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# Exploration of Management and Leadership Techniques that Enhance Joint Working in an Agile Project

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October 2020

A thesis submitted in partial fulfilment of the requirements of Edinburgh Napier University, for the award of Doctor of Business Administration.

# Declaration

I declare that this Doctor of Business Administration thesis is my own work and that all sources literary and electronic have been properly acknowledged as and when they occur in the body of the text.

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Date: 06 October 2020

# Acknowledgements

This academic milestone necessitated tremendous input and support from numerous people. In this regard, I would like to thank my supervisors and the Napier University unit's facilitators. Some of them worked diligently for long hours and did not relent or give up on me that you are escort my journey as research student from the first to the last day. They gave me legitimate support pertaining to this research: Their support is a testament to the University's commitment to excellence.

Thanks to my manager that you gave me the chance, and back me up at each time.

The interviewees were also outstanding in the manner that they offered me their much-deserved cooperation and time. Numerous people supported me and became a foundational pillar. I acknowledge any person that inspired me to push on and stay on the course. Thanks to all they are supported my research that you discussed and inspired me.

I extend an exceptional thanks to a friend who motivated me to start this academic journey.

Thanks to my family for supporting my choices on the academic journey.

Lastly, I am exceptionally grateful for my partner and his support behind my academic journey and that you are standing by me the whole time. I say a very special thank you!

# Abstract

The purpose of this research is to explore the connection between management techniques and leadership techniques that influence collaboration in projects. The specific objective of this study is to identify the way in which (project) managers and leaders can positively influence the cooperation of each project member.

It is not the task of this study to examine individual factors, risks or barriers that influence project success, and this study is unable to encompass the entire evaluations of possible guidelines, (process) models, standards, technologies or methods. The focus is on work obstacles that confront project members to show possibilities for working together while identifying practical solutions for managers and leaders. This study highlights the personal obstacles with the approach of agile (e.g., Scrum) and hybrid (e.g., V-Model® or waterfall, and Scrum) methodologies, but with the focus on techniques that can be used in a project. The study follows a semi-structured interview design with in-depth thematic data analysis. Interviews are used to understand the impediments between the interviewee and their work. The analysis examines the real view of the project members with a realistic view of the researcher. Study results suggest that team members have a pivotal role, and important aspects of joint working are revealed in the work arrangement and execution of the project work. Overall, the findings should make an important contribution to enhance collaboration in projects and generate fresh insight into manage and lead projects.

Key words: management, manager, leadership, leader, collaboration, teamwork, joint working, technique, project, agile, traditional, Scrum, V-Model®, waterfall, working together

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# List of Abbreviations

AppOps .... Application and Operations
DANCE ..... Dynamic and changing, Ambiguous and uncertain, Non-linear and unpredictable, Complex and Emergent
DevOps .... Development and Operations
DIN ..... Deutsches Institut für Normung (German Institute for Standardization)
DOI ..... Declaration Of Interdependence
HR ..... Human Resource
IBM ..... International Business Machine
IEEE ..... Institute of Electrical and Electronics Engineers
LeSS ..... Large Scale Scrum
MVP ..... Minimal Viable Product
OLA ..... Organizational Leadership Assessment
PM ..... Project Management or Project Manager (context relevant)
PMBOK® . Project Management Body Of Knowledge®
PMI ..... Project Management Institute
PMP® ..... Project Management Professionals®
PoC..... Proof of Concepts
QFD ..... Quality Function Deployment (the house of quality)
SAFe ..... Scale Agile Framework
SCARF ..... Status, Certainty, Autonomy, Relatedness, and Fairness
SLS ..... Servant Leadership Survey
SMART ..... Specific, Measurable, Achievable, Realistic, and Time bound
SPEC ..... Scope, Plan, Execute, and Control
SRAA ..... Sense, Respond, Adapt, and Adjust
SWOT ..... Strength, Weakness, Opportunities, and Threats
WBS ..... Work Breakdown Structure

# 1 Chapter 1: Introduction

## 1.1 Introductory remarks

Chapter 1 builds the framework for this study by defining its aim and objectives. It includes an explanation of the keywords to understand the relevance, the complexity relating to the project, and identifies the research gap and problem. All possible influence aspects and the preferred goal for this study are also mentioned.

Next, a brief historical overview offers a common understanding of the management and leadership origins and developments (after 1900) by focusing on themes having an impact on this study. That enhance the understanding to the context of this study as an overview. The focus is on techniques for management and leadership to enhance the teamwork in a project.

