PhD Thesis

University of Gloucestershire
at Cheltenham and Gloucester

Doctorate of Philosophy (PhD)

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A new model for virtual team building and leadership in the German automotive industry

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A thesis submitted to the University of Gloucestershire
in accordance with the requirements of the degree
Doctor of Philosophy (PhD) in the School of Business

Submission: 12/2021

AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of the University of Gloucestershire and is original except were indicated by specific reference in the text. No part of the thesis has been submitted as part of any other academic award. The thesis has not been presented to any other education institution in the United Kingdom or overseas. Any views expressed in the thesis are those of the author and in no way represent those of the University.

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Date 09/15/2021

doi:10.46289/JG39XN16

Coming together is a beginning, staying together is progress, and working together is success.

Henry Ford

ACKNOWLEDGEMENTS

Primarily, I would like to express my heartfelt thanks to Dr. Martin George Wynn and Dr. David Dawson, who acted as my PhD supervisors and supported me through the challenges. They both guided me exceptionally well through the research path over four years and shaped my views on both research and life.

I would like to express my special thanks for the support of my wife and parents, who enabled me to complete the research work within the planned time frame. To my daughter Emilia, I owe the highest respect for keeping me going with a sunny temper even in tough times and for allowing me, together with my wife, to carry out the research at weekends and after work.

In addition, I would like to thank my colleagues who acted as participants in the research interviews. The findings have enabled me to make a significant contribution to scholarship and research in virtual team building and leadership, thereby adding knowledge and recommendations to both scholarship and management practice. The thesis would not have been possible without the contributions of these colleagues in the relevant field.

I am pleased that my findings have been included as a chapter in the book "Digital Transformation, Industry Use Cases, and the Impact of Disruptive Technologies", published by IGI-Global (Wynn, 2021), and also in a forthcoming academic journal (Quade et al., 2021). Furthermore, I was able to participate in the "COLLA" conference, organised by IARIA, in Porto in 2020 (Quade et al., 2020).

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ABSTRACT

A virtual team building and leadership model, which addresses continuous improvement or change in the way teams collaborate remotely, would be an asset to the automotive industry. The purpose of this research is to examine how such a model can be created and be used as a guide for virtual team building and leadership in this industry. This model can be used to encourage teamwork, but also to provide a positive influence on the leader of the team, which in turn has a positive impact on project outcomes.

Projects in the automotive industry are typically complex, subject to tight schedules and rapidly deployed. A model for team building and leadership that is time-saving due to the automation of internal team processes and promotion of individual autonomy is therefore appropriate and of value. This study presents a theoretical model with five main stages that looks at virtual team building and leadership, namely Creation, Organisation, Relationship Building, Performance and Evaluation, and Sign-off & Closure (for which the acronym V-CORPS is used).

The research design is based on an online survey followed by interviews of employees in a large US automotive supplier company based in Germany. The approach is qualitative, inductive and uses eighteen semi-structured interviews from different levels of management providing data to build the model. This model was then refined through an online survey with a reduced number of experts.

The findings provide material for the creation of a model that can be used as a guide for virtual and co-located team building and leadership in the automotive industry. The guide can also be used to optimise already established teams. Since the model was not only built but also evaluated by the experts, it can be applied in an operational context. In general, applying the V-CORPS model offers a new approach to structured team building and leadership in the automotive industry.

1. INTRODUCTION

1.1 Introduction

This chapter explains the elements of the research methodology used to develop a new model for virtual team building and leadership in the automotive industry (the V-CORPS model). Section 1.2 outlines the background and rationale of this research. This section provides an overview of vehicle development in the automotive industry and the importance of all stakeholders working together to bring a vehicle into production. Additionally, it discusses why this V-CORPS model is desirable and what impact it will have on the automotive industry. Section 1.3 describes the motivation for researching this topic. The research questions and objectives are presented in order to clarify which requirements the model needed to fulfil in order to be used in operational practice. Section 1.4 summarises the research structure and provides an overview of each chapter of the thesis. Section 1.5 provides insights into the overall research process with a general overview of the methodological approach of the thesis. Section 1.6 summarises the chapter.

1.2 Background, research subject and significance

Nowadays, automobiles are constantly becoming more complex due to increasingly stricter laws on emissions and vehicle safety, e-mobility, autonomous driving, and connectivity. As a result, individual products not only have to function during the lifetime of a vehicle, but they must above all provide a combination of systems between individual devices. In order to develop and implement these systems in one or more vehicle models, an increasing number of companies have to work together.

A single car today comprises approximately 30,000 parts, and the **O**riginal **E**quipment **M**anufacturers (OEMs) have to constantly cooperate with suppliers and sub-suppliers, as producing all parts in-house is neither efficient nor lucrative, considering the amount of resources, labour, factories, and tools required. For this reason, OEMs prefer to engage with suppliers and sub-suppliers, which in turn gives them flexibility and time to develop new innovations.

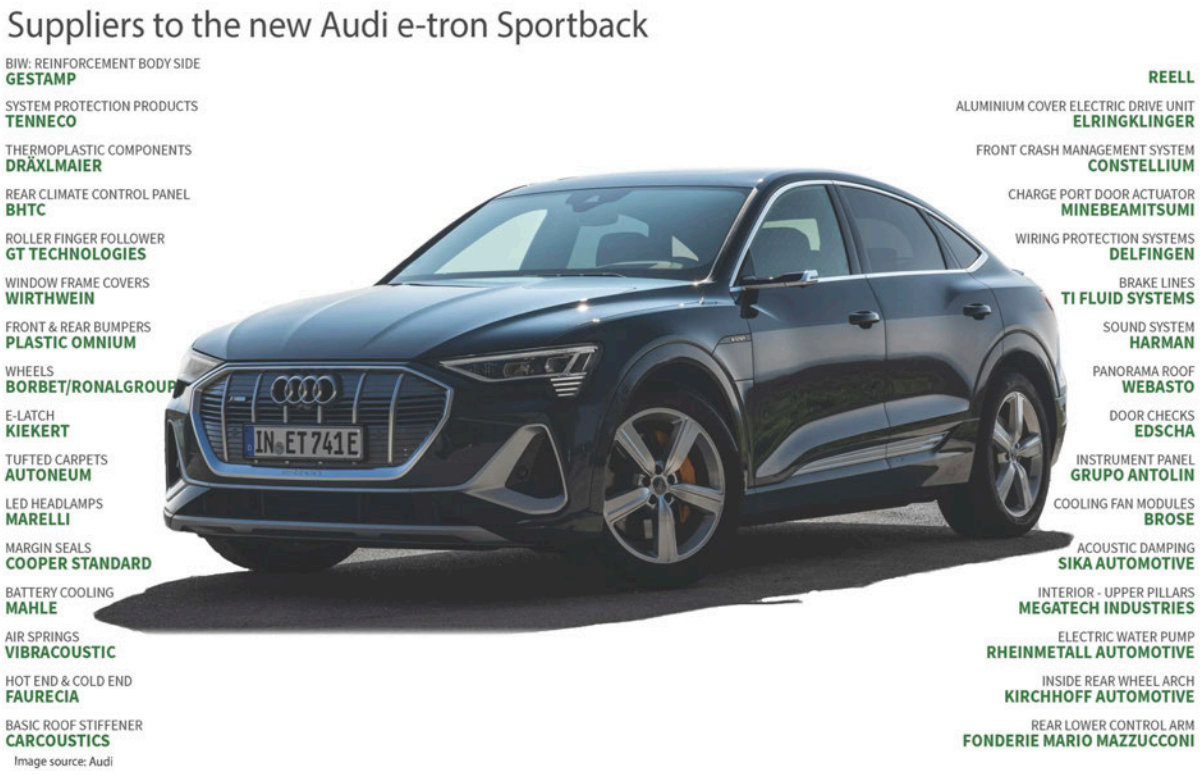

Figure 1 Supplier infographic on the base of Audi e-tron Sportback (Kapoor, 2021).

Figure 1 shows the involvement of suppliers based on the Audi e-tron Sportback. Audi worked with over 600 suppliers worldwide and extended it to 1000 by the end of 2018 (Pham, 2018). This increase in the number of suppliers also means that the know-how regarding research and design is, to a degree, being externalised. Therefore, it is essential for the OEM to be well connected with its suppliers in order to be able to work very effectively not only on site but also at a distance, since not all suppliers can be on site. This is of major significance for the sales launch and release processes, which are very time-critical, especially for the new models.

Projects in the automotive are often time-critical and planned without a time buffer in case of unexpected challenges (e.g., failing to pass legal requirements). Due to the fixed **S**tart **O**f **P**roduction (SOP) with the development, production and supply chains behind them, an extension of the project duration is complex and not cost-effective. There is therefore a need to remain within the given timeframe of a project, while using this timeframe as effectively as possible. Strong performance has already been achieved in terms of production technology (e.g., just-in-time, just-in-sequence production) or the rise of new digital industrial technology which makes it possible to gather and analyze data across machines, enabling faster, more flexible, and efficient processes to produce higher-quality goods at reduced costs (Industry 4.0). However,

team management is still very often based on traditional hierarchical and sometimes inflexible structures, without making extensive use of these digital possibilities.

Since OEMs are growing globally and also increasingly involving suppliers, the building and leading of teams that operate at a distance has become a key element of a company's overall performance. The complexity of projects is increasing due to the growing global agility of companies, and the building and leading of teams is also becoming more complex, as the leader cannot always be on site, or not at all, due to the usually very high work dynamics. The automotive industry is considered to be the most diversified industry, since on the one hand a lot of different know-how is needed to produce a vehicle in a limited time, and on the other hand the requirements in terms of costs and quality are constantly increasing. In order to create the necessary "time-space" for the leader in these time-limited projects, a set of guidelines for the structured building and leading of one or more teams at a distance can support effective team management and leadership. The focus of this research is thus on the automotive industry, in which the challenges of leading virtual teams is arguably greater than in other industry sectors.

Companies operate globally, but there is often a lack of understanding of virtual team building and leadership, as guidelines and structures for this are often not in place. Many leaders therefore face challenges in building and leading remote teams, as it is frequently unclear how to build such a team and what to look for in a leader to ensure that a team works effectively and performs as expected. Training usually takes place when a team does not work as expected and the leader does not know how to manage them further. Therefore, a guide for virtual team building and leadership would be helpful to cover the needed requirements, so that a solid basis is created on which not only the leader but also the team can work and progress.

The aim was to adapt and update the Tuckman and Jensen (1977) model for building and leading virtual teams, while utilizing Information and Communication Technology (ICT) for the automotive industry. The research provides a step-by-step guide on how to effectively build and lead a virtual team, with team members located in different regions, with different cultures, backgrounds, and time zones. These differences can be advantageously adapted and used in not only the automotive industry, but also other sectors, such as the military and education (Mortensen et al., 2009).

The extensive development of virtual teams and the globalisation of business has necessitated developing virtual leadership techniques, on which the effectiveness of virtual teams depends (Liao, 2017). To ensure the effectiveness of each team member and leader, there is a need to prepare them during the team-building phases. This will strongly improve the trust built between the leader, the team, and the organisation and further increase the coherence of the team (Gilson et al., 2014; Knoll et al., 2015).

1.3 Research motivation aim, questions, and objectives

Leading projects in the automotive industry is very challenging and usually a race against time, since one has to act multidimensionally and never lose sight of time, quality, and costs. However, a leader who only concentrates on the three aforementioned factors alone typically negatively affects the team. Due to the high workload, the leader does not frequently notice why the project is not proceeding as he/she envisages. Operationally, the blame is often placed on the business processes or the existing systems by the leader, without considering his/her relationship with the team. Particularly in virtual leadership, where several mentalities come together, this can be seen as fatal. In a remotely driven way of working, the team has to be considered first, since only then does the leader have the possibility of changing something in the short term (Zeuge et al., 2020).

In the automotive environment, standardised structures and efficient working methods are seen as essential to underpin corporate success. Accordingly, current systems are often kept, or even new ones acquired, in the hope that through their use a significant improvement in team performance can be achieved. The team itself is not taken into focus, as the company assumes that different team members have to harmonise with each other, as it is about one goal (the completion of a project on time).

This situation, along with ever-increasing global digitalisation, has led to the development of a model to encourage the German automotive industry to rethink and examine new possibilities. The aim was to develop a model for virtual team building and leadership that shows the leader options while also supporting the leader in what they must consider when building remote-controlled teams. Accordingly, leaders should be shown the influence that they have on team performance, and how effective team performance can free up time. The model developed in this research summarises the common challenges of virtual leadership and structures a process to counteract

them. Additionally, the structure of the stages is such that they are both sequential and independently flexible to use.

The aim of this research is to develop a model for virtual team building and leadership that can be applied in operations in the German automotive industry. The research focuses on answering the following questions:

1. Can the **C**ritical **S**uccess **F**actors (CSFs) for the leadership of virtual teams in the German automotive industry be identified from the analysis of the extant literature?
2. Can a **P**rovisional **C**onceptual **F**ramework (PCF) of virtual leadership in the German automotive industry be developed based on the existing literature?
3. Through the analyses of project management expert interviews, is it possible to develop, apply, and evaluate a new operational model for e-leadership of virtual teams that minimises personal contact and optimises project outcomes in the German automobile industry?

Based on the **R**esearch **Q**uestions (RQs), the following **R**esearch **O**bjectives (ROs) are addressed:

- RO1: To analyze the existing literature while identifying CSFs for the virtual leadership of virtual teams in the German automobile industry.
- RO2: To review existing literature on virtual leadership and teams and to develop a PCF in the context of virtual leadership in the German automotive industry.
- RO3: To develop a new operational model for the virtual leadership that minimises personal contact and optimises project outcomes in the German automotive industry.

Answering these questions and achieving these objectives will create a model that will substantially improve the leadership of remotely controlled teams. Since no model for virtual team building and leadership exists at present, this model can act as a point of departure that can have a significant impact on teams, contributing to an increase in work-life balance and improve team performance.

1.4 Thesis structure

This thesis comprises eight chapters, beginning with this introduction to provide an overview of the research. Chapter two focuses on the literature review of virtual leadership, generating relevant information on current methods and the general progress of the use of such working methods. This chapter additionally presents the

history of leadership and virtual leadership to provide an overview of the development of leadership and why virtual leadership is necessary. Following this, the development of virtual teams in the automotive industry, why they are seen as the basis of success, and why their importance is increasing in the automotive industry is also discussed. Next, the advantages and disadvantages of such teams in this industry are discussed and the possibilities of virtual leadership are shown. Subsequently, the CSFs are generated and the ROs reaffirmed.

Chapter three establishes the PCF. The individual stages are examined for their suitability for inclusion in the V-CORPS model. Additional figures show why the use of these stages is required. Chapter four presents the research design, which not only sets the methodology and paradigm, but also provides reasons why the in-depth interviews were necessary and the use of a qualitative approach. Chapter five presents the results of the first survey and the eighteen expert interviews on the Conceptual V-CORPS Model.

In chapter six, the data are analysed from chapter five and validated. The model is then further enhanced through the discussion of each stage. Following this, the enhanced model is evaluated by six of the eighteen experts. In chapter seven, the operational V-CORPS model is presented and discussed, and the significance of V-CORPS as a guide is shown. The role of digital transformation is also discussed in this chapter. Subsequently, the three RQs are answered. Chapter eight summarises the results of this thesis, discussing the main findings as well as the answers to the RQs. The contributions to theory and practice are presented and comments on the limitations of the study are provided. Finally, potential future research is discussed.

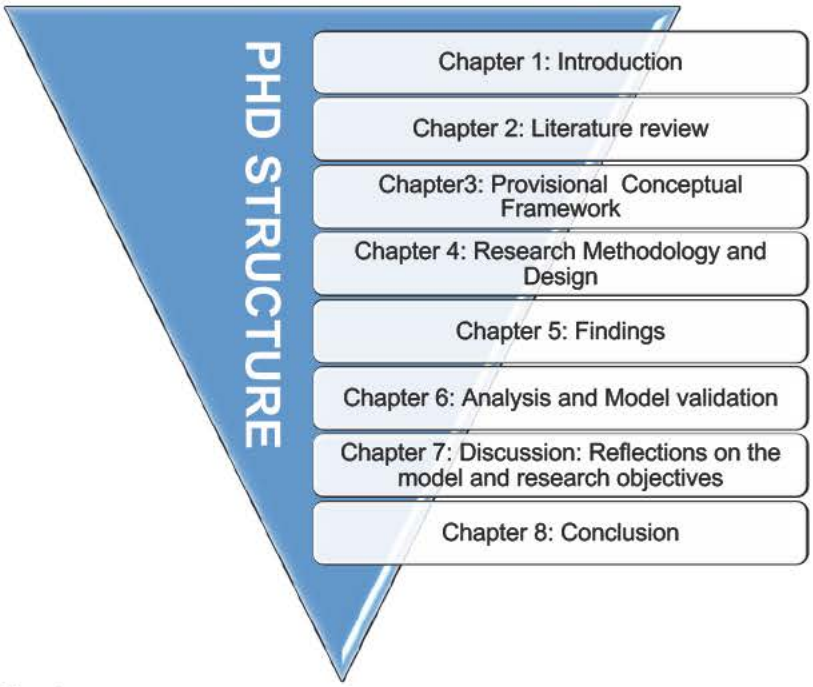

Figure 2 Thesis Structure

Figure 2 presents an overview of the thesis structure.

1.5 Methodology

The model was developed and validated based on an online survey with semi-structured interviews in a US global automotive supplier company that is situated in Germany. An inductive and qualitative approach was chosen, which involved a survey consisting of a questionnaire followed by semi-structured interviews. Data from these interviews were obtained and evaluated with existing data from the literature review to develop the initial stage model (preliminary V-CORPS). The model was then validated and refined for operational use through a subsequent online survey with six of the eighteen experts.

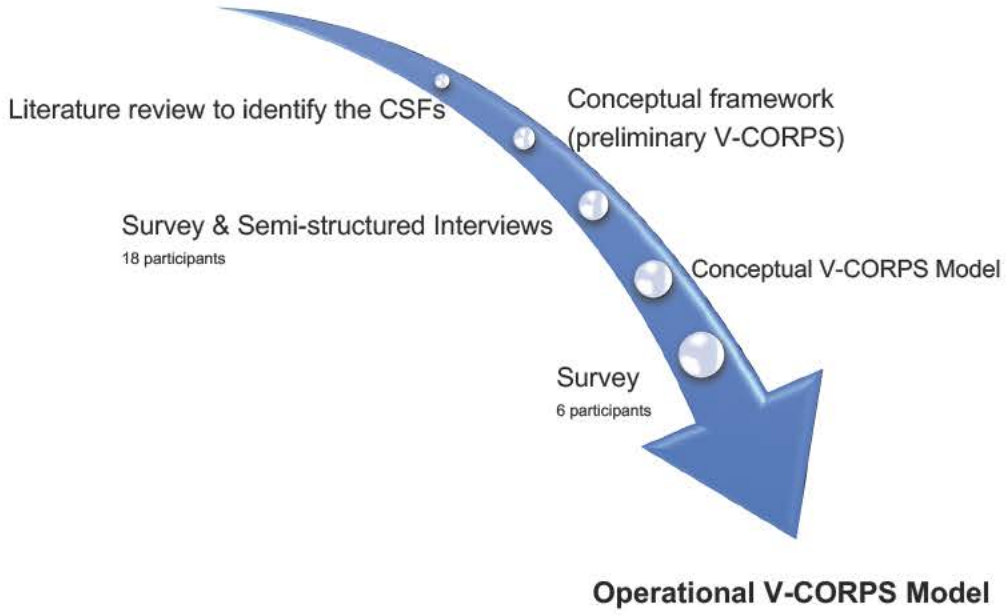

Figure 3 V-CORPS model development and evaluation process

An overview of the six steps of the research process is presented in Figure 3. Each step was carried out sequentially and interlinked. The research was based on a survey conducted in a single company, but due to the selection of experts, from line management to the CEO, a wide range of data was obtained. The interviews were analysed through data reduction and coding, and then were summarised in the form of statements and implemented in the model's development. The conceptual framework was validated through a survey and semi-structured interviews with eighteen experts. Following this, the data were used to create a conceptual V-CORPS model, which was then tested for operational capabilities through a survey.

1.6 Summary

The German automotive industry is experiencing a revolutionary shift from fossil fuels to electric power, which is taking place in a highly accelerated manner. OEMs are increasingly trying to switch completely to the production of electric vehicles to meet their set climate objectives. This requires large amounts of investment for extensive refurbishment measures in the production area. At the same time, employees are increasingly striving for a work-life balance, which in turn is causing companies to rethink their working methods and models. The V-CORPS model provides a better

understanding of virtual team building, leadership, and each team member in order to support the leader to deliver these objectives for both OEMs and staff.

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2. LITERATURE REVIEW

2.1 Introduction

According to Lipnack and Stamps (1999), there is a need for twenty-first-century organisation and innovation to solve twenty-first-century problems. Correspondingly, scholars have started to think more comprehensively about the complexity of projects with dispersed teams, and new possibilities for project management. These scholars not only consider the aspects of managing a project, such as time, cost and quality, but are also required to find a response to the challenges to carry out projects in practice, and the poor track records of previous projects (Svejvig & Andersen, 2015). To find and define the correct response to poor track records, scholars have to consider the aspects of is a multicultural team managed in an effective manner.

Jugdev et al. (2001) explained that project management is seen as a holistic discipline for achieving organisational efficiency, effectiveness, and innovation. The examination of the available literature of virtual leadership in the automotive industry was carried out to issues such as project complexity, social process, value creation, conceptualisation and practitioner development (Svejvig & Andersen, 2015) can be achieved at a distance. This allows methods to be extracted or developed to influence team members when a face-to-face meeting is not possible. This is because teams often encounter problems during project periods (which are defined by the achievement of project milestones), such as time zone conflicts and cultural differences, which slow down productivity and increase miscommunication (Layng, 2016). As the available literature on the automotive sector is somewhat scarce, the literature review must be extended to other sectors, including medicine, IT, and the general technical sector.

The reason for such an extension was that gathering additional data is useful to the automotive sector, as this extension of data is useful to analyse and determine the influence of social and behavioural elements which affect the management of projects (Svejvig & Andersen, 2015). This extension will further help to determine whether concepts and ideas can be adopted from other sectors, and whether these can prove viable for leading virtual teams in the automotive industry. This review not only aims to obtain a clear picture of the current situation of virtual leadership in the automotive industry by comparing it with other sectors, but it also intends to investigate the

challenges that are insurmountable under current circumstances or need adjustment when applied to the automotive sector.

The literature review was a benchmark analysis for the current research project, with the goal of rethinking the leadership for dispersed teams in the automotive industry, looking particularly at team leading from a distance and its influence on team members. This benchmark is very important for future automotive projects led from a distance, in relation to changing the way that leading dispersed teams work with team members, enabling new time-saving elements such as a reduction of travel time. In addition, it will become possible to know which elements of virtual leadership can be adapted to the automotive sector, and how such elements can be used to influence people more effectively from a distance. In addition, it will provide an overview of the current possibilities, available tools, and features (e.g., the horizontal communication of team members or the liberation from isolation of team members) for such projects. Horizontal communication is a transmission of information between people, divisions, departments, or units within the same level of organisational hierarchy. This can be distinguished from vertical communication, which is the transmission of information between different levels of the organisational hierarchy.

The objectives of this literature review are to demonstrate gaps and limitations in the material currently available relating to virtual leadership in the automotive sector, as well as providing a basis for preparing interviews to be conducted by experts. The review also provides the basic elements for the development of a model for leading from a distance in the automotive sector. The fundamental concepts will be influential in rethinking team management (Svejvig & Andersen, 2015) through the model for the automotive industry.

This chapter is structured into nine sections. Following this introductory section, section 2.2 focuses on the history of leadership, and the development of leadership throughout the last few decades, while further emphasising the importance of leadership. Section 2.3 considers the historical development of virtual teams and defines how this will become an important working practice in the future. Section 2.4 addresses the necessary requirements for building a successful virtual team within sector. Section 2.5 considers how virtual teams are fundamental for a successful project, and details the required tools and techniques needed to lead an effective team.

The possibility of working with teams across the globe and the importance of virtual teams in the automotive sector is discussed in section 2.6, and section 2.7 addresses the advantages and disadvantages of working with virtual teams in the automotive industry specifically. Section 2.8 assesses the connection/communication methods of virtual leadership available to the automotive industry and covers the possibilities of virtual leading in this sector. The conclusion in section 2.9 summarises the initial impressions discussed regarding virtual team building and leadership in the automotive industry, reveals the current gaps and limitations in our current virtual leadership knowledge, and identifies the requirements for addressing these issues.

2.2 Leadership history

When looking back over human history, leadership is as old as humanity. Every kingdom or war has needed somebody to take the responsibility during the action, make decisions and manage people, mostly for a particular goal or achievement. An effective leader is defined by their number of successes, and then by their actions. It is certainly not possible to compare today's leaders with those of the past, given that leadership worked through commands, where soldiers had to follow the orders of a king or commander. By contrast, today's leaders work through social influence; for example, building trust and promoting cohesive teams. It was possible to neglect leadership until the Industrial Revolution in the early-18th century, as leadership from a kingdom or an army came in the form of a command and not of a task, which would be carried out as a part of somebody's employment. Early (2017) revealed that leadership can be divided into eight theories and eras, through this period can see the historical development and current working basis of leadership.

2.2.1 Great Man theory (1840 onwards)

This theory sees the leader as a hero, a unique individual through whom heroic courage, for example, is greatly influential. Mostovicz et al. (2009) identified the qualifications of a leader, who must be seen as somehow unattainable to the common man and therefore has those people who follow them. The Great Man theory assumes that all great leaders are born and not made, and only a certain number of men possess the characteristic(s) of a great leader (Foster, 2010).

Under the Great Man theory, the leadership process is defined as following someone's instructions without contradiction, as if they are doing something heroic. Nowadays,

the Great Man theory fits well with a top-down approach by assuming that the leader has the natural capabilities for leadership, and is brought to such a position through observation or a particular set of actions (Foster, 2010). The Great Man theory is more applicable in the military, where one only has to react to orders. The top-down approach is also more common in Asian regions, whereas in the western regions a flat hierarchy is desired, especially in start-ups. Thereby are decisions usually not determined but decided collectively. Therefore, the Great Man theory may be considered outdated in modern companies and is not applicable for modern times.

2.2.2 Trait theory (1910-1950)

According to Zivick (2011), effective leaders have innate personality traits or attributes that distinguish them from less effective leaders. The focus here is on three factors: communicational competence, environmental awareness and the power of influence (Zhang & Fjermestad, 2006). By identifying these key characteristics, the potential leadership abilities of a person can be predicted (Zivick, 2011). Furthermore, by using certain characteristics (mental, physical and social), it may be possible to identify potential leaders early on, explain leadership behaviour, and participate in their development (Early, 2017). In addition, here and in the virtual environment, the individual personality traits of managers play an important role, and are supported through training and developmental programmes (Eissa et al., 2012).

Nevertheless, Zivick's (2011) statement about effective and less effective leaders cannot be generalized, as leaders without innate personality traits or characteristics can also be very effective through targeted training. The only distinction to be made is that people with innate personality traits or characteristics require less effort on their path to becoming an effective leader than those without these traits.

2.2.3 Behavioural theory (1950-1970)

Behaviour-based leadership theory counters trait theory in the sense that it states successful leaders are not created at birth, but can develop through the acquisition of specific methods to grow into effective leaders (Zivick, 2011). Angell (2013) shows that behavioural theory explains human behaviour by analysing the antecedents and consequences present in the individual's environment, along with the learned associations they have acquired through previous experience. The use of this theory is also helpful in choosing a leader and suitable team members, as it promotes team

cohesion from the beginning of the project. This can be the first step in the right direction and a way of creating a selection criteria for team members in projects with special requirements. Early (2017) states that this theory supports the investigation of the question “are you born – or can you learn – to be a leader?”, and whether task-oriented or relationship-oriented leadership is necessary for the project.

Leadership can be created through targeted training, as described in the Trait Theory. In the project environment, situational leadership is required, as it entails the most flexibility and enables the leader to better intervene and act in the project environment.

2.2.4 Contingency theory (1970-1990)

When using contingency theory, the leader must diagnose and match a variety of leadership factors, including relationships between leaders and members, the nature of the task, and their positions of power, using a specially designed model (Burian et al., 2014).

McKenzie and Love (2017) identified the leader as a person who is able to find the appropriate leadership style from the situations they thrive upon, as the theory explains that there is no consistent way of leading and that every leadership style should be based on certain situations. This signifies that there are certain people who perform at the highest level at certain times but give less when taken out of their element. Strube and Garcia (1981) identified, through Fiedler's contingency model of leadership effectiveness, group performance as being a function of the Leader x Situation interaction. According to this theory, it can be concluded that a leader is more effective when their leadership style fits the situation.

2.2.5 Leader-follower theory (1990 onwards)

Early (2017) found that the role of followers (a contextual variable) was a natural extension of contingency theory, marking a significant departure from the Great man Theory and its concept of heroic individuals leading from the front. The goal of this theory does not concern how a leader can influence team members so that they follow. Similarly, Foster (2010) shows followers and leaders as orbiting around the purpose, but not followers orbiting around the leader.

2.2.6 Transformational leadership theory (1985-2010)

The theory of transformative leadership states that managers can motivate employees by considering aspects that go beyond the mere self-interest of the employee at work (Guinalíu & Jordán, 2016). Bass and Riggio (2006) described leaders and managers motivating their groups through punishments and incentives. The goal of this theory is to maximise pleasant experiences and reduce unpleasant ones through team building and project processes. The leader has to find a solution to motivate team members to fulfil their tasks in the best possible way.

2.2.7 New directions theory (2010 onwards)

The application of this theory highlights how the concept of leadership has evolved throughout history, emphasizing the fact that new leadership fundamentals need to be considered all the time. Early (2017) explained that contextual factors such as national culture, hierarchical levels of leadership, gender, and race, can empower or inhibit leadership outcomes or behaviour. Furthermore, the influence of ethics and morals on the behaviour of executives, such as an emancipatory bias, can have consequences for the effectiveness of leadership practices. It is, thus, essential to consider and analyse these factors.

2.2.8 System leadership theory (2015 onwards)

System leadership is the way in which a leader can create an organisational environment to maximise team member potential, so that they can work more effectively together. As Burian et al. (2014) found, in reality, a leader needs their team or followers as much as the followers or team needs their leader, and it is important to use different leadership applications and methods to promote trust, motivation, team cohesiveness, and overcome isolation issues. Dreier et al. (2019) stated that system leaders have to consider three sections (remote working, networking, and communicating challenging work tasks) to be able to influence team members and help them to achieve a project’s goals.

Burian et al. (2014) revealed that today's leadership models must contain a representative sample of the capabilities and constraints, of individuals and group elements, processed when arriving at a decision, action or outcome. This can be achieved through system leadership, as system leaders operate from local to global

levels and have an influence on the inside and outside of the organization (Dreier et al., 2019).

2.3 Virtual leadership history

Leadership results are dependent on teamwork, as leadership is measured on the outcome of teamwork. As a result, the leader must place a high value on teamwork in order to generate the best leadership results. Teamwork for projects started in the late 1950s. However, communication possibilities from a distance were not effective at this time, and the avoidance of the distance barrier was only made possible by phone. This was most the case for most co-located teams until the 1980s.

Communication technology developments emerged in the late-1980s and early-1990s, and many companies implemented self-managing or instigated work teams, which additionally were pushed through the computer era as communication support (Nader et al., 2009). This meant that companies considered improvements in their team leadership processes with the goals of reducing travel costs, cycle time, and allowing people to work more autonomously. Zuboff (1989) considered the computerisation of the workplace to be a phenomenon that both workers and managers have to deal with. This statement was underpinned by the actions of global companies such as Goodyear, Motorola, Texas Instruments, and General Electric, which began exporting team concepts to their foreign affiliates in Asia, Europe, and Latin America, integrating global human resource practices in the mid-1990s (Kirkman et al., 2001). Zuboff (1989) revealed that employees become more deeply integrated into work processes as work became more IT-based.

Chudoba et al. (2005) detailed arrangements under which distributed work became increasingly common in the 1990s, but the question emerged of how distributed work, or virtual teaming, differs from localised work. Nader et al. (2009) showed that geographically-dispersed teams allowed for organisations to hire and retain the best people, regardless of their location. Schmidt (2015) explained how the workload undertaken in virtual teams created the need for virtual leadership, and that these leaders that are in charge of managing virtual teams and virtual workers have had to help them to be as productive as possible. Furthermore, the support of ICTs helped to overcome barriers to collaboration, leading to enhanced flexibility, which was

desperately needed to meet the needs presented by the rapidly-changing work environments at the end of the 1990s (Boudreau et al., 1998).

The 2000s saw major developments in the ICT industry (computers, mobile phones and internet). Scholars such as Avolio and Kahai (2003); Avolio et al. (2009); Kirkman et al. (2001) said that this period is about the investigation and development of virtual team building and leading. Greater unification of team members led to communication technology for networking. Day (2000) underlined this by stating such communication technology is about investing in and developing social capital, with a primary developmental emphasis on building support. Due to the many communication technology improvements and continuation of globalisation, virtual teams have rapidly increased worldwide (Rosen et al., 2002). Such companies assumed that team effectiveness would also grow through better communication technology (Avolio et al., 2000).

By the mid-2000s, it was shown by Caulat (2006) that fewer than 30% of virtual teams were seen to be effective and successful, and there was often frustration around virtual working regarding missing guidance and structure for virtual work. According to this investigation, these companies had to understand that better communication technologies would not bring better project results when the project team members do not perform well.

Nader et al. (2009) showed that team success depends on team selection at the beginning of the project. The leader plays a significant role at the beginning, during and the end of the project, and is responsible for team cohesion. The virtual leader has to make the definition of the project's outcomes, and the priorities are clear to his team members at the beginning, while also providing a supportive team environment. In addition, he has to select the appropriate team members with the necessary skill sets before the project's commencement (Hunsaker & Hunsaker, 2008). The combination of building social capital with communication technology has made it possible to define virtual teams as groups of people who work interdependently with shared purposes across space, time, and organisation boundaries, using technology appropriately to communicate and collaborate (Kirkman et al., 2001).

From 2010, there has been a deeper investigation into the development of team effectiveness. This is because communication technology is seen as a supportive tool but not as the main element of virtual leadership. Mehtab et al. (2017) confirmed that

virtual work settings have many issues and challenges which must be addressed to enhance the team's performance. The leadership of virtual teams has to involve the digitalisation of people, as digitalisation shapes organisations, work environments and processes, thus creating new challenges for leaders to face (Cortellazzo et al., 2019). Themes such as trust building over distances, promoting team cohesiveness and team influence are current topics which must be updated for each team and working sector. Building and promoting trust is one of the most important issues, as without trust, processes stop and start erratically, motivation is quickly lost, or relationships are damaged, with productivity and communication suffering as a result (Duckworth, 2008). The application of project management methods (e.g., Scrum, Agile) are digitalised from a distance, but are not generally for this working sector.

For future investigations it is important to distinguish and consider virtual leadership and virtual leaders. This distinction is important, because virtual leadership involves managing distributed working teams whose members mainly cooperate through electronic media, and virtual leaders are "boundary managers" who inspire people from a distance to develop self-management capabilities (DasGupta, 2011).

2.4 Building of virtual teams in the automotive industry

As the automotive industry operates globally, working with virtual teams has become indispensable. It is therefore essential to consider the critical aspects of team building and leadership to work with them effectively through and on virtual platforms. Building a team which has to work virtually requires the main focus to be on people, so as to use them as primary tools. Literature investigation confirms that co-located and virtual leadership is based on the same team developmental stages, as defined by Tuckman (1965) and Tuckman and Jensen (1977) for small co-located teams (see Figure 5) (Maes & Weldy, 2018).

The basis for Figure 5 is found in Figure 4, which shows the main group developmental stages. These four stages can be seen as the group developmental sequence for interpersonal relationships between team members of co-located teams. In the first part of the model's development, interpersonal relationships and task activities are considered, resulting in a four-stage model in which each stage needs to be successfully navigated to reach effective group functioning (Bonebright, 2010).

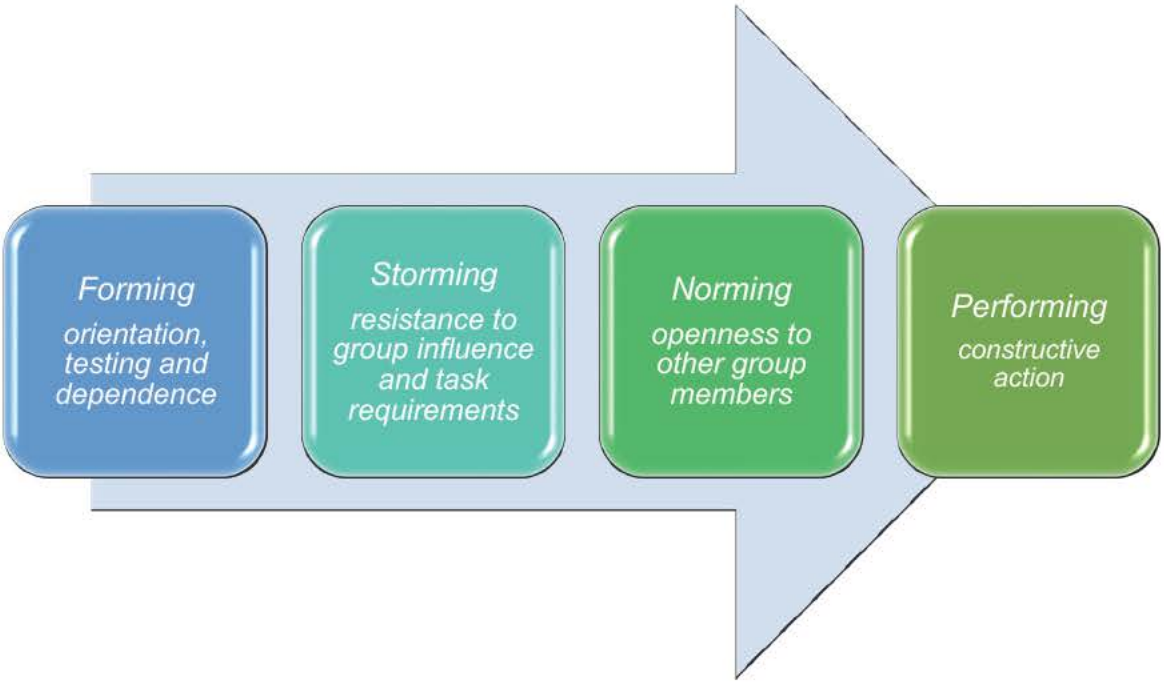

Figure 4 Stages of group development (Tuckman, 1965)

Table 1 was designed for the development of small groups by Tuckman (1965). It shows the respective stages of an associated group structure and the activities behind them for such development.

Stages	Group structure	Task activity
Forming	Testing and dependence	Orientation of the task
Storming	Intragroup conflict	Emotional response to task demands
Norming	In-group feeling and cohesiveness development; new standards evolve, and new roles are adopted	Open exchange of relevant interpretations; intimate, personal opinions are expressed
Performing	Roles become flexible and functional; structural issues have been resolved; structure can support task performance	Interpersonal structure becomes the tool of task activities; group energy is channelled into the task; solutions can emerge

Table 1 Tuckman's stages of Group Development (Tuckman, 2001)

As depicted in Figure 4, performing is seen as a "problem-solving instrument", as members adapt and play roles that will enhance activities (Bonebright, 2010). The Adjourning stage was not identified in Tuckman's (1965) initial model but the separation of team members must be considered important throughout the life of the group, and as a separate and distinct final stage (Tuckman & Jensen, 1977). The stages of development are thus not seen as a process, but more as a life cycle (Figure 5) for the spin-off and reintegration of team members. Tuckman and Jensen (1977)

found that in groups where substantial amounts of activity take place, interpersonal feelings are found, and group dissolution becomes an extremely important issue for many of the members. Considering these factors, it is essential to see the Adjourning stage (Table 2) as an independent stage that is necessary for the group development life cycle (Figure 5) and further group development.

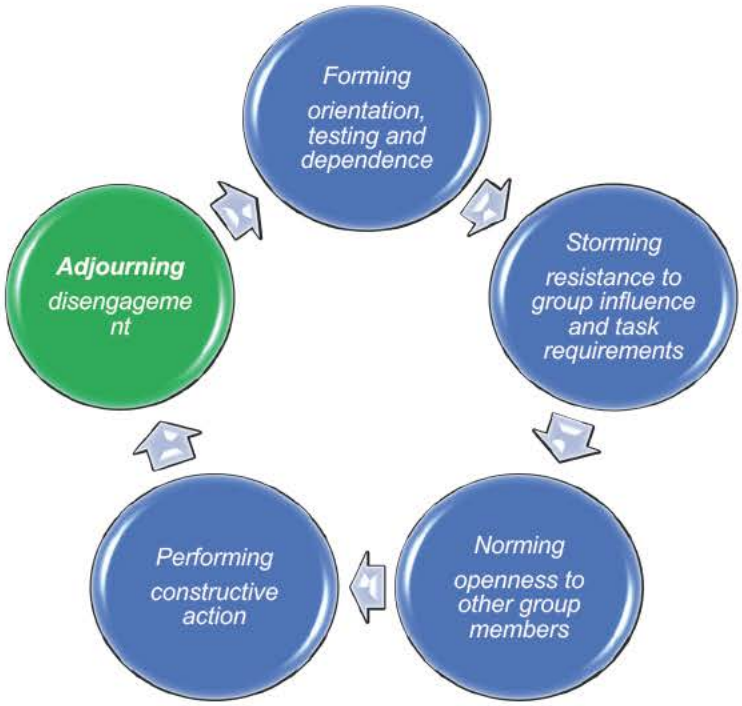

Figure 5 Tuckman and Jensen's Group Development Life Cycle

Stage	Group structure	Task activity
Adjourning	Anxiety about separation and termination; sadness; feelings; towards the leader and group members	Self-evaluation

Table 2 Tuckman and Jensen's Group Development (Tuckman, 2001)

Tuckman's model has some limitations, which the literature review has not provide a representative sample of settings where small group development processes are likely to occur (Bonebright, 2010). Additionally, the adaptation of the model to working areas is challenging, because the model development is based on organising and conceptualising existing research data and theoretical precepts rather than presenting original empirical data to support a particular model (Tuckman & Jensen, 1977). This appears in the review, when Cassidy (2007) explained that the *Storming* stage may not be clearly defined for practitioners outside of therapeutic groups. It will thus be difficult to apply to daily working lives and needs to be customised for individual team development situations. This model also does not consider how group members

change over time and the steps that must be taken to implement them when a project is at an advanced stage (Rickards & Moger, 2000).

One way forward is to find and define how to do this in the best virtual way for the automotive industry. Lipnack and Stamps (1999) explained that people constitute the core of virtual teams. Working with people from a distance is different from working face-to-face. In the automotive industry, before a project starts, team building for virtual leading poses major challenges. The formation of a team happens mostly without the project manager. Team members are taken from an account pool and when the team is to be led from distance, a face-to-face “kick-off” meeting is not considered. For when development must be done virtually, the finished product, including associated production and supply chains, has to function in the real world. Layng (2016) ascertained that communication is the heart of distributed and traditional project teams. She stated that many issues faced by virtual teams, such as conflict management, trust and team cohesion, are rooted in team communication behaviour and processes. During the team-building process, it is essential to identify the CSFs for leading teams over distance. Moreover, it is important to choose people who are open-minded and ready to work virtually, as many of them may prefer to meet in person.

However, it is essential for the automotive sector that people act and react conscientiously in their duties. Furthermore, they must be aware of the importance of their working positions and the consequences of their actions. This is something which could be promoted over the project’s duration because they have to develop security-related tasks. DasGupta (2011) listed seven basic factors for team members and leaders to work virtually: sincerity, responsiveness, alertness, willingness to learn and re-learn, a sense of adventure, vision, and selflessness. It is also important to consider trust and social influence on team members.

Duckworth (2008) explained that without trust between teammates, processes stop and start erratically, motivation dies quickly, or worse, relationships intensify and are damaged, with productivity and communication suffering as a result. Team members must depend on each other and develop a healthy understanding of errors and failures. This develops a healthy team spirit over the whole project. It is also essential for leaders to build and promote trust in a team, but this can only be done in face-to-face meetings, where the team members can get to know one another, and where project managers can also introduce themselves. Layng (2016) confirmed that building trust

through face-to-face meetings and the use of visual media is essential at the beginning of a project. Basic rules for communication with each individual virtual employee/team must be clearly determined and defined (i.e., when and for how long the communication should take place) over the course of the project. Trust is an ongoing, growing and working process because diverse team members can only form an impression after a first meeting, with this first impression possibly being the basis of building trust.

For further project and trust building procedures, social influence is a significant factor. Among the various project requirements, such as whether a project is a development or customer application, it is significant for the project manager to know, from the beginning of the project, how to create a team leading and steering strategy, and take into consideration how it should be presented outwardly to the customer, both internally and in front of the team. They also need to create a strategy for team influence during the project. This is important when working with mechanical/automotive engineers, whose understanding of tasks lies in sensibly perceptible and verifiable results (positivism) (Romero et al., 2013). Avolio et al. (2014) saw social influence as a process typically associated with the leadership of individuals, groups, and at organisational levels. This contradicts Chudoba and Maznevski (2000), who stated that the social benefits of regular face-to-face meetings ultimately enrich team performance.

Face-to-face meetings are costly and time-consuming. Therefore, bringing all of the team members together in one place regularly will have a negative effect on the project's lead-time. Indeed, Layng (2016) showed that though media richness though virtual communication is the key to success, it is still no replacement for face-to-face communication, and that a first face-to-face meeting is not a cost but a recurring investment. This first meeting adds value to team cohesion and gives a positive start for the leader when considering the social influence of the project, because the first perception leaves a lasting impression. Moreover, it is important to build a team in which face-to-face communication is not essential for a project's success, and where team members can work more autonomously, using globalisation and different time zones as advantages.

The goal of this must be to manage employees from different places and time zones without face-to-face meetings to avoid limitations in performance and efficiency. For

instance, typical German and US business hours can only overlap by an hour or two per day, so any meetings between German and US workers must be scheduled within that narrow window (Casio & Shurygailo, 2003). Considering Casio and Shurygailo (2003) statement, it is essential to understand that team members working remotely but collaboratively over a project in a limited timeframe are under more pressure, due to different time zones, than the members of a team that meet face-to-face. This can be avoided with a small number of meetings and the autonomous work of team members. It is also sufficient to use this narrow window for a short briefing, and if one member is off duty, another can work in different place and time zone during that time. Additionally, technical support in the form of programmes is also needed. Lee-Kelley and Sankey (2008) explained the importance of communication between virtual team members and the effects of using technology to communicate. Technology for communication is already in daily use in the automotive industry, but it would prove more useful and labour-saving to develop software which enabled leading from a distance. An additional aspect for team building is, that each manager analyses the impact of the virtual work arrangements in their own leadership style, adapting them accordingly (Casio & Shurygailo, 2003). The style of leadership must be rethought and be individually and separately customisable for each project team.

In the automotive sector, there must be differentiation between internal and external projects. The crucial difference between them is the level of pressure, which is lower in the former than the latter. However, as Casio and Shurygailo (2003) explained, no one leadership style is necessarily best for a virtual team. The leader therefore has to build a team which can work in a virtual environment and customise their style of leading. The leader has to also keep a focus on team familiarity for understanding the role of team member relationships in distributed settings (Travis et al., 2019). After considering the requirements of team building for automotive projects, it is essential to emphasise that trust, special social influence regarding steering, motivating and escalating team members, and technical support will make it possible to create and lead a team in the automotive sector.

2.5 The virtual team as the basis for a successful project

Lipnack and Stamps (1999) argued that the success of a virtual team depends more on people (90%) than on technology (10%). It is therefore essential to understand the key differences between teams that interact physically with each other, such as sports

teams, orchestras, aeroplane crews, and virtual teams, separated by time and distance, and cooperating without any physical interaction (Casio & Shurygailo, 2003). Lipnack and Stamps (1999) discovered that working in a virtual environment requires a new kind of organisation, a new kind of management, and a new kind of leadership.

Therefore, new ways and solutions for remote leadership for the automotive industry must be developed. By doing so, the affected individuals can be encouraged to rethink local leadership, which can then be used as a basis for the next steps of virtual leadership. In the automotive industry (and also in other sectors with physical interaction), virtual projects present challenges, such as expanding the imagination of the physical product presentation virtually, that are different to conventional, local projects, and pose questions as to how they might be more useful than face-to-face teams in delivering value in specific contexts (Lee-Kelley & Sankey, 2008). However, the physical interaction aspect can mostly be balanced through communication technology e.g., creating a rapid prototype model.

The social aspect, which deals with how it is possible to lead, steer, influence, motivate, for example, team members without seeing them, plays a significant role on the main reasons for team success. Creating positive team cohesion and trust between team members is also a challenge over distance. Therefore, these factors, which include creating a high level of initiative and leadership responsibility, gaining a shared understanding for decision making and problem solving, and promoting shared trust and understanding, all contribute to the success of the project. Moreover, the performance of virtual teams depends on the leader's influence on the team (Hill & Bartol, 2016).

According to Casio and Shurygailo (2003), leaders plays a significant role in team leading, as an extensive amount of research has revealed that leaders make a critical difference to team performance. Building a trust-based relationship between leaders, their teams and team members is the basis of the whole project procedure, and it is necessary to delineate what can be more readily achieved face-to-face than from a distance, such as building trust quickly. Once the purpose and people are determined, the means which are most useful for tying those people together to accomplish the work they have agreed upon can be decided (Lipnack & Stamps, 1999). Casio and Shurygailo (2003) stated that from a project leadership perspective, the most

appropriate course of action is certainly to have regularly established meetings for natural work groups.

In a project with dispersed team members, however, it will be difficult to meet this requirement. The time difference is an obstacle that can affect a project negatively, therefore regular meetings are important, especially for virtual teams. Therefore, overcoming time distance through the use of telecommunication and information technologies and using them for communication and performance improvement in a team must be utilized (Lee-Kelley & Sankey, 2008). Telecommunication and **I**nformation **T**echnology (IT) are the most useful tools for leading and controlling a team over distance, yet a well-defined procedure for using them in taxed teams is necessary. The combined use of **A**dvanced **I**nformation **T**echnology (AIT), which includes email systems, message boards, groupware, and **G**roup **S**upport **S**ystems (GSS), knowledge management systems, executive information systems and collaborative customer relationship management software is extensive and complex. Supply chain management systems support leadership tools for planning, decision-making, dissemination and control of information and team members (Kahai et al., 2000).

Meetings are the only possible opportunity for bringing all of the team members together in one place (locally or virtually), bringing them up to perform and understanding or updating the project situation as a leader. As Casio and Shurygailo (2003) argued, meetings are the lifeblood of virtual teams. Layng (2016) suggested not only focusing on virtual communication but also improving it, especially on issues that arise as a result of communication of virtual teams, including ambiguity, lack of non-verbal cues, cultural preferences and usage, language, lack of visibility, sharing of information and time zone differences (Lee-Kelley & Sankey, 2008). An additional solution to the time barrier is social influence on team members. Indeed, Lee-Kelley and Sankey (2008) showed that a virtual team may be more of a psychological reality than a sociological entity. However, considering the cultural barriers and different languages of virtual team members, it may be difficult for further virtual project steps if the social aspect is not taken into account. Today, it is surely the case that language barriers are mostly neglected when the business language is English. This must be considered situational because there is a different understanding of the business language quality, and sometimes it is better to use an interpreter to avoid language barriers.

There are cultural and mental barriers, however, which should not be neglected. It is up to the style and sensitivity of project leaders to influence and motivate team members, avoiding cultural misunderstandings. Project leaders also have to bring up competencies such as, networking and appropriate use of technology, self-management, and cultural and interpersonal awareness (Lee-Kelley & Sankey, 2008). It is also significant to have a face-to-face kick-off meeting with other managers and team members who work for them (Casio & Shurygailo, 2003), as the first impression of co-workers is highly significant for future interactions.

Additionally, this first meeting is important for presenting and defining the project goals and distributing and explaining responsibilities. After this meeting, it is essential to incorporate these first impressions into an action plan of how to deal with certain team members and certain characteristics during the project. What is more is that this provides common ground, shared meaning or social context that constitute the essential element for communication within a team (Layng, 2016). As Burg (2013) explained, most business communication today still depends on conference calls and email chains, which makes it challenging to get to know one's partners in a team. Considering Layng's (2016) investigation, that a positive social influence on team members depends on the success of project results. In addition to this, the competence, including personality and leadership style of project managers is also a success factor for individual projects (Turner et al., 2005). It is essential to note that the influence must aim towards breaking or avoiding psychological barriers. One of these barriers is virtual distance, although "virtual distance is a psychological distance created between people by an over-reliance on electronic communication – no matter where those communications originate and end" (Lojeski & Reilly, 2010).

