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THE ROLE OF REFLECTION IN VIRTUAL TEAM EFFECTIVENESS

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Abstract

Purpose – Based on theoretical analysis and interview data, the aim is to reveal the impact of virtual team reflection on organisational collaboration. The authors identify the challenges faced by virtual teams and reveal the characteristics of the virtual team reflection process;

Design/methodology/approach – the work uses methods of analysis of scientific literature and semi-structured interviews with managers, as well as comparative analysis.

Findings – The use of more advanced communication technologies makes virtual teams more functional and flexible. Virtual teams face several challenges that have a negative impact on collaboration that arise in the team collaboration process: low trust, conflicts, lack of motivation of members, leadership/leadership difficulties and cultural diversity. It is therefore necessary for the virtual team to apply reflective practices in its activities. Successful reflection is determined by the creation of an open environment, psychological factors such as a sense of evaluation and security clear rules for meetings. Reflection strengthens the virtual team, increases the sense of community, and contributes to the development of each team member and the team as a whole. The study showed that reflection is used as a risk management tool in virtual teams to mitigate threats by preventing obstacles from becoming problems;

Research limitations/implications – The study was carried out in the field of project management, which prevents the generalisation of the findings to other fields.

Practical implications – Advances in information and communication technologies and globalisation have led to the emergence of new ways of organising work, such as virtual teams, teleworking, and others. With the Covid-19 pandemic, which has forced many organisations to implement virtual teams in a rapid and sudden manner, this article will help practitioners to structure their knowledge about virtual teams and discover new ways to improve collaboration in such teams;

Originality/Value – the pandemic has fundamentally changed the way work is organised, forcing teams to look for ways to collaborate effectively virtually and to cope with the challenges. This paper presents a tool for continuous reflection in virtual teams that will lead to better results in organisations;

Keywords: virtual team, reflection, project management.

Research type: viewpoint.

JEL classification: M10, M12.

Introduction

The recent Covid-19 pandemic has provided a good opportunity to build on previous knowledge about virtual teams and to discover new ways to improve the collaboration of such teams (Caputo, 2023, p. 2). Virtual teams undoubtedly provide organisations with greater flexibility and responsiveness to the changing global business market (Walsh, 2019, p. 99). Smooth communication and collaboration in any organisational environment is key to management success, and this has become even more evident as work execution has moved to virtual space (Swart et al., 2022, p. 59). The pandemic has fundamentally changed the way work is organised, forcing teams to look for ways and tools to collaborate effectively in a virtual environment and cope with challenges. One such tool is the virtual team's continuous reflection.

Virtual teams are currently being studied quite extensively in foreign academic literature, but there are still many unanswered questions. Shaik and Makhecha (2019) reviewed the challenges that teams face in virtual environments, explored the interactions between virtual team members, and delved deeper into the factors that encourage employees to be engaged in virtual teams. Samul et al. (2020) analysed virtual teams and the multicultural differences between team members. Thuong (2019) sought to identify the advantages and disadvantages of virtual teams in her study. Schaubroeck and Yu (2017); Lechner and Mortlock (2022) explored collaboration, issues and psychological safety in virtual teams. Ledwith and Ludden (2016); Bell and Kozlowski (2002) analysed the typology of virtual teams. Bhat and et al. (2017) investigated problem areas of virtual teams such as information sharing, communication and trust factor. The issue of trust in virtual teams has been more extensively studied by a number of foreign authors (Zaharie, 2021; Breuer et al. (2020); Walsh (2019); Guerriero and Gronier (2014); Huang (2012); De Jong et al. (2016). The aspect of motivation in virtual teams has been touched upon by Baldonado (2013); Clear and Kassabova (2005). The aspect of reflection in virtual teams has also been touched upon by several foreign authors: Karaturhan (2022); He (2017); Jones and Graham (2015).

Researchers have found that some of the biggest challenges of virtual teams are low levels of trust among team members, lack of motivation, conflicts, management and leadership difficulties, and cultural diversity (Swart et al., 2022, p. 60; Ashkanasy et al., 2020, p. 36; Holtz et al., 2020, p. 157; Davidavičienė and Al Majzoub, 2022, p. 4; Kukytė, 2021, p. 12). An analysis of the literature has shown that reflection can help to address these issues and have a positive impact on collaboration (Holtz et al., 2020, p. 163; Khosravi et al., 2020, p. 40; Morrison-Smith and Ruiz, 2020, p. 13). However, in the Lithuanian context, virtual team reflection in project management has not yet been investigated, which creates a need for this empirical study that will seek to uncover the impact of virtual team reflection on collaboration in a project management context. Thus, there is

no doubt that the reflection of virtual teams in the context of organisational management requires further investigation.

