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MODELING THE FACTORS DETERMINING A VIRTUAL TEAM'S DECISION-MAKING

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VILNIAUS GEDIMINO TECHNIKOS UNIVERSITETAS

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VIRTUALIOS KOMANDOS SPRENDIMŲ PRIĖMIMĄ LEMIANČIŲ VEIKSNIŲ MODELIAVIMAS

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Abstract

Virtual teams (VTs) are becoming increasingly popular in organizations due to their significant benefits, such as improving performance and efficiently achieving objectives. While VTs have many advantages, they also face many challenges that, if not addressed, may prevent them from delivering the desired results. Decision-making is an important issue hindering the effectiveness of VTs. Organizations may fail in implementing successful strategies when there are improper decisions among team members. Research is lacking in understanding decision-making in VTs in the Middle East, especially in such situations as the Covid-19 pandemic. The Middle East has been overlooked despite such studies being conducted in the United States and Europe. In the Middle East, VTs have some behavioral characteristics which make specific scientific solutions necessary. To gain scientific knowledge of Middle East specificities, this study is carried out in the region, taking UAE as a representative case. The objective of this research is to create a model for enhancing VT decision-making by evaluating the factors affecting decision-making in VTs in the Middle East. The methodology used is a literature review, survey methods, expert evaluation, and structural equation modeling.

The results showed that (1) decision-making is positively correlated with information sharing, trust, Transformational Leadership, Culture Intelligence, and task conflict, (2) decision-making is negatively correlated with Relationship Conflict (3) Language showed no correlation with VT decision-making. The findings of this study serve as a step toward future research into factors useful for improving VT-associated decision-making.

Reziumė

Virtualios komandos (VK) organizacijose tampa vis populiaresnės dėl jų teikiamos didelės naudos, pavyzdžiui, geresnių rezultatų ir efektyvesnio tikslų siekimo. Nors VK turi daug privalumų, jos taip pat susiduria su daugybe iššūkių, kurių nesprendžiant gali būti užkirstas kelias pasiekti norimų rezultatų. Svarbi problema, trukdanti VK veiksmingumui, yra sprendimų priėmimas. Organizacijoms gali nepavykti įgyvendinti sėkmingas strategijas, kai komandos nariai priima netinkamus sprendimus. Trūksta tyrimų, kaip suprasti VK sprendimų priėmimą Artimuosiuose Rytuose, ypač tokiose situacijose, kai plinta COVID-19. Artimieji Rytai buvo ignoruojami, nors tokie tyrimai buvo atliekami Jungtinėse Valstijose ir Europoje. Artimuosiuose Rytuose VK pasižymi tam tikromis elgsenos ypatybėmis, dėl kurių būtini specifiniai moksliniai sprendimai. Siekiant įgyti mokslinių žinių apie Artimųjų Rytų ypatumus, šis tyrimas atliekamas regione, kaip pavyzdį imant JAE. Šio tyrimo tikslas – sukurti VK sprendimų priėmimo tobulinimo modelį, įvertinant VK sprendimų priėmimui įtakos turinčius veiksnius. Taikyta literatūros apžvalga, apklausos metodai, ekspertų vertinimas ir struktūrinių lygčių modeliavimas.

Rezultatai parodė, kad (1) sprendimų priėmimas teigiamai koreliuoja su dalijimusi informacija, pasitikėjimu, transformaciniu vadovavimu, kultūriniu intelektu ir užduočių konfliktu, (2) sprendimų priėmimas neigiamai koreliuoja su santykių konfliktu, (3) kalba neturi jokios koreliacijos su VK sprendimų priėmimu. Šio tyrimo išvados yra žingsnis į priekį būsimiems tyrimams, kurių metu bus tiriami veiksniai, naudingi su VK susijusiam sprendimų priėmimui tobulinti.

Notations

Abbreviations

ICT – information and communication technologies;
VO– virtual organizations;
VT – virtual teams;
CQ – cultural intelligence;
OB – organizational behavior;
TL – transformational leadership;
IS – information sharing;
AVE – average extracted variance;
MIS – management information systems;
AI – artificial intelligence;
ERP – enterprise resource planning;
SIS – strategic information systems;
OI – organizational intelligence.

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Introduction

Formulation of the Problem

With the advent of ICT (Information and Communication Technology), organizational behavior and design have changed, leading to the creation of virtual organizations (Vos) and, thus, the existence of virtual teams (VTs) (Davidaviciene & Al Majzoub, 2022). Virtual teams offer organizations such benefits as decreasing travel costs, highly flexible working patterns, 24/7 productivity, and enhancing knowledge and presence locally in addition to reacting rapidly to dynamic changes in their business environment. Many businesses have made remote working permanent even after the Covid-19 pandemic (Stratone et al., 2022; Garro-Abarca et al., 2021). These adjustments suggest that in the future, companies and management experts will emphasize virtual team research more, especially VT decision-making, which is still an obstacle to benefit from virtual teams (Wei, Heckman, Crowston & Li, 2017). Virtual teams still have few research studies on decision-making (Tan, 2019; Zakaria, 2017), or they are conducted in laboratories with students instead of actual teams (Paul & Dennis, 2018). Hence, it is essential to study the factors affecting VT decision-making.

Companies in the Middle East have been increasingly adopting virtual team concepts over the last couple of decades, but such studies and especially on the factors affecting VT decision-making, are rare or nonexistent. Very few qualita-

tive studies focus on VT decisions in IT organizations in the Middle East. Naturally, due to different cultures and work ethics, studies conducted in other nations may not be appropriate for the Middle East. This prompted a research endeavor focused on Middle Eastern VT decision-making in IT businesses (Diab-Bahman & Al-Enzi, 2020; Al Kaabi, Sidek & Mosali, 2022; Mitchell, 2021; Sagar, Arif & Rana, 2021), which clearly shows a lack of knowledge, research, and data on the topic. Specifically, the United Arab Emirates, as part of the Middle East region, was selected for this study to gain scientific insight into the specificities of this region.

Relevance of the Dissertation

In corporate settings, 88% of employees say virtual teamwork is critical to productivity in their organizations (Ismailov & Laurier, 2022; Meluso, Johnson, & Bagrow, 2021), 56% of virtual team members said they could contribute to organizational direction, values, and processes. 75% of virtual teams worldwide say that remote collaboration has increased their productivity (Klonek & Parker, 2021). The global business activity involves 85% of employees working in virtual teams. Among them, 89% work in at least one team, while 27% are in more than four virtual teams. Diverse teams make and execute decisions leading to 60% better results. 87% of the time, teams that are diverse in age and location make better business decisions. Decision-making in VT is an important component of its performance (Batırlık, Gencer & Akkucuk, 2022). The Middle East, especially UAE, is no exception to these changes, as 80% of the companies shifted to VTs (Meluso et al., 2021). Studies showed that decision-making in virtual teams is especially significant in UAE due to the following facts:

1. Remote work: Due to the COVID-19 pandemic, remote work has become more widespread in the UAE. According to a survey by the Dubai Chamber of Commerce and Industry, 70% of businesses in Dubai have adopted remote work policies, and 60% of companies in Abu Dhabi have implemented remote work arrangements (Staff, 2021)
2. ICT market size: The UAE's ICT market is estimated to be worth AED 92.6 billion (USD 25.2 billion) in 2021, with an expected growth rate of 3.3% over the next five years (TRA, 2021)
3. Technology adoption: The UAE has a high level of technology adoption, meaning that virtual teams can easily use digital tools for communication and collaboration. According to the "ICT Landscape Report 2021" by the Telecommunications Regulatory Authority (TRA), 99% of households in the UAE have access to the Internet, and 86% of Internet users have smartphones (Report, 2022).

4. Multicultural workforce: The UAE is known for its diverse workforce, with people from different nationalities and cultural backgrounds working together. This diversity can bring unique perspectives and ideas to virtual teams, but it can also present communication and cultural challenges (Kiek, 2020).
5. Flexible work arrangements: The UAE government has introduced initiatives to support flexible work arrangements, including part-time work, job sharing, and remote work. The government has also encouraged the private sector to adopt flexible work arrangements to improve work-life balance and productivity (Staff, 2021).

Despite the subject's importance, very few studies have been published in the UAE, which indicates a severe lack of knowledge, experience, and statistics. A major contribution of this study is that it assists in identifying and developing factors that will enhance VT decision-making in developing countries.

The Object of Research

The research object is the factors impacting decision-making in virtual teams.

Aim of the Dissertation

The dissertation aims to identify and evaluate the factors impacting decision-making in virtual teams.

Tasks of the Dissertation

So that to achieve the aim of the dissertation, the following tasks were set:

1. To analyze studies in the fields of ICT, virtual teams, and decision-making to develop a theoretical framework for modeling VT decision-making.
2. To identify factors for research and constructing a theoretical model that suggests a solution for VT decision-making in the case of the IT industry in the UAE.
3. To evaluate and identify the most significant factors impacting VT decision-making to construct a model that enables enhancing VT decision-making.

Research Methodology

The research methodology applied in this dissertation is as follows: systematic, comparative analysis and synthesis of scientific literature were used aiming to conceptualize the main constructs, formulate hypotheses and, thus, formulate the theoretical framework; a survey, structural equation modeling (SEM), expert evaluation (multi-criteria scoring, multi-criteria evaluation); the explanatory factor analysis (EFA), confirmatory factor analysis (CFA). Before assessing the model, constructs were tested using such validity and reliability tests as Cronbach's alpha, Bartlett's test of sphericity, Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy, average variance extracted test (AVE), correlation matrix, and factors loadings. CFA includes hierarchical OLS regression and structural equation modeling (SEM). The analysis was performed using IBM SPSS (Statistical Package for the Social Sciences) version 25 software and IBM AMOS 23.

Scientific Novelty of the Dissertation

The Scientific novelty of the dissertation is as follows:

1. Creation of a model based on discovered factors that have a substantial association with VT decision-making. As a result, addressing gaps in the science of improved VT decision-making contribute to growing knowledge of existing models and enriching the knowledge of virtual teams.
2. The VT decision-making model was developed in the UAE in the IT business, and it provides new scientific value and precise knowledge about VT decision-making specificity in emerging countries.
3. Contributions to the following management theories: resource-based view (RBV) and thriving at work. The RBV theory argues that a firm's resources and capabilities are the primary determinants of its competitive advantage. Hence, this study contributes to this theory by examining how virtual teams' resources and capabilities can be leveraged to enhance their decision-making effectiveness. For example, virtual teams' diverse backgrounds, skills, and experiences can be harnessed to generate creative and innovative solutions to problems. Additionally, examining the use of technology and communication tools in virtual teams can provide insights into how these resources can be effectively utilized to improve decision-making outcomes.

4. Thriving is a management theory that focuses on the individual's positive and thriving experience within an organization. Therefore, this study contributes to this theory by exploring how virtual teams can thrive and promote well-being despite the challenges associated with remote work. For example, transformational leadership behaviors, such as inspiring and motivating team members, are positively related to team members' perception of decision-making effectiveness and individual thriving. Similarly, higher levels of cultural intelligence among team members are positively associated with better decision-making outcomes and individual thriving. Finally, the effective use of ICT tools, such as video conferencing and project management software, can enhance virtual team decision-making outcomes and promote team members.

Practical Value of the Research Findings

The factors studied in this research, i.e., ICT, cultural intelligence, transformational leadership, task and relationship conflict, trust, and information sharing, hold practical significance for virtual team decision-making in various organizational settings. The findings of this study can be applied by organizations to enhance the decision-making of their virtual teams and, ultimately, to improve overall organizational performance.

The practical significance of this study lies in identifying factors critical for virtual team decision-making success. By understanding how these factors impact decision-making, organizations can develop strategies and policies that foster effective virtual team collaboration. Specifically, organizations can invest in ICT tools and infrastructure that facilitate communication and information sharing among virtual team members. Moreover, they can foster cultural intelligence among team members to better understand and navigate cross-cultural differences. Transformational leadership behaviors can also be developed to inspire and motivate team members toward shared goals and objectives.

Furthermore, organizations can use the findings of this study to manage task and relationship conflicts within virtual teams. By fostering trust and promoting open communication, virtual team members can work towards constructively resolving conflicts and contributing to better decision-making outcomes.

Overall, this study's practical significance lies in identifying factors that contribute to effective virtual team decision-making, which organizations can leverage to enhance their decision-making and overall performance.

Defended Statements

The defended statements of the dissertation are as follows:

1. Seven factors and solutions are most effective and relevant for improving VT decision-making in companies working in the Middle Eastern IT industry, i.e., cultural intelligence, task conflict, relationship conflict, transformational leadership, trust, ICT, and information sharing.
2. The proposed VT decision-making model adds to two management theories: resource-based view (RBV) and thriving at work.
3. Identified gaps and a lack of scientific knowledge regarding VT decision-making in developing countries indicate that the created model is significant in improving VT decision-making (tested in UAE's IT industry).

Approval of the Research Findings

The following scientific articles on the topic of the dissertation were published: three articles in peer-reviewed scientific journals (Davidaviciene & Al Majzoub, 2022; Davidavičiene, Al Majzoub & Meidute-Kavaliauskiene, 2020; Davidaviciene, Majzoub & Meidute-Kavaliauskiene, 2020) and three articles in conference proceedings (Al Majzoub, 2020; Al Majzoub & Davidavičienė, 2018, 2019; Al Majzoub, 2019).

The dissertation's results were published in three scientific conferences:

- 10th International Scientific Conference "Business and Management 2018," 3–4 May 2018, Vilnius Gediminas Technical University, Lithuania.
- International Scientific Conference "Contemporary Issues in Business, Management, and Economics Engineering 2019," 9–10 May 2019, Vilnius Gediminas Technical University, Lithuania.
- Academics World International Conference "International Conference on Management and Information Technology 2019," 6–7 December 2019, Beirut, Lebanon.

The Structure of the Dissertation

The dissertation consists of an introduction, three chapters, and a general conclusion. The dissertation consists of 133 pages without annexes. There are also six annexes (A, B, C, D, E, F). It contains 9 figures and 33 tables (appendices). Additionally, 268 literature sources are referenced in the dissertation.

1

Theoretical Research on Virtual Team's Decision-Making

This chapter provides an overview of the information and communication technologies concept, virtual organizations, virtual teams, and decision-making. It handles previous models applied for evaluating information and communication technologies processes and a brief explanation of their application. The research results of this chapter were published in three publications (Al Majzoub & Davidaviciene, 2018, 2019; Al Majzoub, 2019).

1.1. Information and Communication Technologies

Our lives are transformed by ICT, whether it is personal, social interactions, business environment, or corporate culture (Davidaviciene, Al Majzoub, et al., 2020). Information and communication technologies are becoming an essential part of the modernized lifestyle. As countries grow, organizations and institutional structures must be reconfigured to match the change. Most countries have developed national ICT policies to act as a framework for ICT integration in society (Apanaviciene, Vanagas & Fokaides, 2020). Change is the most important challenge for organizations. It emerges in the organization for several reasons, including a

recession, budget reduction, pressure from the market, or advancement in information and communication technologies (Al Majzoub & Davidavičienė, 2018). The change will cause major adjustments to organizational plans at the operational and strategic levels (Bajis, Chaar, Basheti & Moles, 2017). ICT plays a significant role in the organization's design as it is advancing and rapidly growing. It is used to restructure business practices, introduce new technologies, and eliminate obsolete jobs via automation (Brauns, 2015). To deal with the technological change brought by ICT to the world, organizations need to have an up-to-date organizational design. For intelligence organizations to adjust their plans, they need information about their environment (Purnamasari, Harahap, Irawan & Fajri Wibowo, 2022). Organizations will be unable to function without that information. By connecting different organizational units and providing such tools as business intelligence (BI), ICT provides organizations with intelligent information (Hiran & Henten, 2020). ICT heavily impacts the work of organizations, allowing employees to work anytime and anywhere (Nijp, Beckers, van de Voorde, Geurts & Kompier, 2016). With the increased number of customers and employees, companies need to develop effective systems that will act as a platform for information exchange and communication.

Enterprises today rely heavily on ICT to enhance, improve, and grow their productivity which results in a competitive advantage. ICT also provides managers with tools that facilitate their decision-making, monitoring, improving service, and empowering staff (Chen, Yen, Lin, & Chou, 2018). Companies are aware that technologies drive growth and development, and most managers deploy them to serve as an interface in generating strategic decisions. Technology and management competency are the determinants of the organization's capability (Bolukbas & Fuat, 2018). Business success is related to information and communication technology because it affects the mechanism used to capture the value and gain profit. Thus, ICT is an integral part of the company's business-level strategy. The company's internal IT was inaccurately framed as a functional-level strategy only, while it plays a significant role in business strategy. IT affects the company structure, creates value, and provides alternative business strategies. IT enhances the current capabilities and creates new capabilities, including the flexibility to focus on changing opportunities (Perienen, 2020).

According to researchers (Lipowski & Angowski, 2017; Witman, 2018; Zhang, 2022), decisions are based on the data-driven increase in performance and profitability and provide the effectiveness of management decisions. If at least two conditions are met, data-driven decisions are more effective. First, organizational culture must support data-driven decisions. Second, it requires coordination in all units inside the organization, in which the organization collects, analyzes, and uses the data. These stages are important and must be done correctly, or the decision reached will not bring added value to the organization. For example, if

data collection is done incorrectly, it will be invalid for analysis and use (Maxwell, Rotz, & Garcia, 2016). Executives and policymakers have been concerned about the profitability of companies' IT investments for decades. Although IT investments can improve companies' performance, they do not guarantee this automatically and require management to realize their power. The practice of internal IT management, whether it is planning, organizing, or controlling, received the attention of many scholars and executives (Ilmudeen & Bao, 2018).

IT investment requires enormous capital allocation and spending. Most of this spending is made toward the IT infrastructure, normally consisting of about 54% of the IT investment. IT infrastructure investment is defined as investment managing the shared IT service. IT infrastructure can provide a competitive advantage as it is not easily imitated by competitors and requires time and effort. Technologies redefine the structure of the industry, provide a competitive advantage, and change competition rules. Most functions in firms are integrated into IT, which is not merely a company department but an enabler to the whole organization, providing a competitive advantage. Moreover, IT applications are an important part of company strategy, affecting all parts of a company's business (Mohamad, Zainuddin & Kendall, 2017).

Data generation and storage have become easier thanks to advances in information and communication technologies. As a result, data-driven decision-making is becoming more important in organizations. The more accurate and precise the data, the more and higher the performance of the organizations. Consequently, companies started to gather data about their suppliers, customers, partners, and competitors for effective decision-making (Márquez & Vázquez, 2018). The main role of information and communication technologies is to help people share knowledge through a common platform. ICT makes it easier for organizations to acquire, store and disseminate knowledge required for making strategic decisions (Soto-Acosta, 2016). Digital business strategies are increasingly used due to advances in ICT. Decision-making requires close collaboration and agreement among team members (Bragge, Kallio, Seppälä, Lainema & Malo, 2017).

Hence, theory and previous research studies will be analyzed to ascertain the impact and changes in organizational design, intelligence, and decision-making. Trends, gaps, and future management models will be identified.

1.1.1. Changes in the Organization in the Era of Information and Communication Technologies Development

Globally, the use of ICT has been increasing. From 1993–2017, the number of internet users increased by 27.75 percent, according to the Internet World Stats report (internetworldstats, 2017). A technology that stores, retrieves, transmits, or manipulates data is known as information and communication technology, or ICT.

Tools for information and communication have several benefits, such as (Hao, Guo & Wu, 2022):

1. The ability to analyze massive amounts of data that are impossible for humans to analyze.
2. Offer and generate a large volume of knowledge that is impossible for a human to generate. For instance, information and communication technology tools can assess technology attributes using statistical studies and provide relationships between technology and corporations.
3. Use the data that has been stored to support the decision-making process.

ICT is transforming into a crucial business component thanks to increased investments (Yu, Yazan, Junjan & Iacob, 2022). As a result, ICT directly influences organizational behavior, particularly in terms of organizational design, intelligence, and decision-making. In summary of the most crucial fundamental elements in organizational behavior study, these three features will be further examined and presented.

Organizational design is defined as "the way an organization is to be structured and operated by its members. It is both a plan and a process" (Sartipi, 2020). The design of an organization emphasizes adapting the organizational structure, which impacts how people and tasks change and how technology advances. Organization structure is defined as "the logical relations or the decision rule connections between people in an organization" (Liebel, Tichy, Knauss, Ljungkrantz & Knauss, 2018). ICT helps organizations in changing processes and transforming the organization to meet it is desired goals and objectives. Four new organizational types, including virtual, negotiated, and traditional organizations and vertically integrated conglomerates, have been developed as a result of information technology changes. These are the details about them:

1. Virtual organizations: People can work from different locations thanks to such technologies as e-mail and video conferencing. This eliminates the need for offices and allows employees to work from anywhere, including their homes or, e.g., a coffee shop.
2. Organizations that use such technologies as electronic data interchange (EDI) and e-mails to coordinate with many enterprises to produce and deliver their products are known as "negotiated organizations."
3. Traditional organizations are businesses that occasionally make minor technological upgrades. To become more responsive, traditional businesses must adopt a vertical model.
4. Vertically integrated conglomerates utilize electronic data transmission, particularly where there is an imbalance of power between customers and suppliers.

Due to the rapid growth of ICT and the expansion of markets, the most common types of organizations are virtual and negotiated. By implementing virtual

organizations, companies can reduce overhead costs, do more with less, respond to market changes, and satisfy customer demands via a geographically and organizationally distributed workforce. Negotiated organizations save money by avoiding the costs of opening an office and hiring staff. They can coordinate among several companies creating and distributing their goods using e-mails or other types of communication offered by ICT (Al Majzoub & Davidavičienė, 2018).

ICT can reduce layers in the organizational hierarchy, which has proven to be one of its benefits to organizations. The result is a simplified organizational structure, centralization of decisions at executive levels, and their decentralization at operations levels, as well as a broader sphere of control (Quisenberry, 2018). ICT development has also led to changes in organizational intelligence.

Organizational intelligence. Ismail & Al-Assa (2020) defined organizational intelligence as "the capacity of an organization to create knowledge and use it to strategically adapt to its environment." It is similar in purpose to the individual's intelligence quotient (IQ). Information processing and interpretation are among the most common definitions of organizational intelligence.

In raw form, data have no meaning, but when they are arranged in meaningful ways, information is revealed (Boulesnane & Bouzidi, 2013). The definition of knowledge is the capacity to act based on study and experience (Yolles, 2005). Knowledge is more important for problem-solving than data and information (Tang & Sivaramakrishnan, 2003). Weinberg and Harding (2004) defined wisdom as "a state of the human mind characterized by profound understanding and deep insight." Information and knowledge are linked at an individual level by the person's ability to make connections. In the organization, wisdom is the knowledge and experience shared by individuals, teams, and departments, and this is the notion of natural intelligence. A taxonomy of organizational intelligence was introduced in conjunction with information and communication technologies and influenced by it. The taxonomy is presented in Fig. 1. In an organization, two different types of intelligence exist: natural and artificial.

Artificial intelligence (AI) is a different sort of intelligence that has been presented, defined, and highlighted as a result of ICT progress. AI is "the part of computer science concerned with designing intelligent computer systems, that is, systems that exhibit the characteristics we associate with intelligence in human behavior" (Casey, 1988). AI enables users to automate administrative and team collaboration duties. According to a Harvard Business Review survey (Kolbjørnsrud, Amico & Thomas, 2016), even though managers currently spend more than half of their time on administrative tasks and quality assurance, the majority of these jobs will soon be automated. Automation of these tasks is possible with the use of AI. AI will automate the most monotonous professions, freeing human beings to take on new, more creative roles that require empathy, collaboration, and exchange (Hariz, Renouard & Mokhtari, 2007).

Another aspect of using AI is reputation risk management, which was developed to study the behavior of numerous and contradictory incentives. This method is effective because it links the bad behavior of managers and employees to the firm's financial incentives. For instance, in the banking scandals where personnel opened thousands of accounts before closing them, this was done because their compensation was predicated on how many accounts they opened (Witman, 2018). Natural intelligence has more requirements than artificial intelligence, but as information and communication technology advances, artificial intelligence's function will grow, as demonstrated in Fig. 1.1 (Tang & Sivaramakrishnan, 2003).

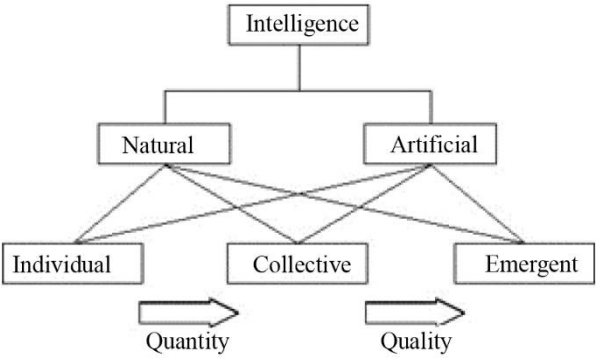

Fig. 1.1. Taxonomy of Intelligence (Tang & Sivaramakrishnan, 2003b)

Although organizational learning focuses on collective intelligence and how crucial it is to foster departmental synergy, organizational intelligence is not just the average intelligence of the organization's employees. Emergent intelligence is researched to promote departmental synergy. Less research has been done on the phenomenon of emergent intelligence in organizations. EI is intelligent behavior that has been developed as a result of interactions between numerous employees in businesses. People may communicate and share their thoughts and behaviors online utilizing forums, blogs, and other platforms thanks to the Internet and advancements in information technologies. Such connections between employees of the same organization are possible through internal systems like conference calls or Skype for Business (Bradberry & Su, 2006).

Organizational intelligence (OI) can be divided into three categories: aggregate individual intelligence, interrelationships between individual intelligence, and organizational intelligence. According to the taxonomy, OI has three levels: individual intelligence, collective intelligence, and emergent intelligence, which result from the interactions between individuals. This variance will be used in next

organizational future studies. To make sense of organizational intelligence, an analyst expert network provides the necessary technical support, skill, and knowledge. It shows how organizational intelligence and knowledge management are related. Knowledge management focuses on organizational goals, including superior performance, innovation, competitive advantage, integration, etc. Knowledge management replaces the old belief "knowledge is power" with "sharing knowledge is power." For organizations to gain and foster innovation, creation, and knowledge sharing, OI will transform the data into knowledge and knowledge into actions (Keshavarz, Esmaili Givi & Shekari, 2018). Through technology, knowledge is shared between employees of an organization more effectively. However, it does not take away from the necessity of employee cooperation. A learning organization will have a competitive advantage due to ICT's role as a catalyst; sharing knowledge is one of the most difficult challenges because it cannot be forced or controlled. To motivate their employees to share their knowledge, managers need to find a way to motivate them. Depending on the quality of the relationship and strength of the relationship, researchers (Al Majzoub & Davidavičienė, 2018; Eisenberg & Mattarelli, 2017; Shaik, Makhecha, & Gouda, 2019) found that information and knowledge sharing is more likely to occur between two parties with strong relationships. With the help of ICT, employees will be able to communicate via a variety of tools, including wikis, intranets, video conferencing, voice mail, and e-mail (Hortovanyi & Ferincz, 2015). Another significant feature in the ICT development age is the evolution of decision-making.

Decision-making. Choosing a suitable solution from the available options to a current challenge is the essence of decision-making (Boulesnane, Bouzidi & Bouzidi, 2013). Zeleny treats decision-making as a process, a dynamic and interconnected unity of precision, decision, and post-decision stages, and defines it as the act of choosing the most desirable alternative (Zeleny, 2011). Huarng, Mas-Tur, and Calabuig Moreno (2018) described decision-making as an intentional process involving the analysis of data, the evaluation of alternatives, and the actual decision-making strategic decisions essential for carrying out corporate strategies.

The challenge is not how to store these data but how to manage them so that people can make strategic decisions (Boulesnane et al., 2013). Data management, storage, and repurposing have become easier and cheaper with the advancement of information and communication technologies (Hedelin & Allwood, 2002). Through these new communication and information technology tools, organizations are providing a platform for knowledge sharing (Rumizen, 1998). ICT infrastructure offers two important strategic capabilities to organizations:

1. The implementation of this infrastructure will facilitate cross-functional communication and information sharing among functions and divisions.

2. Organizations will have the ability to make decisions more efficiently and effectively by using ICT (Piñeros Espinosa & Gómez Santos, 2017).
3. Technologies affect decision-making in the following ways:
4. Data processing capabilities: Through tools like data mining and data warehouses, organizations will be able to process and analyze enormous amounts of data thanks to ICT.
5. IT improves speed by allowing businesses to access millions of pieces of information quickly.
6. IT supports group decision-making: By giving groups the necessary tools, such as a group decision support system (GDSS), it enables groups of individuals to reach decisions.

The ICT evolution and the changing nature of organizations are proof that organizations are changing over time. ICT must be adapted by organizations to remain competitive and gain an edge over their competitors. The creation of virtual organizations (VO is one of the most significant changes caused by ICT in organizations.

1.1.2. Information and Communication Technology Adoption and Tools

Some of the most popular models for forecasting ICT adoption include the technology acceptance model (TAM), the Theory of Planned Behavior (TPB), the Unified Theory of Acceptance and Use of Technology (UTAUT), and the Diffusion of Innovation (DOI) theory. The technology acceptance model (Perienen, 2020; Zalat, Hamed & Bolbol, 2021) explains how users view and utilize technology. Two factors determine TAM, i.e., (1) perceived utility, which is the extent to which a user will consider a piece of technology to be useful in carrying out his or her work; and (2) perceived ease of use, which expresses how the technology involves little effort to use and is not complicated to use. Icek Ajzen created the Theory of Planned Behavior (TPB) in 1991. It maintains that society adopts technology attitudes toward acts or behaviors based on three factors: the impact of the act on the user's life, the subjective norm, and the perceived behavior control. In fact, the subjective norm is inextricably linked to the user's environment, such as social networks, culture, etc. (Sharma & Mishra, 2014).

Evertt Rogers created the Diffusion of Innovation (DOI) theory in 1962. The theory describes how new ideas become widely used throughout time and how technology is disseminated. The diffusion steps are as follows: knowledge (the individual is exposed to the innovation, however, lacks the information to know more about it); persuasion (the individual is now influenced to learn more about the innovation; decision (the person will weigh the positives and negatives of the

innovation and decide whether to use it or not); implementation (how far an individual can test the innovation); and confirmation (decides whether to use the idea in the end).

The unified theory of acceptance and use of technology (UTAUT) was developed by Venkatesh and others in 2003. Based on four theoretical constructs, this is another theory about how users accept and use information technology systems (Venkatesh, Thong & Xu, 2016).

The technology acceptance model (TAM), the Theory of Planned Behavior (TPB), the unified theory of acceptance and use of technology (UTAUT), and the Diffusion of Innovation (DOI) theory are all related to decision-making in the context of technology adoption. These models and theories provide frameworks for understanding users' decision-making processes when it comes to technology adoption. They highlight the importance of such factors as perceived ease of use, usefulness, attitudes, subjective norms, social influence, facilitating conditions, and involvement in the decision-making process. By understanding these factors, researchers and practitioners can develop strategies to encourage users to adopt and use technology.

Today, globalization has forced organizations to find and develop tools that facilitate communication between VT members because of the rapid changes in global business today. Information and communication technology (ICT) helps organizations plan, forecast, monitor, and control their daily operations and supports problem-solving and decision-making by providing precise and reliable data. The use of powerful computer software and network information systems allows for flexibility and the elimination of redundant management functions (Brugger, 2018). Organizations will struggle to make decisions in the absence of systematic methods to manage data. By using ICT systems, data can be organized and used correctly, allowing teams to make timely and accurate decisions. Companies must keep an eye out for dangers and potential opportunities if they are to stay ahead and acquire a sustained competitive advantage. This calls for the use of ICT, where the most crucial component is the accuracy of the data (Ndubuisi et al., 2022). Table 1.1 lists some of the ICT tools that are commonly utilized in enterprises.

The rapid development of ICT and the Covid-19 pandemic have forced employees to work from home (Garro-Abarca, Palos-Sanchez & Aguayo-Camacho, 2021). This led to more virtual arrangements, such as teleworking, virtual teams, and computer-mediated work (Klonek, Kanse, Wee, Runneboom & Parker, 2022). The pandemic has significantly altered the work environment and demands of many people, resulting in a significant move to working from home or teleworking. Teleworking makes employees available anywhere, which is especially beneficial for organizations.

Table 1.1. Digital Collaboration Tools

Digital Collaboration Tools	Example of ICT Tools	Description
Web conferencing and online collaboration	Skype for Business, BlueJeans, Cisco WebEx Meetings, GoTo Meeting, Zoom, and MS Teams	Web conferencing and collaboration tool that provide a virtual hub to easily organize and prioritize projects; it is also used as web conferencing and can be used for both internal and external meetings (Khatib, Alhosani, Alhosani, Matrooshi & Salami, 2022; Davy T.K. Ng, Ng & Chu, 2022; Xu, 2022).
Project and team tools	ClickUp, Primavera, Microsoft Projects, Basecamp, Teamwork Projects, Proof Hub, Zoho Projects, Nifty, Trello, JIRA, Asana	Project and team tools are used for project management, such as resource allocation, task sharing, and scheduling, by a wide range of industries. It allows a team to monitor and control their budget, schedule, and all documentation used in the project (Khatib et al., 2022; Davy Tsz Kit Ng, 2022a; Nicholas, Hirst, Chyriwsky & Danby, 2022).
Tools for presentations	Google Slides, SlideShare, Prezi, Sutori, and NearPod	Tools used to share documents, images, presentations, etc., between team members (Davy Tsz Kit Ng, 2022b; Wang & Zhang, 2022; Xu, 2022).
Tools for sharing information and file storage	Google Spreadsheets, Google Docs, Mural MeisterTask, Google Slides, Google Drive, One Drive, MS SharePoint, and Dropbox	Provides the ability to share information on one document and allows team members to work on the same docs (Elshami et al., 2022; Davy Tsz Kit Ng, 2022a; Nicholas et al., 2022).
Tools for brainstorming/organizing	Coggle, Mindomo, Postermywall, Xmind, and Gochart	These tools are used for mind mapping and brainstorming and are very important during decision-making (Liu, Su, Xu & Lu, 2022; Mirzahmedova, 2022; Wang & Zhang, 2022).
Business communications tools	Intranet/social intranet, chat rooms, private and group messaging, discussion forums and internal blogs	A private hub of tools used inside the organization for an employee to announce and share the company's news and build an information organization, and allow employees to distribute news or information to specific people or everybody (Elshami et al., 2022; Davy Tsz Kit Ng, 2022a; Nicholas et al., 2022).

