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Table of Contents

List of Tables II

List of abbreviations II

1. Introduction.....	1
2. Theoretical Background.....	2
2.1 Teams.....	2
2.2 Teamwork.....	5
2.3 Meetings.....	6
2.4 Theories on media.....	11
2.5 Conflict Resolutions.....	15
2.6 Role of Leadership.....	17
2.7 Cultural Diversity.....	18
2.8 Meeting Effectiveness.....	19
3. Methodology.....	21
3.1 Structured Literature Review.....	21
3.2 Research Questions.....	22
3.3 The Review Protocol.....	23
3.4 Literature Search.....	24
3.5 Article Impact.....	27
3.6 Analytical Framework.....	29
3.7 Reliability.....	31
3.8 Validity.....	32
3.9 Coding.....	32
4. Results.....	33
4.1 Region of Research.....	33
4.2 Study Design.....	34
4.3 Theoretical Framework.....	35
4.4 Dominant Themes.....	38
4.5 Research Focus and Contextual Factors.....	39
4.5.1 Team Effectiveness and Performance.....	39
4.5.2 Videoconference Fatigue and Well-Being.....	42
4.5.3 Meeting Design and Technology Alternatives.....	43
4.5.4 Communication Dynamics and Participation.....	44
4.5.5 Inclusion, Equity, and Social Dynamics.....	45
4.6 Contextual Factors.....	47
4.6.1 Organizational Culture and Hierarchy.....	47
4.6.2 Cultural Context.....	48
5. Research Gap and Limitations.....	49
6. Conclusion.....	50
Literature.....	52
Abstract.....	65

List of Tables

Table 1.	Academic databases used for literature search.....	24
Table 2.	Bibliometric indicators of the top eight selected journals.....	26
Table 3.	Journal quality assessment using AJG 2024.....	27
Table 4.	Top eight articles by Google Scholar Citations.....	28
Table 5.	Analytical Framework.....	30
Table 6.	Krippendorff's Alpha (α).....	31
Table 7.	Geographic Distribution.....	33
Table 8.	Studies by Methodology used.....	34
Table 9.	Theoretical Framework.....	37
Table 10.	Research Themes.....	39
Table 11.	Factors influencing Effectiveness.....	41

List of abbreviations

ACM	Association for Computing Machinery
AI	Artificial Intelligence
AJG	Academic Journal Guide
CABS	Chartered Association of Business Schools
CPY	Citations per Year
GSS	Group Supporting Systems
HCI	Human-Computer Interaction
IVR	Immersive Virtual Reality
KPI	Key Performance Indicator
MRT	Media Richness Theory
MST	Media Synchronicity Theory
MNT	Media Naturalness Theory
SJR	SCImago Journal Rank
SLR	Structured Literature Review
SNIP	Source Normalized Impact per Paper
VE	Virtual Environments
XR	Extended Reality

1. Introduction

The rapid digitalization of organizational processes led to major changes in coordination, communication, and decision-making in organizations worldwide. Virtual meetings have become much more developed due to innovations in communication technologies. One of the first steps toward organizing remote work was creating telephone conferences in the middle of the twentieth century when multiple people were able to connect to each other only via audio. Video communication technologies and the invention of the Internet at the end of the twentieth century have made the appearance of video conferencing possible. The broad usage of the Internet in the beginning of the twenty-first century increased the efficiency of virtual meetings. Due to the emergence of the COVID-19 pandemic, virtual meetings became one of the main tools for working both locally and internationally. Numerous studies exist in various fields such as management, organizational behaviour, psychology and information systems, which makes the issue of virtual teamwork quite complex and multifaceted. This thesis attempts to contribute to the conceptualization of virtual teamwork in today's global economy. The focus of this research is on teams operating in organizational context and not on videoconferencing between organizational representatives and clients or partners. It gives a comprehensive overview of effects of virtual meetings on important components of teamwork such as communication, coordination, trust, and team performance. Even though virtual meetings are widely used and offer many benefits like flexibility and organizational efficiency, it creates questions about their long-term effect on teamwork. Virtual collaboration allows employees to cooperate and coordinate actions despite geographical distances, increases efficiency and improves work-life balance. Nevertheless, it is uncertain whether virtual collaboration can replace all the features of face-to-face collaboration. By studying the changes in meeting procedures in virtual environment, this thesis will analyse the shift in meeting structures, involvement of the participants, and decision-making process. The study will consider the challenges and opportunities associated with distributed collaboration, the need to adopt new communication rules, and the ways of developing trust in the absence of face-to-face contact. Cultural differences are also considered as one of the factors that shape virtual collaboration. The importance of flexible meeting format and adaptive interaction patterns will be analysed. The thesis will contribute to understanding of the optimal organization of virtual teamwork practices based on application of best practices that would help to maintain high performance and innovation of teams in the globalized and digital world. The integration of advanced technologies in collaboration processes leads to the continuous evolution of the role of virtual meetings. Such trends as artificial intelligence, automated meeting-supporting tools, immersive digital environments, and integration of collaboration ecosystems are continuously changing communication patterns. The results will allow to reveal gaps and contradictions in the existing international literature on virtual teamwork and meeting effectiveness. Through integration of prior research, this thesis seeks to identify the patterns, mechanisms, and effects of using virtual meetings in organizations.

Structure of A Thesis

The thesis is structured as follows: the first part presents the theoretical framework concerning teamwork and meetings, with an emphasis on virtual meetings. Relevant theoretical perspectives from management and information systems research, such as media richness, media synchronicity, and social presence theory, provide a conceptual foundation for analysing and synthesizing the literature on virtual meetings and teamwork. The second section presents the methodology and research design. The structured literature review, as a research method, is suitable for synthesizing fragmented research, identifying patterns and contradictions, and developing a comprehensive overview of emerging research fields. In management research, the literature review process is a key tool used to manage the diversity of knowledge for a specific academic inquiry (Tranfield et al., 2003). The research was conducted by adopting the structured literature review methodology proposed by Massaro et al. (2016). The literature search was performed using established academic databases such as ScienceDirect, Scopus, and Google Scholar. The search focused on peer-reviewed journal articles in English. The studies included were subjected to thematic coding to obtain relevant information. The resulting themes were organized into analytical categories that specifically addressed the aspects of teamwork and meeting practices. These categories included characteristics of virtual meetings, comparisons between meeting modalities, findings related to meeting structure, patterns of participation, and decision-making outcomes. The potential limitations of this thesis include publication bias, language restrictions that could exclude relevant studies published in non-English languages, and the fast-paced development of digital collaboration technologies. These factors were considered when interpreting the findings and drawing conclusions from the review. In the final section, the thesis presents the results of the analysis and discusses possibilities for future research.

2. Theoretical Background

2.1 Teams

Based on prior research on virtuality and geographically distant teamwork, teams can be described from fully co-located, traditional to fully virtual. Early work distinguishes between face-to-face (co-located) and distributed or virtual teams, from the perspective of physical location and technology-mediated communication (Hinds and Bailey, 2003; Kirkman and Mathieu, 2005). Synthesizing these concepts, teams can be categorized into four broad types: co-located, distributed, hybrid, and fully virtual. The degree of virtuality within a team influences communication processes, coordination mechanisms, trust development, and overall team effectiveness.

Co-located Teams

Co-located or traditional teams are groups of people who mainly perform their activities in a single physical space, for instance in an office, a building or a single workplace. The physical

presence of team members allows for direct face-to-face communication and informal interactions. Physical proximity allows for spontaneous conversations and interpretation of non-verbal cues which increases the amount of knowledge sharing compared to the distributed teams (Allen, 1977). Research on the effects of workplace proximity suggests that the physical distance regulates the frequency of personal interactions among people. When team members share the same space, they can observe and interact informally, thus obtaining information regarding the context of activity of their colleagues. This situational awareness helps to overcome coordination problems and solve some of the challenges identified in distributed teams research, such as the mutual knowledge problem (Cramton, 2001). For this reason, co-located teams often experience smoother coordination processes and faster conflict resolution. Furthermore, co-located teams often experience stronger social bonds and trust, factors that are critical for team performance and innovation (Olson and Olson, 2000). Direct interactions help in establishing relationships and creating team identities, which can result in better team cooperation and less conflicts. According to Gibson and Gibbs (2006), the teams that work remotely and communicate mostly electronically may experience certain difficulties with collaboration and limitations to innovation. On the other hand, co-located teams may have a limited access to geographically distant expertise and lack the flexibility offered by the distributed and hybrid approaches. While proximity is a great advantage, it does not automatically lead to high effectiveness, since other aspects such as team dynamics, management and organizational culture remain significant mediating factors (Salas et al., 2018).

Distributed Teams

Distributed teams consist of members who are located in different geographical locations. Although members of distributed teams may occasionally meet in person, most of the interaction occurs remotely, often involving coordination of activities in different places, time zones, or organizational units. One of the central challenges in distributed collaboration is the difficulty of establishing and maintaining shared understanding, known as “mutual knowledge problem” (Cramton, 2001). Existing studies on distributed collaboration have shown that shared mental models improve coordination and the effectiveness of teams by ensuring that team members share similar views about the nature of their tasks (DeChurch and Mesmer-Magnus, 2010; Johnson et al., 2009). In addition, shared communication norms and relational expectations are critical for reducing conflict and improving team cohesion (Arendt et al., 2024). The research on distributed collaboration has demonstrated that structured coordination practices, such as scheduled meetings and communication rules, may help overcome difficulties that are related to distance and asynchronous collaboration (Stray and Moe, 2020). Although distributed teams face certain obstacles, they also bring several benefits for organizations. They enable access to talent from various geographic locations, help conduct operations globally, and allow for continuous workflows across different time zones. Studies suggest that geographic dispersion can lead to greater informational variety and, therefore, increase the range of perspectives, potentially improving problem-solving and innovation when organized effectively (Cramton and Hinds, 2005).

Hybrid Teams

Hybrid teams, broadly defined, combine face-to-face and technology-mediated collaboration, either because members change work locations or because some members are remote while others are physically present. Rather than representing a single fixed structure, hybrid teamwork reflects a flexible continuum shaped by organizational policies and task demands (Wu et al., 2023). Such teams unite the advantages of face-to-face collaboration and flexibility that is offered by remote work. In relation to the dynamics of communication in distributed and hybrid teams, there is evidence that the structure of the team affects how team members obtain advice and exchange information, as the communication architecture determines the possibilities for people to get information and work together (Borgatti and Cross, 2003). Furthermore, physical distance could decrease social relations between people and the frequency of their communication, thus limiting the process of information sharing and building of knowledge networks (Allen, 1977; Yang et al., 2022). According to empirical findings related to team virtuality, technology-mediated collaboration contributes to information exchange, while face-to-face collaboration helps build trust and openness (Mesmer-Magnus et al., 2011). This suggests that hybrid teams may benefit from deliberately aligning communication modes with task requirements, such as using in-person meetings for relationship building and digital tools for structured information sharing. As emphasized in teamwork research, successful collaboration depends on the alignment of team processes, technological infrastructure, and organizational support mechanisms (Salas et al., 2018).

Virtual Teams

Virtual teams are groups whose members work primarily through digital communication technologies. Members of virtual teams may be dispersed geographically and even located in different countries, and collaboration is achieved through video conferencing, messaging systems, and collaboration software. As defined by Kirkman and Mathieu (2005), virtuality refers to the degree to which team members depend on electronic devices, are distributed among various locations, and face structural changes. Similarly, Gibson and Gibbs (2006) argue that varying levels of distance, technological dependence, and cultural diversity produce different team dynamics and outcomes. The degrees of virtuality influence communication patterns, trust development, and performance. (Martins, et al., 2004; Hinds and Bailey, 2003).

One of the most extensively researched aspects in virtual teams is their effect on communication and team processes. As virtuality increases, teams tend to use technology-mediated communication. As a result, there is less information richness and less room for feedback in communication. As reported in meta-analysis conducted by Ortiz de Guinea et al. (2012), higher levels of virtuality are linked to a decline in communication frequency and knowledge sharing, as well as to an increase in task-related conflicts. Digital tools for communication can help exchange distinctive information when interactions are either organized or asynchronous. As argued by Mesmer-Magnus et al. (2011) virtual settings are characterized by higher exchange of unique information compared to collocated teams, which can facilitate decision-making in

specific tasks. Research also states that efficient information exchange is one of the most important predictors of team performance (Mesmer-Magnus and DeChurch, 2009). Another advantage of virtual teams is access to broader talent pools and more flexibility to organize collaboration. They allow organizations to leverage global talent and respond more flexibly to changing demands. On the other hand, research shows that virtual collaboration can affect social and communication networks. They become less dynamic and the pattern of spontaneous interactions necessary for knowledge exchange and innovations is disrupted (Yang et al., 2022).

Research by Webster and Wong (2008) highlights that successful performance of virtual teams relies significantly on the appropriate use of communication technologies and the alignment between task requirements and media capabilities. Their work emphasizes that technology used in virtual teams should not be seen as a mere communication channel, but as an active agent that affects interaction patterns, knowledge exchange and team performance. In particular, the authors argue that when communication tools are carefully matched to task demands and effectively implemented, they can support coordination and enable levels of collaboration similar to those found in traditional teams. Gilson et al. (2015) conducted a review of research in the field of virtual teams and revealed four themes that characterize this area, such as communication processes, leadership in virtual teams, team trust, and technological infrastructure.

2.2 Teamwork

The concept of teamwork is highly multidimensional and dynamic in nature, involving interpersonal interaction, coordinated performance of tasks, adaptability, and facilitative organizational conditions (Salas et al., 2018). Teamwork is the joint effort of individuals performing their actions collectively towards a common purpose or task. It is commonly described as the coordinated interaction of interdependent members who share responsibility and accountability for collective outcomes. In organizations and projects, teamwork is considered an important tool for integration of knowledge, skills and other resources for improving performance of tasks and achieving the results that could not be achieved individually (Kozlowski and Ilgen, 2006). Effective teamwork is supported by key dimensions, including communication, coordination, balanced member contribution, mutual support, effort, and cohesion, which have been shown to directly influence project success (Hoegl and Gemuenden, 2001). In addition to these internal dimensions, effective teamwork is strongly influenced by structural and contextual conditions within organizations. According to Hackman (2002), team effectiveness is not only a matter of interpersonal processes but also of the design and the organization itself where the teams function. In his model, successful teamwork requires specific and appealing goals, proper team composition, supportive organizational systems and enabling structures that encourage cooperation and responsibility. Teamwork includes some key behavioral aspects such as adaptability, mutual performance monitoring and team orientation that are especially significant in case of teamwork in complex conditions (Salas et al., 2005). Furthermore, psychological safety is very important in promoting efficient teamwork because it helps establish open communication and cooperation between individuals and promotes willingness to share ideas, opinions and problems. Edmondson (1999) argues that

psychologically safe teams provide a space where people feel free to express their ideas, ask questions, point out mistakes and confront other people without feeling ashamed, rejected or punished. It leads to improved openness, communication, creativity and learning that are necessary for developing innovations and making progress. Psychological safety also builds up trust between members and helps resolve conflicts constructively, which enables teams to solve problems and make decisions effectively. In organizational environments, teamwork extends to practical processes such as collaboration, leadership, and conflict resolution, all of which support coordinated action and effective collective performance (Rydenfält et al., 2017).

2.3 Meetings

Meetings represent a central mechanism for coordination, decision-making, and communication within organizations. Allen et al. (2015) describe meetings as structured social interactions through which organizational members exchange information, align goals, solve problems, and maintain professional relationships. There are numerous studies which prove that employees spend a considerable amount of time on meeting during their workday. Besides their operational role in organizational activities, meetings have an impact on how employees see their working environment and the connection between themselves and the organization. Rogelberg et al. (2006) note that there is a direct connection between meeting quality and employee attitudes such as job satisfaction, job engagement and the perception of organizational effectiveness. If meetings are conducted well, then participants will see them as beneficial and effective with positive results on mood and commitment to the organizational tasks. Conversely, frequent exposure to poorly managed meetings may lead to frustration, reduced motivation, and negative attitudes toward management and the organization.