The 'Research limitations and ethical consideration' offers the limitations and ethical issues concerning this research, followed by an explanation of the structure as an overview of the construction for this study.

This paper aims to offer specific research aim and objectives, sets the research context, explains the limitations and ethical influences, and explains the structure for this study. Finally, a summary of Chapter 1 will be offered.

## 1.2 Research aim and objectives

The research aim is to examine management and leadership techniques to enhanced joint working in a project.

The most organisations operating with a traditional approach to generate value for the business. They use a business model that includes business activities on specific aspects. A business activity can be organised in a project to produce an outcome (e.g., a product or solution). The project management is responsible for the realisation of a project, must include the entire environment, and is an intersection of both business (management) and project management. (Project) management is a process, and the (project) manager is the executive organ. Rikkilä et al. (2013) examined the challenges between theory and practice, and arguing that management and organisation culture have an impact on the approaches to manage and lead a project team. From the organisation perspective is required a high-functioning, hybrid (a combination of traditional

with agile) project management office (PMO) to 'support a range of disciplines, providing command and control for traditional approaches and entrepreneurial enablement for agile teams' (KPMG, 2017, p. 8), and to enabling agility and organisational success. Agility is 'a property of an organization to sense and respond to market changes and continuously deliver value to customers' (ScrumAlliance, 2019, p. 6). Goldman et al. (1995) developed 'delivering value to the customers, being ready for change, valuing human knowledge and skills, and forming virtual partnerships' (Yusuf et al., 2019, p. 3) as the four dimensions of agility, and Conforto et al. (2014) includes, as enabler, 'knowledge management, strong leadership commitment, organisation learning, organisational culture, multidisciplinary teams, decentralised decision-making, customer and stakeholder involvement' (Yusuf et al., 2019, p. 3). Further studies on strategic agility were published by e.g., Clauss et al. (2019), Doz, & Kosonen (2008), Doz, & Kosonen (2010), Fourné et al. (2014), Gurkov et al. (2017), Morton et al. (2018), Vaillant & Lafuente (2019), or Weber & Tarba (2014).

A project (Figure 1) uses a project methodology that is differentiating into i.e., traditional (Annex 1), agile (Annex 2) or hybrid, and can be extending with a framework (i.e., SAFe, LeSS, Nexus – Annex 4), various ceremonies or methods (i.e., Design Thinking, DevOps), and the project methodology assumes a project model (e.g., waterfall, V-Model®, Scrum). A project (Annex 3) using mostly an agile approach to organising and managing the specific aspects i.e., to improve customer satisfaction, or reduce time to market (ScrumAlliance, 2018). Agile is 'an organizational approach and mindset defined by the values and principles of the Agile Manifesto' (ScrumAlliance, 2019, p. 6). The best sources for the agile approach are AgileAlliance (2015), Beck et al. (2001), Pinkston (2015), ScrumAlliance (n.d.), or Takeuchi & Nonaka (1986) and is described in Annex 2. Plögert (1996), Balci et al. (n.d.), Corbett (2013), or Sommerville (2018) are some of the best sources for the traditional approach that is described in Annex 1.

Specific project aspects (Figure 1) are managed via project processes / phases (e.g., strategy, design, construction, test). A process includes a sequence of procedures as activities, actions, or tasks. A procedure grouping techniques and techniques are using to precede specific procedure. A definition of a project and the relations are described in Annex 3. Leadership is a process where the focus is on its accomplishment and the leader is the executive organ in this regard. The leadership approach is mainly about the human needs – it is used for

motivating and inspiring people (team members). The manager and leader use several practices to promote activities, or actions that are understood as technique for the various procedures. The development of the mindsets management and leadership are based mainly on the sources Drucker (2012), Peters (2015), Laub (2018), Northouse (2018), and PMI (2017) for this study.