End of Table 1.1

Digital Collaboration Tools	Example of ICT Tools	Description
Management information systems (MIS)	Management reporting systems, inventory control, sales control, business intelligence, and enterprise resource planning (ERP)	These systems are used to convert the collected transactional data into information to provide an organization with planning and management decisions. MIS helps managers by submitting weekly, monthly, and annual reports; organizations can plan, monitor, and regulate activities. They support structured decision-making. Examples of MIS are financial reporting and budget forecasting and analysis (Khatib et al., 2022; Liu et al., 2022; Nicholas et al., 2022).
Decision support systems (DSS) and expert systems	Model management systems, knowledge base, ERP, and database management systems	Systems, also called executive information systems, help the users make a decision by providing required and very useful information that will support the unstructured decision. They are used to get access to a data warehouse to retrieve relevant information that will help in unstructured or semi-structured decision-making (Elshami et al., 2022; Khatib et al., 2022; Davy Tsz Kit Ng, 2022a).

Teleworking is becoming a strong trend in the current job market because of the technological and geographic advantages that it provides in enabling employees to work from multiple locations. Companies worldwide are adopting more teleworking since it has benefits for employees and organizations (Tavares, Santos, Diogo & Ratten, 2020). For employees, it improves the quality of life by decreasing stress that results from travelling to work, greater flexibility in working hours, and increases employee work-life balance. Despite the benefits of teleworking, other researchers (Gilson, O'Neill & Costa, 2021; Golden, 2021) discovered that it has a negative impact on employees, such as difficulty separating space and working life, difficulty disconnecting from work, excessive activities, professional isolation, and inadequate remuneration (Diab-Bahman & Al-Enzi, 2020). The most commonly utilized technologies in enterprises are online collaboration tools. Fig. 1.2 shows the most used ICT tools by firms.

Scholars have found that low media synchronicity, such as e-mail and instant messaging, are more effective when exchanging information, while high media synchronicity tools, such as Zoom and MS Teams, are more effective when trying to involve in the processes of understanding how other people understand and

interpret the exchanged information, and then reach a mutual agreement or decision (Garro-Abarca et al., 2021; Lindeblad, Voytenko, Mont & Arnfalk, 2016; Plotnick, Hiltz & Privman, 2016).

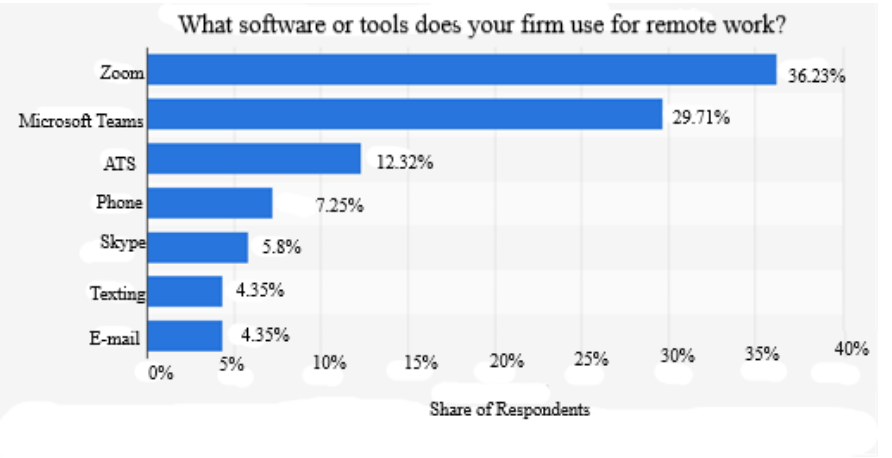

Fig. 1.2. ICT tools used by firms (https://www.statista.com/)

As travel restrictions increased due to the pandemic, organizations were forced to rely more heavily on virtual teams (Gilson, Costa, O'Neill & Maynard, 2021). The tools mentioned above are based on Internet technologies that are used by VT in organizations to communicate, meet, coordinate, and execute team processes and decision-making. Companies can benefit from these tools by becoming more efficient and making the most of their resources, especially since the Covid-19 pandemic necessitated lockdowns and remote working scenarios. The decision regarding the tools to be used is based on the organization's need, considering all functionalities and costs involved in using this tool.

Despite its growth, knowledge is still lacking in ICT use in the world and, especially in the Middle East. ICT use and the function of supporting teams in the virtual world have contradicting results. Some researchers (Derven, 2016; Lindeblad et al., 2016; Sukrat, Mahatanankoon & Papasratorn, 2018) found that ICT positively affects the work of VTs, while others (Bhat, Pande & Ahuja, 2017; Chewning, Lai & Doerfel, 2013; Wang, Cho & Denton, 2017) found it negatively affects it, which created some confusion.

Up to now, a gap persists in the scientific knowledge in the field of VT concerning its peculiarities, significance, and importance in organizations. Thus, the next section is dedicated to the analysis of virtual organizations and teams to gain better insights and understanding.

1.2. Virtual Organization and Teams

The introduction of virtual teams has been one of the major changes caused by the Fourth Industrial Revolution, particularly in the way work is managed and structured. In the knowledge economy, with more processes dependent on information and communication technologies, virtual organizations (VO) and virtual teams (VT) have become frequent phenomena. Organizations are increasing their reliance on virtual teams to achieve their objectives and enhance their performance while working remotely in multinational teams or when such teams are part of a strategic decision of organizational structure (Davidaviciene, Al Majzoub, et al., 2020).

The definition of virtual organizations has evolved over time as technology has advanced, and new forms of collaboration have emerged. In the early days of the Internet, virtual organizations were often defined as groups of individuals or companies that collaborated remotely using such technology as e-mail and instant messaging.

As the Internet and other communication technologies became more advanced, the definition of virtual organizations expanded to include groups that worked together in real-time using video conferencing and other collaboration tools. These organizations were able to operate without a physical office, and their members could be located anywhere in the world.

More recently, the rise of cloud computing and other technologies has led to the emergence of even more complex virtual organizations. These organizations may include hundreds or even thousands of members and may operate across multiple time zones and languages. They may use a variety of tools and platforms to collaborate, including project management software, social media, and virtual reality environments.

In addition to the evolving technology landscape, the definition of virtual organizations has also been shaped by changes in the global economy and the nature of work itself. As companies have become more globalized, they have increasingly turned to virtual organizations to facilitate collaboration across borders and time zones. At the same time, the rise of the gig economy and the growth of remote work have created new opportunities for individuals to participate in virtual organizations and earn a living without ever leaving their homes.

Despite these changes, the fundamental concept of virtual organizations remains the same: they are groups of individuals and companies that collaborate using technology, often without a physical office or centralized location. As technology continues to evolve and the nature of work continues to change, the definition of virtual organizations can be expected to continue evolving as well (Batırlık et al., 2022; Laudon, 2021; Plotnick et al., 2016)

In response to the growing need to access talent on demand, many organizations have searched for outsourcing workers who offer complementary skills, flexible schedules, and locations. The dispersion of teams has made it challenging for organizations to manage teams from different locations and cultures (Panteli, Yalabik & Rapti, 2019). Virtual teams are exposed to greater diversity than physical teams (Dong, Ehrlich, Macy & Muller, 2016). Due to the high level of innovations needed, the globalization of business, and the advance of ICT, the number of VTs have strongly increased. ICT has helped remove the barriers to communication between different teams across different geographical locations (Adamovic, 2017).

The definition of virtual teams has evolved over time as advances in technology and changes in work practices have transformed the way teams operate. In the past, virtual teams were typically defined as teams whose members were geographically dispersed and relied on technology to communicate and collaborate. However, as technology has advanced and remote work has become more common, the definition of virtual teams has become more nuanced and complex.

Today, virtual teams are commonly defined as teams that work together across distance, time, and organizational boundaries using communication and collaboration technologies. These technologies include e-mail, video conferencing, instant messaging, and project management tools, among others. Virtual teams can be comprised of members situated in different geographic locations, working on different schedules, and coming from different organizations.

In addition to the technological and organizational aspects, the definition of virtual teams has also evolved to include considerations of the social and cultural dimensions of virtual work (Batırlık et al., 2022; Bhat et al., 2017; Presbitero, 2019).

With the help and advance of ICT, organizations started shifting to team-based work over the past several decades. Team design has moved beyond the configuration of employees to be in the same location and now includes members that are dispersed over multiple different geographical locations and from different organizations. The result of this shift is the creation of virtual teams that brings new types of work patterns, decision-making styles, and relationships (Flavián, Guinalíu & Jordán, 2022). These changes bring new challenges to theory and research on team effectiveness. The VT benefits offered to organizations are indicated and recognized by many researchers (Ackermann & Yearworth, 2018a; Bartelt, Dennis, Yuan & Barlow, 2013; Johnson, Martineau, Kouamé, Turgut & Poisson-de-Haro, 2018; Wei, Heckman, Crowston & Li, 2017), i.e., (1) the possibility for team members to work on several projects and coordinate tasks without being physically present, which eliminates the need for travel and results in lower costs (for flights, hotels, etc.); (2) supported flexible working patterns; and (3) a

possibility for organizations to easily adapt to changing market conditions, clients, and the business itself.

Employees and companies both benefit from virtual teams. The freedom to work remotely improves work-life balance and employee satisfaction. Due to the development of ICT, employers can now engage professionals from other countries (Liao, 2017). However, the greatest challenge is creating cohesion among a worldwide virtual team. Because variety delivers a bordered area of expertise, several empirical research efforts regarding team diversity's influence on team performance have demonstrated that it can be advantageous and produce higher performance than homogeneous teams. Other research revealed that homogeneous teams function better than diverse teams because of less room for misunderstanding and team conflict (Ndubuisi et al., 2022). For virtual teams to be high performing, they must be managed properly. Diversification occurs at two levels: at the surface level and the deep level. As the focus shifts from what makes teams successful to why some teams are more successful than others, many people are interested in examining the mechanism that results in effective teams (Jaakson, Reino & McClenaghan, 2019). Nowadays, a company's competitiveness, as opposed to its tangible assets, is produced from its intangible assets, such as knowledge sharing and decision-making (Navimipour & Charband, 2016). VT is formed to accomplish organizational goals. The purpose of virtual teams should be explicit, achievable, measurable, a key driver for project milestones, and, if needed, refreshed as circumstances change. Before achieving high performance, all teams will go into stages that are iterative and complex. There are four stages of team development, as presented in Fig. 1.3: forming, storming, norming, and performing (Derven, 2016).

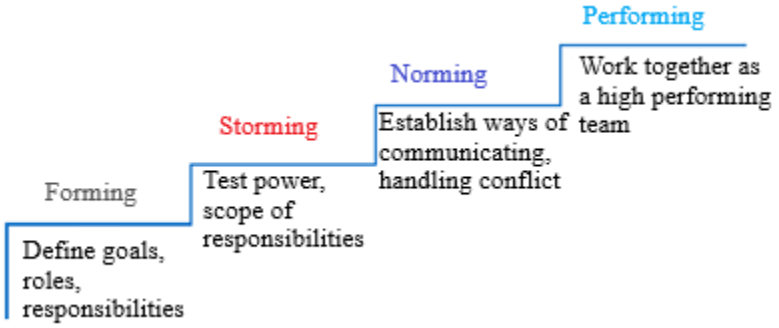

Fig. 1.3. Team development stages

- Forming: Team members define and discuss expectations and boundaries and clarify goals and responsibilities within the team (Zoltan & Vancea, 2016).

- Storming: This is a difficult stage for team members as they are more focused on the impression rather than on the project or task. They will monitor who will support them and who will undermine them and will seek to prove their value to their leader (Tuckman, 1965).
- Norming: At this stage, the group will be able to manage conflict, big decisions can be made and implemented, and new ideas can be turned into reality (Derven, 2016).
- Performing: The team is now like a well-oiled engine, running smoothly, without any conflict, and performing highly (Hacker, Johnson, Saunders & Thayer, 2019).

Diversity in VTs refers to the perception that the other person is different. This refers to multiple dimensions, such as nationality, language, age, educational background, task skills, and relational skills. The influence of diversity on group performance is studied from two different perspectives: information-processing and social categorization perspectives. The information-processing perspective claims that diversity has a positive effect on group performance. It emphasizes the role of such nonvisible attributes as knowledge, skills, ability, and group performance. Diversity brings different knowledge and expertise to the decision-making process. Meanwhile, social categorization argues that the homogeneity of the group will lead to better performance. This is because employees will classify themselves, as well as other members of the group, based on such demographic attributes as ethnicity and gender. Individual self-categorization will allow individuals to distinguish between the in-group and the out-group, which is fundamental for understanding and organizing their social world. The more homogeneous the group, the more likely the cohesion will be, and the less conflict between the members will occur, which will lead to high performance (Newman & Ford, 2021). Diversity in teams promotes new ideas, whereas homogeneous teams easily fall into groupthink (Derven, 2016).

However, despite the attention given to VTs, scientific studies are lacking in decision-making in VTs and especially the factors that affect them. Decision-making is one challenge for VTs. Hence, the next section is dedicated to decision-making.

1.3. Decision-Making

Decision-making is the process where a specific course of action is chosen in response to threats or opportunities by organizational members. Good decisions result in courses of action that help an organization reach success (Ada & Ghaffarzadeh, 2015).

Decision-making is fundamental to an organization's business plan development, goal orientation, and problem-solving. An organization's decisions are made by a group of people bringing multiple complementary and contradictory perspectives on the problem (Rokou & Kirytopoulos, 2014). The definition of decision-making has evolved over time as scholars and practitioners have gained a deeper understanding of the process and its role in organizations. Traditionally, decision-making was defined as the process of choosing among alternatives based on a set of criteria or objectives. This definition focused on the outcome of the decision and did not consider the process of arriving at that outcome. More recently, the definition of decision-making has expanded to include the process of making the decision itself. This process includes identifying the problem or opportunity, gathering information, evaluating alternatives, and choosing a course of action. This expanded definition recognizes that the quality of the decision depends not only on the outcome but also on the quality of the process used to arrive at that outcome. Another aspect of the evolving decision-making definition is the recognition that decisions are made in complex and dynamic environments. In the past, decision-making was often viewed as a rational and logical process following a set of predetermined steps. However, this view does not consider the fact that decisions are made in environments that are often uncertain, ambiguous, and rapidly changing.

As a result, the decision-making definition now includes the ability to adapt to changing circumstances and make decisions in real-time. This requires the ability to analyze information quickly, make decisions based on incomplete information, and be flexible enough to adjust a course as new information becomes available.

Finally, the decision-making definition has evolved to include the role of technology in the decision-making process. Advances in artificial intelligence and machine learning have made it possible to analyze large amounts of data and identify patterns and insights that would be difficult or impossible for humans to detect. This has led to the development of decision support systems that can help organizations make better decisions by providing data-driven insights and recommendations (Topaloglu & Anac, 2021; Zhang, 2022).

People who are going to make the decision will need to weigh the potential gain against the potential loss in order to arrive at a decision (Glazer & Karpati, 2018). An important aspect of the performance of a virtual team is the decision-making process. A team's ability to make effective decisions is critical for team effectiveness. It is very important to examine the interaction patterns in group decision-making since the interaction is the essence of group decision-making. Group decision-making is complex and characterized by complex processes. Virtual teams make decisions through a series of activities and choices rather than a single decision (Wei et al., 2017). Due to the need to negotiate the opinions and

ideas of multiple team members, decision-making in VTs is complex. Despite a greater exchange of information by virtual teams than by traditional teams, bad decisions still happen due to the team VT members' failure to consider the knowledge they get from their colleagues. Members will be impacted by confirmation bias, which is the propensity for team members to seek information that supports their initial views and disregard contradictory evidence. This will lead to poor decision-making and poor performance from the team (Bartelt et al., 2013). Group decision-making has been investigated by several researchers (Maynard, Mathieu, Gilson, Sanchez & Dean, 2019; Mcfall, 2015; Said, Ilias & Kamel, 2017).

Tuckman (1965) identified five stages taking place inside the team, including forming, storming, norming, performing, and adjourning. Fisher proposed four steps, i.e., orientation, conflict, emergence, and reinforcement. Tubbs used the Fisher model but renamed the steps to orientation, conflict, consensus, and closure. All these models are like Simon's decision-making model of intelligence design and choice, which is used for both groups and individuals.

Group decision-making is a collaborative effort of interaction, communication, and other activities, such as finding information, searching for answers, or problem-solving between two or more individuals (Kasman & Ali, 2022). A decision that requires different individuals to be involved is called group decision-making (GDM), where each member recognizes the existence of a problem and tries to solve it collectively. Once a consensus is reached among team members, a decision is reached. Consensus is defined as "the total and unanimous agreement of all experts concerning the feasible alternatives." To obtain a final solution in GDM, two steps are applied: first is the consensus, and the second is the selection (José, Herrera-Viedma, Chiclana & Tapia, 2018). The advantages of decisions made by a group over an individual decision have been widely studied in the literature (Crowston, 2020; Koksalmis & Kabak, 2019; Tuckman, 1965; Turban & Shelly, 2011). Group decision-making integrates individual knowledge, ability, and skill to search for a decision that will result in a better decision. It provides a sense of committing to results among team members since all members participate in reaching the decision and share the responsibility (Kasman & Ali, 2022).

Decision types can be classified into two types programmed and non-programmed decisions, as shown in Table 1.2.

Programmed decisions are decisions that are repetitive and routine, dealing with frequently occurring situations. They have a clear starting point from where to start, a clearly defined goal, and a well-defined procedure to reach that goal. When similar circumstances or events arise, decision-makers will follow the same procedures. Programmed decision-making focuses on implementing decisions using highly standardized steps that are represented in manuals and standard operating procedures. Non-programmed decisions are unstructured and unique and

deal with complex situations. When decision-makers face a complex situation, they seek to reduce the decision into a sub-decision, which makes it easier and more familiar to solve and deal with the problem. The proportion of non-programmed decisions made by managers increases at each hierarchy level. This is due to the highly needed decision-making skills and creativity, which present the biggest challenges for decision-makers.

Table 1.2. Decision-making types (Afshari, 2012; Rokou & Kirytopoulos, 2014)

Programmed Decision	Non-Programmed Decision
Routine decisions.	Unique, unstructured, without a known or pre-specified procedure.
Has a clear starting point and goal as well as a well-defined procedure to reach the goal.	Occurs when the decision-maker is dealing with a new or not recent problem.
Follows structured and non-creative patterns.	A decision situation is very complex and important or requires an innovative procedure.

Virtual teams, on the other hand, refer to teams of individuals collaborating and working together to achieve common goals while being geographically dispersed and relying on technology to communicate and collaborate. In the context of decision-making, virtual teams can face unique challenges that can affect both programmed and non-programmed decisions (Klein & Sharma, 2022b).

For programmed decisions, virtual teams may face challenges in establishing and following standard procedures and rules due to communication barriers, cultural differences, and varying levels of technological literacy among team members. These challenges can slow down the decision-making process and increase the likelihood of errors or misunderstandings (Dai, Wang & Kirillova, 2022).

For non-programmed decisions, virtual teams may face challenges in the decision-making process due to the lack of face-to-face interaction, difficulty in building trust and consensus, and limited access to information and resources. These challenges can result in decision-making delays, lower quality of decisions, and increased risk of conflicts and misunderstandings among team members.

Overall, the relationship between decision-making types and virtual teams highlights the importance of effective communication, collaboration, and decision-making processes in achieving successful outcomes in a virtual team environment. Effective virtual team leaders must be able to navigate the challenges of virtual team decision-making and facilitate a collaborative and inclusive decision-making process to ensure successful outcomes (Klein & Sharma, 2022a).

By comparing the decision made to standards, the study of decision-making allows us to evaluate whether the decision made was good or bad. Some models allow for evaluating the decisions, called normative models. Judgments are compared to normative models, and attempts are made to find any existing bias and to try and understand and explain it by using descriptive models. Biases are defined as any deviation from the model. With both normative and descriptive models in existence, these biases can be corrected to improve the decisions. The prescriptions for such a correction are called prescriptive models (Han & Hazard, 2022). Thus, three types of decision-making models were developed: normative, descriptive, and prescriptive models. The normative model shows how the decision should be made by decision-makers. The descriptive model shows the way decisions are made by explaining human behavior. The prescriptive model combines the two other models by having the characteristic of decision-makers in mind while showing how a decision should be made. Decision-making models are presented in such sequential activities as a workflow. A decision workflow is defined as follows: "a decision workflow represents the depiction of the sequential mental activities performed by the decision-maker starting with the discovery of the need for a decision and ending with the execution of the chosen alternative" (Karimi, 2013).

Researchers (Ballestar, Grau-Carles & Sainz, 2016; Kostelić & Pavlović, 2018; Zhang, 2022) have proposed different frameworks to describe the phases of decision-making in teams. A phase refers to "a period of coherent activity that serves some decision-related function, such as problem definition, orientation, solution development, or socio-emotional expression" (Crowston, 2020). Many early models were based on Simon's decision-making model. These models proposed normative or rational models to describe how decisions are made in a unified manner. Simon's decision-making model is presented in Table 1.3.

Rook & Fisher (1995) proposed an alternative normative model consisting of four phases: orientation, conflict, emergence, and reinforcement. Even though both models assume that groups will follow systematic logic to reach decisions, they differ in the phases followed to reach decisions. According to Poole and Roth's analysis of small groups, these models do not always accurately represent how decisions are made. Moreover, Simon has verified that people do not always make decisions thinking logically (Wei et al., 2017).

An alternative to the normative model is the non-phasic model, such as the garbage can model, proposed by Cohen, March, and Oslen. The decision-making in an organization is characterized by fragmentation and chaos. A problem, solution, choice, and participants are all combined independently, and the decisions are arrived at when these four processes coincide as a unit under organizational structure (Han & Hazard, 2022). A non-logical search is used to reach a decision.

Although sometimes a non-logical search is used to reach a decision, in other instances, a logical search may be needed. In a new phase model proposed by Poole (1983), multiple sequence models are assumed to be used; groups use different decision sequences based on their decision situation. As well as the sequences described, groups will also follow more complicated paths to reach a decision, causing some phases to repeat themselves as groups may notice lagging activities or encounter problems in previous phases and then go back and forth in another phase. Context is another important factor to consider when studying decision-making. Depending on the circumstances, groups will take different paths to achieve a decision (Wei et al., 2017).

Table 1.3. Simon's decision-making model (Kalantari & Simon, 2010)

Simon's model	Major tasks (activities)	Process activities
Intelligence	Identify problems Collect information Information sharing Identify decision criteria Prioritizing decision criteria	Brainstorming Nominal group techniques Voting Ranking Deliberation negotiation
Design	Find alternatives Evaluate alternatives Compare alternatives Prioritize alternatives	Brainstorming Delphi method Voting Ranking
Choice	Alternative selection Sensitivity analysis Implementation	Choice models Decision analysis plan a negotiation

The following four decision-making models are examined next: rational, bounded rationality, intuitive, and political models.

Rational model. The earliest theory regarding rationality and decision-making was that all decision-makers are rational in their choices and try to utilize the decision through the full knowledge of a problem, alternative, and the consequences of each. This means that models originating from a rational choice can be prescriptive in guiding an organization and an individual in how to reach a decision or descriptive in trying to find how an individual and an organization behave during decision-making (Winnaar & Scholtz, 2019). The rational theories of decision-making assume that decision-makers are rational, goal-oriented, and ruled by reason. This is achieved by identifying and weighing all possible alternatives as well as the consequences of each one (Andersen, 2019). Rational decision-making causes decision-makers to look for several alternatives and their probabilities before choosing one.

For rational decision-making to be successful, a structured process must be followed that requires conscious effort and time. The rational procedure helps decision makers in their goal to achieve a decision by helping them to establish criteria and to identify and evaluate an alternative (Abubakar, Elrehail, Alatailat & Alev, 2019a). This model requires the decision makers to have complete knowledge of the choices and their evaluation and comparison criteria (Cascetta, Cartenì, Pagliara & Montanino, 2015a). Researchers (Kasman & Ali, 2022; Luoma, 2016; Shahid, Rappon & Berta, 2019) have reported positive outcomes of rationality in decision-making. Decision-makers who use rational decisions use their cognition and knowledgeability; they rely upon information gathering and analysis to perform the calculation of each alternative outcome before making or committing to a decision (Kolbe, Bossink & Man, 2019). Rational decision-making investigates how the issue can be divided into a structured decision problem. Its states that the issue should be handled by analyzing and thinking about a set of alternative options and their outcome before reaching a decision (Kolbe, Bossink, & Man, 2019). A rational decision must be comparative, flexible, aware, and consistent (Cascetta, Cartenì, Pagliara & Montanino, 2015b).

Bounded rationality model. One of Simon's works in decision theory is the introduction of the concept of bounded rationality (Alexander, Walker & Naim, 2014a). Simon's work, and especially his bounded rationality approach in decision-making, which is choosing an outcome that is good enough but not the optimal one (referred to as satisficing), gave rise to economic cognitive psychology for decision-making research. This created three major competing cognitive perspectives about decision-making probability, logic, and heuristic models. Decision analysis techniques explained that this model could be classified into three categories: normative, descriptive, and prescriptive. A normative model deals with how people make decisions based on logic and reason that often cannot be understood, e.g., the expected utility theory (Mcfall, 2015). Expected utility benefit is when a decision-maker acts rationally, but the options are prioritized according to what is the expected utility or benefit from it (Alexander, Walker & Naim, 2014b). Descriptive models deal with how and why people make decisions, e.g., the prospect theory. Finally, the prescriptive model explains how people should make a decision, e.g., value-focused thinking (Mcfall, 2015). The prospect theory states that decision-makers will make a risky decision when things are going badly (Alexander et al., 2014b). Classical and neoclassical theories state that the main goal of decision-making is to be rational in collecting all information, generating all possible alternatives and examining their consequences, and finally, choosing the best alternative that will solve the investigated issue. Simon challenged these two approaches and asserted that these two concepts are not realistic and do not correspond with the real world because decision-makers will not have control over the environmental factors as well their mental capabilities. Bounded

rationality challenges the rationality concept in making a decision due to the mental limitation capability of decision-makers (Kalantari & Simon, 2010).

Rationality decreases when people are faced with high uncertainty, creating a threatening situation (Winnaar & Scholtz, 2019). Based on bounded rationality, decision-makers do not always consider the goal when making a decision because they do not have complete information about the environment. Instead, decision-makers select alternatives that satisfy the minimum requirements, i.e., those alternatives that satisfy the requirement. The rationality model states that all alternatives must be considered before selecting one, but people evaluate them sequentially until they find the first satisfactory alternative, which contradicts the rationality model (Mcfall, 2015).

Intuitive decision-making. Intuitive decision-making is defined as "holistic thinking, immediate insight, seeing the answer without knowing how it was reached." Intuition is often perceived by decision-makers as a pattern of feelings and objects in seemingly unconnected facts. The role of intuitive decision-making is of two steps (1) Emotional decisions are made explicitly, and (2) implicit decisions are made based on past decisions (Abubakar, Elrehail, Alatailat & Alev, 2019b). Intuitive decision-making allows VT members to express their gut feeling and emotions, whether it is positive or negative emotion about a decision option. In purely intuitive decision-making, emotions are used to reach a decision instead of reasoning, as in rational decision-making (Kolbe et al., 2019). There is a growing interest in understanding "impulse-driven behavioral logics" behind decision-making, which complements future and past research that seeks to understand the "intendedly rational logics" of decision-making. Intuitive decision-making has been proposed as an alternative and complementary approach. Intuitive decision-making is defined as "choices for alternatives that are driven by affectively charged judgments that arise through rapid, nonconscious, and holistic associations." An intuitive process occurs on the nonconscious and subconscious levels, which, in contrast to the rational process, can be managed consciously and actively (Kolbe et al., 2019). Simon challenged the view postulating that a decision being made intuitively or judgmentally is irrational. He claimed that if a decision is made based on an intuitive response and is also based on the experience of the decision-maker, it can be considered rational. He argued that both the conscious and nonconscious parts would function the same in the decision-making process, and "they involve drawing on factual premises and value premises, and operating on them to form conclusions" (Kalantari & Simon, 2010).

Political decision-making. In contrast to the rational model, decision-makers do not focus on a single issue but on inter-organizational problems to achieve their personal goals instead of organizational ones. Political decision-making is concerned with the social interaction between members through forming alliances

during the decision-making process. Political decision-making is defined as follows: "decisions emerge from a process in which decision-makers have different goals, forming alliances to achieve their goals in which the preferences of the most powerful prevail." Several research efforts have reported a negative outcome of political behavior on organizational performance and decision outcomes (Kolbe et al., 2019). Political pressure can override the rational analysis, which will deter the decision (Alexander et al., 2014b). The decision-making models are presented in Table 1.4.

Table 1.4. Decision-making models (Awuor, Weng, Piedad & Militar, 2022; Humphreys & Trotman, 2022)

Rational model	Bounded rationality	Intuitive decision-making	Political model
1. Decision-makers are confronted with several known alternative courses of action. 2. Each alternative has possible consequences. These consequences are known by the decision-makers. 3. Decision-makers rank the consequences and choose an alternative.	1. Sequential attention to an alternative solution. 2. Heuristic. 3. Satisficing.	1. Explicit decision that is based and reached based on emotions. 2. Implicit decision based on a previous decision.	1. Decision-makers focus on achieving their personal instead of organizational goals. 2. Political pressure can override rational analysis.

Previous research has demonstrated that using structured decision-making models can improve the efficiency and quality of decision-making (Šmite, Wohlin, Aurum, Jabangwe & Numminen, 2013). Team decision processes focus on how a team shares, examines and uses the information to make a decision (O'Neill, Hancock, Zivkov, Larson & Law, 2016). Decision-making in a team is an important component of its performance. The most effective decisions are those made after collecting and analyzing information. It is here where a strong team differs from a weak one (Wei et al., 2017). Scholars (Johnson et al., 2018; Meluso et al., 2021; Oesch & Dunbar, 2018) agreed that effective teams must first thoroughly define the issue before deciding on a course of action (Wei et al., 2017).

Decision-making models provide a structured approach to making decisions based on specific criteria, factors, and processes. The relationship between decision-making models and virtual teams is important as virtual teams often face

unique challenges in making decisions due to their geographically dispersed nature, reliance on technology, and potential communication barriers. By using decision-making models, virtual teams can ensure that their decision-making process is structured, effective, and transparent. In the context of virtual teams, decision-making models can help to overcome such challenges as communication barriers and time and cultural differences. By using a structured decision-making model, virtual teams can ensure that all team members are involved in the decision-making process and that decisions are based on established criteria and processes. Additionally, decision-making models can help in the promotion of transparency and accountability, which is important in virtual team settings where team members may not have direct visibility into each other's work. Overall, the relationship between decision-making models and virtual teams is important in promoting effective decision-making, collaboration, and success.

Employees at all levels of organizations need to become familiar with decision-making models and understand the bias that can lead to a bad decision. Understanding these models will provide high-quality, efficient decisions, which will affect the overall organization's performance. The next chapter analyzes factors affecting decision-making in VT and presents the model and hypotheses.

1.4. Conclusions of the First Chapter and Formulation of the Dissertation Tasks

Based on the performed literature review, the following can be stated:

1. Information and communication technologies (ICT) are transforming personal, social, and business lives. Many countries have developed national ICT policies to guide integration. ICT is crucial for business success, affecting mechanisms used to capture the value and gain profit.
2. Organizational behavior, design, intelligence, and decision-making are directly influenced by ICT. Virtual, negotiated, and traditional organizations and vertically integrated conglomerates are new organization types that have emerged due to information technology changes. Virtual and negotiated organizations are the most common types today, enabling companies to reduce costs and respond to market changes.
3. The fourth industrial revolution has led to the creation of virtual teams, which offer such benefits as improved work-life balance and employee satisfaction. Various models, such as the technology acceptance model and the Theory of Planned Behavior, help forecast ICT adoption.
4. Organizations rely on effective decision-making for success, and virtual teams reach decisions using a sequence of activities rather than a single activity.

5. Models, such as rational, bounded rationality, intuitive, and political models, help evaluate decisions.

The next chapter will explore factors affecting decision-making and construct a theoretical model.

2

Forming Research Methodology for Identifying Factors Affecting Virtual Team Decision-Making

This chapter examines and explains the decision-making model of VTs in organizations in detail. The suggested model deals with measuring VT decision-making by analyzing how VT decisions are made by examining factors that affect them. The need is assessed to measure VT decision-making in the Middle East countries (UAE) to provide strategic insights for transferring VT decision-making into increased VT performance and hence, organizational performance. The research results of this chapter were published in two publications (Davidavičiene c 2020a; Davidaviciene et al., 2020b).

2.1. Factors Affecting Decision-Making

In recent years, there has been a change in the structure of an organization from hierarchical structures to team structures. With team structure, the power is decentralized, allowing teams to be responsible for decision-making in the organization (O'Neill et al., 2016). Virtual teams allow people with different backgrounds, expertise, and culture to work together, despite their physical location. This results in successful and optimal decision-making. Group decision-making

occurs when team members interact with each other to reach a decision (Ureña, Kou, Dong, Chiclana & Herrera-Viedma, 2019). The study of decision-making involves locating and selecting options in accordance with the decision-maker's values and preferences. Making a decision involves other options to be considered. As many options as possible should be identified to choose the one that most closely fits objectives, preferences, beliefs, and other criteria (Fülöp, 2001). Making decisions as a team is crucial to its effectiveness (Flores-Garcia & Bruch, 2019). Effective decisions are critical for team effectiveness, and a well-performing team will have effective decision-making. For a better understanding of group decisions in virtual team dynamics, an analysis of the interaction patterns within group decision-making is very important since interactions are at the heart of group decisions. By involving a series of activities and choices, virtual teams make decisions more continuously (Wei et al., 2017). The need to consult multiple team members makes VT decisions complex (Salcinovic, Drew, Dijkstra, Waddington & Serpell, 2022). To completely understand the causes of successful and unsuccessful decision-making effectiveness, it is crucial to research the entire decision-making effectiveness. Cultural intelligence, conflict (task and relationship), transformational leadership, trust, ICT, information sharing, and language are factors that received the greatest attention and citations by several authors, as shown in Table 2.1.