Meetings are one of the key organizational settings where leadership behaviour, participation and collaboration take place. Regular interaction through meetings builds trust, resolves conflicts and creates common ground among team members (Rogelberg et al., 2006). Leach et al. (2009) argue that meetings, which have clearly stated objectives, have structured agendas, involve active participation from all sides and roles of participants are clearly defined, have a positive impact on team effectiveness, team satisfaction and goal achievement. Such meetings create opportunities for employees to exchange perspectives, clarify expectations, and coordinate actions toward shared organizational objectives. Ineffective meetings usually end up with communication failures, demotivation and poor allocation of organizational resources. Employees usually find ineffective meetings as unproductive and exhausting, particularly when meetings lack a clear purpose or fail to produce results. Effective meetings facilitate problem solving, promote shared understanding, and support team cohesion, whereas poorly managed meetings can result in inefficiency, reduced productivity, and participant dissatisfaction (Geimer et al., 2015).

The effectiveness of meetings is defined both through the structure and interpersonal-psychological aspects. According to Kauffeld and Lehmann-Willenbrock (2012), the communication during meetings influences the results of its work significantly. Constructive

communication supports building teamwork, the exchange of knowledge and solution of arising problems. Edmondson (1999) highlights the importance of the psychological safety of the environment and emphasizes that members of the group will be ready to participate actively and make suggestions, if they can do it without fear of criticism or negative consequences. Such an atmosphere will help in creating favourable conditions for participation and decision making.

Meetings also serve as important mechanisms for organizational learning and knowledge exchange. According to Mesmer-Magnus and DeChurch (2009), information exchange in the groups contributes to higher performance because it allows integrating various kinds of knowledge, improves the quality of decision making and helps to build a common perception of tasks and goals. Through these exchanges, meetings help teams coordinate complex tasks, align priorities, and respond effectively to organizational challenges. As organizations become increasingly knowledge-intensive, the importance of meetings as knowledge sharing and perception building processes is especially high. Besides, the introduction of new information technologies has changed the format of meetings. According to Gilson et al. (2015), the development of communication technologies makes it possible for teams to collaborate with each other beyond the borders of geography and organization, therefore, increasing the number of virtual meetings. Virtual meetings possess many advantages in terms of flexibility and accessibility but raise some difficulties connected with the quality of communication, motivation of participants and interpretation of nonverbal communication. Researchers have increasingly focused on understanding how meeting processes and outcomes differ between face-to-face and virtual environments. Given their importance for the overall success of the organization, meetings cannot be considered just administrative procedures but rather strategic ones that may influence significantly the performance of the team and organization. As Allen et al. (2015) claim, organizations that improve the quality of meetings increase the satisfaction and effectiveness of employees.

Virtual meetings

Virtual meetings are synchronous interactions made possible due to digital communication technologies, allowing participants to engage despite physical distances. They have undergone substantial evolution since their early beginnings, driven by continuous advancements in communication technologies. Early research in this area focused primarily on the challenges associated with distributed work and remote communication. One of the most influential studies, conducted by Olson and Olson (2000), introduced the concept that “distance matters” in collaborative work. Their research highlighted that physical distance between team members can create barriers to communication, including reduced shared context, limited informal interaction, and fewer nonverbal communication cues compared to in-person meetings. As communication technologies evolved, researchers began exploring how organizations could overcome these limitations. Jarvenpaa and Leidner (1999) examined trust development in global virtual teams and found that effective communication helps develop trust between geographically distant members. In particular, it was found that trust is possible in teams with established clear communication practices, frequent interactions, and reliable task performance irrespective of geographic remoteness.

The first revolution in virtual meetings came in the 1990s with the advent of communication technologies over the Internet and improvements in video compression technology, which allowed for the appearance of early video-conferencing systems (Daft and Lengel, 1986; Hinds and Bailey, 2003). These innovations allowed for the integration of both visual and auditory interaction, thereby making remote communication more effective. Further, in the 2000s, the spread of global Internet infrastructure led to better reliability, quality and accessibility of virtual meetings by improving audio and video transmission of higher resolution and allowing bigger groups of participants to attend virtual meetings from more geographically distant locations (Gibson and Gibbs, 2006). Recently, the use of virtual meetings has become even more widespread due to the global pandemic of COVID-19, which led to an urgent shift to remote work (Waizenegger et al., 2020). This period produced significant technological innovation, including the integration of new advanced functions such as screen sharing, real-time collaborative document editing, virtual whiteboards, and artificial intelligence-driven tools for transcription, language translation, and meeting analytics (Karl et al., 2022). Moreover, the development of cloud computing and mobile technologies has increased the flexibility of virtual collaboration by allowing people to participate in virtual meetings using laptops, tablets, and even smartphones. All these innovations have made virtual meetings go beyond supplementary communication tool and become a core part of modern interaction.

The COVID-19 Pandemic served as an indication of the start of an important shift in the application of virtual meeting technologies. Due to governmental requirements of maintaining social distancing and organizational transitions towards telework, digital communication channels became the main way of ensuring continuity of operations. From 2020 onwards, there was increased scholarly interest in the issue of impacts of prolonged communication via technology on employees' well-being, involvement, and productivity. In their field experiment lasting for four weeks, Shockley et al. (2021) showed that keeping cameras on while working in virtual teams led to higher fatigue, especially among females and newer employees. The increased fatigue decreased the level of participation and employee voice in virtual meetings. It should be noted that maintaining the camera on in order to promote involvement and increase social presence in virtual teams, regardless of additional cognitive and self-presentation requirements, had negative impact on well-being of employees. According to Amankwah-Amoah (2021), the pandemic became an important catalyst of accelerated digital transformation leading to adoption of digital technologies which would take several years without the pandemic circumstances. At the same time, the rapid growth of using virtual meetings was associated with emerging issues related to the well-being of employees and effectiveness of communication processes. The study conducted by Karl et al. (2022) regarding the experiences of employees with virtual meetings during the pandemic revealed that virtual meetings contributed to better accessibility and decreased the need for traveling but the increased use of video conferences could contribute to the development of fatigue and decreased engagement of employees. This tendency was defined as "virtual meeting fatigue" or "Zoom fatigue" and reflected the increased cognitive load of employees due to prolonged digital communication. Thus, finding ways to improve the effectiveness and sustainability of virtual meetings in teleworking conditions became one of the goals of scholars and organizations. Another piece of evidence about psychological impacts of virtual meetings can be provided by the research

conducted by Nurmi and Pakarinen (2023). In their study of virtual meeting fatigue, the authors used subjective measures and cardiac activity as objective measures. The results showed that virtual meetings are more associated with passive fatigue caused by drowsiness and under-stimulation rather than cognitive exhaustion. Work engagement was identified as an important moderator of virtual meeting fatigue showing that employees with high engagement are less prone to fatigue during virtual collaboration. Thus, the virtual collaboration requires not only the presence of appropriate technological tools but also psychological, behavioural, and interpersonal components.

Virtual meetings impact the distribution of information. Based on meta-analytical studies, it has been proven that the interactions conducted using technological platforms could promote the exchange of unique or non-redundant information and influence communication openness (Mesmer-Magnus et al., 2011). Therefore, virtual collaboration might change how the information is distributed in the group, improving decision-making in some settings, but requiring coordination efforts to ensure inclusivity and clarity. Moreover, studies suggest that virtuality impacts the type of information teams exchange, but not the decrease in total exchanges. The teams with high levels of virtual interactions were found to exchange a greater amount of unique information compared to less virtual teams. According to Mesmer-Magnus and DeChurch (2009), both the openness and uniqueness of information sharing are key predictors of the team performance, showing how the communication structure matters. Analyses of digital interaction patterns suggest that remote work increases asynchronous communication while reducing cross-group connections and spontaneous interactions, which may constrain the flow of novel information across networks (Yang et al., 2022). One of the limitations of the virtual meetings is that there is less transfer of nonverbal and contextual signals compared to face-to-face interactions. These signals help maintain attention, express emotions, and build relationships between people. As a result, lack of non-verbal interactions might decrease engagement and make the conversation unnatural, reducing the team cohesion and social connections (Mesmer-Magnus et al., 2011). Furthermore, virtual communication often limits the opportunity for spontaneous interactions. Informal interactions are crucial for building the trust and relationships within the team (Cramton, 2001). Virtual meetings provide the convenience and flexibility of scheduling, helping to speed up the process of decision-making in many cases. For example, in the case of agile software development teams and rapid decision-making, where fast expert judgments are required (Stray et al., 2016). However, the decision-making process depends on the participants' expertise and common understanding of the roles, tasks, and relevant information.

Mutual Knowledge Problem in Virtual Meetings

The mutual knowledge problem can be considered one of the most significant obstacles for distributed collaboration and computer-mediated communication. It refers to the problem of identifying which information, assumptions, and context knowledge are shared by participants in their interactions (Cramton, 2001). For communication in collaborative work to be effective, participants should have shared understanding of the relevant information. The lack of shared understanding can lead to problems and difficulties with coordinating. Olson and Olson (2000)

claim that geographical distance makes it difficult to build a common context that leads to less efficient coordination and higher chances of misunderstandings. To overcome these challenges in a collaborative way, organizations often resort to using structured communication practices, shared digital workspace, and tools for facilitating collaboration that allow team members to communicate more transparently. However, research in the field continues to emphasize that the problem of maintaining shared understanding is one of the most critical problems in distributed environments. In traditional in person settings, people usually establish shared understanding in an informal way. In particular, such cues as nonverbal communication, shared workspaces, and informal communication help people clarify their assumptions and ensure that other people perceive information in the same way. However, in virtual settings, these contextual cues are not available for many participants, which means that they do not know what others know or think about some issues. Some of the factors contributing to the problem of mutual knowledge are unequal access to context information, uneven distribution of knowledge among team members, delayed communication, and lack of interpretation of messages without immediate feedback. For example, in the case of virtual meetings, participants do not know if other people have access to the same documents, possess the same background information or interpret instructions in the same way. Such uncertainties can lead to incorrect assumptions about shared knowledge and ultimately hinder collaboration. (Cramton, 2001).

AI in virtual meetings

Various AI-powered solutions are introduced by modern virtual meeting platforms to facilitate communication, collaboration, increase productivity, and decision-making. These technologies support a range of functions, including automatic transcription, real-time translation, meeting summarization, task identification, scheduling assistance, and participant engagement analysis. Such platforms as Microsoft Teams, Zoom, Google Meet use AI algorithms to produce automatic meeting transcripts, which helps to review the discussions and to remember them better. Another way how AI makes meeting minute generation easier for participants is automatic summarization. According to Lu and Wang (2024), AI-based solutions for generating minutes of the meetings can help to simplify the task and increase its accuracy and efficiency by identifying the speakers and extracting information from discussions. Also, Kane et al. (2025) proved that the influence of AI-generated summaries on the collaboration process includes more efficient synthesis of the information and coordination of discussions.

AI-powered solutions can be used for increasing the effectiveness of the meetings and engagement of participants. Machine learning algorithms can analyse the communication dynamics, participation levels, speaking times and these results can be used for managing communication processes, preventing potential imbalances, and increasing overall the meeting quality. According to Allen (2026), data-based feedback on the meeting behaviours can contribute to more productive interactions within the teams. Through the analysis of communication dynamics, participation levels, and interaction dynamics, it is possible to learn about the quality of collaboration and inclusiveness of the meeting. Hosseinkashi et al. (2024) found that data-driven analysis of remote meetings can help identify factors associated with

effective and inclusive collaboration, enabling organizations to better understand how communication behaviours influence meeting outcomes. Such insights can help managers design more productive and engaging meeting environments.

At the same time, the introduction of AI solutions in virtual meetings poses some ethical challenges for organizations and employees. According to Cardon et al. (2023), the recording and analysis of the meeting communications using AI-powered solutions can cause some concerns related to privacy, surveillance, psychological safety of the employees, and the degree of their autonomy. The issue of privacy and security of the collected data becomes particularly urgent as AI tools record and store large amounts of meeting data. The employees can be concerned about the recording of the discussions and their analysis, especially in case when the AI tool analyses the participation dynamics and produces behavioural insights. Additionally, algorithmic bias, inaccuracies in transcription or translation, and overreliance on automated recommendations may affect the quality and fairness of meeting outcomes. Therefore, organizations must carefully balance the advantages of AI-enabled meeting technologies with ethical considerations and appropriate governance practices. As these technologies continue to develop, understanding their impact on communication, teamwork, and organizational effectiveness will become an increasingly important area of research. It is expected that AI systems will get more influence in the collaborative environment. As was suggested by Allen (2026), organizations move towards the future when AI can not only support the meeting communication processes but also participate in it and contribute to the decision-making process.

2.4 Theories on media

Although Media Richness Theory, Media Synchronicity Theory, and Social Presence Theory all address mediated communication, their analytical focus and underlying assumptions are different. Media Richness Theory focuses on the ability of media to eliminate ambiguity and uncertainty by correlating media richness with task complexity (Daft and Lengel, 1986). In contrast, Media Synchronicity Theory pays less attention to richness and more attention to communication processes, making the distinction between conveyance and convergence and arguing that success depends on the match between media and synchronization of interaction (Dennis and Valacich, 1999; Dennis et al., 2008). Social Presence Theory considers communication process from a relational and psychological perspective, addressing the issue of how media affects perceptions of interpersonal relationship and immediacy (Albertson, 1980). It has been established that social presence affects satisfaction, trust, and participation in online communication settings environments (Gunawardena and Zittle, 1997; Lowenthal, 2010).

Media Richness Theory

Media Richness Theory (MRT) suggests that the effectiveness of communication depends on the capability of a medium to transfer information and diminishes ambiguity. According to the

theory, media can be characterized in terms of "richness", which refers to the ability to change understanding and to process complex information effectively. As argued by Trevino, Daft, and Lengel (1987), organizational communication effectiveness can be improved through matching media characteristics to task requirements, considering that media vary in the capability to manage uncertainty. Rich media provide quick feedback, multi-cues, personalization, and variation of language, and therefore help establish common understanding, while lean media give few informational cues and are more suitable for routine or simple communication (Dennis and Valacich, 1999). Communication effectiveness is higher when the information processing capability of the chosen medium matches the complexity or ambiguity of the communication task (Dennis et al., 2008). MRT continues to be popular in the analysis of digital communication and organizational interaction. At the same time, modern scholars constantly reconsider its usefulness, as the theory was developed before the emergence of some modern communication technologies (Kock, 2005). Rich media, such as online conferences and video calls, provide multi-cues (verbal and non-verbal), fast feedback, and personal approach, which can increase inclusiveness, satisfaction and mutual understanding of distant team members. Specifically, richer media are useful in complex or sensitive interactions that involve complicated communication and emotional understanding. Virtual teams using rich communication methods usually experience higher inclusion and satisfaction, which allows them to establish social connections and improve teamwork. Importantly, however, predictions of MRT were proven most effectively in relation to native and highly proficient English speakers. People with low language proficiency experienced lower inclusion across all channels and did not find rich media beneficial for reaching mutual agreement (Fleischmann et al., 2020). MRT is important in the investigation of online team meetings, providing a way to explore how various media affect the performance, decision-making and social interaction of teams in virtual environment. For example, studies found that team members who used computer-mediated communication took longer to make decisions, highlighting the impact of media richness on the temporal aspects of collaboration in online meeting. However, improvements in decision quality were not always consistent across team types (Dennis et al., 1999; Dennis et al., 1998).

Some limitations of application of MRT to modern electronic media and virtual teams prompted the development of other theories, such as Media Synchronicity Theory. This development demonstrates the continued importance of MRT as a fundamental theory for studying the effectiveness of communication in online team meetings (DeLuca et al., 2008; Dennis et al., 1998).