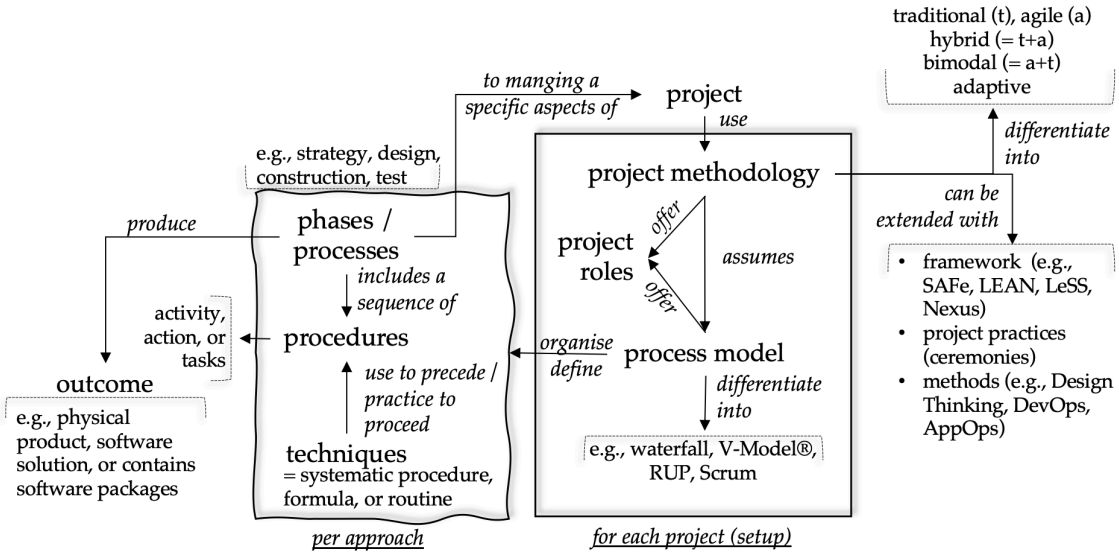


**Figure 1 Overview project and its components**

The annually report of the ScrumAlliance® underline over the last years that is using a mix of traditional approach for organisation and an agile approach to produce an outcome (ScrumAlliance, 2018; ScrumAlliance, 2019). The agility of a project is influence by the organisation, because the organisation provides the framework conditions for the project environment that the project can react and adapt ideas, methods, technologies, and culture aspects (Shams et al., 2020). Liu et al. (2018) argues 'firms must quickly respond to market changes and become more innovative in order' (p. 98). Cao et al. (2013) argues that 'agile methods are appropriate when project scope and requirements change rapidly' (p. 191), 'teams often adapt agile methods to suit their specific needs' (p. 192), and 'requirements of agile development methods pose conflicts with the use of traditional funding processes' (p. 192). Udokporo et al. (2020) analysed in their empirical study that agile practices are 'supported for cost reduction and lead time reduction' (p. 8), and 'from an organisational and production perspective, agile practices' best outcomes could be achieved when implemented as part of a broader competitive and operational strategy' (p. 8). An organisation should focus on agile in combination with (dynamic) capabilities, competences, culture, or performance that is examined by i.e., Boehm & Turner (2005), Carvalho et al.

(2019), Chakravarty et al. (2013), Goldman et al. (1995), Hoda et al. (2012), Lee et al. (2015), Oosterhout et al. (2006), Queiroz et al. (2018), Roberts & Grover (2012a), Tallon & Pinsonneault (2011), Teece et al. (2016), or Vinodh et al. (2010) as well as underline with empirical studies from i.e., Liu et al. (2018), Lu & Ramamurthy (2011), or Roberts & Grover (2012b).

That builds the stage to examine techniques towards enhancing collaboration in projects and the research objectives examines how the research aim with a focus on management and leadership techniques should be achieved. The research objectives are:

1. to examine management techniques that affect collaboration in a project.
2. to examine leadership techniques that affect teamwork.
3. to examine in what manner management is associated with leadership for collaboration in a project.

A challenge is that organisations break down (traditional) business activities (i.e., resource / cost / budget /task planning, hierarchies) into a project and an issue is the confrontation of process-oriented (management) vs. people-oriented (leadership) that create especially hurdles for the collaborative working (Annex 3; ScrumAlliance, 2018). That offering the impact to examine which techniques can be used to create the basis for collaborative working (as responsible person for the realisation of a project and as intersection between business and project) and which techniques can be used to proceed a common collaboration (as bridge between management and team members, and to strength each individual team member needs) as well as which techniques are useful for each team member, and what can do managers and leaders together to strength teamwork in a project. This shows how importance it is to scrutinised the effects of management, leadership, and agility on teamwork in practice.

Research objectives (1) and (2) are examined to point out the important aspects for teamwork that can be influenced by the management and leadership in a project, clarifying '*Which aspects influence collaboration in a project?*' and '*How can one influence these aspects to enhance the teamwork in a project?*', respectively. Research objective (3) examines the combinations of management and leadership techniques to answer the following: '*What possible influence do the manager and leader have?*'.