Table 2.1. Studied factors by authors (compiled by the author)

Factor	Authors
ICT	(Ackermann & Yearworth, 2018b; Baralou & Dionysiou, 2022; Eisenberg, Post & Ditomaso, 2019; Marín-Díaz, Riquelme & Cabero-Almenara, 2020; Salcinovic et al., 2022)
Trust	(Davidavičiene et al., 2020; Garro-Abarca et al., 2021; Topaloglu & Anac, 2021; Ureña, Kou, Dong, Chiclana & Herrera-Viedma, 2019)
Language	(Davidaviciene, Al Majzoub, et al., 2020; Kiely, Butler & Finnegan, 2022; Kwok, Chiu, Rosenbaum & Cunningham, 2022; Presbitero, 2019)
Information sharing	(Davidaviciene & Al Majzoub, 2020; Flavián et al., 2022; Majzoub, 2019; Zhang, 2022)
Cultural intelligence	(Batırlık et al., 2022; Hiran & Henten, 2020; Morrison-Smith & Ruiz, 2020; Shaik et al., 2019)
Transformational leadership	(Davidavičiene et al., 2020; Han & Hazard, 2022; Kanthawongs, 2022; Panteli et al., 2019)
(Task & relationship) conflict	(Klonek et al., 2022; Morrison-Smith & Ruiz, 2020; Wang, Wang, & Chang, 2019; Wu & Abdul-Nour, 2020)

Table 2.1 summarizes the factors studied by the author. These factors will be discussed further in detail.

2.1.1. Task and Relationship Conflict

Conflict is detrimental to teamwork and negatively affects the organization (Lee et al., 2018). A virtual team consists of members representing different knowledge, culture, values, and perceptions. This diversity has the potential to improve decision-making in VTs by introducing fresh knowledge, skills, and solutions, and to spark a conflict among VT members, impairing decision-making (Wu, Zhao, Zuo & Zillante, 2019). A conflict results from differences in perceptions, opinions, communication, and values between people working together. Cultural values, norms, and social interactions are programmed into the minds of people, allowing them to interpret behaviors based on those beliefs and values. A conflict is likely to occur between team members when representatives of different cultures interact and misunderstand each other's intentions or perceive the other's behavior and motives as threatening (Cagiltay, Bichelmeyer & Kaplan Akilli, 2015). Team members using ICT lack the ability to communicate non-verbally, making it difficult to identify a conflict that exists between team members (Orengo & Thompson, 2015).

Different factors can cause conflict between team members, such as cultural differences, disagreements about group values, and demographic differences. There are two types of conflict: (1) task conflicts and (2) relationship conflicts. There are several reasons for relationship conflict between teams: different norms, values, behaviors, and attitudes. Conflicts related to task assignments are often about policies and procedures when distributing resources or divergent interpretations of facts. Conflict manifestation and perception are two ways to experience a conflict. Manifested conflict members are unaware of the conflict, and their overt behavior demonstrates that they are unaware. Members of the perceived conflict appear to be aware of the dispute from their actions (Paul & Dennis, 2018).

Task conflicts are defined as "conflicts about the distribution of resources, procedures and policies and judgments and interpretation of facts." Task conflicts promote opposing thinking and enhance the sharing of broader thoughts and ideas that are beneficial in decision-making. Disagreement about the task that needs to be solved leads to a healthy discussion between team members, which allows members to scrutinize task-related issues and engage in deeper thinking and sharing of related ideas; this process helps the group to be more effective and enhances a decision (Lee, Avgar & Park, 2018).

Relationship conflict is defined as "interpersonal incompatibilities among the team members, which typically includes animosity, tension, and annoyance

among members within a group" (Nawaz & Gomes, 2018). Relationship conflicts increase the perception of negativity between team members, leading them to avoid and disengage with one another, which creates social categorization between members, and hence, negatively affects decisions (Lee et al., 2018). Relationship conflict will lead to such negative emotions as anger, frustration, jealousy, and tension, negatively affecting on team's performance and decision-making (Rezvani, Barrett & Khosravi, 2018).

Identity-based is another type of conflict that arises from disagreements over the intrinsic value of social groups. The conflict between different identity groups is the origin of this conflict which has nothing to do with work. An interpersonal conflict is more difficult to resolve than a social identity conflict because other members of the group take sides according to gender, race, sexual orientation, nationality, or religion. These conflicts are emotionally charged and are very hard to resolve. Competition over resources or fear of invading identities can be the causes of conflict (Peñarroja, González-Anta, Orengo, Zornoza, & Gamero, 2022).

Task conflict and conflict in interpersonal relationships will be the main topics of this study. Conflicts at work and in personal life interact and have an impact on one another. In contrast to an interpersonal conflict, a task conflict does not involve such intense negative emotions (Wang et al., 2019). There is a negative link between a task and a relationship. A task conflict can trigger a relationship conflict between team members. A task conflict can involve emotional and personal feelings, especially when one's conflict is misconstrued as harmful (Lee et al., 2018). Task and relationship conflicts among team members are mainly caused by ICT use, team size, culture, and task function (Chang, Hung & Hsieh, 2014; Wu, 2020).

Decision-making in virtual teams will degrade as a result of the disagreement because members will be uncomfortable, and information will not be shared that will boost decision-making (Derven, 2016). Research (Topaloglu & Anac, 2021; Wang et al., 2019; Witman, 2018; Zhang & Zhang, 2019) showed that when it comes to non-routine and cognitive tasks, a task conflict enhances performance, but a personal conflict is harmful to VT decisions. This means that conflicts can be both productive and destructive for team performance. An interpersonal conflict is influenced by a variety of things, including disagreement (different wants, values, etc.), interference (when a team member works against the accomplishment of another's goals), and bad emotions (e.g., anger) (Wang et al., 2019). Decision-making requires members with different functional backgrounds to exchange ideas, synthesizing diverse viewpoints into a unified view, which is caused by functional diversity among VT members. It will take some time for the perception of "who knows what" to be formed among team members (Wu, 2020). Due

to the different perspectives of team members presented through task conflict, decision-making can be enhanced (Wu, 2020). In a sense, a task conflict stimulates communication and information sharing, which, in turn, helps the decision-making effectiveness (Kiernan, Ledwith & Lynch, 2019; Susskind & Odom-reed, 2019)

The following hypotheses are derived from the above literature:

H1. a: A relationship conflict has a negative effect on decision-making effectiveness in VTs.

H1. b: A non-routine and cognitive task conflict has a positive effect on decision-making effectiveness in VTs.

2.1.2. Transformational Leadership

Due to organizational changes from hierarchical to more flexible structures, organizations have been forced to find new ways to manage work. Leadership is crucial to the success of a business since it makes a significant impact on the performance of the people on the team (Carita, 2014). According to Maduka, Edwards, Greenwood, Osborne, and Babatunde (2018), leadership is defined as "influencing of behaviors and attitude of individuals, including the interaction within and between groups regarding goals and vision achievements." In VTs, the team leader is a virtual leader who communicates with them via ICT. This leader must exert a lot of effort to oversee team projects, foster relationships, and facilitate teamwork (Flavian, Guinalíu & Jordan, 2018).

Trust, conflict management, decision-making, and expressing one's opinion are just some difficulties that arise from team members not physically interacting with one another. These difficulties may have an impact on the success of virtual teams. These challenges are overcome by leadership (Hoch & Dulebohn, 2017). According to VTs, leaders are individuals who inspire others, achieve the greatest possible job completion, effectively manage conflict, and increase team member happiness. A team leader who develops a personal connection with their teammates promotes trust and unity (Paul, Drake & Liang, 2016). To succeed in international business, leaders must have a solid understanding of many cultures and languages (Zwerg-Villegas & Martínez-Díaz, 2016).

Virtual environments present a variety of difficulties for leaders, including managing distant teams, fostering connections and trust among team members, and managing conflict. When there is no face-to-face engagement, leaders have a tougher time doing their tasks; for example, differences in cultural background can lead to conflicts between members due to incorrect interpretation of messages. Communication and motivation must be used effectively by the leader to motivate the members of their team. In virtual settings, all leaders must have certain characteristics embedded into them, such as leadership techniques, communication

techniques, personal skills, collaboration skills, and global communication skills (Eisenberg et al., 2019). Leaders who deal with their subordinates' behavior in the team by giving rewards and punishments make employees more willing to participate in decision-making (Navimipour & Charband, 2016).

Literature focuses on three types of leadership styles: transactional, laissez-faire, and transformational, but transformational leadership gets a lot of attention in literature reviews (Acai et al., 2018b; Al Zain et al., 2018; Derven, 2016; Gibbs et al., 2017; Plotnick et al., 2016). High levels of performance at work and on the team are the outcome of transformational leadership's ability to inspire followers to realize their full potential and perform at their highest level. Transformational leadership is characterized by motivation, influence, taking the individual into account, and stimulating their mind (Eisenberg, Post & Ditomaso, 2019). To support the team's objectives and motivate individuals to provide their best effort, a successful VT leader practices transformative leadership (Maduka et al., 2018). Transformative leaders are results-drivers with a keen sense of relationships. They recruit team members with complementary abilities, foster a collaborative work environment, and prioritize the best suggestions when making judgments (Derven, 2016).

Transformational leaders demonstrate the following four traits (leader's ability to be a mentor): idealized influence, which is the degree to which followers admire their leader's actions; intellectual stimulation, which is the degree to which the leader challenges norms and takes risks; inspirational motivation, which is the degree to which followers find the leader's mission and vision appealing; and individual consideration. For transformational leaders to enhance decision-making, they need to display these four behaviors (Mohaghegh & Furlan, 2020). Leadership is transformational if it inspires loyalty, trust, admiration, and respect in followers (Maduka et al., 2018). Leadership that encourages autonomous decision-making is transformational (Parveen, 2019). When VTs work under a transformational leadership style, their decision-making is more accurate (Mukherjee, 2012). Positive results can be achieved through the transformational leadership style and improved problem-solving and decision-making (Chang & Lee, 2013) (Anak Manggai, Bin Thukiman, Bin Othman, & J Simon, 2019). Based on the above, the following hypothesis was proposed:

H2: Transformational leadership has a positive effect on VT's decision-making effectiveness.

2.1.3. Cultural Intelligence

Almost every company today has people from different nationalities working together to achieve organizational goals. Understanding how culture influences our work is especially important when it comes to decision-making. Understanding

the factors that drive people's behavior and decisions is crucial to understanding how they make or reach decisions. Cultural differences between team members can cause negative behaviors, as values and attitudes are influenced strongly by culture (Harzing & Pudelko, 2014). Culture will be transmitted from generation to generation by the structures and systems created in the organization (Glazer & Karpati, 2018). Culture influences the way individuals feel, behave, and think. A person's cultural background influences how he or she collects, processes, and gathers information. In addition, it impacts how information is processed and the explanation individuals provide as to why they reached such decisions (Glazer & Karpati, 2018). Decisions are impacted by culture to varying degrees (Glazer & Karpati, 2018).

Culture is the shared values, characteristics, and behaviors of residents in a region (Duran & Popescu, 2014). Information is interpreted and processed differently according to the cultural context. Depending on the interpreter's national culture, information is evaluated and interpreted differently (Paul & Dennis, 2018). Yates & Oliveira (2016) found that some cultures base decisions on their preferences and values, while other cultures look for advice. Working in the social system helps individuals to learn new things. They communicate their social ideals to other community members, influencing choices and deeds (Guan et al., 2015).

Culture plays a significant role in decision-making. Before deciding, individuals need to understand the cultural norms, values, and beliefs of others. In some cultures, this may lead to decision-makers not consulting anyone (Glazer & Karpati, 2018). Based on experience scenarios, people frame their understanding of a situation, and cultures shape and influence these frames. To make sense of events, an individual can access, interpret, and retrieve information. Individuals' cultures determine how they interpret and impose meaning on particular circumstances (Glazer & Karpati, 2018). Depending on whether they see it as an opportunity or a threat, or neither, people from various cultures interpret the same piece of information differently (Yates & Oliveira, 2016). Uncertainty avoidance, individualism, power distance, and masculinity vs. femininity are the four cultural characteristics that Hofstede developed, making him one of the most influential scientists in the field of cultural studies (Duran & Popescu, 2014; Harzing & Pudelko, 2014).

1. Individualism vs. collectivism: In addition to receiving considerable research, individualist culture places a great deal of emphasis on autonomy and individual achievement (Yates & Oliveira, 2016). In an individualistic culture, there is a strong emphasis on individual effort, whereas, in a collectivist culture, there is a strong focus on paramount group needs (Glazer & Karpati, 2018). An individualist culture places a higher priority on personal goals than group goals, whereas a collectivist mindset expects

each member to work together to achieve their goals (Guan & Chen, 2015). Due to these differences, different cultures have taken different approaches to decision-making. Individualist cultures tend to view decision-making positively (Yates & Oliveira, 2016).

2. Power distance: Power distance culture accepts that power is not shared equally and reinforces strict hierarchies between supervisors and subordinates. The supervisor is the only one able to make team decisions.
3. Masculinity vs. femininity: Cultures of masculinity emphasize the different roles of men and women; they emphasize wealth and victory and solve conflicts using force. In feminine culture, social networks are promoted, as well as environmental welfare. Decisions are made through open conversations and consensus (Glazer & Karpati, 2018).
4. Uncertainty avoidance: A culture of uncertainty avoidance is based on structures, responsibilities, regulations, and processes. On the other hand, cultures with low levels of uncertainty avoidance are more tolerant of ambiguity and innovation, and the workers are possibly less stressed. People who work in organizations with poor ambiguity tolerance tend to ask more questions or engage in more discussions before making decisions (Glazer et al., 2018).

Hall (1976) argued that culture is expressed differently through communication. According to Hall, there are two categories of cultural communication: low-context and high-context. While language and laws are explicitly used in low-context cultures, high-context cultures make use of such contextual aspects as body language and voice tone (Harzing & Pudelko, 2014). The varying cultural origins of VT members make communication and decision-making difficult. But cultural intelligence (CQ) lessens the drawbacks of cultural variety and improves judgment (Wood & St. Peters, 2014). VT members are less likely to experience deep or surface-level diversity challenges, which can have a negative impact on decision-making if they have higher levels of CQ (Presbitero, 2019). Lack of cultural intelligence among team members negatively impacts decision-making due to misunderstandings, conflict, and diminished trust (Shaik et al., 2019).

Cultural Intelligence is defined as "a person's capability for successful adaptation to new cultural settings, that is, for unfamiliar settings attributable to cultural context." The culture quotient (CQ) is a four-dimensional construct of cultural intelligence (Shaik, Makhecha & Gouda, 2020). There are four dimensions to the construct: (1) metacognition, which refers to how individuals respond to their knowledge of various cultures (Wood & St. Peters, 2014); (2) cognitive competence, which requires a person must be aware of the norms and values of the culture; (3) motivation, and one way to motivate someone is by directing their efforts toward learning, understanding, and communicating across cultures regardless of the encountered challenges (Bernardo & Presbitero, 2018); and (4)

behavioral interaction involves actions taken by employees across cultures by using verbal and non-verbal cues. People's ability to function in different cultural environments is measured by their cultural quotient (Wood & St. Peters, 2014). The following hypothesis was proposed based on the literature review: CQ mitigates the negative effects that culture has on VT members:

H3: The decision-making effectiveness in VTs will be positively impacted by cultural intelligence (CQ).

2.1.4. Trust

A virtual team, compared to traditional face-to-face teams, experience more issues and challenges due to the loss of body language and non-verbal cues. Building trust is one of the most important challenges that are faced by VTs (Yu, 2019). Trust is the main destroyer of virtual working teams and one of the most important factors that affect team performance (Zuofa & Ochieng, 2017). It is difficult to build trust between team members due to physical distance and cultural differences. Trust is one of the main determinants of an organization's success and growth. Creating trust in virtual teams is different from building trust in traditional teams because there is no face-to-face interaction between team members, which makes establishing confidence in a virtual setting challenging (Flavian et al., 2018).

Trust **"**is the extent to which one party is willing to depend on something or somebody in a given situation with a feeling of relative security, even though negative consequences are possible." In a team context, trust is defined as "the degree of confidence of team members in one another" (Wook, 2016). The following four features of this definition are as follow: (1) reliance on the trustee; (2) trustworthiness of the person who is being trusted; (3) positive and negative utility that will lead to either a positive or bad consequence; and (4) the risk that the trusting party will accept. When one has confidence in another person, they are willing to put themselves in a vulnerable position for them because they know they can rely on them (Paul et al., 2016). Trust in the VT follows the belief that each member will act upon the agreed commitment with good intentions and will work hard on behalf of the group (Chang et al., 2014). A trusting relationship allows people to be taken advantage of for the collective good of the team. Building trust mostly depends on the members' cultural backgrounds (Lippert & Dulewicz, 2018). Virtual teams achieve trust through sharing timely and appropriate responses through ICT, which are task-based relationships, unlike traditional teams, which build trust by interacting face-to-face (Han & Beyerlein, 2016). A team's ability to share knowledge and make decisions is highly influenced by trust between team members. Having trust between team members reduces the psychological distance between them (Flavian et al., 2018). When team members trust their partners, they

will have strong social ties, which will increase their contribution to decision-making (Navimipour & Charband, 2016). If virtual teams are temporary and working under time constraints, they form what is known as swift trust. Swift trust is unique trust, which is associated only with virtual teams, and it is not cognitive or affective and occurs at the early stage of team formation (Yu, 2019).

There are three different types of trust: knowledge-based, identity-based, and calculus-based trust. The early development of trust is crucial for the development of knowledge-based trust. Within the VT, trust is precarious. In social exchange theory, trust is established after swift trust is established and depends on the knowledge gained about team members as well as positive and negative events that occur or will occur in the future (Jaakson et al., 2019). When people are in a trusting environment, they tend to believe that their behaviors will result in positive outcomes. There is a sense of obligation when team members trust each other to share knowledge, and they are more motivated to share knowledge to avoid breaking the obligation. This enhances decision-making when team members trust each other (Pangil & Chan, 2014). Ability, benevolence, and integrity were three factors considered as trust antecedents. A leader's ability is determined by their skills and competencies, benevolence by their intentions and motivations, and integrity by their conduct (Flavian et al., 2018).

The level of trust varies between physical and online teams. Trust tends to grow over time in collaborative settings where team members interact in person. Virtual environments initially have a high level of trust, but over time, they may either decline or rise (Jaakson et al., 2019). Team members are more inclined to trust one another if they have good interpersonal relationships (Maynard, Mathieu, Gilson, Sanchez & Dean, 2019). Cognitive-based trust emerges within a virtual team because of (1) the lack of emotions and feelings transferred between team members due to information and communication technologies (ICT) having a detrimental effect on trust; and (2) trust decisions are influenced by competence, goodness, and integrity of team members (Alsharo, Gregg & Ramirez, 2017). There is mistrust in virtual teams for a variety of reasons, including the absence of nonverbal cues and geographic separation. Team members' mutual trust leads to the best possible decision-making (Lowry, Schuetzler, Giboney & Gregory, 2015). According to research, trust has a favorable impact on how VTs make decisions (Drouin & Bourgault, 2013; Shagholi, Hussin, Siraj & Naimie, 2010). Decision-makers respect the advice of reliable sources (Ureña et al., 2019). When making decisions online and maintaining relationships between members of virtual teams, trust is crucial (Flavian et al., 2018). Trust makes people more likely to ask for help and engage in other activities, which affects virtual teams' decision-making (Bond-Barnard, Fletcher & Steyn, 2018). Based on the foregoing, trust is an important factor in VT decision-making. The following hypothesis was formulated:

H4: Trust between VT members will positively affect VT decision-making effectiveness.

2.1.5. Language Communality

Language has been labelled as a neglected factor by many scholars (Harzing & Pudelko, 2014) and is one of the main obstacles and the root of the problem in cross-cultural communication. Language encompasses social interactions and customs, which vary from culture to culture (Cagiltay et al., 2015). Rather than being a criterion for graduation, language proficiency is increasingly a requirement for admission. Case studies and the course delivered as a whole, however, only show indirect contact and not actual interaction between team members. First-hand experience is required to develop soft skills needed for managers and employees, like cultural intelligence and agility. Companies are adopting overseas assignments to improve their managers' skills (Zwerg-Villegas & Martínez-Díaz, 2016). In recent years, language has become increasingly popular as a factor in VT decision-making. Different linguistic abilities have been shown to interfere with communication between team members. Language differences have a negative effect on group decisions, lowering group trust (Klitmøller, Schneider & Jonsen, 2015).

It is common for multinational corporations to have employees from different cultures who speak different languages. Recently, language differences have received research attention as one of the most important factors in interpreting information to reach a decision. Language barriers can make it more difficult for VT members to communicate with one another, resulting in conflict and disrupting decision-making. VT members are frustrated and dissatisfied by language problems, which negatively affect their decision-making (Harzing & Pudelko, 2014). Team members who speak a common language are more likely to work cohesively and make better decisions. Individuals in VTs are defined as language communality in the degree to which they share common knowledge of grammar, vocabulary, and other aspects of the English language (Klitmøller & Lauring, 2013). Communication between members of a virtual team can be disrupted by language differences, thus affecting decision-making. Language differences also contribute to social categorization between team members, reducing understanding between them. Low language proficiency on a virtual team will lead to anxiety and uncertainty, which will negatively affect their decision-making (Klitmøller et al., 2015).

Language differences may lead to conflict and the formation of subgroups. Social categorization is an issue faced by a virtual team that can lead to a decrease in performance and affects decision-making (Li, Yuan, Bazarova & Bell, 2019). Team members who do not communicate in their mother tongue but instead use a

second language will face difficulty in providing proper meaning, which can cause misunderstandings directly affecting decision processes. Native speakers have multiple meanings for words, whereas people using a second language lose nuances (Harzing & Pudelko, 2014). Language is one of the most important factors and, if managed correctly, will enhance decision-making. VT members who are less proficient in the spoken language will exclude themselves and disengage from group discussions, which will affect decision-making badly (Presbitero, 2019). Multilingual teams have diversity in spoken language, which affects team understanding and team outcome. Language proficiency can lead to fault lines which can create power struggles and subgroup formation. In addition, the lack of language fluency will lead to difficulty in expressing members' ideas and interpreting emotions (Fleischmann, Aritz & Cardon, 2019).

Language diversity is defined as the number of languages spoken and managed inside the organization (Lauring & Selmer, 2009). Due to differences in language proficiency between VT members, influences the team's decision-making by creating a social categorization between them (Presbitero, 2019). English language is the most common language spoken across international companies and has become the spoken corporate language. It allows non-natives to communicate with each other's and communicate with native speakers (Lauring & Selmer, 2009). Individuals that are unfamiliar with spoken language are prone to misinterpret information received by other group members and find it more difficult to communicate (Lauring & Selmer, 2012). To obtain effective communication for complex knowledge or information sharing between VT members that can be prone to different interpretations, lean media must be used. For sharing noncomplex information or knowledge that does not have much room for a different interpretation, rich media can be used (Swol & Kane, 2019).

Less language-proficient members feel insecure and dominated by proficient group members, which leads individuals to avoid communication and hamper the sharing of ideas, which affects decision-making due to withheld unique information. It is important that team members can choose an appropriate medium to share ideas and prevent frustration. Research shows that people communicating in non-native tongues prefer lean media over rich media (Klitmøller et al., 2015). For testing, the following hypothesis is offered:

H5: The language communality difference will have a negative effect on decision-making effectiveness in VTs.

2.1.6. Information Sharing

Information sharing refers to the attempt of an individual to intentionally and consciously provide information related to decision-making. Information sharing has been viewed as an antecedent of successful decisions. Unique information sharing

by team members provides the team with all available cognitive resources to reach a decision (Xiao, Zhang & Basadur, 2016). Information is an essential element in providing competitive advantage and success in any organization. Information sharing between members means that individuals share their unique information to turn it into team information (Espevik & Hystad, 2022). Moreover, information sharing is not an obligatory action, as members voluntarily choose to share their unique information (Hahm, 2017). To achieve success in GVT, information sharing and collaboration are key components. Most teams do not reach appropriate decisions because members discuss what is relevant and likely to be common and neglect to discuss unique things. For a vigilant decision-making process, information sharing needs to be constructively discussed and integrated (Maynard et al., 2019).

Due to differences in information, knowledge, and skills among members, organizations use teams to make decisions. It is mainly the efficiency and the ability of members to share information that determines the completeness of information sharing in a team. According to research, teams have difficulty making decisions due to the failure to share important information or unique information during information exchange, as members tend to focus on the information they already know (Mcleod, 2013). One of the major reasons why organizations shifted to work teams is because challenges are too complex to be handled by one individual. Thus, team members must engage in information sharing to address and solve such complexity. Information sharing between VT members will enhance decision-making (Neill, Holland, Hancock & Mclarnon, 2019). VT members communicate to reach a decision. This communication leads to an exchange of information related to the problem they need to solve and the process of how to reach a decision. Such information sharing can be of two types: common information sharing and unique information sharing. Common information is known to all team members, and its discussed widely in the team. People, especially low-status members, can obtain recognition and respect from others by sharing common information. In addition, by repeating common information, members can increase their understanding and familiarity with each other. Unique information is known only to individuals and is unknown to other team members, and it is very important for decision-making (Luo, Wang, Yoon & Tong, 2019).

VTs need to exchange information to solve complex problems and make decisions (Cordes, 2016). Team members must motivate the process of sharing unique information by not involving in any judgment or mocking of the information shared by other members (Neill et al., 2019). The more information team can share, store, analyze and use, the better the team's decision. Information sharing increases team knowledge, which improves decision-making (Wilderom, 2020). As more relevant information is gathered and analyzed, decision-making becomes more effective. Successful VT tends to analyze in depth the information

they gather before reaching a decision (Wei et al., 2017). Effective decision-making will be achieved by proper information sharing between VT members and a shared comprehension of what information is pertinent. Team identification and the lack of trust between team members are some of the obstacles to proper information sharing. Team members who share information will be able to make an informed decision since proper information sharing will help the group, first, to understand the problem situation, second, to establish decision criteria, and third, to assess the pros and cons of the decision (Mcleod, 2013).

As more relevant information is gathered and analyzed, the more effective decision-making becomes. By using ICT to keep in touch, virtual teams differ from face-to-face teams in the way they communicate. Multiple perspectives from team members pose a challenge to VTs and can result in weak information exchange. While VT teams share more information than FTF teams, incorrect judgments nonetheless happen as a result of VT members ignoring special or crucial pieces of information; they learn from other team members. This results in bad decisions and subpar teamwork (Bartelt et al., 2013). The members fail to discuss unique information for decision-making if the information sharing is too extensive and overlapping (Baumann & Bonner, 2013). According to the literature reviewed above, failure to share unique information or sharing inadequate information has a significant impact on decision-making. Hence, the following hypothesis is proposed:

H6: Decision-making effectiveness in VTs is positively affected by sharing of unique information.

2.1.7. Information and Communication Technologies

Change in organizational structure can be caused by the rapid development of ICT (Davidavičienė, Raudeliūnienė, Vengrienė & Jakubavičius, 2018). Because of its cost and efficiency, face-to-face communication is no longer the preferred or primary mode of communication (Parlamis & Dibble, 2019). ICT presents challenges as well as opportunities for organizations (Merkevičius, Davidavičienė, Raudeliuniene & Buleca, 2015). ICT advancements and the demand for organizations to have access to world-class expertise have led to the use of virtual teams (Eisenberg et al., 2019). ICT is increasingly used by organizations for communication among team members, resulting in communication problems with VT members, which impact VT performance and decision-making (Gilson, Maynard, & Bergiel, 2013). ICT affects various virtual team processes, including decision-making (Bartelt et al., 2013).

ICT benefits group decision-making in virtual teams by enhancing team member cooperation (Ackermann & Yearworth, 2018b). ICT helps team members

cross boundaries, whether it is physical or social. Group decision-making is challenged by these tools. In contrast to face-to-face meetings, the use of ICT tools will prolong the conversation and eliminate verbal cues that could cause unconventional or poor conclusions (Harzing & Pudelko, 2014). Team information is shared, collected, and exchanged in a whole new way thanks to information technology (O'Neill et al., 2016). ICT is an important factor that affects decision-making in virtual teams. ICT removes such barriers as space and facilitates interaction between VT members. Since everyone is involved, computer-mediated group decision-making produces more accurate conclusions since it allows the team to openly share their thoughts and opinions (Wei et al., 2017).

Virtual team members can use decision-making systems to facilitate their decision-making (Ould, Bouhalouan & Adla, 2016). As a result of computer-mediated technologies, all participants can give their opinions without being interrupted or mocked, which makes group decision-making more democratic. In addition, it facilitates information sharing among members and allows them to share information beneficial for decision-making. Researchers (Aydin & Seker, 2021; Witman, 2018) discovered that asynchronous technology facilitates better decision-making for several reasons; it increases member participation, enables access to all discussions at any time, and allows for additional time for archiving and reflecting on participants' contributions (Wei et al., 2017). When expressing ideas or documenting purposes, some employees prefer to use e-mail to avoid constant interruptions (Handke, Schulte, Schneider & Kauffeld, 2019). Virtual teams can make better decisions using collaborative technologies and groupware (Carita, 2014). By relying heavily on ICT, VTs can overcome geographical distances and asynchronicity (Bisbe & Sivabalan, 2017).

The ICT tools chosen by VT members should match the demands of the tasks they perform, and they should be able to communicate effectively and efficiently. When decision-making is involved, matching media with task demands can be very difficult. In global virtual teams, choosing the right media is very important to establish effective communication. It is generally recommended that media choice be determined by task requirements rather than by the relationships between members of the team. High-performance teams and media choices are positively correlated, according to research (Ruppel, Gong, & Tworoger, 2013).

Message or information is considered effective if the medium can carry and fulfil its purpose of transferring it, including the media richness theory (MRT) and social presence theory (SPT). Based on SPT, the larger the bandwidth of the message, the greater the chance of it being effectively delivered. The MRT predicts that media will produce different kinds of feedback based on their immediate response capability, their level of personalization, and language variety. Because it provides verbal and non-verbal cues during communication, face-to-face is considered the richest medium. By contrast, e-mail is considered the least rich form

of media because it lacks clues regarding content (Handke et al., 2019). Media richness theory has shown that an organization's success depends on its ability to process information of appropriate richness in a way that reduces uncertainty and clarifies equivocality. When ICT is not utilized in virtual teams, information sharing between team members is limited in quality and quantity (Tan, 2019). In light of the above-discussed literature, ICT has direct effects on VT decision-making, especially when the right media is utilized for communicating the decision-making message. Considering the above, it is essential to choose appropriate media to communicate among team members to reach a decision. Hence, the following hypothesis is proposed:

H7: Proper ICT choice will have a positive effect on team decision-making effectiveness.

Since authors who are subject-matter specialists in the field of VT most frequently cited and highlighted these factors, an empirical study will be conducted to assess their impacts on VT decision-making. The next section provides the research methodology and empirical tests of the hypotheses.

2.2. Middle East Peculiarities, Opportunities, and Challenges

Over the past few years, the use of virtual teams in the IT industry has increased significantly. Many US and European companies are building or contracting for new IT services, which will be created in globally distributed teams, such as Indian or Chinese. In recent years, IT organizations have used more geographically dispersed virtual teams. Many companies in the USA, Europe, and Japan outsource such products, services, and solutions. These products and services are created in globally distributed teams in multiple locations in different countries. However, current patterns indicate that new areas in the Middle East are establishing themselves as hubs for IT companies. These Middle Eastern locations include Oman, Dubai, Abu Dhabi, and Qatar. The proximity of these nations to the Arab market is their key selling point. These countries are primarily attractive because they are located near the Arab market. There are very large differences between needs and abilities for investing across sub-regions of the Middle East. Saudi Arabia, Qatar, Kuwait, and the United Arab Emirates are the countries with the highest investments in basic infrastructure (Göll & Zwiers, 2018). Several characteristics distinguish the Middle East from other countries:

- In the Middle East, there are gender, racial, and nationality-based wage and position disparities that make it difficult for team members to communicate with one another. On the positioning scales, male nationals consistently score higher than their female counterparts. The salaries of

Western expatriates are higher. Promotions are determined by nationality rather than credentials.

- In other countries around the world, the workweek runs from Monday through Friday. In contrast, the Middle East works from Sunday through Thursday. There are just four working days that are shared by all the sites as a result. On Fridays, Saturdays, and Sundays, e-mail service must be used for cross-site communication. In addition, it can be quite challenging to predict with absolute certainty the day that a national public holiday will be observed in the Middle East. This impedes communication among sites.
- Islam is the most common religion in the Middle East; team leaders are urged to observe each team member's prayer times to prevent cultural misunderstandings. To enable everyone to participate, meetings should not be scheduled during these times.

Since the Middle East is multicultural, engaging people from all backgrounds and nations in various projects, it is crucial to comprehend the phenomena of these groups that relate across cultural boundaries. The inability of VTs to successfully bridge the three barriers, namely, geographic time zones, distance, and cultural differences, has been proven to be closely connected to their failure (Kaur et al. 2016). Thus, it is impossible to overstate the importance of managing virtual teams in the Middle East (Topaloglu & Anac, 2021).