Media Synchronicity Theory

Media Synchronicity Theory (MST), initially formulated by Dennis and Valacich (1999) and later developed by Dennis et al. (2008), contributes to earlier communication theories by explaining how communication effectiveness depends on the degree to which communication processes are synchronized among participants. The theory distinguishes between two fundamental communication processes: conveyance, involving the transmission of new information that requires individual processing and interpretation, and convergence, involving the development of shared understanding and agreement through interaction (Dennis and

Valacich, 1999). In contrast to previous approaches to media richness, according to MST, no single communication tool is better than others. Effectiveness of each type of communication tools depends on the correspondence between characteristics of communication processes and the capacities of a particular medium. As MST suggests, high-synchronicity media, for example, face-to-face communication or videoconferencing, are more appropriate for performing convergence, as they allow providing instant feedback, quick clarification, and coordinated interaction of participants. These media enable teams to quickly resolve misunderstandings, negotiate meaning, and establish consensus during collaborative work. On the other hand, conveyance processes are best performed using low-synchronicity media, such as email, messaging applications, or online collaborative tools that give participants more time to reflect on the information provided to them (Dennis et al., 2008). Asynchronous communication tools may therefore be especially beneficial when teams need to exchange large amounts of information, review complex documents, or collaborate across different time zones. Experimental research involving virtual teams solving complex problems supports the MST assumption that different communication media effectively serve different communication functions within the same task. For example, asynchronous tools such as email or bulletin boards may effectively facilitate information exchange across geographical distances and temporal boundaries, while synchronous media such as video conferencing are more effective for achieving shared understanding, coordinating decisions, and resolving ambiguity during collaboration (DeLuca et al., 2008).

Social Presence Theory

Social Presence Theory, first developed by Short, Williams, and Christie (1976), explains how different forms of media have different capabilities of conveying the feeling of presence of another person during communication. This notion implies the degree to which the particular form of media allows people to experience another person's psychological presence, which affects interpersonal communication and relations development. According to the theory, media differ in terms of the possibility to transfer both non-verbal and relational clues, with richer media enabling more feelings of warmth, immediacy, and social presence. Later research expanded the concept beyond media characteristics to include users' perceptions and contextual factors, emphasizing that social presence contributes significantly to satisfaction, trust, and engagement in mediated communication (Gunawardena and Zittle, 1997). In online settings, social presence affects interaction quality, participation rate, and collaborative outcomes (Tu and McIsaac, 2002). As digital communication technologies evolved, scholars have continued to refine the concept, highlighting its relevance for virtual teamwork and online meetings where perceived interpersonal connection affects communication effectiveness (Lowenthal, 2010). Traditional videoconferencing platforms often exhibit limitations, including reduced access to nonverbal cues and fewer opportunities for spontaneous interaction. Such restrictions may result in fatigue, decrease in engagement and sense of disconnection, and therefore lead to low social presence and ineffective virtual meetings. Such challenges underscore the need for technological developments that better support interpersonal communication and user well-being (Bailenson, 2021).

Feelings of social presence can be improved using virtual environments (VEs) and avatars' communication, which provide common space for collaboration. VEs allow for more natural manifestation of non-verbal behaviours compared to traditional videoconferencing and contribute to the feeling of connectedness. According to the empirical research, these technologies increase conversational flow, facilitate effective turns taking, and promote the feeling of togetherness, making the level of interaction similar to face-to-face communication (Freeman et al., 2022; Oh et al., 2018; Slater, 2009). However, there are individual differences in the use of these technologies depending on personal attitude towards virtual reality and involvement into it. VEs provide an opportunity to create more natural social interaction and make collaboration more inclusive as far as virtual spaces with synchronous communication tools are involved (Freeman et al., 2022; Dwivedi et al., 2022).

Media Naturalness Theory

Media Naturalness Theory, as proposed by Ned Kock, provides a theoretical framework for examining the effectiveness of different communication media in relation to human interaction. According to the theory, communication media differ in terms of their ability to support human interactions efficiently. The theory relies upon evolutionary assumptions and states that the main part of human communication skills has been formed during face-to-face interactions. Therefore, media reproducing face-to-face interaction features are considered more natural while those failing to do that are unnatural and require additional cognitive effort from a person to communicate properly. This increased mental effort arises because individuals must understand meaning without the usual contextual and nonverbal cues, which can lead to misinterpretations, decreased engagement, and slower communication. According to this perspective, in-person communication is characterized by five essential elements: physical co-location, synchronicity, exchange of facial expressions, the use of body language, and spoken language. These elements are biologically embedded and facilitate efficient information processing. Media that support these characteristics, such as video conferencing technologies, are therefore associated with higher levels of naturalness. In contrast, text-based communication channels, including email and instant messaging, lack several of these features and are consequently less natural. A central proposition of MNT is that lower levels of naturalness increase cognitive effort, ambiguity, and the likelihood of misinterpretation. In less natural communication environments, individuals must compensate for the absence of nonverbal and contextual cues, which can diminish the effectiveness of communication and user satisfaction. At the same time, Media Naturalness Theory allows considering certain advantages of unnatural media, such as reduction of communication apprehension and control over the content of the message that may be useful in dealing with sensitive or complex issues (Kock, 2005; Kock, 2011).

In the context of this thesis, Media Naturalness Theory is a valuable tool to assess the impact of choosing particular media on the results of communication. The usage of highly natural media would be appropriate for complex communication while less natural media would suit better for routine and asynchronous communication. This perspective complements related theories, such as Media Richness Theory and the *Hyperpersonal* Model, by offering an

evolutionary explanation for media effects on communication behaviour (Daft and Lengel, 1986; Kock, 2005; Walther, 1996). The extensions of Media Naturalness Theory include trust and leadership in virtual teams. While physical distance and technological constraints can impede communication, the theory posits that individuals adapt their communicative behaviour to compensate for reduced naturalness. It means that human communication is the key thing and not technology and it is possible to overcome problems with trust, coordination and leadership using effective communication media and practices. Empirical research on virtual teams supports this view, demonstrating that communication patterns and media use significantly influence trust development and leadership effectiveness in distributed contexts (Kock, 2005; Kock, 2011; Gilson et al., 2015; Jarvenpaa and Leidner, 1999). The theory, also, encourages understanding compensatory adaptation processes, whereby teams adjust interaction behaviours to "compensate" for the reduced media naturalness in virtual settings. Such adaptive strategies can mitigate the loss of natural cues and maintain meeting effectiveness, satisfaction, and trust over time (Hantula et al., 2011).

2.5 Conflict Resolutions in Virtual Meetings

Organizational conflict was viewed quite negatively and mostly regarded as dysfunctional in early organizational theory. Modern research on conflict distinguishes task and relationship conflict, the former being disagreement in ideas or perspectives, and the latter being interpersonal conflict. Whereas task conflict might, in certain conditions, be beneficial by allowing for critical thinking and information sharing, its impact on performance is mixed and affected by many factors, such as psychological safety and communication norms (Jehn, 1995; De Dreu and Weingart, 2003; Edmondson, 1999). In case of uncertainty about other person's intentions in the absence of shared frame of reference, task conflict may develop into relationship conflict, decreasing trust and cooperation (Simons and Peterson, 2000). Effective teamwork therefore relies on coordination mechanisms such as shared goals, clear role structures, and communication routines that make expectations transparent and predictable (Kozlowski and Ilgen, 2006; Marks et al., 2001). Structured interaction, role clarity, and facilitative leadership can preserve cognitive diversity while limiting interpersonal strain (Edmondson, 1999; Marks et al., 2001). The empirical data show that teams perform optimally when the conflict is properly managed rather than resolved. Therefore, efficient teamwork requires not absence of disagreement but ability to transform it into productive collaboration.

Conflict in virtual meetings often arises from several structural challenges associated with digital communication platforms. First, it is the lack of nonverbal cues, such as facial expressions, gestures, body language, to understand the communicative intention of the message (Walther, 1996; Daft and Lengel, 1986). In addition, technical difficulties, such as unstable internet connections, audio delays, and software disruptions can further hinder communication and increase frustration among participants (Bailenson, 2021). Delayed responses as feature of asynchronous communication may result in impatience and confusion, thus interfering with conversation and making it more likely to develop in conflict (Jarvenpaa and Leidner, 1999; Freeman et al., 2022). Another factor that contributes to the conflict is lack of informal contacts that emerge in face-to-face communication naturally, such as casual

conversations before or after the official meetings. They have an important function of building trust, empathy and understanding that is necessary for proper conflict management. The absence of such interactions in virtual environment leads to weak social relations and transactional communication climate. Collaboration becomes less efficient, and probability of conflict increases (Cramton, 2001; Jarvenpaa and Leidner, 1999; Olson and Olson, 2000; Gilson et al., 2015).

Another aspect of the conflict that emerges in virtual environment is the power dynamic that may be quite different from face-to-face environment. Some people may dominate the discussion, while others may participate less because of limited opportunities to speak and inability to involve. Such imbalance creates feelings of exclusion and raises tension, especially if the facilitator does not try to promote equality (Olson and Olson, 2000; Gilson et al., 2015). Different cultures and level of digital literacy can cause misunderstanding and discomfort, and influence how people perceive communication and engage in discussion (Ang et al., 2007; van Dijk, 2006).

Communication tools used in virtual meetings affect the dynamics of the conflict by changing interaction patterns, perception of the interlocutors and management of the disagreement. Tools that incorporate multimodal communication capabilities, support nonverbal cues, and enable interactive engagement can enhance clarity and coordination, thereby reducing the likelihood of misunderstanding. Also, AI-based decision-support tools can help structure communication and manage dispute process effectively in virtual environment (Dennis et al., 2008; Bailenson, 2021; Freeman et al., 2022; Zeleznikow, 2021). Audio and video conferencing tools enable synchronous interaction, allowing participants to access nonverbal cues such as facial expressions and vocal tone. They are crucial for understanding of emotions and communicative intention of participants, especially in conflict situation. There is the empirical evidence that richer modes of communication foster better cooperation, trust and understanding compared to the lean media (Bos et al., 2002). However, some limitations like delay, cognitive overload and lack of nuance of nonverbal cues can affect communication in a negative way and increase risk of misunderstanding. These constraints may negatively affect coordination and engagement in virtual teams (Mesmer-Magnus et al., 2011). Besides, mediated interaction can disturb natural conversational flow and turn taking. The use of synchronous communication tools and their possibilities of structured interaction can solve this problem by improving coordination and controlling domination and interruption in discussion (Dennis et al., 2008).

Integrating artificial intelligence (AI) and intelligent decision-support systems in online communication tools offers promising opportunities for improving conflict management. Such systems can analyse prior cases to suggest negotiation strategies, support mediation processes, and enhance the information available to disputing parties, thereby increasing the efficiency and effectiveness of conflict resolution in virtual environments (Carneiro et al., 2013; Carneiro et al., 2014; Zeleznikow, 2021). Besides, these tools can help structure communication and control discussion process. These features may help mitigate some limitations of human-mediated interactions, although their effectiveness depends on system design and user acceptance (Zeleznikow, 2021). More sophisticated settings, including virtual reality

environment, increase interaction richness, providing additional contextual and visual cues, increasing engagement and decreasing misunderstandings in distributed communication (Freeman et al., 2022).

Effective conflict management in virtual meetings requires deliberate and structured communication practices. Research on team processes shows that structured interaction enhances communication quality and minimizes misunderstandings in distributed environments (Marks et al., 2001; Gilson et al., 2015). More recent studies on remote work also emphasize the importance of clear communication norms and facilitation in improving collaboration and reducing conflict in virtual teams (Wang et al., 2021; Contreras et al., 2020). Encouraging active listening behaviours, including paraphrasing and acknowledgment of others' contributions, further promotes mutual understanding and reduces misinterpretation. Psychological safety is crucial in this process, as it fosters openness and trust among participants (Edmondson, 1999). In addition, usage of various collaboration tools can provide multiple options for participation and accommodate preferences of communication (Kozlowski and Ilgen, 2006; Freeman et al., 2022).

2.6 Role of Leadership

Leadership in virtual meetings requires the deliberate management of attention, participation, and shared understanding under conditions of reduced social presence. Within distributed communication environments, leaders cannot depend on the emergence of interactional cues to regulate conversation and have to structure their communication in terms of articulating goals, managing participation and alignment of team members (Gilson et al., 2015). Research on e-leadership indicates that effectiveness relies not on the formal position but on the communication skills of leaders, especially those related to creating psychological safety and trust in situations when relational cues are absent (Avolio et al., 2000; Purvanova and Bono, 2009). Without such structuring, virtual meetings are likely to encounter problems with participation inequality and diffusion of responsibility which result in decreased accountability and quality of decisions. In such cases, leaders act as facilitators of shared understanding who integrate dispersed messages through clarification, paraphrasing and confirmation to ensure alignment of the group (Marks et al., 2001; Gilson et al., 2015). Empirical research also shows that supportive and transformational leadership behaviours like encouragement, recognition and setting expectations are particularly valuable for virtual teams where the perception of leadership is based on communicative behaviour rather than mere presence (Hoch and Kozlowski, 2014).

Empirical findings show that leadership in virtual teams tends to be distributed among multiple participants rather than centralized in one person. Nevertheless, the effectiveness of shared leadership behaviours can vary depending on the kind of the behaviour and cultural context (Hoch and Kozlowski, 2014; Mayer et al., 2023). Task-oriented behaviours, such as goal setting, role clarification, and structured coordination, are always positively correlated with satisfaction and productivity of team members. Relationship-oriented behaviours can give

inconsistent results and are sometimes viewed unfavourably in the context of strongly hierarchical cultures or cultures with distinct expectations about interaction in virtual environment (Mayer et al., 2023). Additionally, the studies of emergent leadership in virtual and project-based teams demonstrate the significance of vision setting, creative problem-solving and questioning as competencies that improve communication and performance of teams and are performed regardless of officially designated positions of leaders. The recognition of these competencies and their use can also vary depending on context and cultural differences (Ziek and Smulowitz, 2014). In comparative studies, it has been found that leadership is evaluated more positively in face-to-face teams than in virtual teams. The positive perception of leadership in co-located settings is often associated with better communication channels and interpersonal relations (Stratone et al., 2022). Also, in the case of virtual teams, leadership becomes very important in terms of building trust and dealing with conflicts among members. However, according to Kashive et al. (2022) there is a lack of research into whether leadership styles in different cultural contexts are adjusted for virtual reality. It appears to be one of the topics to explore in the future. Some new findings in relation to digital collaboration environments have shown that interaction design and communication capabilities play a role in leadership and, thus, its effectiveness in virtual teams is mediated by technological factors (Freeman et al., 2022). Leadership in virtual teams is often viewed as more difficult than conventional leadership because of reduced communication richness, nonverbal barriers, and the possibility of cultural misunderstandings. These aspects highlight the importance of adaptive, culturally intelligent, and context-sensitive leadership to achieve good collaboration in virtual teams (Kniffin et al., 2021).

2.7 Cultural Diversity

Virtual meetings are shaped by cultural influences as there are certain opportunities and challenges related to varying communication styles, expectations and interpretation of behaviours. With the increasing globalization of business, cultural diversity becomes especially important for organizations. In particular, high context cultures, common in numerous Asian and Latin American countries, place considerable value on nonverbal communication and context, making face-to-face communication especially beneficial. On the other hand, cultures characterized by individualism, like that of the USA and Western Europe, may provide more flexibility in terms of team building and collaboration. While cultural diversity is a source of innovation, creativity and increased productivity, it may be associated with the emergence of conflicts and communication barriers (Cichomska et al., 2015). Cultural heterogeneity in virtual teams adds value to communications since it provides multiple perspectives and approaches to solving problems. Different cultural views contribute to the emergence of creativity and innovations due to combining of diverse experiences and ideas. However, cultural differences in virtual teams create significant communication barriers associated with miscommunication and conflict due to the different norms in expressing opinions, preference of indirect communication and different attitudes towards hierarchy and deadlines (Varhelahti and Turnquist, 2021). Divergent norms, languages and communication styles may lead to misunderstandings in virtual setting, when communication context is limited (Stahl et al., 2010). Differences in professional roles, power distances and communication practices may also

become a barrier to communication and coordination between team members (Gilson et al., 2015). According to Dekker et al. (2008), virtual team behaviours were different for different cultures, as there was significant variability in the frequency of interaction behaviours and their perception among the samples from Netherlands, USA, India and Belgium. Therefore, respectfulness as an additional category became necessary in order to describe culturally specific interaction patterns of the Indian and Belgian samples. These findings highlight the necessity to take cultural aspects into consideration when studying virtual teams and show that norms of effective collaboration and communication may vary for different national and organizational cultures.