Rost (1993) argues that management and leadership start with the genesis of humans. In practice, there are various concepts, approaches, models, or theories to encourage management or leadership (Rost, 1993). Grint (2010) finds the term *leadership* in 14,139 books in October 2003 and 53,121 in 2009 on Amazon.co.uk. On the same site finds 60,000 books for leadership and over 80,000 for management in June 2019. These numbers show the constant development and movements, thereby supporting Bossons et al. (2015) that leadership is a development process of every generation. Various sources (i.e., articles, books, studies, or reports) offers approaches or mindsets about manage, lead, or describes theoretically various process models (frameworks) for a project (Annex 3; Annex 4). The combination of management and leadership with a project orientation in practice and a focus on collaboration within a project has not yet been examined. Additionally, several sources mix management, manager, leadership, and leader – this required to offer a clear distinction.

The literature offers some separate aspects of a project i.e., communication highly influences the working process, but the author's own experience tells that communication is not the sole criteria for enhancing the teamwork. Studies and books stated that a manager and documentation is no longer essential in a project, but it is possible to work without management and no documentation of the knowledge. Canty (2015) argued that no documentation is required. Sanghera (2018) argued that management is essential for milestones, cost and quality as well as to successfully realise a project and that 'projects are inseparable from project management' (chapter 1), but the Scrum approach did not include a management. These arguments show that it makes sense to examine the combination of possible management and leadership techniques with a focus on teamwork.

Adriano et al. (2015) say that economists predict a huge rise in the unemployment rate due to rising automation manifested in the field of industrialisation e.g., Industry 4.0 (Lu, 2017; Xu & Duan, 2019; Xu et al., 2018), Internet of things (IoT) (Cheng et al., 2018; Li & Zhao, 2018), or cloud computing (Berman et al., 2012; Garrison et al., 2015; Marston et al., 2011). Would people lose their jobs with increasing use of new work methods? The risk is that people would not notice the changing times or lose their individual identity, but simply build barriers and fail to understand new working arrangements as well as the necessity of continuously developing skills and knowledge. They would not

understand the importance of embracing new techniques and new ways of working. This research focuses on hurdles faced by project members in terms of teamwork and identifying practical solutions.

All these make it essential to point out the contribution to the association of management and leadership techniques to enhance joint working in a project. This is what is missing, and this is the reason to explore management and leadership techniques that influence project members and to point out different perspectives for managers and leaders.

## 1.3 Research context

During the 1950s and 1960s, leading was based on balance of power, whereby one person (the boss) collected all information to distribute tasks to workers, gave proper instructions, controlled the results in keeping with the command, and demanded obedience with dominant style and a respected, elevated social status**.** Peters (2015) argues the advantage of this was stability, security and benefits the welfare of each worker and their families.

Stogdill (1974) published the first significant long-term study of the characteristics of leadership (timeframe 1904–1947 and 1948–1970) with the effect that the picture of the worker changed from animal to machine. The statistical interpretation of a leadership experiment, known as the Hawthorne Study, was conducted from Mayo and Roethlisberger (timeframe 1920–1950). The Hawthorne Study examines the environment influence factors to the worker's performance and pointed out that 'workers were people with social needs, self-esteem needs, and self-fulfilment needs, needs often neglected in the workplace' (Laub, 2018, pos. 864). The result was the evolution of a behavioural approach for leadership (Franke & Kaul, 1978; Hughes et al., 2014; Jones, 1992).

In the 1960s, Blake and Mouton developed the *managerial grid* within the two dimensions of *concern for people* (relation-oriented behaviours) and *concern for production* (task-oriented behaviours) by 'creating a set of different management behaviours resulting from a varied combination of these two behaviours' (Laub, 2018, pos. 871). Hersey and Blanchard redeveloped this concept and 'introduced four distinct manager styles (directions, coaching, supporting, and delegating)' (Laub, 2018, pos. 902) so that the manager can flexibly react on the needs of the worker. It is known as situational management, situational leadership or adaptive leadership (Canty, 2015; Kalbfleisch, 2010; Kolbert, 2004).

During the 1970s–1990s, the attitude of the dominant style changed to a cooperative style because the increasing globally networked economy was assuming increasingly varied tasks. It provided independent work for each subordinate worker – it was not possible to handle this development from the dominant position as one boss. The term 'boss' came to be known as a type of leader who plays both coaching and visionary functions to motivate the subordinate. The superior and the subordinate formulate common objectives for the subordinate; with the former supervising active tracking the latter's work. The subordinate was enabled to bring their own expertise in coordination with the superior, and to take responsibility for their own work (Peters, 2015).