Numerous global corporations have chosen to locate in the United Arab Emirates (UAE), drawn on the country's extensive growth plan (Kaur, Arif & Akre 2016). Several studies have been carried out on the challenges faced by globally distributed virtual teams and possible solutions, but there have been relatively few studies that focus on VTs in the Middle East, particularly on VT decision-making (Al Kaabi, Sidek & Mosali, 2022). Research on virtual teams is still in its nascent stages, and since virtual teams are relatively new, few areas of research have been examined, especially in the Middle East (Davidaviciene & Al Majzoub, 2022). Since Middle Eastern cultures and work ethics are different from those in other countries, research conducted in other countries might not apply to the Middle East. VT decision-making is a new concept in the Middle East, and many researchers (Al Kaabi et al., 2022; Davidavičiene et al., 2020; Sagar, Arif & Rana, 2021) are looking into them, especially in light of the Covid-19 pandemic. The United Arab Emirates has maritime borders with Qatar and Iran in the Persian Gulf and shares borders with Oman and Saudi Arabia on the eastern end of the Arabian Peninsula. There are two main cities in the country: Abu Dhabi, the capital, and Dubai, the most populous and busiest international hub. There are seven emirates in the United Arab Emirates, including Abu Dhabi, Dubai, Sharjah, Ajman, Ras Al Khaimah, Fujairah, and Umm Al Quwain. In terms of oil, it is the

sixth in the world and seventh for natural gas reserves. Among the Gulf Cooperation Council members, the UAE has the most diversified economy. Increasingly, the country is turning to tourism and business for its economic growth in the 21st century instead of oil and gas. A 5% value-added tax was implemented in 2018 in place of the government's income tax, but there is no income tax. UAE is a major hub for international trade and business and a competitive market for the Information and Communications Technology (ICT) sector. Government initiatives, such as Abu Dhabi Economic Vision 2030 and UAE Vision 2021, aim to create a competitive knowledge economy and set up an open, efficient, effective, and globally integrated business economy to reduce dependence on oil revenue. Several steps have been taken by the UAE government to support the development of the knowledge economy. The UAE government has established several Foreign Trade Zones (FTZs), such as Dubai Internet city and silicon oasis, that specializes in ICT and act as industry clusters for high technologies. Companies within these zones are exempt from 100% import and export taxes, capital and profits can be repatriated, and corporate tax exemptions for 50 years can be renewed. The UAE, and especially Dubai, enjoy minimal trade barriers, making them an ideal location for businesses serving the entire Middle East and North African region. This is also driving the demand for IT software and services within the private sector. UAE is the leader in the Middle East when it comes to ICT and digitalization. Investments in ICT are increasing and approaching USD 1 billion, but closer analysis reveals the biggest chunk is in the UAE (Göll & Zwiers, 2018). Several multinational companies have been attracted to the United Arab Emirates (UAE) because of its massive development programs, especially those in the IT industry (Kaur, Arif & Akre, 2016). As a result of the COVID-19 pandemic, organizations were allowed to examine teams during a time of change while forcing them to determine their essential activities and how to execute them in a virtual environment. There have been significant studies conducted in the United States and Europe regarding this area, but not in the Middle East. Specialized scientific answers are still needed to enhance VT decision-making. Considering that the Middle East is a multicultural region, it is crucial to understand the phenomenon of cross-cultural VTs (Sagar et al., 2021). The Middle East lacks many quantitative studies on VT decisions in IT organizations, even though VT decision-making has been examined in many studies. Naturally, due to different cultures and work ethics, studies conducted in other nations may not be appropriate for the Middle East. To address this issue, a research effort was needed focusing on Middle Eastern VT decision-making in IT organizations.

2.3. Methodology

The literature review discussed the scientific problem in-depth and pointed out the necessity of developing a theoretical model of VT decision-making in organizations. This section aims to give a general overview of the methodology. The research philosophy is presented in Fig. 2.1.

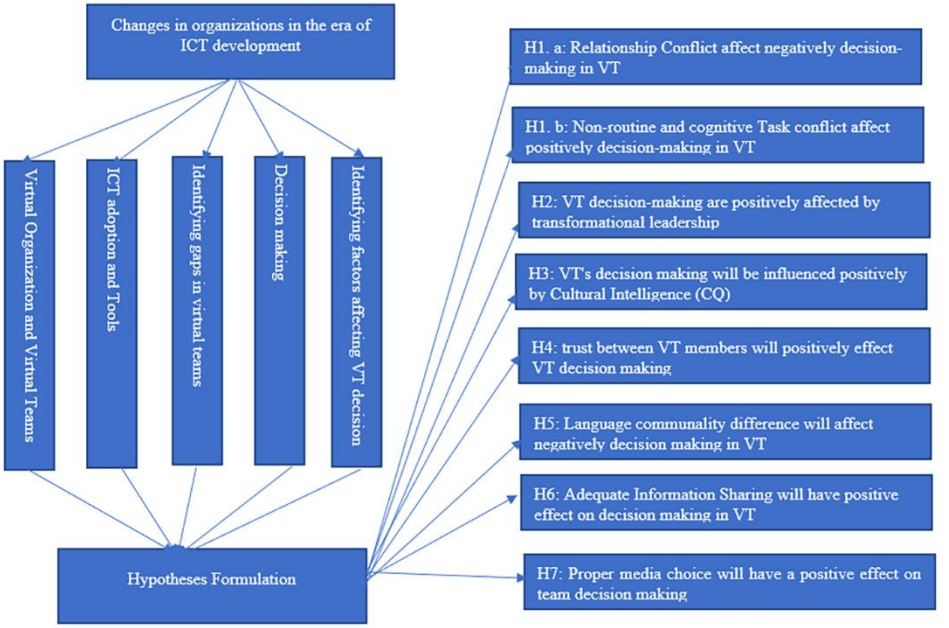

Fig. 2.1. Research philosophy (compiled by the author, 2022)

In this case, the model aims to be adapted to all possible candidates in Middle East countries as well. The model consists of eight factors that affect decision-making in VTs. These factors are task and relationship conflict, ICT, transformational leadership, cultural intelligence, trust, language, and information sharing. The survey research methodology and the qualitative research method were used to explore the relationship between information sharing, trust, language, task conflict, CQ, ICT, TL, and relationship conflict in VT decision-making.

The structural equation model (SEM) and experts' multi-criteria scoring methods were used for the presented UAE module. SEM was used for the following reasons:

1. Examining complex relationships: SEM is particularly useful when analyzing complex relationships among multiple variables. It can provide a

way to test theoretical models and hypotheses about the relationships between variables in a more comprehensive way than traditional regression analysis (Zhang, 2022).

2. Testing multiple hypotheses simultaneously: SEM allows researchers to test multiple hypotheses simultaneously, which can be more efficient than running separate analyses for each hypothesis (Sarstedt et al., 2022).
3. Handling missing data: SEM can handle missing data more effectively than other modeling techniques, such as regression analysis. This is especially important in such fields as psychology and social sciences, where missing data is common (Cheung, Cooper-Thomas, Lau & Wang, 2023).
4. Combining measurement and structural models: SEM allows researchers to combine measurement and structural models into a single framework. This means that researchers can evaluate both the validity of their measures and the relationships between variables in the same analysis (Sarstedt et al., 2022).
5. Testing causal relationships: SEM can be used to test causal relationships between variables. This is particularly useful in such fields as economics, where researchers are interested in understanding the effects of one variable on another (Zhang, 2022).

Expert multi-criteria scoring was used for the following reasons:

1. Provides a fuller picture: Multi-scoring method allows experts to evaluate the product from different perspectives and aspects of usability. By using multiple criteria to evaluate the product, experts can provide a fuller picture of its strengths and weaknesses.
2. Reduces individual biases: Different experts may have different perspectives, biases, or preferences when it comes to evaluating usability. By using a multi-scoring method, the potential for individual biases can be reduced, and the evaluation can be more objective and accurate.
3. Allows for prioritization of issues: Using a multi-scoring method can help prioritize usability issues based on their severity or impact. By assigning scores to each issue, experts can identify the most critical issues that need to be addressed first.
4. Facilitates comparison between products: Using a consistent multi-scoring method across different products or systems can make it easier to compare their relative strengths and weaknesses. This can be particularly useful when making decisions about which product or system to use or when benchmarking against competitors.
5. Overall, an expert evaluation with a multi-scoring method can provide a more complete and objective evaluation of a product's usability, which can help ensure that it meets the needs and expectations of its intended audience.

Research process and procedures. Fig. 2.2 explains how the research process and procedures were used. First, data were collected from VT employees, which led to the creation and testing of the model. Second, data were collected from experts, which led to the creation of the defended model.

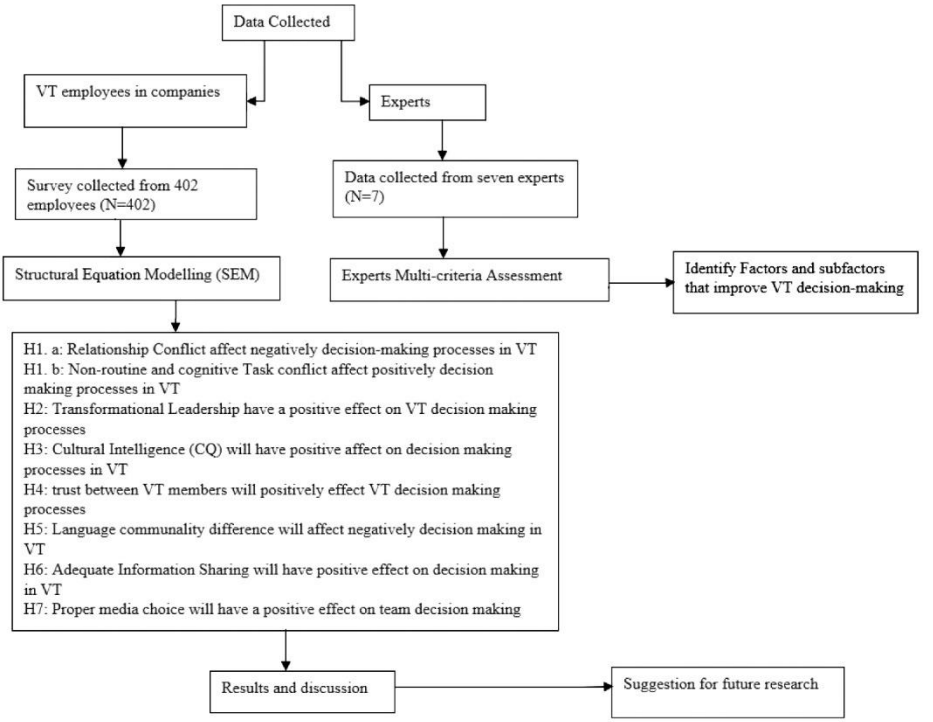

Fig. 2.2. Research process and procedures (compiled by the author, 2022)

Using an empirical procedure, hypotheses were tested. The objective is to validate the theoretical model through its application to real-life situations. Data was collected through an online survey created in Google Forms and distributed to IT industry professionals operating in virtual teams. Annex A includes the questionnaires sent. The following hypothesis was tested using a structural equational model (SEM).

- H1. a: A relationship conflict has a negative effect on decision-making effectiveness in VTs.
- H1. b: A non-routine and cognitive task conflict has a positive effect on decision-making effectiveness in VTs.
- H2: Transformational leadership has a positive effect on VT's decision-making effectiveness.

- H3: The decision-making effectiveness in VTs will be positively impacted by cultural intelligence (CQ).
- H4: Trust between VT members will positively affect VT decision-making effectiveness.
- H5: The language communality difference will have a negative effect on decision-making effectiveness in VTs.
- H6: Decision-making effectiveness in VTs is positively affected by sharing of unique information.
- H7: Proper ICT choice will have a positive effect on team decision-making effectiveness.

These hypotheses led to the creation of the proposed theoretical model presented in Fig. 2.3.

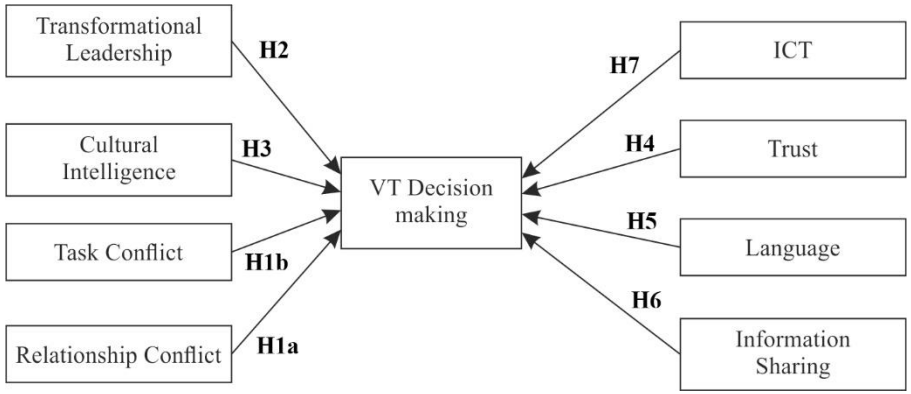

Fig. 2.3. Proposed Theoretical Model

Fifty-one questions were formulated using the literature review (Annex A). Self-administered online survey (Google Forms) with 51 questions was used to gather the data for this study from persons operating in virtual teams. The question answers were based on a five-point Likert-scales ranging from "1," meaning "strongly disagree," to "5," meaning "strongly agree." The elements used to evaluate the variables were obtained from scientific studies. ICT questions were obtained from Eisenberg et al. (2019), O'Neill et al. (2016), and Wei et al. (2017). An example of a question is, "ICT overcomes geographic distance during alternative selection in decision making." Language questions were obtained from Klitmøller et al. (2015). An example of a question is, "Difference in language affects information gathering during decision-making." Information-sharing questions were obtained from Baumann and Bonner (2013) and Uitdewilligen and Waller (2018). An example of a question is, "We usually receive all important information on time." Trust questions were obtained from Flavian et al. (2018).

An example of a question is, “Team members will perform actions that are important to the team.” Relationship conflict questions were obtained from Olson, Parayitam, and Bao (2007). An example of a question is, “Relationship conflicts cause the withhold of information while decision-making.” Task conflict questions were obtained from Olson et al. (2007). An example of a question is, “Task conflict enhances sharing of important information while reaching a decision.” Cultural intelligence questions were obtained from Presbitero (2019). An example of a question is, “I can accurately understand the feelings of people from other cultures before agreeing on a decision.” Transformational leadership questions were obtained from Muganda and Pillay (2013). An example of a question is, “Team leader encouraged people to exchange ideas and collect data.” Decision-making questions were obtained from Mohaghegh and Furlan (2020). An example of a question is, “Team will analyze the problem in depth before searching for a solution.”

The study sample consisted of virtual team members working in the UAE’s IT sector. The sampling method used in this study was purposive sampling, where members of virtual teams were selected based on their availability and willingness to participate in the study.

Enterprise resource planning (ERP), business intelligence (BI), and specialist knowledge consulting organizations in the information and communication technologies (ICT) sector was targeted. Companies in the IT sector were chosen since members of IT teams work online and are spread all over the world; however, the data was gathered only from teams situated in the UAE. The survey was distributed to 1027 employees, and 470 of them reacted positively to the invitation. However, after removing those who did not complete the surveys and those who did not collaborate in virtual teams, the sample size was down to 402 employees. The survey was conducted from March to June 2019. The time frame was chosen to ensure that enough responses could be obtained while minimizing the burden on participants. The survey was distributed via e-mail to reach a broad and diverse audience.

The importance of ethics was considered in the research, and several steps were taken to ensure the study met ethical standards. First, ethical approval from the organizations’ management was obtained prior to conducting the study. The participants were informed about the purpose of the study, and their informed consent was obtained beforehand. It was ensured that all responses were kept confidential and anonymous to protect the participants’ privacy. Additionally, the relevant national data protection and confidentiality laws were followed. The structural equation methodology was used to analyze the data. Since this technique is highly sensitive to cases of missing and atypical data, an exhaustive analysis of the database was necessary before statistical analysis. The sample size is considered adequate for the structural equation methodology (SEM) (Wolf, Harrington,

Clark & Miller, 2015a). Several reasons for using the structural equational model (SEM) can be found. First, it includes confirmatory partial least squares path modeling, path analysis (PA), and factor analysis (CFA). Second, it is also employed to evaluate latent constructs, which are mostly unobservable (Garro-Abarca et al., 2021; Wolf, Harrington, Clark & Miller, 2015b). The model was run on AMOS 23.0 and SPSS 23. CFI, SRMR, RMSEA, and PCLOSE were used to validate the model fit. Annex B includes the formulas for the model fit.

2.4. Conclusions of the Second Chapter

The following conclusions can be drawn from a consideration of the research context described and the methods created for the study:

1. The factors examined are ICT, information sharing, trust, language, task and relationship conflict, TL, and CQ. The chapter specifically covers the uniqueness, possibilities, and difficulties experienced in the United Arab Emirates (UAE) regarding VT decision-making.
2. The motivations for selecting the Middle East, particularly the UAE, are discussed, including the scarcity of studies in this area and the emergence of the new COVID-19 pandemic.
3. The theoretical foundation used for this dissertation is described, and seven hypotheses were generated to test the proposed theoretical framework. This chapter demonstrates the methods that must be used to accomplish the goals of the research.
4. The research model for the dissertation is presented, including tests of correlation using structural equation modeling (SEM) and expert multicriteria assessment.

The next section discusses in detail how the correlation analysis and test validation of the results were obtained.

3

Testing the Factors Affecting Virtual Teams' Decision-Making Model in the United Arab Emirates

This chapter presents the factors affecting the VT decision-making model tested by empirical research that measures the VT decision-making in an organization using the structural equation model (SEM). In addition, expert multi-criteria assessments were used in the defended research model to improve the performance of VT decision-making. The results of this chapter have been presented in two scientific papers (Davidaviciene & Al Majzoub, 2022; Davidavičiene et al., 2020a, 2020b)

3.1. Data Analysis Results and Discussion

The previous chapter illustrated and explained the methodology.

Questions about respondents' demographic characteristics were used to create a profile. Descriptive statistics were used to summarize the sets of data gathered from the distribution of the questionnaires. Descriptive statistics are useful to the researcher to describe the frequency of such characteristics as sex, age, and race. Demographic questions, including gender, age group, and working experience, were asked in this study.

The results obtained from the descriptive statistics are shown in Table 3.1.

Table 3.1. Demographic characteristics of respondents

Category	Number	Percentage
Age		
22 and <30	135	33.58%
=> 30 and <40	204	50.7%
=> 40 and <50	43	10.7%
>=50	20	5.02 %
Gender		
Male	299	74.43%
Female	103	25.57%
Way of communication		
Online	105	26.1%
Face-to-face	25	6.2%
Both	272	67.7%
Member type		
Team member	370	92%
Team leader	32	8%
Experience in years		
<1	130	32.33%
=>1 and <5	207	51.49%
=>5 and <10	40	9.95%
=>10	25	6.23%

Once these results were obtained, expert evaluation was used to find more detail. The identification of necessary criteria for enhancing the quality and performance of the factors affecting decision-making benefits the whole system by determining ways to improve such factors' performance.

Seven experts were chosen to form the panel. The experts were employees from three different organizations with master's degrees in IT, business, or computer engineering and at least five years of experience working in VTs. The questionnaires sent to experts are available in Annex E.

The demographics of the experts are found in Table 3.2 (Davidaviciene & Al Majzoub, 2022; Davidaviciene, Al Majzoub, et al., 2020).

The sum of the number of points/marks assigned to the seven factors (Points for Factors) had to equal ten. The methods used were multi-criteria scoring and multi-criteria evaluation (Ma, Du, Liu & Shen, 2022; Wang, Chen, Li, Zheng & Khoo, 2021). An excel form was e-mailed to IT industry experts for the collection of study data. The survey had two parts. The first part ranked the importance of factors that affected VT decision-making, and the second part ranked subfactors based on how they impact factors discussed in part 1. Points for subfactors also

had to amount to ten points. This rule could not be violated since data validation occurred in the excel sheet sent to experts.

Table 3.2. Demographics of Experts

Demographics	Number	Percentage
Gender		
Male	5	71.5%
Female	2	28.5%
Age		
Between 30 and 45	4	57%
Between 46 and 60	3	43%
Number of years working in VT		
Between 5 and 10	2	28.5%
>10	5	71.5%

Once the required methodology was identified, the obtained results could be discussed, seeking correlation relationships.

Construct validity and reliability. This section describes the testing of the model and hypotheses through testing the internal consistency, item analysis, and model evaluation using SEM. To construct validity and reliability, the following tests were performed:

1. Unidimensionality was measured by using the confirmatory factor analysis (CFA), comparative fit index (CFI), and root mean square error of approximation (RMSEA).
2. Cronbach's alpha method was used to assess the reliability of the questions used for measurement. To be acceptable, values should be above 0.7 to reflect acceptable reliability.
3. Confirmatory factor analysis (CFA) was used to determine the dimensional structure of the scale based on eigenvalues greater than 1.
4. A maximum likelihood method was used since it is the best method to determine the parameters of distribution that are the most appropriate to describe the given data.
5. To validate the measurement model, its convergent and discriminant validities were assessed. The standardized path loadings of all items were significant and exceeded the value of 0.5. The composite reliability (CR) exceeded 1.96, and the average variance extracted (AVE) exceeded 0.5. Therefore, convergent validity was supported. The maximum squared variance was calculated and found to be less than AVE, supporting discriminant validity. Multicollinearity also tested the correlation between

independent variables to be less than 0.3; thus, there were no multicollinearity issues found.

6. The adequacy of the sample was assessed using the KMO (Kaiser-Meyer-Olkin) measure, which is used to determine whether a given set of variables is suitable for factor analysis. It ranges from 0 to 1, with values closer to 1 indicating that the set of variables is more appropriate for factor analysis. A KMO value of 0.6 or higher is considered acceptable, while a value of 0.8 or higher is considered very good. In practical terms, the KMO measure assesses the degree to which the variables in a dataset are related to each other and whether they share enough common variance to justify the use of factor analysis. A higher KMO value indicates that the variables are more closely related to each other and that factor analysis is more likely to yield meaningful results (Costales, Catulay, Costales & Bermudez, 2022).
7. Homoscedasticity (Bartlett's test, the correlation matrix is not an identity matrix). Bartlett's test is a statistical test used to assess the homogeneity of variances across groups or treatments in an analysis of variance (ANOVA). It tests the null hypothesis that the variances of the dependent variable are equal across all groups or treatments against the alternative hypothesis that they are not equal.
8. Communalities and eigenvalues were tested as they are important in determining the number of factors to extract in factor analysis and in interpreting the results. In general, a factor analysis seeks to explain as much of the variance in the original variables as possible with a smaller number of factors. High communalities and eigenvalues indicate that a larger proportion of the variance in the variables can be explained by the extracted factors and that the factor analysis is more likely to yield meaningful and interpretable results. The results are presented in the tables below.

Table 3.3 shows two tests that indicate the suitability of the data for structure detection. The Kaiser-Meyer-Olkin measure of sampling adequacy is a statistic that indicates the proportion of variance in variables that might be caused by underlying factors. The value of 0.831, which is above 0.60, indicates factor analysis and is useful with the data (Shrestha, 2021).

Table 3.3. Kaiser-Meyer-Olkin and Bartlett's test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.831
Bartlett's Test of Sphericity	Approx. Chi-Square	3393.564
	df	990
	Sig.	0.000

Bartlett's test of sphericity tests the hypothesis that a correlation matrix is an identity matrix, which would indicate that variables are unrelated and, therefore, unsuitable for structure detection. Bartlett's test of sphericity is significant $p<0.001$; thus, there is a significant difference between a correlation matrix and an identity matrix, in which there are no correlations between variables.

Annex C includes information about the standard regression weight.

Table 3.4 gives the reliability statistics and item total of the task conflict factor.

Table 3.4. Reliability statistics and item total of task conflict

Cronbach's Alpha			N of Items		
0. 852			5		
Inter-Item Correlation Matrix					
	Q1	Q2	Q3	Q4	Q5
Q1	1.000	0.339	0.188	0.179	0.286
Q2	0.339	1.000	0.236	0.175	0.304
Q3	0.188	0.236	1.000	0.203	0.310
Q4	0.179	0.175	0.203	1.000	0.225
Q5	0.286	0.304	0.310	0.225	1.000

Five items were used in the task conflict values scale for reliability analysis. The questionnaire achieved acceptable reliability according to Cronbach's alpha, $\alpha = 0.852$, which is above 0.7. The ideal range of average inter-item correlation is 0.15 to 0.50; less indicates that the items are not well correlated and do not measure the same construct or idea very well (if at all). More than 0.50, and the items are so close as to be almost repetitive. All the values for the task conflict are between 0.15 and 0.50; this means they are measuring the same construct.

Table 3.5 gives the reliability statistics and item total of the CQ factor.

Reliability analysis was carried out on cultural intelligence values scale comprising five items. Cronbach's alpha showed the questionnaire to reach acceptable reliability, $\alpha = 0.801$, which is above 0.7.

All the values for cultural intelligence are between 0.15 and 0.50; this means they are measuring the same construct. All items appeared to be worthy of retention, resulting in a decrease in the alpha if deleted. The corrected item-total correlation is above 0.3.

Table 3.5. Reliability statistics and item total of cultural intelligence

Cronbach's Alpha			N of Items		
0.801			5		
Inter-Item Correlation Matrix					
	Q6	Q7	Q8	Q9	Q10
Q6	1.000	0.228	0.240	0.192	0.173
Q7	0.228	1.000	0.187	0.188	0.185
Q8	0.240	0.187	1.000	0.163	0.196
Q9	0.192	0.188	0.163	1.000	0.193
Q10	0.173	0.185	0.196	0.193	1.000

The reliability statistics and item total of the TL factor is shown in Table 3.6.

Table 3.6. Reliability statistics and item total of transformational leadership

Cronbach's Alpha			N of Items		
0.798			5		
Inter-Item Correlation Matrix					
	Q11	Q12	Q13	Q14	Q15
Q11	1.000	0.165	0.169	0.228	0.237
Q12	0.165	1.000	0.154	0.241	0.236
Q13	0.169	0.154	1.000	0.176	0.228
Q14	0.228	0.241	0.176	1.000	0.177
Q15	0.237	0.236	0.228	0.177	1.000

Reliability analysis was carried out on the transformational leadership values scale comprising five items. Cronbach's alpha showed the questionnaire to reach acceptable reliability, $\alpha = 0.798$, which is above 0.7.

All the values for cultural intelligence are between 0.15 and 0.50; this means they are measuring the same construct.

All items appeared to be worthy of retention, resulting in a decrease in the alpha if deleted. The corrected item-total correlation is above 0.3.

The reliability statistics and item total of the decision-making is shown in Table 3.7.

Reliability analysis was carried out on a decision-making values scale comprising five items. Cronbach's alpha showed the questionnaire to reach acceptable reliability, $\alpha = 0.852$, which is above 0.7.

All the values for cultural intelligence are between 0.15 and 0.50; this means they are measuring the same construct.

All items appeared to be worthy of retention, resulting in a decrease in the alpha if deleted. The corrected item-total correlation is above 0.3.

Table 3.7. Reliability statistics and item total of decision-making

Cronbach's Alpha			N of Items		
0.852			5		
Inter-Item Correlation Matrix					
	Q16	Q17	Q18	Q19	Q20
Q16	1.000	0.165	0.255	0.388	0.263
Q17	0.165	1.000	0.244	0.237	0.095
Q18	0.255	0.244	1.000	0.186	0.180
Q19	0.388	0.237	0.186	1.000	0.277
Q20	0.263	0.095	0.180	0.277	1.000

The reliability statistics and item total of the relationship conflict factor is shown in Table 3.8.

Table 3.8. Reliability statistics and item total of relationship conflict

Cronbach's Alpha			N of Items		
0.821			5		
Inter-Item Correlation Matrix					
	Q21	Q22	Q23	Q24	Q25
Q21	1.000	0.152	0.189	0.172	0.250
Q22	0.152	1.000	0.170	0.190	0.207
Q23	0.189	0.170	1.000	0.203	0.242
Q24	0.172	0.190	0.203	1.000	0.210
Q25	0.250	0.207	0.242	0.210	1.000

Reliability analysis was carried out on a relationship conflict values scale comprising five items. Cronbach's alpha showed the questionnaire to reach acceptable reliability, $\alpha = 0.821$, which is above 0.7.

All the values for cultural intelligence are between 0.15 and 0.50; this means they are measuring the same construct.

All items appeared to be worthy of retention, resulting in a decrease in the alpha if deleted. The corrected item-total correlation is above 0.3.

The reliability statistics and item total of the ICT factor is shown in Table 3.9.

Table 3.9. Reliability statistics and item total of ICT

Cronbach's Alpha			N of Items		
0.856			5		
Inter-Item Correlation Matrix					
	Q26	Q27	Q28	Q29	Q30
Q26	1.000	0.196	0.169	0.172	0.186
Q27	0.196	1.000	0.250	0.164	0.161
Q28	0.169	0.250	1.000	0.165	0.219
Q29	0.172	0.164	0.165	1.000	0.249
Q30	0.186	0.161	0.219	0.249	1.000

Reliability analysis was carried out on an ICT values scale comprising five items. Cronbach's alpha showed the questionnaire to reach acceptable reliability, $\alpha = 0.856$, which is above 0.7. The ideal range of average inter-item correlation is 0.15 to 0.50; less means the items are not well correlated and do not measure the same construct or idea very well (if at all). More than 0.50 means the items are so close as to be almost repetitive. All the values for cultural intelligence are between 0.15 and 0.50; this means they are measuring the same construct.

All items appeared to be worthy of retention, resulting in a decrease in the alpha if deleted. The corrected item-total correlation is above 0.3.

The reliability statistics and item total of the trust factor is shown in Table 3.10.

Table 3.10. Reliability statistics and item total of the trust

Cronbach's Alpha			N of Items		
0.762			5		
Inter-Item Correlation Matrix					
	Q31	Q32	Q33	Q34	Q35
Q31	1.000	0.176	0.161	.0202	0.185
Q32	0.176	1.000	0.182	.0157	0.178
Q33	0.161	0.182	1.000	0.247	0.162
Q34	0.202	0.157	0.247	1.000	0.202
Q35	0.185	0.178	0.162	0.202	1.000

Reliability analysis was carried out on a trust values scale comprising five items. Cronbach's alpha showed the questionnaire to reach acceptable reliability, $\alpha = 0.762$, which is above 0.7.

The ideal range of average inter-item correlation is 0.15 to 0.50; less means the items are not well correlated and do not measure the same construct or idea very well (if at all). More than 0.50 shows that the items are so close as to be almost repetitive. All the values for cultural intelligence are between 0.15 and 0.50; this means they are measuring the same construct.

All items appeared to be worthy of retention, resulting in a decrease in the alpha if deleted. The corrected item-total correlation is above 0.3.

The reliability statistics and item total of the language factor is shown in Table 3.11.

Table 3.11. Reliability statistics and item total of language

Cronbach's Alpha			N of Items	
0.778			5	
Inter-Item Correlation Matrix				
	Q36	Q38	Q39	Q40
Q36	1.000	0.163	0.181	0.194
Q38	0.163	1.000	0.277	0.195
Q39	0.181	0.277	1.000	0.182
Q40	0.194	0.195	0.182	1.000

Reliability analysis was carried out on a language values scale comprising five items. Cronbach's alpha showed the questionnaire to reach acceptable reliability, $\alpha = 0.778$, which is above 0.7.

The ideal range of average inter-item correlation is 0.15 to 0.50; less means the items are not well correlated and do not measure the same construct or idea very well (if at all). More than 0.50 shows that the items are so close as to be almost repetitive. All the values for cultural intelligence are between 0.15 and 0.50; this means they are measuring the same construct.

All items appeared to be worthy of retention, resulting in a decrease in the alpha if deleted. The corrected item-total correlation is above 0.3.

The one exception to this was item 4, which would increase the alpha to $\alpha = 0.778$ instead of $\alpha = 0.65$. As such, the removal of this item should be considered.

The reliability statistics and item total of the information sharing factor is shown in Table 3.12.

Table 3.12. Reliability statistics and item total of information sharing

Cronbach's Alpha			N of Items		
0.901			5		
Inter-Item Correlation Matrix					
	Q41	Q42	Q43	Q44	Q45
Q41	1.000	0.219	0.178	0.246	0.300
Q42	0.219	1.000	0.188	0.254	0.235
Q43	0.178	0.188	1.000	0.233	0.214
Q44	0.246	0.254	0.233	1.000	0.187
Q45	0.300	0.235	0.214	0.187	1.000

Reliability analysis was carried out on an information-sharing values scale comprising five items. Cronbach's alpha showed the questionnaire to reach acceptable reliability, $\alpha = 0.901$, which is above 0.7.

The ideal range of average inter-item correlation is 0.15 to 0.50; less means the items are not well correlated and do not measure the same construct or idea very well (if at all). More than 0.50 shows that the items are so close as to be almost repetitive. All the values for cultural intelligence are between 0.15 and 0.50; this means they are measuring the same construct.

All items appeared to be worthy of retention, resulting in a decrease in the alpha if deleted. The corrected item-total correlation is above 0.3.

SEM communalities, extraction method, and total variance are given in Annex F.

Third, the measurement model was tested for internal reliability, convergent validity, and discriminant validity. The model of decision-making affecting VTs is presented in Fig. 1.2 (seven hypotheses) and was validated using structural equation models. A Cronbach's alpha reliability test was conducted on the variables in this study. The Cronbach's alpha method was used to assess the reliability of the questioners used for measurement; to be acceptable, values should be above 0.7 (Amirrudin, Nasution & Supahar, 2020; Stadler, Sailer & Fischer, 2021) to reflect acceptable reliability. The variables that were considered all exceed the value of 0.7, as presented in Table 3.13. In addition, the average variance extracted test (AVE) was applied to further test the convergent validity. In case the value of AVE is more than or equals 0.5, then this indicates the presence of validity; an AVE less than 0.50 means your items explain more errors than the variance in the constructs. All values above 0.5 mean that items explain variance in the construct.

The dimensionality of the scale was determined by the confirmation factor analysis (CFA) based on eigenvalues of more than 1. The maximum likelihood was used to determine the parameters of the distribution that are best suited to

describe the given data, as it is the most accurate of the normal theory estimation techniques.

Table 3.13. Cronbach's alpha for the indicators

Indicators	Factor Loading	Cronbach's Alpha	AVE
Relationship conflict	0.772	0.821	0.74
Task conflict	0.75	0.852	0.71
Transformational leadership	0.748	0.798	0.68
Cultural intelligence	0.738	0.801	0.66
Trust	0.766	0.762	0.72
Language	0.784	0.778	0.64
Information sharing	0.748	0.901	0.71
ICT	0.756	0.856	0.65

Descriptive statistics of the indicators and variables are presented in Annex D. The average above 3.5 means that respondents highly agree with the statements. A value between 2.5 and 3.5 means medium agreement with the statements, and a value less than 2.5 shows low agreement with the statements. The task conflict factor has an average of 3.6, which is above 3.5, indicating high agreement with the statements. The two following items scored the highest value in measuring the tasks, "Task conflict increases the collection of information while reaching a decision" and "Task conflict will likely occur during the process of creating alternatives conflict." The lowest-scored item was "A lot of disagreements over different ideas about the decision." The cultural intelligence factor has an average of 3.61, which is above 3.5, indicating high agreement with the statements. The highest-scored item in measuring CQ was "I know the ways in which cultures in my team differ in decision-making." The lowest-scored item in measuring CQ was "I think a lot about the influence that culture has on my behavior and that of others who are culturally different when agreeing on decision-making." The transformational leadership factor has an average of 3.66, which is above 3.5, indicating high agreement with the statements. The highest-scored item in measuring TL was "Team leader encouraged people to exchange ideas and collect data." The lowest-scored item was "The decision-making was guided by the team leader, who included the members." The relationship conflict factor has an average of 3.67, which is above 3.5, indicating a high agreement with the statements. The following item scored the highest value in measuring relationship conflict "Relationship conflicts cause the withhold of information while decision-making." The lowest-scored item was "Did any group members exhibit personality conflicts when making decisions?" ICT factor has an average of 3.62, which is above 3.5, indicating a high agreement with the statements. The highest-scored

item in measuring ICT was "ICT overcomes geographic distance during problem identification in decision-making." The lowest-scored item was "ICT overcomes geographic distance during alternative selection in decision-making." The trust factor has an average of 3.6, which is above 3.5, indicating a high agreement with the statements. The highest-scored item in measuring trust was "The trustee has a positive orientation towards the trustor beyond an egoistic profit motive." While the lowest-scored item was "Beliefs or attitudes toward the other person and the intention to trust them." The language factor has an average of 3.59, which is above 3.5, indicating a high agreement with the statements. The highest-scored item in measuring language was "Difference in language cause disruption between team members." While the lowest-scored item was "Difference in language creates conflict in choosing an alternative in decision making." The information sharing factor has an average of 3.55, which is above 3.5, indicating high agreement with the statements. The highest-scored item in measuring information sharing was "Information shared between team members was useful in decision-making." While the lowest-scored item was "We usually receive all important information on time." Decision-making has an average of 3.58, which is above 3.5, indicating a high agreement with the statements. The highest-scored item in measuring decision-making was "Adequate analysis of informing will result in effective decision-making." The lowest-scored item was "Adequate gathering of informing will result in effective decision-making." Overall, all results were greater than 3.5, which indicates that all respondents agreed with the statements.