The aim of the study is to reveal the impact of reflection of virtual team members on collaboration in projects. It is not enough to analyse the phenomenon of virtual team reflection in project management from a normative and theoretical perspective. It is a complex multidimensional process, combining various skills and competences, requiring close interaction. Therefore, "the need for qualitative research arises in order to explain the interaction of social actors in social reality, their behaviour in specific contexts and situations" (Poteliūnienė, 2017, p. 69).

Based on theoretical analysis and interview data, the aim is to reveal the impact of virtual team reflection on organisational collaboration. The authors identify the challenges faced by virtual teams and reveal the characteristics of the virtual team reflection process.

The first part of the paper discusses the theoretical aspects of virtual teams, the structure and characteristics of virtual teams and the importance of reflection in virtual team collaboration. The second part presents the results of the qualitative research and concludes with a table of respondents' quotes.

1. Theoretical background

1.1. Structure and features of a virtual team

Today, in the 21st century, traditional teams alone are no longer sufficient to meet the rapidly changing needs of the business environment. In this age of technology, the wide range of communication options that have emerged make it easy to transform organisations, and the virtual teams that have emerged in these organisations allow us to look at work in a slightly different way than we did before. When it comes to the concept of the virtual team itself, different authors have described it in rather similar terms, but there is no single definition either. According to Bell and Kozlowski (2002, p. 8), virtual teams are working arrangements in which team members are geographically dispersed, have limited face-to-face contact, work with each other, use electronic communication tools and share common goals. This description is complemented by Gibson and Cohen (2003, p. 29), who define a virtual team as team members who are geographically dispersed, have a shared responsibility for delivering results on time and at a cost, and use common design tools to work and communicate electronically. In the view of Leenders, Engelen and Kratzer (2003, p. 70), virtual teams are groups of individuals, whose members may be drawn from geographically different locations and often for a defined period of time, collaborating on a specific project. According to Ale Ebrahim, Ahmed and Taha, (2009, p. 2654), virtual teams consist of members located in more than one physical location. They suggest that this team characteristic has led to the

widespread use of a variety of forms of computer-based communication, allowing geographically dispersed members to coordinate their actions through individual effort.

Samul et al. (2020, p. 14) identified some of the main characteristics of virtual teams. According to them, virtual teams consist of participants who are geographically dispersed, who work together and have a certain amount of knowledge in order to achieve common goals and exchange results, and whose communication is facilitated by information technology. The authors identify only two characteristics that distinguish virtual teams from traditional face-to-face teams: spatial distance and means of communication. Spatial distance refers to the geographical dispersion of the team members, while the means of communication refer to electronic (digital) technologies.

The term virtual team is commonly used in this article, but it is worth mentioning that virtual teams are referred to in various ways in the scientific literature, e.g. remote teams, distributed teams, remote teams, etc. These similar terms, referring to essentially the same virtual work, can be considered synonymous. Belzunegui-Eraso and Erro-Garcés (2020, p. 3) in their study attempted to define levels of virtuality by distinguishing between types of telework.

Schaubroeck and Yu (2017, p. 2) identified the following types of virtual teams: short-term project teams, extreme action teams, self-managed task teams. Gibson and Cohen (2003, p. 4) point out that team members can belong to the same organisation or even to several different organisations, which can lead to further types of virtual teams: transnational or global and multi-organisational, and even transnational or global teams. The use of technology alone does not make a team virtual, it requires that team members are united by shared tasks and responsibility for results.

As can be seen from an analysis of the scientific literature, virtual teams have both advantages and disadvantages. Thuong (2019, p. 70) summarised them by noting that, despite the advantages of virtual teams for the organisation, this form of work organisation also has its own disadvantages (see Table 1).