In conclusion, a successful project depends on the sensitivity of project managers in ensuring a social influence on team members while avoiding psychological barriers. According to Subrahmanyam (2019), leaders better influence team members through the use of computer-mediated communication and targeted training, explicitly focusing on building trust, exchanging information among one another, and dealing with the ups and downs during the project to improve cohesion. These components are required for effective management of team members at a distance, which underpins the model for virtual team building and leadership.

2.6 The importance of virtual teams in the automotive industry

In a survey by Lepsinger and DeRosa (2015), conducted by the Society for Human Resource Management in 2012, 66% of multinational and 46% of all organisations used virtual teams in the workplace. This makes it clear that using virtual teams is becoming increasingly commonplace. In addition, ever-faster communication links and the increasing digitisation of the corporate world are changing the way job opportunities are created. Barnwell et al. (2014) investigated the two core components of e-leadership: communication and technology.

Technological advancements in different communication tools coupled with 5G mobile broadband technology across Europe has given organisations the much needed support for employee development (Eissa et al., 2012). Digitalisation regarding industry 4.0 has already changed (5G is an integral part of the overall Industry 4.0 vision and implementation (Lemstra, 2018)), and will change organisational methods for working irreversibly. Cortellazzo et al. (2019) defined the increased use of supportive tools as accelerating the development of digitisation in organisations, work environments and processes, which creates new challenges for leaders. Leaders need to define virtual leadership and teams, something which is becoming increasingly important, along with digitalisation. This new method of communication also brings about new possibilities for virtual working, so it is essential that leaders rethink their way of leading and adapt themselves to new possibilities, with the goal of being more effective as a team during future projects. Eissa et al. (2012) have underlined an effective leader need to obtain the necessary skills required to perform their jobs and be effective in them.

This section reviews virtual team literature and describes new possibilities for leading globally dispersed team members in the automotive sector. The automotive industry has grown rapidly over the last decade, and if we look at the predictions of Müller et al. (2013), the global profit for the automotive industry is expected to increase by almost 50% between 2012 and 2020. Given previous expectations, it is now understandable that the growth of industry and the resulting complexity of the processes to be controlled have enabled virtual teams, with a growing response to the need to react to the market quickly, and for more cost-effective and rapid solutions for complex organisational issues (Nader et al., 2009).

The importance of the implementation of co-located teams in different areas of the automotive sector is not in doubt, according to Nader et al. (2009), who explained that virtual teams enable organisations to bundle up the talents and expertise of employees and non-employees by eliminating time and space barriers. Moreover, Piccoli et al. (2004) have investigated virtual teams representing one such organisational form, which could revolutionise the workplace and provide organisations with an unprecedented level of flexibility and responsiveness. Through virtual teams, it will be possible to work without being bound to a certain workspace. This must be seen as a challenge in the automotive sector when looking at the explanations of complex technical issues. In order to make the explanation possible from a distance, the support of companies in the submission of technical possibilities is unavoidable.

This is due to the steep development of electronic information and communication media support in the last decades, which has made distributed works much more accessible, fast and efficient (Hertel et al., 2005). This technology has made it possible to create complex products more collaboratively both internally and externally, while involving suppliers throughout the design process (Nader et al., 2009). According to Nader et al. (2009), it is also possible to investigate, simulate and improve existing products. Moreover, recent developments have not only made it possible to simulate tests but have also enabled participants to see them without being in the same place at the same time. Indeed, organisations are currently facing significant and unprecedented challenges in an ever-dynamic, continuously changing and complex environment (Rezgui, 2007).

Scientists have investigated the ways in which complex and equivocal tasks in virtual teams necessitate rich media support systems (Chudoba & Maznevski, 2000). Media is indispensable not only for work over distance, and for the automotive sector in particular it is crucial for communication, but also works as an investigative, simulation, and development tool which can be used by each team member independently. The evidence shows that a technological facilitator role in the form of a virtual team leader can be very important to virtual team success (Thomas & Bostrom, 2005), which is a crucial factor in the automotive industry. Without this, it is not possible to keep the virtual team member network alive, and further steps, such as development procedures, become considerably more difficult. It can be said, then, that media

richness is both a connection between virtual team members and an essential working tool.

Despite the fact that the production of a new car today includes several suppliers which are acting in an important role in the manufacturing exercise (Anderson et al., 2007), it is challenging to bring all of these members together in one place. In addition, the globalisation of economies and the working environments of competing companies has increased pressure to build a sufficient number of users of innovation in a social system, open new markets, fill skills gaps and develop further product developments of all kinds of progression and organisational agreements across multiple countries (Cummings & Teng, 2003). Moreover, strong business and social pressures necessitate the adoption of virtual team working (Nader et al., 2009).

The use of a virtual team covers a wide range of activities and forms of technology-supported working style (Anderson et al., 2007). The aforementioned complexity of automotive development projects as well as the short development time needed for these, requires the effective use of time. Nevertheless, creative thinking is necessary for the creation of temporal clearances during this effective use of time and is mostly enabled through cuts in bureaucracy and with as little travelling as possible. Virtual teams have more effective research and design continuity decisions when compared to face-to-face teams, as virtual teams have asynchronous communication, which allows more time for digestion and reduces the pressure of group conformity (Cummings & Teng, 2003). Working with a virtual team enables the valuation of time and space by utilising modern computer-driven technologies (Nader et al., 2009).

This allows also for virtual organisations in which the work of individuals is not restricted by time and place, and communication is actively facilitated through IT (Nader et al., 2009). The automotive industry can also benefit from this by, for example, deploying team members at required locations with the associated areas of responsibility to accelerate a project on-site. With this method, virtual groups can only exist when several teleworkers are combined, and each member reports to the same manager (Nader et al., 2009). For the automotive sector, a matrix organisation is essential for ensuring hierarchical reporting to high management levels, and to ensure decision-making and escalation steps are recorded and acted upon. At the same time, it is unavoidable for virtual leaders to be available, so that they can be reached during work

hours should a remote employee have an urgent issue which needs to be addressed (Casio & Shurygailo, 2003).

It is not necessary to be continuously available for automotive development or application projects when there is little urgency for the project's completion. However, it is essential to work effectively and autonomously with a smaller number of frequent meetings, and with a significant amount of horizontal communication between team members. This type of work automatically creates dynamism and free space, so that the working process is more flexible, which is also the goal of automotive projects. In addition, a virtual team may allow people to collaborate more productively from a distance (Gassmann & Von Zedtwitz, 2003) and make it possible to have more free space while at work. In the automotive sector, it must be possible to work with virtual teams when a transition between the virtual and physical world is available. Finally, as Nader et al. (2009) have shown, virtual team members must have clear roles and responsibilities.

2.7 Advantages and disadvantages of virtual teams in the automotive industry

The concept of the virtual team does not fit well with the idea that a trip to a coffee corner or across a floor to a familiar colleague remains the most reliable and effective way to review and revise a new idea (Gassmann & Von Zedtwitz, 2003). A trip to a coffee corner does not promote time effectiveness and responsible work efficiency that would be provided by using a virtual team. The same situation is seen with the water-cooler effect. This instead promotes social interaction among team members in co-located teams, which in a virtual team would be practically impossible. This is why it is essential to compare the pros and cons of virtual and co-located teams. Berry (2011) found that managing virtual teams is different to, and more complex than, managing face-to-face teams, even though they share many characteristics.

Managing virtual teams certainly brings some challenges, and there is a need to rethink the leading processes and social influence on team members from a distance. Nonetheless, technical support and a method that allows working from a distance will still provide a wider range of opportunities than working with co-located teams. Virtual and co-located teams have not only their idiosyncratic complexities in the automotive industry, but the experience level required for leading from a distance in the automotive industry is not to a sufficiently high standard. Cascio (2000) investigated the five main

disadvantages of virtual teams: a lack of physical interaction, loss of face-to-face synergies, lack of trust, more significant concerns regarding predictability and reliability, and a lack of social interaction. For this reason, leading a team from a distance is a challenging process in which social influence plays a significant role. However, further steps will demonstrate that new options are available nowadays, although it remains necessary to carry out certain investigations.

2.7.1 Lack of physical interaction

In an age of smartphones, the demand for physical interaction has proven to be increasingly less important. In addition, working in a virtual team requires working with individuals, whereby it is possible that individuals who are used to working virtually will no longer need to communicate orally (Lee-Kelley & Sankey, 2008). Horwitz et al. (2006) described virtual teams are based on individuals' collaborations in geographically dispersed work groups in different time zones and countries. Moreover, leaders of virtual team members expect them to become interdependent, negotiate cultural differences successfully (Dekker et al., 2008) and accomplish their tasks through computer-mediated technology (Hunsaker & Hunsaker, 2008). At this point, team selection is a key factor which differentiates successful teams from unsuccessful ones (Nader et al., 2009). With these factors in mind, it can be assumed that the medium of physical interaction can be neglected. During the selection process of project team members, the most important factor is their ability to work from a distance.

2.7.2 Loss of face-to-face synergies

The PMI (2013) defined meetings as most effective when the participants can all meet face-to-face in the same location. However, virtual meetings can be held using available communication technology with additional preparation and organisation to achieve the same effectiveness as a face-to-face meeting. As a consequence of this, synergies can never be lost when virtual teams are led by those who make sure meetings are as efficient as possible. From the previous text, it is understood that virtual teams work with individuals, and therefore it is important to take the suggestion from Lee-Kelley and Sankey (2008) and have a kick-off meeting after the team has been set up to form interpersonal relationships. In addition, through a face-to-face kick-off meeting with other managers and team members, it will be both possible and

important to define explicit roles, responsibilities, deliverables, and communication mechanisms with those members of the company (Casio & Shurygailo, 2003).

After this meeting, together with the team members, virtual team leaders need to ensure that the project is clearly defined, outcome priorities and a supportive team environment is established, and members with the necessary skills have been selected (Hunsaker & Hunsaker, 2008). To avoid the loss of synergies, virtual team members require different types of training for successful distance-working than ordinary teams (Nader et al., 2009) giving the effect of social influence through communication. In virtual teams plays communication a key role in success or failure (Layng, 2016). Communication allows for directly influencing social aspects of teams. In addition to this, the performance of teams has a positive impact on satisfaction within virtual teams (Nader et al., 2009). During the selection process of team members, different types of training, for example regarding self-motivation, or time structuring, and communication between team members help avoid the lack of face-to-face synergy. Traditional teams take the coordination of tasks straightforwardly and perform them with their fellow team members, whereas in virtual teams tasks must be much more solidly structured (Nader et al., 2009).

2.7.3 Lack of trust

Following Lipnack and Stamps (1999), who stated that trust is the most important base in leading virtual teams, and that from which all else flows, it is surely more likely to build trust through daily or weekly face-to-face meetings. However, working with virtual teams requires a different kind of effort from team members and leaders, and so it is possible to rethink ways of leading and using communication technology after the first face-to-face kick-off meeting to build trust with all team members. Anderson et al. (2007) found that the effective use of communication, especially during the early stages of a team's development, plays an equally important role in gaining and maintaining trust.

It should also be noted that following the team creation process, continuous communication is unavoidable when promoting or changing the first impressions after the kick-off meeting, which ensures understanding within teams. Furthermore, in order to build and promote trust in virtual teams, it is necessary to set constant expectations and deliver results that fulfil or exceed them (Casio & Shurygailo, 2003). Layng (2016)

argued that building trust is directly linked to communication and how well that virtual communication is managed and maintained. Jarvenpaa and Leidner (1999) suggested that regular and timely communication feedback is the key for building trust and commitment in distributed teams.

Nowadays, technical means of communication are multifarious, but companies should instruct teams about their use. The first instance of building trust could be promoted during the first steps of team building by looking at collaborative endeavours among team members. Furthermore, the first kick-off meeting being on-site and further communication is also necessary. Layng (2016) underscored that communication is closely associated with trust. It is therefore one of the highest priorities to set clear communication guidelines and, in addition to this, organisations need a shared technology interface on which all workers are adequately trained. Time is not then wasted by team members trying to learn new software while communicating virtually. This is also strategically important as the analysis has demonstrated that virtual groups build trust through consistent communication using multiple channels.

2.7.4 Lack of social interaction

Social interaction can also be defined as the social influence of team members, and this is a consolidation of virtual leadership if certain aspects are considered. In addition, virtual leadership is defined as a process of social influence through the support of AIT to generate change in attitudes, feelings, thinking, behaviour, and performance within individuals, groups, and organisations (Kahai et al., 2000). The promotion of social interaction must be done from the beginning of team building, as Lin et al. (2008) suggested, because it is necessary for leaders to have an influence on the effectiveness of teams. This promotion could be done in the form of interactions through a number of social messages, which introduce the participants and provide some personal background before focusing on work (Casio & Shurygailo, 2003).

The introduction of oneself is significant for team members and leaders, not only for getting to know team members, but also for having a sense of their experience level. For this reason, it is essential to use communication technology immediately after the face-to-face meeting, because communication during a project plays a key role in the success or failure of these virtual teams, and restructures the work, supporting a virtual

workplace and providing extra social support mechanisms to reduce alienation (Layng, 2016).

To have social influence on team members, virtual leaders have provide a large number of different communication technologies to ensure a social presence (Walvoord et al., 2008). The use of communication technology through leaders makes the virtual socialisation of team members possible, allowing them to assess their team's capabilities, receive, effectively supply and accept feedback from their colleagues, as well as volunteer for additional responsibilities, and share personal information reliably (Cowan, 2014). Moreover, it enables team members to communicate, promoting a sense of connectedness to leaders, as well as allowing leaders to create a social presence (Cowan, 2014). Nader et al. (2009) showed that virtual teams are comprised of members located in more than one physical location.

Therefore, it can be implied that team members have the openness and tolerance to work with people from different places. For them, it is essential to have a clear sense of their leaders' intentions, expectations, trust, and social-emotional characteristics (Walvoord et al., 2008). In general, it is possible to have social interaction through virtual leadership as managing virtual teams means managing a multiplicity of communication strategies and project management techniques, in addition to the human and social factors (Cowan, 2014). Consequently, it is possible to eliminate any possible disadvantages regarding the lack of social interaction over distance through the modern means of communication.

2.7.5 The effectiveness of virtual teams in the automotive industry

The geographical expansion of the automotive industry for today and the additional work with different global suppliers and sub-suppliers during the project encourage leaders to work with team members from different locations, and this has become increasingly attractive to organisations over the past decade (Maes & Weldy, 2018). In the automotive industry, the development and application of new products and technologies are the key factors for company success in an increasingly competitive market that requires faster time-to-market and ever-higher product quality (Lawson et al., 2016).

The use of virtual teams therefore contributes to the productivity improvement of employees, in aspects ranging from requiring a greater focus, to being more conscious

in interactions (Solomon, 2016), which is a prerequisite for effective virtual teams. One essential factor is the outsourcing of the responsibility for product development during the project, which comes mostly from the automotive industry, as 75% of car products are purchased from suppliers (Bratzel, 2018). This means that suppliers develop a product according to customer requirements, so the OEM has to coordinate supplier development teams. Additionally, the OEM has to check if the developed product fulfils their requirements, because they will take full responsibility when something is not correct with the car in front of the end customer.

The importance of effective work is another factor for the transition of the automotive industry into working virtually, with the goal of saving on time and costs. Maes and Weldy (2018) have shown that factors such as business decisions and economic considerations have also been key drivers in making virtual teams more appealing. The effectiveness of teams can only be achieved when team members are not only trained and coached, but also considered for working virtually (team built) (McDowell et al., 2011). In addition to training and coaching, productivity is very closely bound up with the psychological side of working with people from a distance.

Maes and Weldy (2018) explained that top management needs to be deliberate in creating a team culture in which collaboration becomes the norm for virtual teams. Ford et al. (2017) showed that one of the most important motivational factors for people to work effectively from a distance is trust, and when the primary means of communication is computer-mediated, there must be a strong and enduring foundation of trust. It is essential that team members trust their leaders, each other, and the organisation to be effective, and this is necessary for virtual teams (Gilson et al., 2014). Ford et al. (2017) underlined trust as a central aspect that unifies team members, holding them together.

Maes and Weldy (2018) described virtual team effectiveness through a combination of different teams and leading factors, which they find through an analysis of different articles. These factors include the correct team make-up, the right size, clearly-defined roles, the right leadership, the right technology and the right organisational inputs rather than outputs (Maes & Weldy, 2018). However, these factors may be a little superficial, as the article does not really define what ‘right’ is. Nevertheless, it is possible to understand that all of these factors are, more or less, related to organisational skills and as such must be developed and handled by the leader.

In the automotive sector, these factors are of pivotal importance regarding the different types of computer-mediated technologies, project requirements and authority specifications during projects. Moreover, the consideration of organisational and cultural barriers is another serious impediment to the effectiveness of virtual teams (Layng, 2016). This could be solved when co-located multicultural teams share a degree of common language, while the variation in proficiency levels has an important impact on team cohesiveness, team effectiveness and knowledge sharing (Lauring & Selmer, 2012). Furthermore, the effectiveness of teams from a distance can also be enhanced by frequent and regular communication.

Nader et al. (2009) claimed that information richness is one of the most important criteria for technology selection, whereby the most significant impediment to the effectiveness of virtual teams is the implementation of technology. Communication technology is an unavoidable tool needed to work virtually and gain success with during projects. In addition, internal group dynamics and external support mechanisms must also be present for a team to succeed in the virtual world (Lurey, 2001). It is therefore important to have a healthy information flow within teams during projects, which must be led and promoted by project managers. As far as an application project is concerned, project managers play a significant role because they are the ones who face customer demands and are thus aware of the requirements and their expectations. This aspect is also underlined by Ford et al. (2017), explaining that team effectiveness is based on the question of whether team members do not receive information about corporate knowledge, have to wait for information until a team member logs in for a new day, cannot access each other or exchange input or output, or have a faulty telephone system.

There is also the possibility that managers are likely to face virtual team barriers culturally or internally, but it is the task of the manager to overcome any potential conflicts as well as cultural and functional diversities, along with mistrust among the members of virtual teams (Nader et al., 2009). This consideration is also shared by Lee-Kelley and Sankey (2008) when they stated that migration or similar large-scale projects, personal project management competency, appropriate use of technology and networking ability, willingness for self-management, and cultural and interpersonal awareness are the fundamentals of successful virtual teams. To work effectively with a team from a distance, it is essential to fulfil different project requirements – excellent

communication skills, a high level of emotional intelligence, resilience, self-motivation, and sensitivity to culture (Solomon, 2016).

These requirements play a significant role for project managers during automotive projects, a proper understanding of which enables managers to guide their teams effectively through project tasks and use their teams as a mechanism to fulfil these requirements. The previous statement was also underlined by Ford et al. (2017) through the description that teams expect their leaders to be the visible and effective cheerleaders for both teams and team members. A successful virtual team is only possible when it is used as an important mechanism for organisations seeking to leverage scarce resources across geographical and other boundaries (Munkvold & Zigurs, 2007).

For these reasons, then possible to consider effective virtual teams as being dependent on the effectiveness of their managers. Ford et al. (2017) underlined that all successful managers have to ensure that they have provided the necessary organisational support for their employees, while effective leaders also ensure that they build honest relationships. Moreover, is promoting virtual teams effectiveness possible through effective group leaders, when they integrate team members' efforts, promote friendships, mitigate conflicts, and enhance collaboration (Ford et al., 2017). The difference between regular and high-performing teams is their passionate dedication to reach project goals, identification with and emotional bonding among team members, as well as a balance between unity and respect for individual differences (Nader et al., 2009).

2.8 Virtual leadership in the automotive industry

Virtual leadership has become increasingly popular in recent years. The advantages of flexibility and higher levels of independence make virtual teams more attractive, but it can also be a compelling venture as far as the mindset, language barriers and social influence among team members are concerned (Scheunemann & Bühlmann, 2018). Indeed, the language barrier may be neglected but all of the other points must be carefully considered in terms of the essence of successful leading from a distance.

Considering the point that today's automotive projects are working with suppliers and sub-suppliers worldwide, virtual leadership becomes indispensable in that it helps free up quite a lot of time, especially when leaders are not bound to travel. Nader et al.

(2009) underlined that leading in a virtual way will reduce bureaucracy, cycle time, and improve service, whereby professionals will take on the decision-making and problem-solving responsibilities that are normally the preserve of management. This will bring enrichment for the automotive industry, as it will be possible to give more autonomous actions to the team and responsibilities to each employee. Consequently, project leaders will have more time and space to work on project optimisation steps, and team-working processes. Indeed, the changes to leading from a distance might be uncomfortable for leaders of regular teams, given that virtual teams may require new methods of supervision (Jarvenpaa & Leidner, 1999), but the concept of leading over distance in the automotive sector will support and give direction for success. An effective elaboration of the project management model can support and show the possibilities of leading from a distance.

The explanations offered by Caulat (2006) can be seen as a disadvantage for virtual leadership when considering that developing and leading effective virtual teams remains a significant challenge. The main points to consider here include the challenges involved and the need to set the main aspects for overcoming them. Caulat (2006) has seen an impressive amount of literature about virtual leading over the last decade, and through this it is possible to understand that people are already working in this way. Today, the quantity of literature is even larger, and it must be possible to integrate, adjust or adopt the ideas therein to the automotive sector for virtual leading. The automotive sector is a widely diversified field when we consider different and mostly dispersed teams for development, production, and quality, for example. Therefore, this depends on leaders and their resources to bring all of the team members together and lead them successfully. As Caulat (2006) described, the difference between mediocre and high-performing virtual teams is the development of virtual leaders who are able to develop and lead virtual teams. It is therefore important to examine team members and implement a development process with them before and during projects.

Avolio et al. (2000) defined virtual leadership as a process of social influence, which should also be supported by IT. While this being the case, for working practices in the foreseeable future, a manager can communicate clearly, transparently and consistently across a distributed and diverse workforces (UKG, 2020). In the age of smart phones and mobile internet, this is more possible than it was in previous

decades. Leadership have to be rethought, because it is not the goals but rather the means of reaching them that have changed since in this new age of virtual leaders need to implement these goals electronically via computer-mediated virtual teams that are dispersed over space and time (DasGupta, 2011). The investigation made by DasGupta (2011) followed the point that the virtual leader may never physically meet one or more of their team members, and that the main communication medium is the computer. This was also underlined by Cowan (2014), as she described that a first face-to-face meeting is actually not necessary, contrary to what is stated in the majority of literature.

Indeed, although these statements are justified, it is always essential to consider where this way of leading is applicable and with what type of person it is possible to work with without seeing them. The consideration of mentality also plays a significant role here. In some nationalities, team members might not show a full measure of respect without first having seen the leader in front of them. In automotive projects, it is also possible that some employees are working in project development and their work is based on test results and calculations, and they usually believe in what they see. It is therefore essential to have a first face-to-face kick-off meeting in such cases.

In her article, Cowan (2014) explained that in the medical sector, nurse leaders manage performance by initiating structure and coordinating communication. This approach is applicable and key for the automotive industry to build a structure at the beginning of a project, then applying that structure as a basis to the whole project for all members in dispersed teams. The structure in automotive projects is of vital significance, as project results are obtained throughout the lifetime of the project and therefore those in charge have major responsibility for the lives of others. For working from a distance, it is important that the leader keeps track of the tasks of their team members. Avolio and Kahai (2003) showed that virtual leadership is only possible when a leader participates with his team members through technology to inform them and to be informed.

Through the use of communication technology, it is also possible to use virtual leadership as a network in the automotive industry and bring all of the hierarchical levels together. The possibility of virtual leadership through communication technology is that different hierarchical levels within an organisation can be achieved, and that this can be associated with individuals or groups and can be situation-dependent (Avolio

et al., 2009). In the automotive industry, it is essential that leaders stand out from the group, because they not only have to take responsibility for the work of their team, but also make decisions that can influence the team, project and particularly the company. Therefore, both prior to and during projects, leaders must ask themselves what they think of their teams and how management perceives the effectiveness of their leadership because, these are questions to which the answers vary according to context in each particular leadership model (Schmidt, 2015).

This is very important in the automotive sector because the success of a project is always attributed to the team, whereas it is leaders that are blamed for failure. It is therefore important to establish clear rules and structures for projects in the automotive industry and get leaders to understand their team members. This understanding can help prevent product recalls, and avoid damage caused by human error, for example.

2.9 Towards a set of CSFs for virtual teams

Considering the history of leadership combined with the literature review, it can be concluded that leadership has become more versatile and complex, in terms of people and project leading, over the past few decades. This has been done with the support of project management methods (Agile, Scrum, Kanban, Waterfall) in the 90s and the use of faster and cheaper communication technology (AIT). Indeed, by using these methods, it is possible to achieve goals and milestones more effectively in relation to task distribution and control, and to work with effective time utilisation (i.e., high workload in the shortest time possible), but there is usually a reference to co-located teams.

Whether these methods would also work for virtually managed teams in the automotive industry is not answered through the literature. This may imply that the missing information is a gap in virtual leadership, which allows for the possibility that virtual leadership is not applicable to the automotive industry. The need to find a reliable model for virtual team building and leadership in the automotive industry, which is becoming increasingly appealing, is essential.

The possibility (in relation to AIT) of work from a distance creates a better working dynamic, which can negatively affect social influence due to the distance between team members. To counteract this, increasing use of social influencing between team members and the demonstration of virtual leading advantages by the project

management is necessary. During their investigations with virtually dispersed teams, certain authors (Caulat, 2006; Duckworth, 2008; Ford et al., 2017; Lipnack & Stamps, 1999; Maes & Weldy, 2018) emphasised that trust between leaders and their team members, as well as among team members themselves, is the most important aspect for leading from a distance, and that it is possible to take trust as a basis for working with virtual teams. Trust and the building of it is a prerequisite for team cohesiveness and can be adopted from the IT or medical sectors as an essential aspect of virtual teams in the automotive sector.

In general, gaining trust is part of social influence not only for remote team members, as described by Avolio et al. (2000) and Scheunemann and Bühlmann (2018), but as the greatest challenge in overcoming distance and time barriers and winning over team members. The first step is the kick-off meeting, which must take place together for team members to meet each other and become familiar with each other. Additionally, to promote evidence-based trust, data from current workforce management solutions should also be collected and curated as this data plays a crucial role for executives. This puts each individual team member within the company in a supporting role, thereby achieving company's objectives (UKG, 2020). This can be seen as an important project investment, along with dealing with any prejudices regarding attitudes towards working with different nationalities.

In addition, the virtual leader can set the rules of conduct regarding communication preferences and mail answering for example, making it possible to create a team structure capable of avoiding any misunderstandings during the project. This is an essential base for virtual team development and is a developing process for the whole project.

Finding this virtual way is important, as time is generally seen as a limited resource. Indeed, maximum time efficiency is particularly indispensable when dealing with projects in the dynamic world of the automotive industry, especially when the complexity of projects and customer requirements simultaneously increase. The first approach can be primarily taken from the field of medicine, where a hierarchical geographic structure is established at the beginning of the project and with the use of virtual meeting software, such as RingCentral, Adobe Connect, Zoho Meeting. It is also useful to take the three leadership skills of communication, decision-making, and self-initiative (Cowan, 2014), and adopt them directly to the automotive industry.

As a result of the automotive industry becoming increasingly globalised, it is possible to take the requirements for virtual team building from section 2.4 of this research and concentrate it on virtual team leading alone. The virtual team structure can be transferred one-to-one from other areas, and so the next step is to ensure the establishment and coordination of communication, so that social influence can be carried out correctly.

The CSFs (Figure 6), which are crucial for successful virtual team building and leading, can be deduced from a direct comparison between the automotive industry and other different working sectors. The CSFs taken from the historical development of project management, leadership and virtual leadership can be adapted to the automotive sector, as this sector is specifically for leading without seeing for work in a technical environment. The CSFs concentrate on aspects for virtual team building and leadership, which are essential for success during the project.

They are as follows:

- **Building trust**

  Building trust is the most essential and challenging aspect for leading not only from over a distance which is mostly mentioned during the review. It is underlined in different articles (including Maes & Weldy, 2018; Scheunemann & Bühlmann, 2018; Seshadri & Elangovan, 2019) that successful teamwork is only possible through trust. Ford et al. (2017) described trust as the key to a capable virtual team. Moreover, it is an excellent social behaviour to trust each other. For a new model based on Tuckman and Jensen (1977), it is essential to reconsider trust as an influential factor in the steps of “Forming, Storming, Norming, Performing and Adjourning”, and building them effectively from a distance.

- **Creating a team structure**

  Working with team members from different places entails a different work attitude and way of working. For this purpose, it is essential to create a team structure to work as a unit virtually. The team structure is essential in connecting the team members and creating an individual approach to the working behaviour of every team member. For example, how each team member might prefer to communicate in critical situations. Moreover, this structure can be seen as a

contract for team members, who agree that with such treatment during the project, they can do their work without delay.

- **Overcome cultural and language barriers**

  The avoidance of cultural barriers serves as a preventive measure for possible bias between the different team members. Nader et al. (2009) explained that cultural barriers are a serious impediment to the effectiveness of virtual teams. It is essential that the general understanding of culture is neutralised by the leader and that neither origin nor gender plays a role in the team, only ability counting.

  Language barriers are an essential issue which cannot be neglected. Given that the members of virtual teams often do not speak the same language, many companies opt for mutual understanding through English (Scheunemann & Bühlmann, 2018). It is essential, as shown during this review, that the leader considers this issue and supports it, perhaps through translation, during complex negotiations. Additionally, team members may have a common way of avoiding misunderstandings and time-wasting through misinterpreted instructions or information.

- **Managing time and distance barriers**

  One of the most important aspects for virtual working and working more effectively is the overcoming of time and distance barriers. To counteract this, the use of the "follow the sun methodology" is possible, but also the increased use of ICT, with the goal of creating more autonomous work (giving free space for each team member) and bringing all team members together in one place, virtually, during critical situations. This avoidance is essential to consider through the model, and also for the leader to give team members a feeling of security (the feeling that they are not alone) during the project.

- **Influence through horizontal communication**

  As most leaders work with interdisciplinary teams during a project without direct authority to issue instructions (disciplinary superior relationship), leadership must be considered in the way in which team members are influenced. The influencing of team members must take place through an equal communication to avoid escalating talks and small disputes among one another. Alistoun and

Upfold (2012) explained that virtual leaders can be trained to successfully influence team members while relying on computer-mediated communication, building trust, shortening subjective distance, sharing information, processing gains and losses, dealing with feelings of isolation, encouraging participation, and enhancing coordination and cohesion.

When communication is made on the same hierarchical level as team members (horizontal communication), the leader communicates on the same wavelength as the team members and only reveals their hierarchical position in urgent or emergency situations. Influencing team members has an impact on team and work behaviour and must be considered before and during the project and constantly be improved upon by getting to know the team members.

CSFs show not only the basic points for a successful virtual team, but also which factors are essential for successful virtual leading. One thing which becomes clear through the literature is that leading teams over distance is a growing and ongoing process, which is more complex than leading co-located teams. CSFs are key and are typically neglected or underestimated in a daily work routine as a result of a high workload, which also brings the most challenges for virtual leaders. The tendency to work virtually is growing (Maes & Weldy, 2018) this is also visible in the greater effectiveness of virtual teams from less than 30% (Caulat, 2006) to 68% (Solomon, 2016). Nevertheless, the work area must also be considered here, since working at a distance is usually preferred in the IT sector, but a local presence (e.g., for a technical discussion) is usually necessary in the automotive sector. CSFs are thus essential for having a basis for proceeding in working with dispersed team members or teams.

After the consideration of an investigation of the literature, it can be said that a model of virtual project leadership in the automotive industry does not yet exist. The development of this model will be made possible through the combination of a conceptual framework and interviews with automotive experts. In this case, there will be 18 randomly selected interviewees, comprising experienced managers of different levels in the automotive industry (e.g., vice presidents, directors, heads of PM) as well as some participants from the line management working on international and global projects. The objective is to consider and investigate the related literature together with the evaluated interviews. The research outcome is intended to address the gap and

adjust and coordinated the automotive sector. After data collection and analysis, it will be possible to build a generic model for leading teams from a distance.

In summary, with this data in mind, it is now possible to explain the first outcome of the research process.

Research Objectives:

- To analyze the existing literature while identifying CSFs for the virtual leadership of virtual teams in the automobile industry.
- Review existing literature on virtual leadership and virtual teams and identify develop a PCF for the analysis of virtual leadership in the automotive industry.
- Develop a new operational model for the virtual leadership through a conceptual review that minimises personal contact and optimises project outcomes in the automotive industry.

The introduction of a model that facilitates remote leadership in the automotive sector will bring about an overall improvement in leadership quality. Moreover, it will bring new and significant opportunities for leading without face-to-face communication and enable team members to work more autonomously.

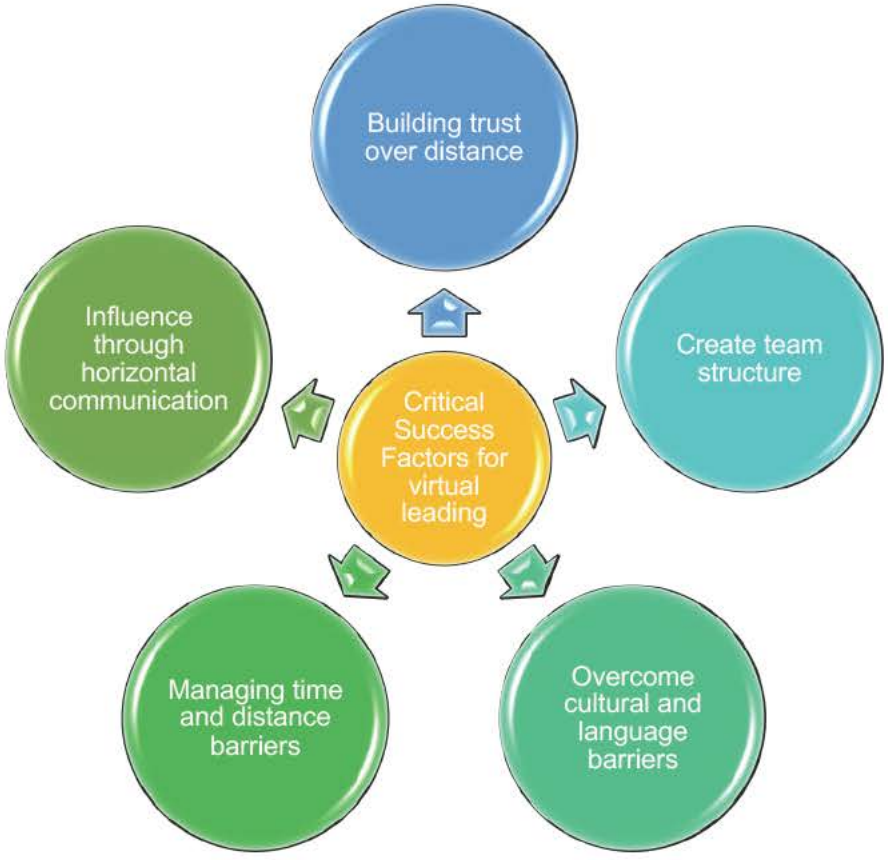

Figure 6 Provisional CSFs for virtual leading

3. PROVISIONAL CONCEPTUAL FRAMEWORK

3.1 Introduction

This chapter presents a PCF derived from the existing literature, to be used for the research and analysis of leading from a distance in the automotive industry.

The PCF builds upon the Tuckman and Jensen (1977) model, a model which focuses on small group development. For it to be relevant to the automotive industry in the 21st century, this model needs to be adapted to the realities of new virtual leadership. This can be achieved by incorporating new technical and human aspects of work, the majority of which were not considered or understood in 1977. The current technical environment of the automotive sector is essential for the PCF as the technical issues often experienced when working from a distance must be carefully weighed and considered to implement the virtual world into the physical.

The PCF is shown in Table 3 and provides the basis of the operational model (V-CORPS) and how its features can be implemented in a real-life work setting. The second step considers each CSF separately as, by doing so, it will reveal how each step of this newly developed method benefits the building and leading of a virtual team. It is important to note that this model is based on the stages of group development in Figure 4 (section 2.4), which has been constructed for co-located teams.

The adaptation process for virtual teams takes place with the consideration of previously applied methods from different sectors (e.g., IT, medicine, and general project management), as well as the possibilities for the support of crucial communication tools. The PCF takes into account a number of management challenges for when building and developing a virtual team. The challenges described by managers within the industry include a reduction of speed during the team-forming stage. The reasons include, among others: labour legislation relating to occupational health and social interactions, stress and fatigue, and data security (Pyöriä, 2011).

Other leadership challenges for team leading with low levels of team cohesiveness often include a difficulty in establishing trust, conflicts, social factors, a lack of mutual knowledge of context and access to dispersed knowledge (MacDuffie, 2007). Here, the priorities of the leadership are crucial, given that leaders are measured by the work and contributions of each individual team member. Consequently, the greatest challenge faced is guiding these members without ever having seen them in person.

Furthermore, considering the growing demand for flexibility from both employees and employers due to the expansion of globalisation, working in the same physical environment has become increasingly more unattractive for all parties involved.

According to Chudoba and Maznevski (2000), Espinosa et al. (2014), and Malhotra and Majchrzak (2004), it has become more common to see organisations relying more heavily on virtual teams for core processes, including knowledge management, **R**esearch and **D**esign (R&D), software development, customer service, and strategic analysis. The desire for flexible working environments came to the fore during the global financial crisis of 2008-9, where multinational companies around the globe rethought the structure of project management in the 21st century. The focus on reducing travel costs while improving upon lead-time and efficiency through the use of aggrandised communication technology, saw them looking at alternatives to the high costs of travel.

In such a dynamic environment, product realisation is not possible if time (which can be considered a limited resource) is lost due to its inefficient use, and this realisation therefore meant that it was no longer competitive. Accordingly, the development and completion of a single project would incur significantly high costs, mostly attributed to the loss of time through such delays. Companies reacted to this by improving upon their internal processes for a faster turnaround time and widening their markets and customer bases. One of these improvements is the deployment of virtual teams, along with the addition of virtual platforms through the support of ICT. This in turn brought diverse talents and expertise from across the globe and enabled industries to build world-class teams through the use of readily available talent.

It is important to distinguish the way of working between co-located and virtual teams, and how they communicate to reach their goals (for the automotive SOP, Figure 7). A co-located team is a group of individuals who interact interdependently and are brought together (or come together voluntarily) to achieve certain outcomes or accomplish particular tasks (Berry, 2011). They also have the possibility of having a face-to-face conversation at any given time. In addition to this, virtual teams are to comprise the same individuals as co-located ones, with the premise of working in difficult locations while communicating through the use of ICT. Virtual team members comprise talent across various geographical locations, cultures, and time zones.

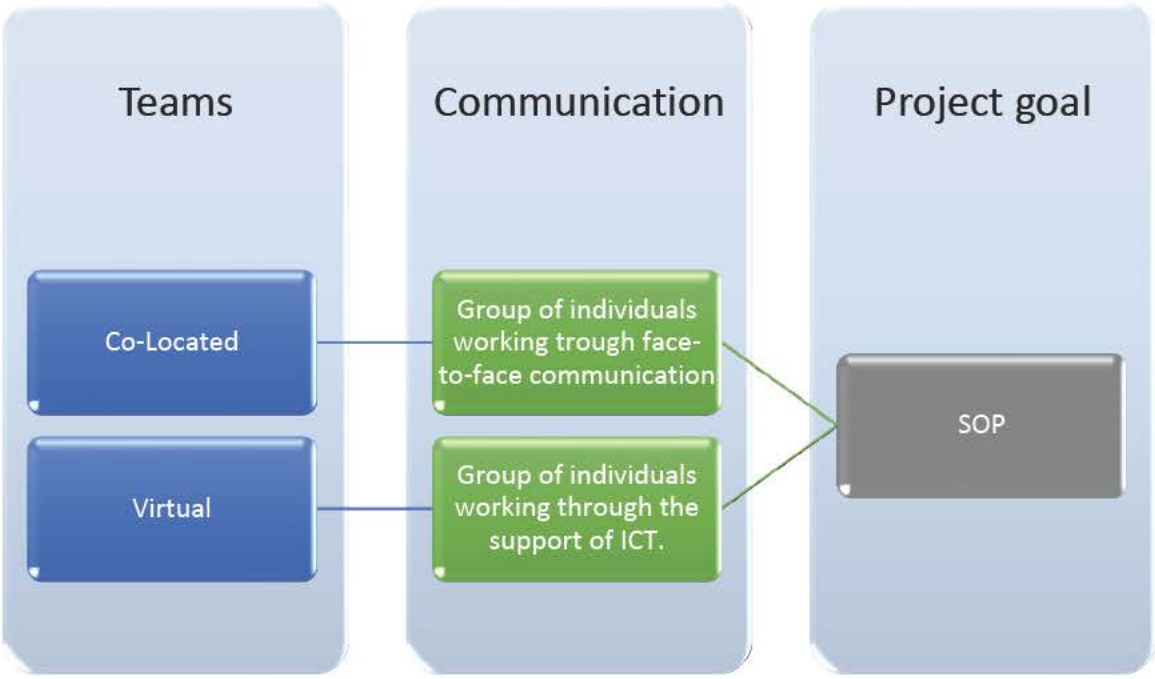

Figure 7 Communication between co-located and virtual teams to reach their SOP in the project

Managing virtual teams is substantially different and requires a higher level of intricacy when compared to managing face-to-face teams. To be precise, virtual teams are groups of individuals that share most of the characteristics and dynamics found in traditional teams (Berry, 2011). However, the challenge for virtual teams is linked to cultural differences, mentalities, work settings and other factors which are of significance for the virtual leader when influencing team members from a distance. Cortellazzo et al. (2019) stated that by focusing on behavioural norms, as in traditional teams, virtual teams require a clearer definition of the norms pertaining to their use of communication tools, through which information flows and activities are performed. Furthermore, Berry (2011) demonstrated that the effective management of a virtual team depends on the basic principles of knowledge and understanding of team dynamics which are independent of the temporal, spatial and communicative differences between virtual and personal work environments. This is significant for developing this model, as leaders these days are measured from the performance stage, so the success of this stage is vital.

3.2 V-CORPS development

Team-building approaches can be traced back to the Tuckman team development model (Figure 4 in section 2.4). The model shown in Table 3 is based on the Tuckman and Jensen's model but with the premise that this model is applicable for both virtual

and co-located teams and solely for small group development. However, Tuckman's model does not deal with the premise that virtual teams are more dynamic, in the sense that time may be used more effectively when working from a distance, or the complexity involved when considering the selection process of team members, or the most efficient way of leading them from a distance. Additionally, cultural differences, language barriers, and contrasting time zones further add to the complexity of leading a virtual team. The provisional CSFs depicted in Figure 6 in section 2.9 are the essential items for each stage during the V-CORPS model for building and leading a virtual team. Moreover, it shows the complexity of virtual team building and leading through the use of these CSFs in the V-CORPS stages. With the combination of ICT to reconstruct Figure 5 in section 2.4 and bring it up to date, these reconsiderations are crucial as a ground base for the final V-CORPS model.

CSF/ V-CORPS Stage	Creation	Organisation	Relationship Building	Performance & Evaluation	Sign-off & Closure
Building Trust	First impressions (Face-to-face meeting)	Assigning roles for individual members Clearly define project tasks	Conduct the "Big Five" analysis of each team member Offer support in critical situations	Outline the importance of reliability between team members and the dependency of performance	Acknowledgement of lessons learned Reflection on team leading
Create Team Structure	Address corporate policies	Defining the terms of the project rules	Team working contract and a team chat/forum to perpetuate the team communication	Highlight the importance and the effectiveness of the project structure	Team dissolution. Creation of a long-lasting relationship
Overcome Cultural and Language Barriers	Establish whether any cultural or language barriers exist	Definition of support actions in the steps to be taken should an issue arise	Equal treatment and support during breakdowns of communication	Stress the importance of work culture Ensure that performance comes before individuality	Private contact data exchange (if desirable) Remain in touch with team members after project time
Manage Time and Distance Barriers	Investigate all possibilities	Definition of the working tools used for the project	Show dependencies between tasks and team members	Train, show and explain methods for working without time waste	Overcome anxiety about separation and ending
Horizontal Communication	Round of interviews Leader treats team members as equals	Highlight the importance of teamwork *One team = One unit*	Intervene only when crucial, e.g., decision-making, supportive roles, and escalating situations	Create a relaxed environment while focusing the team on specific project milestones	Project evaluation. Team members show support for the actions of the leader TMs leave the project feeling appreciated

Table 3 CSF actions in the V-CORPS stages

3.2.1 Creating the virtual team

The selection of the most suitable team members for a virtual team not only has to fulfil the relevant skills needed for a project's success, but each member must also be able to work remotely with colleagues who are like-minded in terms of self-motivation and independence (Scheunemann & Bühlmann, 2018).

The leader is obligated to conduct a pre-analysis of each team member and discuss with their line managers to determine their capability to work in a virtual setting. This pre-analysis is essential for the next steps of team member selection, since the virtual teams tend to be sensitive to trust, communication among themselves and coordinated due to the absent-mindedness and mutual prejudice due to the origin (in terms of working method) (Rosen et al., 2007). As Caulat (2006) showed, people who are innately process-oriented and structure-driven might be effective when managing the virtual process of communication between the members during a project, but might find it challenging to facilitate and participate in virtual meetings where spontaneity is required. To overcome these challenges, a leaders must have a selection procedure, as this will enable them to decide upon which team members are suitable for a specific role.

Furthermore, cross-cultural awareness is detrimental for team cohesion, influence, and the promotion of trust. It is necessary that the leader be in place as the first team-building measure, with an overview of team member actions and reactions, especially during the 'Creation' period. The CSFs support the leader during the Creation stage to identify what makes team members tick behaviourally while the team passes each CSF stage. ‘Building Trust’, as Seshadri and Elangovan (2019) defined, is an interpersonal challenge faced by leaders who need to overcome this to foster collaboration with team members via communication, building relationships and trust.

Caulat (2006) argues that by working with diverse cultures as the Japanese, Indians, Swedes, and Russians, she realised that cross-cultural awareness may have helped in understanding each other better, which is essential for the avoidance of cultural and language barriers and can be sufficient as a base for establishing a solid basis for trust to develop the team. Not only does the selection and mental awareness of virtual team members require challenges which must be considered before bringing team members together, but the alignment of the team members is also used during the ‘creation’ stage. Team member pre-investigation is an indispensable process which must be

done before the selection of team members. This process of virtual team building 'Creation' is shown in Figure 8, where not only the leader but also the team CSFs are shown, as well as the expected outcomes of a virtual team.

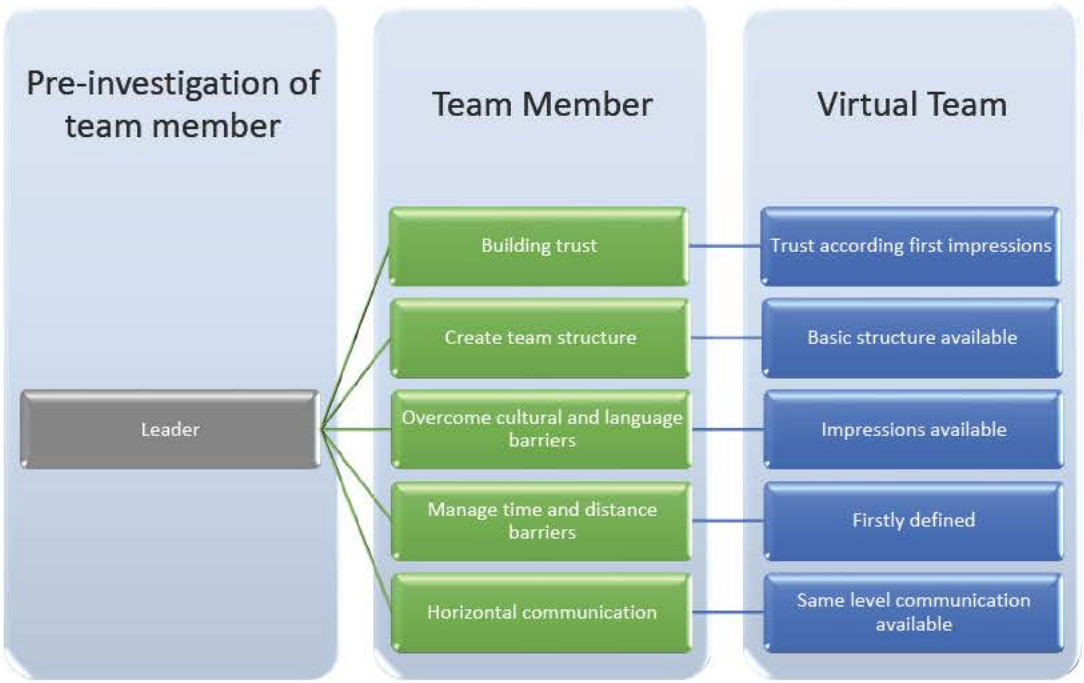

Figure 8 Team Creation for virtual leadership in the automotive industry

The pre-assessment process of individual candidates is critical for a company's decision to work virtually. Moreover, it is the first face-to-face meeting with team members which can leave a positive or negative long-lasting impression, which is undoubtedly essential for all future project procedures. Zigurs (2003) suggests that the initial meeting is one of the most important factors for success, and the needs of each employee must be discussed during this face-to-face meeting. Additionally, the leader should be encouraged to use the CSFs for the 'Creation' stage to further understand and develop the first impressions of the team. This process moderates the five stages between the team members and the best possible outcome for virtual team cohesion.

3.2.2 Organise the virtual team

Regardless of whether the team works virtually or in a co-localised manner, the uniform team structure before and during the project is an essential factor in avoiding time-consuming discussions (e.g., showing and defining the way of work and the project goals) that do not relate to the project topic.

The Organisational stage of the virtual team needs special consideration, not only in terms of team structure and working procedures, but also relating to social aspects, avoiding miscommunication or misunderstandings which can affect an entire team's performance. It is therefore essential to sensitise each team member relating to their social behaviour through the CSFs of this stage, which has an effect on the others and is considered in full by the leader. This will bring an 'Organisational' structure which is indispensable in terms of communication and knowledge sharing, as it is more challenging when compared to face-to-face counterparts (Klitmøller & Lauring, 2013). By committing to a virtual project, leaders must provide help when dealing with a complicated project environment that includes challenges in language, political climates, organisational policies, time zones, and cultures (Barnwell et al., 2014). To counteract these challenges, it is important to outline the CSFs through the 'Organisation' stage and discuss it with each of them with all team members present to define the framework and rules of engagement for the duration of the project.

During the Organisation stage, the leader's role is to be a moderator between the team members and only intervene in critical situations such as escalations between team members. Figure 9 depicts the essential stages successively during the team 'Organisation' stage for working over distance. It is crucial at this stage to consider the leader and the team as separate entities, as they will bond and grow together throughout the upcoming stages and develop a stronger sense of cohesion throughout the project.

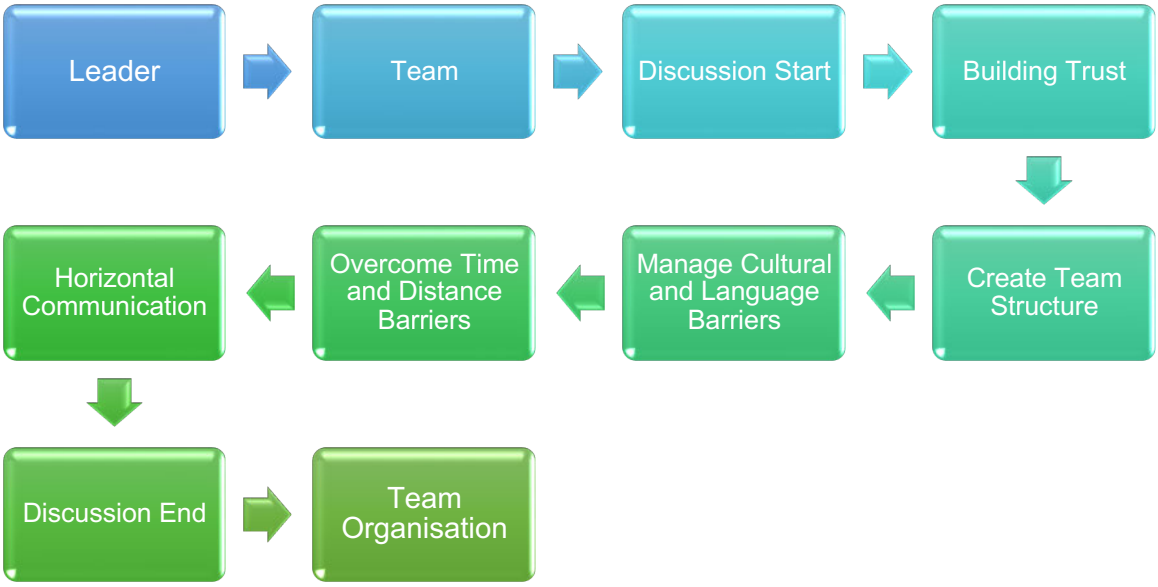

Figure 9 Organisation stage of virtual teams

Figure 9 presents the organisation of each CSF and highlights the necessary steps for successful team organisation. Additionally, the CSFs highlight the importance of cultural and language management barriers of each member before and during the project, which is significant as virtual workers with low language proficiency often invoke apprehension and uncertainty in individuals (Neeley et al., 2012). This Organisation stage is necessary to remove obstacles and improve the cohesion of the team (Figure 9), while explaining the potential challenges of a project and the leader's expectations.