Effective communication process in virtual meetings involves being sensitive to culture related differences and tailoring communication practices according to different perspectives. In empirical research, cultural intelligence, a capacity for recognizing, understanding, and adapting to cultural differences is considered an important competence for successful cooperation and leadership in multicultural virtual teams (Ang et al., 2007; Rockstuhl et al., 2011). Leaders of culturally diverse virtual teams should use adaptive leadership techniques that are characterized by goal specification, role definition, and culturally sensitive conflict management to increase coherence of the team (Horwitz et al., 2006; Gilson et al., 2015). Although leadership development literature also draws attention to adaptive skills needed to manage diverse teams, their application in the context of virtual communication calls for careful consideration of communication processes and circumstances (Asfahani, 2025). People who come from collectivistic cultures report higher levels of trust, communication, and collaboration than people from more individualistic cultures (Mockaitis et al., 2012). According to modern research, cultural intelligence and intercultural competence allow individuals to understand diverse communication practices and respond to them appropriately (Rockstuhl et al., 2011). Programs for developing such qualities as trust, open communication, and building relationships can significantly improve cooperation in virtual teams (Wang et al., 2021). Besides, studies on remote and digitally mediated teamwork show that increased cultural awareness and advanced communication skills can help achieve better coordination, satisfaction, and trust between the team members (Carillo et al., 2021; Wang et al., 2021).

2.8 Meeting Effectiveness

To measure the efficiency and productivity of virtual meetings requires an approach that is multidimensional since there is no single key performance indicator (KPI) that can sufficiently cover all aspects of the performance of a team in this regard. The existing literature on workplace productivity suggests a multidimensional set of KPIs covering task performance, communication process, participation, relations, and the employee experience. Previous studies imply that the effectiveness of teams cannot be measured by means of a single factor and should be considered from several dimensions (Kozlowski and Ilgen, 2006; Gilson et al., 2015). In particular, metrics that will refer to participation and engagement like attendance rate, reaction frequency, verbal participation can provide significant information about collaboration and interaction in virtual teams. Research on remote and hybrid working conditions shows that the active participation is highly correlated with team effectiveness especially in case when there

are limited non-verbal interactions and lack of social cues which prevent interactions and engagements (Carillo et al., 2021). Consistent participation shows the commitment, involvement of the team, psychological commitment of the employees, and how they see their inclusion in collaborative process. The efficiency of process can be measured with the help of time related indicators such as the punctuality of meetings, the timing of task performance, decision making, time spent on resolving issues or achieving consensus. Research on digital collaboration shows that structured coordination and efficiency of communication process is very important for maintaining productivity and preventing delays in virtual environment (Wang et al., 2021). Teams that establish clear agendas, communication protocols, and decision-making procedures are generally better able to manage meeting time effectively and reduce inefficiencies associated with fragmented communication or technological interruptions.

Output-based indicators continue to be crucial for assessing the concrete results of virtual meetings. For instance, they may cover such aspects as the number and quality of made decisions, achieved project milestones, innovations, and accomplished task assignments. Still, output-based indicators are not enough to evaluate the overall effectiveness of virtual collaboration. Subjective indicators, including perceived meeting effectiveness, communication clarity, satisfaction with collaboration, and perceived workload should also be taken into consideration because they refer to the experiential and psychological aspect of virtual teamwork (Bailenson, 2021; Freeman et al., 2022). Employees' perceptions of meeting quality determine their motivation, engagement, and involvement in the future collaboration. At the same time, the communication structure and patterns of communication are also key indicators of virtual team effectiveness. The objective behavioural indicators of the participation in virtual meetings include speaking times, number of turns in communication, responsiveness, and vocal communication patterns that relate to positive evaluations of peer rating of project effectiveness (O'Bryan et al., 2024). The balance of participation and equal opportunity of communication are especially important in the context of virtual teamwork since the virtual environment may stimulate some team members to dominate in communication, and others will remain silent. Monitoring the balance of the interactions allows understanding more about inclusivity and the quality of collaboration in a team. Those factors should be complemented with the relational and psychological dimensions. There is evidence that teams having higher levels of trust and psychological safety have more efficient collaboration and knowledge exchange and better performance in the virtual environment (Edmondson, 1999).

An equally important aspect refers to cognitive and well-being variables associated with prolonged virtual collaboration. Recent developments in scientific research dedicated to virtual meeting fatigue suggest that a high meeting rate, camera usage, and increased cognitive load may negatively impact employees' ability to concentrate, stay engaged, and be productive (Shockley et al., 2021; Nurmi and Pakarinen, 2023). Variables like meeting overload, cognitive exhaustion, stress experienced by employees, and work-life balance could provide more information about sustainable virtual collaboration processes. The monitoring of such variables becomes especially vital in cases of hybrid and remote work since lines between professional and personal spheres tend to be blurred.

The quality and reliability of technologies affect the process of communication and information exchange in technology-mediated collaboration environments. Such factors as the reliability of the platform, quality of audio and video connections, simplicity of using technologies, accessibility, and frequency of technology failures might largely affect communication quality and results of meetings. Technology failures, for example, instability of the internet connection, lags of audio connection, software problems, or poor functions of the platform might disrupt the communication flow and lead to lack of engagement and frustration of participants. That is why the quality of communication technologies and digital infrastructure is an essential part of assessing the efficiency of virtual meetings (Gilson et al., 2015). Research studies conducted during and after the period of the COVID-19 pandemic also prove the significance of the quality of technologies in maintaining the productivity and collaboration of employees. According to the findings of Wang et al. (2021), digital work effectiveness highly depended on the existence of a reliable communication platform and effective technologies of support systems. Employees with many technical issues experienced low productivity, cognitive load, and communication difficulties. The same problem, according to Bailenson (2021), is a lack of quality of technologies used in video-conferencing platforms leading to cognitive overload and "Zoom fatigue" since the participants need to compensate for all communication failures like lags, poor nonverbal cues, or quality of audiovisual connections. Quality and user-friendly technologies allow fostering social presence and trust building by facilitating interaction (Nevo and Chengalur-Smith, 2011).

Cutler et al. (2021) have found several elements that were positively correlated with effective and inclusive meetings in virtual environments. In particular, practices like distribution of communication material before meetings, delivery of summaries after the end of meetings, inclusion of clear agenda, availability of good audio and video quality, and encouragement to use video were associated with better meeting experience and inclusiveness of participants. These findings highlight the significance of structural aspects of meetings, their proper preparation, and technological components in ensuring productive collaboration. Geimer et al. (2015) studied employees' perception of meeting effectiveness using an international survey involving the participation of respondents from more than 40 countries. Respondents often reported inefficiency of meetings due to poor planning, lack of clarity regarding objectives, poor facilitation, low level of engagement of participants and poor follow-up actions. Negative perceptions were mostly associated with organizational problems such as lack of clear agenda, poor time management, wrong choice of participants, and improper discussion structures. Positive perceptions of meetings were associated with productive interactions, exchange of information, collaborative problem solving and successful outcomes of the processes.

3. Methodology

3.1 Structured Literature Review

A structured literature review (SLR) refers to a systematic and clear procedure of examining academic literature in a particular research area. It includes the assessment of the quality and

contribution of previous research, organization and analysis of the results, and summarization of the current state of knowledge. Conducting SLR helps to provide useful insights and critical reflections on the research area and contributes to the theoretical development and identification of future research areas and questions (Massaro et al., 2016). As Snyder (2019) states, the process of SLR is based on a systematic and rigorous approach which involves the identification of relevant studies, critical evaluation of the quality of evidence, and the synthesis of the results to make useful conclusions and recommendations. With the growing popularity of digital communication technology and remote working conditions in organizations, the number of studies investigating the effects of virtual communication on teamwork and organizational performance has significantly increased. Being fragmented and interdisciplinary, the literature can be better analysed by means of SLR methodology to develop a comprehensive picture of the current state of the field. Therefore, the purpose of the present study is to examine, analyse, and synthesize peer-reviewed literature on virtual meetings, teamwork, communication, and collaboration in organizational context using the methodology developed by Massaro et al. (2016). According to Massaro et al. (2016), conducting SLR includes the following ten steps:

- 1) formulation of research questions
- 2) development of literature review protocol
- 3) determination of the type of included studies and conducting a structured literature search
- 4) analysing the identified studies and assessment of their influence
- 5) development of an analytical framework
- 6) evaluation of the reliability of the review process
- 7) conducting validity tests
- 8) coding and categorizing the collected data
- 9) critical analysis and synthesis of the reviewed studies
- 10) proposing future research directions and research questions

3.2 Research Questions

As Massaro et al. (2016) suggest, a structured literature review is expected not only to synthesize the existing knowledge but to make its critical assessment and define the ways of future research. With this purpose, this study is centered around three research questions. These research questions are designed to investigate the current state of knowledge, identify trends and themes in the literature, as well as explore directions for future research. The research questions are presented below.

RQ1: How do virtual meetings influence teamwork in organizations?

The major goal of the first research question is to investigate the current state of knowledge in the field. In other words, it seeks to identify and analyse the existing body of literature concerning virtual meetings and their impact on teams and teamwork in organizational settings.

RQ2: What factors affect the effectiveness of virtual meetings in organizational teams?

The second research question is focused on the analysis of main themes, trends, and factors revealed in the literature. For this purpose, the structured analytical framework is used to conduct a systematic analysis of the studies reviewed, identify themes and assess the factors that influence the effectiveness of virtual meetings.

RQ3: What gaps and directions for future research exist in the literature about virtual meetings and organizational performance?

The last research question is designed to reveal the unexplored topics, limitations of methods used in literature, and other relevant issues associated with virtual meetings and organizational performance.

3.3 The Review Protocol

The literature review protocol forms the basis of the SLR process. It guarantees a systematic, clear, and reliable way of performing the review (Massaro et al., 2016). As a framework, it describes the methodology, the strategy, the inclusion and exclusion criteria, and the procedures of analysis that will be used during the research. In order to build a solid foundation for the review, it was important to follow a strict process of choosing relevant peer-reviewed journal articles. To ensure that only the appropriate articles would be included into the review, specific criteria were applied. Only articles published in the first quartile (Q1) of the SCImago Journal Rank (SJR) journals for 2025 were selected for the purpose of this review. Although it is believed that peer-reviewed articles form the cornerstone of the academic research, other sources can be used based on the purpose of the review (Massaro et al., 2016). The search was limited to articles published between 2019 and 2026. Google Scholar, ScienceDirect, and Scopus databases were used to find relevant literature. Various keywords connected with virtual meetings, virtual teamwork, remote collaboration, communication effectiveness, and organizational performance were used to identify articles that meet the criteria of the investigation. Using different databases and search terms increases the comprehensiveness of the literature review. As a result of the search process, all articles were downloaded as PDFs and assessed for relevance. All articles irrelevant to the research goals were excluded. It is necessary to mention that the literature review covered only studies about employees and work teams in organizations (no studies of educational, healthcare, and other non-organizational nature were analysed). In order to achieve methodological consistency of the results, inclusion and exclusion criteria were clearly defined. The selected articles were coded in NVivo software in order to organize and categorize the collected information. This process helped in identifying certain patterns, relationships and recurring themes in the literature and analysis of the research questions. The focus of the literature review was set on studies that assess virtual meetings as a communication tool and its influence on teamwork quality, communication effectiveness, collaboration, trust, cohesion, productivity, and organizational performance. The design phase established the databases, the search strategy, the screening, and analytical procedure.

3.4 Literature Search

During this stage, the process of identification and selection of studies involves systematic searching of academic literature and the selection of relevant studies based on predefined criteria. The main purpose of this step is to identify and consolidate the most appropriate literature on the topic and form the basis of the literature review (Knopf, 2006). Based on Okoli's (2015) suggestions, the search was performed using major academic databases such as Scopus, ScienceDirect, and Google Scholar. The following screening process was conducted in several stages.

Table 1. Academic databases used for literature search

Database	Purpose	Relevance to Study
Scopus	Multidisciplinary academic database	Broad coverage of management, communication, and business research
ScienceDirect	Publisher database with peer-reviewed journals	Access to management, psychology, and organizational research
Google Scholar	Broad academic search engine	Additional identification of relevant studies and citation tracking

Source: own work

The process of literature search began with conducting an initial keyword search based on specifically chosen terms relevant to the research topic according to the suggestions by Massaro et al. (2016). Search terms included combinations of keywords such as "virtual meetings," "virtual teams," "remote collaboration," "digital communication," "virtual communication," "videoconferencing", "hybrid work," and "meeting effectiveness." In order to refine the search process and make sure all aspects of literature on the topic were covered, Boolean operators (AND, OR) were used in the search. For example, the following search strings were employed: ("virtual meetings" OR "online meetings") and ("teamwork" OR "collaboration"). It was important to develop a search strategy for acquiring literature from various disciplines, such as management, organizational behaviour, communication studies, psychology, and information systems, due to the interdisciplinary nature of the topic. With respect to the rapidly changing technologies of digital communication and remote work, specific attention was paid to finding recent works to cover the latest advancements in the field. This search strategy was expanded to include not only peer-reviewed journal articles, but also other scholarly sources in order to provide an overview of all literature available (Massaro et al., 2016).

The literature search identified a total of 268 potentially relevant articles across the three selected academic databases. Of these, 133 articles were retrieved from Google Scholar, 43

from ScienceDirect, and 92 from Scopus. Following the initial search, a total of 12 duplicates were identified and removed.

According to the recommendations of Xiao and Watson (2019), the screening of articles began with the examination of titles and abstracts. At the stage of screening by title and abstract, the articles were evaluated according to four criteria developed to assess whether the study is relevant to the research questions or not. First, the study is focused on an organizational context, involving employees, work teams or any kind of collaboration between professionals, and not in educational, health care or any other non-organizational setting. Second, the study had to explore virtual meetings, including video conferences, audio conferences or any hybrid types of meetings. Third, it was necessary that the research was based on the use of the primary research design, including quantitative, qualitative or mixed methods, or it could be a systematic review or meta-analysis. Finally, the study had to address real-time meetings and communication process, and not some form of asynchronous collaboration. The review was limited to the articles published in English in order to provide the consistent analysis of the results. It included both empirical and conceptual studies addressing virtual meetings as a means of communication and their impact on teamwork quality, communication effectiveness, collaboration, trust, cohesion, productivity and organizational performance.

The abstracts of the other 256 papers were then analysed to identify their applicability to the research questions. As a result, 163 articles that do not properly reflect on the research questions or fail to fulfil the inclusion criteria were excluded from the study. Therefore, 93 articles remained eligible for a full text review. In this stage, the relevance, quality, and applicability of the selected studies were analysed based on the inclusion and exclusion criteria developed at the initial stage of the research. Following the full-text review, 47 studies satisfied all selection criteria and were included in the data extraction and analysis phase.

Influence of the journals was determined based on citation metrics that consisted of the number of citations and citations per year (CPY). In addition, journal quality was assessed using established Scopus journal metrics, such as CiteScore, SCImago Journal Rank (SJR), and Source Normalized Impact per Paper (SNIP). Table 2. presents the quality indicators of the journals in which the most influential studies included in this review were published.

Table 2. Bibliometric indicators of the top eight selected journals

Source	Cite Score	2022-25 Citations	2022-25 Documents	% Cited	SNIP	SJR 2025
Human Resource Management Review	32.6	5244	161	93	5.085	4.892
European Journal of Information Systems	20.7	3781	183	94	2.720	3.238
Business Horizons	20.2	4438	220	94	2.729	2.744
Electronic Markets	16.8	5726	340	83	2.644	2.143
Information and Management	16.3	7204	443	86	2.254	2.220
Journal of Applied Psychology	15.0	4806	320	94	2.914	5.473
Journal of Organizational Behaviour	14.2	4135	292	92	2.983	3.999
Journal of Vocational Behaviour	10.2	2612	257	83	2.325	3.075

Source: Collected by the author based on data from <https://www.scimagojr.com/journalrank.php> and <https://www.scopus.com>

Although the initial search strategy focused exclusively on peer-reviewed journal articles, the inclusion criteria were subsequently expanded in line with the recommendations of Massaro et al. (2016). The authors argue that, when investigating an emerging research field, conference proceedings can provide valuable insights into ongoing scholarly discussions, emerging themes, and recent developments that may not yet be reflected in established journal publications. Given the rapidly evolving nature of virtual communication technologies and remote collaboration practices, conference papers were considered an important complementary source of evidence. Five conference papers were included in the final sample: three papers published in the Proceedings of the (Association for Computing Machinery) ACM on Human Computer Interaction and two papers published in the Proceedings of the ACM Conference on Computer Supported Cooperative Work and Social Computing.