Table 1. Advantages and disadvantages of virtual teams

Benefits	Disadvantages
Reduced time and financial costs	Conflict resolution issues
Creativity and orginality between team members	Lack of physical interaction
Talent from all over the world	Difficulties in development conceptual understanding of the problem
Increase in productivity/profit	Lack of technological knowledge
Equal opportunities for all employees	Challenges for companies in adopting a virtual team as it is not suitable for all organisations
Reducing discrimination based on age and race	Psychological challenges for employees
Faster knowledge sharing	Problems of trust, expectations, experience
Reduces pollution	Promotion problems
Ability to work in a variety of areas From any location and time zone	Challenges for managers in change management styles to adapt to new virtual collaborations

Source: compiled by the authors from N. U. Thuong (2019, p. 70).

It can be argued that there is no single universal definition of a virtual team, but research has identified the main elements of a virtual team, i.e. a virtual team consists of a small number of people participating in a communication process through communication and information technology and working towards a common goal within a set time frame. Virtual teams are characterized by a particularly high degree of flexibility and dynamism, as they transcend temporal and geographical boundaries, which is particularly important and becomes an advantage for an organization to meet the rapidly changing needs of the business environment and to remain competitive.

1.2. Reflection in virtual team collaboration

Reflection or self-reflection is a phenomenon that involves a person's ability to know oneself, one's feelings and experiences. Guerriero and Gronier (2014, p. 231) describe the concept of reflection as a process in which team members openly reflect on the team's goals, strategies (e.g., decision-making) and processes (e.g., communication), analyse them and adapt them to the current or foreseeable circumstances. For reflection to take place correctly, it requires analysing and evaluating one's own actions and decisions (Ladygienė and Lazdauskaitė 2017). This means that for teams to be effective, they need to respond in an appropriate way to changing circumstances and environments**.**

According to Žilėnienė and Pečiuliauskienė (2008, p. 242), self-assessment is a source of critical information that influences self-improvement and allows for a more targeted adjustment of changes in personal characteristics. Čepukienė and Pakrosnis (2011, p. 125) distinguish three elements of reflection: self-reflection, self-awareness and self-disclosure. Analysing scientific sources, it can be seen that reflection is a process that involves several dimensions. Virtual team reflection should include the following stages: stating (identifying the problem); feeling (this stage is about how the problem makes you feel); evaluating (each member of the virtual team gives his/her assessment of the problem); analysing (analysing the solutions to the problem); concluding (discussing the benefits of solving the problem): anticipating (identifying the next steps after solving the problem).

According to Khosravi et.al (2020, p. 37), conflicts and trust issues in virtual teams should be addressed and managed by empowering members' competences and soft skills, which are cultivated through reflection. The authors identified two types of reflexivity that have a significant impact on virtual team collaboration:

- *Task reflexivity*. This type enables teams to create optimal strategies for performance, detect deviations from expected results and modify the team's functioning to adapt to changes in needs.

- *Social reflexivity*. Allows teams to constructively integrate different opinions in conflict resolution.

According to Ališauskienė and Kairienė (2011, p. 95), the maturity of a virtual team is achieved when information is openly shared, members feel focused, functional roles are defined, responsibilities are assumed and necessary skills are developed. Lechner and Mortlock (2022, p. 7) argue that it takes time for relationships between people to become more sustainable. Sociality is particularly important for people, so a virtual team can have an extension of physical contact, i.e. physical and regular meetings. Geographically distant teams could work well together if response times to queries and messages are fixed and the frequency of communication between them is defined. Encouraging team members to communicate with each other more frequently over a "virtual cup of coffee" also contributes to building trust. In turn, in an environment where, according to Khosravi, Rezvani and Ashkanasy (2020, p. 40), virtual team members regularly engage in reflection, and are able to regulate and understand their emotions in conflict situations, they are more likely to achieve a productive outcome. The impact of reflection on collaboration is highlighted by Holtz et.al (2020, p. 163), who argue that learning to manage and regulate emotions in virtual teams creates a positive climate that fosters collective motivation and engagement of virtual team members. The practice of reflection is essential as it facilitates collaboration and increases team productivity. As Olson (2014, p. 31) observes, there is a lot that a manager can do to make remote working successful. In implementing a reflection tool, the authors suggest the use of '360-degree assessment' in virtual teams, as well as regular remote (or face-to-face) meetings with all team members and with each one individually.