During the Organisational stage, the leader is able to form his or her own vision of the team by responding to the CSFs in this stage, focusing on the reaction of each team member. This stage will further support the leader in understanding which individual approach will prove to be the most beneficial for each team member, encouraging them to be more effective during the project. Additionally, it will be possible to create an initial strategy for handling or guiding the whole team, with the goal of bringing them together with more autonomy.

3.2.3 Relationship Building in the virtual team

After a joint agreement for team organisation, a base for relationship building between the leader and the team members themselves is established. Building relationships is the foundation of all teamwork, especially for virtual teams, to counteract affinity distance, i.e. interdependence, relationship, social, and cultural distance (Layng,

2016). Furthermore, it is necessary to counteract prejudices relating to the work performances towards the different nationalities of the team members.

The Creation and Organization stages can be considered as pre working stages, where the leader establishes a base for the Relationship Building stage. This enables him/her to work to a clearer structure based on the demands of each individual team member. Layng (2016) has stated that virtual research should take a minimum of two weeks before virtual communication begins on a project. This recommendation has been confirmed by Akkirman and Harris (2005) and Duckworth (2008), who believed that a group needs to become more socially grounded by either meeting face-to-face, or by taking part in "virtual water cooler communication", a synonym for gathering and connecting in a certain environment (e.g., the office), so that workers can bond with their group.

Accordingly, this will support relationship building and help to discover the similarities between each member to establish the correct task-based approach between themselves before the project starts. Additionally, it is important for virtually-led teams to create a social environment to promote team cohesion, which will be established through interpersonal challenges for the leader and will ensure that team members communicate well with each other, build upon relationships, and foster trust (Seshadri & Elangovan, 2019). Moreover, by building upon these previously virtual communication commonalities will help to further create sympathy, trust, and encourage team spirit.

The behaviour of a leader towards their team members is critical at this stage because he/she can influence and moderate the relationship building stage for the needed project requirements. Additionally, through the use of the CSFs to build trust, (Goldberg, 1990) (Figure 10), a better understanding of the personality type of the leader and each individual team member can be revealed. The leader must orientate himself/herself around the performance of the team during team meetings, where team members can ask general questions about their own performance at the beginning of each meeting, and thus reveal the inner thoughts and feelings of the team.

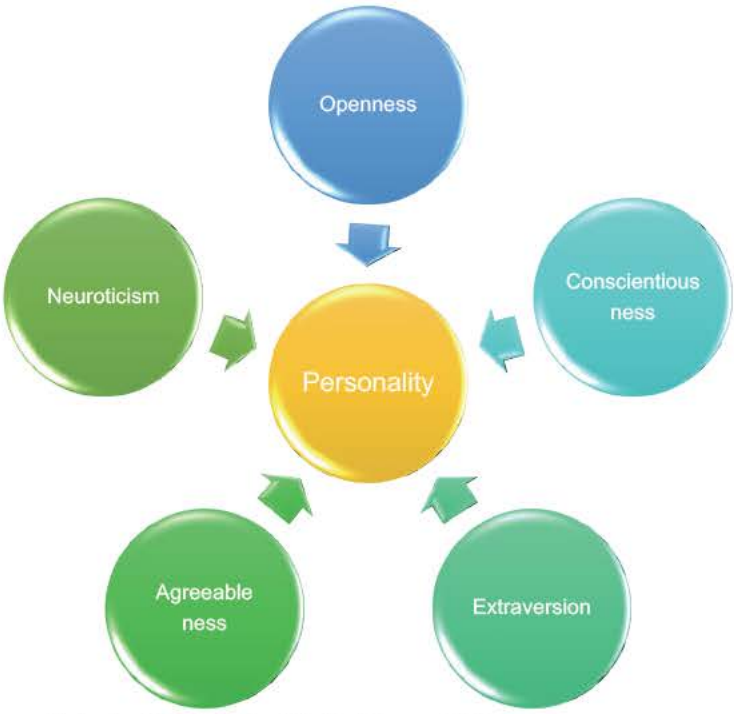

Figure 10 Big Five personality traits (OCEAN Model) (Goldberg, 1990)

- **O**penness – being open to new ways and possibilities of working
- **C**onscientiousness – effective, organised and setting an example for the team
- **E**xtraversion – being agreeable with the team members
- **A**greeableness – being friendly, cooperative, and sympathetic to each other
- **N**euroticism – being intellectually open

The Big Five model is used for analysing the five major personality types, and this will enable trust to be built more effectively as the leader will be in a better position to understand the potential team member's personality traits during the relationship building stage. This, accompanied by an acknowledgement of language, time, and distance barriers, will help to develop better team cohesion and strategy. Here, the leader has to create a work agreement (which is essential for virtual teams) between the team members in the form of a harmonised document, which will be further developed throughout future discussions. This document may be viewed by the team at any point for them to retrieve the following information:

- Availability (when are the team members available?)
- Communication (how does each team member prefer to communicate?)

- Language (does each team member have the same level of language understanding? Will further language development be needed? Or will an interpreter be needed?)
- Time differences (especially important for team meetings)
- Team chat creation (to help the team members stay up to date, or have a short discussion)

The use of horizontal communication is a method which encourages a leader to bring themselves to the same hierarchical level as the team throughout the project. By doing so, a leader has to act as a leader by influencing actions of their team, rather than dictating, and should only intervene in critical situations. The results of this method will create a more relaxed working-relationship, whereby team members sense that the leader is one of them, resulting in a higher level of receptiveness among team members. The way in which horizontal communication is carried out by a leader is paramount, as he has no way of knowing how each team member will react without meeting with them first. As Caulat (2006) discovered, traditional teleconferencing etiquette is counterproductive when developing trust and intimacy, so it is of the utmost importance that the first team meeting is face-to-face.

By using the relationship building stage in combination with the Big Five model (Figure 11), it is possible that the leader can analyse their own personalities and their team members, in turn discovering what kind of leadership is appropriate for each member, and how to employ the suitable team member in the relevant position. This is a subsequent step after the Organisation stage and is used to gain a better understanding of each individual team member.

These combined methods will help to determine the most suitable role for an employee and ensure that their skills are maximised to their fullest potential by allocating them to the correct position. This model is also suitable for relationship building between team members, for working from a distance, and for enabling a stronger influence on them as it is specifically designed for the automotive industry. Furthermore, the leader must not neglect the interests of each team member and may benefit from designating a brief amount of time at the beginning of each team meeting to speak about non-project-related issues. This provides an added value of trust, which can greatly improve team

effectiveness because the leader mediates the team in some interests besides the project.

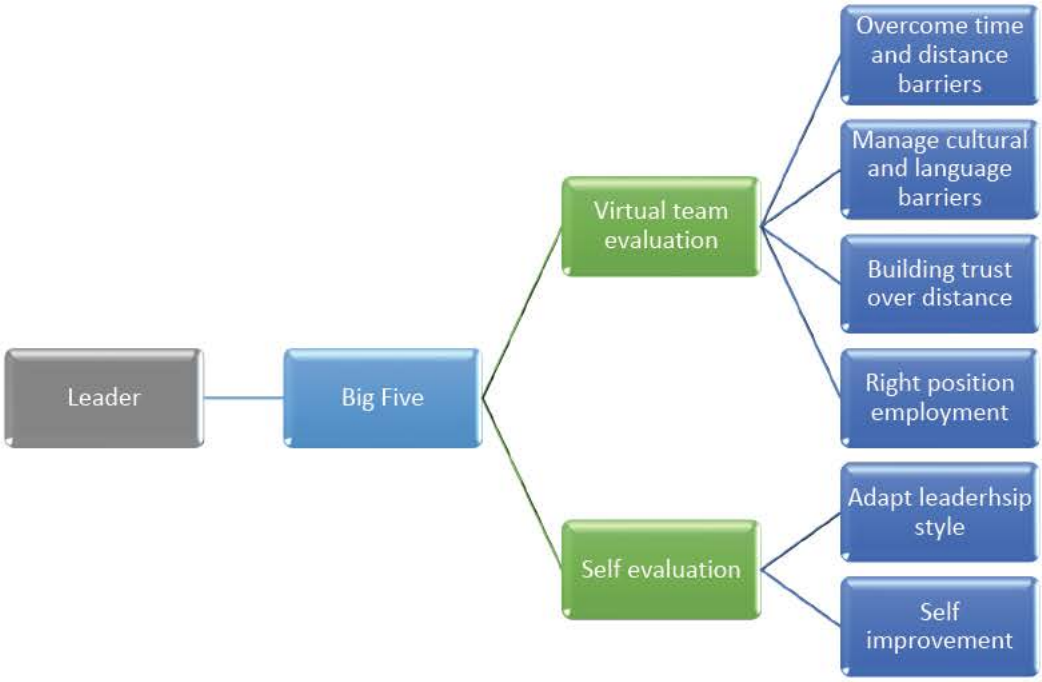

Figure 11 Relationship Building through the evaluation of Goldberg's Big Five model

3.2.4 Performance & Evaluation in the virtual team

Bringing a team to a performance level during a project is a growing and ongoing procedure which relies on different key factors. First, it is essential to update the team as often as possible and be responsible for enabling sufficient and reliable communication channels. The more up to date that the team is, the better their performance will be, and therefore fewer miscommunications and misunderstandings will arise.

It is essential to find an opportunity to bring more personality and dependency to the virtual world for better performance. Concentrating on the CSFs, it is important to connect the team members to each other and show them their importance and reliability. It is also necessary to instil the values within them that their performance quality depends on each other and encourage them to consider what kind of impact their jobs have on the company. Additionally, there must be an effective information exchange for a form of team performance regarding how and when to use the appropriate medium, an effective strategy for empowering individuals, altering behaviour, and developing a cohesive team. Moreover, the leader is required to take responsibility for the information exchange, to show the team how to effectively use

the designated team structure to reach the expected performance stage, and how it will make a significant, positive impact on the project.

The same is true for decision-making in a project-specific situation, where team performance counts. Care taken by the leader (e.g., the inclusion of all team members in the decision) is vital for the success of the whole team. In virtual teams, language and mental barriers are other factors that must be considered by the leader, as it is crucial for the whole team to fully comprehend one another correctly and speak openly with each other to avoid mismatches and see if any insecurities are apparent. This means that every team member has the same starting point for each decision. Through this approach, the team members will be encouraged to present their own proposals, or independently make a decision on their own. Horizontal communication is an additional aspect, where team members have the feeling that they are on the same level of the leader and are able to make decisions. This type of management (flat hierarchical structure) is particularly common in Europe.

However, in Asia, leadership through vertical communication is a more common practice which has to be considered when working with dispersed team members from this region. In many Asian countries, respect for a leader (regardless of their position) is remarkably high, and it is dishonourable or even insolent to contradict them. For this reason, it may prove to be more effective to use horizontal communication for virtual teams while performing the evaluation stage to obtain more free-thinking results.

Figure 12 shows the CSFs which are necessary to work on with a virtual team to produce effective results, and further encourage and promote team performance. This means that the leader has to take the steps detailed in Figure 12 to maximise the effectiveness of a project's results, and all team members need to be taken through the highlighted procedures. Moreover, it shows the required input of the leader in expecting effective results from their virtual team.

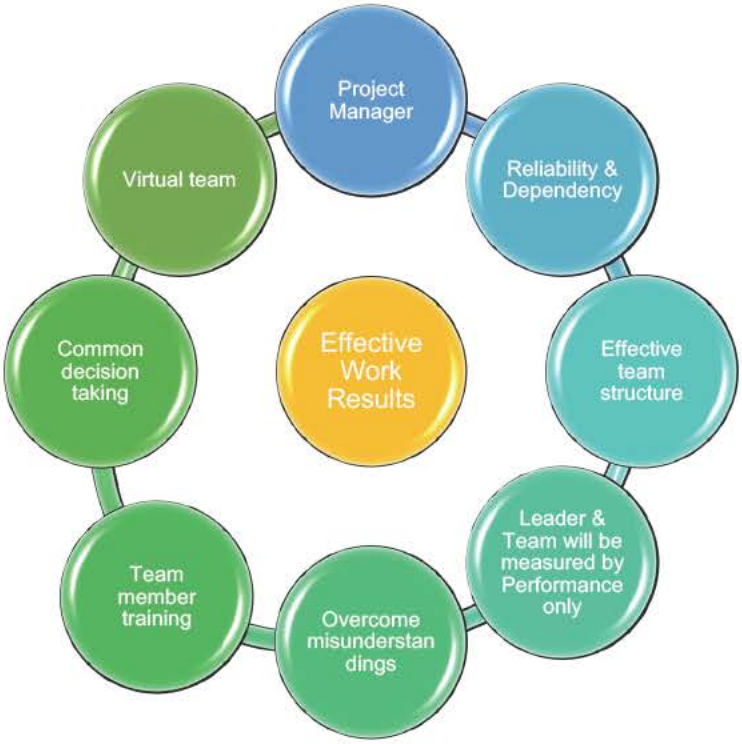

Figure 12 Performance & Evaluation of effective work results circle for virtual working teams

3.2.5 Sign-off & Closure in the virtual team

By binding the individual team members to a unit during the project stages, a psychological contract is created, one which can be regarded as both the social team influence of a leader and between the team members themselves. The dissolution of this contract (after project completion) is therefore an important aspect for future projects which require the sensitivity of virtual teams. King (2000) defined a psychological contract as an individual's belief in the perception of reciprocal obligations between that person and another party. For working in a team, this can also be considered as a contract between team members, albeit unofficial, but essential for the current and future potential projects.

Especially considering the maintenance of trust building, this contract is another vital aspect for virtual teams, and some pre-preparation is necessary before decommissioning a team. The steps for disbanding this psychological contract are shown in Figure 13 under the CSFs' for Sign off & Closure as each project team has a psychological basis for team cohesion, which is especially relevant when leading from a distance.

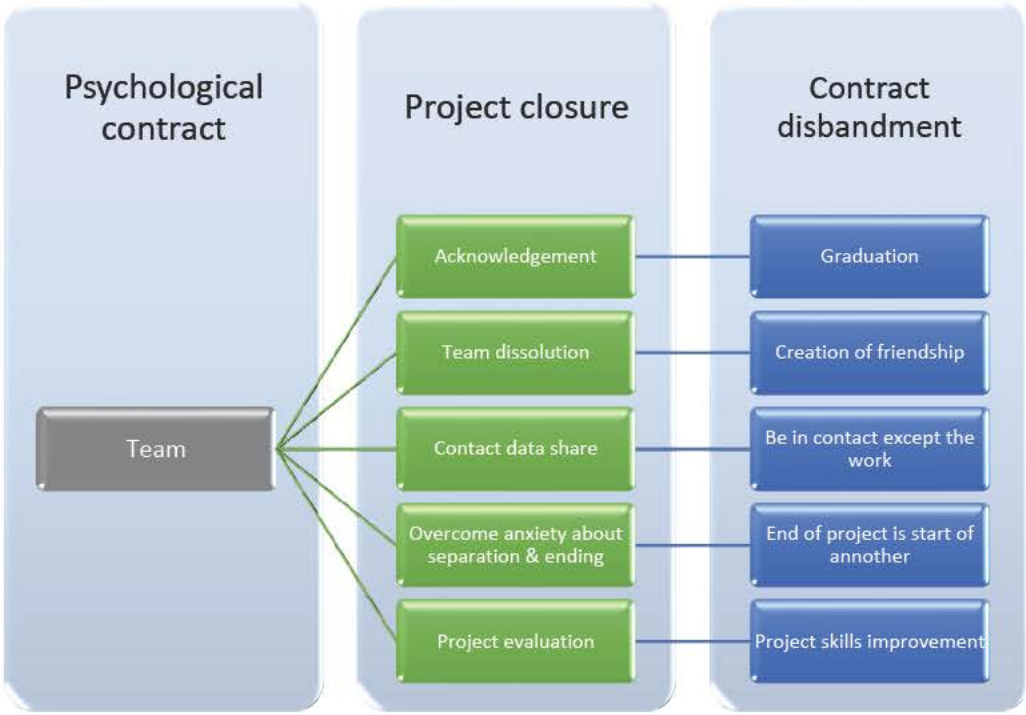

Figure 13 Sign-off & Closure of virtual working teams

This disbanding is characterised by individual preparation for a project completion meeting with each team member in one place. The preparatory work is characterised by the fact that the leader makes an appointment with the entire team on site and pays attention to the CSFs for the project closure with the goal to disband the contract (Figure 13) in a delicate way. The entire team must come together, as they did in the kick-off meeting at the beginning of the process, to ensure that the project is disbanded correctly.

Here, the leader plays a significant role as it is their responsibility to show appreciation for the team and acknowledge their service during the project. This acknowledgement of service must be clear, as it is the duty of the leader to create a positive final impression while ending the contract. Moreover, the team dissolution process will be easier when a sense of friendship has been established between all members of the group, as the team will be more likely to continue contacting one another post-project. In addition to this, in order to avoid any potential anxiety or separation concerns once a project has ended, it would be beneficial for the leader to express the likelihood of future potential projects. The final point of discussion should focus on the evaluation of the project, where both the positive and negative aspects are brought to attention.

By highlighting both the positives and negatives, the team will learn from these issues and could potentially work more effectively during the next available project. The leader

should also have their team ready at the end of the project to give some reflection on project management, so that the negative aspects can be corrected for the next project.

As the team members are unlikely to meet again in the future in a social manner due to the physical distance barrier from one another, it is the responsibility of the leader to think about the team members at least on public holidays, so that re-entry into team life will become easier when returning to a new project. Project disbandment can also be undertaken in a virtual way, but psychological effectiveness in terms of the appreciation of individual team members is not as valuable as a local presence.

3.3 Summary

This chapter presented the development of the conceptual V-CORPS model. The individual stages - Creation, Organisation, Relationship Building, Performance & Evaluation and Sign-off & Closure - were explained in detail, and their significance for the model was shown. Additionally, a figure for the respective stage was used to show how these stages can impact a team.

As the conceptual V-CORPS model is based on literature, a methodology is reported in the following chapter. The methodology focuses on the literature review, the questionnaire and the follow-up interviews for the model's identification and evaluation. By defining a suitable methodology, this helped to achieve primary research results, leading to the development and evaluation of a PCF.

4. RESEARCH METHODOLOGY AND DESIGN

4.1 Introduction

This chapter discusses the methodology and design of this research project that has been applied to developing the proposed model for virtual team building and leadership in the automotive industry. In general terms, "research design" refers to the general plan set by the researcher, and how this plan is executed to answer the questions presented in the research. This chapter shows why the selected methods have been chosen for this research to answer the RQs.

Section 4.2 provides an overview of the research design and methodology. Section 4.3 discusses the adopted research paradigm and examines these methodological choices in more detail. By considering the paradigm as it relates to ontology and epistemology, an interpretivist orientation for the research was chosen. Subsequently, in sections 4.4 to 4.6, the qualitative research method and the survey approach are discussed and justified. In section 4.7, the interview questions asked of the experts are developed, discussed, and summarised. This chapter concludes with section 4.8, which provides a general summary of these sections.

4.2 Overview of research methodology and design

Research design represents the structure that guides the appropriate research methods for the execution of data collection, and the subsequent analysis of the gathered data. This section focuses on the methodological choice of multi-method qualitative data collection (Saunders et al., 2019), which will be explained in further detail during this section.

The research onion developed by Saunders et al. (2007) guides a researcher through stages which must be passed to design an effective methodology. The `onion` is separated into layers, with the first referring to philosophy. Research philosophy is the set of beliefs which focus on the nature of reality being investigated. The second layer refers to the approach to theory development, which can either be inductive or deductive. The third layer details research strategy, which refers to how a researcher collects data. This is followed by methodological choices, which include the mono method and the multi-method approach. The next layer focuses on time horizons, which is in essence the timeframe of the project itself, and the final layer relates to data

collection, whereby the researcher must answer both how and why the research is being undertaken, and the techniques and procedures used for the research.

A path through the research onion for this research is traced in Figure 14 below. These selections represent research "philosophy, approach, strategy, horizon and method", and have influenced the selection criteria as detailed through the layers of “the research onion” (Saunders et al., 2019) and will be discussed in further detail below.

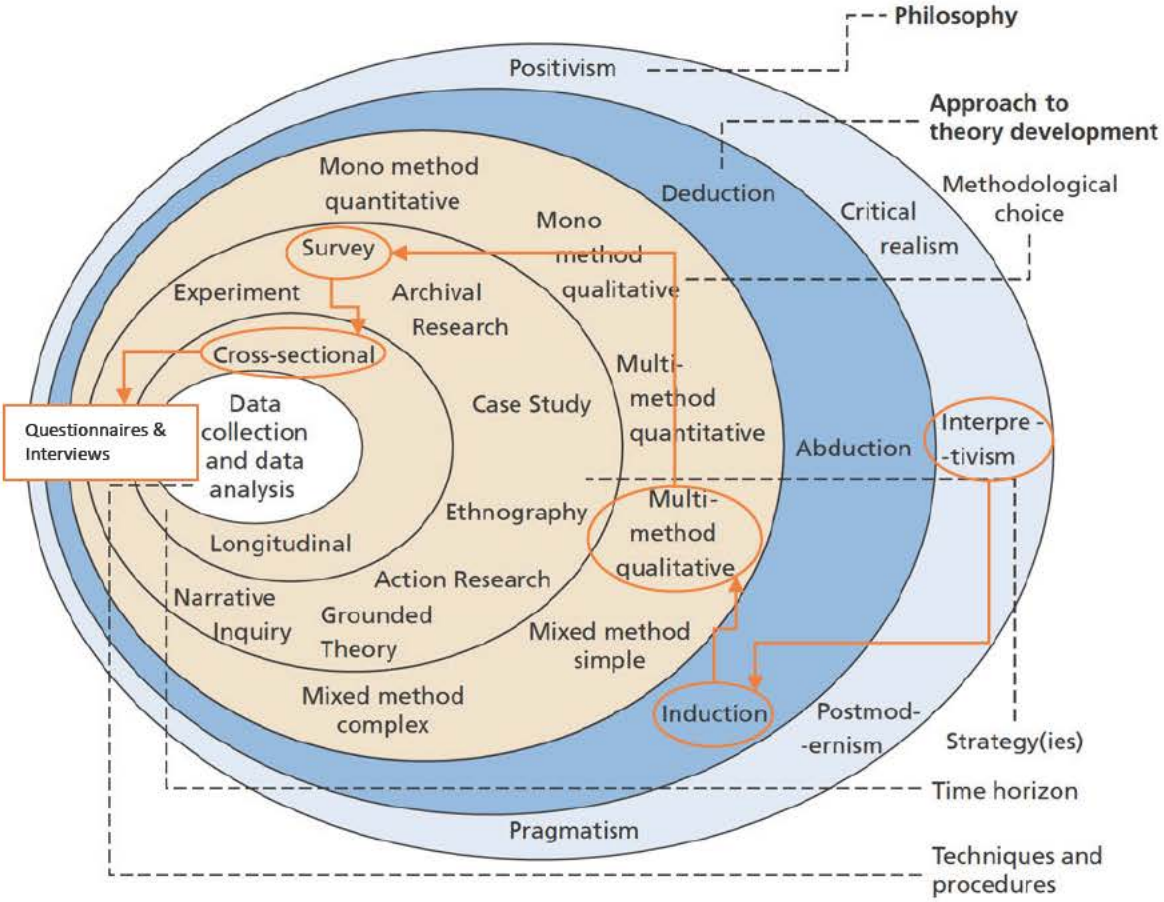

Figure 14 The research `onion` (Saunders et al., 2019)

The first layer of the research onion refers to the philosophical position of the researcher. As highlighted in the image above, the epistemological position of the researcher is “interpretivist”. This position was chosen as an interpretivist integrates humanistic qualitative methods and interests into a study, whereas other positions, such as “positivist”, prefer scientific quantitative methods (Layder, 2006). The reason an interpretivist position was chosen for this research is further discussed. Since this research took into account the opinions and experiences of experts in the automotive field, a terminological approach was most appropriate due to the limited amount of available data.

The next layer of the research onion refers to the approach used to theory development. For the purposes of this research, the inductive approach was chosen. Inductive reasoning is used when collective observations and experiences, including knowledge attained from other individuals and working practices, are combined to establish a “general truth”, or acknowledged fact. The inductive approach was developed through the observation of empirical data, which suits this research as the theory itself was built upon existing methods, experiences, and working practices relating to virtual team building and leadership in the automotive industry, which were based on the results from targeted interviews, and the literature review focusing on other sectors.

The aim was to create a model for virtual team building and leadership, which was able to be appropriately based upon data collection. The use of qualitative multi-methods for an investigation was very challenging, since different methodological traditions bring with them different communication traditions that are associated with different technical, rhetorical, and aesthetic criteria and norms (Greene, 2008). This was relevant for the research as the interviewees were requested to complete a questionnaire, which consists of selective and open-ended questions. The survey process was followed-up with semi-structured interviews to clarify the findings from the questionnaire (Saunders et al., 2019). As a result, a qualitative methodology in relation to the questionnaire was used for the respondents, and a quantitative analysis was carried out after the survey.

For the fourth layer of the research onion, a survey from a German automotive supplier, in the form of questionnaires and interviews, was given to key personnel. As automotive companies have similar working styles, the survey helped to analyse the V-CORPs model and make it more practical. The use of the survey and the focus on a single automotive supplier in Germany allowed for a reflection on the suitability of virtual leadership in the German automotive industry. This was justified by the surveys, as they not only allowed for an intensive examination with the environment of the object of study, but also dealt with a theoretical topic in a practical way. Thus, a survey proved the most suitable method to investigate the actual potential of virtual leadership in the automotive industry in Germany. The survey was based on questionnaires followed by semi-structured interviews, which were conducted in a short period due to the busy schedule of the interview partners. This method is a cross-sectional time horizon

(commonly referred to as a “snapshot”), and provided an insight into the current automotive working environment (Saunders et al., 2019).

It was necessary to gather the data through semi-structured interviews to and addresses the ROs to create the required model, as through this method further generalisations could be made relating to virtual team building and leading across the automotive industry. This assumption was based on the targeted responses to industry specific issues, which may be common among other companies within this sector. Yin (2009) considers the interview as an important source for data collection, although the way in which an interview is conducted can be structured in several different formats. This affected the semi-structured interviews, as the first step of this process comprises the completion of a questionnaire by the interviewee, while the second step uses these questionnaires as the basis of discussion during the face-to-face interviews. Both steps strongly contribute to the base of the model, interviews of experts in the automotive industry were used to gather data for this research.

The main focus was on the approach to answer the RQs, as well as the methods of data collection and evaluation techniques needed for the construction of the model. This research was conducted according to the three-step analysis form of (Saunders et al., 2019).

These steps were:

1. A preliminary search to generate and refine the ideas of the research
2. A critical literature review to provide the context and theoretical framework for the research
3. Interviewing “experts'' from one survey company in the German automotive industry and conducting focus group interviews to research the findings within a wider body of knowledge

To summarise, the epistemological position chosen for this research is interpretivist. The researcher used an inductive approach, which uses qualitative multi methods focusing on a survey from one automotive company in Germany. The time horizon was cross-sectional, and the data collection technique was done through questionnaires and interviews. The mentioned selections will be explained further in the coming chapters and justifying why the chosen approaches were necessary to obtain the final model.

4.3 Paradigm

To establish the appropriate philosophy for this research, a discussion regarding the correct ontology and epistemological position was undertaken. The researcher had to develop a reflective strategy between the relationship of his philosophical position, and the way he/she conducts and actively shapes the research (Alvesson & Sköldberg, 2000). In addition, it has been important for the researcher to consider his own beliefs and suppositions about the development of knowledge and the manner in which this knowledge relates to the research (Saunders et al., 2019). These dependencies are shown in Figure 15.

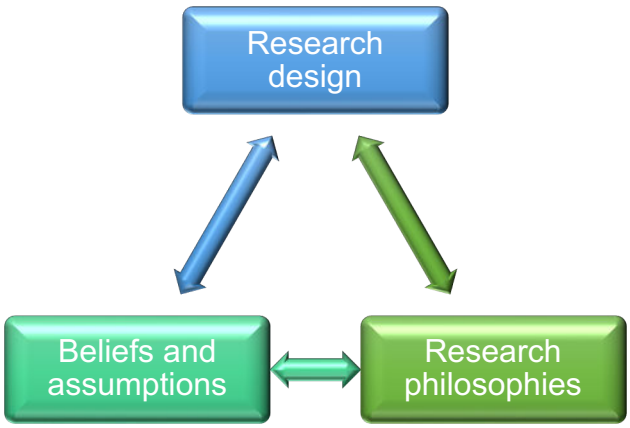

Figure 15 A reflexive process (Saunders et al., 2019)

This investigation was the key to discovering and understanding the appropriate paradigm. The paradigmatic position of the researcher provides an opportunity for the reader to understand a researcher's way of thinking and bring behavioural aspects relating to the theme of the research into reality. In general, there is no acknowledged consensus among economic and management researchers on which philosophy is the best (Tsoukas & Knudsen, 2003).

4.3.1 Ontology

According to Lawson (2012), ontology is a term which was used to designate the study of what exists, and the mode of existence of different entities, which in this case relates to the characteristics of virtual team building and leadership. Saunders et al. (2019) explained that ontology refers to assumptions about the nature of reality and is needed to understand what kind of reality virtual team building and leadership is, and how the work of these teams affects the real world. Therefore, the leader must create the real

environment so that his/her team members do not lose touch with reality during the project stage.

There are several ways in which a project manager can lead a team over distance, but through ontology, it is possible to determine how the researcher relates to the nature of reality in the management sector (Saunders et al., 2019). The research V-CORPS model acts as a base to blend these styles of leadership together, and reality itself. Once this had been understood, it was then possible to define through the research model the nature of reality. Furthermore, by investigating the connections that are already understood between the virtual and real world, and understanding the form of this existence in practice, this has helped in the understanding of the creation of this entity itself (Martins, 2018).

An ontological adjustment reveals real patterns of management behaviour common among certain real working environments. These patterns may be used to predict management behaviour in future projects and challenges (Saunders et al., 2019). This in turn allows for a deeper understanding of the most important criteria which will affect project efficiency for the future of virtual teams. By understanding leadership, and in this case, how virtual leadership can influence an employee's state of mind, it may help to share visions, missions, future goals, and common values (Martins, 2018). Saunders et al. (2019) stated that management (leadership) is an objective entity which adopts an objectivist stance to the study of particular aspects of management in a specific organisation, which in this case, is an automotive company continuing its working practices during the COVID-19 pandemic.

Table 4 highlights the social phenomena of management, which helps to visualise the measures of virtual team building and leadership in an objectivist way. Additionally, a researcher's ontology can be discovered through the questions shown in Table 4. The answers to these questions will help the researcher to choose an objective approach. The ontology position is therefore classified as objectivism, especially relating to the notion of “creating reality”. Through the use of this ontology in this research, known reality is constructed through the consciousness of several people working together through the means and understandings of what has evolved socially and experientially. This method forms the basis of the research model, since the desired results can be constructed through reality which is created by individuals. Therefore, the question of

reality in virtual team building and leadership can only be answered by the ontology, which has been defined in the field of interpretivism.

Assumption type	Questions	Continua with two sets of extremes		
		Objectivism	⇔	**Subjectivism**
Ontology	• What is the nature of reality?	Real	⇔	Nominal/decided by convention
	• What is the world like?	External	⇔	Socially constructed
	• For example:	One true reality (universalism)	⇔	Multiple realities (relativism)
	– What are organisations like?	Granular (things)	⇔	Flowing (processes)
	– What is it like being in organisations?	Order	⇔	Chaos
	– What is it like being a manager or being managed?			

Table 4 Philosophical assumptions as a multidimensional set of continua (Saunders et al., 2019)

4.3.2 Epistemology

Burrell and Morgan (1980) have described epistemology as assumptions relating to knowledge, what acceptable and valid legitimate knowledge is, and how to express this knowledge to others. To define the epistemological position of the researcher, one must consider the nature and purpose of the research itself, and to better understand the reality of the theme and how to correctly interpret it. Saunders et al. (2019) explained the importance of understanding the implications of different epistemological assumptions in relation to a choice of method(s), including the strengths and limitations of subsequent research findings.

This research has been based on literature review and semi-structured interviews to gather qualitative data, it enabled different entities to be compared and analysed. The analysis of this data and the investigation of its different contexts (especially from interviews) has been used to construct the research model stages. It was crucial for this epistemological position to analyse, investigate, and focus on the differences between the interviewees and the literature, and discover the most diverse and similar aspects which were of benefit to the research model in the automotive area.

A terminology approach proved more suitable when an interpretivism epistemology is used, which places importance of actions over structure, and therefore becomes the goal for a qualitative researcher to see the quintessential factors for virtual leadership from the perspective of a human actor (Layder, 2006). Moreover, the questions

answered relating to “objectivism” and “subjectivism”, as shown in Table 5, help to define the epistemology theme and position of this research.

Assumption type	Questions	Continua with two sets of extremes		
		Objectivism	⇔	**Subjectivism**
Epistemology	• How can we know what we know? • What is considered acceptable knowledge? • What constitutes good-quality data? • What kinds of contribution to knowledge can be made?	Adopt assumptions of the natural scientist	⇔	Adopt the assumptions of the arts and humanities
		Facts	⇔	Opinions
		Numbers	⇔	Narratives
		Observable phenomena	⇔	Attributed meanings
		Law-like generalisations	⇔	Individuals and contexts, specifics

Table 5 Philosophical assumptions as a multidimensional set of continua (Saunders et al., 2019)

For the purposes of this research, the answers to the questions have been shown in Table 5. The philosophical assumption based on these answers would suggest ‘objectivism’ as the correct position, when considering the first chosen answer. Therefore, a researcher representing the epistemological position of an interpretivist is the most suitable position when formulating the understanding of virtual team building and leadership in the automotive area, in terms of developing a suitable model for it. Interpretivism counts as a predominant philosophical approach that contributes to the understanding of the social world through meaningful interpretations of the real world, which has already been interpreted through meanings, and produced as a necessary part of common everyday activities (Chowdhury, 2014).

4.3.3 Summary

This section presents the aspects about the interpretivist position of this research. Table 6 summarizes the main factors needed to understand why interpretivism is the suitable approach for this research, while showing the correlations between ontology and epistemology which relate to the theme of this research and the build of the final model.

Ontology (nature of reality or being)	**Epistemology** (what constitutes acceptable knowledge)
Interpretivism	
Complex, rich	Theories and concepts too simplistic
Socially constructed through culture and language	Focus on narratives, stories, perceptions and
Multiple meanings, interpretations, realities	interpretations
Flux of processes, experiences, practices	New understandings and worldviews as contribution

Table 6 Comparison of five research philosophies in business and management research (cut out) (Saunders et al., 2019)

The ontological side shows the nature of reality which is complex in relation to the research project. This reality offers a comprehensive view of the topic and the automotive industry, with the possibility of a new understanding of how to work in this area. In addition, virtual teams tend to be socially built through culture and language itself, but they also need to be restructured to work together as a dispersed team. The diverse meanings, interpretations, and realities together with the experiences and practices of the interviewed experts on the research topic also have an impact on the flow of the research process.

To summarise, the table shows the chosen epistemological side of the theory and the concepts of this research. It also highlights the research on perceptions, which are considered an observation of this theme through literature review. Additionally, the “stories” or shared experiences of the experts’, are obtained through a questionnaire and a follow-up interview, which matches the methodology of an Interpretivist researcher. The interpretation of the previous steps provides new understandings and worldviews to the research theme and contributes to the model of virtual team building and leadership in the automotive industry. For these reasons, the position of the interpretivist has been chosen for this research.

4.4 Theory development approaches

To determine the correct approach needed to develop and apply a model for virtual team building and leadership, understanding the effectiveness of a team during the performance stage of the model is essential for the success of a team.

Given that the model will be used throughout the lifetime of a project, it is important to choose the appropriate theoretical approach to apply the CSFs and the model stages in the most appropriate way, and improve them when necessary. Jackson and Parry (2011) defined two distinct methods for dealing with the question of an effective leader, which they have determined to be 'the common-sense way' (the inductive approach)

and 'the scientific way' (the deductive approach). These approaches have their own positive and negative aspects, and to discover which approach is best suited for answering the question of how to build a team through effective leadership, it is essential to compare and contrast the two approaches together.

Both approaches must first be separately analysed based on their merits to find and define the most suitable approach for this research. First, the deductive approach begins by first analysing general observations, before focusing on specific observations seen in a work-based environment. According Saunders et al. (2019), the deductive approach begins with an investigation into a theory through academic literature which in turn is used to design a research strategy to test this theory. Additionally, the observation of a hypothesis prior to examining the specific outcomes is necessary to modify the theory according to the findings.

The finalisation of the deductive approach comes from the gathered facts in a logical form. This means that through the deductive approach, it is possible to investigate a theme more deeply through the separation of unique observations from the general. De Vet and Wauters (2018), refers to the deductive approach as a “top-down” approach which starts with a theory followed by a hypothesis, it is then investigated through observation and concluded through confirmation. According to this method, a deductive approach may be applicable in a positivistic approach, in which circumstances are described by measurable properties and can be examined objectively to provide causal explanations, and build upon potential predictive powers (Howard et al., 2006).

The inductive approach, in contrast to the deductive approach, begins by focusing on specific observations, before moving onto general observations. The researcher does not have the possibility to develop a theory from the literature as the hypothesis, or in this case, a lack of a hypothesis, is already implicit as the theory is developed through the engagements which are then correlated with data (Thin, 2018). Saunders et al. (2019) confirmed that if a researcher starts by collecting data to explore a phenomenon to generate a theory thereafter, this will form a conceptual framework, it is then necessary to use an inductive approach.

The researcher has not only to observe the literature of this research theme, but to also investigate the actual situation of the demands and needs of this field. Additionally, the researcher needs to access other fields where the literature is available to the

researched field and adopt features from there to create the first patterns (e.g., the provisional research model). Based on these patterns, it is then possible to create a tentative hypothesis that can be explored through application (e.g., interviews). This could be considered as an alternative approach to develop a theory by interviewing a sample of the employees and their supervisors about their collective experiences of their working area (Saunders et al., 2019).

Based on this, a theory can be created if it was constructed on this premise. This approach is also known as a “bottom-up” approach for a certain rule or structural development, in which the basis for virtual team building and leadership has been taken from different areas and adapted for the automotive industry, which serves as the core basis for the development for performance-oriented work (Blakstad et al., 2010). The inductive approach provides an insight into the way in which people interpret and perceive their social world, yet is still critical and particularly concerned with the context in which such events take place (Saunders et al., 2019).

The abductive approach combines the inductive and deductive approaches together to reveal new discoveries in a methodological and logically structured format. Suddaby (2006) described the abductive approach as a combination of the deductive and inductive approach which alternates between theory to data (deduction), and vis-versa (induction). The use of the abductive approach in this research would require comprehensive data collection that enables the topic of virtual team building and leadership in the automotive sector to be identified and explained in detail. However, the use of this approach is unsuitable for this research as the availability of comprehensive data in this sector is limited. Saunders et al. (2019) recommended using an abductive approach when collecting data for phenomenal research, identifying topics, or explaining patterns to develop a new theory or modify an existing one, which is then tested by additional data collection. Nonetheless, it would have been possible to use the abductive approach if a larger amount of data were available, although this is not the case for this research as the data is limited.

This research comprises combining the exploratory and explanatory properties with the aim of creating a useful model that significantly contributes to virtual team building and leadership in the automotive industry. It is particularly important to ascertain the extent to which the CSFs influence the virtual team through the model stages. The data on virtual leadership was collected from literature relating to other fields that had

to be adapted to the technical working environment and in the case of the automotive industry, through a combination of interviews and literature. Since the epistemological position of this research is based on interpretivism, as noted in section 4.3, the inductive approach was a suitable means of testing as deduction has the tendency to construct a rigid methodology that does not permit alternative explanations of what may occur in certain situations (Saunders et al., 2019). In summary, this research is based on a qualitative, inductive approach and uses a single data collection method.

4.5 Qualitative research method

The word “qualitative” is often seen as a synonym for a data collection technique (e.g. an interview) or a data analysis procedure (e.g. categorising data) that generates or uses non-numerical data (Saunders et al., 2019). The qualitative approach is often used to help a researcher determine the appropriate method for conducting a study, and how to gather data for analysis through observation. The selection of the suitable data which fits the theme of the research is paramount to avoiding errors during the data analyses procedure.

As qualitative research is often associated with a philosophy of interpretivism (Denzin & Lincoln, 2011). It is particularly useful for research that is aimed at exploring goals in a real working environment, by analysing connections and processes in organisations to find appropriate improvements in practices and processes. Model being tested in this research is a new concept which contributes to and influences both project management and leadership style and contributes to building and leadership of virtual teams in the automotive industry. The use of qualitative research allows answering RQs more precisely, as it aims to understand and extrapolate answers from similar situations (Golafshani, 2018).

A qualitative approach, using a multi method, allows for a researcher to obtain results to answer the questions put forward by the researcher. As Saunders et al. (2019) confirmed, a qualitative approach can use more than one qualitative data collection technique, such as gathering qualitative data to use in semi-structured interviews, and a corresponding qualitative analysis procedure. Therefore, an inductive approach is best suited for this research. In addition, analytical, inductive, and qualitative case studies offer a flexible structure that allows changes in the research focus during the course of research (Saunders et al., 2019).

4.6 Survey

The research strategy is based on a survey which contained the combination of an online questionnaire and interviews. Groves (2004) considered the survey as a systematic method for obtaining information in a specific subject area. The purpose of this survey was to analyse and improve the V-CORPS model and CSFs, in the context of team building and leadership over a short or long period, on a global scale in the automotive industry. According to Saunders et al. (2019), a survey can be strategically used when the questions of "who, what, where, how many, how much" are being posed when an investigator has to collect data in an economical way which allows easy comparison.

The survey selected for this research was conducted at a global German automotive supplier headquartered in the US. This company was created through the merger of a former US and Japanese company with an extensive customer portfolio and a similar range of products. This German company is a part of its global supply chain, primarily responsible for the EMEA region. A survey from a company of this magnitude has helped to provide insights into a global automotive company, as the opinions of the experts' have been compared and contrasted. As a result, the research model activities for each stage and CSFs have been created based on the data extracted from this organisation. The scope of research carried out to date in the field of virtual team building and leadership is mostly insignificant for the automotive industry, as this theme is primarily focused on healthcare and IT working environments. For this reason, an investigation of this area through a survey validated the conceptual framework. The V-CORPS model was created from it, providing the feasibility for its implementation across in the automotive industry.

The survey focuses on the views held by the experts in this industry who have significant experience in the automotive sector and had worked at a multitude of companies prior to this study.

Yin (2013) gives the following five reasons when conducting a survey would prove to be beneficial:

1. If a survey is a well-formulated theory when tested (here, the analogy to the critical experiment must be considered).
2. If a justification for a survey represents an extreme.

3. When it is necessary to capture the circumstances and conditions of such a representative.
4. When it is a question of an informative individual survey.
5. When the aim is to examine the individual survey at two or more different points in time (longitudinal cases).

According to Yin (2013) a survey can be categorised into five schemes of strategic research: experiments, surveys, archival analysis, histories, and case studies (Table 7) and refers to the types of questions beginning with "who," "what," "where", "how," and "why". This strategy can be used for all research purposes – exploratory, descriptive, or explanatory (Hayat et al., 2013). Additionally, there are also three other conditions to identify the research strategy which relates to the type of RQs being posed, the extent of control an investigator has over actual behavioural events, and the degree of focus on the contemporary as opposed to historical events (Yin, 2013). Each of these questions require a strategy to answer them effectively, and thus offers the possibility of choosing the appropriate survey strategy for the research topic (Table 7).

Strategy	Form of research question	Requires control over behavioural events?	Focuses on contemporary events?
Experiment	How, why	yes	yes
Survey	Who, what, where, how many, how much	no	yes
Archival analysis	Who, what, where, how many, how much	no	yes/no
History	How, why	no	no
Case study	How, why	no	yes

Table 7 Relevant Situations for Different Research Strategies Source: COSMOS, cited in Yin (2013)

Table 7 illustrates how a survey is focused on contemporary events, mostly relating to the "who," "what," "where", "how many," and "how much" questions as mentioned at the start of this section. These types of questions are essential for developing the questionnaire and the following interviews related to the model of virtual team building and leadership in the automotive industry. The survey was carried out in the operative, and the questions for the interview were based on the literature review. One of the advantages of this survey is that the researcher had no influence on the respondent's answers, so the answers could not be manipulated. The researcher also had to interpret and reproduce them correctly.

This approach of a survey created the possibility, based on the evaluation of the interview results (which are questions based on the literature review, research objectives, the PCF, and the provisional CSFs), provided the opportunity to see where virtual team building, and leadership would benefit in the automotive industry. Due to the researcher being able to gather materials and evidence from six different sources, which are: documents, archival records, interviews, direct observation, participant observation and physical artefacts (Yin, 2013). This gave the survey a wide range of possibilities for data collection, which greatly benefited the qualitative features of this research. The research itself was focused on two out of the six aforementioned sources, whereby documents, in the form of questionnaire, and interviews were used to develop and build the model. This evidence was then used to answer the questions, which were investigated in section 4.7.

This research is not considered to be a true case study, which addresses questions "how" and "why" (Table 7) that are applied to a concrete case. According to Yin (2013) the previously stated questions are more explanatory than exploratory and are preferred for case studies, stories, and experiments. However, as this research has been used to develop a model for virtual team building and leadership, exploratory research is required here, so that explanatory research may follow subsequently. Saunders et al. (2016) found that to do such exploratory research adequately, the use of a survey is the most effective way of achieving the goal. Yin (2013) found that, in general, the case study is considered by many researchers to be a less desirable form of research due to the lack of rigor in case study research. In addition, a case study cannot really be used to formulate a general statement, when only one case is studied (Yin, 2013).

There were eighteen interviewees who all worked in the same global automotive supplier company, who are experienced managers within this industry, such as Vice Presidents, Directors, and Heads of Project Management, and who have worked on international and global projects. The selection of the company for the individual survey was based on its position within the global market, and its customer and product portfolio in the automotive industry. This company, as of 2020, had approximately 50,000 employees distributed over 98 production sites in 25 countries, with a turnover of 7.5 billion euros in 2018, as well as an annual investment (R&D) of around 1.2 billion euros (these figures were dependent on newly acquired projects at the SOP for

globally operating customers). The company works as a matrix organisation in which every department and every product is assigned to specific regions (e.g., EMEA, US, Japan, China). The decisions are made on a global level, but product implementation is adapted for the specific country or region. This being the case, leadership over a distance is unavoidable due to the nature of this firm's decision-making processes. As of 2020, the company is working on over 1000 different projects over a distance with the support of ICT.

The results of these interviews were able to provide sufficient relevant material for the validation of the research model and the concepts related to virtual leadership in the automotive industry itself, since the automotive industry mostly works according to the same leadership principles and therefore practices from one globally active group can often draw conclusions about an industry itself. This research thus allows the development and confirmation of a research model for team building and leading over distance within the automotive industry.

4.7 Questionnaires and interviews

The initial information gathered for this research comes from the literature review, as shown in chapter 2, from different sectors that are already engaged in virtual leadership. In addition to the literature review, further data was collected from interviews with managers from different levels of the organisation who are currently employed within the automotive industry. The interviews were a continuation of the questionnaire, as they have helped to obtain a deeper analysis of the research model by creating individual questions for each of the V-CORPS model stages. Saunders et al. (2019) explained that the interviews deal with targeted questions and thus collect valid and reliable data which are essential for the validation of the V-CORPS model. The collection of data was done through a three-step procedure (Figure 16).

Figure 16 Three-step data collection procedure

First, the questionnaires were emailed to the eighteen interviewees. The selection criteria focused on gathering experienced managers in the automotive industry currently working on global projects with dispersed teams (Table 8). Each

questionnaire consisted of 30 questions (see Appendix I). Bryman (2012) describes mailed questionnaires as the most popular self-questionnaire form, and the key advantage is that the respondents can dedicate more time to it, and can therefore offer more detailed answers, as the respondents are not put under any form of temporal or spatial pressure.

The eighteen members of different management levels took part in the interview stage. The questionnaire began with introductory questions to familiarise those interviewed about the theme of the research. Fink (2017) believed that unexpected results are obtained when the respondents are requested to answer freely, and in addition to this, it is essential to use rating questions to gain a true impression from the respondents relating to the theme of the research. The questions themselves were open-ended and contain Likert-scale questions and also contain open-ended questions to obtain unexpected results, which provided more originality and value to this research.

The most reliable way to gather the opinions from the respondents is through the use of the Likert-Style rating system, or a “Likert scale” (Saunders et al., 2019). This scale allows the respondents to choose from one from the four, five, six or seven-point rating scale (in this case, "Strongly agree" to "Strongly disagree") to the written statement. In this research, Likert-scale questions helped to obtain the experts' experiences and views on the research topic. Besides using the Likert scale, the questionnaire concluded with questions aimed at identifying whether or not some CSFs were necessary for the final build of the model, and to further understand the meaning of these CSFs. Questions such as these are known as dichotomous questions (Saunders et al., 2019), and are often said to be the fastest way to respond to a question on a questionnaire.

Once this stage had been completed, the completed questionnaires were then analysed to determine the overall impressions of the respondents on the topic. Three weeks later, the semi-structured interviews took place. Then, the semi-structured interviews were conducted with each manager to better understand their previous experience in international project management, and their understanding of virtual team leadership in general (both through building and leading a team). As the questionnaires were distributed in advance, the evaluated answers and conceptual framework were used to stimulate discussion in the semi-structured interviews with each of the eighteen experts involved in different projects within their respective

companies (Table 8). The meeting with the experts' played a significant role in the building of the model (Yin, 2013), allowing for it to be built under realistic circumstances.

1. **Head of Product Innovation:** 25 years of work experience as a director of product development, with different teams and 22 product patents.
2. **Head of Project Management:** 26 years of work experience as project manager in the automotive industry.
3. **President EMEA:** 15 years of work experience as a Plant and Project Manager
4. **Vice President:** 21 years of work experience as a Product costing analyst
5. **Project Manager:** 7 years of work experience as a Project Manager
6. **Product Manager:** 6 years of work experience as a Product Manager in China
7. **Head of Product Innovation:** 18 years of work experience as Project and Product Manager.
8. **Vice President Business Development:** 20 years of work experience in sales and project development.
9. **President and CEO Global:** 30 years of work experience in Product development and strategic Project Management.
10. **Project Manager**: 15 years of work experience as a Project Manager in the automotive industry.
11. **Senior Key Account Manager:** 15 years of work experience in the sales sector.
12. **Product Certification Manager:** 19 years of work experience in programme management and product certification in the European and Japanese regions.
13. **Agile Coach:** 22 years of work experience in Project Management.
14. **Project Manager:** 10 years of work experience in the automotive area.
15. **COO EMEA Region:** 20 years of work experience in automotive engineering, and 10 years as a Managing director.
16. **Development Director:** 22 years of work experience in automotive engineering, and 16 years product development responsible
17. **Industry Representative in EMEA and CIS region:** 17 years of work experience, and 13 years in project management
18. **Product Manager:** 7 years of work experience as a Product Manager in CIS region

Table 8 Interviewed experts' roles and experiences to develop the virtual leadership model

Table 8 shows the individual experts with their collective experience in the automotive area.

The completed questionnaires were evaluated through an application called Online Survey. The interviews were deliberately not recorded, as the interviewees had not agreed to this, and it was not intended to violate data protection regulations. Nevertheless, important key points were noted during these interviews and wording of individual statements in the research was discussed with the experts. All this was stored, and password protected on a personal computer and data carrier.

The evaluation of the interview material and empirical data were used to analyse the PCF to build the final model. In addition, the interviews served as a form of open exchange from management level to improve virtual team building and leadership. By evaluating and comparing the individual answers to the respective questions, the answers gathered through each individual section were examined and ranked according to importance. This was determined during the evaluation process and the ranking was done based upon the similarities of the statements made by each expert during the interview. Through this ranking system, the answers revealed which areas each expert was strongest/weakest in, and this helped to determine which level/s of management attached greater importance to certain attributes and characteristics for a functioning team.

The questions were allocated accordingly to the stages of the provisional V-CORPS model (Table 3), which allowed for a systematic analysis of the information collected for the further stages of the project, as well as ensuring total coverage of virtual team building and leadership in the automotive industry. These levels are the CSF (Figure 6) stages which had been investigated during the literature review stage in chapter 2. As previously named, these two sections have influenced the questionnaire questions needed for this research. The questionnaire structure mirrors the five stages in the V-CORPS model and each question belongs each section of the stated stages of this model, as seen in Table 3. This systematic approach ensures that all stages of team building, and leadership have been considered, analysed, and discussed.