Since the present structured literature review is conducted from the perspective of international business, the quality of the journals is also assessed based on the Academic Journal Guide (AJG) 2024 developed by the Chartered Association of Business Schools (CABS). The AJG is one of the most important journals ranking systems in the business and management disciplines. Table 3. present the rankings of journals in which studies included in this review were published.

Table 3. Journal quality assessment using AJG 2024

Source	AJG Ranking	Number of Articles
Journal of Applied Psychology	4*	1
Journal of Vocational Behaviour	4	1
Journal of Organizational Behaviour	4	1
European Journal of Information Systems	4	1
Internet Research	3	1
Information Technology and People	3	2
Information and Management	3	2
Human Resource Management Review	3	1
Human Factors	3	1
Applied Psychology	3	1
Innovation: Organization & Management	2	1
Electronic Markets	2	2
Entropy	2	1
Journal of Intellectual Capital	2	1
Managerial Auditing Journal	2	1
Review of Managerial Science	2	1
Small Group Research	2	1
Computers in Human Behaviour	2	3
Business Horizons	2	2

Source: Collected by the author based on data from <https://journalranking.org>

Some of the journals included in this study are not listed in the AJG because they primarily belong to disciplines outside the scope of the AJG, such as psychology, computer science, communication, and multidisciplinary research. All of them are also internationally recognized and classified as Q1 in the SJR.

3.5 Article Impact

The academic impact of the selected studies was assessed using total citation counts. The citation count is a measure of the frequency of the usage of the paper by other scholars, and it is used as a marker of its importance and significance in the certain scientific area. Highly cited papers can be considered as the basis for the further research, as stated by Serenko and Dumay (2015). Citation counts were used to determine papers which have greatly influenced the development of literature on virtual meetings and organizational cooperation. In accordance with the recommendations provided by Massaro et al. (2016), citation count was used as an additional factor to measure the importance of identified papers. Papers with zero citation were

not included into the analysis, since they do not have significant influence on the academic world. However, some recent publications were considered despite their low citation count because of the short period after their publication. The information about citation count was collected using the Publish or Perish software (Harzing, 2007). The program retrieves information about citations from Google Scholar database. Google Scholar was chosen for its extensive collection of academic papers and citation tracking system (Dumay, 2014). The use of total citation counts enabled the identification of influential studies and ensured that the review incorporated relevant literature into analysis.

Table 4. Top eight articles by Google Scholar Citations

Authors	Title	Citation count
Waizenegger et al. (2020)	An affordance perspective of team collaboration and enforced working from home during COVID-19	1415
Karl et al. (2022)	Virtual Work Meetings During the COVID-19 Pandemic: The Good, Bad, and Ugly	652
Schockley (2021)	The fatiguing effects of camera use in virtual meetings: A within-person field experiment.	440
Riedl et al. (2022)	On the stress potential of videoconferencing: definition and root causes of Zoom fatigue	424
Defilippis et al. (2022)	The impact of COVID-19 on digital communication patterns	166
Standaert et al. (2022)	Business meetings in a post pandemic world: When and how to meet virtually	166
Fauville et al. (2023)	Video-conferencing usage dynamics and nonverbal mechanisms exacerbate Zoom Fatigue, particularly for women	151
Saatçi et al. (2020)	(Re)Configuring Hybrid Meetings: Moving from User-Centered Design to Meeting-Centered Design	107

Source: Compiled by the author based on data from <https://harzing.com/resources/publish-or-perish>

Table 4. presents the articles that have received more than 100 citations. As expected, many of the highly cited papers have appeared during the era of COVID-19 and in the subsequent years. The concentration of such influential works can be mainly attributed to the rapid and sudden change from traditional office work environments to working from home and remote work settings. Organizations operating in various sectors found themselves forced to rely on digital means of communication, particularly videoconferencing tools, in unprecedented numbers for maintaining communication and coordinating activities. The urgent need to understand the implications of virtual communication for teamwork, collaboration, and organizational performance stimulated a significant increase in scholarly attention and research activity in this area.

3.6 Analytical Framework

The purpose of an analytical framework is to provide a systematic procedure for arranging, classifying, and consolidating the results of a series of studies. This includes a group of topics, ideas, or variables that have direct connection to the goals and questions of the research. In accordance with the proposal made by Massaro et al. (2016), the original framework was adjusted to fit the goals and topics of the current study. The framework includes five analytical dimensions:

- 1) Region
- 2) Study Design
- 3) Theoretical Framework
- 4) Research Focus
- 5) Factor Category

The first dimension, *Region*, provides data on the geographic spread of scientific literature on the issue. The use of such a dimension makes it possible to find out which regions have been thoroughly investigated and which need further exploration (Massaro et al., 2016). The selected articles were divided into the following regions according to this criterion: the United States, the European Union (EU), Asia, and Other. The second dimension, *Study Design*, evaluates the methodologies used in the analysed studies. Its analysis allows us to find out the main research methodologies and reveal any methodological gaps that exist in the literature (Massaro et al., 2016). The analysed studies were categorized as follows: observational, experimental, qualitative, quasi-experimental, literature review, meta-analysis, and mixed-methods research. *The Theoretical Frameworks* used in the selected studies help understand the mechanism of virtual meetings' impact on communication, leadership, collaboration, trust, participation, and meeting effectiveness in general. The fourth dimension, *Research Focus*, includes the primary topics covered by the selected articles. It shows which areas have been thoroughly explored by scholars and, therefore, may give some hints about the potential areas for future research (Massaro et al., 2016). By analysing the thematic concentration of scientific studies, it is possible to understand the scope of academic interest. With regard to virtual meetings, this phase allows comparing the results obtained in the field of team effectiveness and performance, videoconference fatigue and well-being, meeting design and alternative technologies, communication dynamics and participation and inclusion, equity, and social dynamics. *The Contextual Factors* include various aspects that define the context of virtual meetings, namely organization culture and hierarchy, team composition and demographics, cultural context, and the pandemic context and work arrangements. The classification allows analysing the effectiveness of virtual meetings in various organizational and research contexts. The analytical framework and its results are provided in Table 5.

Table 5. Analytical Framework

Category	Attributes	Results
Region	USA	17
	EU	17
	Other	7
	Asia	6
	Total	47
Study Design	Observational	20
	Experimental	9
	Mixed methods	7
	Structured review	5
	Qualitative	2
	Meta analysis	2
	Quasi-experimental design	2
	Total	47
Theoretical Framework	Communication and Media Theories	20
	Affordance and Technology Adoption Theories	10
	Social and Organizational Theories	8
	Meeting Science	6
	Leadership Theories	3
	Total	47
Research Focus	Team Effectiveness and Performance	12
	Videoconference Fatigue and Well-Being	10
	Meeting Design and Technology Alternatives	10
	Inclusion, Equity, and Social Dynamics	7
	Communication Dynamics and Participation	8
	Total	47
Contextual Factors	Organizational Culture and Hierarchy	22
	Team Composition and Demographics	13
	Pandemic Context and Work Arrangements	7
	Cultural Context	4
	Total	47

Source: own work

The data collected were analysed using Microsoft Excel and synthesized within a concept matrix. The matrix served as a structured tool for organizing and comparing findings across studies. It was developed iteratively as more themes were identified throughout the literature review process (Webster and Watson, 2002; Wolfswinkel et al., 2013).

3.7 Reliability

As structured literature reviews rely on the judgment and evaluation of researchers during the coding and classification process, may be influenced by researchers' subjective interpretations (Hayes and Krippendorff, 2007). In the context of this study, the selected articles were coded and categorized using NVivo software. As Massaro et al. (2016) point out, the process of coding involves possible biases on the part of the researcher. Therefore, appropriate measures should be implemented to ensure the reliability of the coding procedure. One of the most widely recommended approaches for assessing reliability in SLR studies is the calculation of Krippendorff's Alpha (α). According to Krippendorff (2018), the reliability of coding is assured when the value of α exceeds 0.800. When the α value varies from 0.667 to 0.800, such results allow drawing general conclusions. Krippendorff's Alpha can be calculated with the use of various statistical software. The calculation process has become more accessible using online Krippendorff's Alpha calculators. To calculate the α , one needs to develop a dataset where the results of all coders are provided in separate columns. The reliability is usually evaluated by analysing the decisions of coding made by two or more independent coders. It can also be assessed by repeated coding by the same researcher at different points in time. This approach, referred to as *intracoder* reliability, enables the evaluation of coding consistency and stability over time (Lacy et al., 2015). In the current research, all the included articles were coded twice with the interval of three weeks between the coding procedures. In both cases, the articles were coded according to the predefined dimensions of the framework, including region, study design, study setting, research focus, and factor category. The findings suggest that the coding process was conducted systematically and consistently. The results of the reliability analysis are presented in Table 6.

Table 6. Krippendorff's Alpha (α)

	N Agreements	N Disagreements	N Cases	N Decisions	Percentage Agreement	Krippendorff's Alpha
Region	47	0	47	94	100	1
Study Design	47	0	47	94	100	1
Theoretical Framework	46	1	47	94	97,90	0,974
Research Focus	46	1	47	94	97,90	0,974
Factor Category	44	3	47	94	93,60	0,921

Source: own calculations using the K-Alpha Calculator (Marzi et al., 2024).

Although the Research Focus and Factor Category dimensions produced slightly lower values than the other categories, these differences were relatively small and may be explained by minor variations in coding decisions. It should be noted that all Krippendorff's Alpha coefficients exceeded the recommended threshold of 0.800.

3.8 Validity

In order to make sure that the methodology of research is robust, its internal and external validity were measured. The former refers to the accuracy of the studies chosen to reflect the research topic, and the latter to generalizability of the results obtained in terms of the analysed sample (Dumay et al., 2016). According to Massaro et al. (2016), internal validity can be improved via time-series analysis and clarity of data presentation, while external validity can be increased by using more sources of evidence and further clarifying the findings. Internal validity was achieved with the help of chronological analysis of the studies selected for the purposes of this literature review. According to Serenko and Dumay (2015), the timeframe of a structured literature review should depend on the characteristics of the field under investigation. As explained in chapter 3.3, the timeframe between 2019 and 2026 was selected to analyse the most recent evolution of virtual meeting research. Although videoconferencing technologies have existed for many years, this specific period was chosen since the COVID-19 pandemic made their usage and further academic studies more widespread. To assess the external validity of the selected literature, the quality and academic impact of the included articles were evaluated using citation-based measures, as presented in Table 4. In addition, the quality and scholarly influence of the journals in which the studies were published were assessed using established Scopus metrics, including CiteScore, SCImago Journal Rank (SJR), and Source Normalized Impact per Paper (SNIP).

3.9 Coding

Proper coding framework allows conducting systematic coding, classification, and analysis of the chosen literature in order to answer research questions. Coding can be performed either manually or with the support of specialized software (Massaro et al., 2016). Software tools are essential to the coding process, as they facilitate the systematic organization and analysis of data while increasing the efficiency and effectiveness of data analysis. The coding framework can be adjusted and changed without any need in updating data as research questions and objectives of the paper may change during the course of the study (Massaro et al., 2016). Due to the increasing availability of analytical software, NVivo was used as the tool for coding process. NVivo provides the possibility to manage the volume of the textual data including its import, organization, management, and analysis. Furthermore, it supports the creation of coding categories, the identification of themes, and the exploration of relationships among concepts within the selected literature. After creating coding framework, the coding process was conducted by uploading the selected articles into NVivo and analysing them according to the predefined dimensions. Relevant sections of the articles were assigned to specific categories to ensure a systematic and consistent classification of the literature. When coding process was

finished, the results of the coding were exported from NVivo to Microsoft Excel. The dataset that was exported included all coding assignments and classifications that were made during the review process. Microsoft Excel was used for further data analysis, including the application of pivot tables and other descriptive analytical techniques.

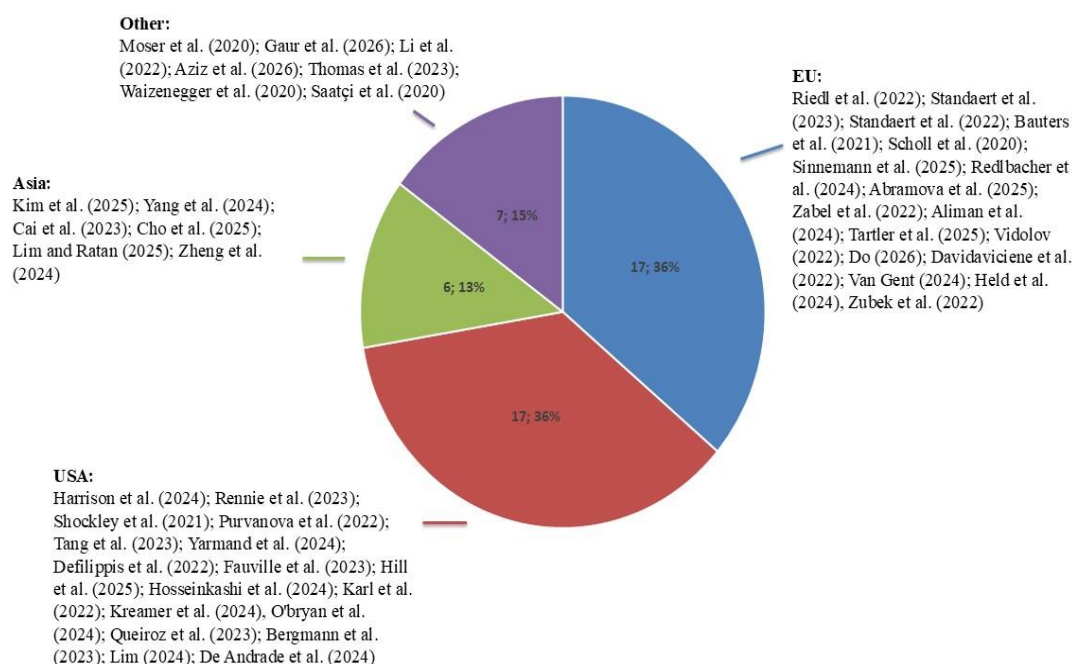
Findings related to Research Questions are provided in the following section.

4. Results

4.1 Region of Research

Following the established methodology, the geographic distribution of the selected studies was analysed to obtain more comprehensive information about the research topic. Analysis of the research done in various countries may assist in gaining knowledge about the phenomenon because cultural, social, and institutional context may impact the results of the research. The geographic region of the chosen study was identified through the institution where the first author of the study works. The identified regions were then coded and classified according to the predefined regional categories in NVivo. The region codes were divided into four main regional categories: *The EU* category includes studies that were conducted in Germany, Austria, Belgium, Poland, Italy, Ireland, Lithuania, and the Netherlands. *The Asia* category includes studies conducted in China and South Korea. All the other countries with only a few studies were included in the category *Other*, such as Switzerland, the United Kingdom, India, Pakistan, Australia, New Zealand, and Singapore.