It can be argued that reflection in a virtual team can be a tool for evaluation and development of its members. Applying reflection to virtual collaboration can make a positive difference to the challenges faced by virtual teams, i.e. it can build trust between team members, increase motivation and engagement, and mitigate conflict situations. The use of reflection in virtual teams can help to learn more about oneself and the team. Shared reflection in a virtual team can serve as a communication channel to understand each team member's intentions, cultural values and emotional states.

It can be argued that there is no single universal definition of a virtual team, but research has identified the main elements of a virtual team, i.e. a virtual team consists of a small number of people participating in a communication process through communication and information technology and working towards a common goal within a set time frame. Virtual teams are characterized by a particularly high degree of flexibility and dynamism, as they transcend temporal and geographical boundaries, which is particularly important and becomes an advantage for an

organization to meet the rapidly changing needs of the business environment and to remain competitive.

2. Research methodology

Semi-structured interview method was chosen. The data collected through the interview method was analysed using *qualitative content analysis.* Qualitative data analysis involves examining, researching, organizing and discovering conclusions (Gaižauskaitė & Valavičienė, 2016, p. 37). The information in the interview texts was carefully read, transcribed, meaning units were extracted and codes were assigned to them. Subsequently, the data were systematised by transferring them into tables and identifying categories and subcategories.

Research ethics. Each respondent was contacted personally by email and consented to participate in the study was obtained. The topic, process and objectives of the study were then discussed, and the interview questions were made available in advance. Respondents were assured of anonymity and confidentiality of the information they provided. It was explained to them that the data would be processed and stored in such a way that it would not be possible to link the answers to a particular interview to the respondent who participated in it.

The selection of the participants was *purposive*, i.e. the study sought respondents whose personal experiences and social contexts would allow them to answer the interview questions most accurately and completely. In other words, "participants in qualitative research are selected because they have certain characteristics or experiences that contribute to a better understanding of the phenomenon under study" (Gaižauskaitė & Valavičienė, 2016, p. 37).

Characteristics of the subjects. Six respondents were interviewed (see Table 2). All of the interviewees are professionals in their field, with both experience and competences in their field. All the respondents are from different virtual teams, which is why the qualitative research allowed for the collection of diverse data. In the selection of the research participants, criteria were set to ensure that all respondents had experience of working in virtual teams and project activities, and that they were reflective of these.

Table 2. Subject characteristics

Study participant code	Gender	Age	Education	Experience of working in a virtual team
E1	Male	38	Higher education	6 years
E2	Male	40	Higher education	5 years
E3	Male	44	Higher education	3 years
E4	Male	33	Higher education	2 years
E5	Female	44	Higher education	4 years
E6	Male	29	Higher education	3 years

Compiled by the authors.

Survey instrument. The research questions are divided into two blocks.

Table 3 .Survey instrument

Bloks	Questions	Targeting of questions
Block I These questions are designed to identify the factors influencing the success or failure of the virtual team reflection process in terms of collaboration	1. "What skills and competences are needed to work in a virtual team?" 2. "What actions/practices help you overcome challenges in a virtual team?" 3. "What factors influence the success/failure of reflection between a virtual team and its members?	1. The aim was to identify the skills and competences needed to work in a virtual team. 2. The aim was to identify actions/practices to overcome challenges in a virtual team. 3. The aim was to find out the factors influencing the success/failure of reflection of the virtual team and its members.
Block II The questions in this block are designed to explore the impact of reflection on collaboration between virtual team members	1. "In what ways do you reflect in your virtual team?" 2. "What effect does ongoing reflection have on the collaboration of your virtual team members?"	1. The aim was to explore the ways in which reflection is carried out in a virtual team. 2. The aim was to investigate the impact of ongoing reflection on the collaboration of virtual team members.

Compiled by the authors.

The research questions are also divided into two main themes, which are subdivided into sub-topics.

Theme I. Factors influencing the success or failure of the virtual team reflection process in terms of collaboration :

a) Investigating the skills and competences needed to work in a virtual team;

b) Exploring actions/practices to overcome challenges in virtual teams;

c) Factors influencing the success/failure of the virtual team and its members' reflection;

Theme II. The impact of reflection on virtual team collaboration:

a) Exploring reflection in virtual teams;

b) Investigating the impact of reflection on collaboration among virtual team members.

The results of the interviews are presented in a structured way: first, the research questions are asked, then the data analysis is carried out, and finally, tables of informants' quotations are presented, based on which categories and sub-categories are identified. Interview responses are grouped into categories and subcategories, which are illustrated with quotes from the interview protocols. Each quotation is accompanied by the number of the informant who gave the interview.