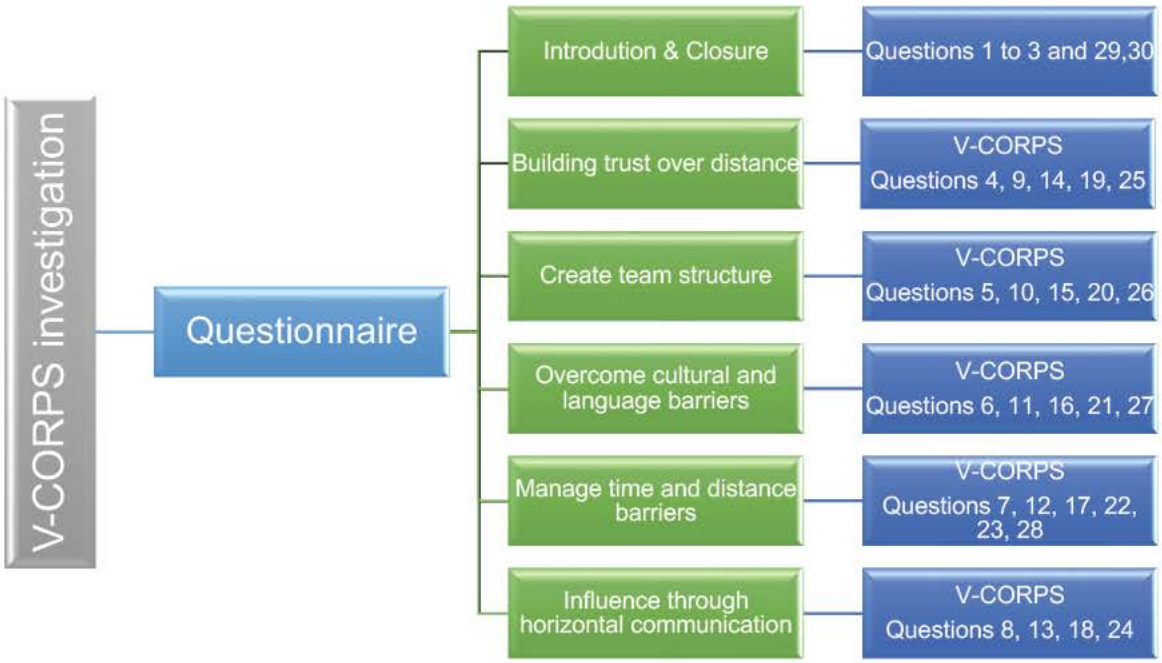

Figure 17 Relationship between Conceptual Framework and Questionaire

Figure 17 shows the relationship between the questionnaire design and the conceptual framework. The questionnaire used in this study (see Appendix I) was designed to investigate the V-CORPS model (Table 3). The specific questions were developed from a combination of the literature review and the conceptual framework and were tailored to this specific case. During the design stage of the questionnaire, the researcher focused on ensuring that the questions were explicitly focused on the CSFs, in the areas of the V-CORPS model, that were easy to understand and avoided ambiguity. Figure 17 provides an overview of which CSF (in green bars) belongs to the questions during the V-CORPS stages.

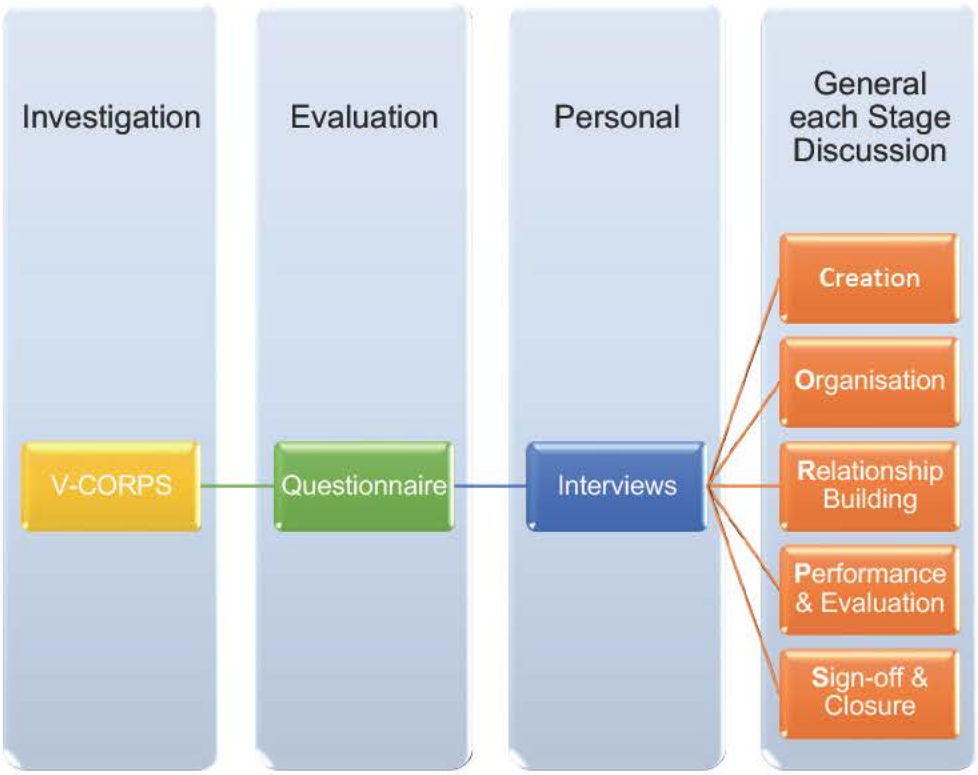

Figure 18 Relationship between conceptual Framework and Interview questions

After completing the questionnaire, a further step for the V-CORPS model investigation followed, which is shown in Figure 18. The evaluation of the completed questionnaires served as a basis for the six general questions (see Appendix I) relating to the respective stages of the V-CORPS model, which were discussed in detail in the expert interviews to gain a deeper understanding of the significance of the respective stages. The interviews were either conducted via Microsoft Teams or face-to-face. For this investigation, the researcher used a variety of interviewees with different skills and experiences, as named in Table 8, in order to note the contrasting views held by these experts.

Figure 18 also shows the relationship between the questionnaire, the interviews, and the V-CORPS stages. Since the interviewed experts came from different management levels, their answers were examined for parallels and similarities. By evaluating the individual sections of the questionnaire in relation to the model, important points were collected, before being further developed in the subsequent interview.

The third step focused on cross-sectional data analysis. Here, the data was analysed from all responses and materials from the interviews. The analysis of the completed questionnaires was carried out with Online Survey and interview transcripts were carried out through data processing (Figure 24). The data analysis helped to identify

how much information can be extracted from a single survey. On the one hand, it was possible to concentrate specifically on the topic by reading, interpreting, and evaluating the answers. On the other hand, it was also possible to understand how well the respondents had understood the topic. As a further aspect, one can recognise from the answers whether or not the respondents have been employed in a company for too long, and have developed a certain level of operational blindness, and thus react to innovations with increased scepticism.

Since the survey ran through all management levels, it gives the opportunity to identify the most significant points which were necessary for developing the model. In conjunction with the assessment of the relevant literature, the analysis formed the basis for developing a model for leading projects over distances, as well as highlighting the possibilities of virtual team leadership.

Finally, all available data which was gathered from the previous literature and interviews were used to investigate the importance of the CSFs during the model stages. In addition, this data provided the necessary support for creating a model for virtual team building and leadership, as they are based on experiences from real working environments, making them more useful and easier to adapt to real work situations. Furthermore, as the full potential of virtual leadership in the automotive industry had not been previously fully investigated, it has also offered a wide range of possibilities within technical working sectors. It is particularly important that the model, which is the focus of this research, follows a flexible approach to data collection.

4.8 Summary

This chapter has introduced the research methodology and design used for this research, as well as its definition, and how they relate to the philosophical views of the researcher.

Initially, the research methodology and design were weighed and discussed to decide upon the most suitable approach for this study. Paradigms were examined, which led to an interpretivist epistemological position being chosen, which led to the use of questionnaires and interviews, as discussed in section 4.3.3. For the purposes of this scientific investigation, the most suitable methodological choice is the inductive approach. After much consideration, the abductive and deductive approaches were

deemed unsuitable, as these approaches would not have been able to construct a rigid methodology for this research.

The qualitative approach was selected as the most suitable approach for this research as it provided the possibility to investigate organisational processes and understand failure of practices. In addition, this research used a survey of expert views in one company for data collection. This chapter introduced the questionnaire and interviewees, and the approach of the interview process was explained. The reasons why the Likert scale and the open-ended questions were chosen and discussed, and the evaluation methods that were used when comparing and contrasting the data collected with the available literature were further presented. By approaching the data in this manner, the suitability of the methods chosen to answer the RQs and their connection to the underlying philosophical views of the researcher have been established. This enables the researcher to conduct empirical research and present the results in the findings.

5. FINDINGS

5.1 Introduction

This chapter evaluates the feedback obtained from the questionnaires and interviews and presents an overview of how this data helped to develop the model for virtual team building and leadership. In section 5.2, the questionnaires are analysed. The extracted data reveals the views of the experts, which have been used to create a model for virtual team building and leadership in the automotive industry. The extracted data from the questionnaires formed the basis for the interview questions. The interviews are analysed in section 5.3, whereby their analysis enabled gaining a deeper insight into the needs of the experts. In addition, an evaluation of the V-CORPS model was made possible by each individual expert, whereby this helped to verify the model and ascertain whether it needed to be further developed. Section 5.4 summarises these findings and presents a conclusion.

5.2 Questionnaire findings

5.2.1 Introduction

In this section, the experts' answers to the questionnaire are analysed and summarised as a preliminary evaluation of the model. This analysis was used to create the interview questions as the next step of the survey (see section 4.6).

The evaluation of the questionnaires indicated the technical orientation of the experts, and whether they preferred a future-oriented solution or their regular working methods. The questionnaire contained eight open-ended questions (at least one per question stage) where the experts had the opportunity to answer them free of external influences or abstain entirely.

5.2.2 Questionnaire: Introduction stage

The introduction stage aimed to give the experts an overview of virtual leadership before they considered each stage of the model. All the questions for this and the following sections of the questionnaire are listed in the Appendix I. The objective is to gather experience related data from the experts regarding virtual team building and leadership in the automotive industry.

Question	Outcome	Finding	Research action
Introduction			
1.	94.4% positive feedback 5.6% negative feedback	Virtual team building and leadership is important for the automotive industry	Creating a model for virtual team building and leadership to harmonise the processes in the automotive industry
2.	88.9% positive feedback 11.1% negative feedback	CSFs on how to build and lead virtual teams are crucial for working efficiently	CSFs must be considered and implemented in the model
3.	1. Lack of trust 2. Language barriers 3. Lack of communication	Experts see the three outcoming factors as the most critical in working with teams over distance	The model has to demonstrate and give possibilities on how to overcome or avoid them

Table 9 Findings from the Questionnaire: Introduction stage

Table 9 shows the summary of the findings from the introductory stage of the questionnaire.

The majority of the experts (94.4%) agreed with question 1 and felt that there is a need for working in a virtual way in the automotive industry, whereas 5.6% of the respondents did not agree. Based on this, it is evident that the creation of a model for virtual team building and leadership with the goal of harmonising team-working processes is necessary within the automotive industry.

Question 2 reveals that 88.9% of the experts agreed that the CSFs were useful for virtual team-working practices. 55.6% are confident that the mentioned CSFs are necessary when working over a distance, while 33.3% of respondents agreed with the CSFs, but not as strongly as the aforementioned. 11.1% disagreed with the usefulness of the CSFs. Therefore, the CSFs were considered, defined, and implemented in the model.

Question 3, an open-ended question, revealed the experts' own experiences relating to the most common negative performance related issues when leading a team over a distance. Every expert explained how the greatest challenge is to build trust. They went on to say how language barriers and cultural differences were also factors which have led to negative performances in the past, with one expert citing how by ignoring these factors, this can lead to a lack of team charter and spirit. They further stated that improper communication regarding clear project direction and goals also hinder project performance. It is a challenge to find the appropriate approach for all team members

to increase their performance, as improper implementation of the directive also causes inefficient work. The challenge is to implement the new tools in a team while convincing the team members about the positive influence through the use of them on the project. Moreover, proper training must be given to team members in the appropriate way so that may use the tools effectively.

5.2.3 Questionnaire: Creation stage

This section relates to the first stage of the V-CORPS model and gathers the experience of the experts regarding this theme while also analysing the first stage of the model for further improvement.

Question	Outcome	Finding	Research action
Creation			
4.	94.4% positive feedback 5.6% negative feedback	A good impression of each other is important during the first kick-off meeting	The model emphasises the importance of the first meeting and the actions of the leader
5.	100% positive feedback	Discussing the company's expectations to the team is important	The model must take this in consideration
6.	88.9% positive feedback 11.1% negative feedback	It is an important factor to address the cultural and language barriers in the team	This must be implemented in the model in the early stages
6.a	83.3% positive feedback 16.7% negative feedback	These barriers are often neglected in the working environment	The model must underline the importance of it
7.	50% positive feedback 16.7% no opinion 33.3% negative feedback	Neutral response regarding the presentation of new communication technologies	The model must show that this is a long-term investment in improving teamwork performance
8.	1. Open communication 2. Respect 3. Guidelines	The experts felt that the three mentioned aspects were important to promote equality in the workplace	Particularly in the initial stage, emphasis must be placed on this so that there are no negative impacts on the manager and team members

Table 10 Findings from the Questionnaire: Creation stage

Table 10 shows the summary of the results from the creation stage of the questionnaire.

94.4% of the experts agreed with question 4 and believed that the first impression of each other has a significant impact on the project results. 44.4% are convinced of the necessity of this stage, while 50% agree that this should not be overlooked. 5.6%

disagreed with this statement. Therefore, the model outlines the importance of the first meeting and the suggested actions of the leader during this stage.

Every expert agreed with question 5, and felt that the company's expectations, and the intended direction of the project, are significant for success. 66.7% strongly agreed that it is vital to explain and discover ways of fulfilling the company's expectations before commencing a project, whereas 38.9% believed that this is important to discuss. This aspect was considered in the development of the V-CORPS model as an important step.

55.6% of the experts agreed with question 6 and believed that it is important to address cultural and language barriers to avoid miscommunication, and consequently, wasting time and money during the project stage. Shachaf (2008) found out that a lack of addressing cultural and language barriers can result in miscommunication, which endangers team trust, cohesion, and identity. 33.3% of the experts agreed that addressing these issues is an important factor to improve team behaviour, while 11.1% were neutral. As the majority of the experts considered this factor important, this aspect was included in the model in the initial stages.

Question 6a follows up on the previous statement and asks if cultural and language barriers are often neglected at the start of a project. 83.3% agreed that these barriers are often neglected in the working environment, although 16.7% disagreed that these issues tended to be addressed reasonably well. The importance of this was underlined in the model.

The answers to question 7 revealed the necessity for team leaders to bring innovative ICT solutions to avoid time and distance barriers. 50% agreed or see it as mandatory for team leaders to present new possibilities to their teams. 16.7% were neutral on the matter, while 33% disagreed with the statement. The neutral responses were investigated during the interview stage.

Question 8, an open-ended question, referred to the important measures or circumstances that are required to make team members feel valued and equal to the leader via horizontal communication. Every expert stated that open communication, and the direct contact of team members, brings the desired level of success. Additionally, the leader must be open to team member suggestions and take them seriously. This line of reasoning has been suggested by Layng (2016) who confirmed

that communication has an important key role in the success or failure of virtual teams, and subsequently, on the performance of a project. Additionally, a leader must treat individual team member ideas and remarks with respect and create an opportunity for everyone to contribute. Particularly in the initial stage, emphasis must be placed on this so that there are no overriding effects on the manager. Moreover, every success and failure must be taken as a team, and not as the result of a leader's actions alone. Overall, the experts felt that the three mentioned aspects (Table 10) were important to promote equality in the workplace.

5.2.4 Questionnaire: Organisation stage

This section refers to the second stage of the V-CORPS model and relates to team organisation. The views of the experts were gathered to analyse potential improvements for this stage.

Question	Outcome	Finding	Research action
Organisation			
9.	94.4% positive feedback 5.6% negative feedback	A clearly defined role in a team for each team member promotes team cohesion and trust improvement	Definition of roles in a team is a part of trust building which must be implemented in the model
10.	100% positive feedback	The adherence to project rules is important	To be implemented in the model and considered as a critical factor
11.	100% positive feedback	Team has to know how to escalate when necessary	The model must mention that the leader must show the escalation steps
12.	94.4% positive feedback 5.6% negative feedback	The definition of working guidelines are important for virtual teams	The model has to define the most crucial steps
13.	88.3% positive feedback 5.9% no opinion 5.9% negative feedback	Emphasising the team is one unit is important for the team in the early stages	The model must define where this CSF takes place

Table 11 Findings from the Questionnaire: Organisation stage

Table 11 shows the summary of the results from the creation stage of the questionnaire.

66.7% of the experts agreed with question 9 and felt that it is important to define the roles of virtual team members for better team cohesion. The vast majority of experts saw the definition of roles in a team as inevitable so that each individual team member must be aware of their responsibilities. 27.8% of the experts considered the definition

of roles in a virtual team to be important. One expert (5.6%) did not believe that defining roles in a virtual team is necessary. This consideration contradicts the statement by Derven (2016), whereby a virtual team has its own culture and basic rules that contribute to the formation of cohesion, and at the same, time support the team building process in the early stages. Since 94.4% of the experts considered the definition of roles to be important, confidence-building measures play an important role in the organisational stage of the V-CORPS model. Therefore, the definition of the roles in a team is part of trust building and is implemented in the model.

Question 10 summarises the experts' views towards team members complying with general project rules. This can be seen as a psychological contract between all team members among themselves and the leader. Every expert agreed that it is important to bind team members to the project rules. This aspect is thus implemented in the model and viewed as a critical factor.

Question 11 reveals that 100% of the experts believed that it is important for team members to know when to consult the leader for additional support or escalating issues. 38.9% saw this as an unavoidable issue which has to be clarified in the early stages of team building, regardless of the expert's management level. A further 61.1% saw this action as important, but not unavoidable. Therefore, the model highlights the fact that the leader has to explain escalation steps to his/her team.

50% of the experts agreed with question 12, believing that it is a very important issue, as all team members, including the leader, prefer to know each member's working preferences to ensure reliable working. 44.4% saw that this is important. Overall, 94.4% of the experts saw this definition as important, and from this, it is evident that this definition has a significant impact on team performance. 5,6% was neutral, which contradicts Solomon (2016) who explained that guidelines and structure is crucial for team interactions and it is necessary to discuss and establish operating rules. As 94.4% agreed with the findings of Solomon (2016), common work guidelines and practices play a significant role when building a team and the V-CORPS defines the most crucial steps.

41.2% of the experts strongly agreed with question 13, while 47.1% agreed, which means 88.3% believe that the responsibility for success and failures are not due to the actions of one person, but rather as a team. Two of the experts, 11.8%, either disagreed or were neutral towards this question. This contradicts Godar and Ferris

(2004) who believed that a virtual team is an interdependent unit which contains individuals who think, feel, and act together. For this reason, it is important to unify thoughts as early as possible. Therefore, this model defines where this CSF takes place.

5.2.5 Questionnaire: Relationship Building stage

The section refers to the third stage of the V-CORPS model. The experts were asked their opinions on this matter to analyse potential improvements for this stage.

Question	Outcome	Finding	Research action
Relationship Building			
14.	100% positive feedback	The experts agreed that the analysis of themselves and the team members is an important factor	The model has to show a number of possibilities in relation to the analysis while also defining which CSF this belongs to
15.	100% positive feedback	An internal fixed team agreement is important for the team	Provide defined essential aspects for team agreement in the model
16.	1. Cultural barrier 2. Language barrier 3. Communication over distance	The experts consider these points as the most critical aspects which must be overcome	The model must define ways and possibilities on how to overcome or improve them
17.	94.4% positive feedback 5.6% negative feedback	Project success depends on the importance of teamwork	Promote team cohesion and the importance of working together as a team through the model
17.a	82.4% positive feedback 5.9% no opinion 11.8% negative feedback	This is often overlooked by the leader	Outline through the model the actions of the leader in this stage
18.	1. Leader must be present in critical situation 2. Team must be able to solve a critical situation up to certain level 3. Leader must be informed about critical situation	The experts consider these aspects the way in which the leader and the team should intervene during a critical situation	The model has to outline what the leader has to do during the team building stage so that not only he but also the team will intervene during a critical situation

Table 12 Findings from the Questionnaire: Relationship Building stage

Table 12 shows a summary of the results for the relationship building stage.

The results established in question 14 show that 66.7% are convinced that leaders have to do an analysis of themselves and their team members to find a way to build trust. Additionally, 33.3% confirmed that self and team member analysis is important. The summary shows that all leaders were opened to analysing themselves to ascertain

what kind of leader they are and discover parallels with other team members. Therefore, as every expert agreed, this model outlines a number of possibilities for these analyses, while also defining which CSF this belongs to.

Every expert agreed with question 15 and believed that a fixed agreement for efficient working practice with the team members is necessary. 56.3% considered this as unavoidable, as clarifying the rules between each other during the team relationship building is crucial for an efficient team. 43.8% also agreed with this, but not as strongly as the others. Given that 100% of the experts are in favour of a firm agreement for an efficient team, this process was added during the relationship building stage of the V-CORPS model.

Question 16, which was an open-ended question, looked at the difficulties of implementing an equal treatment policy for virtual teams that work from a distance, and was divided into three factors. The first factor focused on the leader, whereby the leader needs to be sufficiently prepared and experienced to lead a team from a distance. Due to time constraints, it is often not possible to prepare and evaluate the leader efficiently. The second factor was on different cultures (mentality), which is often not taken into account and can lead to a bad impression of the manager from the team members. The challenge is to get around this and convey to the team that honest feedback from one another effectively brings the team closer together. The third factor relates to communication and language barriers that can lead to misunderstandings during the meetings and work stages. Although a basic language level is required, there are often restrictions, which leads to additional loops in the project. In addition, communication between team members outside of meetings is often avoided due to this lack of language skills. Time difference also plays an important role if a team member has no opportunity to speak to another and has to resort to communication by email. Methods and possibilities are defined in the model to manage or improve the listed aspects.

Questions 17 and 17.a compare the importance of teamwork and how often it is overlooked by the leader, and how these factors in with a project's success. In question 17, 94.4% of the experts agreed that it is important to emphasise the connection between teamwork and project success. 50% strongly agreed that this is a very important process, to be done in the relationship building stage, while 44% agreed. 5.6% of the experts were neutral on this question. Overall, 11.8% strongly agreed that

this focus is often overlooked, whereas 70.6% agreed with this statement. One expert (5.9%) had no opinion on the statement. The other two experts (11.8%) disagreed with expressing emphasis on this matter. Furthermore, 44.4% of the experts agreed that it is important to emphasise teamwork in the team building stages (Question 17), but only 11.8% of the experts believed that this is not often overlooked (Question 17a). This was clarified in the personal interviews, as it was essential to know how such an important factor for the success of a project can be so often overlooked.

Question 18, an open-ended question, had sixteen out of eighteen participating experts express how the manager does not have to intervene in a critical situation if the situation and the level of trust with his/her team members is secure. The experts believed that a leader is unavoidable in an escalating situation and must be visible to the team members, although when the team is sufficiently experienced to solve the problems themselves, the leader must only be informed. One of the experts stated that a team leader must always be in control of critical situations so that he knows how to act during further project steps. The manager must always keep an eye on the critical situations and intervene as in the first step of an escalation. The leader's intervention is important when a decision needs to be made or when team members are at odds with one another. Therefore, the most important aspects were taken and the further steps in the research actions were defined.

5.2.6 Questionnaire: Performance & Evaluation stage

This section is the fourth stage of the V-CORPS model which gathers the experience of the experts about team performance and while making analyses for further improvement. The performance stage is where the leader has to steer their team members during the project, and it is this stage which affects working practices.

Question	Outcome	Finding	Research action
Performance & Evaluation			
19.	1. Team performance results depend on and be measured by their leadership 2. Performance depends on the team also (motivated to do the task)	The experts were clear that team performance can be measured by their leadership and if the team is sufficiently motivated to do the task	These points must be considered in the model during the performance & evaluation stage, emphasising that motivation is a part of trust building

20.	team reliability = successful project performance	The experts all agreed that team reliability and successful project performance are one and the same	This point must be considered in the stage called, both in building trust and in building the team structure. The model should play a pioneering role here and give the leader sufficient freedom
21.	94.7% positive feedback 5.3% negative feedback	Consistent individual and project performance depend on communication and team structure	This aspect must be considered in the model not only in the performance stage but also in the previous stages
22.	50% positive feedback 16.7% no opinion 33.3% negative feedback	The experts were split whether or not work culture and performance comes before individuality	The model must show that it is harder to work alone than in a team
23.	1. Insufficient time to learn about new working methods 2. In acceptance through unwillingness to leave the comfort zone 3. Professional Training and reliable and easy systems	The three points stated by the experts show that time, lack of training and lack of interest are the risks for introducing new working methods.	For this purpose, the model should submit suggestions to the manager which can be used to convince the team of this and increase their motivation for new methods
24.	16.7% positive feedback 5.6% no opinion 77.8% negative feedback	Only through pressure it is possible to effectively focus on achieving specific project milestones	The model must clearly show when and what type of pressure must be put on both the team and the individual. The pressuring time must also be taken into account here

Table 13 Findings from the Questionnaire: Performance & Evaluation stage

Table 13 summarizes the answers as well as the subsequent steps of the Performance & Evaluation stage.

Question 19 was answered by sixteen out of eighteen of the experts who were convinced that the performance of the manager is measured by the results of their team. In addition, the success of the team depends on whether team members were selected by the manager and whether the team is prepared for the performance stage. One expert expressed the need for an effective evaluation tool as it can help improve a team. The majority of the experts saw the manager responsible for the formation and organisation of the team in the preliminary stage, but in the implementation stage these experts believed that the failure of a project was not due to the manager. Given that three experts (16.6%) disagreed with the statement and the remaining 83.4% either agreed, the manager's performance is measured on the results of the team members.

In view of the results, it appears that the manager is measured through the performance of the team and that the performance also depends on the team and its motivation. This must be addressed in the following steps in the V-CORPS model, as the development of a motivation is not only carried out in the performance level.

The responses to question 20 confirmed that the success of the project depends on the reliability of the team. Here 100% of the experts agreed that the correlation between the two is one-to-one. One of the experts named this correlation as one of the key factors for a successful team. In addition, an unreliable team will often fail because the team cannot ensure a proper roll-out of the project and suffers from its credibility to internal and external stakeholders. The development manager explained that reliability is based on motivation and that every team member needs to understand what they are responsible for. The Global CEO stated that due to constant pressure, workload, or bad leadership, even a successful team cannot perform at its best. In addition, like the EMEA CEO, agreed that reliability is directly related to teamwork and performance. Therefore, the build-up of reliability in the V-CORPS has to be taken into account in this stage.

In question 21, 94.7% of the experts answered in the affirmative that a logical and well-communicated team structure influences project performance. 36.8% strongly agreed with this structure and only saw the project success through this approach. The other 57.6% also found this process important. One of the experts did not agree with the notion of a logical and well-communicated team structure. As a result, communication has a significant impact on project performance. It must be made clear in the model that team performance and reliability depend not only on mutual trust, but also on communication.

Regarding question 22, the experts were rather divided in their opinions, as 50% of the experts believed that work culture and performance must take precedence over individuality. In addition, 16.7% were neutral and did not consider the correlation between work culture and performance or individuality. For the remaining 33.3%, individuality was more important than work culture and performance. The experts focused more on the aspect of what specialties each team member has and how they can best use each team member to achieve their best performance. Therefore, these experts choose a different way to achieve the best performance of their team members to improve team cohesion and the trust aspect of team members. Since the breakdown

here was unclear, this aspect was further explored in the interview to answer this question in further detail.

Question 23 was answered by 16 of 18 experts, and their answers can be categorised under three distinct subjects: lack of time, lack of training, and dissatisfaction.

In the first category, most of the experts stated that insufficient time was given for team members to become familiar with new methods. This is particularly the case if the method is complex and needs to be tried out while team members get used to the new method.

The second category, 'lack of training', was one of the main concerns of the experts, as they viewed a lack of training for virtual teams and leaders especially worrisome. People must be adequately prepared for virtual work with the support of an IT system infrastructure. In addition, as the Product Manager mentioned, the new methodological systems must be adequately explained and understood. In this case, a test after training and a helpful method where the trainer can see based on the results would enable a clear path for the participants. Moreover, the experts stated that a leader who is not fully trained in the new method often becomes problematic when they try to use what has been learned in the working environment. Therefore, it is important to have good professional training, communication, and strong management for the introduction of new methods.

The third category refers to the dissatisfaction often experienced by team members. The COO of the EMEA region stated the response “We have always done it this way” is mostly said by people who want to stay within their comfort zones and are not flexible or open to changing their working methods. As the Global CEO outlined that people do not want to adapt to a new system.

Considering these three aforementioned categories, it is important that the leader shows the team new working methods and sends them in addition to training courses where the advantage of the method is presented.

Question 24 referred to the avoidance of team pressure. 77.8% of the experts disagreed with this statement, and they believed that only through pressure it is possible to reach the effective work results from the team members. One of the experts (5.6%), had no opinion on this statement. The remaining three experts, of which 11.1% agree and 5.6% strongly agree, do not believe in applying pressure to their teams. This

being the case, they do not put pressure on team members for the team members to reach their tasks more effectively. The majority of the experts decided to build up pressure on the team, although this has been better defined in the interview stage.

5.2.7 Questionnaire: Sign-off & Closure stage

This section focuses on the fifth stage of the V-CORPS model and gathers the experience of the experts regarding sign-off and closures, in addition to analysing the fifth stage of the model. The first question asked was “Are there any other important CSFs?”.

Question	Result	Finding	Research action
Sign-off & Closure			
25.	100% positive feedback	Project closure meetings build trust and motivation for further projects	The model has to provide suggestions on how to create this meeting and also influence team leader behaviour
26.	88.9% positive feedback 5.6% no opinion 5.6% negative feedback	It is important to have a good relationship with the team members after the project	The model must provide assistance here during this stage for the leader
27.	66.7% positive feedback 33.3% negative feedback	A feedback session on lessons learned provide a strong base for improvements in future projects	The leader should be guided through the use of the model here to make the meeting constructive and avoid hostility
28.	94.4% positive feedback 5.6% no opinion	It is important that team members feel valued after the project	Mutual appreciation must be the goal of this stage

Table 14 Findings from the Questionnaire: Sign off & Closure stage

Table 14 summarizes the answers as well as the subsequent steps of the sign-off and closure stage. The experts responded positively to all statements.

Question 25 referred to the final meeting, and all experts believed the final meeting is an important process to motivate the team and build on their trust. 66.7% of the experts saw this meeting as unavoidable, as having a last discussion with the team about the positive and negative aspects of the project is always needed, while also discussing what could be improved in the future. The remaining 33.3% of the experts also agreed that a final conversation was needed but see this closure meeting not as important as the previous experts. The resulting improvements have a positive effect on team members as everyone contributed and participated in the improvement. Turner (2014) believes that future improvement in team performance can only be achieved through

the knowledge gained from past activities (learning from past projects). For this reason, the sign-off and closure section is included in the V-CORPS model to improve future collaboration in the virtual teams.

In answer to question 26, 88.9% of the experts responded positively, while 33.3% of them saw this as a very important aspect to have a good relationship with team members, as this shows an appreciation for team members. Additionally, 55.6% saw a good relationship with team members as significant. The other two experts (11.2%) saw the relationship status differently. One of the experts (5.6%) was neutral towards this relationship. The other expert (5.6%) did not agree with this statement. The promotion of a good relationship after the end of the project was seen as important, which was confirmed by Hill and Bartol (2016) since the promotion of good relationships between team members has a positive effect on collaborative context, therefore the working atmosphere in a virtual team is also relaxed and motivates members to be helpful towards other team members.

In question 27, the experts saw this as an inevitable step that is necessary to improve the performance of team members in the future. 38.9% of the experts were convinced that this feedback session was the basis for improvement in future projects. An additional 27.8% of the experts also thought that it was important to have this session, but they did not see it as an unavoidable process. They considered this session as an improvement process but are not 100% convinced that this would be the basis for the future projects. Moreover, 33.3% of the experts felt that this session provides no improvement for the future. 11.1% of them see this session as unnecessary and that this session adds no benefits for future projects. Furthermore, 22.2% disagreed that this session created a strong base for future projects. The rejection of this session also contradicts the fact that providing team feedback on stages that have gone well and commitments are important actions for building trust for existing and future projects (Duckworth, 2008).

Question 28 showed that the majority of experts are convinced that showing appreciation after leaving a project is an important factor for improving project performance, which is given importance in the V-CORPS stage. 94.4% of the experts responded positively. 38.9% were absolutely convinced that they valued the feelings of their team members after the project has closed. In addition, 55.6% of the experts agreed with the feeling of appreciation after leaving a project, but they did not see it as

important as the previous experts. Only one of the experts (5.6%) had a neutral stance on this topic.

5.2.8 Questionnaire: Conclusion stage

Question	Outcome	Finding	Research action
Conclusion			
29.	1. Will to succeed 2. Focus on Diversification 3. Counteract egoistic behaviour	The stated points are seen as additional CSFs.	It must be clearly assessed here whether these points already belong to the CSFs as mentioned or are really new.
30.	88.9% positive feedback 11.1% no opinion	The CSFs are important for a successful project in the automotive industry.	The CSFs must be analysed after the interviews if they cover all of the mentioned points of the experts.

Table 15 Findings from the Questionnaire: Conclusion stage

Table 15 summarizes the most important aspects that contribute to the CSFs at the end of this survey.

Question 29, which was answered by thirteen out of eighteen of the experts, explained the additional aspects that should be considered when building a team. Although aspects such as team commitment, openness, respect, courage, focus, personal motivation, and the promotion of teamwork can all be incorporated into the existing CSFs, the characteristics are specifically targeted, and individual team members should be approached individually to achieve the best performance. All experts put the primary focus on the leader. This means that a successful team can only be formed and led by someone with leadership qualities. In addition, this person should ensure that aspects such as authenticity, truthfulness, open-mindedness, and a lack of egoistic behaviour of individual team members are covered as much as possible, so that they have a solid foundation for a successful team. As suggested by the COO EMEA, the leader should also focus strongly on team diversification, which in turn means that the selection of different teams promotes success and creativity in team development.

In question 30, the majority of the experts (88.9%) considered achievement of the CSFs to be essential for the success of the project. In addition, 38.9% see it as important to pay attention to the CSFs, but not as critically as the majority. From this, it can be deduced that the perspectives of the experts, coupled with their experience, suggests the CSFs can be taken as of clear relevance to be used across all stages

with the stages of the V-CORPS model. Two experts (11.1%) had a rather neutral attitude towards the CSFs. In summary, the CSFs are important from the perspective of the experts and were further expanded upon during the interview stage.

5.2.9 Summary

The evaluation of the questionnaire in this section gave a clear picture of the views of the experts for challenges, and obstacles of virtual team building and leadership in the automotive industry. The evaluation of the responses to questions in the individual stages of the V-CORPS model enabled the definition of the role of a leader in a team to be clarified, as this is mainly measured by the success of the team. In addition, it also became clear that secondary aspects such as capacity bottlenecks and time-critical projects can lead to poor project results. The answers in the questionnaire also highlighted how strongly the experts felt their duty towards their team members and their main role in a functioning project. Overall, it can be said that the experts showed a keen interest in the V-CORPS model, and this provided a basis for subsequent discussion in one-to-one interviews, based around six open questions, as detailed below.

5.3 Interview findings

5.3.1 Introduction

The interview responses are analysed in this section. The analysis of the responses provided a better understanding of the experts' needs and requirements on this topic. The aim was to identify the challenges of virtual team building and leadership in order to take them into account when creating the model and to facilitate their outcomes through the application of the model.

The experts evaluated the V-CORPS model by going through the individual stages and expressing their views and experiences. These were additionally entered into the V-CORPS model to complete the existing CSFs in the sections and analyse them in the follow-up, with the aim of sustainably improving the team building and leadership process.

5.3.2 Interview: Introduction stage

In the introductory stage of the interview, the expectations of the interview partners regarding the V-CORPS model were determined.

According to the European CEO, the V-CORPS model could be used as a checklist that offers leaders a basis on how they can deal with the stages of team building and leading. According to the Global CEO, the automotive industry itself is one of the most complex industries due to its diversity. It therefore makes sense to introduce structures and standardisations to make working life easier by providing leaders with a framework (through a model such as V-CORPS), and then allow them to develop freely in the further steps of team building and leadership. The Vice President of Industrial Development reiterated that such a model can be used as a kind of yardstick by which the leader can measure his perspective in each stage. Several Heads of departments also see such a model as indispensable for working across multiple locations and for harmonising these processes. In addition, the experts generally saw the importance of such a model and believed that it should be used by both the experienced, and especially, by the less experienced leaders. According to one Department Head, the use of the V-CORPS is dependent on the success of the project. The Product Manager made this clear by stating that such a model can counteract the avoidance of various criteria during team building and leadership. This model can be particularly useful in critical situations if the project has stalled, and the leader can investigate the cause with the help of the guide.

All experts agreed that such a model has a positive effect for virtual team building and leadership. The Industrial Representative confirmed that using the V-CORPS model would save time, make work easier, and could potentially avoid additional risks and critical errors in team building (e.g., due to skipping stages or insufficient processing). Above all, new leaders would develop a better understanding of group formation and internalise processes from the start. The Head of Innovations confirmed that leaders will initially be trained to create clear structures in team building and that this will result in a standardisation of working processes, while also enabling working practices with personal freedom. The Product Certification Manager confirmed this statement, proclaiming that by using such a model the efficiency of the leaders and team members would increase. Additionally, as mentioned by the Vice President of Industrial Development, the V-CORPS model provides a strong base for virtual leading and encourages leaders not to act on emotions. Generally, the experts' expectations of the V-CORPS are that it serves to support and set directions for virtual team building and leadership, while not limiting or restricting leadership.

The following question concerned the experts' expectations regarding the improvement of working methods, sustainability, and performance through the use of the V-CORPS model.

In terms of working methods, the Head of Product Development expects the V-CORPS model to create clear and understandable processes, thereby creating an increase efficiency in the team. This was also confirmed by the Head of Product Innovation, where he equates improving working methods with optimised processes. The Agile Coach regards the V-CORPS model as a supportive measure, whereby the leader generally needs to have a certain basic understanding of team development. This makes it possible for the leader to find the appropriate tool for team management individually for each stage with the help of a model to improve working methods, as he uses the suitable method at the relevant moment. The Vice President of Industrial Development was in favour of using such a model to remain organised, act, react, and adapt more quickly to each situation or changes. In addition, he sees that the automotive industry has to be more creative to avoid costs, and the use of an adherence to working methods play a crucial role in this. Therefore, he believes that such a model can help to increase efficiency. The Project Manager described the model as a kind of “cheat sheet” which will help to improve or optimise the working methods, since a leader can pinpoint precisely where an improvement in a team must be given at each individual stage.

The COO EMEA saw sustainability through the use of the V-CORPS model as a support to counteract employee personnel changes through better leadership and the structuring of a team. In addition, the Vice President of Industrial Development explained that leaders should learn how to convince their team members to feel that they are part of a unit. The Vice President of Business Development made it clear that the guideline puts the team in the foreground, so the leader must promote the way of working together so that it is mutually beneficial for the employees while promoting team spirit. In addition, according to the Global CEO, the model should show the balancing act between freedom and the border of the team, and this should also be given to the team in the appropriate amount to not restrict the freedom of each team member too much.

Nevertheless, the European CEO made it clear that the model helps to build sustainability, although it still depends more on the leader and the team as a whole.

The Vice President of Industrial Development also underlined this by saying that the model alone cannot prevent employee fluctuation, but still offers a good starting point for the appropriate way of working in the virtual world. The Industrial Representative added that the communication barriers among team members can be reduced by using the V-CORPS model and that one can therefore expect an increase in the independence of a team. The Head of Innovation described the model as a performance-enhancing measure, as one moves away from old values and habits and takes new, more efficient ways to work effectively with one another.

5.3.3 Interview: Creation stage

In the creation stage, the context of team building was discussed with the experts to understand the essential aspects of team building and general working life.

The experts were therefore asked to select what they considered to be the most important stage out of three stages of creation, organisation, and relationship building, as well as justifying this choice. 33% of the experts considered the creation stage as the most important stage. According to the Director of Development, the Senior Sales Manager, and the Agile Coach, if an error is made during the creation stage, these errors will persist until the end of a project.

However, these errors can be minimised if care is taken during this stage. The COO and CEO EMEA replied that the selection of team members is difficult for any leader, although if chosen correctly, the following stages require less interaction from the leader. The Director of Development added that faults during the creation stage can be compensated for by employing additional team members in the following stages, but these faults can rarely be fully corrected in this way. The Agile Coach believed that it is unnecessary to design the creation stage face-to-face, but it is important to approach team members with basic trust and expect this in return. The Vice President of Industrial Development felt that leadership is 90% responsible in this stage, as the course is set at this time for building trust and the working methods for the team determine how they should work together. Moreover, the Development Director emphasised that in this stage you can not only remove the bias of team members, but also prevent long-term rivalry, tension, and one upmanship.

By contrast, 28% of the experts considered the organisation stage as the most important stage. According to the Head of Project Management and the Project

Manager, an excellent organisation stage can often achieve the required performance, as it is essential that everyone knows what to do, rather than what everyone can do well with each other. The Global CEO stated that if everyone in the team knows their task, and the role allocation through the organisation stage is clear, then no further clarification loops are necessary. He also stated that team members need to know their responsibilities for them to work as a team. The interviewed Project Manager stated that a well-coordinated team with poor organisation tends to lead to poor performance, whereas a badly coordinated team with adequate organisation leads to a better performance. In addition, the Head of Product Innovation added that if a team's organisation is well organised, the leader not only has an overview of the project but also of the team, therefore identifying deviations more quickly. The Product Certification Manager sees the organisation stage as a system where boundaries are defined, which he finds crucial for team building, as setting boundaries grants the team its freedom.

39% of the experts saw relationship building as their primary focus when building a team. The Vice Presidents explained that this is the most difficult stage after which the leader has to rely on their team. It was reinforced by the Industrial Representative by reporting that with this stage starts in the operational and that creation and organisation are involved. Moreover, the experts saw it as a priority to gain trust from the team members, which makes their statements only possible through good communication. According to the Project Manager, it is essential for this stage to take precedent, as the success of the project depends on it. The Vice President of Business Development believed that efficient work is only possible through a good basis of trust, which is only possible through excellent communication. The Head of Product Innovation said that when strangers meet, it is important that you do something together and bond.

In addition, the Industrial Representative added that the communication itself from the leader, and among each other, should take place horizontally on the same wavelength and not from above. The Project Manager and the Head of Innovation saw both the project success and the project performance as being dependent on establishing relationships. The Product Manager outlined that in the first two stages (creation and organisation) the leader does not have much scope for personal development. Therefore, the relationship stage is the only stage when the leader has a freely decisive role.

Only one expert, or 6%, believed that the creation stage has the greatest impact on the fourth stage of the model. The Project Manager justified this by stating this stage enables the selection of team members, thereby creating better team composition and performance as a result. If team members are deployed according to their strengths and weaknesses, they are generally more satisfied and perform better. Furthermore, if the team has a solid basis of social coordination due to this selection, which only needs to be underpinned by the leader, this can gain a certain degree of harmony in the team.

22% of the experts felt that the organisation stage has the greatest impact on the performance stage. The Senior Sales Manager saw it as crucial, that every team member has to understand their task. He saw it as the task of the leader to ensure that the goal and the tasks are clearly defined, understood, and above all accepted. This was also confirmed by the Head of Product Innovation when he stated that through the organisation stage, there are clear processes, and it is the ideal way to generate a good performance. The Global CEO added that it further depends on how ambitious the team is and what cultural differences there are in the team, so that the leader can organise this. The Head of Product Innovation sees the organisation stage as one that keeps the team in balance and that should also take social behaviour among each other into account during this stage.

67% believed that relationship building has the greatest impact on the fourth stage. The Vice President of Business Development said that it is not possible to undertake a project without clear structure and organisation, although if there also is no mutual trust, the team's ability to adapt to new or unexpected situations is rather difficult. The CEO EMEA added that the relationship stage shows how committed the team members are in the performance stage, as it is critical for a team to work together, as an individual cannot represent the team. The Product Certification Manager even cited this as a key factor for team members to work together in harmony, and that a team must know that it is essential to work as one unit. According to the Head of Project Management, relationship building is what underpins the organisation stage and that there can only be a good performance if there is good chemistry. The Vice President of Industrial Development added that if the team does not follow the leader, then the leader cannot collaborate well either, as it is crucial to ensure that the team has the

appropriate tools and the necessary resources. In addition, he said that only a good relationship with one another creates good team performance.

The Industrial Representative shared the COO EMEA's view by explaining that the better the relationship building stage is when completed, the better the performance stage will be in the team itself, as this results in a higher exchange of experience, more trust, and a better utilisation of team resources. The experts saw that a good team performance is 80% dependent on the leader, since ultimately only the leader has the overall overview of the project. In addition, it was discussed why in the expert's opinion one-third of all experts interviewed in the questionnaire disagreed with the statement that a manager should present new innovations in communication technology to the team. The Head of Product Innovation, the Project Manager, and the Senior Key Account Manager also confirmed that in this case the managers tend to stick to old systems and believe that one should work according to the structure according to which it has always worked. This was also backed up by the Industry Representative, in which he said that the executives are doing this to maintain standardisation.

The Development Director and the Agile Coach added the factor of delegation by explaining that the leader does not want such an introduction of an innovation to come as a top-down delegation, and thus the team becomes less motivated. In addition, concerns were expressed from the Vice President of Business Development, the Industry Representative, and the Project Managers, saying that introducing such systems would cause a loss to efficiency, as well as unexpected risks due to a hypothetical new system, and according to the Project Managers, leaders usually have neither the time nor money to invest in new technology. Both the CEO EMEA and the Global CEO believed that managers do not have the core knowledge to introduce such systems, and one should get the help of an external specialist, as also suggested by various experts. The COO EMEA believed that leaders do not see this as their responsibility and are not usually interested in helping their team members to expand their knowledge against various software platforms. The Vice President of Industrial Development believed that a typical leader would fail to lead teams from a distance if the leader does not accept changes to working life.

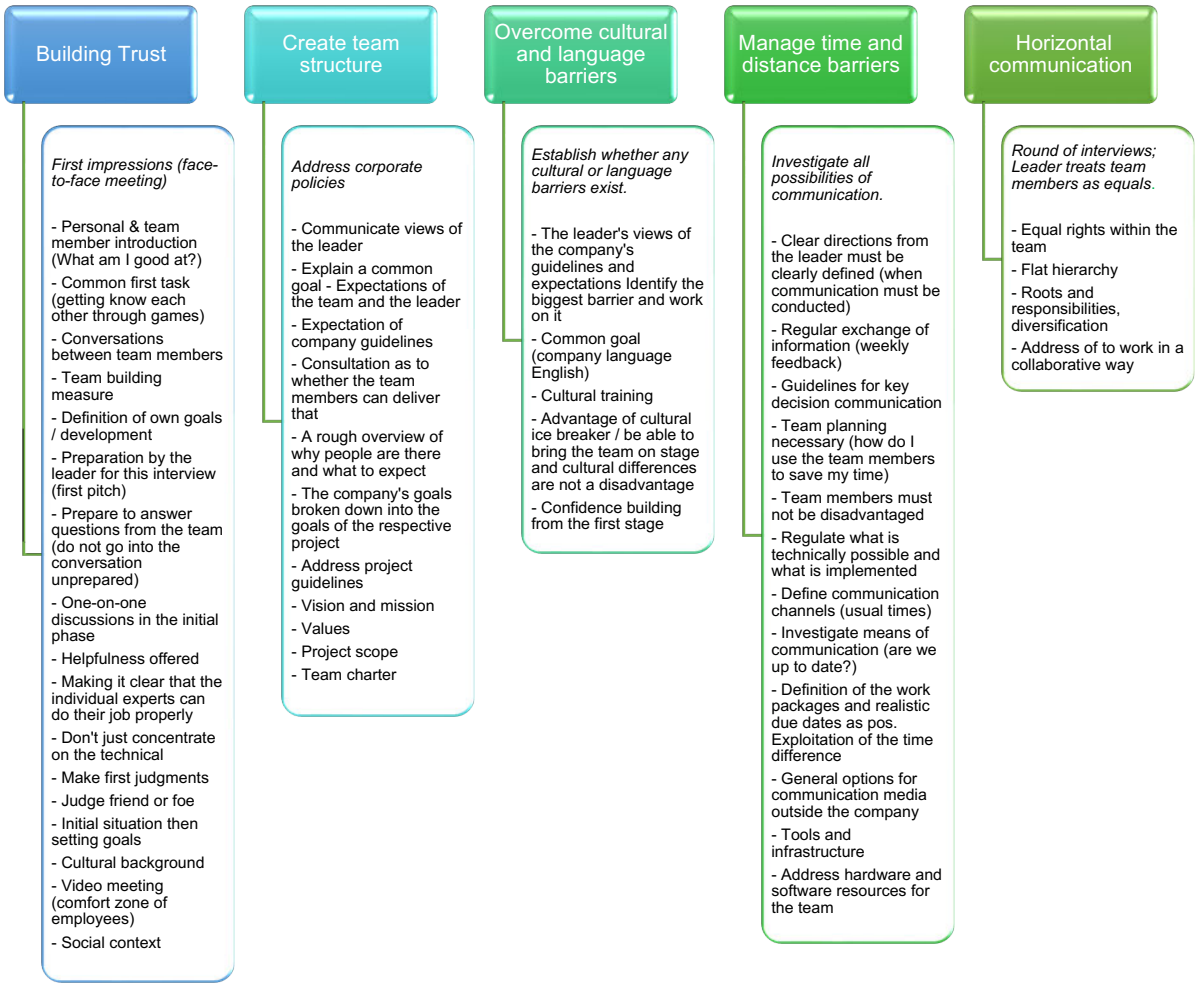

Figure 19 Development of the CSFs for the Creation stage of the V-CORPS model

Figure 19 shows the additional comments made by the experts concerning the individual CFSs in the creation stage. The phrases in italics, which were taken from the literature review were presented in the interview and the experts occasionally gave additional aspects which were important to consider. The figure gives some indication of the relative importance attributed to building trust and overcoming time and distance barriers, creating team structure, avoiding cultural and language barriers and horizontal communication in the creation stage of the model.

5.3.4 Interview: Organisation stage

In terms of the organisation stage, the experts were asked why management tends to focus more on organising project activities than on the team.

All of the experts stated that it is generally assumed that team members are sufficiently professional to work together. The Global CEO confirmed that it is often a requirement of the team that they are able to work together. This was also backed up by the COO EMEA by saying that there is an expectation of professionalism on the part of management that adult people can work well together. In addition, he added that the leader is measured by the success of the project and as a project is measurable by its success, this factor is taken into consideration first. The Vice President of Industrial Development believes that cost plays a decisive role since projects are often started with a small budget. As a result, the leader has no choice but to do what is possible with the existing team.

The EMEA CEO added that organisation is a construct which must focus only on measurable aspects (achieved performances), implying that team organisation is generally not as important. He confirmed that in everyday work, only goals and interactions are usually defined, with the aim of allowing freedom for one's own creativity. He also emphasised that this means working hard with coordination, with a consensus among the leader’s team members. However, a leader usually lacks the required time to do this. The Vice President of Business Development also shared this view, saying that it is usually easier to concentrate on the organisation of the project than on the team. In addition, he sees the organisation of the project as a mechanical work order that is easier to implement. In general, it is due to the view of the company guidelines, because there the focus is on the processes. However, in the long term, he sees a turnaround on increased flexibility in the automotive industry, as the processes are so tightly designed that individuality is lost as every person involved becomes too tied to the processes. However, he also believed that this process rigidness is rather counterproductive, as the processes are too tight to allow the team to react quickly to changes in the course of the project, thereby failing in the long term.

These views of top management are shared by both line management (the Project and Product Managers) and middle management (the Senior Sales Manager, Industrial Representative, and various Heads of departments). In addition, the Industrial Representative believed that team organisation often faces a delta gap in every project, and that the leader is used to being the one who has managed it. This was also confirmed by the Head of Innovation, who said that team organisation is lost due to performance orientation and usually remains as a side effect, since reaching

milestones has top priority. Moreover, the Project Manager added this often happens when clear project goals have not been defined and one does not wish to report back to a team with half of the required information. Once this is done, the project is at an advanced stage and there is little time to organise it properly.