Table 7. Geographic Distribution



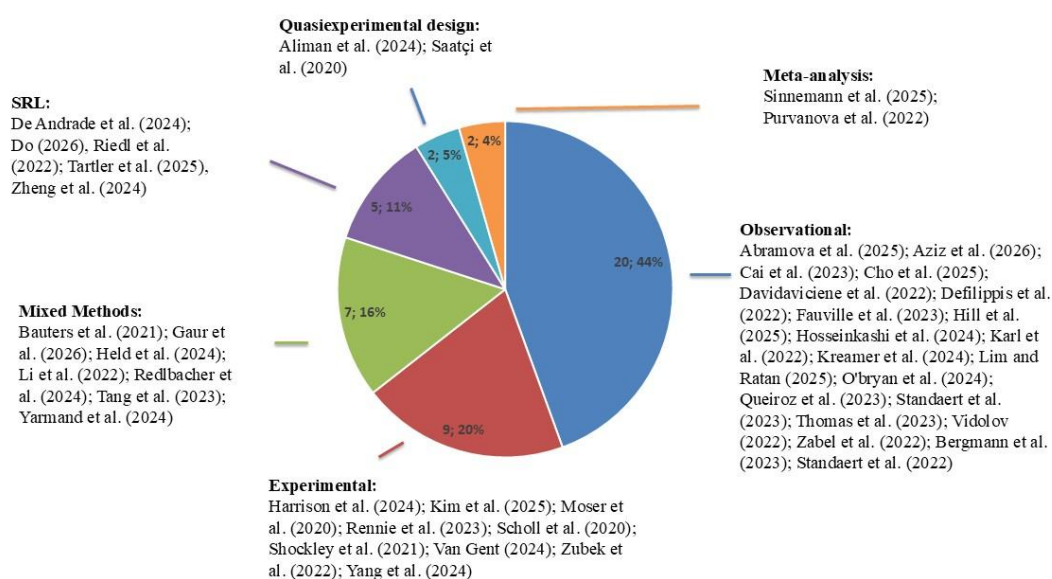
Source: own work

The geographic distribution of the studies shows that research on virtual meetings is mostly conducted in the regions of the European Union and the United States. The two regions included 17 studies (36.2%) and together comprised 72.3% of all the studies. Asia included 6 studies (12.8%), and 7 studies (14.9%) were conducted in other regions. It may be seen that there is unequal geographic distribution of the literature in question because research activities are predominantly conducted in the Western countries. At the same time, fewer studies in Asia and other regions give an opportunity for further investigation in the future.

4.2 Study Design

Categorization of the studies by methodology used and participants allows drawing meaningful conclusions regarding the benefits and limitations of the existing literature. With analysis of methodology and participant characteristics in different studies, it is possible to determine the level of findings' generalizability. It was found that observational studies constitute the largest group of studies, accounting for 20 studies (42.6%) among all. This distribution pattern suggests that the majority of the research done in the sphere of virtual meetings focuses on describing the natural phenomenon that takes place in organizational setting. The second type of studies is the experimental ones and constitutes 9 studies (19.1%). The emphasis is put on determining the causal relationship between variables and effectiveness of virtual meetings. Mixed-methods studies account for 7 studies (14.9%) and prove the importance of combining both quantitative and qualitative data to obtain comprehensive information about virtual meetings. The structured literature reviews represent 5 studies (10.6%) and indicate that there is an increasing effort to synthesize the accumulated knowledge base. There are only two qualitative studies (4.3%) and same number of meta-analyses and quasi-experiments (4.3%) among all studies analysed.

Table 8. Studies by Methodology used



Source: own work

As the research is focused on organizational teams, the requirement of existence of the organizational context is set as one of the criteria for inclusion into the final literature sample. The participants' characteristics were evaluated for the selected studies. The analysis showed that employees and professionals constituted the most frequently studied participant group, accounting for 25 studies (53.2%) of the total sample. Students represent the second largest group and there are 8 such studies (17.0%). It might be explained by the appropriateness of students for experimental studies. There are 6 studies (12.8%) where the characteristics of participants are not indicated and, the generalizability of the findings cannot be estimated. There are 5 studies (10.6%) of structured literature reviews which do not have primary participants at all. And there are 3 studies (6.4%) where the participants are the mixed group consisting of students and professionals. These kinds of studies allow comparing the perspectives of different populations and might contribute to wider understanding of virtual meetings. One of the main sources of heterogeneity in the literature is the discrepancy between the results obtained through laboratory experiments and those gained in organizational field studies. The results obtained using the student and laboratory samples should be considered cautiously in terms of their generalizability. Purvanova and Kenda (2022) demonstrated that findings obtained in non-organizational settings, particularly those based on undergraduate student samples, short-term teams, and laboratory-based experiments, may not accurately reflect the dynamics and outcomes observed in organizational virtual teams. This statement is applicable to several studies included in the present review, particularly, experimental studies comparing different meeting modalities (van Gent et al., 2024; Moser et al., 2020; Yang et al., 2024) and studying the effect of communication and hierarchy in virtual collaboration (Kim et al., 2025). As the results of these studies were obtained using the student samples or in controlled laboratory environment, they should be analysed considering the methodological limitations of these studies. At the same time, the studies conducted in the real organizational setting are more useful in terms of identification of factors affecting the efficiency of virtual meetings. Some examples include the studies on board monitoring effectiveness (Cai et al., 2023), process innovation in organizations (Redlbacher et al., 2024), videoconferencing fatigue in enterprise environments (Bergmann et al., 2023), audit committee auditor communication (Cho et al., 2025), virtual meeting participation and communication patterns (Kreamer et al., 2024), and inclusiveness and effectiveness of remote and hybrid meetings (Yarmand et al., 2024). As these studies examined actual workplace contexts and involved professional participants, their findings are more directly applicable to organizational teams and therefore provide a stronger basis for understanding the practical implications of virtual meetings.

4.3 Theoretical Framework

Theoretical frameworks adopted within the analysed studies provide complementary viewpoints that help better understand the complexity of virtual meetings. Communication and media theories prevail among those frameworks, where Media Naturalness Theory, Media Richness Theory, and Social Presence Theory are the most common approaches used (Riedl, 2022; Aziz et al., 2026; Tartler et al., 2025; Queiroz et al., 2023; Thomas et al., 2023). These theories provide insights into the effects that technological features of communication media have on efforts, communication quality, social presence, trust, collaboration, and the

effectiveness of meetings when compared to the traditional in-person interaction. For example, Riedl (2021) defines Zoom fatigue from the viewpoint of Media Naturalness Theory, Li et al. (2022) and Queiroz et al. (2023) apply Media Richness Theory to define the effects on communication quality and well-being, while Van Gent et al. (2024) and Thomas et al. (2023) rely on Social Presence Theory in their analyses of virtual co-presence and engagement. All these theories assume that face-to-face communication is the standard against which virtual communication is measured.

Theories adopted from social and organizational psychology such as Self-Presentation Theory, Status Characteristics Theory, Social Identity Theory, Psychological Safety, and Conservation of Resources Theory provide additional insights into interpersonal processes involved in virtual interactions, such as participation, hierarchy, identity, resources management, and well-being. In this respect, Shockley et al. (2021) explain camera related fatigue by means of self-presentation processes, Kim et al. (2025) and Kreamer et al. (2024) explore status dynamics and participation inequalities, Gaur et al. (2026) emphasize the significance of psychological safety and emotional contagion, and Standaert et al. (2023) and Zheng et al. (2024) apply Conservation of Resources Theory to describe simultaneous resource losses and gains in virtual settings.

Leadership theories such as Transformational Leadership Theory, E-Leadership Theory, and Emotional Contagion Theory help to analyse leadership behaviours, emotional influence, and leadership emergence in a digitally mediated setting, as illustrated by Gaur et al. (2026), Davidaviciene et al. (2022), and Rennie et al. (2023). Also, Affordance Theory used by Waizenegger et al. (2020), Redlbacher et al. (2024), and Vidolov (2022) explains how digital technologies create new affordances for collaboration and interaction.

Apart from this, frameworks developed specifically for meeting analysis such as Meeting Science and Meeting Design, applied by Karl et al. (2022), Hosseinkashi (2024), Tartler et al. (2025), and Standaert et al. (2022) pay special attention to the fact that meeting effectiveness is influenced not only by the communication technology but also by the meeting purposes, participants' characteristics, organizational context, and design choices. Additional contribution from Bergmann et al. (2023), Moser et al. (2020), Saatçi et al. (2020), Zubek et al. (2022), and Cho et al. (2025) highlight increasing interest in interdisciplinary approaches to explain complex phenomena of virtual meetings. In general, the choice of the theoretical framework has an important impact on the explanation of virtual meetings. Table 9. summarizes the frameworks adopted within the reviewed studies and illustrates the key theories that explain virtual meetings.

Table 9. Theoretical Framework

Theoretical Framework	Theories	Representative Studies
Communication and Media Theories	Media Naturalness Theory	Aziz et al. (2026); Cho et al. (2025); Karl et al. (2022); Purvanova et al. (2022); Riedl et al. (2022); Standaert et al. (2023); Tartler et al. (2025); Zheng et al. (2024)
	Media Richness Theory	Aliman et al. (2024); Aziz et al. (2026); Fauville et al. (2023); Karl et al. (2022); Li et al. (2022); Queiroz et al. (2023); Shockley et al. (2021); Tartler et al. (2025); Zabel et al. (2022); Zheng et al. (2024)
	Social Presence Theory	Aliman et al. (2024); Aziz et al. (2026); Cho et al. (2025); Harrison et al. (2024); Karl et al. (2022); Scholl et al. (2020); Standaert et al. (2023); Tartler et al. (2025); Thomas et al. (2023); Van Gent (2024)
	Hyperpersonal Model	Fauville et al. (2023); Queiroz et al. (2023); Scholl et al. (2020)
	Nonverbal Overload Theory	Fauville et al. (2023); Held et al. (2024)
	Media Synchronicity Theory	Thomas et al. (2023); De Andrade et al. (2024) (continued)
Affordance and Technology Adoption Theories	Digital Communication Theory	Defilippis et al. (2022)
	Affordance Theory	Redlbacher et al. (2024); Waizenegger et al. (2020); Vidolov (2022) (continued)
	Human-Computer Interaction (HCI)	Bauters et al. (2021); Saatçi et al. (2020); Tang et al. (2023); Yang et al. (2024)
	Team Effectiveness Models	Purvanova et al. (2022); Sinnemann et al. (2025)
	Sociotechnical Systems Theory/ Dynamical System Theory	Yarmand et al. (2024); Zubeck et al. (2022)

(continued)

Table 9. Theoretical Framework

Social and Organizational Theories	Self-Awareness Theory	Abramova et al. (2025)
	Social Network Theory	O'bryan et al. (2024)
	Status Characteristics / Expectation States Theory	Shockley et al. (2021); Kim et al. (2025); Do (2026)
	Social Identity Theory	Harrison et al. (2024); Zheng et al. (2024); Do (2026)
	Conservation of Resources Theory	Standaert et al. (2023); Zheng et al. (2024); Lim (2024)
	Social Role Theory	Cai et al. (2023); Hill et al. (2025)
	Cognitive Load Theory	Moser et al. (2020)
	Social Psychological Framework	Lim and Ratan (2025)
Meeting Science	Meeting Science	Hosseinkashi et al. (2024); Standaert et al. (2022); Lim (2024); Kreamer et al. (2024); Karl et al. (2022); De Andrade et al. (2024)
	Psychological Safety	Lim (2024); Kreamer et al. (2024); Gaur et al. (2026)
	Cognitive Load Theory	Moser et al. (2020)
	Dialectical Approach	Bergmann et al. (2023)
Leadership	Transformational Leadership	Davidaviciene et al. (2022); Gaur et al. (2026)
	Leadership Emergence	Rennie et al. (2023)

Source: own work

The reviewed studies demonstrate a move toward more complex, multi-theory models. The most theoretically ambitious studies combined communication theories with psychological frameworks to address both the technological mediation and human experience dimensions simultaneously.

4.4 Dominant Themes

The body of literature on virtual meetings can be classified in several predominant themes, presented in Table 10. below. The first one that is discussed extensively is the theme of meeting effectiveness and many papers discuss what makes the success of meeting (Defilippis et al., 2022; Karl et al., 2022; Hosseinkashi et al., 2024; Tang et al., 2023; Kim et al., 2025). The second important theme is participant satisfaction, productivity and enjoyment and researchers try to understand the effects of virtual meetings on users' experience, involvement and

productivity (O'Bryan et al., 2024; Bauters et al., 2021; Harrison et al., 2024). Another theme that has been researched extensively by many authors is teamwork and leadership when they analyse collaboration, coordination, trust, psychological safety and communication in virtual settings (Kreamer et al., 2024; Zheng et al., 2024; Gaur et al., 2026; Rennie et al., 2023). Other popular themes include decision making where the effect of virtual environment on group decisions and decision quality is assessed (Cai et al., 2023; Cho et al., 2025) and the phenomenon of virtual meeting fatigue that has become increasingly popular due to wide use of remote work (Bergmann et al., 2023; Fauville et al., 2023; Riedl et al., 2022). More recently there have been some new trends in virtual meetings such as the effect of virtual reality (Held et al., 2024; Aliman et al., 2024; Moser et al., 2020) and the issue of gender differences in meetings (Hill et al., 2025; Yang et al., 2024).

Table 10. Research Themes

Research Focus	Representative Studies
Meeting Effectiveness	Defilippis et al. (2022); Yarmand et al. (2024); Karl et al. (2022); Saatçi et al. (2020); Hosseinkashi et al. (2024); Standaert et al. (2022); Tang et al. (2023); Tartler et al. (2025); Zabel et al. (2022); De Andrade et al. (2024); Kim et al. (2025) Kreamer et al. (2024)
Satisfaction, Productivity and Enjoyment	O'bryan et al. (2024); Bauters et al. (2021); Harrison et al. (2024); Lim and Ratan (2025); Thomas et al. (2023); Van Gent (2024); Abramova et al. (2025); Li et al. (2022); Standaert et al. (2023); Vidolov (2022)
Teamwork	Kreamer et al. (2024); Zheng et al. (2024); Do (2026); Waizenegger et al. (2020); Purvanova et al. (2022); Zubek et al. (2022); Sinnemann et al. (2025)
Leadership	Gaur et al. (2026); Rennie et al. (2023); Aziz et al. (2026); Scholl et al. (2020)
Decision Making	Cai et al. (2023); Cho et al. (2025); Davidaviciene et al. (2022); Redlbacher et al. (2024); Shockley et al. (2021)
Fatigue	Bergmann et al. (2023); Fauville et al. (2023); Lim (2024); Queiroz et al. (2023); Riedl et al. (2022)
Virtual Reality	Held et al. (2024); Aliman et al. (2024); Moser et al. (2020); van Gent (2024)
Gender	Hill et al. (2025); Yang et al. (2024); Lim and Ratan (2025)

Source: own work

4.5 Research Focus and Contextual Factors

4.5.1 Team Effectiveness and Performance

Among the factors, that shape meeting effectiveness, psychological safety emerges as the most consistent team level enabler of effective meetings (Gaur et al., 2026; Kreamer et al., 2024), while vocal engagement and active communication behaviours prove to be the strongest behavioural predictors of effective meetings (Hosseinkashi et al., 2024; O'Bryan et al., 2024).

Also, characteristics of meeting designs, such as numbers of participants, duration of the meeting, and breaks during the meeting are key structural factors, which are likely to influence the efficiency of virtual meetings and their outcomes (Hosseinkashi et al., 2024; Fauville et al., 2023; Queiroz et al., 2023). Besides the above-mentioned structural factors, the type of task appears to be one of the significant determinants of the efficiency of virtual meetings. According to current literature, there is a certain correlation between types of activities, which are done through virtual meetings and their success. In particular, Redlbacher et al. (2024) found that virtual meetings are highly efficient in terms of the process of innovation and idea generation, particularly for tasks that involve creative thinking. Similar results were obtained by Sinnemann and Weiss (2025), who demonstrated that virtuality contributes to innovation in teams when proper structures and communication processes are established in the group. On the other hand, Kim et al. (2025) note that such tasks as consensus building, coordination, and social negotiation are more challenging in virtual communication settings. These types of activities require high levels of interaction, mutual understanding, and coordination, which are difficult to achieve in technology-mediated communication channels. Virtual meetings are particularly effective in information exchange, idea generation, and brainstorming but rather inefficient for those tasks, which require intense personal interaction, coordination, negotiation, and decision-making.

Another recurrent pattern in the literature is the differentiation between the outcomes oriented towards the completion of a task and those aimed at developing relationships among team members. Aziz et al. (2026) demonstrate that communication in virtual teams promotes leadership effectiveness and intellectual capital development. In the same vein, Cai et al. (2023) prove that virtual board meetings can foster monitoring effectiveness and participation in governance. However, there are several works addressing difficulties with social connections and relationship building. For example, Lim (2024) argues that virtual meetings typically limit the possibilities for informal interaction while Bergmann et al. (2023) point out that videoconferencing environment undermines connection and causes isolation. This finding confirms the principles of Media Naturalness Theory according to which computer-mediated communication requires more cognitive effort and provides fewer social cues than face-to-face communication (Riedl, 2022).