3. Research results and findings

Theme I. Factors influencing the success or failure of the reflection process in a virtual team in terms of collaboration. a) Investigating the skills and competences needed to work in a virtual team.

The analysis of the content of the interviews highlighted key competences (see Table 4).

Table 4. Skills and competences required for working in a virtual team

Excerpts from interviews	Subcategories	Categories
"<...> You must have IT knowledge." (E1); *"Know how to use technology <...>" (E2);* *"Good computer literacy is, of course, a must." (E3);* *"You need to know how to work with communication tools and be able to solve problems quickly when needed." (E6)* *"Well, it's computer literacy skills <...>" (E4)*	IT knowledge	**Technological competences**
" <...> have some experience in your field <...>" (E1); *"<...> have competence in their field <...>" (E2);* *" <...> because I don't know how to enter a student remotely." (E2)*	Work experience in your field	
" <...> active listening." (E6)	Active listening skills	**Communication competences**
" <...> clearly express ideas in writing <...>" (E4)	Ability to express ideas fluently in writing	
" <...> in the virtual world, they expect more of you and your autonomy <...>" (E1) *"<...> to be able to work in a limited communication space, because there is no talking or discussing over lunch, over coffee or in the office." (E5)*	Ability to work independently	**Decision-making competences**
" <...> sense of responsibility <...>" (E4)	Readiness to take responsibility	
"self-motivation, that if the work starts at 8, not to start at 9, to stick to the work schedule, work plans <...>" (E4)	Discipline	**Personal competences**
"but here in the virtual world you expect more of a result <...>" (E1)	Delivering results	
" <...> not to be afraid to be by yourself, distancing yourself from the team and thus not creating social bonds." (E5)	Uniqueness	
"Don't be afraid to speak your mind <...> smooth communication <...>" (E6)	Self-confidence	
" <...> be prepared for a statement to be answered by silence." (E6)	Calm response	
"<...> understanding, as virtual communication is unusual/uncomfortable for some <...>" (E3)	Tolerance for team members	
"<...> must be motivated to work <...>" (E2)	Interest	

Compiled by the authors.

Among the most important competences are IT knowledge and experience in the field. The data show that communication competences such as active listening skills and the ability to express thoughts fluently in writing influence reflection. Personal competences such as being disciplined, result-oriented, unique, self-confident, calm, tolerant of team members and interested are also found to be important. Communication competences, fluency in writing and listening skills are particularly important. The team member must be able to work independently and be prepared to accept responsibility within the limits of his/her role. It is essential that team members are disciplined, result-oriented, self-confident and unafraid to show their uniqueness. A calm and relaxed attitude and tolerance towards team members is also essential. Thus, as the analysis of the survey data shows, working in a virtual team requires quite comprehensive skills and competences.

IT knowledge and experience, communication and personal competences are key. Tolerance and the ability to work independently are important.

Theme I: Factors influencing the success or failure of the reflection process in virtual teams in terms of collaboration: b) Actions/practices to overcome challenges in virtual teams are investigated (see Table 5).

Table 5. Actions/practices to overcome challenges in a virtual team

Excerpts from interviews	Subcategories	Categories
"<...> Agile methodologies are now the most common methodologies used in software companies <...>. We use Scum, <...> it's a set of processes and rules made up of different methodologies. <...> we were always adapting to ourselves, what we need, what we don't need <...>" (E1)	Adaptation of project management methodologies as required	**General rules and procedures**
"<...> After each sprint, we plan two weeks ahead. <...> you set short-term goals to achieve long-term ones." (E1) *" <...> appropriate planning, taking into account members' abilities and health status." (E2)* *" <...> set clear plans, deadlines, sequences of actions, responsibilities." (E4)* *"Make sure you put your plans in writing and not just discuss them <...>" (E4)*	Work planning	
"Short-term goals are formulated as this helps to motivate the team <...>" (E2)	Setting short-term goals	
"It's important to maintain discipline <...>" (E5)	Compliance with procedures	
"Taking breaks during work to refocus and rest." (E6)	Work/rest mode	
" <...> to discuss the result, and to look at what we could have done better based on previous experience, or what went well." (E2); *"<...> meetings, reflection <...>" (E4);* *"Analyses and discussions of challenges and emerging issues." (E6)*	Analysis of experiences	**Reflection**
"Discussions, you need to give time to the virtual team to discuss everything, without forgetting some moderation of the discussion." (E2) *" <...> take more interest in the team's ambitions, in the problems of other team members. Be able to listen and express your opinion." (E5)*	Discussions	
"The ability to "crawl" into another member's shoes <...>" (E5)	Empathy	
" <...> there is an initial oral discussion of the tasks, because it helps everyone to understand better anyway, and gives the opportunity to ask questions <...>" (E1)	Discussion of activities	
"In my case, psychological/philosophical. If you equate a virtual team to rain, it's probably about having the right equipment (tools) and a good attitude (tolerance and motivation)" (E3)	Psychological preparation	**Creating a collaborative environment**
"Self-confidence and convincing myself that I can and will succeed <...>" (E6)	Positive attitude	
" <...> support and help from other team members and not feeling pressured in the work environment."	Good working atmosphere	