According to the Development Director, a project structure is the guarantor for the success of the project. Nevertheless, he sees that such a neglect of team organisation also has detrimental effects if the introduced structures are not grasped well, and top management must intervene and operate via micromanagement. This in turn consequently affects one's own competence in front of team members. The Agile Coach confirmed that executives usually tend to intervene to overcome disharmony within a team, therefore if one does not concentrate on team organisation, and if it is not controlled by the manager, a team cannot work together well. In general, the Project Manager felt that management is taught from the outset (during studies) to concentrate on the task and not on the team. In addition, management often lacks the foresight that team building/organisation is an investment that increases performance. According to the Senior Key Account Manager, this non-consideration of organisation can be prevented by checking the team members' ability to work on the project during the project acquisition phase, when the acquisition team is involved.

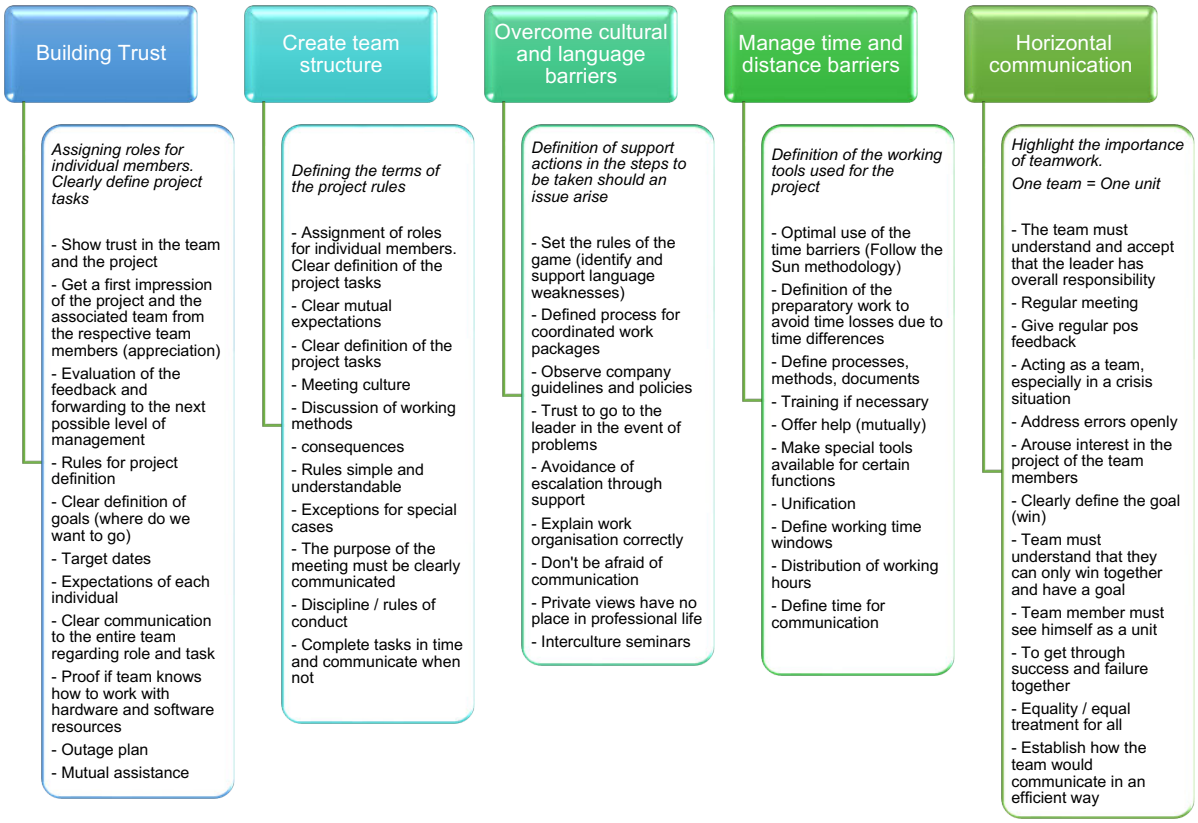

Figure 20 Development of the CSFs for the Organisation stage of the V-CORPS model

Figure 20 shows the additional amendments made by the experts of the individual CSFs in the organisation stage. The phrases in italics, which that were taken from the literature review were presented in the interview and the experts occasionally indicated additional aspects that were significant. The CSF which received the most comments was horizontal communication, followed by building trust, creating team structure, overcoming the time and distance barriers, and finally the avoidance of cultural and linguistic barriers.

5.3.5 Interview: Relationship Building stage

In this stage, it was important to understand if skilfully building up pressure increases or even improves the reliability of team members. The build-up of pressure on the team is setting tight deadlines with ambitious goals, constant reporting by the team to the leader, and constant review of the project's progress in comparison to the goals and specifications set. This leads to an increase of the stress factor on the team and thus a faster processing of the tasks is expected.

Some experts took the view that the pressure exerted tends not to help. The Director of Development confirmed that the pressure generated in the team means that the

team members will look for a way out of it without having to deal with the work. In addition, the Project Manager added that under pressure, all team members work under constraint. The Head of Innovation suggested here that regardless of how cleverly the pressure is built up, the team will be aware of this, which leads in most cases to demotivation. In his experience, dysfunctional teams can occur if the manager builds up pressure clumsily. The Project Manager agreed, stating that the leader has to convey the importance of the task to the team in such a way that the team members do not feel under pressure and are self-motivated to perform. The Product Certification Manager sees the build-up of pressure as a potential means of improvement; however, this pressure will not be sufficient to fix or avoid certain project errors. In his opinion, it is better to apply more pressure on team motivation to see transformations, as this is a proven means of improving success.

The Head of Innovation reported that leaders teach themselves a substantial amount on their own, but this comes at the expense of resources and customer trust. He stated that most leaders are usually burned out, which in turn may mean the loss of an employee for the company. In addition, this was confirmed by the Head of Project Management by saying that regardless of experience, everyone must reach a level where they have achieved an understanding of the task and the team so that they can start their work. Furthermore, he added that failure to prepare usually ends in uncertainty, inadequacy, and often leads to incorrect decisions. This unpreparedness also leads to gaps in a leader's expertise, which has an impact on the company and the team, which can lead to catastrophic consequences under certain circumstances.

Furthermore, the Industry Representative took the view that every team leader needs a concept for team building and leadership before starting the project. The Product Certification Manager explained that the required time for the concept generally depends on the experience of the manager. In general, several Project Managers gain increasing experience in the working world and the training of the manager is often neglected, especially if their superiors themselves lack experience. Such a thing is never admitted but leads to the fact that the leaders are self-taught, and this can lead to undesirable consequences under certain circumstances. In addition, one of the Project Managers said that, as a rule, no time is spent on it, but the expectation of upper management is that the leader will take control of relationship building himself.

One of the interviewed Project Managers believed that higher management mainly focuses on getting things done on time without asking why something does not work. In his experience, insufficient preparation does not fully utilise all human resources to avoid errors in the project, especially when changing from local to global structures. The COO EMEA made it clear that the support structure of the company is mostly lacking when providing support for the leader. Therefore, he added that every manager needs preparation time and that this is often underestimated by companies. The Project Manager confirmed that tasks are only delegated and not asked whether aids (in the form of training) are necessary. Therefore, it would be an advantage if there was a supportive training offer for one to fall back on if necessary. In general, all Project Managers reported that without preparation for leadership at a distance, good performance cannot be expected. As the Product Manager added, leaders at each level need to be trained, especially in the early stages of team building so that they can develop a better understanding of the team.

The CEO EMEA stated that it is very important for leaders to be trained in a functional team structure, since it is very difficult to lead team members in a non-disciplinary management style. In addition, he believed that managing virtual teams is often underestimated as there is insufficient training, and globalisation has forced companies to rethink their working practices. The Agile Coach confirmed that professional support (e.g., through an external coach) makes sense, as a coach gives the leader time for self-reflection and to understand their mistakes. He also believed that it is important for leaders to be generally trained on a continuous basis (every two to three years) so that they can broaden their horizons and correct the mistakes that are not noticed in working life. The Vice President of Industrial Development and the Director of Development are of the same opinion and felt that leaders should be trained to work in a different environment, since the leader must act and react well as a leader, especially when leading from a distance. However, since hardly any time is invested in the training of the leader, the latter runs the risk of having a negative impact on the team due to a lack of education and damaging the relationship with the team. A guide in the form of a model would therefore be a sensible solution. Nevertheless, the Project Manager added here that it is important for an inexperienced leader to not only familiarise themselves well, but to also be accompanied by experienced leaders so

that in case of doubt, one can react at the necessary time. Nevertheless, he sees the guide as helpful for supplementing additional training.

In the further course of the interview, the company's compensation measures for an inadequately prepared leader of virtual teams were discussed.

First and foremost, the experts believed that the company itself must compensate for an unprepared leader via higher resource allocation, which typically involves more team members and a higher budget. Moreover, as the Industry Representative, the COO, CEO EMEA and CEO Global have uniformly said that higher-level management can play a supporting role by supporting the leader in his tasks and keeping him on track. According to the COO, this is the first and easiest section to handle, as it is in the interest of the superordinate manager that his leading team member does a good job, since the superordinate manager has to answer for him at top management level. The CEO EMEA also added that under certain circumstances it is possible to receive support from outside or call-in colleagues with greater experience or, in case of any doubts, change the team. The Project Managers, the Senior Key Account Manager, the Product Manager, the Agile Coach, the Head of Project Management, and the Vice President Business Development all believed that the leader could be led by the team. These harbours a risk of escalations, as in the experience of the Project Manager, adherence to the schedule is not guaranteed and this damages a leader’s reputation.

The Vice President Industrial Development explained that the leader has to present a degree of willingness to change, which in most cases is easier for young executives, as they are usually more sufficient and willing to work collaboratively with team members. In addition, the Project Manager explained that through more intensive communication between the leader and the team, gaps in the knowledge of the leader can be worked on and compensated for. Nevertheless, the leader must also bring in additional effort during the critical initial / transition phases so that the performance of the team does not suffer. However, another Project Manager and the Head of Product Innovation saw that such compensation is not possible, as these risks losing the trust of colleagues, top management, and customers. This in turn inevitably damages the company's reputation, impacting overall team motivation. According to the Director of Development and Vice President of Business Development, in the worst-case scenario, a leader will be changed when he has burned out and can no longer be useful for the company.

When asked whether inexperienced leaders are able to lead virtual teams at a sufficiently high level, almost every expert answered negatively.

Both the Senior Key Account Manager and the Global CEO reported that it is entirely possible. However, for this purpose the inexperienced leader must be self-disciplined, absolutely organised and exude a personality, which is usually very rare. Moreover, such leaders should be given a certain amount of trust so that they can maintain a high level of efficiency and also bring projects to their destination. The Project Manager judged this based on their experience and confirms that inexperienced leaders have a good grasp of comprehension and communication, which generally benefits projects. However, this was denied by the other experts, as maintaining a high level is only possible through experience. The Head of Innovation added that such a leader is rather the exception, and that high level management can usually be blamed in the event of a project's failure. Nevertheless, the other Project Managers, the Product Manager and the Agile Coach believed that an inexperienced manager could lead the team at a rather low level, as this is compensated by more external work. One of the Project Managers who found himself in such a situation also reported that it was very difficult to establish communication between different mentalities. A counteraction could only take place through an on-site presentation and an additional escalation spiral.

Nevertheless, the Product Certification Manager and the Head of Project Management spoke out in favour of the fact that there was no inexperienced person for such a required performance, as team members demand from a leader a certain level of competence and experience. These statements were supported by the Vice President of Industrial Development and the COO EMEA, further clarifying that an inexperienced leader is not prepared to lead a team virtually, as a leader needs certain prerequisites and a variety of experiences for this kind of leadership. The Vice President of Business Development and the CEO EMEA confirmed that an inexperienced leader can only lead such teams to a limited extent or below the expectations of upper management, as such leaders often do not have the correct skills in this regard. The Project Manager would almost rule out a high level here, as basic experience, preparation, and self-assessment are required.

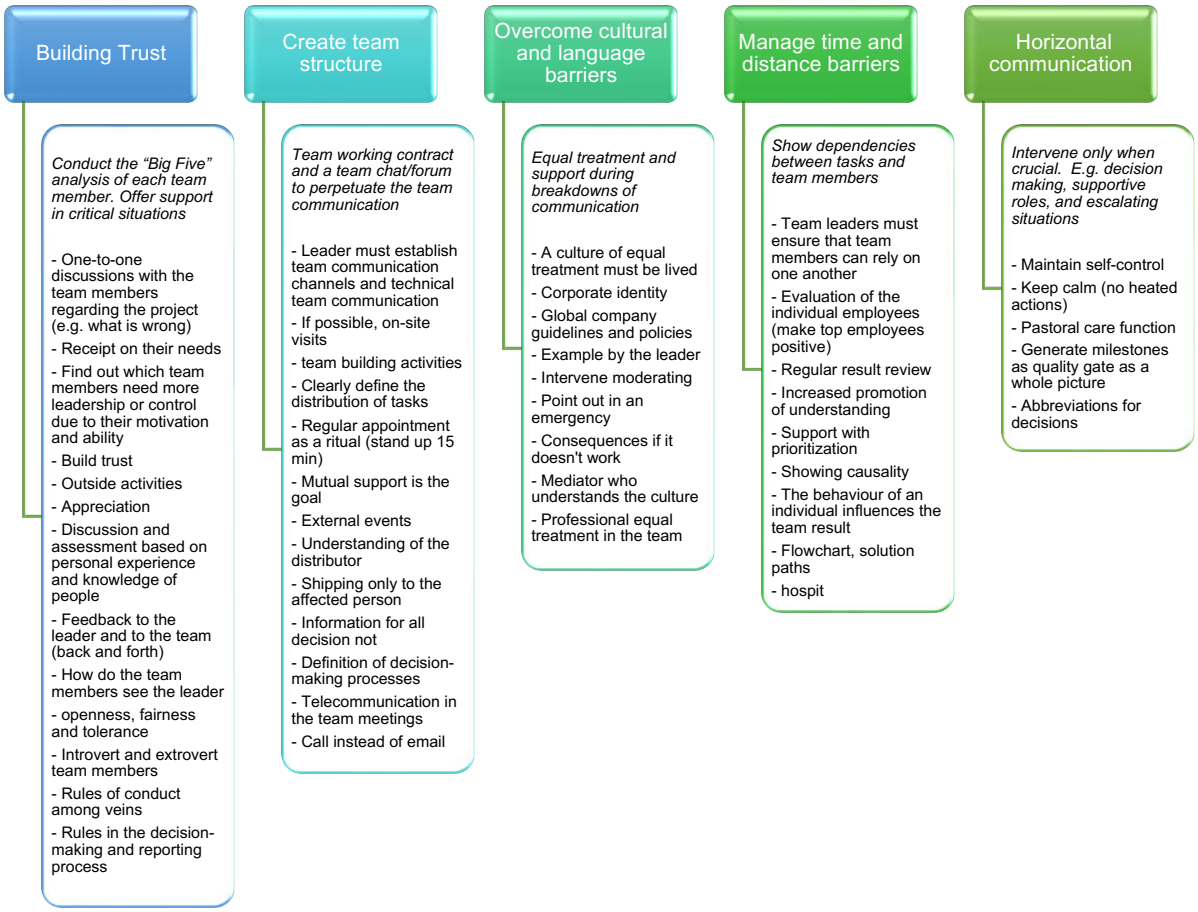

Figure 21 Development of the CSFs for the Relationship Building stage of the V-CORPS model

Figure 21 shows the additional amendments made by the experts of the individual CSFs in the relationship building stage. The phrases in italics, which were taken from the literature review were presented in the interview and the experts occasionally indicated additional aspects that were significant. The section which received the most comments was on building trust, followed by creating team structure, avoiding cultural and linguistic barriers, overcoming time and distance barriers, and finally horizontal communication.

5.3.6 Interview: Performance & Evaluation stage

In this stage, it was important to understand if skilfully building up pressure increases or even improves the reliability of team members.

A part of the experts generally said that the pressure exerted tends not to help. The Development Director confirmed that the pressure generated in the team means that the team members will look for a way out of it without having to deal with the work. In addition, the Project Manager added that under pressure, all team members work

under constraint. The Head of Innovation suggested here that regardless of how cleverly the pressure is built up, it will be noticed by the team, and this leads in most cases to demotivation. In his experience, blockades or even sabotaged teams can occur if the manager builds up pressure clumsily. The Project Manager agreed, stating that the leader has to convey the importance of the task to the team in such a way that the team members do not feel under pressure and are self-motivated to perform. The Product Certification Manager sees the build-up of pressure as a potential means of improvement; however, this pressure will not be sufficient to fix or avoid certain project errors. In his opinion, it is better to apply more pressure on team motivation to see transformations, as this is a proven means of improving success.

The remaining experts believed that the steady build-up of pressure can be used over certain stages. The Industry Representative confirmed that skilful pressure build-up increases performance and reliability and that a manager must have suitable knowledge and excellent instincts of the team to convey this. The Product Manager confirmed this but added that pressure can only increase motivation depending on the situation, because with such a build-up of pressure, this runs the risk of the team giving up. Two Project Managers added that skilfully building up pressure is only helpful if the team has sufficient rest periods. The leader must be aware of how often the pressure medium is used, since improper handling of pressure can have a negative impact on team performance, as team members often become ill or lack motivation. Another Project Manager added that pressure is only passed onto the team to a certain extent, and it is better to convert it as a target.

The rest of the experts all saw the build-up of pressure as critical in the long term only. The Project Manager even saw the build-up of pressure as necessary to maintain a certain level of performance, so that the other team members are made aware of the reliability of the work done. The Global CEO confirmed this handling of teams by saying that it is important to let team members work in the orange area so that they are efficient and not bored or overloaded. In general, he believed that it makes sense to pass on the pressure in a healthy manner, since visions and targeting can often work wonders in team reliability. The COO EMEA and Vice President of Industrial Development added that too much pressure can cause wear and tear in the team, and it is better when the leader must express pressure positively and fight against it with the team, which will be positively accepted by the team. The Agile Coach also reported

that by building up pressure, the team can be increasingly advised on the importance of the task, which then develops a higher sense of reliability. The Head of Project Management believed that the leader should communicate to the team the importance of the task. Both saw that pressure has to be filtered and passed on indirectly or hierarchically to avoid small wars among the team. The CEO EMEA and the Vice President of Business Development saw the build-up of pressure useful for only a short period, since in the medium or long term there is general team exhaustion. In addition, it is important for reliability that pressure is applied selectively over a short period to obtain positive results. The leader needs to understand how to pass pressure on because if the barrier is too high for the team, employees will no longer follow the leader.

During the course of the interview, increasing team performance through the skilful build-up of pressure was discussed with the experts.

The Vice President of Industrial Development denied that this is usually possible through a clever use of built-up pressure. He then added that such behaviour on the part of the leader will not have a positive effect on the team, because the leader will sometimes not know how to build positive pressure on the team, which in turn will lead to demotivation. The Senior Key Account Manager also believed that it cannot make a helpful contribution to team performance, as it often only needs a single team member to act as a brake, which in turn leads to a disbalance in the team, and thus to negative performance. According to the Director of Development, the goal of the leader should be to look for solutions to problems together to then define improvements, and not to harass team members. The Project Manager and the Head of Innovation also saw the positive effect of pressure only if it is exerted positively and in the form of an explanation.

The Industry Representative took a different view, saying that the skilful build-up of pressure promoted the team members' understanding of the task and the overall performance is often positive at the same time. The Project Manager said that it was important to build pressure on the entire team, as high-performing team members know how to behave in such a situation. Another Project Manager stated that it is important for team members to understand why this pressure has arisen and what effects the actions of each individual team member have on it. One of the Project Managers was convinced that additional pressure would have a positive effect on team

performance, as in this way it becomes easier for the leader to identify a team member who is performing negatively. This team member should then be put under pressure through one-on-one interviews with target specifications so that he/she can improve his/her performance.

The Global CEO explained that it is important and also useful to pass on pressure to a team or the individual. The Head of Project Management strongly believed that pressure must not be ignorant and excessive, as although it is acceptable to apply certain pressure, it is also important to have rest periods. Furthermore, praise and recognition should also be given, when necessary, otherwise negative performance can be expected. The Vice President of Business Development, the EMEA CEO, and the Product Certification Manager saw pressure sharing as a temporary solution. According to the Product Certification Manager, such a transfer only applies at the cost of resources, which leads to a reduction in quality, defects, and frustration. The EMEA CEO agreed with this statement and believed that pressure must be passed on to the entire team in a qualified manner. In addition, pressure must be designed as a clarification for the team, in that the leader makes it clear to the team members what the consequences are, e.g., if the project goal is not achieved. The leader needs to know how to pass pressure onto the team, especially when there is massive pressure from upper management. This is especially so when the project goal is impossible, as although at times top management can put pressure on upper management, if the goal is impossible to achieve then no amount of pressure can take away from the reality of the situation.

In general, all experts, except for the Global CEO, believe that the pressure from the manager must be filtered, as too much pressure can throw the team off balance. It is therefore important that the pressure is kept within limits so that the team is neither under-challenged nor overwhelmed. In addition, it is important that pressure is only created for a short period, with a visible option that can be removed when needed. Increasing pressure should also not be the rule, but only the exception, as you cannot expect good performance in the long term if pressure is a constant factor.

In the final part of the interview, the experts were asked based on their experience which methods were used when an increase in reliability was found in the performance stage.

Most experts saw team building as a very useful method in this case. However, additional benefits and praise were also seen as very important. The Vice President of Business Development said that these would be necessary if the team was committed. In addition, he believed that to achieve the best performance, the manager must clearly communicate the company's goals so that these goals are viewed as their own. The EMEA CEO also saw communication as an important factor. He made it clear that successes of the individual are openly communicated in the team and that partial successes are listed positively. Additionally, he stated that the leader must maintain team spirit in the team, while also exemplifying motivation and listing the positive aspects. The Global CEO believed that it is good business practice to create a common enemy (e.g., a competing firm) that must be overcome to move the team forward.

The COO and the Vice President of Industrial Development considered the performance of the leader to be important. The team must be aware that they can always rely on the leader, whereby in particular all kinds of support measures must be made available. The leader must not only be open to new work measures, but also be trained in how to apply them and how to intervene in different situations. The Product Certification Manager added that a truthful understanding of everyone's situation improves team performance. The Head of Project Management saw it as important to reveal perspectives to the team so that they know what they are working on. The Head of Innovations underlined this by adding that it is important to motivate each individual (e.g., through individual treatment) with an additional demonstration of the benefits after the Performance & Evaluation stage. A Project Manager saw it as an incentive for success and feels that it is particularly important that a leader shows the team in general which challenges have been solved in the past. He specifically indicated that it was important to motivate employees through influence and not through pressure.

The other interviewed experts had the same views. The Agile Coach focused on making the tasks more interesting and generally creating the conditions for creating motivation. He also said that it is important to convey appreciation towards the team and celebrate successes together. The Project Managers saw it as important to encourage team members, although this only has to be done moderately so that the distance between the leader and team members can be kept. The team member has to be motivated in one-on-one discussions and that responsibility for their actions are made clear. In general, the Project Managers saw the transfer of the areas of

responsibility to the individual team members as promoting their performance. This was confirmed by the Industrial Representative, who said that by bringing the importance of the project goal for the company closer to team members, a promotion of responsibility for the importance of the individual task in the project increases.

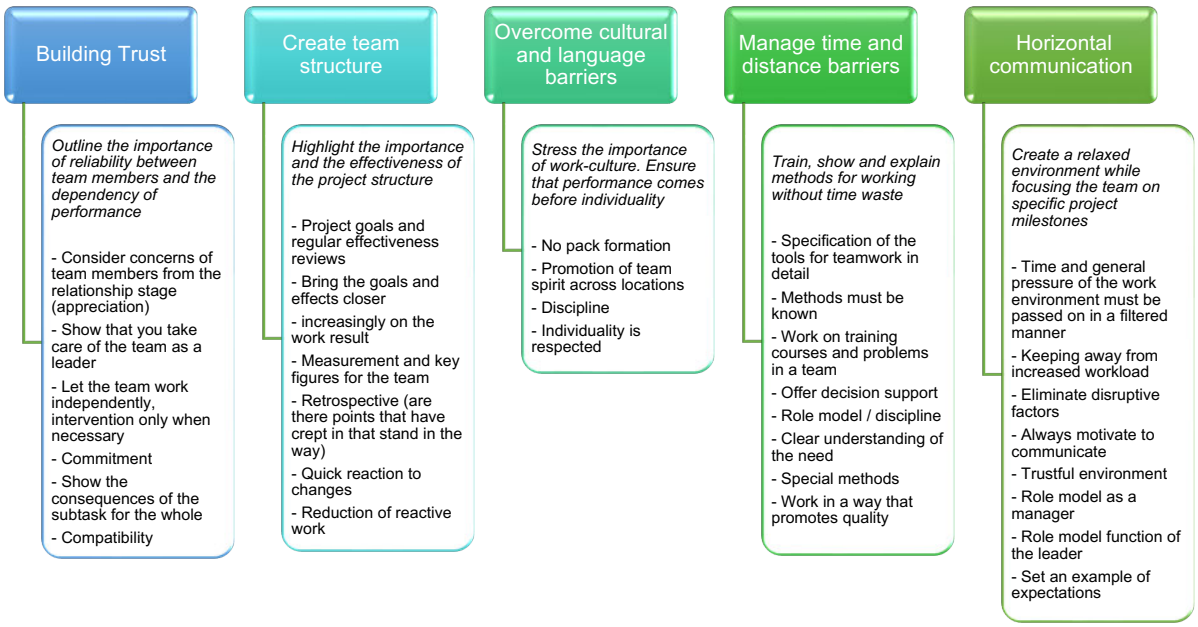

Figure 22 Development of the CSFs for the Performance & Evaluation stage of the V-CORPS model

Figure 22 shows the additional amendments made by the experts of the individual CSFs in the Performance & Evaluation stage. The phrases in italics, which were taken from the literature review were presented in the interview and the experts occasionally indicated additional aspects that were significant. The section which received the most comments was on horizontal communication, followed by building trust, creating team structure, overcoming time and distance barriers, and finally avoiding cultural and linguistic barriers.

5.3.7 Interview: Sign-off & Closure stage

In the final stage of the interview, the questions about team dissolution were discussed. The aim was to ascertain whether it could lead to an escalation of controversial questions during the final meeting and have a negative impact on subsequent projects.

The Product Certification Manager confirmed this, as he believed that different cultures in a team also leads to different approaches for problem-solving. Thus, in his view, it is entirely possible that some are looking for the solution to the problem while others are looking for the culprit. The Head of Project Management believed that the leader

and team members should have learned through the project in a tactful and disciplined manner how to deal with each other to avoid escalations.

The other experts saw no possibilities of escalation. Nevertheless, all believed that it is dependent on the leaders themselves. The Vice President of Industrial Development said very clearly that if the meeting is professionally organised, there is no risk of escalation. The COO EMEA and the Vice President of Business Development went into more detail and made it clear that as long as the meeting is structured constructively, they see no consequences of an escalation. This view was also shared with the Agile Coach, the Senior Key Account Manager, and two Project Managers. The Vice President of Business Development explained that certain moderation techniques must be used in such discussions and that external moderators may also have to be used. The COO EMEA also added that such a meeting should generally be viewed positively, and after the project has completed, everyone tends to be in a better mood. The Agile Coach sees an existing risk of escalation in such discussions, but like the Vice President of Business Development, believed that it is dependent on the course of the project. They see the leader's obligation here is to counteract, where he addresses an open and honest view of the events in the project and particularly emphasises the positive aspects. The Key Account Manager answered that at such a meeting there must be a factual and constructive discussion and no personal attacks.

The Industrial Representative felt that a team needs to understand that such a final meeting is used to improve team and project work and is not a legal process. A Project Manager added here that such a meeting should not serve to assign blame, but rather an objective consideration of what is happening to develop joint improvement potentials. This was also confirmed by the Director of Development, but he added that with such a well-designed conversation, in the worst-case scenario, this would lead to no overall benefits. The two Project Managers also saw such a final meeting as important and confirmed that if it were to escalate, the project would not be over. In their opinion, such escalations would happen much earlier in the project. The Product Manager and the Head of Innovation also saw the final meeting having positive effects for future projects and that it is important to do so. In addition, both made it clear that it is essential that the leader finds introductory and concluding words for this meeting so that the leader guides the conversation.

In general, the EMEA and Global CEO felt the same way, and believed that there would be no escalation, as people usually also want to know what went wrong and how this can be improved in the future. It is important that the meeting is not held politically but objectively, as it is only important for one's own perception and for the new project through qualified feedback. Moreover, the Global CEO revealed that lessons learned are not kept sufficiently in the automotive industry, which he believed has an impact on follow-up projects.

In the final question of the interview, the discussion included consideration of whether, in order to avoid misunderstandings and hostilities between the team members.

All experts answered the question in the affirmative. Everyone also agreed that the meeting can only be kept in balance if the leader behaves as a moderator. The Global CEO added that at such a meeting the leader not only has to deal with the meeting but also understand how it should be led, and his behaviour should also be neutral throughout the entire meeting. The EMEA CEO also sees maintaining the balance in such a meeting as the main task of the leader since he leads the team, so he also has to initiate the conclusion. The Vice President of Business, the Industry Development, and the COO EMEA added that the leader plays the opening and closing roles in such a meeting and his behaviour should be objective. Furthermore, the COO EMEA said that in the event of massive tensions a leader should contact external partners so that the head can also draw and represent his conclusions. The Vice President of Industrial Development explained that the leader should act and react like a team member because he is part of the current situation.

The Senior Key Account Manager confirmed that the leader should control the conversation and it is very important that the leader prepares an introduction so that the team members understand what this final meeting is about. The Product Manager had the same view, only adding that the team must be given positive praise in the opening speech so that there are no resignations or escalations. The Head of Innovation added that the leader has to act neutrally in a de-escalating manner in the event of a conflict. The Product Certification Manager and the Head of Project Management outlined the need for the leader to express the negative positively and define failure as failure to achieve a goal. The leader must also be well-prepared for every situation so that he can deal with it or intervene by taking all of the blame himself to avoid demotivating the team, thereby making the team free of guilt. In general, the

leader in such a meeting must not behave indifferently or negatively, but rather honestly and authentically.

The Project Managers added that self-praise, at the expense of others as well as personal interests or attacks by the leader, must be eliminated. Another Project Manager saw it as important that the leader should design the meeting to improve the weak points sustainably to save time and costs and better master future projects. The Director of Development and the Industrial Representative made it clear that a certain neutrality of the conversation is maintained during the meeting, and as the leader controls the team from start to finish, a leader must always act professionally. A Project Manager summarised it by saying that the most essential aspect for the meeting is how the leader perceives the issues and reacts, this ensures that the atmosphere remains calm.

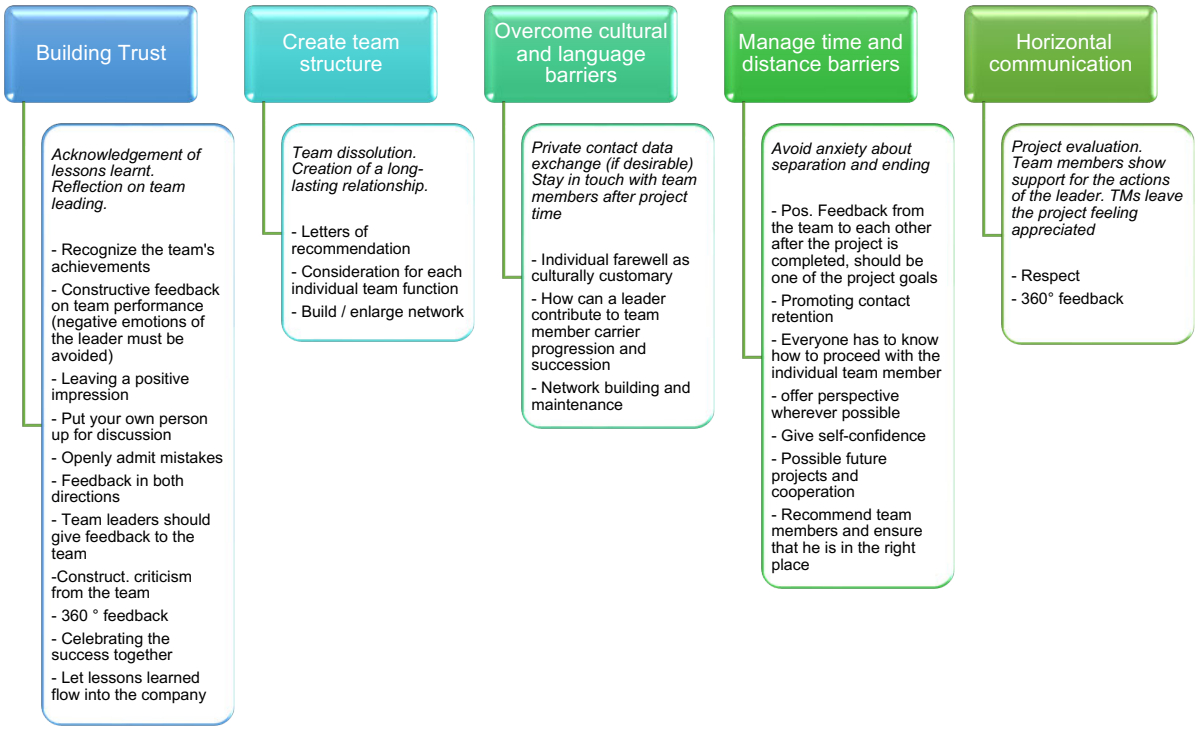

Figure 23 Development of the CSFs for the Sign-off & Closure stage of the V-CORPS model

Figure 23 shows the additional amendments made by the experts of the individual CSFs in the sign-off and closure stage. The phrases in italics, which were taken from the literature review were presented in the interview and the experts occasionally indicated additional aspects that were significant. The section which received the most comments was on building trust, followed by overcoming time and distance barriers, avoiding cultural and linguistic barriers, creating team structure, and finally horizontal communication.

5.3.8 Summary

This section presented the results of the interviews with the experts, with the aim of supplementing the V-CORPS model with operational values from the experts to develop a deeper understanding of its relevance and value. An introduction was initially given, so that the experts understood what was expected of them during the interview. It was clearly stated from the outset that this is an exchange of experience and not a test.

The V-CORPS model was seen by all experts as necessary and desirable for future work, especially as a higher amount of flexibility is desired in the processed-dominated automotive industry. In addition, V-CORPS aids in the development and promotion of young managers, or to expand the horizons of experienced ones. From the interviews, it became clear that the experts had internalised their work to such an extent that they only thought about the course of working stages when asked, and therefore did not always know the answers immediately. The experts saw the need for such a model, as it enabled them to gain an understanding of why the V-CORPS stages are necessary to increase the effectiveness in the ways in which they work.

According to the experts, the V-CORPS model is a good aid which can be used as a tool in working life. Nevertheless, none of them viewed this model as self-explanatory, and therefore training is necessary to use this model effectively.

5.4 Conclusion

In this chapter, the evaluated results of the questionnaires as well as from the interviews with the experts were presented.

The survey (section 4.7) and the evaluation were carried out via www.onlinesurveys.ac.uk. The evaluation in section 5.2 showed a positive tendency to the questions and statements about virtual team building and leadership. The majority of the experts agreed with the statements. The challenges relating to specific aspects of virtual team management were clearly highlighted by answering open-ended questions, which in turn led to further discussions in the subsequent interviews. In addition, by examining the responses of the individual experts, it was possible to identify some contradictions between the Likert-scale responses in the survey and the responses to the open questions, which in turn, could be traced back to an uncertainty

about this topic. These contradictions were also discussed in further detail in the interviews.

The interview questions were based on the evaluation of the questionnaire and were evaluated in section 5.3 with the help of Excel. During the interviews, it became clear that the experts were not familiar with a clear structure for virtual team building and leadership. There was also a clear hierarchical level evident in the responses, as line management usually had a different answer or perspective from upper management. Nevertheless, through the discussion of the V-CORPS stages in detail, it occasionally was revealed that some ideas from different management levels were similar.

These results from sections 5.2 and 5.3 are analysed in the following chapter and incorporated into the V-CORPS model as constructive enhancements based on the experience and perspectives of the experts.

6. ANALYSIS AND MODEL VALIDATION

6.1 Introduction

In this chapter, the data collected from the previous surveys and interviews is analysed and presented as a final V-CORPS model, which has been further analysed and evaluated by a smaller group of experts. The aim was to present the V-CORPS model in the form of a guide that can be used as a tool for virtual team building and leadership. In section 6.2, the corresponding CSFs in the existing V-CORPS stages are analysed and the most important points are identified, before being converted into activities. This identification of the most significant points was achieved by examining the existing PCF, questionnaires, and interviews (Figure 19 – Figure 23) for equivalency and relevance to the current stage and CSF.

These activities are analysed in section 6.3, leading to the creation of the final V-CORPS model (Table 41). The analysis was undertaken by observing and comparing the activities in each CSF with their associated stages together with the responses from the previous surveys and interviews (chapter 5). In section 6.4, a questionnaire (Appendix II) was developed using the final V-CORPS model (Table 41). Twelve questions relate to the final overall V-CORPS model itself. In Section 6.5 additional six questions concern the use of digital technology. The purpose of this questionnaire was to analyze the V-CORPS model for sustainable daily use. It is important to note that these questions were answered by six out of the eighteen previous chosen experts from different management positions. These answers were then analysed in a follow-up interview, before assessing the need for the V-CORPS model in the automotive industry. Section 6.6 summarises the entire chapter.

6.2 Evaluation of V-CORPS stage activity data

During the interviews, the conceptual V-CORPS model was evaluated and amended based on feedback from the experts. This feedback data can be viewed in chapter five. These collected raw data were evaluated and assessed using insights gained from the literature review, survey, and interviews, allowing a focus on the most necessary activities. An example of the result of applying this “evaluation filter” is shown in Figure 24. The aim of this reduction was to convert the points into activities so that the operational V-CORPS model could more effectively act as a guide for virtual team building and leadership. For this purpose, the inductive approach was used, as it

shifted the focus from specific to general considerations regarding virtual team building and leadership, so that potential guidelines could cover as broad an area of team building and leadership as possible. In order to find the reduction of the individual points, the V-CORPS model was analysed as a whole, as this allowed the impact of the activity on the previous, current, and subsequent stages in the V-CORPS model to be viewed. The individual CSFs and the activities they contain were listed in the respective stages and evaluated as to whether they fit the respective CSFs in comparison to the literature, survey, and interview, or are also repeated in the previous CSFs or stages. Particular attention was paid to whether the activity could be implemented in practice and whether it was necessary in this stage. By using cross-sectional data analysis, it became clear whether the listed activities could be unified by combining them into one activity, although a guideline that goes into too much detail can restrict the leader's freedom of thought and action in team building and leadership. This in turn has a negative impact not only on the team to be led, but also on the project itself.

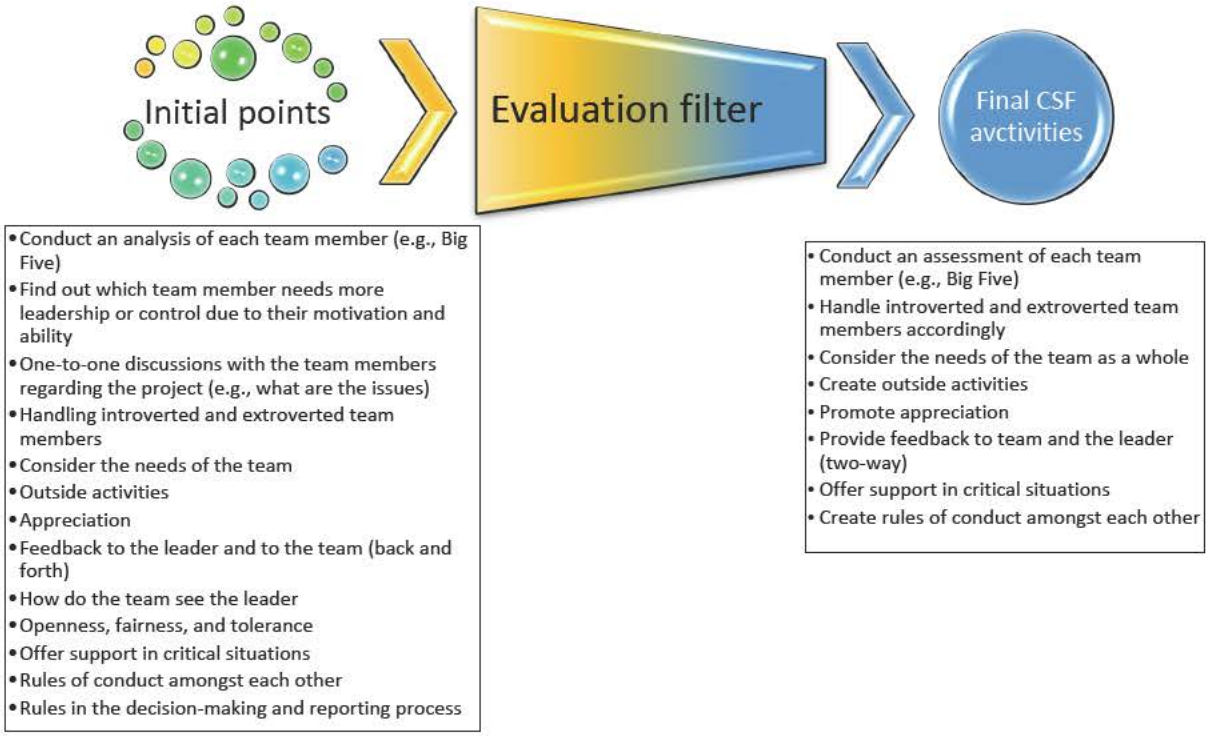

Figure 24 Example of activity reduction in the Relationship Building stage concerning the Building Trust CSF

Figure 24 shows a data processing based on the relationship building stage and the trust building CSF, and how the initial points are filtered by the evaluation filter described at the beginning of the section and transformed into final activities of the operational V-CORPS model.

6.3 Model amendment (after interview and questionnaire feedback)

6.3.1 Introduction

The presentation of the conceptual V-CORPS model through the interviews was viewed positively. This section compares the individual results from the questionnaires and interviews concerning each respective stage of the V-CORPS model, with the intention to adapt V-CORPS from a conceptual entity to an operational model.

6.3.2 Creation

The experts saw the creation stage as the second most important stage before the Performance & Evaluation stage. All experts agreed that a good mutual impression of each other during the first meeting is crucial. Therefore, it can be concluded that such a meeting should take place together either in one place, or at least in front of a camera. The importance of a visual meeting is that mutual perception is better achieved by being able to see in addition to hearing and talking. The consequence of this is that the mutual perception also takes place through body language, and one also understands each other through reactions in relation to the facts. This was reflected in the analysis of the conceptual V-CORPS model. The initial generic label for building trust, alone, was not enough, and so, after consulting the experts, more specific points of attention that appeared to be necessary for the experts in the capitalised were summarised.

CSF/ V-CORPS Stage	Creation
Building trust	• Get first impressions (Face-to-face or video meeting) • Be prepared to answer questions from the team • Facilitate introductions to each other (What am I good at?) • Get to know each other through games (Common first task) • Offer help as requested

Table 16 Creation: Building trust activities for operational V-CORPS model

Table 16 shows the defined activities believed by the experts to be necessary for building trust in the creation stage. The key points are to be viewed and applied either as a process or separately.

Most experts saw the need for structured work through the stages to be prepared for the Performance & Evaluation and Creation stage. By doing so, each team member initially knows their task in the team and also knows which steps are necessary to complete them on time. The formation of structure in the team can be seen as training, since virtual teams need different types of training to work successfully at a distance. Nader et al. (2009) found that virtual teams need different types of training to work successfully at a distance.

CSF/ V-CORPS Stage	Creation
Create team structure	• Address corporate policies • Develop vision and mission • Explain project scope • Address project guidelines and values • Highlight the common goal and the expectations of the team and the leader • Create a team charter, explaining why people are there and what to expect

Table 17 Creation: Create team structure activities for operational V-CORPS model

Table 17 shows the activities for the formation of team structure in the creation stage. First, the team must be made aware of the company's expectations, their goals, and visions. Then the project and its scope are presented and the alignment of project goals, with company goals, are explored and assessed. In addition, the manager's views on the project are shared with the team, as well as presenting a team chart. Then, the initial operations of the project are discussed with the existing team.

Magnusson et al. (2014) saw the physical distance between teams as an additional challenge which lies in the cultural arena, such as gender discrimination as well linguistic differences. This view was also shared by the majority of the experts questioned, as they confirmed that it is important to remove the linguistic as well as the cultural barriers on a professional level. The aim of this elimination was for the team to come to a common denominator in terms of work performance, mutual respect, and trust. According to Layng (2016), these barriers have a sufficient influence on regular delays and failures in the project, although a strong cultural understanding of the leader is required here to counteract these discrepancies. In addition, the experts stated that the removal of such barriers is often neglected in reality, which is mostly due to excessive work dynamics with few free time windows.

CSF/ V-CORPS Stage	Creation
Overcome cultural and language barriers	• Identify cultural or language barriers and address them • Ensure common language • Organise cultural training – and use as an ice breaker • Build confidence from the first stage

Table 18 Creation: Overcome cultural and language barriers activities for operational V-CORPS model

Table 18 lists activities used during the early stages of team development to bring team members to a common level of understanding, while also overcome cultural and language barriers. The aim is to create a common basis where origin, gender, and skin colour do not play a role, as only the common goal of the project counts.

Morrison-Smith and Ruiz (2020) saw technology as a key role in overcoming time and distance. The experts were of the same opinion. The implementation of such technologies in the team plays a decisive role. The experts were divided over whether it is the leader who is responsible for implementing or even introducing such technologies to the team. This can be attributed to the fact that the leader sees the danger of unintentionally desiring the team to use such technologies, which causes a compulsion to use the possible technologies, or that due to the incompetence of the leader, the virtual team is not adequately and effectively trained, causing more challenges than added value through the use of new technology.

CSF/ V-CORPS Stage	Creation
Manage time and distance barriers	• Introduce and regulate technology deployment • Investigate means of communication (are we up to date?) • Define communication channels (usual times) • Address hardware and software resources for the team • Develop regular exchange of information (weekly feedback) • Define team planning (how do I use the team members to save my time)

Table 19 Creation: Manage time and distance barriers activities for operational V-CORPS model

Table 19 shows the activities to manage time and distance barriers. In the initial stages of team building, this is advantageous in the sense that the team is given a ready-made schedule for handling tasks, thereby positively influencing the manager's trust in the team. Since the schedule not only lists the steps necessary for ICT implementation, but also provides the team members with a toolbox before the start of the project, this can be used effectively in the project.

The experts believed that each team should work in a collaborative direction. Accordingly, the leader acts as a role model for the team, demonstrating that all members are free to openly communicate their thoughts on a project in a respectful way. In addition, the leader also addresses the team and does not exclude themselves from problems within the team, but rather approaches them proactively. Respect, tolerance, and fairness were named as the most important criteria for well-functioning communication among each other during the expert's interview. The implementation of these criteria in the team must be done from the beginning. The leader, as Alistoun and Upfold (2012) recommended, must be trained to influence the team members

successfully. In addition, the leader must not be selfish and convey the sense of inclusivity in every respect.

CSF/ V-CORPS Stage	Creation
Horizontal communication	• Create round of interviews • Champion working in a collaborative way • Develop flat hierarchy • Distribute roles and responsibilities

Table 20 Creation: Horizontal communication activities for operational V-CORPS model

Table 20 shows the necessary activities used in the early team building stage. These activities are done to help a team work well as a single unit, while developing a sense of inclusiveness. These activities influence a virtual team without the need for a hierarchical structure, as they encourage collaboration and independence.

6.3.3 Organisation

According to a number of authors (Layng, 2016; Lee-Kelley & Sankey, 2008; Nader et al., 2009; PMI, 2013), effective team meetings are only possible face-to-face, as synergy is lost virtually. The majority of the interviewed experts agreed that a face-to-face meeting has a positive effect on team members among themselves as well as on the project. Here the cost-benefit factor must be considered if it is a worthwhile investment to gather all team members together in a single place for a meeting or meet virtually through the support of ICT visually to go through the necessary aspects for building trust. This aspect should be considered as a team-building activity, which was recommended by Nader et al. (2009) to make virtual working successful.

CSF/ V-CORPS Stage	Organisation
Building trust	• Get a first impression from the respective team members and show appreciation • Show trust in the team and the project • Ascertain each team member's expectations • Create an outage plan • Promote mutual assistance in the team

Table 21 Organisation: Building trust activities for operational V-CORPS model

Table 21 lists the necessary activities that need to be taken to build trust in the team during the organisational stage. It is important to focus more on the team building itself and show them a clearly defined idea of expectations and goals. The main goal is to convey the leader's belief and trust in the team.

Establishing a team structure in the early stages of team building was considered as an important factor by all interviewed experts. It is necessary to establish general project rules in the team from the beginning to work with each other in the further Performance & Evaluation stage. In general, team structure is particularly valuable in

managing distributed team members, as it allows team members to hold each other accountable for their collective and individual performance and increases productivity (UKG, 2020). This has been further advocated by Seshadri and Elangovan (2019), by reinforcing Davidson (2013) statement that task-oriented leadership of virtual teams is more effective when the leader focuses on managing the team to build the team structure. Establishing such a team structure is challenging in the operational sense, as according to the experts, the focus was more on building the project structure and not the team. This means that team structure often develops by itself and neither the team nor the leader is aware of it. Nevertheless, establishing such a team structure becomes increasingly important with increasing team size and project complexity, otherwise team and project effectiveness cannot be expected.

CSF/ V-CORPS Stage	Organisation
Create team structure	• Assign roles for individual members • Discuss working methods • Determine meeting culture • Address consequences in case of non-compliance • Provide understanding of exceptions for special cases • Highlight importance of completing tasks on time and communicating when not

Table 22 Organisation: Create team structure activities for operational V-CORPS model

Table 22 shows the necessary activities when building team structure during the organisational stage. The leader should communicate with the team in a unified way and explain what the structure building goals are, as well as what company expectations for the team to work effectively.

The experts were unanimous in their opinion that the virtual team must be made aware of the necessary procedures for support during team building to overcome cultural or language barriers. Although companies try to counteract this with compliance training, this is generally valid and not explicitly related to working with each other in a team and working at a distance. As working with virtual teams increases, it is crucial for the success of the business to not to focus on the accessibility of technologies, but to think more about overcoming cultural barriers (Solomon, 2016). The aim of these thoughts is to avoid these unexpected side effects in the project itself, which lead to limitations in effective cooperation and also pose obstacles for the leadership itself. Therefore, the perception of such obstacles on the part of the leader is important, so that they can be addressed correctly without loss of time and are also considered as an expected side effect during the Performance & Evaluation stage.

CSF/ V-CORPS Stage	Organisation
Overcome cultural and language barriers	• Observe company guidelines and policies • Define support actions and the steps to be taken should an issue arise • Identify and support language weaknesses • Take away the fear of communicating with the leader • Explain work organisation correctly • Emphasise that private views have no place in professional life • Create cross-cultural seminars

Table 23 Organisation: Overcome cultural and language barriers activities for operational V-CORPS model

Table 23 shows the necessary activities to overcome cultural and language barriers to reach a common understanding in the team regarding working methods, mutual respect, and tolerance. The leader must address their team members individually while assessing where tensions may arise due to different cultural backgrounds.

Overcoming time and distance barriers is another aspect that is often considered in team building and leadership to avoid losses in project activity during the performance and evaluation stage. The experts interviewed almost uniformly agreed that this was necessary. Through the evaluation of the interviews, this aspect is considered secondary in operational terms, as one only concentrates on the measurable, in this case on the project itself. This in turn contradicts Solomon (2016) survey, where 85% of the interviewees saw different time zones as a challenge. This makes it clear that it is necessary to consider these time and distance barriers in operations, primarily in team building, to avoid losses in performance.

CSF/ V-CORPS Stage	Organisation
Manage time and distance barriers	• Define the use of working tools for the project • Define the preparatory work to avoid time loss due to time differences (e.g., Follow the Sun methodology) • Define processes, methods, documents, with templates as appropriate • Make special tools available for certain functions • Define working time windows • Analyse distribution of working hours • Define time for communication • Organise training if necessary • Offer help (mutually)

Table 24 Organisation: Manage time and distance barriers activities for operational V-CORPS model

Table 24 lists the necessary activities to manage time and distance barriers with virtual teams. The mentioned aspects of this are to be seen as team contract conditions, which are decided together as a team contract in the following step of the team building stage. The main goal of such a procedure is to enable the team to work without barriers and transform the disadvantages caused by time and distance into advantages.

Horizontal communication in a team is oriented towards the content and the situation. In this context, the information essentially contributes to coordination within or between the teams to bring them together (Lunenburg, 2010). Such coordination is essential for virtual teams, as when leading at a distance, special attention is paid to the

coordination of the individual team members. Charles (2002) found that horizontal communication is important for creating a functioning corporate culture and a sense of belonging. This was also the view of the majority of the experts interviewed, who believed in emphasising the importance of team unity in the early stages of virtual team building. The aim is for the team to understand that they can only succeed together if they all have the same goal.