Fig. 3.1 illustrates a structural equations model developed to contrast the proposed hypotheses. To test the research hypotheses, structure equation modeling (SEM) was used with AMOS 23.0. The maximum likelihood method was used.

A convergent and discriminant validity test was conducted to validate the measurement model. All items had significant path loadings, which were greater than 0.5. The average variance extracted (AVE) exceeded 0.5, and composite reliability (CR) exceeded 1.96 (Delorme et al., 2021; Shrestha, 2021). Therefore, convergent validity appears to be supported. There is less variation in the maximum squared variance than in the mean, indicating discriminant validity. A multicollinearity test also finds that the correlation between independent variables is less than 0.3, so there is no problem with multicollinearity (Bustani, Khaddafi & Ilham, 2022; Mohammadi, 2022). Table 3.14 shows the results of the model fit for CFI, SRMR, RMSEA, and PCLOSE, which are acceptable.

According to Table 3.15, a fit index for structural equational, also known as chi-square or CMIN, is equal to 2.53 divided by the degree of freedom (DF), which is between 1 and 3. PClose, which gives a test for a close fit, is 0.06, which is above the threshold of 0.05, indicating that the model fits. The comparative fit index (CFI) is 0.92, and the standardized root mean square residual (SRMR) and root mean square error of approximation (RMSEA) are below the threshold.

Data were collected to test the model by using an online survey (Google Forms) and analyzed by using AMOS SPSS. The results of the hypotheses, if it is accepted or rejected, are indicated as shown in Table 3.15 as follows:

- (H1. a): relationship conflict has a critical ratio (CR) of 4.067, an estimate of 0.533, a standard error (SE) of 0.131, and its P-value is less than 0.001. A significance level of 0.001 (two-tailed) indicates that the regression weight for the relationship in the prediction of decision-making is significantly different from zero. This means that (H1. a) is significant.
- (H1. b): task conflict has a critical ratio (CR) of 3.933, an estimate of 0.258, a standard error (SE) of 0.065, and its P-value is less than 0.001. Therefore, at the 0.001 level (two-tailed), the regression weight for task conflict in decision-making differs significantly from zero. Therefore, (H1. b) is significant, indicating that task conflict negatively impacts decision-making.
- (H2): transformational leadership has a critical ratio (CR) of 2.549, an estimate of 0.232, a standard error (SE) of 0.091, and its P-value equal to 0.011. This means that the regression weight for transformational leadership in the prediction of decision-making is significantly different from zero at the 0.001 level (two-tailed). In other words, (H2) is significant.

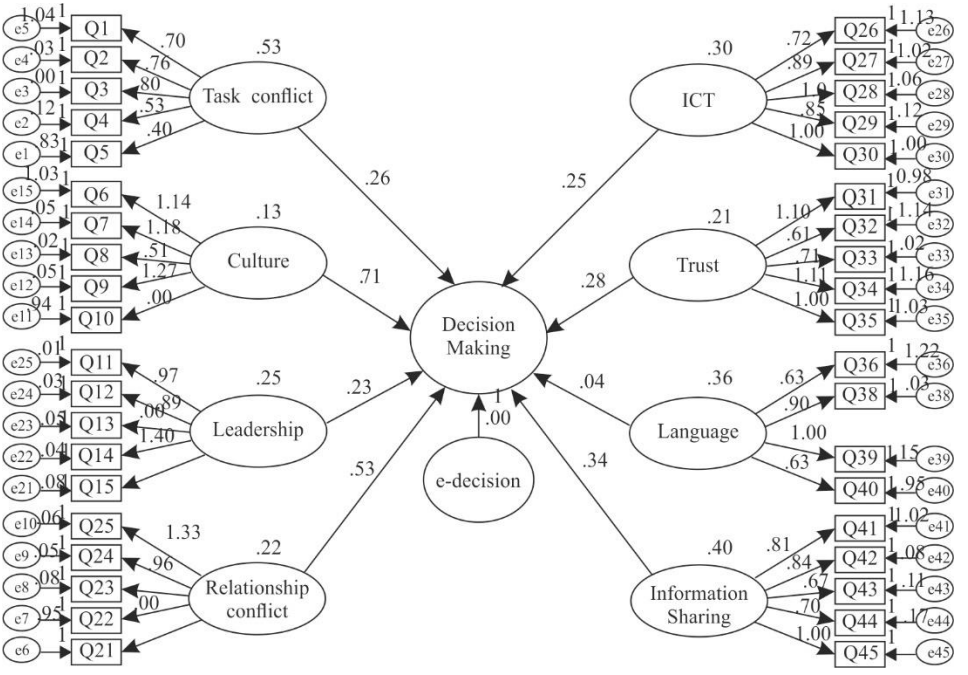

Fig. 3.1. Constructed research model (compiled by the author, 2021)

Table 3.14. Model fit

Measure	Estimate	Threshold	Interpretation
CMIN	1,117	–	–
DF	376	–	–
CMIN/DF	2.53	Between 1 and 3	Acceptable
CFI	0.92	>0.90	Acceptable
SRMR	0.052	<0.08	Acceptable
RMSEA	0.036	<0.06	Acceptable
PClose	0.06	>0.05	Acceptable

Table 3.15. Data results

Hypoth-eses	IV	Estimate	Standard Error	CR	P-value	Result
H1. a	Relationship conflict	0.533	0.131	4.067	***	Supported
H1. b	Task conflict	0.258	0.065	3.933	***	Supported
H2	Leadership	0.232	0.091	2.549	0.011	Supported
H3	Culture	0.715	0.200	3.570	***	Supported
H4	Trust	0.276	0.110	2.511	0.012	Supported
H5	Language	–0.043	0.070	–0.608	0.543	Not Supported
H6	Information sharing	0.34	0.061	3.4	***	Supported
H7	ICT	0.25	0.074	3.37	***	Supported

- (H3): cultural intelligence has a critical ratio (CR) of 3.570, an estimate of .715, a standard error (SE) of 0.200, and its P-value is less than 0.001. This means that the regression weight for cultural intelligence in the prediction of decision-making is significantly different from zero at the 0.001 level (two-tailed). In other words, (H3) is significant.
- (H4): trust has a critical ratio (CR) of 2.511, an estimate of 0.276, a standard error (SE) of 0.110, and its P-value is less than 0.012. This means that the regression weight for trust in the prediction of decision-making is significantly different from zero at the 0.001 level (two-tailed). In other words, (H4) is significant.
- (H5): language communality did not show any significance since the p-value 0.0543> 0.05, and CR is -0.608.
- (H6): information sharing has a critical ratio (CR) of 3.4, an estimate of .34, a standard error (SE) of 0.061, and its P-value is less than 0.001. This indicates that at the 0.001 level, the regression weight for information

sharing in the prediction of decision-making differs considerably from zero (two-tailed). To put it another way, (H6) is significant.

- (H7): ICT Choice has a critical ratio (CR) of 3.37, an estimate of 0. 25, a standard error (SE) of 0. 074, and its P-value is less than 0.001. To put it another way, for ICT in the prediction of decision-making, the regression weight is significantly different from zero at the 0.001 level (two-tailed). In other words, hypothesis (H7) is significant.

Managing task conflicts enhances and stimulates communication; sharing of information generates new ideas, which then enhances and facilitates decision-making. Conflict in relationships will hamper communication between team members and prevent them from sharing ideas, which will negatively influence decision-making and lead to wrong decisions. In transformational leadership, employees are stimulated, motivated, and encouraged to exchange information, which results in informed decisions. A culturally intelligent team can work and cope in different cultural settings, which will lead to enhanced decision-making due to their cultural intelligence. The decision-making is improved and facilitated when employees use the appropriate ICT tools to collaborate and communicate. By fostering trust among employees, they are more willing to share information, which will lead to better decisions.

This study aimed to develop a theoretical model to measure the effect of VT decision-making by examining the following factors: information sharing, trust, language, task and relationship conflict, TL, and CQ. The results showed that information sharing, trust, culture intelligence (CQ), transformational leadership (TL), and task conflict have a positive effect on VT decision-making, while relationship conflict showed a negative impact, and language did not show any significant effect on decision-making inside a VT. This study revealed that the following factors are important for VT decision-making. The first hypothesis sought to answer two questions regarding VT decision-making. First, a relationship conflict affects VT's decision-making negatively. The finding coincides with previous research (Olson et al., 2007; Paul & Dennis, 2018; Wang et al., 2019; Zhang & Zhang, 2019) on the negative effect of a relationship conflict on VT decision-making. Second, a non-routine and cognitive task conflict affects VT decision-making processes positively, which matches previous research about the importance of conflict in non-routine and cognitive tasks and how it enhances the effectiveness of VT decision-making.

The second hypothesis of the research deals with the positive effect of transformational leadership on VT decision-making and how TL can enhance decision-making in VTs. The results showed a positive effect of TL on VT decision-making, which agrees with previous research (Acai et al., 2018b; Al Zain et al., 2018; Derven, 2016; Gibbs et al., 2017; Plotnick et al., 2016). To achieve maximum

performance in VTs, leadership needs to motivate followers to ensure they can realize their potential.

The third hypothesis of the research deals with the positive effect of CQ on VT decision-making. The results overlap with previous research (Glazer & Karpati, 2018; Guan & Chen, 2015; Yates & Oliveira, 2016) on the importance of CQ in enhancing VT decision-making since CQ reduces the negative effect of cultural diversity.

Trust is the primary destroyer of team performance in the fourth hypothesis. It is one of the strongest factors affecting team performance. The results align with previous research (Drouin & Bourgault, 2013; Shagholi et al., 2010). Decision-makers will trust opinions coming from trusted sources, which is the important and positive effect of trust on VT decision-making. The fifth hypothesis is about language commonality differences and their negative effect on VT decision-making. The result did not match previous research on the importance of language in VT decision-making, maybe due to the diversity of people living in UAE and team members interacting daily with multiple nationalities.

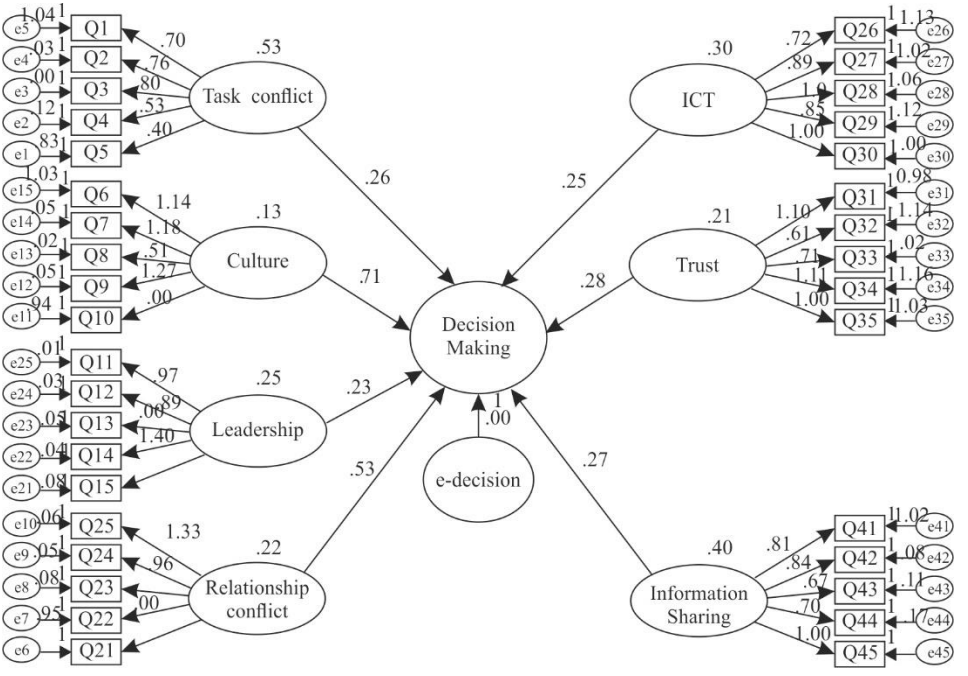

Fig. 3.2. Adjusted research model (compiled by the author, Al Majzoub, 2020)

The sixth hypothesis examines the positive relationship between unique information sharing and its positive effect on VT decision-making.

The results of this study confirmed previous research (Cordes, 2016; Maynard et al., 2019) on the positive effect that sharing unique information has on VT decision-making. As a result of not using important or unique information during information exchange, the team's decision-making is poor.

The seventh hypothesis examines the positive relationship between proper ICT choice and its positive effect on VT decision-making. The results of this study confirmed previous research (Ruppel et al., 2013) on the effect of VT decisions. For team members to communicate effectively and efficiently, ICT tools need to be selected correctly.

This study is intended to identify some of the factors that contribute to enhancing the decision-making for virtual teams using systematic methods. The study does not attempt to provide an explanation of all factors that exist and directly affect VT decisions but focuses on seven major factors: task conflict, relationship conflict, TL, CQ, trust, ICT, and information sharing, and develops propositions to enhance future research in each of them.

The final accepted model is presented in Fig. 3.2 after removing the language factor. Therefore, the final factors that affect VT decision-making are relationship conflict, task conflict, ICT, information sharing, CQ, and TL. The results show that the model is applicable to be used for evaluating VT decision-making in IT organizations.

3.2. Expert Multi-Criteria Assessment Results and Discussion

For managerial implications, it was necessary to identify the criteria needed to enhance the factors affecting decision-making. Multi-criteria scoring and evaluation methods were used. Experts were asked to score or rank each factor and subfactor based on their importance or impact on a particular outcome or decision. These scores or rankings can be combined using mathematical algorithms to generate a composite score or ranking of alternatives.

This approach allows decision-makers to consider multiple criteria or factors simultaneously and to balance competing priorities in a structured and transparent manner. It can be particularly useful in complex decision-making situations where there with different factors or criteria to consider and where expert judgment is needed to weigh the relative importance of each one (Ma et al., 2022; Wang et al., 2021). In this methodology, the expert ranked the factors based on the factor most affecting VT decision-making. The results provided by experts did not have a major difference in the effect of factors. The results in Table 3.16 have the mean of

answers provided by experts. The relationship conflict, trust, and CQ were rated more than other factors using a scale of two points, and task conflict, information sharing, ICT, and TL were given 1 point each. The points given by experts had to total ten.

Table 3.16. Factors ranked by experts (elaborated by the author, Al Majzoub, 2020)

Factor	Rank/Importance
Relationship conflicts have a negative effect	2
Trust has a positive effect	2
Cultural intelligence (CQ) has a positive effect	2
Task conflicts have a positive effect	1
Proper ICT choices have a positive effect	1
Adequate information sharing has a positive effect	1
Transformational leadership has a positive effect	1

The second part was to measure the indicators of the factors. All indicators that ranked below 1.5 were considered to have a low effect, ranks between 1.5 and 2, a medium effect, and 2, a high impact.

Experts were asked to grade six indicators in Table 3.17 to improve relationship conflict factors. The indicators were rated by experts adhering to the rule that the total sum is ten for all six indicators.

Table 3.17. Subfactors enhancing a relationship conflict (elaborated by the author, Al Majzoub 2020)

Indicator's number	Subfactors	Responses
I1	Training and workshops on how to overcome personal conflict and enhance emotional intelligence	3.1
I2	Have clear and detailed deliverables	2.3
I3	Grow and build relationships by doing team-building activities (e.g., Trivia, Jackbox, and virtual escape room)	1.7
I4	Work hours should overlap. Most of the team should be online at the same time for at least two to three hours a day	1.5
I5	Improve communication to prevent team conflict by use of high-medium ICT tools (e.g., MS Teams, Zoom, and Skype for business)	1.4

"Training and workshops on how to overcome personal conflict and enhance emotional intelligence" had the highest grade of 3.1, and "Improve communication to prevent team conflict by use of high medium ICT tools (e.g., MS Teams, Zoom, and Skype for business)" had a lower grade of 1.4, as shown in Table 3.17. I4 and I5 were found to have a low effect on enhancing a relationship conflict, I3 had a medium effect, and I1 and I2 had a high impact.

Table 3.18. Subfactors enhancing trust (elaborated by the author, Al Majzoub 2020)

Indicator's number	Subfactors	Responses
I6	Use of high-medium ICT tools when communicating	2.1
I7	Hiring employees with good skills and knowledge	2
I8	Prevent judgment and mocking by setting clear policies and procedures	1.9
I9	Cultural/diversity training	2
I10	At least once per year, a face-to-face meeting	0.5
I11	Weekly meetings allow team members to socialize frequently and share bits of their lives	1.5

Six indicators were used to propose the enhancement of the trust factor, as shown in Table 3.18. Experts gave the highest ranking of 2.1 to I6, "Use of high medium ICT tools when communicating," and I10, "At least once per year, a face-to-face meeting," received the lowest value of 0.5. I6, I7, and I9 had a high effect on enhancing the trust factor, I8 had a medium effect, and I11 and I10 had a low effect.

Table 3.19. Subfactors enhancing ICT (elaborated by the author, Al Majzoub 2020)

Indicator's number	Subfactors	Responses
I12	Rich medium, user-friendly, and compatible ICT tools to compensate for the absence of non-verbal communication (e.g., MS Teams, Zoom, and Skype for business)	1.8
I13	Real-time orientation training	1.6
I14	Internal resources training	1.9
I15	Identify and appoint specific team members as resident experts on each tool training	1.7
I16	Understand employees and their capacity for using ICT	2
I17	Analyze the choice of the most ICT-relevant specification to adapt to the business process	1

Six indicators, as shown in Table 3.19, were used to propose the enhancement of the ICT factor. Experts gave the highest grade to I16, "Understand employees and capacity for using ICT," while I17, "Analyze choice of the most ICT relevant specification to adapt to business process," scored the lowest, as shown in Table 3.19. I16 had a high impact, I12, I13, and I14 had a medium impact, and I17 had a low impact.

Table 3.20. Subfactors enhancing information sharing (elaborated by the author, Al Majzoub 2020)

Indicator's number	Subfactors	Responses
I18	User-friendly and compatible tools for sharing information (e.g., Google spreadsheets, Icebreaker-Bot, and Google Drive)	2.2
I19	Scheduled monthly meetings	2.5
I20	Workshops and training	2.4
I21	Provide recognition and respect from others for sharing information	1.4
I22	Prevent any judgment or mocking of the information shared by other members	1.5

To enhance the information-sharing factor, five indicators were used, as shown in Table 3.20. Experts gave the highest ranking to I19, "Scheduled monthly meetings," while I21, "Provide recognition and respect from others for sharing information," received the lowest ranking. I18, I19, and I20 had a high effect, and I22 and I21 had a low effect.

Table 3.21. Subfactors enhancing CQ

Indicator's number	Subfactors	Responses
I23	Use of high-medium ICT tools when communicating	1.8
I24	Activities and programs that promote cultural awareness	1.4
I25	Providing the team with a leader with a high CQ level	1.6
I26	Cultural/diversity training	1.9
I27	Hiring a team with a high CQ level	1.9
I28	Weekly meetings allow team members to socialize frequently and share bits of their lives	1.4

Six indicators, as shown in Table 3.21, were used to suggest improving the CQ factor. Experts gave the higher rankings to I27, "Hiring a team with a high CQ level," and I26, "Cultural/diversity training," in the indicators. The lowest rankings were given to I24, "Activities and programs that promote cultural awareness," and I28, "Weekly meeting allowing team members to socialize frequently and share bits of their lives." Thus, I23, I25, I26, and I27 had a medium impact, and I24 and I28 had a low impact.

Table 3.22. Subfactors enhancing TL (elaborated by the author, Al Majzoub 2020)

Indicator's number	Subfactors	Responses
I29	Use of high-medium ICT tools when communicating	1.8
I30	Activities and programs that promote cultural awareness	1.4
I31	Providing the team with a leader with a high CQ level	1.6
I32	Cultural/diversity training	2
I33	Emotional intelligence training	1.9
I34	Keep one-on-one meetings a priority	1.3

Table 3.23. Subfactors enhancing task conflict (elaborated by the author, Al Majzoub 2020)

Indicator's number	Subfactors	Responses
I35	Establish multiple communication tools (e.g., MS Teams, Zoom, and Skype for business)	1.8
I36	Promote opposing thinking using dialectic inquiry (an alternative plan is created by a second group, which is then debated with the proposal)	1.8
I37	Promote opposing thinking using a devil's advocate (the act of expressing a contentious opinion to lead, debate, or test the strength of opposing arguments)	1.8
I38	Enhance the sharing of broader thoughts and ideas (e.g., reward good ideas, offer anonymous participation, do not restrict feedback and idea sharing to performance reviews and meetings)	0.8
I39	Define the work system by setting standards. Standards can reduce the time it takes to accomplish a task	1.9
I40	Have clear and detailed deliverables	1.9

To enhance the TL factor, six indicators were used, as shown in Table 3.22. Experts gave the highest grade of 1.9 to I33, "Emotional intelligence training," and I34 received the lowest grade of 1.3, "Keep one-on-one meetings a priority." The results provided by experts showed that I33, I29, and I31 had a medium effect, and I30, I32, and I34 had a low impact.

To enhance the task conflict factor, five indicators, as shown in Table 3.23, were used. Experts gave the most points to I39, "Define the work system by setting standards. Standards can reduce the time it takes to accomplish a task," 1.9 points to I40, "Have clear and detailed deliverables," and I38, "Enhance the sharing of broader thoughts and ideas (e.g., reward good ideas, offer anonymous participation, do not restrict feedback and idea sharing to performance reviews and meetings)," received the lowest score of 0.8. Thus, I35, I36, I37, I39, and I40 had a medium impact, and I38 had a low impact.

The final model presented in Fig. 3.3 consists of seven factors and 40 indicators to enhance VT decision-making.

Each factor has multiple suggested indicators to enhance, which, in turn, enhances VT decision-making. Due to the increase of teleworking and virtualization generated by the emergence of the Covid-19 pandemic, the following variables are the most relevant to consider when measuring VT decision-making: information sharing, trust, culture intelligence, transformational leadership, and task and relationship conflict. Factors mostly recognized to enhance the performance of the VT decision-making model are task conflict, relationship conflict, transformational leadership, cultural intelligence, trust, ICT, and information sharing, constructed by the following criteria and the impact of these criteria on the factors: relationship conflict, task conflict, ICT, TL, CQ, trust, and information sharing. The orange color indicates a low impact on the factors, the green color indicates a medium impact, and the blue color indica**tes** a high impact.

Managers operating in the VT field should focus on improving the performance of the following factors to have more accurate decision-making. The factors are:

1. Relationship conflict can be improved by focusing on the following criteria:
    a. Provide training and workshops for team members on how to overcome personal conflicts and enhance emotional intelligence.
    b. Have clear and detailed deliverables for project tasks to prevent conflicts.
    c. Leadership should grow and build relationships by doing team-building activities (e.g., Trivia, Jackbox, and virtual escape room).
    d. Working remotely in the VT means different working hours; to reduce the negative effect of this, management should make

sure working hours are overlapping. Most of the team should be online at the same time, at least two to three hours a day.

2. Improve communication to prevent team conflict by using rich-medium ICT tools (e.g., MS Teams, Zoom, and Skype for business).
   The task conflict factor can be improved by taking the following steps:
   a. Establish multiple communication tools (e.g., MS Teams, Zoom, and Skype for business), allowing team members to communicate in asynchronous and synchronous modes.
   b. Promote the opposing thinking using dialectic inquiry (an alternative plan is created by a second group, which is then debated with the proposal), which will enhance the solution provided by team members.
   c. Promote opposing thinking using a devil's advocate (the act of expressing a contentious opinion to lead to debate or to test the
   a. strength of opposing arguments), which will enhance the solution provided by team members.
   b. Enhance the sharing of broader thoughts and ideas (e.g., reward good ideas, offer anonymous participation, do not restrict feedback and idea sharing to performance reviews and meetings).
   c. Define the work system by setting standards. Standards can reduce the time it takes to accomplish tasks.
   d. Have clear and detailed deliverables.
3. The information-sharing factor can be improved by management taking the following steps:
   a. Choosing user-friendly and compatible tools for sharing information (e.g., Google spreadsheets, Icebreaker-Bot, and Google Drive).
   b. Scheduling monthly meetings.
   c. Arranging workshops and training.
   d. Providing recognition and respect from others for sharing information.
   e. Preventing any judgment or mocking of the information shared by other members.
4. Trust
   a. Use of rich-medium ICT tools when communicating.
   b. Hire employees with good skills and knowledge.
   c. Prevent judgment and mocking by setting clear policies and procedures.
   d. Cultural/diversity training.
   e. At least once per year, a face-to-face meeting.

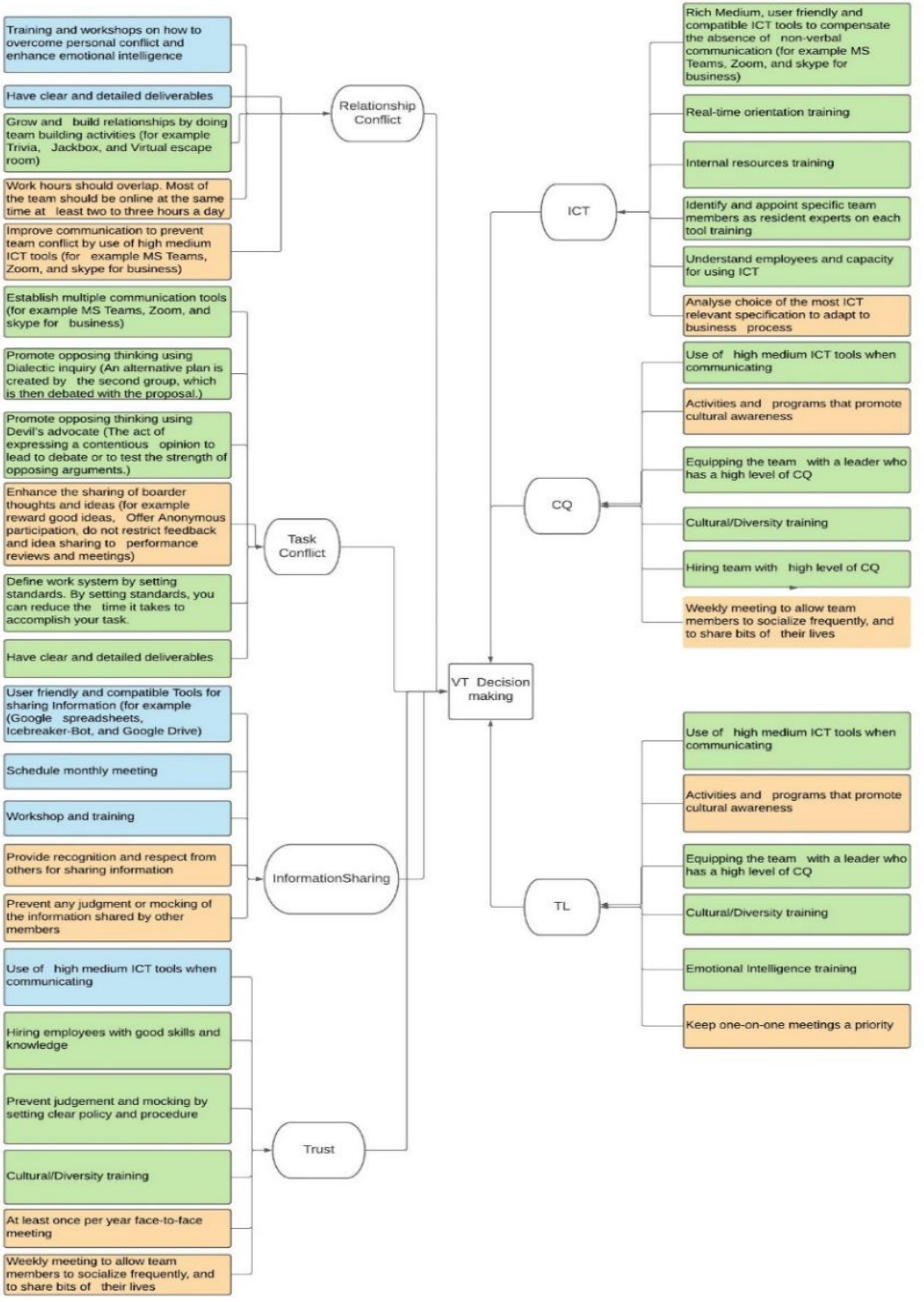

Fig. 3.3. VT decision-making model (compiled by the author, 2022)

   f. Weekly meetings allow team members to socialize frequently and share bits of their lives.
5. The transformational leadership factor can be enhanced by taking the following steps:
   a. Use of rich-medium ICT tools when communicating.
   b. Arrange activities and programs that promote cultural awareness.
   c. Equipping the team with a leader who has a high CQ level.
   d. Arrange cultural/diversity training.
   e. Arrange emotional intelligence training.
   f. Keep one-on-one meetings a priority.
6. The cultural intelligence factor can be improved by the management taking the following steps, which will enhance this factor and, in return, will enhance VT decision-making:
   a. Use rich-medium ICT tools when communicating.
   b. Arrange activities and programs that promote cultural awareness.
   c. Equipping the team with a leader who has a high CQ level.
   d. Arrange cultural/diversity training.
   e. Hire a team with a high CQ level.
   f. Arrange weekly meetings allowing team members to socialize frequently and share bits of their lives.
7. The ICT factor can be improved by taking the following steps, which will enhance this factor and, in return, will enhance VT decision-making:
   a. Using rich medium, user-friendly, and compatible ICT tools to compensate for the absence of non-verbal communication (e.g., MS Teams, Zoom, and Skype for business).
   b. Arrange real-time orientation training.
   c. Arrange internal resources training.
   d. Identify and appoint specific team members as resident experts on each tool training.
   e. Understand employees and the capacity for using ICT.
   f. Analyze the choice of the most ICT-relevant specification to adapt to a business process.

The following factors can be improved, as discussed above, by the management taking the necessary steps and knowing that there are some criteria with higher effects than others, as shown in Fig. 8.

As for the practical contribution, this study provides the following. First, this study provides a new perspective on VT decision-making. This approach can be used by management to enhance VT decisions. Building strong teams that can reach optimal decisions will be very beneficial for the organization. Managers of

existing virtual teams can work to improve decision-making and enhance the related factors, which, in turn, assists the team in making better decisions, thereby improving performance. Companies should consider those factors when hiring new team members to ensure that they have a sense of cohesion with the existing team. It can be further integrated with a new model that is proposed for implementation plans to help create highly effective virtual teams in Middle Eastern countries. This model is a starting point for measuring virtual team decision-making and performance and can also be used to build an implementation plan for VTs in Middle Eastern countries. Developing a new way to share information between team members will improve decision-making. In the case of any difficulties with the new way, a suitable intervention can be implemented, such as regular virtual meetings, to discuss the plans and any other deliverables, such as schedules and timelines. As a result, these are the most important and relevant factors, especially since the Covid-19 pandemic has increased virtualization and teleworking., Companies should consider these factors when making VT decisions.

Second, training can be used by the management to ensure the learning and development of the following factors over time: information sharing, ICT, CQ, TL, and how to handle conflicts related to tasks and relationships. This will allow VT members to develop their competencies and enhance VT decision-making. This study provides virtual team leaders with insights into the multidimensional nature of virtual team management. Giving managers a better understanding of how to manage performance and achieve organizational objectives in virtual settings, it facilitates their achievement of organizational goals. Furthermore, it broadens the horizons of performance management for team leaders by helping them review their leadership characteristics and abilities. This study provides evidence that transformational leadership has a positive effect on decision-making in a VT, information sharing, trust, culture intelligence (CQ), and task and relationship conflict. Based on this study, the following factors should be considered when deciding on a VT. Communication accommodation for virtual teams has to be monitored through their performance appraisals, through the inclusion of communication accommodation as part of the performance indicators in the virtual team to be evaluated and strengthened through rewards and recognitions. VT members must be trained in information sharing, trust, culture intelligence, transformational leadership, and relationship conflict. When it comes to conflict and ICT, they can be managed by using correct channels and proper communication between team members since non-verbal communication in the form of gestures, body language, or facial expressions is not easy to detect, especially when communication happens over e-mail. An interrogatory question or query, for instance, can sometimes sound accusatory and reproachful, leading to negative feelings and misunderstandings. For this reason, videoconferencing and other rich synchronous media should be used as much as possible to discuss problems. As a result,

virtual team leaders can boost their remote work team's productivity and engagement with such simple and inexpensive action.

Finally, the findings of this study serve as a step forward toward future research investigating factors that are useful for improving the decision-making associated with VT in IT organizations.

3.3. Theoretical Contribution

This study makes several contributions to the existing literature. First, this study was conducted in the Middle East, specifically in the UAE, where no such study has been done before. Furthermore, this study was conducted with actual employees, not in a laboratory or with students, thus responding to the call for future research on VTs using organizational employees.

Second, it adds to the current literature regarding VTs and extends the understanding, especially in the field of organizational performance and decision-making, since the number of virtual working teams is increasing daily, and they are becoming more common in organizations. This shift in organizations is due to multiple challenges faced by organizations and, especially, the COVID-19 pandemic, which will help in the understanding of the reason for failed and successful decisions made by VTs and directly affecting the performance of organizations. In addition, it also adds to the literature by revealing the important predictors of VT decision-making. Thus, this study contributes to the VT literature by emphasizing the importance of considering the following factors: information sharing, trust, TL, CQ, task conflict, and relationship conflict affecting VT decision-making, which can be a challenge and an opportunity in the context of VTs.