Compiled by the authors.

The content analysis of the interviews revealed that common rules and procedures such as adapting project management methodologies as needed, work planning, setting short-term goals,

following procedures and working/resting patterns are essential to overcome challenges. The analysis of the survey data highlights the importance of reflection, i.e. the analysis of experiences, discussion, empathy and reflection on performance. It was found that the right environment, psychological preparation, a positive attitude and the right atmosphere at work have an impact on the success of reflection. For a virtual team to work together harmoniously, adapting project management methodologies to their own needs enables them to avoid or resolve disruptions. Equally important are work planning and written plans.

Theme I: Factors influencing the success or failure of the reflection process of the virtual team in relation to the collaboration: c) Factors influencing the success/failure of the reflection process of the virtual team and its members (see Table 6).

Table 6. Factors influencing successful/unsuccessful reflection

Excerpts from interviews	Subcategories	Categories
" <...> Time is limited, and if you have a team of 10 people, that's not much for an hour. So you have really little time to speak or to explain something that you have written, etc." (E1)	Limited time	**Meeting rules**
"Or they might not ask you at all if you keep quiet. It can be really hard for someone who finds it difficult to communicate to say something." (E1)	Giving everyone a voice	
" <...> because he who speaks will speak freely half the time." (E1)	Time management	
"If not successful, too many reflections and meetings <...>" (E4)	Non-performing meetings	
"The moderator, the team leader, also influences reflection, because maybe he will be too technical, he will only want to work and not want to do management <...>." (E1)	Improper moderation	
" <...> it's a good time, because if you're under pressure of work, you won't have time to reflect, because." (E2)	Preset time	
" <...> it is important to set goals <...>" (E5); "Clear goal setting <...>" (E6)	Clear agenda for meetings	
"Members need to feel comfortable, to feel secure that they will not be excluded from the project." (E2)	A sense of security	**Psychological factors**
"It's all about the motivation of the team members to work here and now <...>" (E3)	Team focus	
"If team members are encouraged, involved, valued, trusted and given freedom of action <...>" (E3)	Feeling valued	
" <...> you need to be involved, because there are team members who don't even join." (E1)	Lack of responsibility	
" <...> members who are introverts need to be prepared to answer questions <...>" (E2); *" <...> Successful reflection by team members depends on the type of person." (E6)*	Personality type	
" <...> trust between team members <...> empathy between team members <...>" (E6)	Positive microclimate	**An open-minded environment**
"The absence of fear of making mistakes, openly stating one's wishes, giving freedom to experiment and accepting mistakes as a normal part of the working process <...> without accepting failure painfully." (E5)	Casual atmosphere	

Compiled by the authors.

The analysis of the content of the interviews has highlighted a number of rules that influence reflection. These include meeting rules such as limited time, giving everyone a chance to speak, time management, non-productive meetings, poor moderation, pre-set time, clear agenda. Psychological factors such as sense of security, team focus, sense of judgement, lack of responsibility, personality type were also identified. The study also revealed the influence of an openness-oriented environment, a positive microclimate and an impartial atmosphere on the reflection process.