CSF/ V-CORPS Stage	Organisation
Horizontal communication	• Highlight the importance of teamwork (One team = One unit) • Develop equality (equal treatment for all team members) • Create understanding and acceptance by the team that the leader has overall responsibility • Develop 'acting as a team' (get through success and failure together) • Give positive feedback where possible • Address errors openly

Table 25 Organisation: Horizontal communication activities for operational V-CORPS model

Table 25 shows the individual activities that are necessary for horizontal communication. The primary goal of the leader is to convey to the team that they belong together and that they can only work effectively together as a unit. With the help of the listed points, the leader must convey openness, understanding, and trust to the team so that the team feels that they are taken seriously.

6.3.4 Relationship Building

According to the experts, the relationship building stage has a significant influence on results of the Performance & Evaluation stage. Relationship building is viewed by DasGupta (2011) with cohesion and trust, as these are crucial for the effectiveness of virtual teams. Therefore, building trust is an important part of relationship building and requires the main focus of this stage. The experts saw it as particularly important that the virtual leader sufficiently analyses each team member when building trust to find an individual approach. This shows that the experts consider each team member individually to build mutual trust. Liao (2017) shared these views by confirming that virtual leaders proactively manage the relationship building process to counteract the reduction in social information caused by ICT.

CSF/ V-CORPS Stage	Relationship Building
Building trust	• Conduct an assessment of each team member (e.g., Big Five) • Handle introverted and extroverted team members accordingly • Consider the needs of the team as a whole • Create outside activities • Promote appreciation • Provide feedback to team and the leader (two-way) • Offer support in critical situations • Create rules of conduct among each other

Table 26 Relationship Building: Building trust activities for operational V-CORPS model

Table 26 lists the activities required to build relationships in the team. It is advantageous if the leader analyses each team member to design beneficial individual steps for building relationships with virtual team members. In addition, other aspects such as open mutual communication and assistance in critical situations are necessary to create a lucrative building of trust.

In the opinion of the experts, efficient work practice requires fixed structures and processes. Therefore, a contract between the team and the leader is a progressive step towards this. The study by Ji and Yan (2020) confirmed that team structure helps in teamwork and thereby improves team performance. The introduction of such a structure is done by the leader, as he sets the direction and steers the team. In addition, the leader has to keep a balance so that team members are challenged and encouraged to achieve the best results. The aim of such a structure is the joint definition of working methods, roles, and the required procedure in any work situation to avoid additional time-consuming work.

CSF/ V-CORPS Stage	Relationship Building
Create team structure	• Agree working practices • Establish communication channels and technical team communication • Create on-site visits (if possible) • Create regular meetings (15 min stand up meeting if possible) • Promote mutual support • Create virtual face-to-face meetings and a chat/forum • Call instead of email! • Create rules for the decision-making and reporting processes

Table 27 Relationship Building: Create team structure activities for operational V-CORPS model

Table 27 lists the necessary activities for building a team structure. The definition of a jointly defined teamwork contract is of primary importance, as all of the necessary details relating to work equipment and methods are presented there. The further steps are also necessary to consolidate defined team structures to act effectively in the subsequent stage.

In the relationship building stage, the experts saw the greatest challenges in the implementation of an equal treatment directive. They increasingly highlighted that there was a link between the challenge of promoting a common understanding of the working methods and the inadequate training of the leader, made more difficult by different cultures, and oftentimes insufficient language skills. From this it can be concluded that the leader's key function is to bring the employees onto a common level of understanding, and thus, overcome the cultural and linguistic barriers. Malhotra et al. (2007) confirmed this by stating that the virtual leader has to overcome the intercultural

and linguistic barriers, since team members typically feel a lower sense of connection within a virtual team.

CSF/ V-CORPS Stage	Relationship Building
Overcome cultural and language barriers	• Develop corporate identity • Intervene in an emergency • Create consequences for certain actions • Appoint a mediator who understands the culture and will support you as a coach • Exemplify professional and equal treatment in the team

Table 28 Relationship Building: Overcome cultural and language barriers activities for operational V-CORPS model

Table 28 shows the activities required to overcome cultural and linguistic barriers. Particularly in the case of different cultures in a team, instinct and an individual approach from the leader is required to avoid a blockade of team members, or even hostility. The leader must also not lose sight of the goal and communicate this to his team members in a professional manner.

Overcoming time and distance barriers require a sufficient willingness to make decisions on the part of the team with the leader. Here, the experts believed that the success of the project is dependent on the reliability of the team, although this is a factor often overlooked by the leader in working practice. According to Cummings et al. (2007), both scientists and experts agreed that ICT helps to overcome distance, but it must be taken into account that the coordination is carried out by the leader and that the team members let themselves be guided. In contrast to other types of distance management, temporal distance plays a subordinate role in project management, but understanding must arise to overcome the distances caused by time and space and the barriers that arise as a result (Espinosa et al., 2015).

CSF/ V-CORPS Stage	Relationship Building
Manage time and distance barriers	• Show dependencies between tasks and team members • Ensure that team members can rely on one another • Develop regular results review • Increase promotion of understanding • Offer support with prioritisation • Underline that the behaviour of an individual influences team results • Create flowcharts and solution paths

Table 29 Relationship Building: Manage time and distance barriers activities for operational V-CORPS model

Table 29 lists the activities that are necessary in the relationship building stage to manage the time and distance barriers. Here, not only are the individual activities of the team members discussed by the guide, but also the individual procedures used during the project. After completing this stage, the team members need to get on well with each other and have a basic attitude towards future cooperation.

The horizontal communication at this stage primarily serves to deal with a critical situation during the project. The action of the leader is in particular focus, as it can demonstrate whether he is responsible for the team and whether the team can rely on him, especially in emergency situations. In addition, trust is placed in the team so that it can work independently, and the leader only intervenes in special cases. According to Lunenburg (2010), horizontal communication is used for coordinative purposes on the same hierarchical level. Nevertheless, especially in virtual teams, horizontal communication can be seen as the formation of a flat hierarchy in the team since the leader depends on the team and the team on the leader.

CSF/ V-CORPS Stage	Relationship Building
Horizontal communication	• Intervene only when crucial e.g., key decision-making, supportive roles, and escalating situations • Maintain self-control • Keep calm (no heated actions) • Create a pastoral care function

Table 30 Relationship Building: Horizontal communication activities for operational V-CORPS model

Table 30 lists the activities to be observed which are necessary for the formation of a flat hierarchy through horizontal communication. It is always important that the leader brings a basis of trust and respect across to the team and only intervenes in the event of a decision or emergency. The primary goal of this stage is the automatic processes and an open but respectful communication in the team during the project.

6.3.5 Performance & Evaluation

The performance and evaluation stage handles the team leading stage and the building of trust, where trust is transferred from the leader to the team. The leader shows the team how much he trusts his team, and in return, analyses where there remains a need for building trust. Since building trust has proven to be effective for virtual team relationships, as it supports collaboration and the resulting team performance (Lepsinger & DeRosa, 2015). This is primarily done by the leader, who thereby has an influence on the team performance, since without trust the team does not act and react successfully, which leads to increased performance losses in the project.

This was seen differently by the experts, since based on their experience the performance of the team only depends on the leader if the project only focuses on goals, which is the case in operations. According to the experts, achieving a satisfactory performance is possible by building up basic trust in the team and the

influence of the leader on the team. Nevertheless, additional work is necessary on the part of the leader, which affects the further building of trust.

CSF/ V-CORPS Stage	Performance & Evaluation
Building trust	• Outline the importance of reliability between team members and the dependency on performance • Review the concerns of team members identified in the relationship phase (appreciation) • Create commitment • Show the consequences of subtasks for the whole team • Create compatibility

Table 31 Performance & Evaluation: Building trust activities for operational V-CORPS model

Table 31 shows the activities for further building trust during the performance and evaluation stage. When considering these aspects, it is necessary for the leader to take the suggestions of the team into account and communicate the issues openly. In addition, the leader must also make the team aware of the consequences of their actions.

In the performance and evaluation stage, the development of team structure is considered complete, which is why this stage maintains team structure or optimises it. The team must be shown why the previous stages were necessary and what benefit was taken from them. In addition, the reliability of the team must be maintained, as according to the experts, this correlates one-to-one with the project performance. The literature does not go into the correlation between project performance and team performance, but only refers to this as team result factors (Fung & Siow, 2013). It is necessary to fully relate the team to the performance, as this carries out the work that is controlled by the leader. According to the experts, consistent individual and project performance is only guaranteed through a logical and well-communicated team structure.

CSF/ V-CORPS Stage	Performance & Evaluation
Create team structure	• Highlight the importance and the effectiveness of the project structure • Create project goals and regular effectiveness reviews • Create measurement and key indicators for the team • Consider retrospective issues (are there points that have crept in that stand in the way) • React to changes quickly! • Reduce reactive work

Table 32 Performance & Evaluation: Create team structure activities for operational V-CORPS model

Table 32 shows the necessary activities to maintain team structure during the performance and evaluation stage. The team must regularly evaluate the achievement of the objectives and coordinate further steps to meet project specifications. In addition, the team must be brought closer to the responsibility and importance of fulfilling the tasks to react quickly when changing project tasks.

Avoiding cultural and linguistic barriers is to be seen as a key point during the performance stage. Since this can lead to challenges that are difficult to solve due to misunderstandings. The experts therefore disagreed as to whether the work culture and performance take precedence over the individuality of the individual. Although virtual teams are essential for the growth and development of a company, the multicultural differences between the team must be overcome through constant work to improve the way they work (Stocker et al., 2018). Therefore, it can be concluded from this that work culture and performance come before individuality to allow a multicultural team to act as a unit.

CSF/ V-CORPS Stage	Performance & Evaluation
Manage cultural and language barriers	• Stress the importance of work culture • Ensure that performance comes before individuality • Avoid pack formation in the team • Promote team spirit across locations • Characterise discipline • Respect Individuality

Table 33 Performance & Evaluation: Manage cultural and language barriers activities for operational V-CORPS model

Table 33 contains the activities to manage cultural and linguistic barriers. The aim of these points is to jointly promote the understanding of work and the importance of acting as a team in the performance and evaluation stage. In addition, it is also necessary to respect and openly accept the individuality of the individual to avoid far-reaching misunderstandings.

Subrahmanyam (2019) found that achieving high productivity through ICT is only possible if the virtual leaders are sufficiently educated about it to better influence the team members. Nevertheless, the statement that the leader influences team members was not shared by the experts. Although they advocate that the leader should introduce team members to innovations to improve working practices, professional help is still given for training as to not to pass on incorrectly interpreted information or receive unnecessary challenges through incorrect use of ICT.

CSF/ V-CORPS Stage	Performance & Evaluation
Manage time and distance barriers	• Demonstrate ways of working that avoid wasting time • Specify tools for teamwork in detail • Emphasise that methods and procedures must be known • Work on training courses and problems in a team • Work in a way that promotes quality

Table 34 Performance & Evaluation: Manage time and distance barriers activities for operational V-CORPS model

Table 34 shows the activities to manage time and distance barriers. The primary goal is to show the team the possibilities of working more efficiently or use time and distance

barriers as an advantage. The standardisation of the tools used in a team as well as the centralisation (uniform work portal) has a positive effect on team performance.

Horizontal communication in a team is important during the performance stage, as this allows the team to be better guided by the leader. According to Seshadri and Elangovan (2019), avoiding high workloads with short deadlines in a virtual team has a positive effect on performance, as the team members can better concentrate on certain project milestones. The experts do not agree with avoiding such a workload, since a certain workload is necessary for effective work. Nevertheless, the workload must not be too big in the long run and if so, team members must be given sufficient breaks. Therefore, the leader has to react in a reasonable time for high workloads to avoid negative consequences later (Seshadri & Elangovan, 2019).

CSF/ V-CORPS Stage	Performance & Evaluation
Horizontal communication	• Create an environment where the team can focus on project milestones • Avoid increased workload • Always motivate to communicate • Establish an environment based on trust • Function as a role model

Table 35 Performance & Evaluation: Horizontal communication activities for operational V-CORPS model

Table 35 lists the necessary activities of horizontal communication during the performance and evaluation stage. The aim of applying these points is to avoid an excessive long-term workload on the team. In addition, it is also important to motivate the team to communicate openly and for the leader to act as a role model for the team.

6.3.6 Sign-off & Closure

The Sign-off & Closure stage is to be seen as a project closure meeting that helps the leader and his team to maintain confidence and motivation for future projects. Such maintenance is viewed as a dormant post-project relationship that does not need to be reactivated on recurring projects (Bengtson et al., 2018). After the project, where the energy of the team members is mostly at the lowest level, the leader has to create a final basis of trust so that the team members do not feel exploited and abandoned. According to the experts, a feedback session that aims to highlight the strengths and weaknesses of individual team members serves as a strong basis for future projects.

CSF/ V-CORPS Stage	Sign-Off & Closure
Building trust	• Acknowledge lessons learned, reporting results into the company • Recognise the team's achievements and celebrate them • Get constructive feedback in both directions (360 ° feedback, no negative emotions) • Leave a positive impression • Admit mistakes openly

Table 36 Sign-off & Closure: Building trust activities for operational V-CORPS model

Table 36 lists the activities to build trust or maintain it for later projects. The primary goal is to exchange ideas with the team about the completed project so that they can then spread the successes or failures gained in future projects after completion (Turner, 2014).

After the completion of a project with the virtual team, the team structure needs to be transformed into a network structure, as according to the experts, a good relationship with team members after a project has finished is beneficial to the leader. Bengtson et al. (2018) confirmed that project-based inter-organisational relationships in a network structure have a certain degree of coexistence in longer-term relationships between team members and their leaders.

CSF/ V-CORPS Stage	Sign-Off & Closure
Create team structure	• Ensure smooth team dissolution • Create a long-lasting relationship • Write letters of recommendation • Show consideration for each individual team function • Build / enlarge network

Table 37 Sign-off & Closure: Create team structure activities for operational V-CORPS model

Table 37 lists the activities to provide support when changing from a team structure to a network structure. The aim of this stage is for team members to know that the team as such has been dissolved, and for expanding their networks and recommendations for subsequent projects.

While closing and dissolving a project, the leader has to take cultural customs into account to maintain a good relationship with the team members after the project. The cultural dimensions affect the collaboration and knowledge exchange between both organisations and individuals (Solli-Sæther et al., 2015). For this reason, cultural and language barriers must be taken into account during the project's closure, so that the relationships built up over the project time do not turn negative once a project has ended. This has serious consequences in some cultures since building relationships/trust will be challenging or not possible if the project is negative.

CSF/ V-CORPS Stage	Sign-Off & Closure
Overcome cultural and language barriers	• Exchange (if desirable) private contact data • Remain in touch with team members after project end • Create an individual farewell according to cultural customs and norms • Maintain ongoing network

Table 38 Sign-off & Closure: Overcome cultural and language barriers activities for operational V-CORPS model

Table 38 lists the activities to overcome cultural and language barriers during a project's closure. The leader has the key function here, as he/she has to not only look

at the team as a whole, but also as individuals for both project completion and team dissolution to work successfully.

In the final stage, overcoming the time and distance barriers help to maintain strong future working relationships and outlooks for the disbanded team, if ever a future project will take place again. The experts felt that team members feel more confident about future tasks when the leader gives them a perspective on upcoming projects.

CSF/ V-CORPS Stage	Sign-Off & Closure
Manage time and distance barriers	• Avoid anxiety about separation and ending • Promote contact retention • Offer perspective wherever possible • Give self-confidence • Give outlook for possible future projects and cooperation

Table 39 Sign-off & Closure: Manage time and distance barriers activities for operational V-CORPS model

Table 39 illustrates the activities that should be followed in team dissolution to commit to the team after the project. The primary focus is on the prospects for the individual team members and highlighting the opportunities. In addition, in special cases, a letter of recommendation from the leader is considered to improve the team member's opportunities for promotion.

For the experts, it is important that team members feel valued after leaving a project. Horizontal communication supports this, as it allows the necessary stages for project completion to be discussed neutrally and constructively by both the team and the leader. As a result, the team members leave the project on a neutral level, just as they entered the project at the beginning.

CSF/ V-CORPS Stage	Sign-Off & Closure
Horizontal communication	• Ensure TMs leave the project feeling appreciated • Encourage mutual respect after project completion

Table 40 Sign-off & Closure: Horizontal communication activities for operational V-CORPS model

Table 40 lists the activities to be considered in the final day through horizontal communication so that team members leave the project feeling valued.

6.3.7 Summary

In this section, the surveys and interviews from the experts were compared with the literature. Both similarities and contradictions were identified and explained in the sections concerned. It was concluded that the V-CORPS conceptual model could be amended and improved. Therefore, the conceptual model was extended to an operational V-CORPS model (Table 41) and will be evaluated through an additional expert survey.

CSF/ V-CORPS Stage	Creation	Organisation	Relationship Building	Performance Evaluation	Sign-Off & Closure
Building Trust	• Get first impressions (Face-to-face or video meeting) • Be prepared to answer questions from the team • Facilitate introductions to each other (What am I good at?) • Get to know each other through games (Common first task) • Offer help as requested	• Get a first impression from the respective team members and show appreciation • Show trust in the team and the project • Ascertain each team member's expectations • Create an outage plan • Promote mutual assistance in the team	• Conduct an assessment of each team member (e.g., Big Five) • Handle introverted and extroverted team members accordingly • Consider the needs of the team as a whole • Create outside activities • Promote appreciation • Provide feedback to team and the leader (two-way) • Offer support in critical situations • Create rules of conduct among each other	• Outline the importance of reliability between team members and the dependency on performance • Review the concerns of team members identified in the relationship phase (appreciation) • Create commitment • Show the consequences of subtasks for the whole team • Create compatibility	• Acknowledge lessons learned, reporting results into the company • Recognise the team's achievements and celebrate them • Get constructive feedback in both directions (360 ° feedback, no negative emotions) • Leave a positive impression • Admit mistakes openly
Create Team Structure	• Address corporate policies • Develop vision and mission • Explain project scope • Address project guidelines and values • Highlight the common goal and the expectations of the team and the leader • Create a team charter, explaining why people are there and what to expect	• Assign roles for individual members • Discuss working methods • Determine meeting culture • Address consequences in case of non-compliance • Provide understanding of exceptions for special cases • Highlight importance of completing tasks on time and communicating when not	• Agree working practices • Establish communication channels and technical team communication • Create on-site visits (if possible) • Create regular meetings (15 min stand up meeting if possible) • Promote mutual support • Create virtual face-to-face meetings and a chat/forum • Call instead of email! • Create rules for the decision-making and reporting processes	• Highlight the importance and the effectiveness of the project structure • Create project goals and regular effectiveness reviews • Create measurement and key indicators for the team • Consider retrospective issues (are there points that have crept in that stand in the way) • React to changes quickly • Reduce reactive work	• Ensure smooth team dissolution • Create a long-lasting relationship • Write letters of recommendation • Show consideration for each individual team function • Build / enlarge network
Overcome Cultural and Language Barriers	• Identify cultural or language barriers and address them • Ensure common language • Organise cultural training – and use as an ice breaker • Build confidence from the first stage	• Observe company guidelines and policies • Define support actions and the steps to be taken should an issue arise • Identify and support language weaknesses • Take away the fear of communicating with the leader	• Develop corporate identity • Intervene in an emergency • Create consequences for certain actions • Appoint a mediator who understands the culture and will support you as a coach • Exemplify professional and equal treatment in the team	• Stress the importance of work culture • Ensure that performance comes before individuality • Avoid pack formation in the team • Promote team spirit across locations • Characterise discipline	• Exchange (if desirable) private contact data • Remain in touch with team members after project end • Create an individual farewell according to cultural customs and norms • Maintain ongoing network

		• Explain work organisation correctly • Emphasise that private views have no place in professional life • Create cross-cultural seminars		• Respect Individuality	
Manage Time and Distance Barriers	• Introduce and regulate technology deployment • Investigate means of communication (are we up to date?) • Define communication channels (usual times) • Address hardware and software resources for the team • Develop regular exchange of information (weekly feedback) • Define team planning (how do I use the team members to save my time)	• Define the use of working tools for the project • Define the preparatory work to avoid time loss due to time differences (e.g., Follow the Sun methodology) • Define processes, methods, documents, with templates as appropriate • Make special tools available for certain functions • Define working time windows • Analyse distribution of working hours • Define time for communication • Organise training if necessary • Offer help (mutually)	• Show dependencies between tasks and team members • Ensure that team members can rely on one another • Develop regular results review • Increase promotion of understanding • Offer support with prioritisation • Underline that the behaviour of an individual influences team results • Create flowcharts and solution paths	• Demonstrate ways of working that avoid wasting time • Specify tools for teamwork in detail • Emphasise that methods and procedures must be known • Work on training courses and problems in a team • Work in a way that promotes quality	• Overcome anxiety about separation and ending • Promote contact retention • Offer perspective wherever possible • Give self-confidence • Give outlook for possible future projects and cooperation
Horizontal Communication	• Create round of interviews • Champion working in a collaborative way • Develop flat hierarchy • Distribute roles and responsibilities	• Highlight the importance of teamwork (One team = One unit) • Develop equality (equal treatment for all team members) • Create understanding and acceptance by the team that the leader has overall responsibility • Develop 'acting as a team' (get through success and failure together) • Give positive feedback where possible • Address errors openly	• Intervene only when crucial e.g., key decision-making, supportive roles, and escalating situations • Maintain self-control • Keep calm (no heated actions) • Create a pastoral care function	• Create an environment where the team can focus on project milestones • Avoid increased workload • Always motivate to communicate • Establish an environment based on trust • Function as a role model	• Ensure TMs leave the project feeling appreciated • Encourage mutual respect after project completion

Table 41 Operational V-CORPS model for virtual team building and leadership: Key activities

6.4 Model validation

6.4.1 Introduction

In this section, the operational V-CORPS model is verified (Table 41) with twelve questions on the V-CORPS model itself, and six for the V-CORPS deployment of technology. Six of the eighteen previously interviewed experts were asked to answer the questions via an online survey. The six selected experts had the most experience with distributed teams, as evidenced in the previous research phases. During the survey, Table 41 was presented, and the experts were asked to read through it to answer the following eighteen questions. The questions used a Likert scale with two extremes (e.g., from strongly disagree to strongly agree) and open-ended questions each. In addition, for the Likert scale questions in the last third of the questionnaire, a justification of the answer was requested to better understand the respective decision of the experts. By interviewing the experts again, the aim was to ascertain to what extent the V-CORPS model is applicable in the automotive industry and how it might generally influence everyday work.

6.4.2 V-CORPS Model evaluation

The first part of the survey is used as a means to explain the operational use of the V-CORPS model (Table 41).

100% of the experts supported the view that the V-CORPS model is applicable in the automotive industry, with 50% of them believing that this model is very well suited for the automotive industry. Considering that the experts' answers ranged between 8 and 10 on a scale of 1 – 10, it can be concluded that the model presented in Table 41 is necessary and applicable in a real working environment within this industry. In addition, the openness of the experts to the application of such a model was also very high, which in turn reveals that a general change in the way of working is desired and seen as necessary.

The use of the V-CORPS model as a replacement or addition to the current working methods was affirmed by all experts, yet the V-CORPS model was increasingly seen as an addition to the current working methods, as business life is complex. Five out of six experts would use the model as it gives good guidance on team building and leadership, takes into account important aspects such as different cultures and mentalities, improves open and honest communication, and lists additional activities to

gain team trust. In addition, the model would harmonise well with current systems in the working world. As a result, the experts would expect a generally higher performance from the team in the respective projects. Especially in the case of increased team complexity and projects, V-CORPS can be used as a guideline for paying attention not only to the project itself, but also to the points it contains in relation to the team. One expert even saw the V-CORPS model as a viable substitute for the current method, suggesting starting a pilot project with support to test the success factors, gain comparative conditions, and obtain lessons for future improvements. It is important that the organisation has the appropriate attitude to accept such new methods. Therefore, certain preconditions need to be ensured from the beginning by stakeholders to ensure the success of the programme.

When asked about the profitability of a virtual project that utilises the V-CORPS model, the experts agreed that it has the potential to minimise unnecessary meetings, risks due to misunderstandings, cultural barriers, time barriers, and avoids wasting time. In addition, it supports improving motivation, communication, problem identification and resolution, achieving expected project goals with minimum hassle, and maximum commitment. In general, according to the experts, the model can be seen as a helpful tool that not only shapes the team in a positive way from the beginning, but also aligns all involved to set the suitable tone to build trust as a basis for communication, so that the participants focus on their task and the related commitment. In the opinion of the experts, such a guide reflects the necessary steps and highlights the important basics of virtual team building and leadership. This guide provides also a clear structure and rules to overcome language and cultural barriers and build good and trusting relationships.

In addition, 100% of the experts believed that a dynamic and independent team can be created by following the V-CORPS model. Half of the experts were even absolutely convinced of this. It can be deduced from this that the use of the model has a significant influence on team building and leadership, and consequently, on the project. This can therefore be expected to facilitate team leadership in particular, since a structured team makes it possible for a team to work autonomously.

The use of the V-CORPS model was examined by the experts for solving team-related problems. Moreover, the experts were asked their opinion on where existing methods are insufficient. One of the experts was undecided about V-CORPS, as such a model

has not yet been used in an operational environment. However, he felt that the V-CORPS model is an intelligently developed tool whose users will find it useful in solving team-related problems. However, he expects that adequate use of the tool itself should eliminate risks. Another expert sees a good opportunity for using V-CORPS, especially in burning platform-based projects. These are projects where the escalation level is very high, and disagreements have already occurred.

According to the expert's, the use of the model can help, even if 30% of the points mentioned in it are not taken into account when setting up a new project team due to schedules, experience, etc. Since current models are generally based on hierarchical structures and do not take into consideration the starting point for trust building, the use of such a model is beneficial, as it helps to overcome personal views in favour of a professional statement, which in turn benefits the team. In addition, the use of V-CORPS is important when the team needs to work together and has no experience or even relationship history. In general, using the model in multicultural and interdisciplinary project teams is important, but face-to-face meetings at regular intervals should not be neglected.

The V-CORPS model was assessed for its usefulness as a tool to improve working practices over a distance in the automotive sector. The experts' answers ranged from 8 to 10 (out of 10), with 50% giving it 10 (out of 10). The view was that the use of the model in the form of a tool will prove to be very useful. Therefore, it is evident that the experts are open to using V-CORPs as a tool.

The experts envision a fundamental improvement in the current methods of virtual team building and leadership through the use of the V-CORPS model. Since the model deals with the proper handling and support of virtual teams, the expectation is that the use of the model, which is seen as a tool, will do just that. This in turn will have a positive impact on team performance, and in addition, the model offers comprehensive use in virtual team building and leadership, which leads to a situational and flexible usage. In addition, the model changes the approach from a pure command and control organisation to an open, but structured team approach, which includes every location-independent team member. By using the model, a focus on cooperation at the same level can be expected, as a common understanding, as well as clear goals and responsibilities, are guaranteed.

The experts all agreed that the V-CORPS model provides a clear overview of virtual team building and leadership. The answers ranged from 8 – 10, and the use of the model allows for a very clear overview. The organised structure of the model allows the user to define and analyse the development side of their team, as well as leadership.

The V-CORPS model was considered suitable for use in all project stages by all experts. Although the answer range was between 7 and 10, the majority of the answers (66.9%) were between 9 and 10. This indicates that the model can be applied in every project stage and can therefore be used independently of a project.

When examining the potential of the V-CORPS model, which is to be integrated as a supporting measure for general styles of management in the automotive industry, the experts' views were quite positive. The range of answers scored between 6 and 10, although 66.7% of the experts strongly supported the integration of the model. The experts believed that team building is rarely considered in a project, instead, more focus is on the distribution of tasks, as management tends to focus on meeting deadlines, goals, and what is measurable. The general management style focuses more on hard project goals and less on people, thus V-CORPS could be a perfect complement when paying more attention to team members and stakeholders in general, as it is internationally structured and usually operates within several locations. The V-CORPS model was designed with input from automotive experts, so it is desirable for the current gaps in the tools used today to be addressed in the V-CORPS model. Many managers nowadays are shaped by hierarchy and team members, and most models only define roles and responsibilities, how to reach specific goals, and only provide basic processes and tools.

When asked whether or not the V-CORPS model requires any additional training or explanations, one expert answered 4 (16.6%), whereas the rest ranged between 7 and 9 (83.4%). This shows that the V-CORPS is understandable for most experts, but there remains a need for additional training to avoid misinterpretation and basic applicability.

The experts had some comments on the balance of the model and the topics it contains, as well as the topic areas with the corresponding aspects that should have been additionally emphasised or added. One expert felt that there was a lack of labelling of activities that must be carried out in virtual team building and leadership. Another needed the model in the form of a checklist with a corresponding weighing of

the activities to go through the minimum required elements under time pressure and catch up on the remaining ones later. In general, the experts find the selection of topics and areas very well balanced, but it will never be possible to completely avoid escalations. Here, one expert recommended adding another topic, namely how virtual leadership must be done in very difficult project situations, e.g., when there is no time or opportunity for long discussions. In general, the experts felt that any tool is subject to continuous improvement, like any process or product. However, the current V-CORPS has sufficient consistency to show that it is a tool worth using.

6.4.3 Summary

In this section, the final V-CORPS model (Table 41) was assessed by the experts. The assessment of the model was not divided into individual stages but considered as a whole. The experts commented on both the general usefulness and the use of the model in the automotive industry. By analysing the technology infiltration in the V-CORPS model, a platform of the possible technology to be used in the respective stage was also examined and formed.

6.5 V-CORPS technology deployment

In the second part of the survey (the online questionnaire), the use of technologies in each individual V-CORPS stage was investigated by collecting the experiences and views of the experts on the use of these technologies in daily operations. The survey was also necessary to discover which technology can be used the most successfully in each CSF through the V-CORPS stages, as virtual team building, and leadership is not possible without the use of different and suitable technologies. Through this research, in addition to the guide of virtual team building and leadership (V-CORPS model), the appropriate technology was also submitted.

In order to investigate the influence of digital technologies in virtual teams in operational working life, a V-CORPS technology deployment questionnaire was developed to ascertain how important they are for the respective processes of virtual leadership and communication. This questionnaire was answered by six experts from different management levels from the project leader to the vice president to obtain the views of the different management levels.

Findings confirmed that social media (Facebook, Twitter, LinkedIn, WhatsApp, etc.) are used sparingly in the automotive industry, as products under development are subject to strict secrecy. Nevertheless, five of the six experts interviewed believed social media to be important or very important in the context of virtual teams. This can have a positive effect on team cohesion and can be used for celebrating project successes, for example. The experts also added that social media allows for a quick exchange and dissemination of information.

Cloud computing was also viewed as being important to very important. Centralisation and retrievability of data by team members were seen as key issues, and in general, the experts saw the cloud as an aid that enables parallel work with the same documents and traceability of changes, especially in large teams.

Mobile was considered very important by five of the six experts, highlighting the need for accessibility and communication with the leader by and between respective team members. The experts also saw smartphones with their associated **A**pplication Software (Apps) not only as a means for quick access to data, but also as a flexible communication medium. Smartphones were seen as critical, providing flexible access to globally available company data, and supporting exchange of this data within virtual teams, regardless of time and space.

Virtual meeting technologies were seen as very important by all experts. It was described as a must for working globally, with such technologies offering an ideal platform for the exchange of information and also as an additional means of keep team members up to date. The experts considered Big Data and analytics to be important or very important, particularly in the context of simplifying reports and minimising required analysis by the end user, notably for competitive analysis.

The experts considered Big Data and analytics to be in the range of important to very important. It simplifies the creation of reports and required analyses. In addition, it provides an advantage for purely fact-based information. It also examines the value of information to see if it has a significant impact on the project's outcome, and is particularly helpful in brainstorming and competitive analysis, as the unneeded information can be extracted.

Agile project planning tools were seen as very important by five out of six experts. Such a programme allows identifying risks, leaks, and opportunities in a timely manner. In

addition, such a tool enables creating a project overview with the corresponding reports and identifying team performance. Furthermore, one of the experts believed that the V-CORPS model would work perfectly with the Agile approach. Although two of the experts felt that the Agile approach was unsuitable for long hardware projects, and that the Agile approach was more commonly seen in software projects where it is becoming increasingly popular. Nevertheless, two other experts replied that from a team's perspective, regular and repetitively structured planning has a positive effect and optimisations can be made through the lessons learned during a project.

The use of digital technologies can be divided into specific functional areas such as virtual messaging services, shared **C**ustomer **R**elationship **M**anagement (CRM) systems, interactive displays, project management tools, document storage and file sharing, meeting and video conferencing tools, and document creation (Harris-Briggs, 2018). The use of these technologies requires the appropriate training and support and establishing appropriate standards and procedures (for example for document version control). Possible digital technology deployment within the framework of the V-CORPS model is indicated in Table 42.

CSF/ V-CORPS Stage	Creation	Organisation	Relationship Building	Performance & Evaluation	Sign-Off & Closure
Building trust	**Virtual meetings technologies** create an initial connection between the team and the leader. In addition, this technology connects all team members involved and brings them together in one place **Agile project planning tools** particularly need to be used in the Performance & Evaluation Stage, as it shows the team that the leader has a clear vision of how the team is going to work so that the team can adapt to it **Social media** allows people to network outside the workplace and to share parts of their private lives and interests with each other on the team				
Create team structure	**Cloud Computing:** The leader has to show to the team the added value of the cloud and ensure connectivity and the data availability in it **Mobile:** these devices increase the flexibility of the team **Virtual Meetings Technologies:** The use of this tool allows for team collaboration and agreement undertaking **Agile project planning tools:** Used to allocate specific roles and tasks to be completed by team members during a project.				
Overcome cultural and language barriers	**Social media:** Promotes trust and creates common ground, which has a positive effect on overcoming barriers **Cloud Computing:** All data of a project are available to all team members without restrictions				
Manage time and distance barriers	**Mobile:** Connectivity beyond working hours **Cloud Computing:** Central data processing, data provision and information collection point for further processing (e.g., raw data is reproduced by a simulation model) **Big Data and Analytics:** Processing and analysis of large amounts of data without manual input. **Agile project planning tools:** Central work tool for retrieving and passing on tasks (especially needed in the Performance & Evaluation stage).				
Horizontal communication	**Social media:** Maintain contact outside of work. Publishing special activities and events. **Virtual Meetings Technologies:** Maintaining and expanding communication (e.g., team chat).				

Table 42 CSF stages support through digitalisation

Table 42 shows the possible use of technology in the respective V-CORPS stages. This use serves as a list of possible technologies to be used to provide the team with broader networking opportunities, both inside and outside of working hours. This table can be considered as social engineering in the V-CORPS model, as it not only addresses the working tools in the project, but also the inclusion of social aspects in the team.

6.6 Summary

In this chapter, the V-CORPS model was developed further into the form of a guide. The CSFs listed in the individual stages were extracted through data processing (section 6.2) and re-expressed as activities.

In section 6.3, the individual stages and CSFs were discussed while also highlighting the activities requiring observation. As a result, the final V-CORPS model was designed, which was evaluated in section 6.4 by a further questionnaire completed by

six experts. This questionnaire was extended in 6.5 to include the use of possible technologies in the V-CORPS model to generate a list of possible technologies in the respective CSFs. This expansion resulted in an additional list of technologies that can be used as tools in the V-CORPS model for each CSF, while also showing how a leader can improve and encourage social behaviour.

The experts saw the V-CORPS model as a useful additional tool that enriches or even replaces current methods in the automotive industry. Especially by using the model in team building and leadership, the experts expected a significant improvement in team performance and a more extensive promotion of trust among team members. In general, the experts expressed their appreciation of the model as it looked at the non-measurable in a project, which has a significant influence on the measurable.

7. DISCUSSION: REFLECTIONS ON THE MODEL AND RESEARCH QUESTIONS

7.1 Introduction

In this chapter, the V-CORPS model is considered and reflected upon to determine its overall suitability for its area of application, and critically assess its possibilities. Section 7.2 assesses the use of the V-CORPS model in the form of a guide, illustrating how it can be applied to both team building and leadership and whether each stage can be done interdependently. Section 7.3 discusses digital technology and its importance for virtual team building and leadership. In addition, it discusses why traditional ICT is no longer appropriate and the possibilities that the V-CORPS model offers in combination with currently available digital technology. Section 7.4 deals with the RQs to be answered. The answers and the available results are discussed, as well as the critical aspects. Section 7.5 summarises the entire chapter.

7.2 The V-CORPS model as a guide for virtual team building and leadership

The final V-CORPS model can be used in the automotive industry as an operational guide, and is based on the literature review, which was then explored and extended through the survey and a series of semi-structured interviews with associated experts.

The survey and the semi-structured interviews showed that the model of small group development by Tuckman and Jensen (1977) was an appropriate starting point, as it addresses the individual group formation stages "Storming, Norming, Forming, Performing and Adjourning" individually. Nevertheless, the individual stages had to be adapted and expanded upon for remote group development by incorporating the new technologies of the digital era. The increasing complexity of projects nowadays in the automotive industry, together with new technological possibilities for communication and group development, cannot be compared with the requirements of team management in 1977. The increasing globalisation of the automotive industry requires structures for virtual team building and leadership to simplify working conditions, which are currently not yet available.

This research has revealed that current methods for working at a distance in the automotive industry are almost entirely based on measurable processes and less on team building. UKG (2020) confirmed that the Covid-19 situation in particular requires companies to rethink their entire working model to align company requirements with employee demands. Indeed, the trend towards virtual work has increased in recent

years and companies have sufficiently learned how to lead virtual teams (Newman & Ford, 2020). Nevertheless, the creation of a team is mostly neglected, which can be very challenging, or even critical, for the leader if the team and project complexity increases.

The survey and semi-structured interviews provided new insights regarding the current challenges in this industry. The interviews were focused on the views of experts in this industry who have extensive automotive experience and have worked in a wide variety of companies prior to this survey. This helped to look at the topic from a practice-oriented perspective through the application of qualitative methods. In addition, this avoided one-sided data collection from the literature. The benefit of this approach for the automotive industry is that the data collected does not come from a theoretical source but is based on evidence from experts within the industry. The research examined the possibilities of building a virtual team, which works together effectively over a distance and how one can influence this. In addition, the general attitude of the experts from different management levels on the subject was revealed, and whether, as Jarvenpaa and Leidner (1999) stated, it is uncomfortable for them to adapt to the needs of a virtual team.

The evaluation of the interviews (section 5.3) stated that the experts had a very open and positive view of virtual team building and leadership and saw the need for structuring in this area. The research aimed to develop a new management tool that would allow leaders to better influence their team members to achieve higher levels of results and ensure that behavioural risks are well managed and each members' skills are effectively used (Chung & Kim, 2016). Developing such a guide responds to the statement by Caulat (2006) that the development and management of effective virtual teams remains a major challenge, as the support of such a guide allows teams to be built in a structured way. This guide explicitly addresses the risks and challenges associated with mentality, language barriers, and social influence among the team members mentioned in the literature, researched by Scheunemann and Bühlmann (2018), and how to counteract these.

The questionnaire and interview data confirmed that the performance of team members has a significant impact on the performance rating of the leader himself. The team carries out the assigned tasks that are necessary to achieve the project milestone. Furthermore, the interviews confirmed the statement of Schmidt (2015) that

in virtual leadership, leaders are responsible for managing virtual teams and virtual employees, while helping them to be as productive as possible. This significantly influences the way teams are led and managed at a distance. Caulat's (2006) stated that the difference between mediocre and strong teams lies in their development and in the position of the managers who develop and lead them. Leading from a distance means that each of the distributed team members is his or her own supervisor, and independently assumes the necessary responsibility for the project tasks through his or her own actions. However, the leader must pass on this responsibility to the individual team members through defined processes, so that the team members can understand what is behind their actions, and also that team members can function well with each other.

As indicated above, the main difference from purely literature research is that although the V-CORPS model is derived from the literature, its evaluation and application is based on practical experience. This results in a practice-oriented model that can be applied in a workable way. In addition, the model takes into account the challenges of a virtual team through identifying the CSFs in the respective stages and lists suggestions to address the key issues. The model was seen as a guide among the interviewed experts that is concerned more with team building, but still takes team leadership into account. The V-CORPS model supports the leader during all of these stages by guiding him through the entire team building and leadership process. The CSFs need to be considered while using the V-CORPS model to achieve effective teamwork.

The V-CORPS model considers the factors of teamwork identified by Marks et al. (2001): progress control, systems, and team feedback. The approach of the V-CORPS model is to not only address these factors by supporting digitalisation, but to also make the team work increasingly autonomously. The model supports the leader in steering, feedback, and escalation actions in the team during a project. The experts indicated (sections 5.2, 5.3, 6.3, 6.4 and 6.5) that by using the V-CORPS model, unnecessary meetings, risks due to misunderstandings, cultural barriers, and time barriers would be reduced and wasted time would be avoided. This would fulfil the requirement highlighted by Lee et al. (2009) that teams need to be adapted for higher demand dynamics that equip the virtual team with the ability to respond more quickly and effectively to change.

The V-CORPS model supports an improvement in overall team building and leadership process capability, as it primarily looks at improving motivation, communication, problem identification, and resolution, while achieving the expected project goals with minimal effort and maximum commitment as investigated by Fung and Siow (2013). In addition, the use of the model helps to positively shape team spirit, as well as aligning all involved to build mutual trust to focus on the task and the related commitment. In addition, through the use of the model, the experts suggested that the team may become more dynamic and independent (section 6.4.2).

The V-CORPS model guides the construction of a virtual leadership process which can be seen as an input/output model (Figure 25). McGrath (1984) noted that input deals with tangible entities such as human and material resources, knowledge, tasks and technological requirements. The model stages are applicable to each stage of team development individually. Since there are several task points in each stage, they can be applied to any team building and leadership stage and therefore do not require a strict chronological order. Nevertheless, the consideration of the stages must be differentiated, as the input (Creation and Organisation) and feedback (Sign-off and Closure) stages are only necessary at the beginning and end of a project. On the contrary, the process (relationship building) and output (Performance & Evaluation) stages are to be considered iteratively throughout the entire project's duration. However, when considering the application of V-CORPS into a virtual team, the stages must be considered cyclically, since the stages must also be taken into account for each new or existing team.

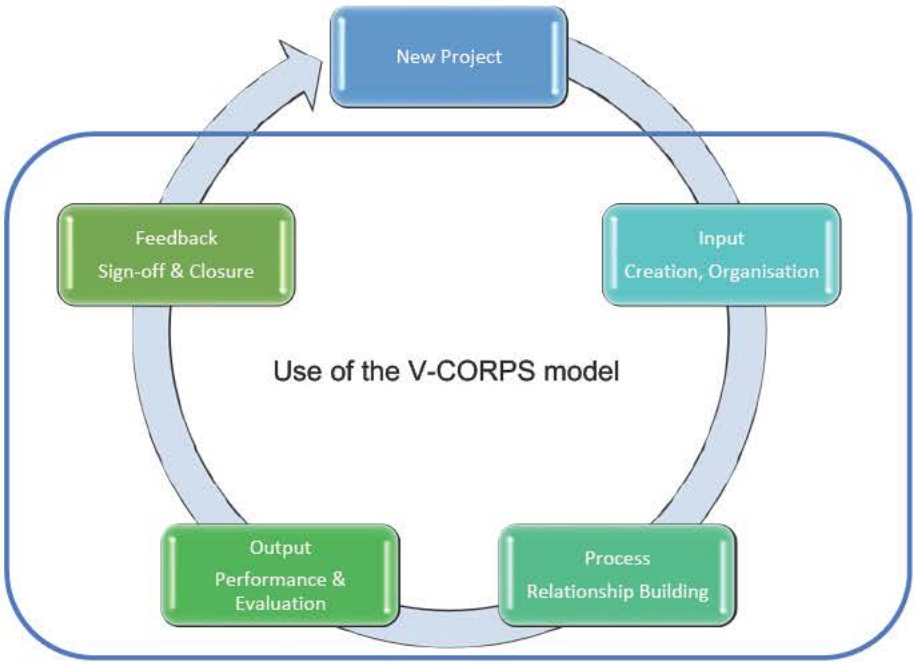

Figure 25 V-CORPS application in an input output model of virtual leadership process

Here, input was considered as the first two stages of the model, as the majority of experts in the first survey considered the relationship building stage as the most important of the first three, before the performance and evaluation. The first two stages lay the foundation for the process of the relationship stage. In the relationship building stage, the mutual relationship is consolidated once again and the preparatory work for the performance and evaluation stage is then completed. This is similar to what a number of authors (Caulat, 2006; Duckworth, 2008; Ford et al., 2017; Lipnack & Stamps, 1999; Maes & Weldy, 2018) have emphasised, namely that trust between leaders and their team members as well as between the team members themselves is the most important aspect for leading remotely, while trust is the basis for working with virtual teams.

A good team relationship is based on trust, which requires sufficient groundwork (Fung & Siow, 2013). Output is measured by the quantity and/or quality of products, the consequences for members, and the potential for teams to work effectively in the future (Guzzo & Dickson, 1996). Here, the output is only to be seen as performance and evaluation, as only here can measurable results be obtained. Additionally, the general atmosphere in the company must be taken into account, as even a good team can deliver poor project results if, for example, there are insufficient resources available in the company during the project.

The feedback session is the final instrument of the input/output model used to dissolve the team, discuss common events during the project, and apply or improve what has been learned in the following project.

7.3 Digital technology for virtual team building and leadership

The evolution of IT, referred to as digital transformation, is an essential element of virtual team building and leadership. ICT was first used to overcome barriers of time and distance while promoting collaboration and increasing flexibility in a team (Boudreau et al., 1998). ICT has evolved to include new digital technologies that are particularly relevant and valuable to the operation of virtual teams. According to Cortellazzo et al. (2019), all team members are empowered to use their knowledge innovatively, leading to a collaborative and dynamic work process. Virtual leadership is a process of social influence which is supported by IT (Avolio et al., 2000). Over the years, IT has changed from a supporting role to be a fundamental component of virtual leadership. A pure communication and information base has been replaced by digital technologies and their use greatly enhances the virtual leadership process. This is particularly true of virtual meeting technologies, as they create a virtual place to build, consolidate, and continue mutual relationships.

Digital technologies, through camera-based systems, enable more face-to-face communication between team members and support team-building activities. In the process, basic building blocks and regulations for the promotion of teamwork are defined and agreed upon. In this context, the use of such technologies enables a central point of contact for the team, which is comparable to going to the office every day. Shifting the way teams work from a real to a virtual environment is increasingly associated with flexibility, accessibility, and efficiency, as digital technologies provide both a “pool” and a “tool” function. The virtual "pool" function provides the leader and team members the possibility to come together in the form of meetings or mutual exchanges and can be seen as a virtual workplace. In addition, this function offers the possibility to request help from experts for short-term support for specific tasks. The "tool" function offers a selection of tools that are not only used for general communication throughout the project, but also as a project and team tracking tool, through a joint pre-coordination in one of the V-CORPS stages.

The creation of a central virtual contact point for all team members is essential for a virtual team. A study by DasGupta (2011) confirmed that a physical meeting of team

members is rather the exception and the computer can be considered as the main communication medium. In addition, smartphones in particular have a strong role in digital transformation, as they are superior to computers in some respects, especially in terms of flexibility. The experts were almost unanimously convinced that smartphones have a very important technological influence on virtual work. No other mobile device offers such a wide range of applications as the smartphone and its apps. In addition, digitalisation offers entire portals that enable not only communication but also project and team tracking tools, as well as central data access (e.g., servers, data storage, etc.), which is part of the move to cloud computing that most organisations are embarked upon.

Digital transformation helps by simplifying, or even automating certain work processes, and thus increases efficiency as the team can concentrate fully on the tasks at hand. Table 42 showed that digital technology has an impact in each stage of the V-CORPS model involving the use of a broad spectrum of tools and technologies, including social media, mobile, cloud computing, big data, and analytics, as well as agile project planning tools.

In virtual team building and leadership, the V-CORPS model supports the leader in taking a “background” role and react when needed. The support of digital technology is essential as it gives the leader an overview of the project activities and enables the team to work autonomously. This aligns with the view of Schmidt (2015) whereby leaders must ask themselves what they think of their teams and how management perceives the effectiveness of their leadership. By using the stages from the V-CORPS model, the leader can get a clear overview of how to relate to the team and where there is a need for optimisation. In addition, digital technology helps the leader to see the effectiveness of his leadership and the performance of each individual team member at any time, for example, through a tracking tool.

Digital technology plays an important role in planning and executing strategies to overcome various challenges (Peters et al., 2016). The experts were ambivalent about this but given the fact that both projects and teams are getting larger and more complex, digital technology support is required, and more likely inevitable, as human errors need to be kept to a minimum due to the increasing dynamics of work. This is confirmed by HBR (2016), who believed that choosing the proper technology leads to overcoming barriers with virtual teams. Gyimesi and Berman (2011) confirmed that car

manufacturers are under increased pressure following the diesel scandal and electromobility, as additional requirements for the integration of information and interactivity are driving factors for increasing costs and complexity. Therefore, working with virtual teams is done by supporting digital technologies for efficiency and saving time. A wide range of products and systems help increase team productivity by bringing the team together and facilitating project tracking and management while securing sensitive data and documents (Okta, 2020). In this context, with the help of a guide, the use of digital technologies must be set up and structured in a standardised way to keep the introductory phase as short as possible.

Virtual team building and leadership rely heavily on digital technologies, as these are to be seen as the basis of virtual work. Digital technologies not only shape the daily work routine, but also simplify it many times over. However, these technologies will never fulfil the full benefits of social interaction, such as in an on-site team, which is also reflected in the expert's survey. HBR (2016) confirmed that while face-to-face communication is the most appropriate, video and telecommunication can consequently be used to capture the reciprocal mood of team members. Nevertheless, this aspect can be addressed to a large extent through the use of social media, by networking outside the company, and publicising the team's successes and achievements. This not only strengthens the sense of community, but also promotes one's own cause, which increases the level of awareness and the popularity of team members.

Social media can also have a negative effect if, for example, a posting is not interpreted correctly and you as a leader or team member find yourself in need of explanation. Nevertheless, one learns to act and react responsibly with the dissemination of information in social media, as social media is already a major part of our daily lives. Such apps are now accepted by many companies as part of their corporate culture. There are essentially no more restrictions to integrate such apps into the daily work routine.

7.4 Addressing the research questions

7.4.1 Identifying CSFs through the analysis of existing literature

The CSFs listed in Figure 6 (Building trust over distance, Creating team structure, Overcoming cultural and language barriers, Managing time and distance barriers, and

Influence through horizontal communication) were identified through the literature review. The approach in the CSFs was adapted from the working methods of virtual teams from other working areas (mostly IT) to the automotive industry. Applying the CSFs to the entire V-CORPS model leads to a general mindset change on how to build and lead virtual teams in the automotive industry and enables the automotive industry to gain a better understanding of how to build and lead IT teams.

Building trust in a team requires the aspects of mutual perception among one another and the actions taken during the working process. Kozlowski et al. (2021) found that trust and cohesion are essential for a high-performing team; however, building them is more challenging in virtual teams. The HBR (2016) reports that remote working can isolate teams, as building trust is a challenge without face-to-face contact, and failure often results in alienation and a loss of motivation. To address this challenge, trust building was considered critical in the model. In addition, trust in teams should be seen as a generic term of itself, as it represents a broad spectrum such as cohesion, mutual openness, and leadership care.

The *creation of a team structure* has been strongly emphasised in the literature as it is seen as a fall back plan in case trust building does not work completely or at all. Vought (2017) identified the best virtual team structure as one that is built according to the requirements of the company, thereby generating optimal team performance. Therefore, the needs must be taken into account when forming this team structure. The CSF of creating team structure is used throughout all stages of the V-CORPS model, as it allows the leader to adapt their team to the needs of the company as well as the project, if necessary. The leader orientates the formation of team structure for the company and project requirements, while potentially combining these with the needs (use of common IT tools, common team contract, regular communication) of the team or create a compromise solution, as the experts confirmed. The leader has to consider each virtual team member when creating the team structure so that they can work as a virtual unit in the long run. Creating a team structure is essential for the virtual team as it allows for an individualised approach to the working requirements of each team member.

Cultural and language barriers are generally rarely considered in operations and the resulting difficulties often challenge leaders. In general, cultural barriers are serious obstacles to team performance (Shachaf, 2008). Nader et al. (2009) founded that most

companies have a fundamental expectation that the language in most cases is "English" spoken to a particular standard, but they do not consider whether that standard is available in the team. This needs consideration and effective management in the leader's approach to this CSF for cultural and language barriers. The CSF helps to avoid isolated group formations in the team as well as outsider roles of the individual team members, which in turn allows the team to work as one unit.

Building and leading virtual teams is not only done remotely, but also in different time zones. These factors were taken into account when creating the V-CORPS model to examine them and work on proposals to overcome them. The CSF of *overcoming time and distance barriers* offers the team the possibility to define work tools and create a common working standard, which positively impacts the efficiency and collective performance of the team. In operation, this factor is often neglected, although it significantly impacts the common agreement of the tools to be used in the team during the project. By considering this factor in all stages of the V-CORPS model, it enables the team to not only agree on the IT tools to be used, but to also learn about the technical capabilities of the company. In addition, it gives the leader insight into which team member needs additional training in the respective tool.