Third, the dissertation contributes to RBV: the resource-based theory (RBV) suggests that a firm's competitive advantage comes from its unique resources and capabilities. In the context of virtual teams, decision-making can contribute to RBV in several ways:

1. Leveraging diverse expertise: Virtual teams can bring together individuals with diverse expertise and skills from different locations, which can help in the enhancement of the firm's resource base. By leveraging this diversity through effective decision-making, virtual teams can increase the firm's competitiveness and the ability to innovate (Barak-Ventura, Richmond, Hasanyan & Porfiri, 2020).
2. Accessing new resources: Virtual teams can access new resources and capabilities that may not be available within the firm's traditional organizational structure. For example, virtual teams can collaborate with external partners, suppliers, or customers, to gain access to new resources and knowledge.

3. Rapid decision-making: Virtual teams can make decisions faster than traditional teams because of their ability to communicate and collaborate using technologies. This can help firms to respond more rapidly to changes in the market or competitive landscape and to seize new opportunities (Petter, Barber & Barber, 2020).
4. Cost savings: Virtual teams can help firms in the reduction of costs associated with physical infrastructure and overheads, such as office space and travel expenses. By making decisions through virtual collaboration, firms can reduce their costs and allocate resources more efficiently (Taras et al., 2019).

Overall, the contribution of virtual team decision-making to RBV lies in its ability to enhance the firm's resource base, access new resources, make decisions more quickly, and reduce costs. Virtual teams can help firms in gaining a competitive advantage by leveraging the diverse expertise and resources available through virtual collaboration and by making decisions more efficiently and effectively. By utilizing virtual team decision-making to enhance their resource base, firms can create sustainable competitive advantages that can drive long-term success.

Virtual team decision-making can contribute to thriving at work by providing opportunities for employees to collaborate and engage in meaningful work that leads to positive outcomes. Thriving at work is a concept that refers to the experience of feeling energized, fulfilled, and productive at work. Virtual team decision-making can contribute to thriving at work in several ways:

1. Collaboration: Virtual team decision-making provides opportunities for employees to collaborate and work together on meaningful tasks. This can enhance their sense of belonging and engagement and contribute to their overall sense of fulfilment at work (Zajac, Randall & Holladay, 2022).
2. Autonomy: Virtual team decision-making can provide employees with greater autonomy and control over their work. This can help to enhance their sense of competence and mastery and contribute to their overall sense of well-being.
3. Creativity: Virtual team decision-making can provide opportunities for employees to engage in creative problem-solving and decision-making. This can enhance their sense of creativity and innovation and contribute to their overall sense of purpose and meaning at work.
4. Flexibility: Virtual team decision-making can provide employees with greater flexibility in terms of when and where they work. This can enhance their sense of work-life balance and contribute to their overall sense of well-being and satisfaction (Fang et al., 2021).

Overall, virtual team decision-making can contribute to thriving at work by providing opportunities for employees to collaborate, exercise autonomy, engage

in creative work, and enjoy greater flexibility. By leveraging the benefits of virtual team decision-making, organizations can create a work environment that promotes employee well-being, engagement, and productivity, leading to positive outcomes for both the individual and the organization as a whole.

Fourth, this study responds to calls from other researchers (Davidaviciene, Majzoub, et al., 2020; Handke et al., 2019; Klein & Sharma, 2022b; Presbitero, 2019) for more empirical research about the effects of factors on VT decisions in organizations, and to perform on organizational field employees. In addition, the findings suggest implications for research and practice in the fields of organizational behavior, TL, CQ, conflict management, information sharing, trust, and ICT. The implication should be provided to individuals and organizations who are involved in or manage virtual teams. This includes team leaders, members, project managers, HR professionals, and organizational decision-makers who are responsible for managing and optimizing virtual team performance. The implications should be provided through various channels, such as reports, training programs, workshops, and presentations. The content of the implications should be tailored to the specific needs and goals of the target audience. For example, team leaders may benefit from guidance on how to structure virtual team decision-making processes, while project managers may benefit from strategies for facilitating effective communication among team members. This study scientifically tested information sharing, trust, TL, CQ, and task and relationship conflict impact on VT decision-making. Using specific scientific testing, the study supported the major existing research findings. Hence, this study advances the current literature on VT by providing theoretical grounding and empirical support for the critical role these factors play in affecting VT decision-making. There are studies in the literature that examine the factors of virtual team decisions separately; however, this study attempted to analyze them with a more holistic approach. Each factor plays a key role and will be discussed in its contribution to the literature in detail. The below implication is for team leaders and organizational management.

Implications for leadership. Leadership roles in organizations often require leaders to take on many more responsibilities than those found in classrooms and labs. Researchers who work with virtual teams, need to think about leadership in new ways and ensure consistency across studies or better define their boundary conditions (Gibbs, Sivunen & Boyraz, 2017). Theoretically, this study has implications for transformational leadership because it draws upon previous studies that have examined decision-making in virtual teams and applied the transformational leadership paradigm. This study makes an important contribution to the field by studying the TL style in a real workplace. More empirical research is needed to understand how different leadership styles play out in various virtual teams. Enhancing TL will result in better VT decisions. Consequently, transformational leadership contributes significantly to the enhancement of VT decision-making.

Based on the findings, hypothesis H2 is supported, and the results coincide with previous research on the effect of TL on decision-making in the United States and Europe. As determined from the present research, transformational leaders are well suited to lead virtual teams within IT organizations since their TL-style behavior enables better decision-making within VTs. The result of this study has implications for leadership style in virtual teams. As a result, in VTs, TL must negotiate roles and relationships, as well as be accountable for outcomes. Researchers in their research context should explicitly explore transformational leadership.

Implications for Culture. Due to a large gap in the literature on multicultural teams and virtual teams, it is difficult to study intercultural decision-making in virtual teams. The study on VT decision-making typically adopts implicit assumptions about other cultures that are not true. Using organizational field studies to enhance intercultural competence and cosmopolitan orientation among team members, future research studies should examine how culture affects VT decision-making. Additionally, the notion of culture is extended beyond simple measures of nationality by exploring different cultural orientations as part of this study since the UAE includes international employees (Gibbs et al., 2017; Presbitero, 2021). In terms of CQ, the results confirm previous research published on the topic in the literature, showing that CQ positively influences decision-making in VTs, so the results confirm the suggested hypothesis, H3.

Implications for ICT. To examine more explicitly how technology use affects VT decision-making, this research calls for more research in the future. A major observation regarding technology studies and their impact on virtual team decision-making is that only a minority are longitudinal, and most focus on project teams made of students. Not many studies analyze virtual teams and technologies used by organizations. Studies with students belong to comparative approaches since they do not have a common history of working together or with the tools provided (Gibbs et al., 2017). With respect to ICT, the results support previous research suggesting that ICT influences VT decision-making positively, thus providing support for the proposed hypothesis, H7, by adding to the currently existing literature.

Implications for Trust. Trust is the most relevant and important factor, particularly in a world of increasing virtualization and telework. Trust between team members is an important key to their success. Overall, this study contributes to the growing area of research in the trust domain. This study attempted to fill the research gap (Morrison-Smith & Ruiz, 2020) by exploring the role trust plays in teams, particularly its effect on decision-making. Future research could check the effect of trust on a different culture (Flavian et al., 2018). The dissertation's findings generally support the existing trust literature in terms of its effect on VT de-

cision-making (Norman, Avey, Larson & Hughes, 2020). Thus, building trust relationships in VTs is important for decision-making. Due to team peculiarities, building trust within them can be a real challenge since trust is one of the key factors for success. Although some studies explore the effect of trust on team performance, there is still a lack of understanding of the effect made by the ability, benevolence, and integrity of team members on VT decision-making. In addition, this study contributes by answering the call to test the trust effect on VTs with a sample that includes a wider diversity of nationalities (Guinalíu & Jordán, 2016). As for trust, previous studies have shown that trust positively affects decision-making in virtual teams. By adding to the body of knowledge on trust effects on virtual teams, the dissertation's results support hypothesis H4.

Implications for Information Sharing. From the information-sharing perspective, this paper contributed to the information-sharing literature by discussing the mechanism of unique information-sharing and its impact on team decision-making. At the same time, in the context of virtuality, it changed the single perspective used in previous research to different types of information sharing, integrated unique information into the same theoretical model, and effectively distinguished the mechanism of unique information, which is conducive to the in-depth study of information sharing, and its positive effect on VT decision-making (Presbitero, 2021). In addition, this study responded to the call (Luo, Wang, Xiao & Tong, 2020) to study information sharing in a multicultural context in teams. In terms of information sharing, the results support previous research showing that unique information sharing positively impacts decision-making in the VT environment. By offering new evidence to the current literature on trust in the VT environment, the dissertation's results support the proposed hypothesis H6. Further confirming the importance and necessity of unique information in team decision-making, this paper addresses the issue further. In fact, most of the previous studies found that common information played an important role in team decision-making while devaluing or ignoring unique information. It is only by emphasizing the importance of sharing unique information that optimal team decision-making can be achieved.

Implications for language. Few studies have explored the implications of language proficiency in VT. Despite this, cross-border communication, which is often characterized by linguistic differences and geographic dispersion, is heavily dependent on technology. In cross-border interactions, language competency affects communication and influences communication dynamics. Other researchers (Cheung et al., 2023; Fleischmann, Aritz & Cardon, 2019; Oesch & Dunbar, 2018; Waring et al., 2018) found that virtual team members of lower language proficiency tend to feel less included in the decision process, but this study did not find any significant effect for the language on decision-making. This study responded to a research call for the effect of language on VTs (Fleischmann, Aritz

& Cardon, 2020), particularly on decision-making. Other studies found that language proficiency affects VTs, yet this study determined that language had no effect on VT decision-making.

Implications for Conflict. By analyzing VT decision-making and relationship and task conflict, this study contributes to the understanding of conflict management. As a result of its impact on individual, team, and organizational performance, managing conflict in virtual settings is one of the biggest challenges for teams. This study adds to the existing literature on the effect of conflicts on decision-making in VTs by demonstrating that conflict can affect decision-making positively and negatively. The dissertation's results support the proposed hypothesis H1.a.

Finally, this study provides empirical evidence on the effects of these factors on VT decision-making to measure and support the appropriateness of the decision-making in VTs due to the complexity of VT decision-making and the wide variation in affecting factors. The model was also tested using rigorous measures, which revealed that information sharing, trust, culture intelligence, transformational leadership, and task contribute positively to VT decision-making, and a relationship conflict contributes negatively. By understanding a virtual team's decision-making, this paper contributes to the success of virtual teams. The literature review highlighted several compelling research topics and research questions related to multicultural and virtual team leadership, as well as recent work on biculturalism pertaining to leadership, culture, trust, information sharing and conflicts among global teams and their leaders.

3.4. Conclusion of the Third Chapter

This chapter presents a discussion of the results from the SEM and expert multicriteria technique.

1. The results obtained and reported in this chapter are valid and reliable due to the establishment of model fitness, questionnaire validity, and assessments of the accuracy and dependability of the responses. Descriptive statistics were examined in terms of means and standard deviations for the responses to the questions asked and administered in the SEM approach, which showed no low agreement, and most responses agreed with the relative statements requested.
2. The SEM analysis was used to validate the hypotheses, and the findings revealed that task conflict, transformational leadership, and cultural intelligence all positively affect decision-making, while relationship conflict affects negatively, and language showed no correlation effect on decision-

making. All hypotheses were accepted except for hypothesis H5, which was rejected.

3. Expert multi-criteria assessment found identical results to those found in SEM. To enhance VT decision-making, organizations need to increase the effect of factors such as CQ, TL, task conflict, trust, ICT, and information sharing and find ways to reduce or eliminate the effect of relationship conflicts in VTs.

General Conclusions

1. Following a scientific literature study, the most important factors influencing VT decision-making were identified, and a theoretical framework was developed. The key to building research methodology was the analysis of existing studies and extraction of main factors for the virtual teams' decision-making, such as relationship conflict, non-routine and cognitive task conflict, transformational leadership, cultural intelligence, trust between members, language communality difference, information sharing, and selection of appropriate media.
2. These, influencing VT decision-making, factors were further examined in the UAE to evaluate the theoretical model of VT decision-making in the Middle East; more importantly, the study of all the factors together and their effect on decision-making in virtual teams. An organization's decision-making is a critical indicator of its ability to adapt and survive. Creating a competitive advantage and maintaining it is the most important thing an organization can do to survive.
3. This dissertation findings:
   - The dissertation provides guidelines for management in organizations to enhance VT decision-making. When managing teams in VT, for example, management should pay close attention to the

technology used and implemented, the level of trust between members, the willingness to share information between members, as well as communication practices between members.

- These factors can be measured and controlled to enable organizations to make better decisions, which will lead to better performance from the team. While many studies have been conducted on VTs, very little has been done on VT decision-making within organizations in developing countries.
- This research found no evidence between language and decision-making in VTs, as opposed to what has been found in the literature review. A major difference between USA, Europe, and the Middle East can be seen in the language factor, where the language influences VT decision-making in America and Europe but not in the Middle East (UAE).
- By incorporating factors into these models, this study offers a framework for developing additional models that can enhance the performance of VT not only through measurement but also by building a framework for implementing decision-making that will enhance VT performance.

4. As limitation should be named that eight factors were used to measure and enhance the effect on decision-making, but other factors, such as reward, knowledge sharing, and motivation, were not considered in this study. As well, studies in other industries should be made in the future because this study was conducted only in IT organizations. Studies in other countries should be considered for including in future studies as the dissertation study was conducted only in the UAE.

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Summary in Lithuanian

Įvadas

Problemos formulavimas

Atsiradus informacinėms ryšių technologijoms (toliau – IRT), pasikeitė organizacijos elgsena ir struktūra, todėl atsirado virtualiosios organizacijos (toliau – VO), o kartu ir virtualios komandos (toliau – VK) (Davidavičienė & Al Majzoub, 2022). Virtualiosios komandos organizacijoms turi nemažai privalumų, pavyzdžiui, mažina kelionių išlaidas, užtikrina labai lankstų darbo grafiką, produktyvumą 24 valandas per parą 7 dienas per savaitę, didina žinias ir buvimą darbo vietoje, be to, greitai reaguoja į dinamiškus verslo aplinkos pokyčius. Daugelis įmonių, prasidėjus COVID-19, nuotolinį darbą padarė nuolatinį, nepaisant to, kad COVID-19 atvejų kažkiek sumažėjo (Stratone et al., 2022; Garro-Abarca et al., 2021). Visi šie pakeitimai leidžia manyti, kad ateityje įmonės ir vadybos ekspertai labiau akcentuos virtualių komandų tyrimus, ypač VK sprendimų priėmimą, kuris trukdo pasinaudoti virtualių komandų teikiama nauda (Wei, Heckman, Crowston & Li, 2017). Virtualių komandų sprendimų priėmimo tyrimų vis dar yra nedaug (Tan, 2019; Zakaria, 2017) arba jie atliekami laboratorijose su studentais, o ne realiose komandose (Paul & Dennis, 2018). Taigi labai svarbu ištirti veiksnius, darančius įtaką sprendimų priėmimui dirbant virtualiose komandose.

Pastaruosius porą dešimtmečių Artimųjų Rytų įmonės vis dažniau taiko virtualios komandos koncepcijas, tačiau tokie tyrimai, ypač apie veiksnius, turinčius įtakos VK sprendimų priėmimui, čia atliekami retai arba jų iš viso nėra. Nėra daug kokybinių tyrimų,

kuriuose dėmesys būtų sutelktas į VK sprendimus IT organizacijose Artimuosiuose Rytuose. Natūralu, kad dėl skirtingos kultūros ir darbo etikos kitose šalyse atlikti tyrimai gali netikti Artimiesiems Rytams. Tai paskatino imtis mokslinių tyrimų, orientuotų į Artimųjų Rytų VK sprendimų priėmimą IT įmonėse (Diab-Bahman & Al-Enzi, 2020; Al Kaabi, Sidek & Mosali, 2022; Mitchell, 2021; Sagar, Arif & Rana, 2021), kurie aiškiai rodo žinių, tyrimų ir duomenų šia tema trūkumą. Konkrečiai Jungtiniai Arabų Emyratai (JAE), esantys Artimųjų Rytų regione, bus šio tyrimo vieta, siekiant mokslinių žinių apie šio regiono specifiką.

Darbo aktualumas

88 proc. įmonių darbuotojų teigia, kad virtualus komandinis darbas yra labai svarbus produktyvumui (Ismailov & Laurier, 2022; Meluso, Johnson & Bagrow, 2021), savo organizacijose 56 proc. virtualiųjų komandų narių teigė galintys prisidėti prie organizacijos krypties, vertybių ir procesų. 75 proc. virtualiųjų komandų visame pasaulyje teigia, kad nuotolinis bendradarbiavimas padidino jų produktyvumą (Klonek & Parker, 2021). Pasaulyje verslo organizacijose 85 proc. darbuotojų dirba virtualiose komandose. Iš jų 89 proc. dirba bent vienoje komandoje, o 27 proc. – daugiau nei keturiose. Įvairios komandos priėmė ir įgyvendino sprendimus, kurie lėmė 60 proc. geresnius rezultatus. 87 proc. atvejų komandos, kurios skiriasi pagal amžių ir vietovę, priima geresnius verslo sprendimus. Sprendimų priėmimas VK yra svarbus komponentas, lemiantis veiklos rezultatus (Batırlık, Gencer & Akkucuk, 2022). Artimieji Rytai, ypač JAE, nėra išimtis kalbant apie šiuos pokyčius, nes 80 proc. įmonių perėjo prie VK (Meluso et al., 2021). Tyrimai parodė, kad sprendimų priėmimas virtualiose komandose yra ypač reikšmingas JAE dėl šių faktų:

1. Nuotolinis darbas: dėl COVID-19 pandemijos Jungtiniuose Arabų Emyratuose paplito nuotolinis darbas. Dubajaus prekybos ir pramonės rūmų atliktos apklausos duomenimis, 70 proc. įmonių Dubajuje patvirtino nuotolinio darbo politiką, o 60 proc. įmonių Abu Dabyje įgyvendino nuotolinio darbo tvarką (Staff, 2021).
2. IRT rinkos dydis: apskaičiuota, kad JAE IRT rinkos vertė 2021 m. siekė 92,6 mlrd. AED (25,2 mlrd. JAV dolerių), o per ateinančius penkerius metus numatomas 3,3 proc. augimas (TRA, 2021).
3. Technologijų diegimas: tai reiškia, kad virtualiosios komandos gali lengvai naudotis skaitmeninėmis priemonėmis bendraudamos ir bendradarbiaudamos. Remiantis Telekomunikacijų reguliavimo tarnybos (TRA) parengta IRT kraštovaizdžio 2021 m. ataskaita, 99 proc. JAE namų ūkių turi prieigą prie interneto, o 86 proc. interneto naudotojų turi išmaniuosius telefonus (2022 m. ataskaita).
4. Daugiakultūrė darbo jėga: JAE yra įvairios darbo jėgos, dirba skirtingų tautybių ir kultūrų žmonės. Tokia įvairovė virtualioms komandoms gali suteikti unikalių perspektyvų ir idėjų, tačiau ji taip pat gali kelti bendravimo ir kultūrinių iššūkių (Kiek, 2020).
5. Lanksti darbo tvarka: JAE vyriausybė ėmėsi iniciatyvų, kuriomis siekiama palaikyti lanksčias darbo sąlygas, įskaitant darbą ne visą darbo dieną, dalijimąsi darbo vieta ir nuotolinį darbą. Vyriausybė taip pat paskatino privatųjį sektorių

taikyti lanksčias darbo sąlygas, kad būtų pagerinta darbo ir asmeninio gyvenimo pusiausvyra ir našumas (Staff, 2021).

Nepaisant šios problemos svarbos, JAE šia tema paskelbta labai mažai tyrimų, o tai rodo, kad labai trūksta žinių, patirties ir statistinių duomenų. Pagrindinis šio tyrimo indėlis tas, kad padeda nustatyti ir plėtoti veiksnius, kurie pagerins VK sprendimų priėmimą besivystančiose šalyse.

Tyrimo objektas

Tyrimo objektas – veiksniai, darantys poveikį sprendimų priėmimui virtualiose komandose.

Darbo tikslas

Darbo tikslas – nustatyti ir įvertinti veiksnius, lemiančius sprendimų priėmimą virtualiose komandose.

Darbo uždaviniai

Šio darbo tikslui pasiekti formuluojami uždaviniai:

1. Atlikti IRT, virtualių komandų ir sprendimų priėmimo sričių tyrimų analizę, siekiant sukurti teorinį virtualių komandų sprendimų priėmimą lemiančių veiksnių modelį.
2. Identifikuoti tyrimo veiksnius ir suformuoti teorinį modelį VK sprendimams priimti JAE informacinių technologijų srityje.
3. Įvertinti ir nustatyti svarbiausius veiksnius, darančius įtaką VK sprendimų priėmimui, siekiant sukurti modelį, leisiantį pagerinti VK sprendimų priėmimą.

Tyrimų metodika

Darbe taikyti šie tyrimo metodai: sisteminė, lyginamoji mokslinės literatūros analizė ir sintezė, siekiant konceptualizuoti pagrindinius konstruktus, suformuluoti hipotezes ir taip sukurti teorinį pagrindą; apklausa, ekspertinis ir daugiakriteris vertinimas, struktūrinių lygčių modeliavimas (toliau – SEM), aiškinamoji faktorinė analizė, patvirtinančioji faktorinė analizė. Konstruktų validumo ir patikimumo testai taikomi naudojant Kronbacho alfą, Bartleto sferiškumo testą, Kaiserio–Meyerio–Olkino (toliau – KMO) atrankos adekvatumo matą, vidutinės dispersijos testą (toliau – AVE), koreliacijos matricą ir faktorines apkrovas, siekiant patikrinti konstruktų validumą ir patikimumą prieš vertinant modelį.

Darbo mokslinis naujumas

1. Remiantis identifikuotais veiksniais, sukurtas modelis, sietinas su VK sprendimų priėmimu. Taip eliminuotas mokslo žinių trūkumas sietinas su geresniu VK

sprendimų priėmimu, galime prisidėti prie esamų modelių žinių gausinimo ir praturtinti žinias apie VK.

2. Teorinis VK sprendimų priėmimo modelis buvo empiriškai ištestuotas, o jo veikimas demonstruojamas JAE IT versle. Tai kuria mokslinę vertę ir suteikia žinių apie VK sprendimų priėmimo specifiką besivystančiose šalyse.
3. Papildyta ištekliais grindžiamo požiūrio ir klestėjimo darbe teorija, detalizuojant VK narių vaidmenį. Pagrindiniai aspektai: tobulinant sprendimų priėmimą, organizacija pasieks geresnių rezultatų, stiprinant pasitikėjimą, skatinant dalijimąsi informacija, didinant kultūrinių skirtumų suvokimą ir naudojant tinkamas IRT priemones, taip sukuriant vertingus išteklius, kurių konkurentai negali mėgdžioti. Minėtos teorijos pritaikytos virtualios komandos sprendimų priėmimo organizacijose kontekste.
4. Klestėjimas – tai vadybos teorija, orientuota į teigiamą ir klestinčią asmens patirtį organizacijoje. Todėl tyrimas prisideda prie šios teorijos, tirdamas, kaip virtualios komandos gali klestėti ir skatinti gerovę, nepaisant iššūkių, susijusių su nuotoliniu darbu. Pavyzdžiui, transformuojantis vadovavimo elgesys, pvz., komandos narių įkvėpimas ir motyvavimas, yra teigiamai susiję su komandos narių suvokimu apie sprendimų priėmimo veiksmingumą ir individualų klestėjimą. Panašiai aukštesnis komandos narių kultūrinio intelekto lygis yra teigiamai susijęs su geresniais sprendimų priėmimo rezultatais ir individualiu klestėjimu. Galiausiai efektyvus IRT įrankių, tokių kaip vaizdo konferencijos ir projektų valdymo programinė įranga, naudojimas gali pagerinti virtualios komandos sprendimų priėmimo rezultatus ir paskatinti komandos narius.

Darbo rezultatų praktinė reikšmė

Praktinė šio tyrimo reikšmė – nustatyti veiksniai, labai svarbūs virtualios komandos sprendimų priėmimo sėkmei. Suprasdamos, kaip šie veiksniai daro įtaką sprendimų priėmimui, organizacijos gali kurti strategijas ir politiką, skatinančias efektyvų virtualios komandos bendradarbiavimą. Organizacijos gali investuoti į IRT priemones ir infrastruktūrą, kurios palengvina virtualių komandos narių bendravimą ir dalijimąsi informacija. Be to, jie gali skatinti komandos narių kultūrinį intelektą, kad geriau suprastų ir naršytų tarpkultūrinius skirtumus. Transformacinis vadovavimo elgesys taip pat gali būti sukurtas siekiant įkvėpti ir motyvuoti komandos narius siekti bendrų tikslų ir uždavinių.

Be to, organizacijos gali pasinaudoti šio tyrimo išvadomis, siekdamos valdyti užduočių ir santykių konfliktus virtualiose komandose. Skatindami pasitikėjimą ir skatindami atvirą bendravimą, virtualios komandos nariai gali konstruktyviai spręsti konfliktus, kurie prisideda prie geresnių sprendimų priėmimo rezultatų.

Šio tyrimo praktinė reikšmė ta, kad nustatomi veiksniai, prisidedantys prie veiksmingo virtualios komandos sprendimų priėmimo, kuriuos organizacijos gali panaudoti savo sprendimų priėmimui ir bendram našumui pagerinti.

Ginamieji teiginiai

1. Yra septyni veiksniai ir sprendimai, veiksmingiausi ir aktualiausi tobulinant VK sprendimų priėmimą Artimųjų Rytų IT srityje dirbančiose įmonėse. Šie veiksniai yra kultūrinis išprusimas, užduočių konfliktas, santykių konfliktas, transformacinis vadovavimas, pasitikėjimas, IRT ir dalijimasis informacija.
2. Siūlomas VT sprendimų priėmimo modelis papildo dvi vadybos teorijas: ištekliais grindžiamą požiūrį ir klestėjimą darbe.
3. Nustačius spragas ir mokslinių žinių apie VK sprendimų priėmimą besivystančiose šalyse trūkumą, sukurtas modelis yra reikšmingas tobulinant VK sprendimų priėmimą (išbandyta JAE IT srityje).

Darbo rezultatų aprobavimas

Disertacijos tema paskelbti šie moksliniai straipsniai: trys straipsniai recenzuojamuose mokslo žurnaluose (Davidavičienė & Al Majzoub, 2022; Davidaviciene, Al Majzoub & Meidute-Kavaliauskiene, 2020a; Davidaviciene, Al Majzoub & Meidute-Kavaliauskiene, 2020b), trys straipsniai konferencijų straipsnių rinkiniuose (Majzoub, 2019; Al Majzoub, 2020; Al Majzoub & Davidaviciene, 2018, 2019)

Darbo rezultatai buvo paskelbti trijose mokslinėse konferencijose:

- 10-ojoje tarptautinėje mokslinėje konferencijoje „Verslas ir vadyba 2018“, vykusioje 2018 m. gegužės 3–4 d. Vilniaus Gedimino technikos universitete;
- Tarptautinėje mokslinėje konferencijoje „Šiuolaikiniai verslo, vadybos ir ekonomikos inžinerijos klausimai 2019“, vykusioje 2019 m. gegužės 9–10 d. Vilniaus Gedimino technikos universitete, Lietuvoje;
- Tarptautinėje konferencijoje „Akademikų pasaulio tarptautinė vadybos ir informacinių technologijų 2019 m. konferencija“, vykusioje 2019 m. gruodžio 6–7 d. Beirute, Libane.

Disertacijos struktūra

Darbą sudaro įvadas, trys pagrindiniai skyriai, bendrosios išvados, literatūros sąrašas, autoriaus publikacijų disertacijos tema sąrašas ir priedai. Disertacijos apimtis – 133 puslapiai be priedų. Disertacijoje yra 9 paveikslai ir diagramos, 33 lentelės, pateikiami 286 literatūros šaltiniai.

1. Teoriniai virtualios komandos sprendimų priėmimo tyrimai

IRT keičia mūsų gyvenimus, nesvarbu, ar tai būtų asmeninis gyvenimas, socialinis bendravimas, verslo aplinka ar įmonių kultūra (Davidaviciene, Al Majzoub et al., 2020). Besivystant šalims, organizacijų ir institucinė struktūra turi būti pertvarkytos taip, kad atitiktų pokyčius. Dauguma šalių yra parengusios nacionalinę IRT politiką, kuri yra IRT integracijos į visuomenę pagrindas (Apanaviciene, Vanagas & Fokaides, 2020). Verslo sėkmė susijusi su informacinėmis ir ryšių technologijomis, nes jos daro poveikį mechanizmui,

naudojamam vertei kaupti ir pelnui gauti. Pasak mokslininkų, naudojant duomenis priimami sprendimai didina veiklos efektyvumą, pelningumą ir užtikrina valdymo sprendimų veiksmingumą. Dėl padidėjusių investicijų į informacines ir ryšių technologijas jos tampa svarbiu verslo komponentu. IRT daro tiesioginę įtaką organizacinei elgsenai, ypač kalbant apie organizacijos struktūrą, intelektą ir sprendimų priėmimą.

Dėl informacinių technologijų pokyčių susiformavo keturi nauji organizacijų tipai, įskaitant virtualias organizacijas, derybų būdu įsteigtas organizacijas, tradicines organizacijas ir vertikaliai integruotas konglomeratų organizacijas. Sparčiai augant informacinėms ir ryšių technologijoms ir plečiantis rinkoms, dažniausiai pasitaikantys organizacijų tipai yra virtualios ir derybų būdu įsteigtos organizacijos. Veikdamos virtualių organizacijų forma, įmonės gali sumažinti pridėtines išlaidas, padaryti daugiau turėdamos mažiau, reaguoti į rinkos pokyčius ir tenkinti klientų poreikius pasitelkdamos geografiškai ir organizaciniu požiūriu paskirstytus darbuotojus. Ketvirtoji pramonės revoliucija sukėlė dramatiškus darbo struktūros ir valdymo pokyčius. Vienas iš jų buvo virtualių komandų kūrimas. Komandos yra laikinos, skirtingos kultūriniu požiūriu ir geografiškai išsklaidytos. Privalumų, kuriuos virtualios komandos teikia įmonei ir darbuotojams, yra daug. Pvz., komandos nariai gali dirbti su keliais projektais ir koordinuoti užduotis fiziškai nedalyvaudami. Laisvė dirbti nuotoliniu būdu pagerina darbo ir asmeninio gyvenimo pusiausvyrą ir darbuotojų pasitenkinimą (Liao, 2017).

Sprendimų priėmimas yra esminis organizacijos verslo plano rengimo, tikslų siekimo ir problemų sprendimo elementas. Geri sprendimai lemia veiksmų kryptis, padedančias organizacijai siekti sėkmės (Ada & Ghaffarzadeh, 2015). Virtualios komandos priima sprendimus plėtodamos įvairias veiklas ir pasirinkimus, o ne priimdamos vieną sprendimą (Wei et al., 2017). Grupės priimamų sprendimų pranašumai prieš individualius sprendimus plačiai nagrinėjami literatūroje. Grupinis sprendimų priėmimas sujungia į visumą individualias žinias, gebėjimus ir įgūdžius ieškant sprendimo. Jis suteikia grupės nariams atsakomybės už rezultatus jausmą, nes visi dalyvauja priimant sprendimą. Yra modelių, leidžiančių įvertinti sprendimus, tie modeliai yra racionalus, riboto racionalumo, intuityvus ir politinis modelis. Racionalus sprendimų priėmimo modelis grindžiamas koncepcija, kad sprendimų priėmėjai, siekdami maksimaliai pagerinti savo tikslų kokybę, atlieka keletą veiksmų. Riboto racionalumo modelis grindžiamas koncepcija siekti patenkinamo sprendimo, kai sprendimų priėmėjas suranda arba pasiekia ne optimalų, o patenkinamą sprendimą. Intuityvus sprendimų priėmimo modelis tapo svarbiu sprendimų priėmimo modeliu. Jis grindžiamas sprendimų priėmimu be sąmoningo mąstymo. Politinio modelio sprendimų priėmėjai orientuosis į asmeninių, o ne organizacijos tikslų siekimą.

2. Tyrimų metodikos, nustatančios veiksnius, turinčius įtakos virtualios komandos sprendimų priėmimui, formavimas

Pastaraisiais metais organizacijos struktūra keitėsi nuo hierarchinės struktūros prie komandinės. Komandinėje struktūroje valdžia decentralizuojama, todėl komandos gali būti atsakingos už sprendimų priėmimą organizacijoje (O'Neill et al., 2016). Virtualios komandos leidžia skirtingą patirtį, kompetenciją ir kultūrą turintiems žmonėms dirbti kartu, nepaisant jų fizinės buvimo vietos. Tai lemia sėkmingą ir optimalų sprendimų priėmimą.

Grupinis sprendimų priėmimas vyksta, kai komandos nariai bendrauja tarpusavyje. Sprendimų priėmimo tyrimas apima galimybių suradimą ir pasirinkimą pagal sprendimo priėmėjo vertybes ir pageidavimus (Ureña, Kou, Dong, Chiclana & Herrera-Viedma, 2019). Sprendimo priėmimas rodo, kad yra ir kitų galimybių, į kurias reikia atsižvelgti.

Tokiu atveju, nustatę kuo daugiau šių galimybių, galime pasirinkti tą, kuri labiausiai atitinka mūsų tikslus, pageidavimus, įsitikinimus ir kitus kriterijus (Fülöp, 2001). Sprendimų priėmimas komandoje yra labai svarbus jos veiksmingumui (Flores-Garcia & Bruch, 2019). Norint geriau suprasti grupinius sprendimus virtualios komandos dinamikoje, labai svarbu išanalizuoti bendravimo modelius grupės sprendimų priėmimo metu, nes bendravimas yra grupinių sprendimų pagrindas.

Virtualios komandos, įtraukdamos daugybę veiksmų ir pasirinkimų, sprendimus priima nuosekliau (Wei et al., 2017). Dėl būtinybės konsultuotis su keliais komandos nariais VK sprendimai yra sudėtingi (Salcinovic, Drew, Dijkstra, Waddington & Serpell, 2022). Norint visiškai suprasti, kokios yra sėkmingo ir nesėkmingo sprendimų priėmimo priežastys, labai svarbu ištirti visą sprendimų priėmimo procesą.