The analysis of the data showed that the limited time for reflection is a reason for its failure, as it is not possible to analyse everything in depth in a short period of time. Also, too many reflections and meetings have a negative impact on reflection. Failure of reflection can also be due to inadequate moderation. Giving every member of the team the opportunity to speak, time management, proper moderation, pre-assigned time for reflection and a clear agenda for meetings are all prerequisites for successful reflection. A sense of security is important for members to be able to open up in a virtual team. The absence of responsibility has a negative impact not only on the team's productivity and performance, but also on the practice of reflection. A positive microclimate and an impartial atmosphere are important aspects of the practice of reflection in a virtual team. Thus, in order to make reflection in a virtual team a successful process, it is important to create a welcoming environment in which there is cooperation, trust between team members and a desire to achieve a high level of collective performance.

Theme II: The impact of reflection on collaboration in virtual teams. a) Reflection techniques in virtual teams are investigated (see Table 7).

Table 7. Reflection techniques in a virtual team

Excerpts from interviews	Subcategories	Categories
" <...> We do these "retro" meetings or retrospectives. We take an hour to review how we did in the last sprint." (E1)	"Retro" meetings	**Virtual form (1)**
"Virtual evenings have also been organised <...> to help them focus, to talk not only about programming or work, but also about informal topics" (E1); *" <...> The most open and constructive team talk we've ever had in our careers was when we got together in a doughnut with a glass of wine/beer, and we were very comfortable discussing the issues at hand <...>" (E3)"*	Informal virtual meetings	
" <...> make a personal enquiry <...>" (E2)	Reflection by email	
" <...> staff have virtual monthly meetings with managers."	Monthly personal reflection with your manager	
" <...> there is a regular meeting with a different host each time and the format of the meeting changes at the host's discretion <...>" (E5)	Regular group reflection with a rotating moderator	

Table 7 continues on the next page

Continuation of Table 7

Excerpts from interviews	Subcategories	Categories
"Three times a week, virtual team meetings are organised to talk about what the team member is doing, what difficulties they are facing and what help they need." (E6);	Formal reflection on performance	**Virtual form (2)**
" <...> meetings as the situation arises." (E5)	Virtual meetings on demand	
"Physical meetings are organised once a year or every six months." (E2); *" <...> our team meets several times a year live." (E1)*	Physical meetings	**In non-virtual form**
" <...> every quarter we have these roadshows, <...> we name the problems we see and try to solve them." (E4)	Away sessions	

Compiled by the authors.

The content analysis of the interviews highlighted virtual forms of reflection within the team, such as "retro" meetings, informal virtual evenings, email reflection, free-form virtual meeting, monthly face-to-face reflection with the manager, regular group reflection with a rotating meeting moderator, formal reflection of activities, and virtual meetings as needed. Non-virtual forms such as physical meetings, retreats and break-out sessions are also distinguished.

The analysis of the data showed that reflection takes place in virtual and non-virtual forms. Respondents highlighted the analysis of Retro meetings as one of the ways of reflection. Another method that emerged was informal virtual meetings. Another method used for reflection is e-mail. Regular group reflection with a rotating meeting moderator is another form of virtual meetings that emerged from the interviews. The analysis of the data showed that the non-virtual form of reflection practice in virtual teams takes place in two ways: physical meetings and off-site sessions. *It* can be argued that reflective practice is important and that teams are looking for more and more creative ways to strengthen their communication and improve their performance.

Theme II: The impact of reflection on virtual team collaboration. b) The impact of reflection on virtual team collaboration is investigated (see Table 8).

Table 8. The impact of reflection on the collaboration of virtual team members

Excerpts from interviews	Subcategories	Categories
" <...> reflection helps to correct not only oneself but also the team <...>" (E1); *" <...> if <...> several people are concerned or bothered by it, then you are immediately solving a problem not of one person, but of several people or a team." (E1);* *" <...> so that we can change and improve." (E5)* *" <...> reflection is useful to improve oneself and to create a comfortable working environment <...>" (E5)*	Helping you and your team to develop	**Strong team (1)**
" <...> reflection as a game to make the team feel worked <...>" (E1); *" <...> increases engagement as team members share their joys and problems." (E2);* *" <...> strengthens the bond between team members." (E2)* *"Strengthens the sense of community <...>" (E4)*	Strengthening the sense of community	

