notice board, questionnaires, employee handbook, annual or periodic report on the company's activities or internal bulletin.

In the second group he considers the intranet, internal e-marketing, the electronic newsletter or instant messaging to be modern tools. In addition, he sees a tool that has a strong impact on relationship building, namely company events, as an important internal communication tool.

These can be divided into educational (trade fairs, conferences, training courses), educational-integrative (training courses with team-building elements), motivational (team building, combined with workshops supporting soft competences) and image-building (events for employees' families, anniversaries) (Tworzydło, 2023).

Another specificity of tools, aimed directly at projects, is discussed by Nowakowska (2023). She presents tools that are dedicated strictly to communication management in a virtual team, but many of them can also be used successfully in day-to-day stationary teams. Dedicated project management tools are the foundation. The most popular are Asana, Jira or Trello.

With features such as Kanban boards, Gantt charts, task lists or time tracking, they provide transparency and real-time access to information for the entire team. For virtual teams, real-time communication tools are also essential. Programmes such as Slack, Microsoft Teams and Zoom allow for live chats, messaging, video conferencing and even workshops, which goes some way to compensating for the lack of physical meetings between team members.

Collaboration tools are another group. An example is the Google Workspace package (Docs, Sheets, Slides, Drive), which facilitates the creation and editing of documents in real time, thus supporting remote teamwork. When working in a project team, data management is also important.

Cloud tools, such as Google Drive, Dropbox or Microsoft OneDrive, provide secure file storage and sharing. The last group is knowledge management tools. Their scope is very wide. Proposed tools such as Confluence, Notion or Trello enable knowledge assets to be collected, shared and updated so that they are available to all team members regardless of location (Nowakowska, 2023).

3.8 Project Communication Management Patterns

Translating the theoretical knowledge of project team communication management into practical action, Muszyńska (2017) presents her own patterns for project communication management. They can be seen as a kind of development of the previously mentioned team management strategies proposed by Nowakowska (2023). These patterns carry specific solutions that a project manager should take to effectively and efficiently manage communication in his team. Muszyńska (2017) divides proposed patterns into 4 categories: informational, strategic, emotional and practical.

The informational category includes: (1) Developing a communication schedule that includes both two-way information exchange between team members and multi-party video conferencing; (2) Establishing a project repository, a central place where project documentation is stored, shared and managed; (3) Promoting multiple forms of communication, particularly emphasising the role of oral communication (Muszyńska, 2017).

The strategic category includes: (1) Developing a communication plan with assigned responsibilities for communication and documentation tasks; (2) Training the team in terms of the rules and customs of its members' countries when working in an international environment, defining a common language for collaboration. It is also possible to introduce a common "project culture" for the whole team, which will indicate a set of principles to be followed by its members; (3) Appointing a contact person for the project team (Muszyńska, 2017).

The emotional category includes: (1) Persuasion by the project manager of team members to communicate directly with representatives of external stakeholders; (2) Regular visits and secondments of team members to project partners. Rotating team members in this regard should enable them to get to know each other and break down communication barriers; (3) Encouraging team members to share their ideas, comments and observations about their work to help them feel valued (Muszyńska, 2017).

The practical category includes: (1) Reminding the team of the basic principles of communication, such as, making demand in the form of requests, keeping promises and attending meetings (including virtual ones), and keeping a positive message when expressing criticism; (2) Ensuring consistent roles, work procedures and project organisation across external stakeholder teams to synchronise communication and collaboration (Muszyńska, 2017).

Muszyńska (2020) used her communication patterns in later study conducted among 10 international project teams implementing EU co-funded projects in 2014-2019 (Muszyńska, 2020). The research presented is extremely interesting, since

distributed international teams are the type of project teams that require special attention to communication management.

In addition to the standard challenges of working in project teams, there are specific difficulties associated with managing a virtual team, cultural differences and the language barrier (Muszyńska, 2020). She analysed activities implemented in these projects in the context of building internal communication, based on the communication patterns discussed earlier. For her research, however, she used only three categories of patterns: strategic (S), informational (I) and emotional (E). In her research, without giving a reason, she did not include patterns of a practical nature.

For every pattern used, she matched specific desired communication activities that should be implemented in the project. Each activity has an assigned signature. In the case of strategic patterns, these are S1-S4, informational I1-I4, and emotional E1-E5 (Muszyńska, 2020). In terms of common practices in communication management, all projects had clearly established rules and responsibilities at their start (S1).