Several studies also identify meeting design as an essential condition for virtual meeting effectiveness. Hosseinkashi et al. (2024), Yarmand et al. (2024), and Standaert et al. (2022) note that smaller meeting sizes, shorter duration, and formalization of the meeting are usually associated with positive outcomes. The examples of effective practices include clear agenda, active moderation, scheduling of breaks and turn-taking. Moreover, Tartler et al. (2025) emphasize that deliberate meeting design can help to overcome some limitations of virtual communication technologies. In contrast, excessive meeting frequency, lengthy duration, and large group sizes have a negative effect on engagement and cause fatigue and reduce well-being (Karl et al., 2022; Standaert et al., 2023). Zheng et al. (2024) conduct a thorough theoretical analysis of team virtuality and propose a framework suggesting that its influence on team performance is affected by many interplaying mechanisms. Specifically, team virtuality can increase performance through enhancing resource and information availability, increasing

motivation and capability. At the same time, virtuality can hinder team performance due to various cognitive, affective, and relational barriers and limitations of communication technologies and media. As Zheng et al. (2024) state, the effect of team virtuality depends on many boundary conditions such as demographic characteristics of team members, their leadership style and type of performed tasks. Table 11. presents the factors influencing virtual meeting effectiveness found in the analysed literature and corresponding research.

Table 11. Factors influencing Effectiveness

Factors/Effectiveness	Representative Studies
Work Arrangements Technology	Redlbacher et al. (2024); Riedl et al. (2022); Karl et al. (2022); Tang et al. (2023); Bauters et al. (2021); Thomas et al. (2023); Aliman et al. (2024); Moser et al. (2020); Bergmann et al. (2023); Vidolov (2022); Waizenegger et al. (2020); Held et al. (2024), Standaert et al. (2022); Zheng et al. (2024); Sinnemann et al. (2025)
Work Arrangements Meeting Format	Saatçi et al. (2020); Yarmand et al. (2024); Van Gent (2024); Sinnemann et al. (2025); Defilippis et al. (2022); De Andrade et al. (2024); Queiroz et al. (2023); Tartler et al. (2025); Li et al. (2022); Standaert et al. (2023); Fauville et al. (2023)
Work Arrangements Camera	Hosseinkashi et al. (2024); Zabel et al. (2022); Abramova et al. (2025); Gaur et al. (2026); Shockley et al. (2021); Karl et al. (2022)
Leadership Expressivity	Gaur et al. (2026); Davidaviciene et al. (2022); Rennie et al. (2023), Aziz et al. (2026)
Leadership Sociality	Do (2026)
Power Dynamics	Scholl et al. (2020); Harrison et al. (2024)
Nonverbal Dynamics	Zubek et al. (2022); Fauville et al. (2023)
Team Composition Status/Tenure	Cai et al. (2023); Kim et al. (2025); Standaert et al. (2023); Kreamer et al. (2024)
Team Composition Gender	Lim and Ratan (2025); Shockley et al. (2021); Standaert et al. (2023); Fauville et al. (2023); Hill et al. (2025); Kreamer et al. (2024); Yang et al. (2024)
Cultural Context	Cho et al. (2025); Lim (2024); Purvanova et al. (2022); Lim and Ratan (2025); Davidaviciene et al. (2022); Sinnemann et al. (2025); Gaur et al. (2026)
Communication Patterns	Yang et al. (2024); O'bryan et al. (2024); Hill et al. (2025); Hosseinkashi et al. (2024); Yarmand et al. (2024); Defilippis et al. (2022)

Source: own work

4.5.2 Videoconference Fatigue and Well-Being

A particular context that needs to be considered is the COVID-19 pandemic and the subsequent switch to remote working as an experience shaping factor for virtual meetings. Several studies suggest that many observed effects of videoconferencing cannot be separated from the extraordinary circumstances under which remote work was implemented. One of the most researched phenomena is virtual meeting fatigue, also referred to as "Zoom fatigue". Riedl et al. (2022), based on Media Naturalness Theory, mention several reasons for fatigue, such as asynchronous communication, lack of body language information, lack of eye contact, and increased demands on multitasking. According to the authors, these characteristics of computer-mediated communication raise uncertainty and cognitive loads that foster fatigue and decrease the quality of communication. Fauville et al. (2023), relying on Bailenson's theory of nonverbal overload, conducted a large-scale study with 9,787 participants. It provided evidence that mirror anxiety associated with self-view, hyper-gaze resulting from viewing many faces on the screen, physical constraint, and constant necessity to process nonverbal signals are the independent reasons for Zoom fatigue that persist despite the frequency and duration of the meetings. Bergmann et al. (2023) state that the reason for videoconferencing fatigue is the fact that the technologies of communication and work were designed for stable operation conditions and not for prolonged mandatory remote working.

The camera use is another important reason for virtual meeting fatigue. Shockley et al. (2021) conducted a field experiment involving 103 participants and 1,408 daily observations and found that camera-on condition substantially increased daily fatigue and led to lower level of voice and engagement during the meetings. Furthermore, women and less experienced employees reported higher fatigue associated with camera use, meaning that the requirements of self-presentation have differential impact on them. Abramova et al. (2025) state that looking at oneself while listening decreases satisfaction, perceived productivity and enjoyment from the meeting because of increasing self-awareness and self-monitoring. However, self-view while speaking is positively associated with higher satisfaction and enjoyment, suggesting that self-monitoring promotes better communication when people actively participate in it.

Gender differences are another topic related to the issue of virtual meeting fatigue. Fauville et al. (2023) mentioned that women reported higher Zoom fatigue than men as a result of greater exposure to the mechanisms of nonverbal overload. Also, Lim and Ratan (2025) stated that women in the United States reported higher levels of Zoom fatigue and facial dissatisfaction compared to men. However, they did not find gender differences in the group of South Koreans, meaning that the cultural factors could mediate the experience of fatigue. Their findings further indicated that facial dissatisfaction reduced meeting engagement indirectly through Zoom fatigue in the United States, whereas in South Korea facial dissatisfaction negatively affected engagement regardless of fatigue levels.

The impacts of virtual meeting fatigue go beyond the meeting performance and engagement. Li et al. (2022) stated that videoconference fatigue, especially its emotional and occupational

aspects, had a strong association with work-family conflict in the sample of Singaporean employees. Standaert et al. (2023) reported that the frequency of participation in virtual meetings correlated with higher workload, stress and fatigue in Belgian university employees. At the same time, virtual meetings were positively correlated with perceived work influence, meaning that virtual collaboration can bring positive and negative results. Altogether, the findings suggest that fatigue is an important mediator in the impacts of virtual meetings on employees' well-being, engagement and collaboration effectiveness.

4.5.3 Meeting Design and Technology Alternatives

Previous research shows that the choice of the communication technology used during the meetings, as well as the format of meetings itself, considerably influences their effectiveness and outcomes for team cooperation. In a meta-analysis of 167 effect sizes, Sinnemann and Weiss (2025) showed no significant correlation between team virtuality and innovation. However, the correlation was considerably moderated by task design and choice of the communication technology, as discussed in the previous chapter. Furthermore, the use of video communication technology positively influenced innovation, while the use of audio-based communication technologies was less efficient. These findings suggest that not only the design of tasks but also the richness of the communication medium affects the degree to which virtual collaboration improves team effectiveness.

Comparative studies of meeting formats give similar results. Yarmand et al. (2024) found that fully remote meetings were seen as more inclusive and effective than hybrid meetings in a large tech company. Similarly, Saatçi et al. (2020) noticed that hybrid meetings often create asymmetry between co-located and remote participants, which leads to unequal access and, sometimes, even exclusion because of technological issues and dynamics of conversation. As the authors pointed out, facilitation and meeting-oriented design are crucial for overcoming the challenges. This idea is supported by Yarmand et al. (2024), who found that meeting moderator becomes a vital determinant of hybrid meeting success. In a review of the virtual meeting design, Tartler et al. (2025) stressed the role of both technological and procedural aspects of meeting design, such as agenda setting, facilitation, and interaction process structuring.

The development of virtual reality (VR) technologies allowed using an alternative way of organizing virtual meetings. Comparing immersive virtual reality (IVR), videoconferencing, and face-to-face group decision making, Moser et al. (2020) found no significant difference in discussion quality and decision accuracy across all conditions. However, participants reported lower levels of social presence in IVR condition than in face-to-face interaction. Similarly, Aliman et al. (2024) found that VR meetings held with the use of Meta Horizon Workrooms software were associated with better business agility, social presence, and enjoyment but not with differences in engagement levels. Van Gent et al. (2024) found that VR meetings were perceived as more enjoyable than videoconferencing and face-to-face meetings despite the absence of differences in social presence, well-being, and task engagement levels. It can be

concluded that VR provides a viable alternative to videoconferencing, although at the moment there is no evidence of its superiority in terms of teamwork outcomes.

Several authors have proposed decision-support frameworks to guide organizations in selecting appropriate meeting formats. In particular, Standaert et al. (2022) offered a framework that allows matching meeting objectives with communication needs, such as information exchange, decision-making, relationship-building, and emotional communication. The results of their work show that size and duration of meeting become crucial criteria for choosing virtual meeting format. In larger groups and during longer meetings virtual formats are less effective, while virtual meetings seem to be especially suitable for shorter and more focused interactions. In the study involving approximately 15,000 meeting evaluations, Hosseinkashi et al. (2024) found that meeting effectiveness and inclusiveness drop by one percent point for every two added participants. The authors noted that video usage in small meetings increases the rate of participation, while the use of headsets improves participants' involvement. Additionally, more frequent shorter meetings, especially those shorter than 30 minutes, are seen as more effective than longer sessions. These findings collectively emphasize that selection of meeting technologies and formats becomes even more crucial with taking into account the context of task requirements, meeting size, duration, and participants' needs. Thomas et al. (2023) identified media synchronicity, social presence, and the ubiquity of videoconferencing technologies as key determinants of professionals continued use of virtual communication platforms. Their findings indicate that employees are adopting more easily and sustain the use of videoconferencing applications when these technologies effectively support real-time communication, foster a sense of social presence, and are seamlessly integrated into everyday work processes.

4.5.4 Communication Dynamics and Participation

Another theme that emerges from the reviewed literature is the impact of virtual meetings on the process of communication, which influences the quantity and quality of communication among team members. Examining the organizational communication patterns in the period of transition to remote work, Defilippis et al. (2022) identified the significant growth of meeting frequency and number of participants with a simultaneous decrease of the average duration of the meeting. The authors argued that the organizations compensate for the loss of richness of the digital communication by using more frequent and shorter communications to maintain coordination and exchange of information. Communication behaviours within virtual meetings also appear to be closely associated with perceptions of team effectiveness. O'Bryan et al. (2024) found that there is a positive association between the objective indicators of communication, such as time spent speaking, frequency of speaking turns and degree centrality in the communication networks and peer-rated team member effectiveness in virtual project teams. Also, the time spent on one-on-one interactions and interpersonal exchange were positively related to relationship level effectiveness that indicated that active participation is one of the key factors of virtual communication effectiveness.

Despite these benefits, virtual meetings also impose significant constraints on the richness of communication. Lim (2024) found that the remote workers lost the opportunity to engage in spontaneous interactions, access non-verbal information and had more distractions, which decreased the level of engagement. Moreover, the effects of virtual meetings on workplace learning, interpersonal relationships and productivity were mixed, which means that the effect of virtual meetings depends on the organizational context and individual experience. Zubek et al. (2022) found that the patterns of movement coordination differ significantly between video-mediated and face-to-face communication. The communicative gestures tend to become exaggerated in virtual meetings, and the stability of interpersonal coordination was much less than during face-to-face meetings. It was suggested that the change in communicative behaviours may cause the increased cognitive load and fatigue experienced during virtual meetings.

The introduction of the chat communication as another way of participation is one of the main characteristics of virtual meetings. Kreamer et al. (2024) found systematic differences in the use of chat and verbal communication based on demographic and organizational factors. They found out that women tend to participate in virtual meetings more often using the chat than men and men participate more often in verbal discussion. Furthermore, the most intensive use of the chat communication was made by the women working on high organizational levels, while men on senior positions dominated in the verbal discussion. The study also found that the psychological safety of employees had an influence on participation patterns, as the employees on lower organizational levels participated more in chat when feeling psychologically safe. Such results mean that the chat communication could be another way of expressing employees' voices, but depending on the organizational context this could either reduce or reinforce the existing inequalities. The effectiveness of webcam use as a communication tool appears to be strongly influenced by social norms. Zabel et al. (2022) found that people are much more likely to switch on webcams when a large proportion of the meeting participants used it. They claimed that webcams help to increase the perception of authenticity, trust, engagement and social presence during virtual communication. On the other hand, it should be considered that the increased cognitive load and fatigue are the result of using the webcam according to the videoconferencing fatigue literature.

4.5.5 Inclusion, Equity, and Social Dynamics

The literature highlights the importance of social integration and group dynamics. According to Harrison et al. (2024), people already feeling disconnected to their groups had a higher chance of marginalization due to the change to the technologically mediated forms of communication. However, at the same time, the authors argue that the improvement of social integration tactics along with communication technologies can promote engagement and effectiveness. Higher levels of social presence did not bring equal benefits as they could negatively influence people with more resistant or withdrawn types of interactions. There are several studies that focus on the experiences of the employees in virtual meetings and remote work environment. For example, according to Karl et al. (2022), there are both positive and negative opinions about videoconferencing regarding camera and microphone usage, meeting

practices and difficulties associated with working from home. One of the main concerns was the discrepancy between those people who felt camera usage helpful for communication and those people who preferred to keep camera off due to fatigue and privacy issues. In addition, according to Waizenegger et al. (2020), remote work offered both opportunities and challenges. Even though the deliberate virtual interactions promoted social connection and communication, remote work caused role conflict and virtual meeting fatigue. Furthermore, the authors claim that organizations were unprepared to the sudden change to the remote work environment which led to the wide range of differences in employees' experience and results.

From the reviewed literature it becomes obvious that virtual meetings are characterized by the complex and quite challenging relationship with social connections, trust and team cohesion. Several studies emphasize the tension between task efficiency and social integration in virtual work environments. Queiroz et al. (2023) revealed that people consistently feel less socially skilled during videoconferences than during face-to-face meetings. Additionally, videoconference fatigue mediates the effect of meeting characteristics on social connection. More precisely, more frequent and longer meetings cause lower perceived social bonding, while shorter meetings conducted in small groups create better feelings of connection in people. Such findings show the crucial role of meeting structure in maintaining social relationships in the virtual work environment. Aziz et al. (2026) studied employees in the context of telecommunication teams and found that even though the supervisors manage to preserve the leadership effectiveness during virtual communication, they have more problems creating the trust in the team members. It means that even though the virtual communication is sufficient to the execution of task-related leadership roles, it does not promote necessary relational aspects of teamwork. According to Bergmann et al. (2023), the employees of a global technology company felt that videoconferencing technologies are highly efficient for the task coordination, but not enough for the social aspect of working relationships. In addition, the authors claimed that many workplace technologies are focused only on the efficiency and productivity of employees without taking into account their social and relational needs. Team identification is the important aspect for the global and virtual teams. In the structured literature review Do (2026) identified the leadership behaviours, trust and open communication as the major determinants of team identification. The authors argued that temporary nature and multicultural composition of many virtual teams prevent the emergence of the common identity and identification. At the same time, the strong social identification in the team results in positive outcomes including high level of knowledge sharing and better collaboration. Extended reality (XR) technologies may provide some solution for these challenges. In fact, according to Held et al. (2024), the participants of the workplace meetings based on the extended reality technologies experienced better interaction quality, stronger feeling of togetherness and more natural conversation flow in comparison with the traditional videoconferencing environment. Spatial audio and avatar representation were seen as the factors that help with natural turn-taking and richer non-verbal communication. Nevertheless, some limitations, associated with the lack of avatar realism, maturity of technologies and usability, still exist.