Table 8 continues on the next page

Continuation of Table 8

Excerpts from interviews	Subcategories	Categories
" <...> reflection generates some kind of improvement going forward." (E1) *" <...> learn from past situations." (E5);* *" <...> so that we can improve and stop stumbling in places where there were obstacles." (E5)*	Analysis of unsuccessful experiences	**Strong team (2)**
"Reflection helps you to understand how other team members are doing and to get to know them better - what's working and what's not." (E6);	Knowing yourself and your team	
" <...> mitigates the friction caused by the various tasks of the project." (E2)	Reducing tension in the team	
" <...> helps shape the team's <...> value position <...>" (E4) *" <...> reflection is a way of coming back to them and not forgetting them." (E4)*	Strengthening your value position	
" <...> helps everyone to understand what is most important at the moment and where they need to work harder." (E5)	Developing critical thinking	
" <...> to increase the motivation of colleagues, not to be trapped in a bubble of work." (E6)	Increasing motivation	
" <...> influences the closeness and greater understanding between team members towards each other." (E6) "Lack of lively communication strengthens personal ties." (E4)	Strengthening mutual relations	
" <...> obstacles are not allowed to become problems." (E3); *" <...> continued efforts to manage risks" (E3)*	Threat reduction	**Risk management**
"It allows you to stay alert and solve problems before they get worse." (E5)	Problematic vigilance	
" <...> avoids unnecessary conflicts." (E6)	Conflict management	
" <...> reflection helps planning because you know the state of the team <...>" (E2); *" <...> can react and adjust the way the project is run." (E2)*	More accurate planning of project progress	
" <...> reflection keeps problems at bay <...>" (E6)	Saving team time and energy	
" <...> improving the result <...>" (E5); "Clearer understanding of the results to be achieved <...>" (E6)	Improving the result to be achieved	**Enabling change**
" <...> the most important thing to come out of the reflection would be innovation, what can be improved." (E1); "Reflection leads to new insights." (E4)	Innovative solutions	

Compiled by the authors.

The analysis of the content of the interviews has identified factors that influence team members' cooperation. A strong team helps to improve oneself and the team, creating a stronger sense of community, analyzing unsuccessful experiences, getting to know oneself and the team, reducing tension within the team, strengthening the value position, developing critical thinking, increasing motivation, strengthening interpersonal relationships. The content analysis of the interviews highlighted risk management factors such as threat reduction, problem vigilance, conflict management, more accurate project planning, saving team time and energy. Improving the desired outcome and enabling innovative solutions are also highlighted in the analysis of the interview data.

Reflection has been found to strengthen the team and help each member to develop both on an individual and team level. The use of reflective practices in a virtual team creates new experiences and emotions, all of which strengthen the bond between team members and foster a sense of community and engagement. Reflection in a virtual team allows to learn from past situations through the analysis of unsuccessful experiences and to develop critical thinking. Applying reflection to their own activities helps the virtual team to manage some of the risks that could undermine the project or the team's own cooperation. In virtual team collaboration, the use of reflection practices leads to more accurate project planning. Reflection helps the virtual team to change the established norms of communication, strengthens the team's collaboration, motivates them to achieve a better result and at the same time brings new ideas and innovative solutions.

4. Conclusions

Virtual team members are geographically or organisationally distant and coordinate their cooperation through telecommunications and information technology. Virtual teams can be effective because they are characterised by a strong focus on work tasks and goal achievement. The use of more advanced communication technologies makes virtual teams more functional and flexible. Virtual teams face a number of challenges that have a negative impact on collaboration, which arise in the process of team collaboration: low trust, conflicts, lack of motivation of members, leadership/leadership difficulties and cultural diversity. It is therefore necessary for the virtual team to apply reflective practices in its activities. Reflection can serve as a communication channel for the virtual team to understand the intentions, values and emotional states of each team member. Successful reflection is based on the creation of an open environment, psychological factors such as a sense of valuation and security; clear rules for meetings, with a predetermined amount of time for reflection, the form it will take, the opportunity for everyone to speak, etc.

The results of the empirical study showed that reflection in virtual teams has a positive impact on collaboration. The study showed that reflection strengthens the virtual team, increases the sense of togetherness, and contributes to the development of each team member and the team as a whole. The use of reflective practices helps to know your team, strengthens the value position and at the same time reduces tensions within the team. The study showed that reflection in virtual teams is used as a risk management tool that reduces threats by preventing obstacles from becoming problems. It also showed that reflection develops problem vigilance, which in turn saves team members' time and energy from being wasted on solving challenges. The study highlighted the impact of reflection as having the potential to enable change in virtual teams.

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