English was chosen as the common language of communication in all projects (S4). In eight of them, a communication plan was developed and monitored during the work (S3). All projects used email on a daily basis (I2) and various means of communication e.g. project meetings or online meetings (I4). In six out of ten ongoing projects, one joint project knowledge centre was created (I1). Nine projects held a face-to-face project kick-off meeting (E3).

In addition, most projects had bilateral meetings or meetings with some of the partners when necessary (E4) (Muszyńska, 2020). Communication management practices that were used infrequently or were not included at all regarded the development of a 'code of conduct' (S2). In ongoing communication, online conversations and instant messaging were used occasionally in 8 projects (I2). Despite the use of various sources of communication, face-to-face communication (including that using remote communication tools) was sporadic.

Written communication was used most often (E1). Team members were not encouraged to contact informal contacts and build relationships (E2). Most projects lacked dedicated tools for knowledge sharing (E5) (Muszyńska, 2020).

Although not all communication management practices were fully implemented or implemented properly in the projects surveyed, no major problems were reported during the projects. This may suggest that not all these communication practices are necessary for success. At this point, however, it is worth noting the nature of grant projects.

The success of such projects is measured by the realisation of the plan set out in the application, within the specified time and budget. In commercial projects, on the other hand, flexibility and the ability to adapt to ongoing changes are of key

importance. Efficient communication is then key to the success of such a project. It can therefore be anticipated that if all communication patterns were applied correctly in the projects studied, this could shorten their implementation time or reduce their costs.

The research has thus provided new information on the relationship between the use of communication practices and the nature of project funding (Muszyńska, 2020).

4. Research Results and Discussion

4.1 Research Gaps and Paths of Future Research

As a result of the literature review we identified areas that need further study. First and foremost, the need for more in-depth research on the use of communication tools in distributed project teams in the private sector was noted. This will allow a comparison of their approach to communication management compared to project teams in the public sector.

This will increase the diversity of perspectives on aspects of project communication. It is worthwhile to analyze what specific communication technologies and platforms are used by project teams in the private sector and how they affect the effectiveness of project management.

The next research gap identified as a result of the study is the specifics of communication in project teams in different industries. This is because it was noted that there is a need for detailed analyses of how communication practices are adapted to meet the requirements specific to each industry. Each of these industries have its own unique communication challenges and needs, both in virtual and remote environments. These differences can potentially affect the selection of specific communication tools and the organization of specific communication practices.

In the context of communication in international teams, an area that needs to be expanded further is the impact of cultural and linguistic differences on the quality and effectiveness of communication. As mentioned in the article, teams operating in different countries often face difficulties related to cultural norms, communication styles or language barriers.

All this directly affects the understanding of each other, decision-making and team atmosphere. Therefore, it would be appropriate to study the interiors of such teams to identify the most common communication problems and potential solutions used in practice.

Another potential area of research could be the verification of professional practice, in the context of the communication competencies that practitioners possess in

leading project teams. The research could be based on a self-assessment of project managers themselves, or on a survey of needs and preferences among team members. This would allow confronting theoretical findings on the competencies of project leaders with professional practice. In addition, examining the perspectives of team members would identify discrepancies and thus provide guidance for improving the project manager's communication competencies.

Considering the growing importance of artificial intelligence, another area of research, based on the literature review of the above article, may be the application of AI to the internal communication of project teams. Research into these areas will examine how artificial intelligence supports tools and communication practices in project teams. This is an extremely valuable area to explore, in the context of the increasing organization of work in the form of virtual teams and the increased importance of IT tools in project management.

5. Conclusions

The literature analysis conducted showed that effective communication plays a key role in project team management. Emphasis was placed on examining the role of the project leader, whose extensive communication and leadership skills are crucial to the effectiveness of the team. The results of the review also indicate the necessity for the project leader to use appropriate tools and action strategies related to communication within the project team, especially when operating as part of a virtual or international team.

Findings presented in this article constitute an original contribution of the work to the field of project management, highlighting the importance of communication as an essential element to enable project success. The research provides theoretical and practical support for project team leaders, pointing out the importance of soft skills related to communication in a team. On the one hand, high interpersonal communication skills are required, and on the other hand, the skills to consciously manage communication across the project team are also necessary.

The value of the article also lies in its comprehensive approach, combining theoretical analysis with practical implications, which allows for a better understanding of communication processes in project management. An important contribution is identification of research gaps in the area of the role of communication in project teams, and proposition of avenues for future research.

A limitation of the study is the methodology used, based mainly on a literature review and analysis of previously available data. The lack of larger-scale empirical studies limits the generalisability of the results.

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