In the operational area of the automotive industry, teams are often led by a leader without a supervisor relationship, which is particularly challenging at a distance. Therefore, leaders have to prepare their teams for virtual working and create common ground so that they can steer it via influence. Alistoun and Upfold (2012) found that the leader can influence the virtual team through specific training. The aspect of *horizontal communication* is an important criterion as companies increasingly focus on flat hierarchies and fast decision-making processes. Apart from digital support, communication is the manager's most important tool. It enables him/her to steer the team in a goal-oriented way and influence the process efficiently without placing restrictions on team members. This requires a structured development of horizontal communication together with the team throughout all stages of the model.

7.4.2 Developing a PCF through the review of existing literature on virtual leadership and virtual teams

The conceptual framework presented in Table 3 combines the basic structure of the Tuckman and Jensen (1977) model of small group development and the CSFs discussed in the previous section. Tuckman's model only considered small group

development in the field. Given the time in which field team leadership were being developed (see section 2.2-2.4), there were no opportunities to deal with the leadership of dispersed teams and the associated complexity. In addition, the technical possibilities of communication at that time were not comparable with today's digital technologies.

Individual levels were not defined, which carries the danger of a general lack of structure in team development, since each manager interprets these levels differently, no uniform basis for leadership is created. Cortellazzo et al. (2019), showed that the behavioural norms in virtual teams need to be more clearly defined compared to traditional teams, and must include communication tools used for information flow and activities. Such norms are not listed in the Tuckman model, and the social aspect is not considered, as this needs to be built at each stage to foster trust to achieve the best possible performance out of the team. The difference between virtual and co-located teams (Figure 7) lies primarily in the form of communication, which must be regulated in the first stages of team building so that it functions in a performance-oriented manner, and above all, the social aspect is not neglected. HBR (2016) has confirmed that remotely operated teams need clear communication standards, which are challenging to create due to the diversity of technologies. The V-CORPS model considers this in the organisation stage (Table 41), where the structuring of the team and the definition of tools is addressed. This was taken into account when creating the conceptual framework by showing a possible path for building the required form of communication (e.g., team working contract, defining the terms of project rules, definition of working tools (Table 3)).

The conceptual framework was developed based on the literature. The challenges of both building virtual teams and working with them were discussed by researchers (Caulat, 2006; Duckworth, 2008; Ford et al., 2017; Lipnack & Stamps, 1999; Maes & Weldy, 2018) in section 2.9. The leader was seen as the central starting point in both team building and leadership. Berry (2011) stated that effective management of virtual teams depends on basic principles and team dynamics. However, in relation to virtual team building and leadership, a more precise distinction is necessary to be made between basic principles and team dynamics. Therefore, the CSFs were integrated into each stage of the V-CORPS model, so that these basic principles are outlined

there and both social and business aspects are taken into account to obtain sufficient team dynamics.

The dynamics of a team are considered successively in the *performance and evaluation* stage. Team dynamics should be goal-oriented, yet a virtual team must work reliably and as autonomously as possible to achieve the expected performance. The required dynamics must also not have a negative influence on the team, whereby the leader is responsible for controlling and regulating these dynamics while directing the team towards their goals to ensure team sustainability. This was referred in the literature to a limited extent and was still taken into account in the conceptual framework.

The experts were asked to divulge how much strain the team is subjected to in its regular mode of operation, and how long the team may be subjected to a maximum load. They suggested that, as a rule, the team must be loaded in the yellow zone at 75-80% to achieve not only a good performance but also for team sustainability. A workload can also include additional hours of overtime, which in turn must be combined with a recovery period to avoid overloading the team in the long-term and prevent resignation.

The structure of the conceptual framework was presented in chapter 3. Table 3 showed that not all factors related to virtual team building and leadership were considered when building the conceptual framework and that the influence of digital technology was hardly evident. The conceptual framework was evaluated through a survey with semi-structured interviews, as the literature did not provide adequate information to design this model in a way that was applicable in operations. Therefore, some examples were given via the respective CSFs, so that the experts were able to use them as a reference. In addition, the conceptual framework not only showed the underlying complexity of building and leadership of virtual teams, but also listed the required actions in the respective stages to simplify its diversity. In general, the conceptual framework was useful for developing the final V-CORPS model that takes into account digital technologies and can be directly applied in virtual team operations.

7.4.3 Developing, applying, and evaluating a new operational model that minimises personal contact and optimises project outcomes through the analyses of interviews

The conceptual framework was presented to the experts as the foundation for the onward development of the V-CORPS model (Table 3).

The survey of eighteen respondents provided a first impression of the experts' views on this topic in the evaluation stage and was considered in the preparation of the interview questions. The answers were used to determine how open the experts were to the theme of virtual team building and leadership, and whether the experts were in agreement with such a way of working and would be willing to work through the V-CORPS model. Additional information provided from these experts were then discussed in greater depth in the subsequent interviews.

In the interviews, the questions on the respective stages were reduced to five, with sub-items, making it possible to discuss each topic in depth. The aim was to collect the necessary information from the experts on the final model and question its positive and negative aspects. The answers were collected on the V-CORPS model and the challenges in its operational implementation. In addition, the impact of each V-CORPS stage on the other stages was examined to discover which stage has the greatest impact on the performance and evaluation stage. This question was answered, albeit very narrowly, so more research will be needed to define the main impacted stage on the performance and evaluation stage. The individual V-CORPS stages were evaluated, and further key points were added.

Based on these responses, the conceptual framework was evaluated, and each CSF was summarised into bullet points using the data processing (further information in section 6.2). The bullet points of each stage were converted into activities so that the use of the V-CORPS model would not be perceived as prescriptive. As a result, the V-CORPS model was adapted to be used as a guide (Table 41) for virtual team building and leadership.

The V-CORPS guide was further refined and confirmed by a final survey. This evaluation revealed whether this guide could be used in operations or if further improvements would emerge in the process. A subset of the original experts (6 out of 18) was approached for the questionnaire, as they were familiar with the previous V-CORPS model and did not need any further information apart from the presentation of

the final guide. The experts found the guide useful and meaningful, and maintained that it would be able to support or complement existing working methods. It is a different way of working, having practically considered team building. In addition, the guide promotes a different way of looking at the team from the leader's perspective, as issues are taken seriously that were previously taken for granted. Through the guide, the use of digital technology is fundamental since it facilitates the way of working through its control and management functions. The V-CORPS model, which was considered as a supportive tool or guide to be used in conjunction with other project management tools and methodologies for virtual teams, combines team building with leadership and includes team resolution. Such a guide defining team building and leadership in a structured way has not been created to date.

7.5 Summary

In this chapter, the initial V-CORPS conceptual framework and the final operational model were discussed. The conceptual framework for building and leadership of virtual teams was discussed and subsequently reformulated into a guide in the final model. This was followed by a more in-depth discussion on the influence of digital technology and its role in the model. The three RQs were then addressed.

After evaluating the results of the final operational V-CORPS model, it was confirmed by the experts that the model was appropriate and needed as a guide for the operation of virtual teams. Extensive statements concerning the value of the V-CORPS model can be taken from both section 5.2, 5.3 and 6.3. Thus, the CSFs of the respective stages list activity points that need to be undertaken to generate success in leadership at a distance.

Digital technology is a fundamental enabler of leadership at a distance. Section 7.3 revealed that digital technology not only contributes to communication, but also serves as a central point of contact for virtual teams through the multitude of portals with controlling and checking possibilities. In particular, the aspect of the almost limitless flexibility and centralisation of these systems were considered and discussed.

The three RQs were addressed and answered. The literature review confirmed that there have been frameworks in the same vein as the V-CORPS model, but only isolated aspects of either team building, or leadership have been considered. A fully comprehensive model that takes into account virtual team building and leadership that

recognises the significance of digital technologies has not previously been available in the automotive industry.

Therefore, it was necessary to set the identification of CSFs as a research objective and establish and develop these as described in section 7.4.1. Based on this, the preliminary conceptual framework of the V-CORPS model was created for further evaluation by the experts as described in section 7.4.2. The preliminary model was evaluated and refined through a survey and semi-structured interviews to create the final model through a survey as described in section 7.4.3. The entire model was fully analysed and transformed into a final operational V-CORPS guide, which is ready to be applied and has the endorsement of several experts in the automotive industry.

8. CONCLUSION

8.1 Introduction

This chapter provides a conclusion to the thesis. In section 8.2, the main findings are listed and the application of the V-CORPS model, for use as an application or a development project, is addressed. The project process in the automotive industry is also presented to show the influence of the V-CORPS model in this context. Section 8.3 presents the contribution of research to theory and demonstrates why the V-CORPS model addresses a gap in current literature. This includes a discussion of existing theory relevant to the V-CORPS model. Section 8.4 discusses the potential operational impact of using the V-CORPS model. The effects of the model on the team, the company and social aspects are also addressed. In section 8.5, future research perspectives relating to the V-CORPS model are presented, considering team building and leadership itself, as well as additional fields to be investigated.

8.2 Main findings

The entire management level was deliberately selected and interviewed as the intention was to gather information from the leaders. This was significant for the V-CORPS model as it is the leaders for whom this guide should serve as a practical tool. Managers' roles were very important as they could be used to draw conclusions on whether top management agree or disagree with line management. In addition, the weight and significance of the statements of a CEO could be considered different from those of a line manager, as the CEO has a more global view. The candidates' knowledge was mainly based on his practical experience, and this influenced the direction of this research in that it was oriented around creating a model for practical application. Through the interviews, the challenges of working with dispersed teams in this industry were brought to the attention of interviewees by the candidate, which in turn could be taken into account to build a model to address these challenges.

In the operational field, the V-CORPS model can be used as a guide for virtual team building and leadership. This was stated by various experts in the survey and interviews. This model has the potential to influence not only the standardisation of teambuilding and leadership in a company, but also ensures that teams adapt quickly to new projects, thereby ensuring efficient working practices.

With the increasing complexity of vehicles resulting in more complex and extensive projects, an expansion of different suppliers for vehicle projects overall is required for the OEMs. Therefore, a centralised project work scheme is more time efficient for the OEMs, so that suppliers and sub-suppliers will be able to work according to the same project standards. This time efficiency is necessary due to the rigid time limits of development projects, which usually last for approximately 2 to 2.5 years, as both the complexity of the vehicles and component requirements have increased significantly. The development of the V-CORPS model (which can be used in the form of a guide) promotes the formation of a structure for virtual team building and leadership in order to be able to work remotely in the most time-efficient way.

Figure 26 Project milestones of a new product development project in the automotive industry

The V-CORPS model can be applied in practice for achieving project milestones for development and customer projects in the automotive industry (Figure 26). There are five phases in total, starting with the kick-off phase of a project and ending with the handover (SOP) to the production plants. Since every project kick-off has to be prepared, team building is also an essential factor, as the leader and his team are only measured by the success of the project. Therefore, the first three stages of the V-CORPS model (Creation, Organisation, and Relationship Building) must be given special attention during the kick-off phase of the project, as these set the foundation for further teamwork. Nevertheless, the V-CORPS stages are not considered complete here, as the use of the individual V-CORPS stages can be reused depending on the project-specific situation. The subsequent phases of the project (Figure 26) refer more to the Performance & Evaluation stage, but the leader must still analyse the individual CSFs in the respective stages and evaluate them as completed or in need of

improvement. This has the effect of improving the overall productivity of the virtual working team and the achievement of the project milestones in general. The Sign-Off and Closure stage takes place after the SOP has been achieved and cannot be neglected.

When a project is acquired by a company, team members are nominated, and the leader presents the scope of the project. This is followed by a project presentation (Kick-Off phase) in front of the company-specific board, after which the actual development of the product takes place following the approval of the kick-off and the associated project budget. Once this is completed and approved by the board through a Design Review (DR), concept development follows, which is validated through a small amount of testing and submitted to the board for approval in the DR. Then follows the prototype development of the product, which is validated through a series of tests in the prototype state before being submitted to the board for approval in a further DR. After passing this phase, the product is ready for series production and validated through a series of tests (from the prototype phase), where series conditions already prevail (e.g., components are made of series tools, production on a series line, etc.) during which specific production tools and equipment are analysed and validated for their production capability in series production. Once the product has passed these tests and is released by the DR, it has achieved series production readiness, and after additional quality approvals, can the product be handed over to the producing plant (SOP).

Every phase refers to specific milestones (in the form of design and project reviews) that have to be approved by the board before the SOP is reached. Only one Performance & Evaluation stage of the five V-CORPS stages apply. Other stages, on which the Performance & Evaluation stage depends on, are necessary and important, but in operational terms they belong to unwritten rules that are expected from each company. In addition, the Sign-Off and Closure stage, which occurs after the Performance & Evaluation stage, is often neglected as it is not a project milestone eligible for SOP and the leader is responsible for it if he/she seeks to build a sustainable relationship with his/her team members. The V-CORPS model, through its design, draws attention to the stages that are often not considered in operations, and through the CSFs, highlights the need to pay attention to them.

The automotive industry works mostly according to the same performance-based scheme (Figure 26) in terms of new product development and application projects to ensure the safety of product functionality. This applies not only to the OEMs alone, but also to their suppliers and sub-suppliers to evaluate employees based on project results, excluding social interactions between team members. By using V-CORPS, the performance level is brought into focus, as well as four additional levels that deal solely with team building and leadership to improve the overall performance of the team and work-life balance. Suppliers and OEMs work closely together in most cases, so a unified structure in team building and leadership is useful, contributing to the effective use of time, cost reduction, and improvement of team performance through better social positioning during a project. With the use of V-CORPS throughout, it can guide a leader on how to build and lead a remote team in an effective way. However, for this to become a reality, experts working in this field must agree on the need for a new standardised system.

8.3 Contribution to theory

The main contribution of this research was the development and evaluation of the resulting V-CORPS model. Five stages, complemented by five CSFs with listed activities, can be applied to the building and leading of remote teams. A significant validity was given to the model through the questionnaire and interviews provided by the experts in a first step, while other experts were asked to analyse the model, via a questionnaire, in a second step. This allowed these experts to contribute their expertise and experience to the model and they commented positively on the model's potential for operational applications. As the V-CORPS model is seen as a guide for virtual team building and leadership, this model can be applied at the lowest and highest management levels.

An additional contribution of this research to the theory stems from Cortellazzo et al. (2019), who state that one has to include the more digitalisation in the leadership of virtual teams. The V-CORPS model not only demonstrates the importance of team building for the success of leadership at a distance, but also provides possible digital technologies (6.5) for the corresponding stages. The model illustrates that important team-building aspects have to be considered in order to obtain the desired performance of a virtual team. In addition, this research confirms Zivick's (2011) argument that a leader can increase his or her effectiveness by using specific methods.

The V-CORPS model can be considered as such a method. In general, this research enriches the systematic leadership theory (2.2.8), as through the use of the model a team can be built either sequentially (stage by stage) or flexibly (the use of only one or several stages), while also being led systematically.

Additionally, this highlights the fact that working with decentralised managed teams requires a stronger focus on bringing individual team members together compared to co-located teams. This makes it clear that a leader's process focus does not lead to team success nor project success. The model emphasizes that the leaders of the “process-oriented automotive industry”, as it was called by one of the interviewed experts, must take more care of team members and team building itself in order to be able to work more efficiently and generate project success. The basis of project success lies in the mutual trust of team members and the development of social behaviour among each other, as this reduces dissatisfaction and the resulting risks (O'Keefe & Chen, 2011).

Törmänen (2017) investigated the best practices and tools that can be used with remote teams. While addressing team-building activities, he emphasised that physical events should be held whenever possible. The V-CORPS model combines practices in stages with the subdivided CSFs and the technology needed for deployment (section 6.4). The model does not indicate the best tools and best practices, as these still need to be explored through the application of the model in operational settings. Nevertheless, it reveals possibilities that enable virtual team building and leadership without physical meetings.

The model not only focuses on the important factors of team building and leadership (HBR, 2016; Kozlowski et al., 2021; UKG, 2020) but also provides a structured summary of these factors, evaluates them, and publishes them in the form of a guide.

8.4 Contribution to practice

Working with remote teams is becoming increasingly relevant in the global automotive industry. The COVID-19 pandemic has not only accelerated this but also moulded it, as remote teams now rely mainly on technology for both communication and task completion (Gilson et al., 2021). The automotive industry has an important position in the global economy, accounting for 5% of total value added in the EU alone (Ujvari et al., 2020). Therefore, increasing team and management performance for a process-

oriented industry is vital for the implementation of both simple and complex projects. Even before the COVID-19 pandemic, the industry suffered from not only the diesel scandal, but also the EU Commission's increasingly stringent requirements regarding CO2 emissions. As project complexity increases, this industry is also forced to adopt a more flexible way of working, not only locally, but also remotely, as the large number of individual members in a project makes working locally very costly and time-consuming (e.g., by traveling to a place for meetings).

The V-CORPS model gives the leader an overview of the operations that are necessary for building a team. This provides both the leader and the team a broader insight into the project, as well as the daily routines of each team member, which contributes greatly to overall team spirit and builds a solid base of trust. With the generally intensive working environment of the automotive industry, the V-CORPS model offers experienced leaders' clues on what to consider for team building and leadership, and the V-CORPS model can be used as a checklist. For less experienced leaders, the V-CORPS can be used as a guide, which in turn has the added benefit of lessening the burden on the leader's supervisor. In addition, the model encourages the leader to focus not only on managing the workload, but also on the team during the team leadership period.

A further key contribution is the focus on the influence of social aspects during the team-building process. This model illustrates that team building requires more action on the part of the leader to prepare a remote team to work remotely, rather than assuming that team members will find each other on their own. The interviews with the experts revealed that a structured approach to projects exists in companies, but that there is a lack of structured team building, which is very challenging and time-consuming for long-term project performance, as the leaders often do not realise how to deal with new challenges. In addition, the V-CORPS model lists the scope of a leader's services, as the leader has to bring the team together through the use of the model, and at the same time he or she can both evaluate and improve upon it.

Finally, the model enables standardising an approach across virtual projects. Due to the flexibility of the model, it is feasible for the structurally connected automotive industry to adapt their project management practices to the virtual environment. The V-CORPS model provides the leader with a basis for guiding remote workers in the form of a guide. The different technologies to be used (Table 42) complement the

model at the digital level by showing where and how these technologies can be used to facilitate working with remote teams.

There are some additional factors to bear in mind when applying the model in practice. The experts noted that when the model is presented to the leader, he/she may misinterpret it or may not understand it at all, which in turn will have a counterproductive effect on the set goals. Therefore, such a model requires additional training, which must be carried out so that this model, which is seen as a guide by the experts, can be used correctly and have a positive effect on the overall outcomes.

To use this model, the user has to understand it. This is not only about the individual steps that are necessary for virtual team building and leadership but is also about the purpose of this model and how it can be successfully applied for virtual team building and leadership. In addition, the leader must be aware that such a model is not a strict guideline, but rather that it can be used as a guide and leaves room for development in its implementation. After working through the above points, the individual stages and CSFs can be discussed. This discussion will be based on case studies and additional explanations for each application of the V-CORPS model, so that the users understand the importance of each CSF and stage by explaining their backgrounds.

The discussion takes place freely, so that the trainer and the user have a mutual understanding of when to find a possible solution in case of issues. The purpose of this training is for the participants to develop a basic understanding of the model and apply it in appropriate situations. Accordingly, the first goal of virtual team building, and leadership would be achieved, since the leader is able to create and lead a team on a common basis, thereby creating a unified structure at leadership level where team members can quickly adapt to change. The correct application of the model will have a positive impact on virtual team building and leadership.

8.5 Limitations of the present study

This study aimed to develop a new model for virtual team building and leadership in the automotive industry, which is based on a more practice-oriented, rather than theoretical, approach. Nevertheless, this study has some limitations. This is in line with the findings of Saunders et al. (2019), who conclude that in general, all research has its own limitations and creates new opportunities for further research.

This study's main limitation was that the application of the V-CORPS model in an operational project was not feasible. Through its application, it would be possible to determine the maturity of the model and insights into the impact of the model on the team itself. However, such experiments would only be possible through a pilot project approved by the company, which is challenging to achieve in the automotive industry. In addition, the application of the model for the entire automotive industry is based on assumptions, as all questionnaires and interviews were conducted in one company. Considering that this is a company operating globally, it operates according to the generally common and innovative processes of the automotive industry. However, it is important to note that there are no general guidelines or processes for virtual team building and leadership in the automotive industry and that V-CORPS based results can only be achieved if this model is evaluated by stakeholders from several companies.

Another limitation of this research is that the building of the model is based on the experts' statements from one company. Therefore, this research is limited in its suitability for the entire automotive industry. A collection of data from experts in the same industry, but from different companies, would be of value but there will remain challenges in getting the experts to agree to such an interview and to reveal such deep insights into their leadership styles. As already stated in section 8.2, companies in this sector work according to the same working practices, hence the V-CORPS model can theoretically be useable to some degree for the entire automotive industry.

Another limitation of this research is the selection of survey participants. The participants in this research came from different management levels and could therefore give input from a management position. This was also important for this research as it focused on the leader and showed that team performance depends significantly on it. However, further surveys could be used to generate further perspectives and refinements of the model (Table 41).

The team members themselves could be asked about the model. Here it would be important to find out whether they are open to such structured team building and what impact this model would have on their work and on team performance. Considering that ICT, as described by different researchers (Avolio et al., 2009; Boudreau et al., 1998; Cummings et al., 2007), is a foundation for any remote working platform, an additional survey from experts in the IT sector would be useful, as it could be used to

generate an implementation of the model in the form of a supportive tool. The general reflections of experts in the field would also be a valuable contribution to the model.

Generally, additional surveys of the team members, experts from the IT industry, and researchers in this field would be seen as valuable data that could contribute to the further development and optimisation of the model.

8.6 Future Research

Future research areas could usefully explore how the V-CORPS model might be applied in other technical industries (e.g., engineering, aerospace, etc.) and in industries where remote working can be useful. The aim here would be to find out whether the V-CORPS model is generally applicable to the technical-orientated industries sector. The application of the developed model in operations would be useful, as this would generate additional evaluations and provide the opportunity to investigate it in more detail. Subsequently, the application of the model to other industries, such as aerospace, plant construction, or mechanical engineering could be carried out and applied.

The 25 individual cells in the V-CORPS model provide an extensive field of possibilities for research studies on virtual team building and leadership for the future. The stages, and their individual sections, can be investigated explicitly and explored. The model also provides the potential to focus more on the areas of team building, leadership or resolution in more depth, and the extent to which these are interconnected and interdependent with one another. The model can also be explored from the perspective of not only team building and leadership, but also from the fields of psychology and sociology, as the model is about the primary influence of people (team members) in the context of continuous improvement of performance in general. The additional use of digital technology expands potential future research in the context of discovering the best working combination between V-CORPS and digital technology.

Both the V-CORPS model and virtual teams can only be realised through the use of digital technology. With the advancement of digital technology, its application to the building and leadership of virtual teams in the automotive industry needs to be further explored and specified. Some suggestions for the application of digital technologies have been made during this research, yet a comprehensive review is lacking to determine exactly which digital technologies are most appropriate for virtual team

building and leadership. In addition, it is necessary to examine whether there are more suitable alternatives for this or whether additional paths of digitalisation can also be taken when applying this model. The use of digital technologies in a pilot project would make sense, as this would also allow the maturity of the respective technology to be checked in connection with the V-CORPS model and refined accordingly.

The application for theory and practice can take place in further investigations of the V-CORPS model, as well as of the respective stages in detail. It is necessary to devote special attention to the dependence of the stages on each other and the possibility of independent use in project-specific cases. The psychological and sociological aspects also need to be considered – the impact of the model on team members, the extent to which the team's mood can be influenced by the model, and whether the sustainability of each team member for the company can be substantially improved through the use of this model.

8.7 Author's role and influence on outcomes

This thesis author has been working as a senior manager in the automotive industry for several years. Therefore, the need for such a model for working with dispersed teams was recognised and developed based on this insight. The PCF (Table 3) being the basis of this work and developed from the literature, the author determined in outline, in line with the literature, what was necessary in his work environment to build such a team working at a distance, in order to work at the highest possible performance level. Also, the CSFs presented in Table 3 were selected with this in mind, so that they include the important aspects of team building and leadership, but still provide the leader the freedom to work with his team.

When creating statements and open-ended questions in the first part of the survey, the author focused on situations that occur in working life in order to obtain information and perceptions regarding possible improvements that the model would facilitate. The interviews were also designed to get as much feedback as possible on the model and how to improve it.

When evaluating the obtained data, the author took a neutral stance since the development of a model for virtual team building and leadership was the main objective rather than the improvement of his own work processes. The results of this research

contribute to theory and practice and are generally valid for practitioners concerned with improving leadership at a distance.

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APPENDIX I MODEL DEVELOPMENT QUESTIONS

Introduction

1. Virtual team building and leading is important for the automotive industry.

Strongly agree	Agree	No opinion	Disagree	Strongly disagree

2. The critical success factors (CSFs) (Figure 1) on how to lead and build virtual teams are crucial for working efficiently.

Strongly agree	Agree	No opinion	Disagree	Strongly disagree

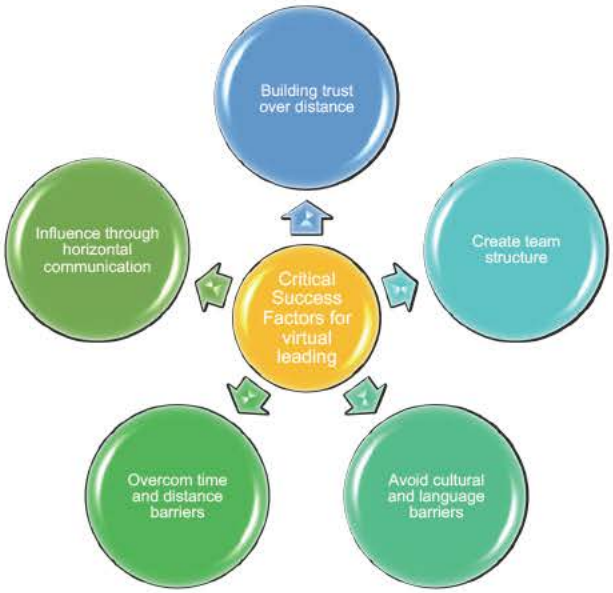

Figure 1 Provisional critical success factors for virtual leading

3. Based on your experience, what do you believe are the most common negative performance related issues when leading a team over a distance?

_____

_____

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_____

Creation

4. It is important for the team members, and for the overall outcome of the project, to have a good first impression of each other during the first face-to-face kick-off meeting.

Strongly agree	Agree	No opinion	Disagree	Strongly disagree

5. It is important to discuss the company's expectations with the newly built team during the first meeting.

Strongly agree	Agree	No opinion	Disagree	Strongly disagree

6. It is important to address cultural and language barriers.

Strongly agree	Agree	No opinion	Disagree	Strongly disagree

a) This is something that is often neglected.

Strongly agree	Agree	No opinion	Disagree	Strongly disagree

7. It is important that a team leader presents new innovation in communication technology for a virtual team, especially when the aim is to avoid time and distance barriers.

Strongly agree	Agree	No opinion	Disagree	Strongly disagree

8. What important measures or circumstances are required to make team members feel valued and equal to the leader (horizontal communication)?

_____

_____

_____

_____

Organisation

9. A clearly-defined role for virtual team members is an important factor to promote better team cohesion (trust improvement).

Strongly agree	Agree	No opinion	Disagree	Strongly disagree

10. It is important for team members to adhere to the general project rules (e.g. punctuality, behaviour).

Strongly agree	Agree	No opinion	Disagree	Strongly disagree

11. An explanation of the individual steps for support and escalation procedures is necessary (in case of a serious team issue or communication breakdown).

Strongly agree	Agree	No opinion	Disagree	Strongly disagree

12. It is important to have a common definition of work guidelines (i.e. the code of conduct) for team members during a virtual project.

Strongly agree	Agree	No opinion	Disagree	Strongly disagree

13. Highlighting the importance of a team unit is important in the early stages of a virtual project.

Strongly agree	Agree	No opinion	Disagree	Strongly disagree

Relationship Building

14. A good virtual team leader is able to analyse himself and his team members sufficiently to find a way to build trust in each individual.

Strongly agree	Agree	No opinion	Disagree	Strongly disagree

15. For efficient working practice, it is important for a team to have a fixed agreement regarding availability, punctuality and reliability, and the use of team chats and forums.

Strongly agree	Agree	No opinion	Disagree	Strongly disagree

16. What are the difficulties of implementing an equal treatment policy in virtual teams operating over a distance?

_____

_____

_____

_____

17. It is important to emphasise the importance of teamwork, and how it affects project success.

Strongly agree	Agree	No opinion	Disagree	Strongly disagree

a) This is something often overlooked by the team leader.

Strongly agree	Agree	No opinion	Disagree	Strongly disagree

18. Can you think of a situation when a virtual team leader must NOT intervene during a critical situation?

_____

_____

_____

_____

Performance Evaluation

19. Do you believe that the performance results of team members should depend on, and be measured by, their leadership?

_____

_____

_____

_____

20. What is the correlation between the reliability of a team and successful project performance?

_____

_____

_____

_____

21. A logical and well-communicated team structure ensures consistent individual and project performance.

Strongly agree	Agree	No opinion	Disagree	Strongly disagree

22. Work culture and performance comes before individuality.

Strongly agree	Agree	No opinion	Disagree	Strongly disagree

23. What are the potential risks when introducing new working methods, aimed at improving team development during a virtual project? Can you give some examples?

_____

_____

_____

_____

24. Avoiding pressure for virtual team members allows them to focus more effectively on achieving specific project milestones.

Strongly agree	Agree	No opinion	Disagree	Strongly disagree

Sign-off & Closure

25. A project closure meeting helps to build trust and motivation for future projects.

Strongly agree	Agree	No opinion	Disagree	Strongly disagree

26. A good relationship with team members after a project has ended is beneficial for the project and senior project management.

Strongly agree	Agree	No opinion	Disagree	Strongly disagree

27. A feedback session aimed at highlighting the strengths and weaknesses of individual team members acts as a strong base for future projects.

Strongly agree	Agree	No opinion	Disagree	Strongly disagree

28. It is important for team members to feel appreciated once they have left a project.

Strongly agree	Agree	No opinion	Disagree	Strongly disagree

Conclusion

29. Are there any other important CSFs? (If yes which and why)

_____

_____

_____

_____

30. The CSFs in Figure 1 are important for a successful project in the automotive industry.

Strongly agree	Agree	No opinion	Disagree	Strongly disagree

Questionnaire used with the eighteen interviewees to develop the virtual leadership model

Introduction

1. Given your experience working with virtual teams, to what extent do you believe that the V-CORPS model would make working life easier?

    a) To what extent would you expect an improvement in working methods, sustainability and performance by using the V-CORPS model?

Creation

The V-CORPS model is subdivided into five stages which serve the team building and leading processes.

2. Which of the first three stages do you consider to be the most important and why?

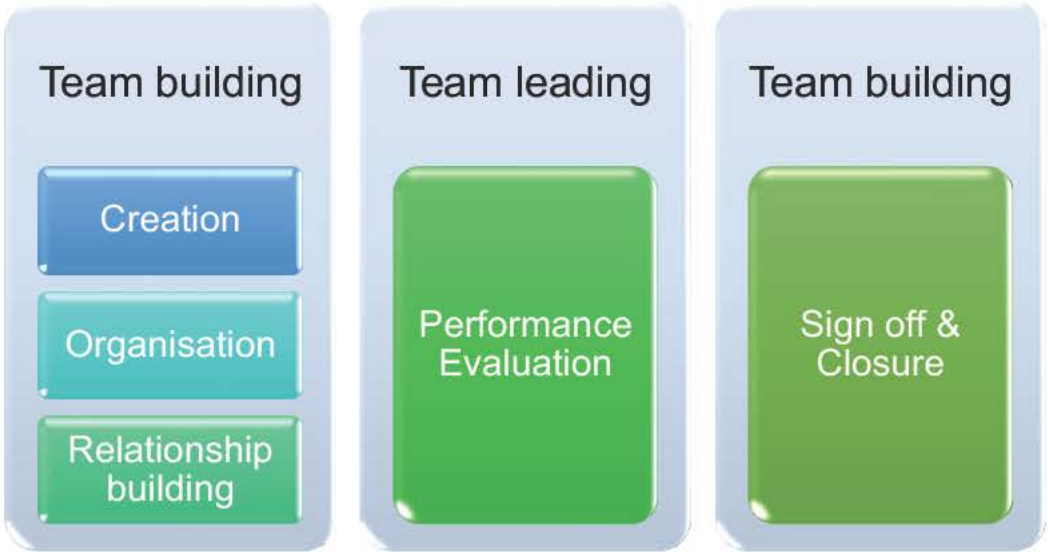


Figure 1 Team building and leading allocation

    a) Which has the greatest impact on the fourth stage of the model?
    b) In your experience, why do you think a third of the experts disagreed with the statement that a leader should present new innovations in communication technologies for virtual teams?

Organisation

Organisation is important in every project so that the project manager and his team can concentrate solely on their work.

3. Why does management tend to focus on organising project activities, and not as much on team member organisation?

Relationship Building

The relationship building stage depends very much on the leader, as he or she carries out the team and self-analysis, draws up team contracts, explains to the team the importance of teamwork and the project success that depends on it. Leaders must also ensure that the team contacts them in good time in case of difficulties so that they can intervene. Nevertheless, the preparation/training of the leader for virtual team building and leadership is often being neglected.

4. Can it be said that often little or no time is necessary to prepare the leader for leadership for a project at a distance?
    a) How is inadequate preparation of the leader of virtual teams compensated for during the course of the project?
    b) In your experience, how is an inexperienced leader prepared to lead virtual teams?

Performance Evaluation

The experts were divided in their opinion on the statement that team performance depends on team leadership. Nevertheless, they were convinced that the correlation between reliability of a team to the leader and project success is 1:1.

5. Can reliability be increased, or even improved, by skilfully building up pressure on team members?
    a) Can this lead to a positive effect on team performance?
    b) If not, which methods can you name from experience where an increase in reliability in the performance stage was noted and why?

Sign-off & Closure

The experts all agreed that a final meeting would help to build trust and would strengthen, or even improve, motivation for future projects. Nevertheless, a third of the experts were not in support of a mutual evaluation meeting where strengths and weaknesses are discussed.

6. Can a final meeting lead to an escalation of problem issues and have a rather negative impact on subsequent projects?
    a) Is the behaviour of the leader essential for keeping the balance, and the objectivity of the discussion to avoid misunderstandings and hostilities between the team members?

Interview questions for the eighteen experts based on the evaluation of the questionnaire

1. Questionnaire

Jisc Online surveys

Questionnaire

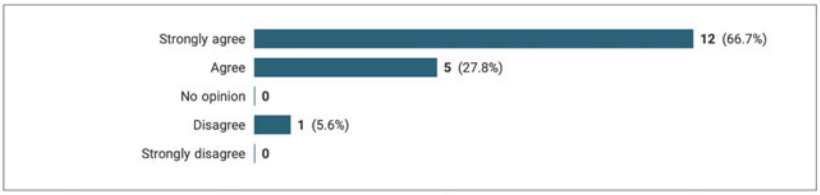
Showing 18 of 18 responses

Showing **all** responses

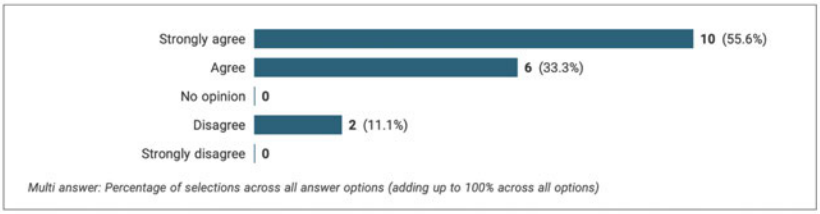
Showing **all** questions

Response rate: 100%

1 Virtual team building and leading is important for the automotive industry.



2 The Critical Success Factors (CSFs) (Figure 1) on how to lead and build virtual teams are crucial for working efficiently. Figure 1 Provisional critical success factors for virtual leading

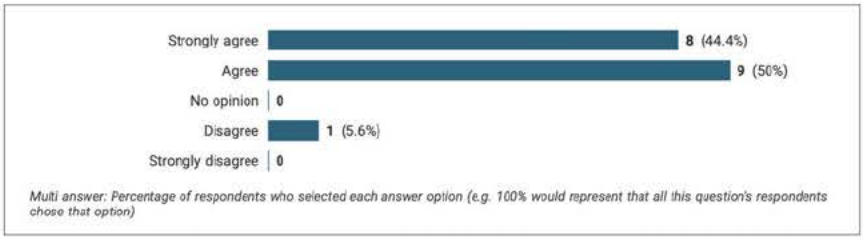


3 Based on your experience, what do you believe are the most common negative performance related issues when leading a team over a distanc

Showing all 18 responses Show less	
Leading a team over a distance requires first of all trust but also tools to manage the team's progress. As we go more towards an agile way of working, it is imperative that teams are properly introduced to the agile and scrums methodology. To summarize leading over a distance requires a modern approach on how to build the trust amongst the team members and for the team members in a faster and efficient way; how to adhere to modern tools of communication such as Ms Teams, JIRA, etc; finaly, how to introduce and build the know-how of the team members in working according to agile/scrums methodology.	606863-606854-61196911
missing trust	606863-606854-61199232
lack of personal contact and risk of missunderstanding / missinterpretation of various tasks which needs to establish well balanced control mechanism and clear communication	606863-606854-61195792
Due to the fact that project teams are consist up of people. In my experience the communication and relationship between project team members influence project success very strong, as well, the relationship and willingness to support project teams on the part of the stakeholders. Clear communication and clear rules are crucial for project success.	606863-606854-61251448
Usage of same communication media to receive or provide data, including the knowledge how to use this media.	606863-606854-61323262
1. Language barriers 2. Personal trust if the Team members are not personally known. 3. Availablity of Team members due to time differences between the regions and personal work load. (The boss in the room next door is more important than the virtual Team leader.)	606863-606854-61537735
- lack of (open) clear communication - lack of clear goals, rules and definition or responsibilities/roles - (most important) lack of knowledge about strengths and weaknesses of employees leading to wrong assignement and low/no commitment of team members - low/no trust in the abilities of team members leading to frustration and low Motivation level	606863-606854-61627451
It is important, but very difficult and sensitive, to find the Right Approach to all Team members. Means to know their characters and behaviours, and to handle all with respect, tolerance and Fairness.	606863-606854-61697072
I do not believe, I am pretty much experienced. Please change wording of the question. Team management over distances tends to avoid facing problems directly. It´s like the voice mail on the phone. You do not have to take the call if required. You rather are going to decide a more pleasant time rather being involved in unexpected and unwillingly discussion. Working with team members on distances requires special skills. Misunderstandings are almost likely to happen. Performance indicators like timing and efficiency become critical.	606863-606854-61725160
Body Language and personal contacts can never be substituded by virtual coming together. The better people know each other, the better it works. Communication over distance is despite all tools difficult, so misundersdtandings are the most negativ influencing factors.	606863-606854-61764889
- Different cultures - No trust/ confidence - different Targets/ daily focus (e.g. production versus development)	606863-606854-61886939
Culture differences and lack of experience in Management to deal with it.	606863-606854-61948297
Most critical for me is both for virtual as well as for co-located Teams to create Team charter & Team spirit. Selection of the Team members for virtual Team is more challenging (relative to language barriers and the missing non-verbal communication). It is in a lot of cases not possible to avoid cultural/language barriers. We have to deal with it. Good Team Meeting preparation - pre-reads, individual follow-ups,...	606863-606854-62307429
A team member: - does not understand his or project tasks correctly and misses the target - fills queasy due to the behavior of the team leader or teammembers and works like "business as usual" (e.g. no initiative) - makes mistakes and is unable to identify the risks or problems in the project (e.g. for the next project phase) due to the high time pressure caused by the wrong project timing - miss the target / makes mistakes in the project due to missing or incorrect communication	606863-606854-62458532
Close exchange in Know-how,sign language and personal topics are missing You can't get infos between the lines Mutual challenging is suffering	606863-606854-62508304
- low/no commitment to the Project deliverables - bad communication - Team efforts not shared transparent and efficiently	606863-606854-62619490
When they don't trust their team members you no longer have a team that is able to act successful. The team members start to spend more time in protecting against other team members or even attacking their colleagues then working on issues due to a lack of faith in their workmates.	606863-606854-62733544
KICK OFF MEETING: Get agreements and aprrovement without clear understanding. Because of that it is importand to define clear work packages togehter with the Team and get agreemend at the beginning.	606863-606854-62913259

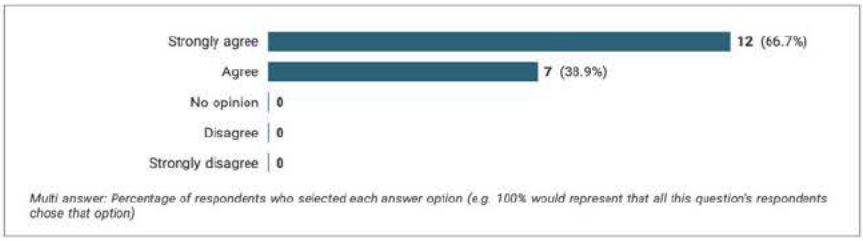
Creation

4 It is important for the team members, and for the overall outcome of the project, to have a good first impression of each other during the first face-to-face kick-off meeting.



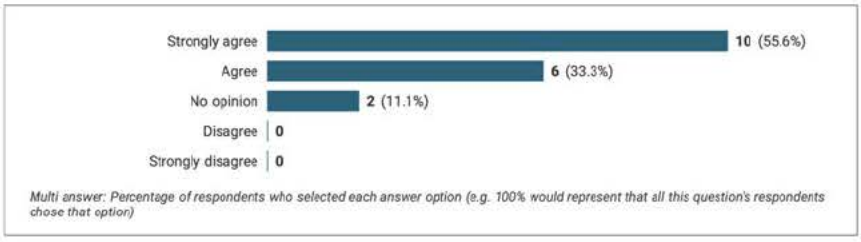
Multi answer: Percentage of respondents who selected each answer option (e.g. 100% would represent that all this question's respondents chose that option)

5 It is important to discuss the company's expectations with the newly built team during the first meeting.



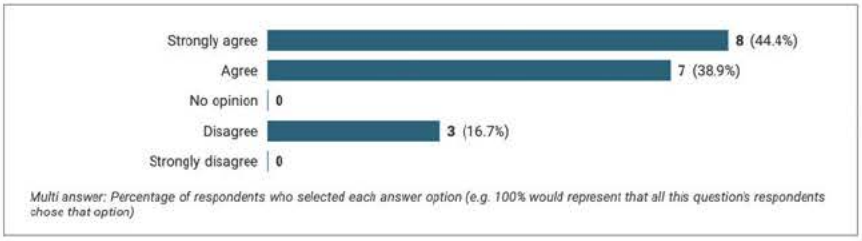
Multi answer: Percentage of respondents who selected each answer option (e.g. 100% would represent that all this question's respondents chose that option)

6 It is important to address cultural and language barriers.



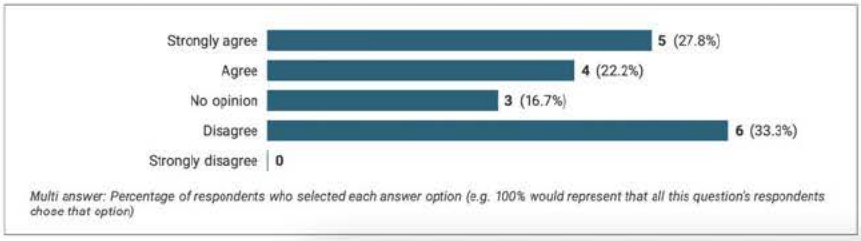
Multi answer: Percentage of respondents who selected each answer option (e.g. 100% would represent that all this question's respondents chose that option)

5.a This is something that is often neglected.



Multi answer: Percentage of respondents who selected each answer option (e.g. 100% would represent that all this question's respondents chose that option)

7 It is important that a team leader presents new innovation in communication technology for a virtual team, especially when the aim is to avoid time and distance barriers.



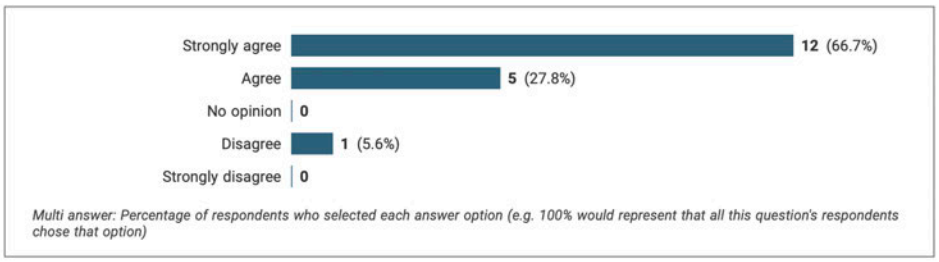
Multi answer: Percentage of respondents who selected each answer option (e.g. 100% would represent that all this question's respondents chose that option)

8 What important measures or circumstances are required to make team members feel valued and equal to the leader (horizontal communication)?

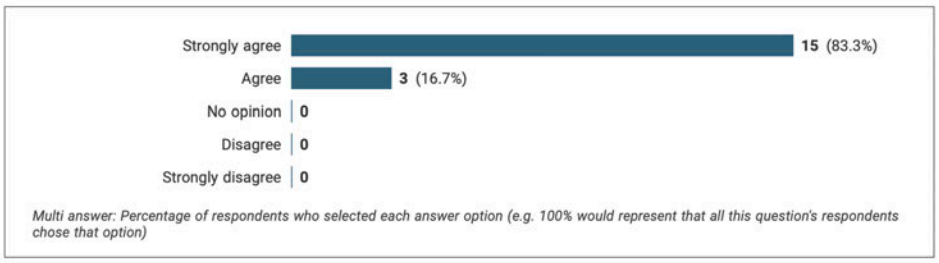
Showing all 18 responses Show less	
I am not familiar with a concept of Horizontal communication requires team members to be equal with the leader. nevertheless, I am convinced that the leader must promote and also foster an open communication and a collaborative way of working. Also the work progress must be visualized in a simple and efficient manner towards the end scope. Adjusting the action plan as progress is being made is important to ensure target and project timing will be met.	606863-606854-61196911
reports like Burndown Chart or Velocity Chart and there comparison with the committed workload	606863-606854-61199232
It is important to "hear" to your Team members, take their information input an thoughts serious and give appropriate feedback to your team	606863-606854-61195792
Concentration on the project contribution and not on hierarchy. Because in most cases the groups are completed not homogeneously. The cultural and gender differences should be consider in project communication. Individual successes should be "celebrated" together. " Do not adorn oneself with borrowed plumes"	606863-606854-61251448
Trust and the same vision of the plan. Everyone should clearly understand what kind of function is required of him / her in the project and the fact that this function is very important to achieve the overall or interim goals.	606863-606854-61323262
1. A personal meeting between all team members where all participants have the opportunity to get to know the team members. 2. Beer!	606863-606854-61537735
- introduction of open communication culture within the team (even if the final decission still be under leader's authority) - ask team members regulary for their opinion - don't allow negative/non constructive judgement of statements of team members during meetings	606863-606854-61627451
respect Tolerance Fairness	606863-606854-61697072
...do not expect something from your team members yourself would not be capable or able to do. Leading means rather to guide your team than to push it where you cannot go alone. Very important...	606863-606854-61725160
recognition and open feedback.	606863-606854-61764889
1) Respect 2) Respect 3) Respect 4) Include into decisions/ ask for opinions 5) Recognition	606863-606854-61886939
Deligation of responsibilities and not just deligation of Task; Communication of Targets and expectations on regulary bases.	606863-606854-61948297
Acknowloding time Zone differences, have clear communication flow, keeping discipline and respect in the virtual Meetings, making sure everyone gets the Chance to speak up and contribute. From my experience Video Team calls add significant value over telephone/Desktop sharing only.	606863-606854-62307429
Equal status. Improve communication within the team, build up a mutual trust and strengthen the confidence in the abilities of the team members	606863-606854-62458532
Clear R&R,Organisation and guidelines,clear tasks and expectation announcement with timeline, clear and regular communication plan, Basically same as in every project just even more precise	606863-606854-62508304
- frequent face to face Meetings and Team events - regular Jour Fixe Appointments with the same set-up scope as face to face Meetings would have - clear communcation and presentation of the teammembers share in the success or Progress of a project	606863-606854-62619490
Easy: Never call the results of their work "your work" to others, always name it to the team or the specific person that did it and don't let someone behind in presenting their results. It makes people proud when their work is honored. Also don't blame someone before others.	606863-606854-62733544
Give Feedbacks and control tasks correctly.	606863-606854-62913259

Organization

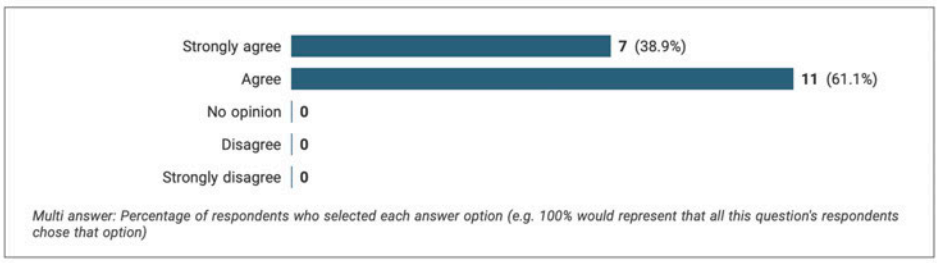
9 A clearly defined role for virtual team members is an important factor to promote better team cohesion (trust improvement).



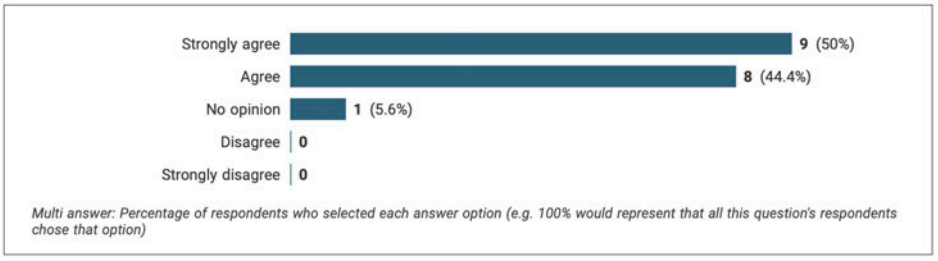
10 It is important for team members to adhere to the general project rules (e.g. punctuality, behaviour).



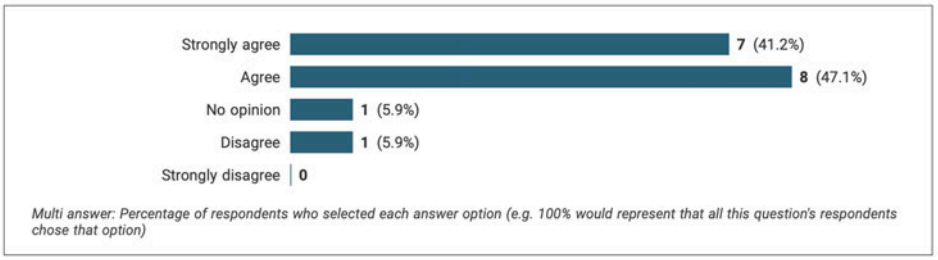
11 An explanation of the individual steps for support and escalation procedures is necessary (in case of a serious team issue or communication breakdown).



12 It is important to have a common definition of work guidelines (i.e. the code of conduct) for team members during a virtual project.

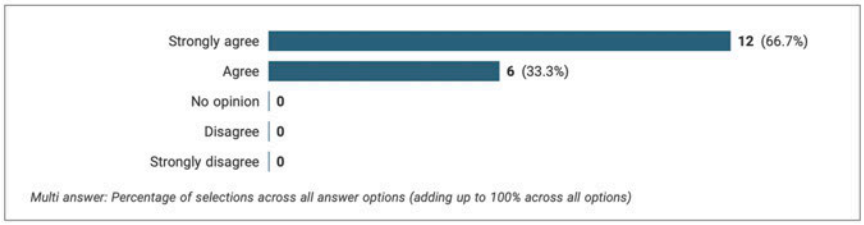


13 Highlighting the importance of a team unit is important in the early stages of a virtual project.



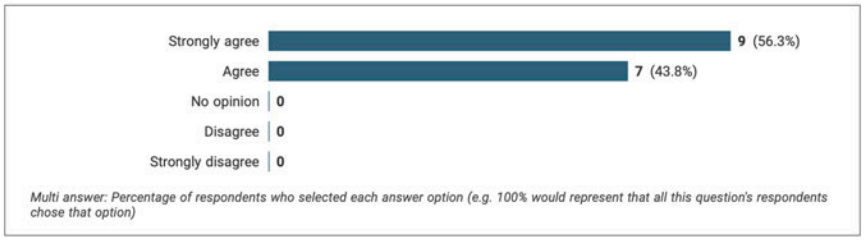
Relationship Building

14 A good virtual team leader is able to analyse himself and his team members sufficiently to find a way to build trust in each individual.