4.6 Contextual Factors

4.6.1 Organizational Culture and Hierarchy

The correlation between videoconferencing and organizational hierarchy depends on the team configuration and leadership style. For example, Kim et al. (2025) found in their study of virtual and face-to-face teams that more differences in power distribution within teams resulted in lower team performance, as differences in influence were more evident during virtual interactions. According to the authors, this negative result could be linked to the lack of status indicators in physical space. In contrast, Rennie et al. (2023) reported that virtual environments can promote more flexible group structures, where communication behaviours such as speech quantity and facial expressiveness play a greater role in leadership development than formally assigned positions. These contrasting findings should be interpreted from the context perspective. Kim et al. (2025) examined teams that had predetermined hierarchy and specific tasks, thus, virtual communication reinforced existing relationships and hierarchy. At the same time, Rennie et al. (2023) analysed new groups, which did not have any existing status hierarchy, thus, leadership developed as a result of communication patterns. In another study, Scholl et al. (2020) showed, via two experimental studies, that individuals who held positions of power felt less responsible for their subordinates in case of anticipated digital interaction compared to in person interaction. This effect could be explained by lower levels of social proximity experienced in digital communication. This research supports media naturalness theory, according to which technologies of communication, which lack features of face-to-face interaction, could have a detrimental effect on social and relational connections.

In terms of corporate governance, Cai et al. (2023) found that remote board meetings in Chinese firms were connected with higher attendance rate, increased readiness to share oppositional opinions, and better investment decision making. As the authors argue, such effects could be explained by the presence of fewer conformity pressures in virtual environment, where board members could freely express their own opinion. This result is especially important in light of high value of interpersonal harmony in Confucian culture. Therefore, under certain conditions, videoconferencing could help to alleviate the social pressure in hierarchical and collectivist environment, which helps to provide an objective and independent evaluation during the decision-making process. Similarly, Redlbacher et al. (2024) show that employees of a highly bureaucratic public sector organization in Germany found virtual meetings more efficient compared to face-to-face ones. According to the authors, this could be explained by the presence of the structured communication, defined by strict sequence of speaking and lower level of crosstalk. Such communication constraints were described as "enabling limits," which promoted cooperation, as well as creativity and innovation.

The broader literature further emphasizes the role of organizational culture, leadership, and communication norms in forming outcomes of virtual collaboration. For example, transformational leadership and cultural intelligence could positively affect decision-making processes in virtual teams (Davidaviciene and Majzoub, 2022), whereas communication

practices and psychological safety influence team performance and leadership in remote environment (Gaur and Vallabh, 2026; Aziz et al., 2026). Furthermore, the research in virtual team dynamics shows that cultural diversity, team virtuality, and communication technologies significantly affect team effectiveness, innovation, and team members' identity (Purvanova and Kenda, 2022; Sinnemann et al., 2025; Do, 2026). Therefore, it could be stated that organizational culture plays a vital role in determining the way people experience videoconferencing and collaborate remotely.

4.6.2 Cultural Context

The second contextual element is national and societal culture, which became an important determinant of the success of virtual meetings and videoconferencing. As the literature review demonstrates, cultural values shape people's perception on communication technology. For example, Gaur and Vallabh (2026) found that in the context of India, which is a society with relatively high-power distance values, leader emotional expressiveness while using videoconferencing increases motivation of subordinates to express emotions, which improves psychological safety and teamwork. Additionally, the authors have proved that emotional intelligence and the usage of camera improved these positive effects. These findings suggest that leadership behaviours become essential to establish trust and increase participation rates in societies with clear hierarchy. On the contrary, Cho et al. (2025) have found that the usage of videoconferencing in Korean listed firms had negative impact on audit quality, indicating that virtual communication technology is less effective. While regular meetings helped to decrease the negative impact, traditional governance mechanisms such as audit committee independence and expertise could not help to overcome the limitations of the media. Therefore, videoconferencing may become an effective way of communication depending on the complexity of communication process and the cultural context.

Lim and Ratan (2025) provide additional examples of cultural moderation in their study on the experience of virtual meetings in the United States and South Korea. Their findings showed that facial dissatisfaction led to lower engagement in both countries through different means. In the case of American participants, Zoom fatigue played a mediating role in this process, whereas in South Korean sample group, facial dissatisfaction decreased engagement without taking fatigue into account. The difference between two samples may be explained by a highly competitive social environment and strict societal norms regarding personal appearance in South Korea. Another evidence of cultural relevance provided by Davidaviciene and Majzoub (2022) is the positive effect of cultural intelligence on decision making processes in virtual teams in the information technology sector of the United Arab Emirates. According to the authors, individuals with higher levels of cultural intelligence are better equipped to navigate the challenges associated with virtual collaboration in culturally diverse environments.

5. Research Gap and Limitations

A major limitation of the present state of the research evidence on virtual meetings relates to the absence of longitudinal, within-organization studies addressing the effects of meeting practices on teamwork over time. Most of the existing studies are based on cross-sectional surveys (Fauville et al., 2023; Hosseinkashi, 2024; Rennie et al., 2023; Do, 2026; Vidolov, 2022), one-time experiments (Kim et al., 2025; Moser et al., 2020; Yang et al., 2024; van Gent et al., 2024) or the research conducted in the special circumstances during the COVID-19 pandemic (Bergmann et al., 2023; Karl et al., 2022; Harrison et al., 2024). In addition, the one field experiment about the effect of camera usage lasted for only four weeks in just one healthcare organization (Shockley et al., 2021). It means that some key questions cannot be answered yet, namely whether teams can adapt to virtual meetings over time, whether the issues related to trust found in cross-sectional studies reduce in the course of long-term interactions (Aziz et al., 2026), and whether the benefits provided by new technologies like VR meetings persist after the initial excitement (Aliman et al., 2024; Held et al., 2024). This aspect is especially crucial when taking into consideration that according to Purvanova and Kenda (2022), the duration of the team was identified as a strong moderating factor in the relation between virtuality and team effectiveness. In the absence of longitudinal data, it is hard to say whether the interventions that improve virtual meetings provide sustainable results or only temporary effects.

Another limitation related to the narrowness of the contexts, samples of participants, and geographical regions covered by the literature. Experiments tend to use samples that consist mainly of undergraduate or graduate students recruited in laboratories or classrooms (Zubek et al., 2022; Kim et al., 2025; Hill and Hincapie, 2025; Moser et al., 2020; Rennie et al., 2023; O'Bryan et al., 2024; Yang et al., 2024; van Gent et al., 2024; Harrison et al., 2024), although there is evidence that results obtained from student populations might not be applicable to organizational teams (Purvanova and Kenda, 2022). In organizational studies, focus is predominantly on technology companies (Kreamer et al., 2024; Bergmann et al., 2023; Waizenegger et al., 2020), while other sectors like healthcare (Shockley et al., 2021), public administration and emergencies (Redlbacher et al., 2024; Aliman et al., 2024), and telecommunications (Aziz et al., 2026) are much less studied. Moreover, most participants are either knowledge workers, managers or students, but frontline employees or operation workers are often missing. It also limits the applicability of the findings concerning the inclusiveness in virtual meetings since people with disabilities and those with limited access to digital devices have not been involved (Hosseinkashi, 2024; Yarmand et al., 2024).

Thirdly, another limitation of the research is the absence of comparative studies and combined interventions evaluation. Even though there are some studies that compare virtual and face-to-face meetings (Cai et al., 2023; Kim et al., 2025; Moser et al., 2020; Cho et al., 2025; van Gent et al., 2024), there is a low number of studies that compare different virtual meetings practices, like various camera policies, meeting duration, size of groups or facilitation methods, in the same organizations. An example of a study that does compare hybrid meetings is Yarmand et al. (2024), but still, it is restricted to only one organization. Moreover, there is no research that

evaluates how many meetings or total hours in meetings could affect the quality of teamwork (Queiroz et al., 2023; Standaert, 2023). Research of new technologies, specifically of VR based meetings, is limited by small samples, short periods of observation and absence of realistic organizational comparisons (Aliman et al., 2024; Held et al., 2024; Yang et al., 2024). Finally, relatively little attention has been given to team level outcomes such as cohesion, shared mental models, and collective efficacy. Instead, most studies focus on individual perceptions (Abramova et al., 2025; Lim and Ratan, 2025) or individual experiences of fatigue (Shockley et al., 2021; Fauville et al., 2023).

6. Conclusion

This thesis examined the impact of virtual meeting on teamwork and meeting effectiveness in organizational context. The selected topic has become relevant due to the extensive use of virtual meetings in organizational practices after the transition to remote work caused by the emergence of the coronavirus infection in 2020. Through a structured literature review, 47 articles published from 2019 to 2026 in peer-reviewed journals were considered to answer the research questions. One of the main results of the literature analysis was identified in the contradictions between current studies. Although meta-analysis proves that virtuality does not affect negatively the overall effectiveness of teams in organizational contexts, the majority of studies point out challenges with respect to trust, participation, social connectedness, fatigue, and well-being. The results prove that it is wrong to say that virtual meetings are effective or ineffective because the outcomes of communication depend on the context and goals of the task.

One of the factors that determine the effectiveness of virtual meetings is the characteristics of the task performed. Virtual meetings are suitable for such tasks as sharing information, reporting the status of projects, and brainstorming due to the ability to structure the process of communication and provide turn taking, thus fostering participation and idea generation. On the other hand, tasks requiring consensus building, trust development, negotiation, and complex decision-making continue to benefit from face-to-face interaction, where richer social cues support collaboration and interpersonal understanding. In addition, organizational context has a considerable effect on the results of the research. In most cases, the results of the research conducted in organizational context prove to be more positive compared to those obtained through laboratory experiments or project teams. Established communication norms, familiarity among colleagues, role clarity, and psychologically safe work environments appear to reduce many of the challenges commonly associated with virtual communication. Throughout the reviewed literature, psychological safety is found to be one of the most powerful predictors of the successful collaboration in virtual context since it fosters participation and communication.

Furthermore, the findings demonstrate that the effects of virtual meetings vary across different demographic characteristics of employees involved in virtual communication. Such factors as gender, organizational hierarchy, and culture influence the process of virtual collaboration. In particular, women are usually considered to be highly effective virtual collaborators although, they experience higher videoconferencing fatigue. Gender differences are also observed in the verbal and textual participation in virtual collaborations. Moreover, cultural context influences these processes, thus indicating that the techniques for successful virtual communication cannot be applicable everywhere. The literature also shows that the design of the meeting can greatly influence the participants' experience and outcomes of the virtual meeting. Smaller meeting sizes, shorter durations, adequate breaks between meetings, active facilitation, expressive

leadership behaviours, and appropriate alignment between communication technology and meeting objectives consistently contribute to more effective virtual collaboration. As for technological characteristics, video communication and new technologies, such as virtual reality, are found to improve collaboration and innovation whereas continuous self-view can increase cognitive load and lead to videoconferencing fatigue.

Although virtual meetings have become a standard mode of communication in modern organizations, the review demonstrates that there is no universal conclusion regarding their effectiveness. These findings suggest that the effectiveness of virtual meetings depends less on the technology itself than on how organizations design, facilitate, and integrate virtual communication into their broader work practices.

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Abstract

Purpose of Research: Digitalization has had a tremendous effect on the process of coordination, communication, and decision making in organizations around the world. Virtual meetings have become extremely popular among remote and hybrid work settings, especially during and after the outbreak of the COVID-19 pandemic. The advantages offered by virtual meetings include flexibility and efficiency of the work process, which changes traditional collaboration principles and meetings. There is an abundant literature on virtual meetings related to such areas as management, organizational behaviour, and information systems. The purpose of the thesis is to perform a systematic literature review, state main findings, resolve possible contradictions, and provide a comprehensive overview of virtual meeting effectiveness. The selected articles are related to the area of teamwork.

Methodology: A literature review has been used as a method for conducting the research. In the course of the study, 47 papers from reputable academic journals in the field have been analysed. The articles have been chosen according to their relevance and impact, as well as citation count. The quality of journals has been estimated by Scopus metrics, including CiteScore, SCImago Journal & Country Rank (SJR), and Source Normalized Impact per Paper (SNIP).

Results: The results of the literature review are inconclusive, which highlights the difficulty of this issue. According to the literature review, there is no general agreement about the efficiency of virtual meetings. This efficiency does not depend mainly on the technology used; rather, it depends mainly on organizational behaviour and the integration of virtual communication within organizational processes.

Limitations of the Study: Most of the selected papers are either cross-sectional surveys, short-term experiments, or data collected during the period of the COVID-19 pandemic, which restricts longitudinal research. Another restriction is connected with the time frame of the selected papers being published since 2020, which aims to capture a rapid increase in publications in this field. Also, there are some papers recently published which have not been validated or reflected yet by other researchers, so the findings might need further verification.

Keywords: videoconferencing, virtual meetings, teamwork, meeting effectiveness

Type of Paper: Structured Literature Review

Deutschsprachiges Abstract

Forschungszweck: Die Digitalisierung hat einen enormen Einfluss auf die Prozesse der Koordination, Kommunikation und Entscheidungsfindung in Organisationen auf der ganzen Welt gehabt. Virtuelle Meetings sind insbesondere während und nach dem Ausbruch der COVID-19-Pandemie in Remote- und hybriden Arbeitsumgebungen äußerst populär geworden. Zu den Vorteilen virtueller Meetings gehören die Flexibilität und Effizienz des Arbeitsprozesses, wodurch traditionelle Prinzipien der Zusammenarbeit und von Meetings verändert werden. Es gibt eine umfangreiche Literatur zu virtuellen Meetings in Bereichen wie Management, Organisationsverhalten und Informationssysteme. Der Zweck der vorliegenden Arbeit besteht darin, eine systematische Literaturübersicht durchzuführen, die wichtigsten Erkenntnisse darzustellen, mögliche Widersprüche aufzulösen und einen umfassenden Überblick über die Effektivität virtueller Meetings zu geben. Die ausgewählten Artikel beziehen sich auf den Bereich der Teamarbeit.

Methodik: Eine Literaturübersicht wurde als Methode zur Durchführung der Forschung verwendet. Im Rahmen der Studie wurden 47 Artikel aus renommierten wissenschaftlichen Fachzeitschriften auf diesem Gebiet analysiert. Die Artikel wurden anhand ihrer Relevanz und ihres Einflusses sowie ihrer Zitationshäufigkeit ausgewählt. Die Qualität der Fachzeitschriften wurde anhand von Scopus-Metriken bewertet, darunter CiteScore, SCImago Journal & Country Rank (SJR) und Source Normalized Impact per Paper (SNIP).

Ergebnisse: Die Ergebnisse der Literaturübersicht sind nicht eindeutig, was die Komplexität der untersuchten Thematik verdeutlicht. Die Analyse der bestehenden Literatur zeigt, dass kein allgemeiner Konsens hinsichtlich der Effektivität virtueller Meetings besteht. Diese Effektivität hängt weniger von der eingesetzten Technologie selbst ab, sondern vielmehr von organisationalen Verhaltensweisen sowie davon, wie virtuelle Kommunikation in organisationale Prozesse integriert wird.

Einschränkungen der Studie: Bei den meisten ausgewählten Artikeln handelt es sich entweder um Querschnittsbefragungen, kurzfristige Experimente oder um Daten, die während der COVID-19-Pandemie erhoben wurden, wodurch die Längsschnittforschung eingeschränkt wird. Eine weitere Einschränkung steht im Zusammenhang mit dem zeitlichen Rahmen der ausgewählten Artikel, die seit 2020 veröffentlicht wurden, wodurch der rasche Anstieg der Publikationen in diesem Forschungsbereich erfasst werden soll. Darüber hinaus gibt es einige kürzlich veröffentlichte Artikel, die von anderen Forschern noch nicht validiert oder reflektiert wurden, sodass die Ergebnisse möglicherweise einer weiteren Überprüfung bedürfen.

Schlüsselwörter: Videokonferenzen, Virtuelle Meetings, Teamarbeit, Meeting-Effektivität

Art der Arbeit: Strukturierte Literaturübersicht