Since 1970, Greenleaf began to define and promote the term *servant leadership*: 'The servant-leader is servant first. It begins with the natural feeling that one wants to serve. Then conscious choice brings one to aspire to lead' (Greenleaf et al., 1998, pos. 1). In 1978, Burns's (2012) *transformational leadership approach*, based on Greenleaf's concept, focused on the ethical dimension. Bass & Riggio (2006) conceived *charismatic and visionary leadership* approaches as a subset of the transformational leadership approach. Heifetz (2009) designed *adaptive leadership* to support leaders, and followers (subordinate) by focusing on continuous shifting environments and complex issues.

Bryman (1992) coined the term *new leadership* with democratic guiding elements. These should be based on the relationship between the superior and the subordinate and change the leader as a member of the management to a leadership personality with 'determination, openness, and decision making' (Peters, 2015, pos. 321). Rock's & Schwartz's (2006) *neuroleadership* approach was a combination of neurosciences with leadership – it relates to the operating modes of the complex human brain by focusing on the reward system and brain plasticity associated with management tasks. The reward system activates happy hormones depending on individual requirements of the subordinate (Hüther, 2016). Brain plasticity offers the realisation that the continuously modified human brain is competent to acquire lifelong learning through appropriate motivation, and stimulation of human needs (Pascual-Leon et al., 2005; Peters, 2015; Rock, 2010a; Rock, 2010b).

Various leadership approaches are differentiated over the focus. They include *authentic leadership* with a moral approach to leading (George, 2007), *cross-culture*

*leadership* with the focus on different cultures (Penley & Ao, 2006), *distance leadership* over spatial distances (Eichenberg, 2007), *diversity leadership* with the focus on different varieties of employees (Graham, 2006), *e-leadership* of employees with the support of technologies (Müller, 2008), *self-leadership* with the intent of self-leading (Manz & Neck, 2012), and *value-based leadership* that focuses on the relation between the leader and employee as well as on the identification of sentimental values (Kraemer, 2011).

In 1996, the Project Management Institute (PMI) published a common official standard titled *A Guide to the Project Management Body of Knowledge* (brief PMBOK® Guide) and is recognised as a standard development organisation by the *American National Standards Institute* (e.g., ANSI/PMI 99-001-2008). The PMI (2017) includes an *Agile Practice Guide* that is developed by collaborating with the Agile Alliance (a non-profit organisation) and 'provides practical guidance geared toward project leaders and team members adapting to an agile approach in planning and executing projects' (PMI, 2017, chapter: Introduction). One main official certification is *Project Management Professional* (PMP®). The PMBOK® is a US standard, and disseminated internationally as guideline for project management. That standard is continuously reworked with a coordination process of several committees, and everyone can submit a change request for the next version (AgileAlliance, 2015; Angermeier, 2013a; Angermeier, 2013b; Beck et al., 2001; PMI, 2017).

Annually, the SCRUM Alliance® publishes the *State of Scrum Report*, which is a summary of analysed surveys (more than 2,000 members and 27 industries in 91 countries) with focus on used methodologies in practice. The results showed that the functional areas are primarily IT (39%), software development (27%), and product development (11%). They showed that the decision to use only Scrum (as agile methodology) decreased from 43% in 2015 to 16% in 2017. In 2015, almost 55% of the companies applied a hybrid form, and this increased to 78% in 2017 (ScrumAlliance, 2018). The next report differentiates between leaders and laggards, and both groups have another view about agile. Leaders response 'we are Agile in both strategy and execution […] culture is definitely an asset to achieving agility' (ScrumAlliance, 2019, p. 5); laggards' response 'we are not Agile in both strategy and execution […] culture is an obstacle to achieving agility' (ScrumAlliance, 2019, p. 5). These influences offered different answers to the usage of traditional approach: 3% (leaders) and 20% (laggards);

hybrid approach: 64% (leaders) and 55% (laggards); and only an agile approach: 33% (leaders) and 25% (laggards) (ScrumAlliance, 2019). Dybå & Dingsøyr (2008) analysed in their empirical study that 'in the USA and Europe reveals […] 14% of companies are using agile methods, and that 49% of the companies […] are interested in adopting them' (p. 837). Boehm & Turner (2005) and Ciric et al. (2019) are suitable as entry point for the challenges to the usage of agile and traditional approaches.