Kultūrinis išprusimas, konfliktas, transformacinis vadovavimas, pasitikėjimas, IRT, dalijimasis informacija ir kalba – šiems veiksniams daugybė šios srities autorių skyrė daugiausia dėmesio ir citatų, kaip parodyta S2.1 lentelėje.

S2.1 lentelė. Tirti veiksniai pagal autorius (sudaryta autoriaus)

Veiksnys	Autoriai
IRT	Ackermann & Yearworth, 2018b; Baralou & Dionysiou, 2022; Eisenberg et al., 2019; Marín-Díaz et al., 2020; Salcinovic et al., 2022
Pasitikėjimas	Davidavičiene et al., 2020; Garro-Abarca et al., 2021; Topaloglu & Anac, 2021; Ureña et al., 201)
Kalba	Davidaviciene, Al Majzoub et al., 2020; Kiely et al., 2022; Kwok, et al., 2022; Presbitero, 2019
Dalijimasis informacija	Davidaviciene & Al Majzoub, 2020; Flavián et al., 2022; Majzoub, 2019; Zhang, 2022
Kultūrinis išprusimas	Batırlık et al., 2022; Hiran & Henten, 2020; Morrison-Smith & Ruiz, 2020; Shaik et al., 2019
Transformacinis vadovavimas	Davidavičiene et al., 2020; Han & Hazard, 2022; Kanthawongs, 2022; Panteli et al., 2019
Užduočių ir santykių konfliktas	Klonek et al., 2022; Morrison-Smith & Ruiz, 2020; Wang et al., 2019; Wu & Abdul-Nour, 2020

Per pastaruosius kelerius metus virtualių komandų naudojimo mastas IT srityje labai išaugo. Daugelis JAV ir Europos bendrovių kuria arba užsako naujas IT paslaugas, kurias sukurs visame pasaulyje pasiskirsčiusios komandos, pavyzdžiui, Indijos ar Kinijos. Pastaraisiais metais IT organizacijos naudoja daugiau geografiškai išsklaidytų virtualių komandų. Šie produktai ir paslaugos kuriami globaliai pasiskirsčiusiose komandose, pavyzdžiui, komandose, esančiose keliose skirtingų šalių vietose. Dabartiniai modeliai rodo, kad naujos sritys įsitvirtina kaip IT įmonių centrai, šios naujai įsitvirtinusios sritys yra Artimuosiuose Rytuose. Šios šalys pirmiausia patrauklios dėl to, kad yra netoli arabų rinkos.

Artimųjų Rytų subregionuose yra labai didelių skirtumų tarp poreikių ir gebėjimų investuoti. Saudo Arabija, Kataras, Kuveitas ir Jungtiniai Arabų Emyratai yra šalys, kuriose į pagrindinę infrastruktūrą investuojama daugiausia. Vidurinius Rytus nuo kitų šalių skiria kelios ypatybės, pvz., Artimuosiuose Rytuose egzistuoja darbo užmokesčio ir pareigų skirtumai dėl lyties, rasės ir tautybės, dėl kurių komandos nariams sunku bendrauti tarpusavyje. Artimuosiuose Rytuose, priešingai, dirbama nuo sekmadienio iki ketvirtadienio. Gali būti gana sudėtinga visiškai tiksliai numatyti, kurią dieną Artimuosiuose Rytuose bus švenčiama valstybinė šventė. Artimuosiuose Rytuose labiausiai paplitusi religija yra islamas, todėl komandų vadovai raginami laikytis kiekvieno komandos nario maldos laiko, kad būtų išvengta kultūrinių nesusipratimų. Kadangi Artimieji Rytai yra daugiakultūris regionas, kuriame įvairių sluoksnių ir tautų žmonės dalyvauja įvairiuose projektuose, labai svarbu suvokti šių grupių reiškinius, susijusius su skirtingomis kultūromis. Neįmanoma pervertinti virtualių komandų valdymo svarbos Artimuosiuose Rytuose, nes tai daugiakultūris regionas, kuriame įvairių tautų ir sluoksnių žmonės bendradarbiauja įvairiuose projektuose. Daugybė pasaulinių korporacijų nusprendė įsikurti Jungtiniuose Arabų Emyratuose, traukiamos šalies plataus masto augimo plano. Atlikta nemažai tyrimų apie iššūkius, su kuriais susiduria pasauliniu mastu pasiskirsčiusios virtualios komandos, ir galimus jų sprendimo būdus, tačiau tyrimų, skirtų VK Artimuosiuose Rytuose, o ypač VK sprendimams priimi, atlikta palyginti nedaug. Šalyje yra du pagrindiniai miestai: sostinė Abu Dabis ir Dubajus, turintis daugiausia gyventojų, judriausias ir laikomas tarptautiniu centru. XXI a. šalis vis dažniau savo ekonominį augimą sieja ne su nafta ir dujomis, o su turizmu ir verslu. JAE, ypač Dubajus, turi minimalias prekybos kliūtis, todėl yra ideali vieta įmonėms, aptarnaujančioms visą Artimųjų Rytų ir Šiaurės Afrikos regioną. JAE pirmauja Artimuosiuose Rytuose, kai kalbama apie IRT ir skaitmeninimą. Investicijos į IRT didėja ir artėja prie 1 mlrd. dolerių, tačiau atidesnė analizė rodo, kad didžiausia jų dalis tenka JAE (Göll & Zwiers, 2018). Keletas tarptautinių bendrovių patraukė į Jungtinius Arabų Emyratus dėl masinių plėtros programų, ypač IT pramonės srityje. Dėl COVID-19 pandemijos organizacijoms buvo suteikta galimybė ištirti komandas permainų laikotarpiu, kartu priverčiant jas nustatyti savo pagrindines veiklas ir būdus, kaip jas vykdyti virtualioje aplinkoje.

Virtualių komandų tyrimai dar tik pradedami, o kadangi virtualios komandos yra palyginti naujos, ištirta nedaug tyrimų sričių, ypač Artimuosiuose Rytuose (Davidaviciene & Al Majzoub, 2022). Kadangi Artimųjų Rytų kultūra ir darbo etika skiriasi nuo kitų šalių kultūrų ir etikos, kitose šalyse atlikti tyrimai gali būti nepritaikomi Artimiesiems Rytams. Būtina atlikti tyrimo projektą, orientuotą į darbuotojus, dirbančius IT įmonėse, įsikūrusiose Artimuosiuose Rytuose, ypač Jungtiniuose Arabų Emyratuose, aptariant VK sprendimų priėmimo specifiką ir ypatumus. Kadangi VK sprendimų priėmimas yra nauja sąvoka Artimuosiuose Rytuose, daugelis tyrėjų ją nagrinėja, ypač COVID-19 pandemijos akivaizdoje.

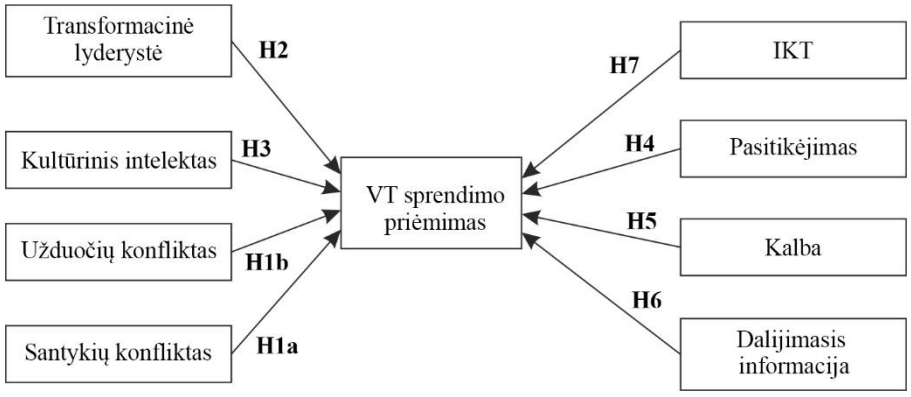
Literatūros apžvalgoje išsamiai aptarta mokslinė problema ir atkreiptas dėmesys į būtinybę matuoti VK sprendimų priėmimo modelį organizacijose. Šiame skyriuje siekiama pateikti bendrą metodikos apžvalgą. Šiuo atveju modelį siekiama pritaikyti ir kitose šalyse. Modelį sudaro aštuoni veiksniai, darantys įtaką VK sprendimų priėmimui. Veiksniai yra šie: užduočių ir santykių konfliktas, IRT, transformacinis vadovavimas, kultūrinis

išprusimas, pasitikėjimas, kalba ir dalijimasis informacija. Šiame tyrime kiekybinis metodas taikomas siekiant ištirti dalijimosi informacija, pasitikėjimo, kalbos, užduočių konfliktų, CQ, IRT, TL ir santykių konfliktų ryšį su VK sprendimų priėmimu. Modelio tikslas – įvertinti ir pagerinti VK sprendimų priėmimą organizacijose, o tai bus gairės organizacijoms siekiant pagerinti jų veiklą ir įgyti konkurencinį pranašumą, kuris lems esamos rinkos dalies išlaikymą ir ateities išlaidų planus. Pateiktam JAE moduliui taikomas struktūrinių lygčių modelio metodas. Pirmiausia iš VK darbuotojų buvo surinkti duomenys, kurie padėjo sukurti ir patikrinti modelį. Antra, buvo surinkti duomenys iš ekspertų, kurie padėjo sukurti ginamą modelį.

Šiame skyriuje hipotezės tikrinamos taikant empirinę procedūrą. Tikslas – patvirtinti teorinį modelį taikant jį realiose situacijose. Duomenys surinkti naudojant internetinę apklausą, sukurtą „Google Forms“ ir išplatintą IT srities specialistams, dirbantiems virtualiose komandose. Ši hipotezė buvo tikrinama naudojant struktūrinį lygčių modelį (SEM).

- H1a: Santykių konfliktas neigiamai veikia VK sprendimų priėmimą.
- H1b: Nerutininių ir kognityvinių užduočių konfliktas teigiamai veikia VK sprendimų priėmimą.
- H2: Transformacinė lyderystė teigiamai veikia VK sprendimų priėmimą.
- H3: VK sprendimų priėmimui teigiamą įtaką daro kultūrinis išprusimas (CQ).
- H4: VK narių tarpusavio pasitikėjimas teigiamai veikia VK sprendimų priėmimą.
- H5: Kalbų skirtumai neigiamai veikia VK sprendimų priėmimą.
- H6: Tinkamas dalijimasis informacija turi teigiamą poveikį VK sprendimų priėmimui.
- H7: Tinkamas informacinių ir komunikacinių (IKT) priemonių pasirinkimas turės teigiamą poveikį komandos sprendimų priėmimui.

Šios hipotezės padėjo sukurti siūlomą teorinį modelį, pateiktą S2.1 pav.



S2.1 pav. Siūlomas teorinis modelis

Klausimynai buvo parengti remiantis literatūros apžvalga.

Savarankiškai parengta internetinė apklausa, kurią sudarė 51 klausimas, siekiant surinkti šio tyrimo duomenis iš asmenų, dirbančių virtualiose komandose. Klausimai buvo pagrįsti penkiabale Likerto skale nuo 1, reiškiančio „Visiškai nesutinku“ iki 5, reiškiančio „Visiškai sutinku“. Kintamiesiems vertinti naudoti elementai buvo gauti iš mokslinių tyrimų. Imtį sudarė JAE IT sektoriuje dirbančių virtualių komandų nariai. Tikslinės įmonės išteklių planavimo, verslo žvalgybos ir specializuotų žinių konsultavimo organizacijos, veikiančios informacinių ir ryšių technologijų sektoriuje. Pasirinktos IT sektoriaus įmonės, nes IT komandų nariai dirba internetu ir yra pasklidę po visą pasaulį, tačiau surinkti tik JAE esančių komandų duomenys. Apklausa buvo išplatinta 1027 darbuotojams, 470 iš jų į kvietimą sureagavo teigiamai. Atmetus tuos, kurie neužpildė apklausų, ir tuos, kurie nebendradarbiavo virtualiose komandose, imties dydis sumažėjo iki 402 darbuotojų. Duomenims analizuoti taikyta struktūrinių lygčių metodika. Kadangi šis metodas labai jautrus trūkstamų ir netipinių duomenų atvejams, prieš pradedant statistinės analizės procesą reikėjo atlikti išsamią duomenų bazės analizę. Imties dydis laikomas pakankamu struktūrinių lygčių metodui taikyti. Galima rasti keletą struktūrinės lygties modelio taikymo priežasčių.

1. Pirmiausia jis apima patvirtinamąjį dalinį mažiausiųjų kvadratų kelio modeliavimą, kelio analizę ir faktorinę analizę.
2. Antra, jis taip pat taikomas vertinant nematomus konstruktus, kurie dažniausiai yra nestebimi.

Modelio atitikčiai patvirtinti buvo taikomi šie metodai: CFI, SRMR, RMSEA ir PCLOSE.

Taigi, nustačius metodą, kuris bus taikomas siekiant rasti atsakymus į tyrimo konteksto klausimus, kitas žingsnis – aptarti gautus rezultatus, ieškant koreliacinių ryšių.

3. Veiksnių, darančių įtaką virtualios komandos sprendimų priėmimo modeliui Jungtiniuose Arabų Emyratuose, patikrinimas

Šiame skyriuje veiksniai, darantys įtaką VK sprendimų priėmimo modeliui, tikrinami empiriniu tyrimu, kuriuo, taikant struktūrinių lygčių modelį (SEM), vertinamas VK sprendimų priėmimas organizacijoje. Be to, ginamame tyrimo modelyje buvo taikomas ekspertų daugiakriteris vertinimas, siekiant pagerinti VK sprendimų priėmimo efektyvumą. Šio skyriaus rezultatai buvo pateikti trijuose moksliniuose straipsniuose. Modelis ir hipotezės patikrintos, tikrinant vidinį nuoseklumą, atliekant elementų analizę ir vertinant modelį naudojant SEM. Patikrintas imties adekvatumas – KMO (Kaiserio–Mejerio–Olkino matas), homoskedastiškumas (Bartleto testas: koreliacijos matrica nėra tapatybės matrica), bendruomeniškumas ir savosios vertės (Costales, Catulay, Costales, & Bermudez, 2022).

Kaiserio–Mejerio–Olkino imties adekvatumo matas yra statistika, rodanti, kokią dalį kintamųjų dispersijos gali lemti pagrindiniai veiksniai. Reikšmė yra 0,831, t. y. didesnė nei 0,60, o tai rodo, kad faktorinė analizė yra naudinga (Shrestha, 2021). Bartleto sferiškumo testas tikrina hipotezę, kad jūsų koreliacijos matrica yra tapatybės matrica, o tai

reikštų, kad kintamieji yra nesusiję ir todėl netinkami struktūrai nustatyti. Bartleto sferiškumo testas yra reikšmingas $p < 0,001$, taigi yra reikšmingas skirtumas tarp koreliacijos matricos ir tapatumo matricos, kurioje nėra jokių sąsajų tarp kintamųjų.

Šiame tyrime Kronbacho alfa patikimumo testas buvo taikytas šio tyrimo kintamiesiems. Kronbacho alfa metodas buvo taikomas matuojant klausiančiųjų patikimumui įvertinti, priimtinos reikšmės turėtų būti didesnės nei 0,7, kad atspindėtų priimtiną patikimumą.

1. Santykių konflikto veiksnį sudaro penki elementai, kurių Kronbacho alfa yra 0,82.
2. Užduočių konflikto veiksnį sudaro penki elementai, kurių Kronbacho alfa yra 0,852.
3. Transformacinio vadovavimo veiksnį sudaro penki elementai, kurių Kronbacho alfa yra 0,798.
4. Kultūrinio išprusimo veiksnį sudaro penki elementai, kurių Kronbacho alfa yra 0,801.
5. Pasitikėjimo veiksnį sudaro penki elementai, kurių Kronbacho alfa yra 0,762.
6. Kalbos veiksnį sudaro keturi elementai, kurių Kronbacho alfa yra 0,778.
7. Dalijimosi informacija veiksnį sudaro penki elementai, kurių Kronbacho alfa yra 0,901.
8. IRT veiksnį sudaro penki elementai, kurių Kronbacho alfa yra 0,856.

Visos reikšmės yra didesnės nei AVE, o tai reiškia, kad elementai paaiškina konstrukto dispersiją. Tyrimo klausimui patikrinti buvo naudojamas struktūrinių lygčių modelis (SEM) kartu su AMOS 23.0 programa. Taikytas didžiausio tikėtinumo metodas. Siekiant patvirtinti matavimo modelį, buvo atliktas konvergentinio ir diskriminantinio validumo testas. Visi elementai turėjo reikšmingas apkrovas, kurios buvo didesnės nei 0,5. Vidutinė išskirta dispersija (AVE) viršijo 0,5, o sudėtinis patikimumas (SP) viršijo 1,96. Todėl atrodo, kad konvergentinis validumas yra patvirtintas. Didžiausia kvadratinė dispersija skiriasi mažiau nei vidurkis, o tai rodo diskriminantinį pagrįstumą. Atlikus daugiakolinearišKumo testą taip pat nustatyta, kad koreliacija tarp nepriklausomųjų kintamųjų yra mažesnė nei 0,3, taigi daugiakolinearišKumo problemos nėra. S3.1 lentelėje pateikti modelio tinkamumo CFI, SRMR, RMSEA ir PCLOSE rezultatai, kurie yra priimtini.

S3.1 lentelė. Modelio tinkamumas

Matas	Vertinimas	Ribinė vertė	Išaiškinimas
CMIN	1,117	–	–
DF	3,6	–	–
CMIN/DF	2,53	Nuo 1 iki 3	Priimtinas
CFI	0,92	>0,90	Priimtinas
SRMR	0,052	<0,08	Priimtinas
RMSEA	0,036	<0,06	Priimtinas
PClose	0,06	>0,05	Priimtinas

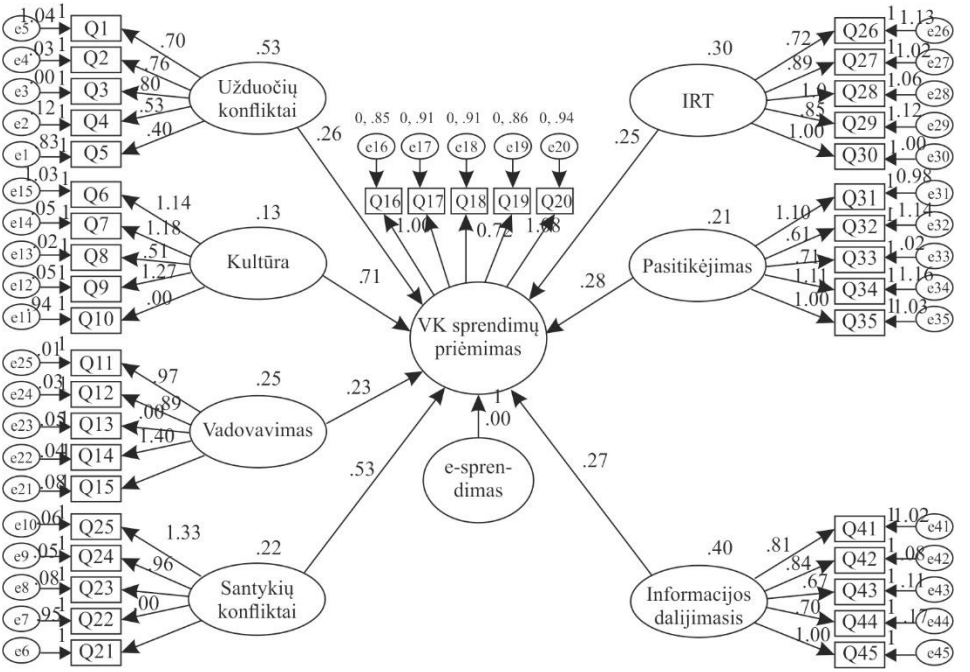
Duomenys modeliui patikrinti buvo renkami naudojant internetinę apklausą („Google Forms“) ir analizuojami naudojant AMOS SPSS. Hipotezių rezultatai, jei jos yra priimtinos arba atmetamos, nurodyti taip, kaip parodyta S3.2 lentelėje:

- – H1.a: Santykio konflikto kritinis santykis (KS) yra 4,067, įvertis – 0,533, standartinė paklaida (SP) – 0,131, jo P vertė mažesnė nei 0,001. 0,001 reikšmingumo lygmuo (dvipusis) rodo, kad santykių regresijos svoris prognozuojant sprendimų priėmimą labai skiriasi nuo nulio. Tai reiškia, kad H1.a yra reikšmingas.
- H1.b: Užduočių konflikto kritinis santykis (KS) yra 3,933, įvertis – 0,258, standartinė paklaida (SP) – 0,065, jo P vertė mažesnė nei 0,001. Taigi, esant 0,001 lygiui (dvipusiam), užduočių konflikto regresijos svoris priimant sprendimus labai skiriasi nuo nulio. Todėl H1.b yra reikšmingas, o tai rodo, kad užduočių konfliktas neigiamai veikia sprendimų priėmimą.
- H2: Transformacinio vadovavimo kritinis santykis (KS) yra 2,549, įvertis – 0,232, standartinė paklaida (SP) – 0,091, jo P reikšmė lygi 0,011. Tai reiškia, kad transformacinio vadovavimo regresijos svoris prognozuojant sprendimų priėmimą labai skiriasi nuo nulio ir yra 0,001 lygmens (dvipusis). Kitaip tariant, H2 yra reikšminga.
- H3: Kultūrinio išprusimo kritinis santykis (KS) yra 3,570, įvertis – .715, standartinė paklaida (SE) – 0,200, jo P reikšmė mažesnė nei 0,001. Tai reiškia, kad kultūrinio išprusimo regresijos svoris prognozuojant sprendimų priėmimą labai skiriasi nuo nulio ir yra 0,001 lygmens (dvipusis). Kitaip tariant, H3 yra reikšminga.
- H4: Pasitikėjimo kritinis santykis (KS) yra 2,511, įvertis – 0,276, standartinė paklaida (SP) – 0,110, jo P reikšmė mažesnė nei 0,012. Tai reiškia, kad pasitikėjimo regresijos svoris prognozuojant sprendimų priėmimą labai skiriasi nuo nulio ir yra 0,001 lygmens (dvipusis). Kitaip tariant, H4 yra reikšminga.
- H5: Kalbinis bendrumas nebuvo reikšmingas, nes P reikšmė 0,0543 > 0,05, o KS yra –0,608.
- H6: dalijimosi informacija kritinis santykis (KS) yra 3,4, įvertis – .34, standartinė paklaida (SP) – 0,061, jo P reikšmė mažesnė nei 0,001. Tai rodo, kad esant 0,001 lygmeniui dalijimosi informacija regresijos svoris prognozuojant sprendimų priėmimą gerokai skiriasi nuo nulio (dvipusis). Kitaip tariant, H6 yra reikšminga.
- H7: IRT pasirinkimo kritinis santykis (KS) yra 3,37, įvertis – 0,25, standartinė paklaida (SP) – 0,074, jo P reikšmė mažesnė nei 0,001. Kitaip tariant, IRT sprendimų priėmimo prognozės atveju regresijos svoris reikšmingai skiriasi nuo nulio ir yra 0,001 lygmens (dvipusis). Kitaip tariant, hipotezė H7 yra reikšminga.

Šiuo tyrimu buvo siekiama sukurti teorinį modelį, skirtą VK sprendimų priėmimo poveikiui įvertinti ir sustiprinti, nagrinėjant šiuos veiksnius: dalijimąsi informacija, pasitikėjimą, kalbą, užduočių ir santykių konfliktus, TL ir CQ. Mūsų rezultatai parodė, kad dalijimasis informacija, pasitikėjimas, kultūrinis išprusimas, transformacinis vadovavimas ir užduočių konfliktas turi teigiamą poveikį VK sprendimų priėmimui, o santykių konfliktas turėjo neigiamą poveikį, kalba neturėjo reikšmingo poveikio VK sprendimų priėmimui. Šio tyrimo rezultatai patvirtina ankstesnių tyrimų, atliktų tiriant poveikį VK sprendimams, rezultatus.

S3.2 lentelė. Duomenų rezultatai

Hipotezė	IV	Vertinimas	Standartinė paklaida	KS	P reikšmė	Rezultatas
H1.a	Santykių konfliktai	.533	.131	4,067	***	Patvirtinta
H1.b	Užduočių konfliktai	.258	.065	3,933	***	Patvirtinta
H2	Vadovavimas	.232	.091	2,549	.011	Patvirtinta
H3	Kultūra	.715	.200	3,570	***	Patvirtinta
H4	Pasitikėjimas	.276	.110	2,511	.012	Patvirtinta
H5	Kalba	–.043	.070	–.608	.543	Nepatvirtinta
H6	Informacijos dalijimasis	.34	.061	3,4	***	Patvirtinta
H7	IRT	.25	.074	3,37	***	Patvirtinta



S3.2 pav. Sudarytas tyrimo modelis

Tyrime nesiekiama paaiškinti visų veiksnių, kurie egzistuoja ir daro tiesioginę įtaką VK sprendimams, tačiau daugiausia dėmesio skiriama septyniems pagrindiniams veiks-

niams: užduočių konfliktams, santykių konfliktams, TL, CQ, pasitikėjimui, IRT ir dalijimuisi informacija, ir parengiami pasiūlymai, kaip pagerinti būsimus kiekvieno iš jų tyrimus. Galutinis priimtas modelis, pašalinus kalbos veiksnį, pateiktas S3.2 pav.

Galutiniai veiksniai, darantys įtaką VK sprendimų priėmimui, yra santykių konfliktai, užduočių konfliktai, IRT, dalijimasis informacija, CQ ir TL. Rezultatai rodo, kad modelį galima taikyti vertinant VK sprendimų priėmimą IT organizacijose.

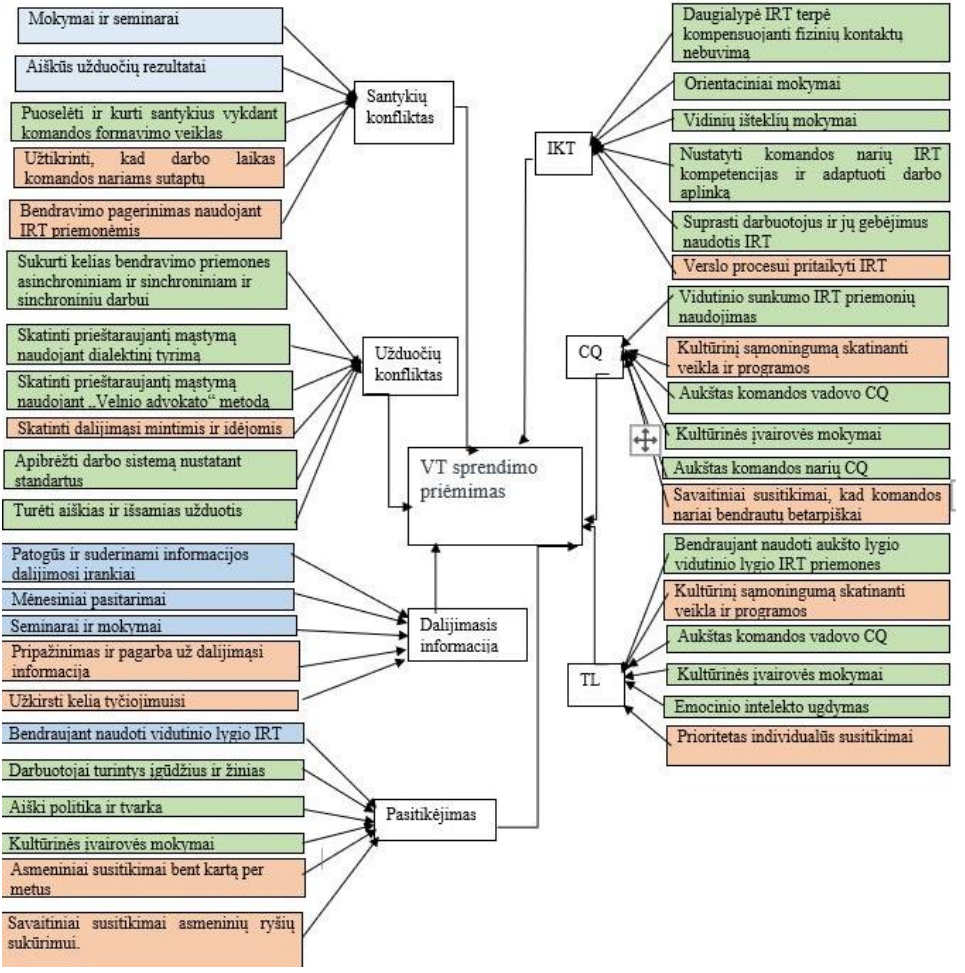
Ekspertų pateikti rezultatai dėl veiksnių poveikio iš esmės nesiskyrė. Santykių konfliktas, CQ ir pasitikėjimas buvo vertinami geriau nei kiti veiksniai, kurių skalė buvo 2 balai, o užduočių konfliktai, dalijimasis informacija, IKT ir TL buvo įvertinti 1 balu. Ekspertų skirti balai turi būti 10 balų. Galutinį S3.2 pav. pateiktą modelį sudaro 7 veiksniai ir 40 rodiklių, skirtų VK sprendimų priėmimui pagerinti. Kiekvienas veiksnys turi kelis siūlomus rodiklius, kurie savo ruožtu gerina VK sprendimų priėmimą.

Geriausiai nustatytas veiksnys, gerinantis VK sprendimų priėmimo modelio efektyvumą, yra užduočių konfliktai, santykių konfliktas, transformacinis vadovavimas, kultūrinis išprusimas, pasitikėjimas, IKT ir dalijimasis informacija, sukonstruoti pagal šiuos kriterijus ir šių kriterijų poveikį veiksniams: santykių konfliktams, užduočių konfliktams, IKT, TL, CQ, pasitikėjimui ir dalijimuisi informacija. Oranžinė spalva rodo mažą poveikį veiksniams, žalia spalva – vidutinį poveikį, o mėlyna spalva – didelį poveikį, kaip parodyta S3.3 pav.

VK srityje dirbantys vadovai turėtų sutelkti dėmesį į toliau išvardytų veiksnių veiksmingumo gerinimą, kad galėtų priimti tikslesnius sprendimus:

1. Santykių konfliktai, kuriuos galima išspręsti sutelkus dėmesį į šiuos kriterijus:
   a) Jie turėtų rengti mokymus ir seminarus komandos nariams apie tai, kaip išspręsti asmeninius konfliktus ir stiprinti emocinį intelektą.
   b) Turėtų aiškius ir išsamius projektų užduočių rezultatus, kad komandos nariai, dirbantys su jais, išvengtų konflikto.
   c) Vadovybė turėtų puoselėti ir kurti santykius, vykdydama komandos formavimo veiklą (pvz., „Trivia“, „Jackbox“ ir virtualūs pabėgimo kambariai).
   d) Nuotolinis darbas tarp VK reiškia skirtingas darbo valandas, kad sumažintų neigiamą to poveikį, vadovybė turėtų užtikrinti, kad darbo valandos sutaptų. Dauguma komandos narių turėtų būti prisijungę prie interneto tuo pačiu metu bent dvi tris valandas per dieną.
   e) Bendravimo pagerinimas, kad būtų išvengta komandinių konfliktų, naudodamiesi vidutinio sudėtingumo IRT priemonėmis (pavyzdžiui, „MS Teams“, „Zoom“ ir „Skype for business“).
2. Užduočių konflikto veiksnį galima pagerinti imantis šių veiksmų:
   a) Sukurti kelias bendravimo priemones (pvz., „MS Teams“, „Zoom“ ir „Skype for business“), kurios leistų komandos nariams bendrauti asinchroniniu ir sinchroniniu režimu.
   b) Skatinti priešingą mąstymą naudojant dialektinį tyrimą (antroji grupė sukuria alternatyvų planą, kuris vėliau aptariamas su pasiūlymu), kuris sustiprins komandos narių pateiktą sprendimą.
   c) Skatinti priešingą mąstymą naudojant „Velnio advokato“ metodą (ginčytinos nuomonės išsakymas, siekiant sukelti diskusiją arba patikrinti priešingų argumentų stiprumą), kuris sustiprins komandos narių pateiktą sprendimą.

d) Skatinti dalijimąsi valdybos narių mintimis ir idėjomis (pvz., apdovanoti už geras idėjas, pasiūlyti anoniminį dalyvavimą, neapriboti grįžtamojo ryšio ir dalijimosi idėjomis veiklos vertinimais ir susirinkimais).
e) Apibrėžti darbo sistemą nustatant standartus. Nustatydama standartus, vadovybė gali sutrumpinti laiką, reikalingą užduočiai atlikti.
f) Turėti aiškius ir išsamius rezultatus.



S3.3 pav. VK sprendimų priėmimo modelis

3. Informacijos dalijimosi veiksnį galima pagerinti vadovybei ėmusis šių veiksmų:
a) Patogūs ir suderinami informacijos dalijimosi įrankiai (pvz., „Google“ skaičiuoklės, „Icebreaker-Bot“ ir „Google Drive“).

b) Numatyti mėnesinį susitikimą.
c) Seminarai ir mokymai.
d) Užtikrinti kitų pripažinimą ir pagarbą už dalijimąsi informacija.
e) Užkirsti kelią bet kokiam kitų narių dalijimosi informacija vertinimui ar tyčiojimuisi iš jos.

4. Pasitikėjimo veiksnį galima pagerinti imantis šių veiksmų:
a) Bendraujant naudoti vidutinio lygio IRT priemones.
b) Samdyti darbuotojus, turinčius gerų įgūdžių ir žinių.
c) Užkirsti kelią vertinimui ir tyčiojimuisi nustatant aiškią politiką ir tvarką.
d) Kultūrinės ir (arba) įvairovės mokymai.
e) Bent kartą per metus organizuoti asmeninį susitikimą.
f) Savaitiniai susitikimai, kad komandos nariai galėtų dažnai bendrauti ir pasidalyti kažkuo iš savo gyvenimo.

5. Transformacinio vadovavimo veiksnį galima sustiprinti imantis šių veiksmų:
a) Bendraujant naudoti aukšto lygio vidutinio lygio IRT priemones.
b) Kultūrinį sąmoningumą skatinanti veikla ir programos.
c) Komandos aprūpinimas vadovu, turinčiu aukštą CQ lygį.
d) Kultūrinės ir (arba) įvairovės mokymai.
e) Emocinio išprusimo mokymai.
f) Prioritetu laikyti individualius susitikimus.