Multi answer: Percentage of selections across all answer options (adding up to 100% across all options)

15 For efficient working practice, it is important for a team to have a fixed agreement regarding availability, punctuality and reliability, and the use of team chats and forums.

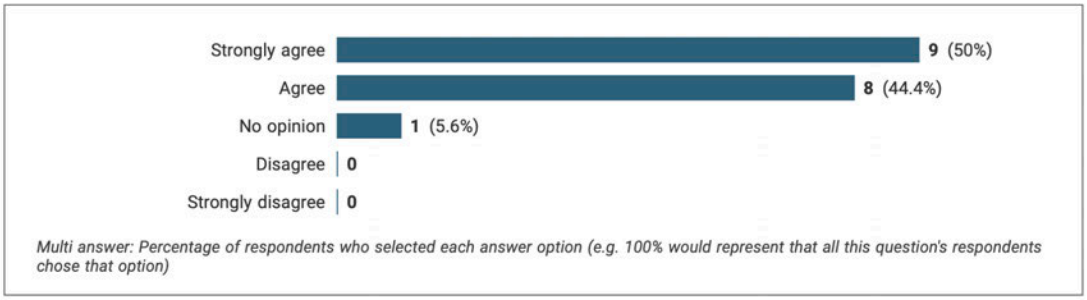


Multi answer: Percentage of respondents who selected each answer option (e.g. 100% would represent that all this question's respondents chose that option)

16 What are the difficulties of implementing an equal treatment policy in virtual teams operating over a distance?

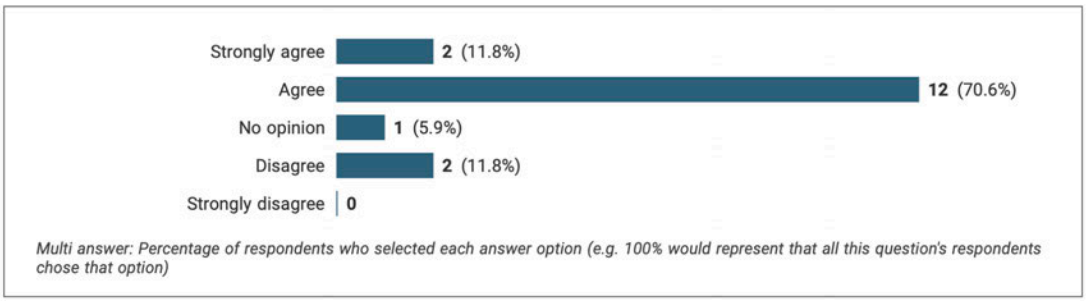
Showing all 18 responses Show less	
Often we plan and allocate the resources to make sure the team is well defined and has all the means to be successful, and sometimes we forget about the team leader. we usually take for granted the abilities or the lack of abilities of a project leader and do not invest sufficient time and resources in preparing the leader. The fact that a leader has now to lead a team over a distance does not necessarily mean that this leader is prepared and knows all the means to coordinate a team over a distance. A sufficient and sustain effort must be put also in assuring that Leader is well prepared and validated to run such means of working, thus it will significantly reduce or ideally eliminate the risk of unequal treatment.	606863-606854-61196911
to get a common understanding	606863-606854-61199232
having the Team on the same status of informations and as well the availability of time windows for communication given due to time zones all over the world	606863-606854-61195792
The hierarchy cannot be completely eliminated, because you still have to lead and be led. In the virtual teams a clear management and distribution of tasks is critical factor.	606863-606854-61251448
Time differences and cultural differences.	606863-606854-61323262
The biggest problem is the punctual and complete processing of the tasks set. As soon as one team member has not completed the task, another member will start claiming it. Thus, equal treatment is no longer given.	606863-606854-61537735
To develop, introduce and consequently adhere to common rules. To really leran team members and their needs.	606863-606854-61627451
Find real clarity and no misunderstandings. Means you Need Always the honest Feedback from the Team members, that you know everything what you said was correctly understood.	606863-606854-61697072
Control seems to be the most difficult factor. Distance does not enable consequences to the team member.	606863-606854-61725160
no comment	606863-606854-61764889
culture education Level personal skills	606863-606854-61886939
Cultural differences and communication of working guidance.	606863-606854-61948297
Time zones, cultural difference (i.e. American culture vs. Japanese - speak up vs more silent). It is even more important in virtual Teams to make sure the "more reluctant/silent" members have a Chance to contribute.	606863-606854-62307429
In multicultural, international teams many members need a different approach due to their mentality	606863-606854-62458532
Language,cultural, Know-how difference hurdle,time zone difference? Different expectations, role distribution	606863-606854-62508304
- cultural differences/habit must be aligned and considered in the Policy - execution in case the policies are not adhered to - besides the virtual Meetings there is no place the Team members going to see/talk to each other (e.g. Coffee Break) and teammembers Deviation to a Policy can be discussed or he/she got reflected by other teammembers any misbehaviour	606863-606854-62619490
Based on the language barriers and cultural differences, the main problem is to recognize the different characters and spirit of the team members and to adjust your own behavior this personality of the people.	606863-606854-62733544
People with different races have different understandings. we should set up an Operation patform with clear defined statues and set up face to face meetings	606863-606854-62913259

17 It is important to emphasise the importance of teamwork, and how it affects project success.



Multi answer: Percentage of respondents who selected each answer option (e.g. 100% would represent that all this question's respondents chose that option)

17.a This is something often overlooked by the team leader.



Multi answer: Percentage of respondents who selected each answer option (e.g. 100% would represent that all this question's respondents chose that option)

18 Can you think of a situation when a virtual team leader must NOT intervene during a critical situation?

Showing all 16 responses Show less	
a leader must be heard and "seen" by the team he or she is leading especially in a critical situation. a critical situation is exactly where a leader is needed, where his or her leadership skills are highly needed.	606863-606854-61196911
if the team is talking about who is doing what	606863-606854-61199232
When you know you have a Team member who is capable to handle this critical Situation any you can trust to get information prior escalation	606863-606854-61195792
Conflicts in the team are not bad per se. If conflicts are resolved objectively, the team leader should hold back.	606863-606854-61251448
If the team can solve an issue by their own without involving the team leader the leader should not intervene in this process. Otherweise there will be is a risk that the leader will be involved in every discusson and decition.	606863-606854-61323262
No. At a certain Level of escalation, the Team leader has to intervene.	606863-606854-61537735
No	606863-606854-61627451
e.g. when there are Deep technical controverse discussion, and the related persons are handling this in a open and constructive manner.	606863-606854-61697072
Team leader always has to take care on critical situation... he has to intervene, there is no choice.	606863-606854-61725160
When he has the feeling that the team can solve itself, he should not intervene.	606863-606854-61764889
Decision building/ judgement from specialists	606863-606854-61886939
Tense but constructive dialogue.	606863-606854-62307429
Yes In the first stage, the teams must be able to solve the problems independently arround these goals (team members have to understand the escalation levels and timing).	606863-606854-62458532
Yes,not everything can be escalated ie Personal topics between team members If a team member takes the responsibility and wants to solve the topic himself	606863-606854-62508304
- no	606863-606854-62619490
It also makes no sense to start to intervene and correct immediatelly when some deviation gets visible. You should give your team members the opportunity to solve critical situations alone and when they don't get on with it you should start to assist them solving the situation as long as you think you can get it under control if necessary.	606863-606854-62733544

Performance

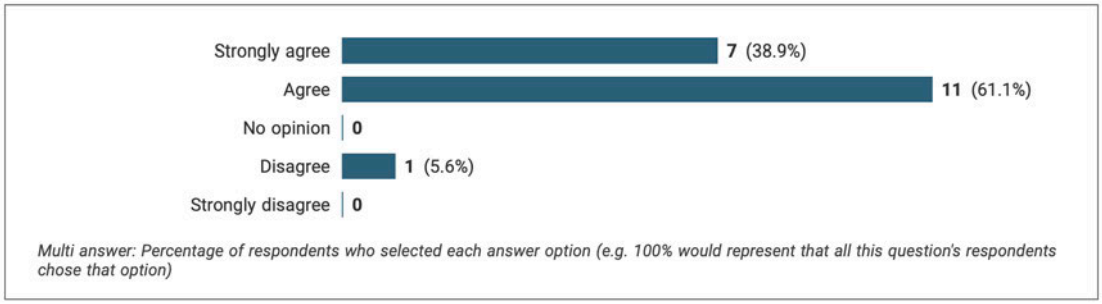
19 Do you believe that the performance results of team members should depend on, and be measured by, their leadership?

Showing all 18 responses Show less	
no	606863-606854-61196911
yes, if the focus is on the objectives	606863-606854-61199232
The Leadership is the performace of the Teamleader, the Team members should be measured by the results they acheive	606863-606854-61195792
Good Evaluation tool can help to improve a team or individual employees.	606863-606854-61251448
Denpends on the situation. For example: In case of a development project, project core team members should be measured by their PMs other supporting functions should be measured by their leadership.	606863-606854-61323262
No, the Performance should be measured by results.	606863-606854-61537735
The performance of individual team members is closely linked to their commitment to what they do. High commitment is strongly linked to right assignment of team members. As it's up to the leadership to find out strengths & weaknesses of employees and to assign them accordingly leads to the conclusion that performance results depend on leadership. The performance should be measured by leadership but also be other team members according clearly defined and well known criteria.	606863-606854-61627451
yes	606863-606854-61697072
No it has not.	606863-606854-61725160
Not only. But the performance indicators should be clearly stated.	606863-606854-61764889
Both------- self assessment of the employee AND from the Leadership, and honest review of potential different opinions	606863-606854-61886939
Absolutly, the Task of Leaders is to set target and review them on regulary bases.	606863-606854-61948297
For certain Team members yes. Not for all - ie. specialists	606863-606854-62307429
Yes and No. Team leadership is very important. The good leadership will show that the team's performance is much better than expected. But the team leader could be as good as his team and vice versa.	606863-606854-62458532
Absolutely	606863-606854-62508304
Yes	606863-606854-62619490
The leadership definitely influences the performance result but the measuring of this is mostly based on a subjective point of view of the leader.	606863-606854-62733544
Yes.	606863-606854-62913259

20 What is the correlation between the reliability of a team and successful project performance?

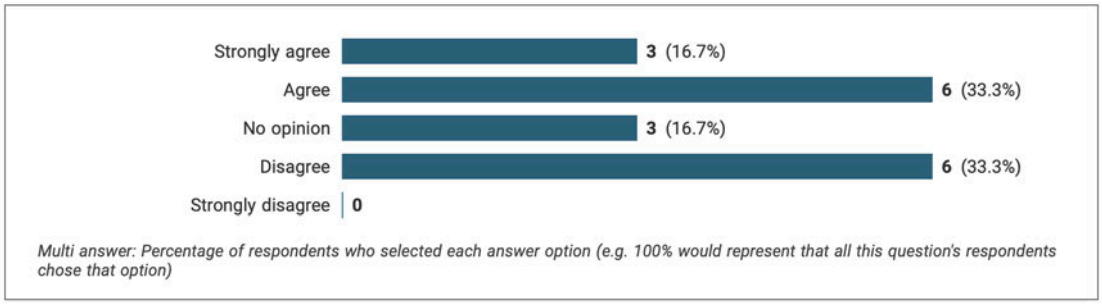
Showing all 18 responses Show less	
100% these 2 are correlated; I believe a team which is not reliable cannot meet its set targets, cannot ensure a proper roll-out of the project and will suffer in terms of respecting its credibility towards the internal and external stakeholders. it will simply fail.	606863-606854-61196911
hight reliability = more success	606863-606854-61199232
A reliable team is the base for a successful project and good performance	606863-606854-61195792
Reliability of members and project success can show strong correlation. If the tasks are not carried out reliably, additional capacities for controlling and monitoring are required, also group cohesion will negatively affected. This factors can lead to project performance Deterioration.	606863-606854-61251448
Reliability of team members is the most important thing to have success in every situation. Otherwise it will leads to frustration and disappointment of the leader and this will leads to negative influence and negative performance of the whole project.	606863-606854-61323262
1:1. The more reliable a Team is, the more success they will have.	606863-606854-61537735
It is essential for the success of a project that the team members and the team leader can rely on each other.	606863-606854-61627451
It is a MUST.	606863-606854-61697072
Team structure has to be made of trust and fairness. These are the only virtual values if you do not have physical control.	606863-606854-61725160
It is one of the key factors, but not the only one.	606863-606854-61764889
Reliability of a team is from my experience based on motivation, so motivation (and understanding of each team member what he is responsible for) is the biggest contribution to success.	606863-606854-61886939
Direct link between a real Team and their Performance.	606863-606854-61948297
Reliability is contributing to success. There might be other examples as well. In most cases - real correlation between the two.	606863-606854-62307429
After the kick off the team should be organized itself and works independently as a "community" around these goals. The teamleader must of course check the team performance but also trust his team.	606863-606854-62458532
A team can be reliable But still without success and visa versa	606863-606854-62508304
Very strong. Mutal undestanding of what Needs to be done, respecitve support are crucial.	606863-606854-62619490
1 to 1 direct correlated.	606863-606854-62733544
trust, discipline and team target thinking.	606863-606854-62913259

21 A logical and well-communicated team structure ensures consistent individual and project performance.



Multi answer: Percentage of respondents who selected each answer option (e.g. 100% would represent that all this question's respondents chose that option)

22 Work culture and performance comes before individuality.

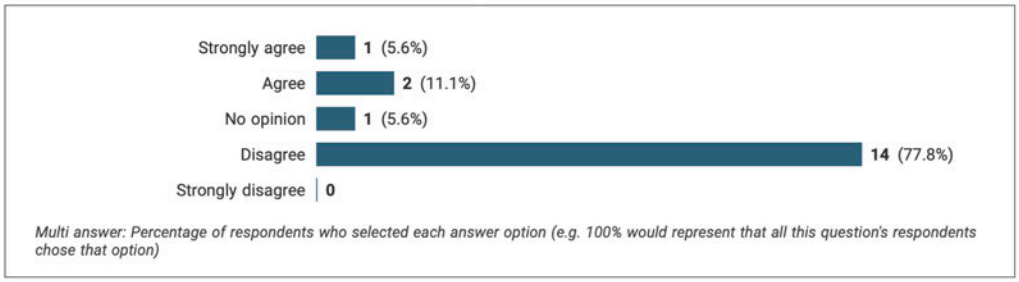


Multi answer: Percentage of respondents who selected each answer option (e.g. 100% would represent that all this question's respondents chose that option)

23 What are the potential risks when introducing new working methods, aimed at improving team development during a virtual project? Can you give some examples?

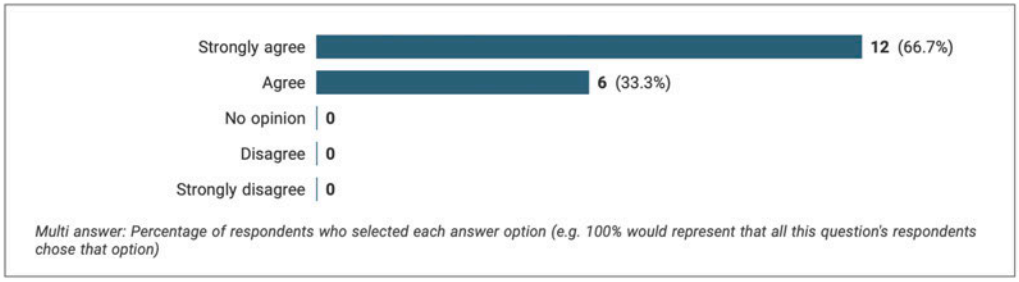
Showing all 16 responses Show less	
often we do not take the right amount of time to allow the team members to learn sufficiently about new working methods. usually when a project starts, it risks that is in delay already. working more and more in virtual teams requires a preparation process; in automotive industry we are still in the learning curve on how to manage virtual teams, how to ensure the success, by what means and by which tools to use. We must prepare the organization to work more and more virtually. We usually fail by first of all having the project leads not adequately trained or prepared for... we do not have the IT infrastructure prepared to sustain a significant part of our company working remotely and virtually (referring to hardware and software). there are needed soft skills trainings (such a cultural awareness training/ time management/ etc.);	606863-606854-61196911
if the new working methods are developed without the team	606863-606854-61199232
Risk is acceptance Training and understanding of new methotd, e.g. tools wrongly used leading to missunderstanding or even failures	606863-606854-61195792
New methods are not sufficiently explained or understood. Introduction of e.g. new software can lead to a loss of productivity in the introductory phase. The introduction of new tools during project operation should be well considered, and the phase in an ongoing project must considered as well.	606863-606854-61251448
It is important to have clear instructions in such new working methods, otherwise there will be risks of misunderstandings. E.g. a new work sheet and nobody knows how to fill it correctly and what is the purpose behind.	606863-606854-61323262
1. The new working method is too complex. 2. Known tools are recognized and the user is used to them. 3. The new working method is not up to date (E.g. Excel files instead of a data base)	606863-606854-61537735
People usually reject any new working methods by nature cause they have to leave their comfort zone and are confronted with something new/unknown. Means any introduction of new working methods requires more or less a complete change of company/work culture which requires enought time and has to be implemented carefully and in small steps. Otherwise there is a risk to get people overwhelmed, frustrated, giving up or even sabotaging.	606863-606854-61627451
For any new tool or method you Need a professionel introduction, Training, Explanation and exercise. New Tools which are only 70% trained become often problematic.	606863-606854-61697072
No risks, only challenges. All can be sorted out by time.	606863-606854-61725160
People may not have the feeling to be disconected by new tools/procedures. They may be frightened.	606863-606854-61764889
- Mis- understanding - some team members could be overloaded (personal skills) - in combination with Question 22, some team members have strong individual skills, but can not use them in a new working method. So, individuality needs to be balanced with best contribution to the team success. (= Destroying individuality results in no motivation)	606863-606854-61886939
Communication and strong Change mangement is the key of success.	606863-606854-61948297
Dissatisfaction (..."We've always done it that way"...), gaps in the communication in the first step, reservation torwards new methods. I created a complex compliance reivew in which several topics were requested. Each team member should read everything and fill out his part. This document was open to everyone during the project. In the beginning this was seen as a senseless waste of time, but during the project it proved to be a helpful support.	606863-606854-62458532
New system doesn't perform New system and people don't have skills or just don't want to adapt Sometimes people believe in system but process is not mature or thought through	606863-606854-62508304
- People tend to stick to their Habits/processes - convincing People w/o the Chance to talk to them in Person, Limits the abiltiy to persuade People About new mehtodes/ideas etc.	606863-606854-62619490
New methods (new ways to report, new methods of hour tracking, a switch to a new PMS-system or new B2B-portal) can make the team members nervous and if they fear to make mistakes and to blame themselves the trouble starts. When they loose their faith they start to act overcautious and work power of the team goes down.	606863-606854-62733544

24 Avoiding pressure for virtual team members allows them to focus more effectively on achieving specific project milestones.

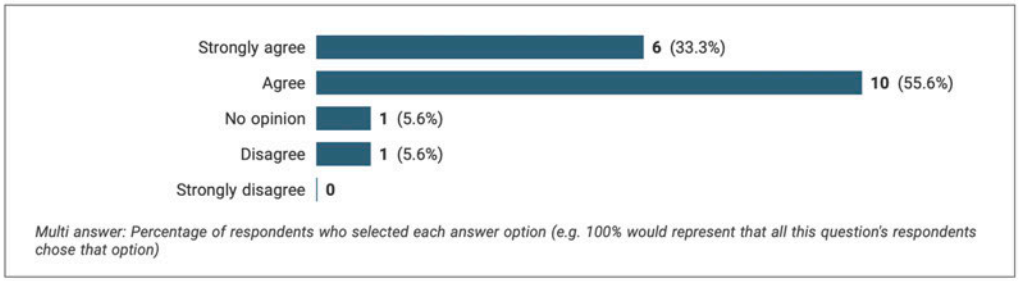


Sign-off & Closure

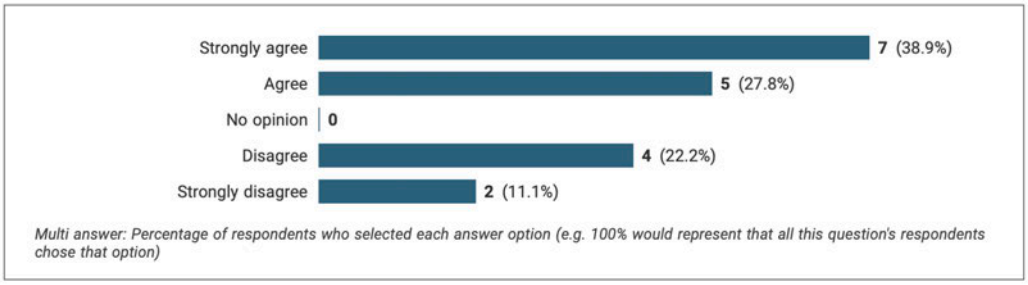
25 A project closure meeting helps to build trust and motivation for future projects.



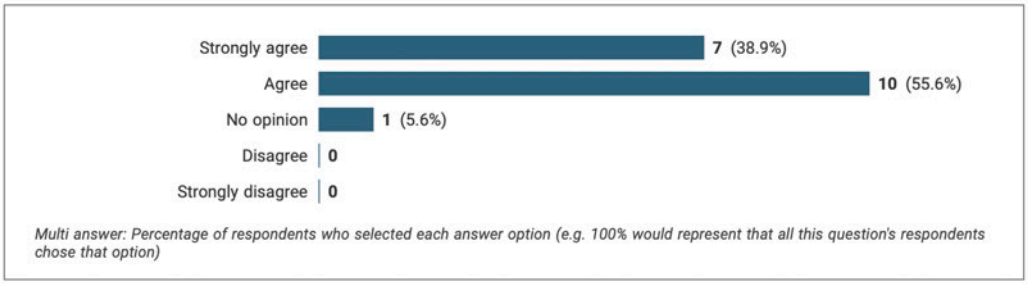
26 A good relationship with team members after a project has ended is beneficial for the project and senior project management.



27 A feedback session aimed at highlighting the strengths and weaknesses of individual team members acts as a strong base for future projects.



28 It is important for team members to feel appreciated once they have left a project.

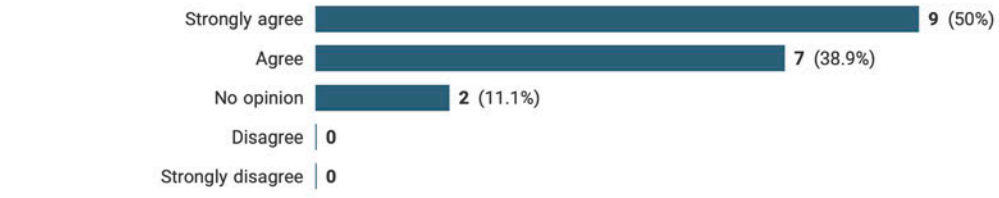


Conclusion

29 Are there any other important CSFs? (If Yes which and why)

Showing all 16 responses Show less	
I believe I have provided some relevant aspects at questions 3, 16 and 23.	606863-606854-61196911
team committment, openness, respect, courage, focus	606863-606854-61199232
Personal structure and leading by sample. Showing high professional personal performance leads to acceptance and identification of the team member with the project and their own tasks	606863-606854-61195792
The will to succeed may become a critical factor.	606863-606854-61251448
Clear project overview for all team members presented constantly by the leader and clear goals for the each team member. It is importand to know where we are and where we are goning to be. It also importand for each team member to know what is the purpose behind his/her tasks.	606863-606854-61323262
Ensure the capacity to be able to fulfill the given Tasks.	606863-606854-61537735
Permanent development of employees (incl. management).	606863-606854-61627451
...	606863-606854-61725160
No comment	606863-606854-61764889
Individuality= personal motivation (Respect, balance and make best use of it, otherwise no motivation, no success)	606863-606854-61886939
Strong focuss on Diversification: Selection of diverse Teams forsters sucess and creativity.	606863-606854-61948297
Assemble the Team with a clear structure. Blend persons with Leadership skills with experts which might lack Leadership.	606863-606854-62307429
Promote teamwork! Each team member has their strengths and weaknesses or more or less experience. The team members have to trust and support each other. Only then is the team balanced and leads to success.	606863-606854-62458532
For me it's always important that people are authentic, truthfull,open minded and not egoistic behavior	606863-606854-62508304
n.a.	606863-606854-62619490
It's all between people, so an additional factor is the team leader itself, his experience, his spirit and the way he acts in leadership. If he is able to develop the positive properties of the team members and can build up thrust between the team members.	606863-606854-62733544

30 The CSFs in Figure 1 are important for a successful project in the automotive industry.



Multi answer: Percentage of respondents who selected each answer option (e.g. 100% would represent that all this question's respondents chose that option)

APPENDIX II MODEL VALIDATION QUESTIONNAIRE

1. To what extent do you think the V-CORPS model is applicable for virtual team building and leadership in the automotive industry?

Not applicable at all	1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐ 8☐ 9☐ 10☐	Very applicable

2. Would you use the V-CORPS model as a replacement for, or in conjunction with, your current working methods? Why/Why not?

_____

_____

_____

3. How do you envision the V-CORPS model might benefit a virtual project?

_____

_____

_____

4. Do you think that adherence to the V-CORPS model will create a more dynamic and independent team?

Not at all	1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐ 8☐ 9☐ 10☐	Yes, definitely

5. In which situations can you envision the V-CORPS model being used to investigate or solve team related issues? Where do you feel current methods are lacking?

_____

_____

_____

6. To what extent do you judge the V-CORPS model to be a useful tool that could be used for improving working practices over a distance in the automotive sector.

Useless	1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐ 8☐ 9☐ 10☐	Very useful

7. How do you envision the V-CORPS model improving team building and leadership over a distance when compared to current methods?

_____

_____

_____

8. Do you think the V-CORPS model provides a clear overview of virtual team building and leadership?

Not clear at all	1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐ 8☐ 9☐ 10☐	Very clear

9. Is the V-CORPS model suitable for all project stages?

Not suitable	1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐ 8☐ 9☐ 10☐	Suitable for all stages

10. The V-CORPS model has the potential to support, and integrate with, the general style of management found across the automotive industry

Strongly disagree	1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐ 8☐ 9☐ 10☐	Strongly agree

11. The V-CORPS model is easy to use and does not require additional training or explanations

Strongly disagree	1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐ 8☐ 9☐ 10☐	Strongly agree

Please provide details:

_____

_____

_____

12. Do you think the balance of themes and topics used in the model is about right? Or should certain aspects of virtual team leadership be emphasised more, or other aspects included?

_____

_____

_____

V-CORPS Technology Deployment

How significant are the following technologies in the operation, management, leadership and communication in Virtual Teams?

13. **SOCIAL MEDIA** (Facebook, Twitter, LinkedIn, WhatsApp etc.)

Insignificant	1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐ 8☐ 9☐ 10☐	Very Significant

How and where is the technology used?

_____

_____

_____

14. CLOUD COMPUTING

Insignificant	1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐ 8☐ 9☐ 10☐	Very Significant

How and where is the technology used?

_____

_____

_____

15. **MOBILE** (Smartphones and Mobile Apps)

Insignificant	1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐ 8☐ 9☐ 10☐	Very Significant

How and where is the technology used?

_____

_____

_____

16. **VIRTUAL MEETINGS TECHNOLOGIES** (SKYPE, MS Teams, Zoom etc.)

Insignificant	1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐ 8☐ 9☐ 10☐	Very Significant

How and where is the technology used?

_____

_____

_____

17. **BIG DATA and ANALYTICS** (Using data sources available over the internet and analytical tools for reporting)

Insignificant	1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐ 8☐ 9☐ 10☐	Very Significant

How and where is the technology used?

_____

_____

_____

18. AGILE PROJECT PLANNING TOOLS

Insignificant	1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐ 8☐ 9☐ 10☐	Very Significant

How and where is the technology used?

_____

_____

_____

Interview questions for operational V-CORPS model validation

Jisc Online surveys

V-CORPS Model validation

Showing 6 of 6 responses

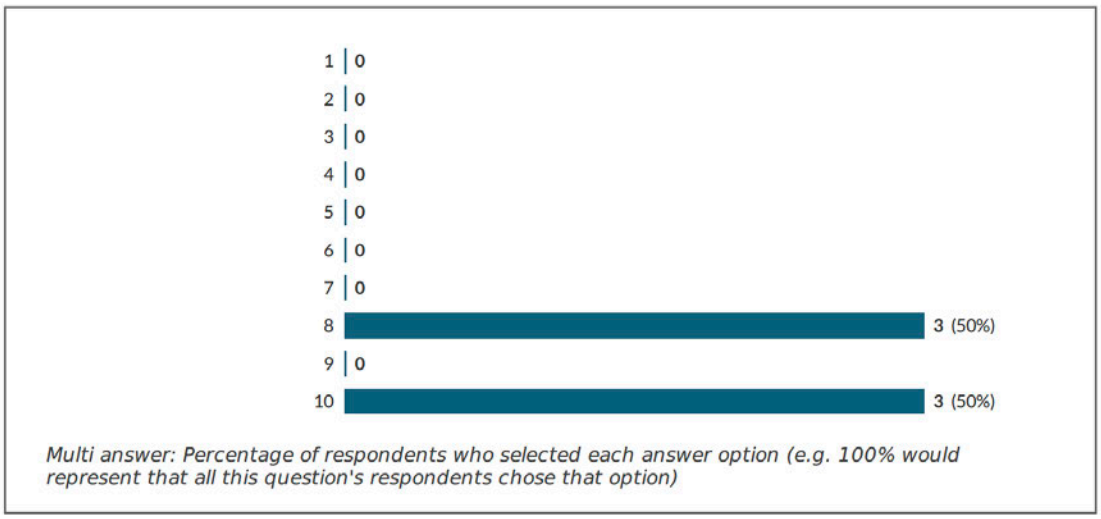
Showing **all** responses

Showing **all** questions

Response rate: 100%

1 To what extent do you think the V-CORPS model is applicable for virtual team building and leadership in the automotive industry?

1.1 Not applicable at all vs Very applicable



Multi answer: Percentage of respondents who selected each answer option (e.g. 100% would represent that all this question's respondents chose that option)

2 Would you use the V-CORPS model as a replacement for, or in conjunction with, your current working methods? Why/Why not?

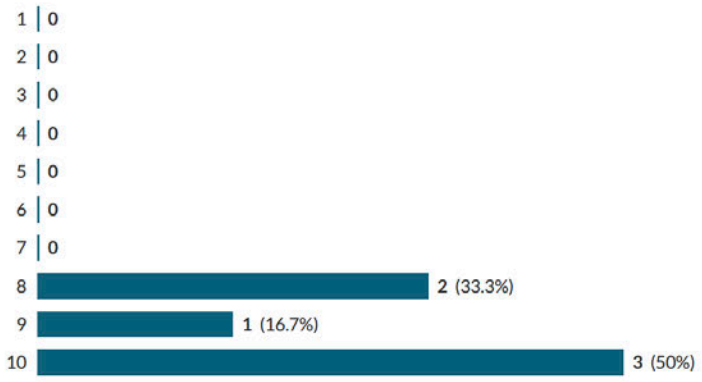
Showing all 6 responses	
Yes, definitely. I would use the model at least as a guide to pay more attention to one or another point (or all points), depending on the complexity of the team / project.	714253-714244-73664254
there are several ways to plan such implementations within different types of organizations. ideally should be a replacement of current methods, applied as a pilot project to test the success factors and have terms of comparison and draw lessons learned for future improvements. however it is important that the organization has also the right mindset to accept such new methods, so certain pre-conditions have to be assured from the beginning by the stakeholders to ensure the program's success.	714253-714244-74168003
I would use the V-CORPS model in conjunction with our current methods. Why? Becaus we have already systems in place but we can inprove in open and honest communication gaining trust in the team.	714253-714244-74283744
in conjunction with, because business life is multifaceted	714253-714244-74468970
Yes, it gives a good guideline and considers important aspects, like different cultures and human beeings	714253-714244-74811398
Yes, I'd use it in conjunction with conventionall methods as I'm expecting a higher performance.	714253-714244-74784801

3 How do you envision the V-CORPS model might benefit a virtual project?

Showing all 6 responses	
This model helps to reduce: unnecessary meetings - risks due to missunderstandings - cultural barriers - time barriers - waste of time This model helps to improve: motivation - communication - problem findings and solutions - achieving expected project goals with min. possible trouble and max. possible commitment	714253-714244-73664254
Hence it is highly focused on setting the right tone from the early stage (building trust, setting the grounds for communication) I am sure if used properly it will be a helpful tool	714253-714244-74168003
It formes the team in a positive way to focus on profession and committment	714253-714244-74283744
reflects on the necessary steps and points out important basics	714253-714244-74468970
Clear structure and rules & reporting	714253-714244-74811398
By providing a guideline how to overcome distance, cultural and language barriers and how to establish good and trustful relationship within the team.	714253-714244-74784801

4 Do you think that adherence to the V-CORPS model will create a more dynamic and independent team?

4.1 Not at all vs Yes, definitely



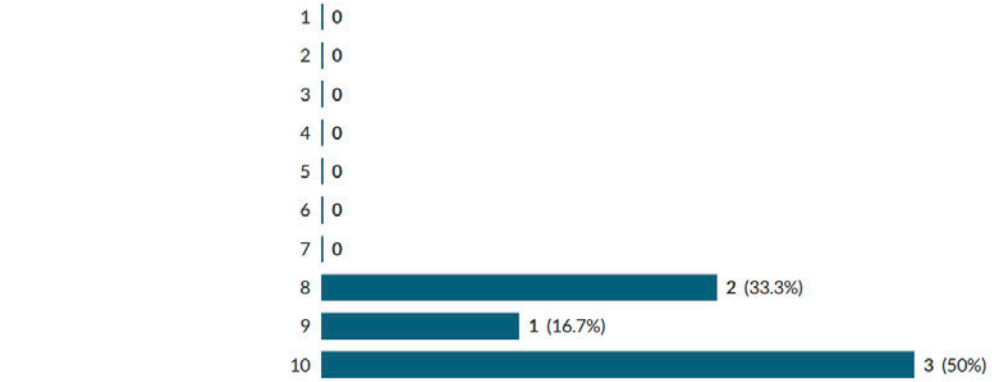
Multi answer: Percentage of respondents who selected each answer option (e.g. 100% would represent that all this question's respondents chose that option)

5 In which situations can you envision the V-CORPS model being used to investigate or solve team related issues? Where do you feel current methods are lacking?

Showing first 5 of 6 responses	
In project based on the burning plattform. at least 30% of the mentioned points are lacking in the building of new project team because of time schedule, PM experiences etc.	714253-714244-73664254
Hard to answer without having it used it before in a real environment. I do believe however that is a smart developed tool, and I am sure its actual users will find it useful to solve team related issues. Although I would expect that using the tool itself adequately, should eliminate such risks.	714253-714244-74168003
It helps to overcome personal views in benefit to professional statement, and it benefits the team approach	714253-714244-74283744
many current models are based on Hirachian structures	714253-714244-74468970
In situations where a team needs to work together and has no relationship/ experience to work together. Most models do not respect the starting point in building trust	714253-714244-74811398

6 To what extent do you judge the V-CORPS model to be a useful tool that could be used for improving working practices over a distance in the automotive sector

6.1 Useless vs Very useful



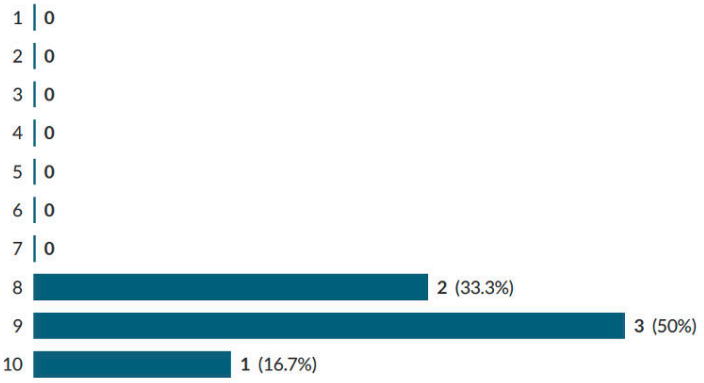
Multi answer: Percentage of respondents who selected each answer option (e.g. 100% would represent that all this question's respondents chose that option)

7 How do you envision the V-CORPS model improving team building and leadership over a distance when compared to current methods?

Showing all 5 responses	
These methods are more extensive and can be used flexibly depending on the situation.	714253-714244-73664254
Its primary considerations are to exactly deal and support teams to work over a distance. Thus the expectation is that the tool, used correctly, will do exactly this.	714253-714244-74168003
It changes the approach from a pure leading and controlling organisation to a open but structured team approach including everyone indepandant from location.	714253-714244-74283744
focused on working together on an equal footing	714253-714244-74468970
Understanding, clear targets and responsibilities	714253-714244-74811398

8 Do you think the V-CORPS model provides a clear overview of virtual team building and leadership?

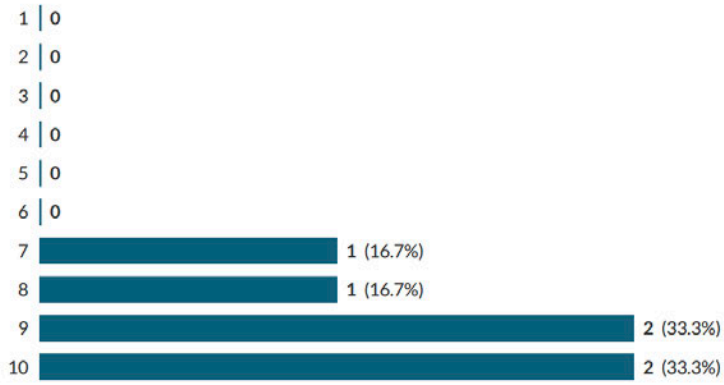
8.1 Not clear at all vs Very clear



Multi answer: Percentage of respondents who selected each answer option (e.g. 100% would represent that all this question's respondents chose that option)

9 Is the V-CORPS model suitable for all project stages?

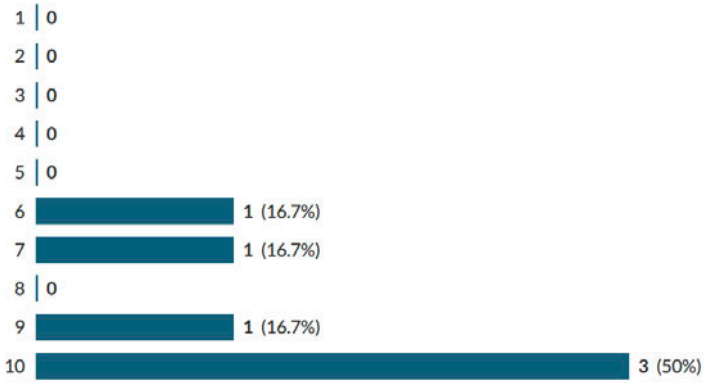
9.1 Not suitable for any stages vs Suitable for all stages



Multi answer: Percentage of respondents who selected each answer option (e.g. 100% would represent that all this question's respondents chose that option)

10 The V-CORPS model has the potential to support, and integrate with, the general style of management found across the automotive industry

10.1 Strongly disagree vs Strongly agree



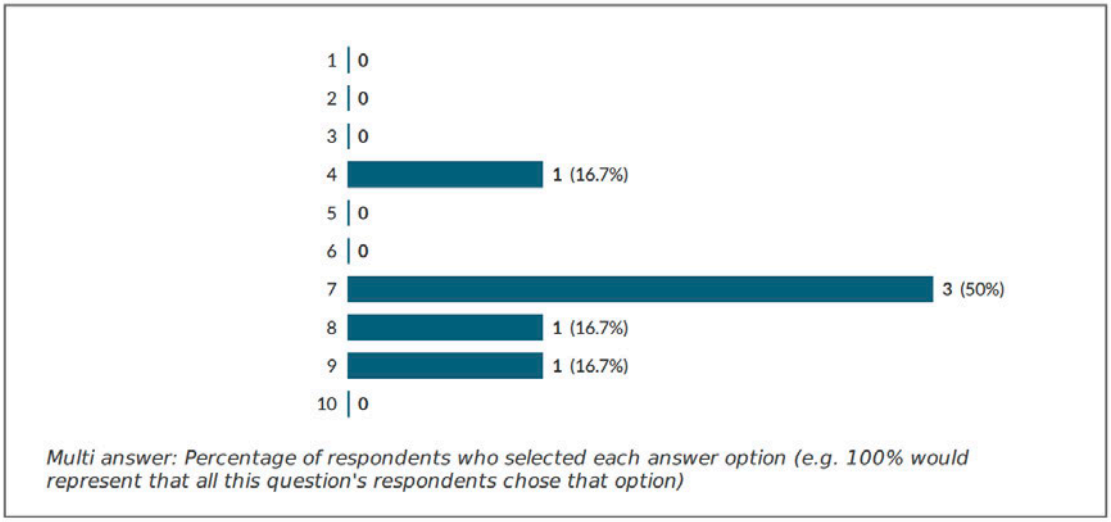
Multi answer: Percentage of respondents who selected each answer option (e.g. 100% would represent that all this question's respondents chose that option)

10.a Please provide details

Showing all 6 responses	
In most cases, the team building is not considered very much in the project, but rather the distribution of tasks, management, to meet deadlines, goals etc.	714253-714244-73664254
As it was designed with input from automotive experts, it is desired that the current gaps in the today used tools have been addressed in the V-CORPS model.	714253-714244-74168003
It generally helps and imporves the style of management in the automotive industry as it structure is highly international and mostly with several locations challenged.	714253-714244-74283744
many of today's managers are very strongly influenced by hierarchy and team member as well	714253-714244-74468970
Most models are defining only roles and responsibilities, targets and supply some processes and tools	714253-714244-74811398
Since general style of management focuses more on hard project objectives but less on people V-CORPS could perfectly complement it and help to pay more attention to team members and stakeholders overall.	714253-714244-74784801

11 The V-CORPS model is easy to use and does not require additional training or explanations

11.1 Strongly disagree vs Strongly agree



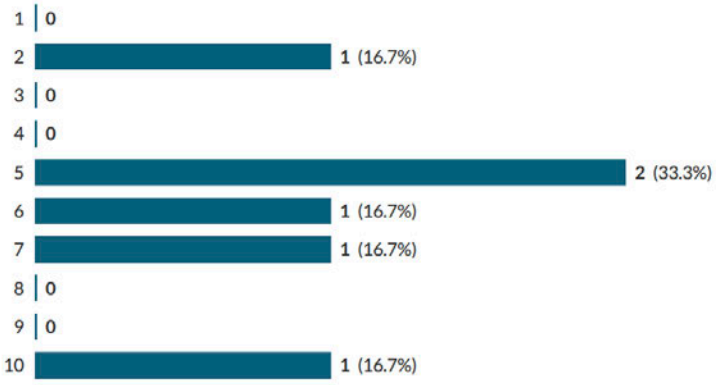
Multi answer: Percentage of respondents who selected each answer option (e.g. 100% would represent that all this question's respondents chose that option)

12 Do you think the balance of themes and topics used in the model is about right? Or should certain aspects of virtual team leadership be emphasised more, or other aspects included?

Showing all 6 responses	
The balance is very good, but I would suggest to emphasize some aspects more ("MUST IN ANY CASE" points)	714253-714244-73664254
Any tool is subjected to continuous improvement, like any process or product. However, it has enough consistency today to demonstrate that it is a tool the is worth to be used.	714253-714244-74168003
as for now in the survey is a good balance of themes and topics	714253-714244-74283744
well balanced	714253-714244-74468970
I would propose a checklist with all items, including a weighting. Means, if there is time pressure, what are the minimum required elements and which could be followed at a later stage	714253-714244-74811398
The selection of topics is very good. Nevertheless, it will never be possible to completely avoid escalations. Here I would add another topic, namely how the virtual leadership has to take place in very tough project situations, for example if there is no time or opportunity for long discussions.	714253-714244-74784801

13 SOCIAL MEDIA (Facebook, Twitter, LinkedIn, WhatsApp etc.)

13.1 Insignificant vs Very Significant



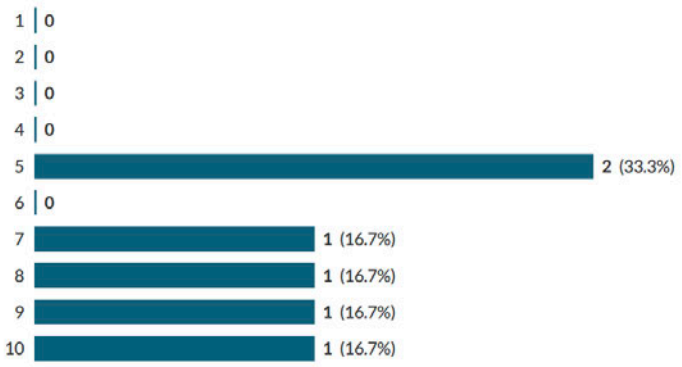
Multi answer: Percentage of respondents who selected each answer option (e.g. 100% would represent that all this question's respondents chose that option)

13.a How and where is the technology used?

Showing all 6 responses	
Whatsapp or Telegram groups to answer quick questions or news.	714253-714244-73664254
Social media is part of our everyday lives including the working environment. Such apps are now widely accepted by companies as part of their corporate identity. There is basically no limitation anymore to include such apps, and others, into our daily work	714253-714244-74168003
Social media is mostly privat used (not all e.g. Linkedin) and should have not so much influence to professional worklife.	714253-714244-74283744
maybe to recrude new employees	714253-714244-74468970
mainly used in personal relationship	714253-714244-74811398
Some of them can be used to highlight good achivements of companies and/or teams and/or individuals not only for promotion but also to increase social/team cohesion within a company and/or team. Other technlogies can facilitate team building and building of non formal relationships.	714253-714244-74784801

14 CLOUD COMPUTING

14.1 Insignificant vs Very Significant



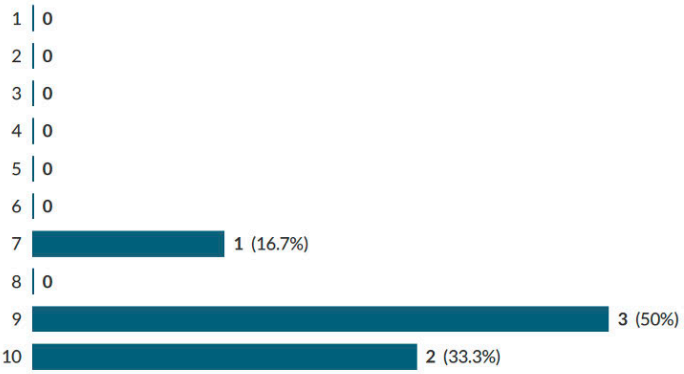
Multi answer: Percentage of respondents who selected each answer option (e.g. 100% would represent that all this question's respondents chose that option)

14.a How and where is the technology used?

Showing first 5 of 6 responses	
Simplifies access to the data compared to access to the main server. Very simple and üpractical way to generate a project team folder	714253-714244-73664254
Not the expert here.	714253-714244-74168003
Central Data storage and Data exchange for defined team	714253-714244-74283744
availability of all information at any time at any place, as long as data security is guaranteed	714253-714244-74468970
Communication & documentation, traceability	714253-714244-74811398

15 MOBILE (Smartphones and Mobile Apps)

15.1 Insignificant vs Very Significant



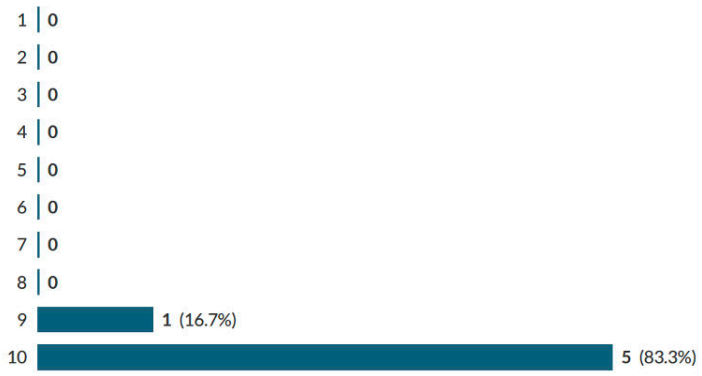
Multi answer: Percentage of respondents who selected each answer option (e.g. 100% would represent that all this question's respondents chose that option)

15.a How and where is the technology used?

Showing first 5 of 6 responses	
Availability of team members and team leaders inside and outside of working hours	714253-714244-73664254
Same answer logic as item 13	714253-714244-74168003
Important for information exchange, but importance degrease du to other alternatives like Skype, TEAMS...	714253-714244-74283744
availability of all information at any time at any place on verios platforms, as long as data security is guaranteed	714253-714244-74468970
Communication, also outside the company IT structure	714253-714244-74811398

16 VIRTUAL MEETINGS TECHNOLOGIES (SKYPE, MSTeams, Zoom etc.)

16.1 Insignificant vs Very Significant



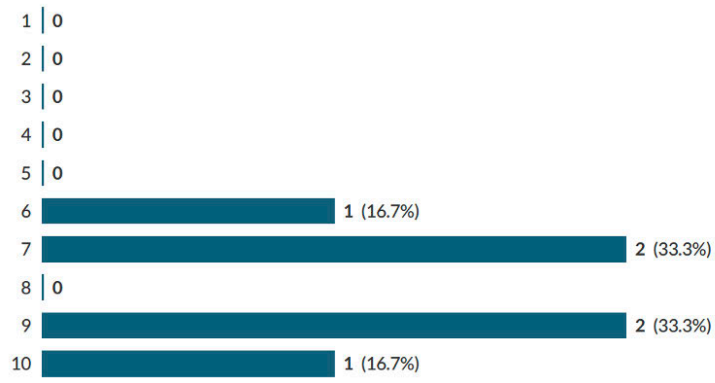
Multi answer: Percentage of respondents who selected each answer option (e.g. 100% would represent that all this question's respondents chose that option)

16.a How and where is the technology used?

Showing all 5 responses	
A must for communication in Virtual Teams	714253-714244-73664254
Ideal platform to exchange information, hold meetings and exchange and keep team members informed / receiving information	714253-714244-74283744
meet and working together without spatial limits based on pre-established rules	714253-714244-74468970
Communication & documentation, traceability	714253-714244-74811398
Inevitable when working global (over long distances).	714253-714244-74784801

17 BIG DATA and ANALYTICS (Using data sources available over the internet and analytical tools for reporting)

17.1 Insignificant vs Very Significant



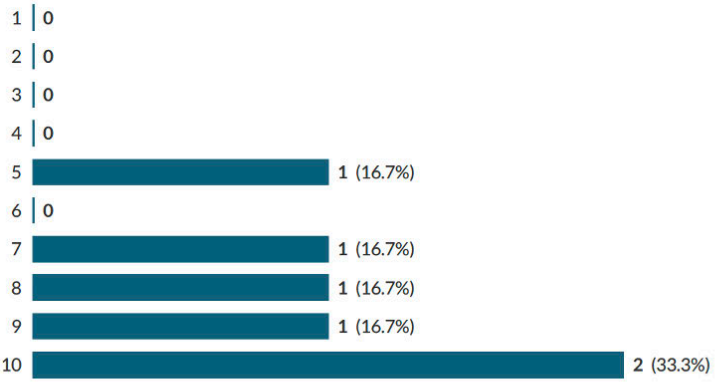
Multi answer: Percentage of respondents who selected each answer option (e.g. 100% would represent that all this question's respondents chose that option)

17.a How and where is the technology used?

Showing all 5 responses	
Simplifies daily work for creating of analysis and reports	714253-714244-73664254
Is getting more and more important with the anvantage of a pure fact based information	714253-714244-74283744
the informative value of analyzes must be profed	714253-714244-74468970
documentation, brain storming, competitive analysis	714253-714244-74811398
Less relevant in automotive.	714253-714244-74784801

18 AGILE PROJECT PLANNING TOOLS

18.1 Insignificant vs Very Significant



Multi answer: Percentage of respondents who selected each answer option (e.g. 100% would represent that all this question's respondents chose that option)

18.a How and where is the technology used?

Showing all 6 responses	
Very important to identify risks, lecks and opportunities in time, to have a great overview about the project (costs, time, quality), to make reports and analysis easier, to identify team performance etc.	714253-714244-73664254
V-CORPS model will work perfectly together with Agile approach.	714253-714244-74168003
Is good for some project aspects like software releases, but not solution for all project aspects with long leading hardware investments	714253-714244-74283744
regular, repetitive structured planning helps the entire team	714253-714244-74468970
Optimization & lessons learned	714253-714244-74811398
More used in software development projects or projects where clear targets are difficult / not possible to define. But getting more important also for general projects.	714253-714244-74784801