6. Kultūrinio išprusimo veiksnį galima pagerinti vadovybei imantis toliau nurodytų veiksmų, kurie sustiprins šį veiksnį, o kartu pagerins VK sprendimų priėmimą:
a) Vidutinio sunkumo IRT priemonių naudojimas bendraujant.
b) Kultūrinį sąmoningumą skatinanti veikla ir programos.
c) Komandos aprūpinimas vadovu, turinčiu aukštą CQ lygį.
d) Kultūrinės ir (arba) įvairovės mokymai.
e) Komandos, pasižyminčios aukštu CQ lygiu, įdarbinimas.
f) Savaitiniai susitikimai, kad komandos nariai galėtų dažnai bendrauti ir dalytis kažkuo iš savo gyvenimo.

7. IRT veiksnį galima pagerinti imantis toliau nurodytų veiksmų, kurie sustiprins šį veiksnį, o kartu pagerins VK sprendimų priėmimą:
a) Daugialypės terpės, patogios naudoti ir suderinamos IRT priemonės, kurios kompensuotų neverbalinio bendravimo nebuvimą (pvz., „MS Teams“, „Zoom“ ir „Skype for business“).
b) Orientaciniai mokymai realiuoju laiku.
c) Vidinių išteklių mokymai.
d) Nustatyti ir paskirti konkrečius komandos narius kaip nuolatinius kiekvienos priemonės mokymų ekspertus.
e) Suprasti darbuotojus ir jų gebėjimus naudotis IRT.
f) Išanalizuoti, kokią labiausiai su IRT susijusią specifiką pasirinkti, kad ji būtų pritaikyta verslo procesui.

Visų pirma šis tyrimas pateikia naują požiūrį į VK sprendimų priėmimą. Stiprių komandų, galinčių priimti optimalius sprendimus, kūrimas bus labai naudingas organizaci-

jai. Esamų virtualių komandų vadovai gali stengtis tobulinti sprendimų priėmimą ir stiprinti veiksnius, darančius įtaką sprendimų priėmimui, o tai savo ruožtu padės komandai priimti geresnius sprendimus ir taip pagerinti veiklos rezultatus. Įmonės turėtų atsižvelgti į šiuos veiksnius samdydamos naujus komandos narius, kad užtikrintų, jog jie jaustų ryšį su esama komanda. Ją galima toliau integruoti su naujuoju moduliu, siūlomu įtraukti į įgyvendinimo planus, kad būtų galima prisidėti prie itin veiksmingų virtualių komandų Artimųjų Rytų šalyse kūrimo. Šis modulis yra atspirties taškas virtualių komandų sprendimams priimti ir veiklos efektyvumui vertinti bei tobulinti, taip pat gali būti naudojamas kuriant VK įgyvendinimo planą Artimųjų Rytų šalyse. Sukūrus naują būdą dalytis informacija tarp komandos narių, pagerės sprendimų priėmimas, o jei jie susidurs su sunkumais dėl naujo veikimo būdo, galima įgyvendinti tinkamą intervenciją, pavyzdžiui, reguliariai rengti virtualius susitikimus planams ir kitiems rezultatams, pavyzdžiui, tvarkaraščiams ir terminams, aptarti. Antra, rengdama mokymus vadovybė gali užtikrinti, kad laikui bėgant būtų plėtojami ir išmokstami šie veiksniai: dalijimasis informacija, IRT, CQ, TL ir kaip spręsti užduočių ir santykių konfliktus, kurie leis VK ugdyti savo kompetenciją, o tai padarius bus priimami geresni VK sprendimai. Šiame tyrime virtualių komandų vadovai sužino apie daugialypį virtualių komandų valdymo pobūdį. Suteikdamas vadovams geresnį supratimą apie tai, kaip valdyti veiklos rezultatus ir siekti organizacijos tikslų virtualioje aplinkoje, jis palengvina organizacijos tikslų siekimą. Jis praplečia veiklos valdymo komandų vadovų akiratį, padėdamas jiems peržiūrėti savo vadovavimo savybes ir gebėjimus. Remiantis šiuo tyrimu, priimant sprendimą VK, reikėtų atsižvelgti į šiuos veiksnius. Virtualių komandų bendravimo pritaikymas turi būti stebimas atliekant jų veiklos vertinimą, įtraukiant bendravimo pritaikymą į virtualios komandos veiklos rodiklius, kurie turi būti vertinami ir stiprinami apdovanojimais bei pripažinimais. Kalbant apie konfliktus ir TIK, tai galima pasiekti naudojant tinkamus kanalus ir tinkamą komandos narių bendravimą, nes neverbalinį bendravimą – gestų, kūno kalbos ar veido išraiškos pavidalu – nelengva nustatyti, ypač kai bendravimas vyksta elektroniniu paštu. Todėl matoma, kad virtualių komandų vadovai gali padidinti savo nuotolinio darbo komandos produktyvumą ir įsitraukimą tokiais paprastais ir nebrangiais veiksmais. Galiausiai šio tyrimo rezultatai yra žingsnis į priekį būsimų tyrimų, kuriuose tiriami veiksniai, naudingi siekiant pagerinti su VK susijusių sprendimų priėmimą IT organizacijose, link.

Teoriniu požiūriu šis tyrimas turi reikšmės transformaciniam vadovavimui, nes remiasi ankstesniais tyrimais, kuriuose buvo nagrinėjamas sprendimų priėmimas virtualiose komandose ir taikoma transformacinio vadovavimo paradigma. Šis tyrimas yra svarbus indėlis į šią sritį, nes tiria TL stilių realioje darbo vietoje. Reikia atlikti daugiau empirinių tyrimų, kad būtų galima suprasti, kaip skirtingi vadovavimo stiliai pasireiškia įvairiose virtualiose komandose. Kaip nustatyta remiantis šiuo tyrimu, transformaciniai vadovai puikiai tinka vadovauti virtualioms komandoms IT organizacijose, nes jų TL stiliaus elgesys leidžia geriau priimti sprendimus VK. Dėl didelio atotrūkio tarp literatūros apie daugiakultūres komandas ir literatūros apie virtualias komandas sunku tirti tarpkultūrinį sprendimų priėmimą virtualiose komandose. Tiriant VK sprendimų priėmimą paprastai priimamos netiesioginės prielaidos apie kitas kultūras, kurios nėra teisingos. Pasitelkdami organizacijos tyrimus vietoje, skirtus komandos narių tarpkultūrinei kompetencijai ir kosmopolitinei orientacijai didinti, skatiname būsimuose moksliniuose tyrimuose nagrinėti,

kaip kultūra veikia VK sprendimų priėmimą. Kultūros sąvoką išplečiame už paprastų pilietybės matų ribų, savo tyrime nagrinėdami skirtingas kultūrines orientacijas, nes JAE yra darbuotojų iš viso pasaulio. Pagrindinis pastebėjimas, susijęs su technologijų tyrimais ir jų įtaka virtualios komandos sprendimų priėmimui, yra tas, kad tik nedidelė dalis jų yra ilgalaikiai – dauguma jų skirti projektų komandoms, sudarytoms iš studentų, ir nėra daug tyrimų, kuriuose būtų stebimos virtualių komandų technologijų naudojimo organizacinės komandos. Studentai dalyvauja daugumoje tyrimų, priklausančių poveikio ir lyginamajam požiūriams, nes jie neturi bendros darbo kartu ar su pateiktomis priemonėmis istorijos. Pasitikėjimas tarp komandos narių yra svarbus raktas į jų sėkmę. Apskritai šis tyrimas prisideda prie augančios tyrimų srities pasitikėjimo srityje. Šiuo tyrimu bandome užpildyti mokslinių tyrimų spragą, nagrinėdami pasitikėjimo vaidmenį komandoms, ypač jo poveikį sprendimų priėmimui. Dėl šių komandų ypatumų pasitikėjimo kūrimas jose gali būti tikras iššūkis, nes pasitikėjimas yra vienas svarbiausių sėkmės veiksnių. Nors kai kuriuose tyrimuose nagrinėjamas pasitikėjimo poveikis komandos veiklos rezultatams, vis dar trūksta žinių, kokią įtaką komandos narių gebėjimai, geranoriškumas ir sąžiningumas turi VK sprendimų priėmimui. Šiuo tyrimu prisidedama atsakant į raginimą patikrinti pasitikėjimo poveikį VK, naudojant imtį, apimančią didesnę tautybių įvairovę. Kalbant apie pasitikėjimą, ankstesni tyrimai parodė, kad pasitikėjimas teigiamai veikia sprendimų priėmimą virtualiose komandose. Informacijos dalijimosi požiūriu šis straipsnis prisidėjo prie informacijos dalijimosi literatūros, nes aptarė unikalios informacijos dalijimosi mechanizmą dėl komandinio sprendimų priėmimo tuo pačiu metu virtualumo kontekste, pakeitė bendrą ankstesnių tyrimų perspektyvą dėl skirtingų informacijos dalijimosi tipų, integravo unikalią informaciją į tą patį teorinį modelį ir efektyviai išskyrė unikalios informacijos mechanizmą, kuris yra palankus giluminiam informacijos dalijimosi ir jo teigiamo poveikio VK sprendimų priėmimui tyrimui. Šis tyrimas paskatino ateityje atlikti tyrimus, skirtus dalijimuisi informacija daugiakultūriame kontekste komandose. Daugeliu ankstesnių tyrimų nustatyta, kad bendra informacija atlieka svarbų vaidmenį priimant komandinius sprendimus, o unikali informacija nuvertinama arba ignoruojama. Nedaug tyrimų nagrinėjo kalbos mokėjimo reikšmę VK. Nepaisant to, tarpvalstybinis bendravimas, kuriam dažnai būdingi kalbiniai skirtumai ir geografinė sklaida, labai priklauso nuo technologijų. Nors kiti tyrėjai nustatė, kad virtualios komandos nariai, blogiau mokantys kalbą, linkę jaustis mažiau įtraukti į sprendimų priėmimo procesą, mūsų tyrime reikšmingo kalbos poveikio sprendimų priėmimui nenustatyta. Šis tyrimas buvo atsakas į būsimus kalbos poveikio VK, ypač sprendimų priėmimui, tyrimus. Kiti tyrimai nustatė, kad kalbos mokėjimas turi įtakos VK, mūsų tyrime kalba neturi įtakos VK sprendimų priėmimui. Analizuodami VK sprendimų priėmimą ir santykių bei užduočių konfliktą, mūsų tyrimas prisideda prie valdymo konflikto supratimo. Dėl savo poveikio individualiems, komandiniams ir organizaciniams rezultatams konfliktų valdymas virtualioje aplinkoje yra vienas didžiausių iššūkių komandoms. Galiausiai šis tyrimas pateikia empirinių įrodymų apie šių veiksnių poveikį VK sprendimų priėmimui, siekiant įvertinti ir paremti sprendimų priėmimo VK tinkamumą dėl VK sprendimų priėmimo sudėtingumo ir didelės jį veikiančių veiksnių įvairovės. Suprantant virtualios komandos sprendimų priėmimą, šis darbas prisideda prie virtualių komandų sėkmės.

Bendrosios išvados

1. Disertacijoje išnagrinėti teoriniai sprendimų priėmimo organizacijose tobulinimo metodai. Atlikus mokslinės literatūros analizę, nustatyti svarbiausi veiksniai, darantys įtaką VT sprendimų priėmimui, ir sukurta teorinis pagrindas empiriniams tyrinėjimams. Esamų tyrimų analizė ir pagrindinių veiksnių, lemiančių virtualių komandų sprendimų priėmimą, tokių kaip santykių konfliktas, neįprastos ir pažintinės užduočių konfliktas, transformacinė lyderystė, kultūrinis intelektas, narių pasitikėjimas, kalbų bendruomeniškumo skirtumai, dalijimasis informacija, atranka, pašalinimas, tinkamos komunikacijos priemonės, buvo kertiniai elementai kuriant tyrimo metodiką.
2. Šie veiksniai buvo toliau nagrinėjami JAE, siekiant įvertinti teorinį VT sprendimų priėmimo modelį Artimuosiuose Rytuose.
3. Teorinio modelio validavimo metu padarytos išvados:
   - Parengtos gairės organizacijų vadovybei, skatinančios VT priimti sprendimus. Pavyzdžiui, valdydama komandą, VT vadovybė turėtų daug dėmesio skirti naudojamai ir įdiegtai technologijai, narių pasitikėjimo lygiui, norui dalytis informacija tarp narių, narių bendravimo praktikai. Šiuos veiksnius galima išmatuoti ir kontroliuoti, kad organizacijos galėtų priimti geresnius sprendimus, o tai lems geresnius komandos rezultatus.
   - Tyrimo metu kalbos ir sprendimų priėmimo VT priklausomybė nenustatyta, priešingai, nei buvo nustatyta literatūros apžvalgoje. Didelį skirtumą tarp JAV, Europos ir Artimųjų Rytų rodo kalbos veiksnys – kalba daro įtaką VT sprendimų priėmimui tiek Amerikoje, tiek Europoje, bet ne Artimuosiuose Rytuose (JAE).
   - Modelis suteikia pagrindą pagerinti VT našumą ne tik matuojant, bet ir sukuriant sprendimų priėmimo įgyvendinimo sistemą, kuri pagerins VT našumą.
4. Disertacijos tyrimų ribotumu gali būti įvardinta tai, kad įvertinti aštuoni veiksniai, naudojami sprendimams priimti, tačiau kiti veiksniai, tokie kaip atlygis, dalijimasis žiniomis ir motyvacija, šiame tyrime nebuvo nagrinėti. Kitų pramonės šakų analizė turėtų būti vertinga ir praplėsti sprendimų priėmimo VT pažinimą. Taip pat pažymėtina, kad šis tyrimas buvo atliktas tik IT sektoriuje JAE.

Annexes

Annex A. Questionnaire's sent to Virtual Team employees

Annex B. Software Formulas

Annex C. Standard regression weights

Annex D. Descriptive statistics of the indicators and variables

Annex E. Questioners send to Experts

Annex F. Structural Equation Modeling Communalities, Extraction method and total variance

Annex A. Questionnaire's sent to VT employees

Respondent's Demographics	
Age	22 and <30 => 30 and <40 => 40 and <50 >=50
Gender	Male Female
Way of communication used	Online Face-to-face Both
Member type	Team Member Team Leader
Experience in years	<1 =>1 and <5 =>5 and <10 =>10
Questions 1 2 3 4 5 SD D N A SA	Sources
Factors affecting VT decision making	
Cultural Intelligence	
I know the ways in which cultures in my team differs in decision making	(Presbitero, 2020)
I can accurately understand the feelings of people from other cultures before agreeing on decision	(Presbitero, 2020)
I think a lot about the influence that culture has on my behaviour and that of others who are culturally different when agreeing on decision making	(Presbitero, 2020)
I am aware that I need to plan my course of action when in different situations and with culturally different people.	(Presbitero, 2020)
I accept delays without becoming upset when in different cultural situations	(Presbitero, 2020)
ICT	

Respondent's Demographics	
overcome geographic distance during problem identification in decision making	(Eisenberg et al., 2019; O'Neill et al., 2016; Wei et al., 2017)
overcome geographic distance during information gathering in decision making	(Eisenberg et al., 2019; O'Neill et al., 2016; Wei et al., 2017)
overcome geographic distance during alternative selection in decision making	(Eisenberg et al., 2019; O'Neill et al., 2016; Wei et al., 2017)
Computer mediated group helped in generating accurate decision making	(Eisenberg et al., 2019; O'Neill et al., 2016; Wei et al., 2017)
Asynchronous technology provides more effective decision.	(Eisenberg et al., 2019; O'Neill et al., 2016; Wei et al., 2017)
Information Sharing	
We usually receive all important information on time	(Baumann & Bonner, 2013; Uitdewilligen & Waller, 2018)
Important information is shared with everyone on time	(Baumann & Bonner, 2013; Uitdewilligen & Waller, 2018)
Information shared between team members were accurate	(Baumann & Bonner, 2013; Uitdewilligen & Waller, 2018)
Information shared with everyone were credibly	(Baumann & Bonner, 2013; Uitdewilligen & Waller, 2018)
Information shared between team members were useful in decision-making	(Baumann & Bonner, 2013; Uitdewilligen & Waller, 2018)
Language	
Difference in language cause disruption between team members	(Klitmøller et al., 2015)
Difference in language effect information gathering during decision making	(Klitmøller et al., 2015)
Difference in language effect information discussion in decision making	(Klitmøller et al., 2015)
Difference in language creates conflict in choosing alternative in decision making	(Klitmøller et al., 2015)
Difference in language reduced understanding of problem	(Klitmøller et al., 2015)
Relationship Conflict	
Conflict in relationships leads people to suppress information while making decisions	(Olson et al., 2007)
How much resentment did the group have toward the decision	(Olson et al., 2007)

Respondent's Demographics	
How much interpersonal conflict existed in the decision-making group	(Olson et al., 2007)
Did any group members exhibit personality conflicts when making decisions	(Olson et al., 2007)
How tense was the group when making the decision	(Olson et al., 2007)
Task Conflict	
task conflict provides a conduit to actualize the benefits of cognitive diversity on decision outcomes.	(Olson et al., 2007)
Task Conflict enhances sharing of important information during reaching decision	(Olson et al., 2007)
Task conflict will likely occur during the process of creating alternatives	(Olson et al., 2007)
Task conflict will result in a commitment to decision	(Olson et al., 2007)
A lot of disagreements over different ideas about decision	(Olson et al., 2007)
Transformational Leadership	
Members were included in decision-making by team leader	(Muganda & Pillay, 2013)
The decision-making was guided by team leader, who included the members	(Muganda & Pillay, 2013)
Team leader encouraged people to exchange ideas and collect data	(Muganda & Pillay, 2013)
Decision-making was being handled by team leader	(Muganda & Pillay, 2013)
Comprehensive information gathering will improve a leader's ability to make decisions	(Muganda & Pillay, 2013)
Trust	
beliefs or attitudes toward the other person and the intention to trust them	(Flavian et al., 2018)
intention to accept some degree of vulnerability derived from the risk of trusting the other party	(Flavian et al., 2018)
Do team members trust in each integrity, benevolence and reliability	(Flavian et al., 2018)

Respondent's Demographics	
team members will perform actions that are important to the team	(Flavian et al., 2018)
the trustee acts in accordance with values and principles, the trustor finds acceptable.	(Flavian et al., 2018)
Decision making	
Problem understanding will result in effective decision-making	(Mohaghegh & Furlan, 2020)
Adequate gathering of informing will result in effective decision-making	(Mohaghegh & Furlan, 2020)
Choosing the best alternative will result in effective decision-making	(Mohaghegh & Furlan, 2020)
Adequate analysis of informing will result in effective decision making	(Mohaghegh & Furlan, 2020)
Generating all possible alternatives will result in effective decision making	(Mohaghegh & Furlan, 2020)
Choosing the best alternative from the set of generated alternatives will result in effective decision making	(Mohaghegh & Furlan, 2020)
Team will analyse the problem in depth before searching for a solution	(Mohaghegh & Furlan, 2020)
Team will generate alternatives before searching for a solution	(Mohaghegh & Furlan, 2020)
Team will choose the best alternatives in searching for a solution	(Mohaghegh & Furlan, 2020)
Team know the consequence of understanding the problem before implementing each alternative	(Mohaghegh & Furlan, 2020)
Team was making decision based on good practices (after choosing the best alternative)	(Mohaghegh & Furlan, 2020)

Annex B. Software Formulas

- *CFI*: Comparative Fit Index A revised form of NFI. Not very sensitive to sample size. Compares the fit of a target model to the fit of an independent, or null, model, and it must be above or equal 0.90. *CFI* is calculated as follows:

$$CFI = 1 - \frac{\max\left[\left(\chi_t^2 - v_t\right), 0\right]}{\max\left[\left(\chi_t^2 - v_t\right), \left(\chi_i^2 - v_i\right), 0\right]}.$$

  Where v_i and v_t are the degree of freedom, and χ_t^2 and χ_i^2 are test statistics of the independence model and the target model respectively.

- *SRMR*: Standardized Root Mean Square Residual The square-root of the difference between the residuals of the sample covariance matrix and the hypothesized model must be less than 0.08. *SRMR* is calculated as follows

$$SRMR = \sqrt{\frac{\sum_{i=1}^{p}\sum_{j=1}^{i}\left[\left(s_{ij} - \hat{\sigma}_{ij}\right)/\left(s_{ii}s_{jj}\right)\right]^2}{p\left(p+1\right)/2}}.$$

- *RMSEA*: Root Mean Square Error of Approximation. A parsimony-adjusted index, values closer to 0 represent a good fit, and must be below 0.06. *RMSEA* is calculated as follows:

$$RMSEA = \sqrt{\max\left\{\left(\frac{\mathrm{F}\left(\mathbf{S}, \sum\left(\hat{\theta}\right)\right)}{v} - \frac{1}{n-1}\right), 0\right\}}.$$

  Where n is the sample size and $v = 1 - t$, where l is the number of unknown parameters and t is the number of independent variables.

- PCLOSE: is a "p value" for testing the null hypothesis that the population *RMSEA* is no greater than 0.06, and the value of PCLose must be greater than 0.05.

Annex C. Standard regression weights

Table C1. Standard regression weight

Factors	**Questions**	**Weight**
TaskConflct	Q5	0.73
TaskConflct	Q4	0.74
TaskConflct	Q3	0.73
TaskConflct	Q2	0.81
TaskConflct	Q1	0.74
RelationshipConflict	Q21	0.78
RelationshipConflict	Q22	0.81
RelationshipConflict	Q23	0.78
RelationshipConflict	Q24	0.75
RelationshipConflict	Q25	0.74
Culture	Q10	0.76
Culture	Q9	0.72
Culture	Q8	0.73
Culture	Q7	0.75
Culture	Q6	0.73
Leadership	Q15	0.75
Leadership	Q14	0.73
Leadership	Q13	0.74
Leadership	Q12	0.79
Leadership	Q11	0.73
Trust	Q31	0.75
Trust	Q32	0.74
Trust	Q33	0.76
Trust	Q34	0.78
Trust	Q35	0.80
Language	Q36	0.78
Language	Q38	0.78
Language	Q39	0.76
Language	Q40	0.80
ICT	Q26	0.81
ICT	Q27	0.74
ICT	Q28	0.75
ICT	Q29	0.77
ICT	Q30	0.71
InformationSharing	Q41	0.73
InformationSharing	Q42	0.71
InformationSharing	Q43	0.78
InformationSharing	Q44	0.78
InformationSharing	Q45	0.74

Annex D. Descriptive statistics of the indicators and variables

Variable	Mean	Standard deviation
Task Conflict	3.61	
Task Conflict enhances sharing of important information during reaching decision	3.60	1.140
Task Conflict increase collection of information during reaching decision	3.67	1.115
Task conflict will likely occur during the process of creating alternatives	3.67	1.045
Task conflict will result in a commitment to decision	3.62	1.128
A lot of disagreements over different ideas about decision	3.53	1.185
Cultural Intelligence	3.61	1.099
I know the ways in which cultures in my team differs in decision making	3.61	1.112
I can accurately understand the feelings of people from other cultures before agreeing on decision	3.59	1.102
I think a lot about the influence that culture has on my behaviour and that of others who are culturally different when agreeing on decision making	3.56	
I am aware that I need to plan my course of action when in different situations and with culturally different people.	3.64	1.112
I accept delays without becoming upset when in different cultural situations	3.65	1.089
Transformational Leadership	3.66	
Members were included in decision-making by team leader.	3.69	1.086
The decision-making was guided by team leader, who included the members	3.60	1.104
Team leader encouraged people to exchange ideas and collect data	3.75	1.109
Decision-making was being handled by team leader	3.67	1.107
Comprehensive information gathering will improve a leader's ability to make decisions	3.59	1.108

Variable	Mean	Standard deviation
Relationship Conflict	3.678	
Conflict in relationships leads people to suppress information while making decisions	3.76	1.090
How much resentment did the group have toward the decision	3.66	1.054
How much interpersonal conflict existed in the decision-making group?	3.71	1.042
Did any group members exhibit personality conflicts when making decisions?	3.59	1.121
How tense was the group when making the decision	3.67	1.081
ICT	3.62	
ICT overcome geographic distance during problem identification in decision making	3.66	1.080
ICT changed the way team gather, share, and exchange information	3.62	1.115
ICT overcome geographic distance during information gathering in decision making	3.65	1.079
ICT overcome geographic distance during alternative selection in decision making	3.56	1.126
Computer mediated group helped in generating accurate decision making	3.61	1.158
Trust	3.6	
Team member will seek a solution that is good for all of us	3.58	1.136
beliefs or attitudes toward the other person and the intention to trust them	3.56	1.076
team members will perform actions that are important to the team	3.63	1.166
the trustee acts in accordance with values and principles, the trustor finds acceptable.	3.61	1.156
the trustee has a positive orientation towards the trustor beyond an egoistic profit motive.	3.65	1.160
Language	3.59	
Difference in language cause disruption between team members	3.70	1.111
Difference in language effect information gathering during decision making	3.64	1.107
Difference in language effect information discussion in decision making	3.54	1.132
Difference in language creates conflict in choosing alternative in decision making	3.53	1.203
Difference in language reduced understanding of problem	3.59	1.068

Variable	Mean	Standard deviation
Information Sharing	3.55	
We usually receive all important information on time	3.52	1.167
Important information is shared with everyone on time	3.53	1.187
Information shared with everyone were credibly	3.55	1.129
Information shared between team members were useful in decision-making	3.61	1.146
Team members share information that is relevant to the task	3.56	1.140
Decision making	3.58	
Intelligence (Problem understanding)	3.60	
Problem understanding will result in effective decision-making	3.62	1.133
Adequate analysis of informing will result in effective decision making	3.64	1.121
Team will analyse the problem in depth before searching for solution	3.56	1.124
Team know the consequence of understanding the problem before implementing each alternative	3.60	1.168
Team was making decision based on good practices (after collecting all information)	3.57	1.175
Design (Generating alternative)	3.56	
Adequate gathering of informing will result in effective decision-making	3.54	1.123
Generating all possible alternatives will result in effective decision making	3.55	1.131
Team will generate alternatives before searching for solution	3.56	1.114
Team know the consequence before generating allow possible alternatives	3.60	1.165
Team was making decision based on good practices (considering all alternatives)	3.55	1.172
Choice (Choose decision from the alternative)	3.58	
Choosing the best alternative will result in effective decision-making	3.57	1.134
Choosing the best alternative from the set of generated alternatives will result in effective decision making	3.60	1.131
Team will choose the best alternatives in searching for solution	3.56	1.121
Team know the best alternative to apply	3.60	1.160
Team was making decision based on good practices (after choosing best alternative)	3.57	1.173

Annex E. Questioners send to Experts

Please give points/marks for the factors/subfactors below. Where 0 is not all likely to have an affect and 10 is extremely likely to have an affect. The total number of points/marks assigned to the below seven factors (**Points for Factors**) must have a sum of 10. For example, if you assigned 4 for the first factor the remaining points are 6, to be distributed among the remaining factors. The same applies for the assigning **points for subfactors** where each part must have a sum of 10 points. Data Validation is performed so the total cannot exceed 10.

	Total Factor Evlaution Score	Points for Factors	Factors	Points for SubFactors	Total Subfactor Evlaution Score	Subfactors			
Factors affecting VT decision making processes	**0**		Relationship Conflicts have negative effect		**0**	Training and workshops on how to overcome personal conflict and enhance emotional intelligence			
						Have clear and detailed deliverables			
						Grow and build relationships by doing team building activities (for example Trivia, Jackbox, and Virtual escape room)			
						Work hours should overlap. Most of the team should be online at the same time at least two to three hours a day			
						Improve communication to prevent team conflict by use of high medium ICT tools (for example MS Teams, Zoom, and skype for business)			
			Task conflicts have positive effect		**0**	Establish multiple communication tools (for example MS Teams, Zoom, and skype for business)			
						Promote opposing thinking using Dialectic inquiry (An alternative plan is created by the second group,			

	Total Factor Evlaution Score	Points for Factors	Factors	Points for SubFactors	Total Subfactor Evlaution Score	Subfactors			
						which is then debated with the proposal.)			
						Promote opposing thinking using Devil's advocate (The act of expressing a contentious opinion to lead to debate or to test the strength of opposing arguments.)			
						Enhance the sharing of boarder thoughts and ideas (for example reward good ideas, Offer Anonymous participation, do not restrict feedback and idea sharing to performance reviews and meetings)			
						Define work system by setting standards. By setting standards, you can reduce the time it takes to accomplish your task.			
						Have clear and detailed deliverables			
			Adequate Information Sharing have positive effect		**0**	User friendly and compatible Tools for sharing Information (for example (Google spreadsheets, Icebreaker-Bot, and Google Drive)			
						Schedule monthly meeting			
						Workshop and training			
						Provide recognition and respect from others for sharing information			

	Total Factor Evlaution Score	Points for Factors	Factors	Points for SubFactors	Total Subfactor Evlaution Score	Subfactors			
						Prevent any judgment or mocking of the information shared by other members			
			Trust have positive effect		**0**	Use of high medium ICT tools when communicating			
						Hiring employees with good skills and knowledge			
						Prevent judgement and mocking by setting clear policy and procedure			
						Cultural/Diversity training			
						At least once per year face-to-face meeting			
						Weekly meeting to allow team members to socialize frequently, and to share bits of their lives			
			Proper ICT choice have positive effect		**0**	Rich Medium, user friendly and compatible ICT tools to compensate the absence of non-verbal communication (for example MS Teams, Zoom, and skype for business)			
						Real-time orientation training			
						Internal resources training			
						Identify and appoint specific team members as resident experts on each tool training			
						Understand employees and capacity for using ICT			
						Analyse choice of the most ICT relevant specification			

	Total Factor Evlaution Score	Points for Factors	Factors	Points for SubFactors	Total Subfactor Evlaution Score	Subfactors			
						to adapt to business process			
			Cultural Intelligence (CQ) have positive effect		**0**	Use of high medium ICT tools when communicating			
						Activities and programs that promote cultural awareness			
						Equipping the team with a leader who has a high level of CQ			
						Cultural/Diversity training			
						Hiring team with high level of CQ			
						Weekly meeting to allow team members to socialize frequently, and to share bits of their lives			
			Transformational Leadership have a positive effect		**0**	Use of high medium ICT tools when communicating			
						Activities and programs that promote cultural awareness			
						Equipping the team with a leader who has a high level of CQ			
						Cultural/Diversity training			
						Emotional Intelligence training			
						Keep one-on-one meetings a priority			

Annex F. Structural Equation Modeling Communalities, Extraction method and total variance

Table F1. Communalities of the questions used

	Initial	Extraction
Q1	1.000	.550
Q2	1.000	.652
Q3	1.000	.537
Q4	1.000	.548
Q5	1.000	.535
Q6	1.000	.540
Q7	1.000	.566
Q8	1.000	.540
Q9	1.000	.522
Q10	1.000	.574
Q11	1.000	.531
Q12	1.000	.625
Q13	1.000	.542
Q14	1.000	.530
Q15	1.000	.559
Q16	1.000	.537
Q17	1.000	.589
Q18	1.000	.557
Q19	1.000	.548
Q20	1.000	.537
Q21	1.000	.610
Q22	1.000	.659
Q23	1.000	.603
Q24	1.000	.568
Q25	1.000	.555
Q26	1.000	.657
Q27	1.000	.544
Q28	1.000	.557
Q29	1.000	.593
Q30	1.000	.501
Q31	1.000	.569
Q32	1.000	.554

	Initial	Extraction
Q33	1.000	.571
Q34	1.000	.610
Q35	1.000	.635
Q36	1.000	.604
Q38	1.000	.610
Q39	1.000	.585
Q40	1.000	.633
Q41	1.000	.532
Q42	1.000	.502
Q43	1.000	.616
Q44	1.000	.602
Q45	1.000	.549
Extraction Method: Principal Component Analysis.		

Table F1 shows the Communalities of each questions, which is the amount of variance in each variable that is accounted for. Initial communalities are estimates of the variance in each variable accounted for by all components or factors. Extraction communalities are estimates of the variance in each variable accounted for by the components. The communalities in this table indicates that the extracted components represent the variables well, since there are no low values all are above 0.5. The total variance explained is shown in Table F2.

Table F2. Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.725	14.944	14.944	6.725	14.944	14.944
2	3.528	7.840	22.784	3.528	7.840	22.784
3	1.546	3.435	26.220	1.546	3.435	26.220
4	1.521	3.379	29.599	1.521	3.379	29.599
5	1.362	3.027	32.626	1.362	3.027	32.626
6	1.334	2.964	35.591	1.334	2.964	35.591
7	1.258	2.796	38.386	1.258	2.796	38.386
8	1.231	2.735	55.708	1.231	2.735	55.708

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
9	.987	2.697	55.908			
10	.952	2.472	56.223			
11	.947	2.449	56.741			
12	.934	2.368	56.803			
13	.916	2.342	57.121			
14	.902	2.259	57.341			
15	.896	2.191	57.899			
16	.860	2.133	60.032			
17	.832	2.071	62.103			
18	.813	1.984	64.087			
19	.804	1.899	65.986			
20	.791	1.867	67.853			
21	.788	1.842	69.695			
22	.779	1.794	71.489			
23	.777	1.727	73.216			
24	.755	1.678	74.894			
25	.745	1.657	76.551			
26	.706	1.569	78.119			
27	.697	1.548	79.667			
28	.661	1.470	81.137			
29	.649	1.443	82.580			
30	.641	1.424	84.004			
31	.614	1.364	85.368			
32	.591	1.314	86.681			
33	.570	1.267	87.948			
34	.557	1.238	89.186			
35	.540	1.200	90.386			
36	.537	1.193	91.579			

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
37	.502	1.116	92.695			
38	.481	1.069	93.764			
39	.456	1.013	94.777			
40	.445	.989	95.766			
41	.422	.937	96.703			
42	.412	.915	97.618			
43	.388	.862	98.480			
44	.359	.798	99.278			
45	.325	.722	100.000			
Extraction Method: Principal Component Analysis.						

The Total column gives the eigenvalue, or amount of variance in the original variables accounted for by each component, all eigenvalue above 1 will be considered as a factor. The % of Variance column gives the ratio, expressed as a percentage, of the variance accounted for by each component to the total variance in all the variables. The Cumulative % column gives the percentage of variance accounted for by the first n components. % 55.708 of the variances accounted by the 8 factors.

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