The Pulse of the Profession (2019) survey results are point out that the following approaches are used in practice: change management (76%), hybrid project management practices (60%), Design Thinking (59%), agile (57%), and DevOps (48%) (Pulse of the Profession, 2019). The report from 2020 offers that organisations focused on culture aspects to 'centres on delivery customer values' (70%), 'is receptive to organizational changes' (53%), 'invest in technology' (53%), and 'values project management' (46%) (Pulse of the Profession 2020, 2020, p. 4) as well as identify as success factors for the future: 'organizational agility (35%), choosing the right technologies to invest in (32%) and securing relevant skills (31%)' (Pulse of the Profession, 2020, p. 2).

The ScrumAlliance (2018) report offers the developing of agile leaders as executive management (61%), Scrum Master (48%), IT manager (27%), Product Owner (22%), software developer / engineer / architect (21%), Project Manager (21%), Program Manager (21%), and Agile coaches (4%) (ScrumAlliance, 2018, p.25). This shows that leadership is performing by different roles and each role needs a fundamental understanding of human needs to act as leader in practice. The Pulse of the Profession report indicates that organisations have a high priority about the skill development of technical (68%), leadership (65%), business (58%), and digital (50%) skills (Pulse of the Profession, 2020).

These support the notion that a hybrid form becomes increasingly popular in reality. Annex 3 provides a deeper understanding of the project concept and its relationships. Annex 1 and Annex 2 can be used to develop an understanding of traditional and agile process models, and to discover possible pain points for joint working described in. The agile process models (Annex 2) can be extended with a scaled framework and some examples are described in Annex 4.

## 1.4 Research limitations and ethical consideration

The research context offers various roles; they can influence the project work. Further research will focus mainly on the groups of manager, leader, and team member because different approaches have assigned other terms for these groups, such as the manager as project manager, PM, lean-agile leadership manager (SAFe), or project lead.

The differences among several project models are not examined. Only the generic can be used for an agile or traditional approach to realise and accomplish a project. The term project refers to agile, traditional, or hybrid approaches.

Various procedures exist for a project. People management and project management, along with topics of actions, creating further opportunities, hiring project members, and providing on/offboarding, financial figures (such as signing, revenue, forecast, budget, cost-rates, or final cost), legal provisions, or regulations like employee-leading law, data security, or data privacy are beyond the scope of this paper. It is not the task of this research to examine individual factors, risks, or barriers that would influence the project success. This research is unable to encompass the entire evaluations of possible guidelines, models, standards, technologies, or methods.

All technical topics, such as installation, configuration, or technical requirements, as well as tools, programs, services, or apps, are excluded. Global working, physical restrictions, Industry 4.0, big data, industry of things (IoT), cloud computing, or gender differences are beyond the scope of this paper.

Managers and leaders should act ethically. Ethics in a project remain confined to projects, customers, and performing organisation, or team with the influences of customer to project, organisation to customer, and project to customer. Personal ethics may trigger 'family values, political leanings, and religious beliefs' (Furman, 2014, chapter 10). The influences of the ethical code, and the possibilities of EDMF are excluded themes for this study (see Annex 3).

Manager or leader should be known the needs, behaviours, and working requirements of the counterpart. Normally, people influenced by their own generation. Argiro et al. (2018) argued the generations can be distinguished by the age, with the most popular category names being: Depression Era (1912–

1921), World War II (1922–1927), Post-War Cohort (1928–1945), Boomers I/ Baby Boomers (1946–1954), Boomers II/ Generation Jones (1955–1965), Generation X (1966–1980), Generation Y/ Echo Boomers/ Millennials (1981–1996), and Generation Z/ Digital Natives (1997–2012). Twenge & Campbell (2008) examined the differences and impacts of the generations to the workplace that managers and leaders can better respond to the expectations of employees. The different generations have their own characteristics, standards, and needs as well as their own lifestyles with the balance between work and leisure time (Haynes, 2011). Leadership approaches (Chapter 2) are good entry points to identifying and satisfying needs. This study cannot examine the influences of the generations (Argiro et al., 2018; Englund & Bucero, 2019; Haynes, 2011; Peters, 2015; Twenge & Campbell, 2008).

Ethical issues in conjunction with a project can be based on fair relationships between the superior and subordinate, the respect of gender equality in the hierarchy structure, accrue of the exploited power potential for one's own benefit, respect for values and virtues (i.e., fairness, truth, courage, wisdom, tolerance), or the subjective ethics of conscience (Kant's categorical imperative) – the moral responsibility for the own actions (Peters, 2015).

## 1.5 Structure of this thesis

This research is outlined as in the following:

**Chapter 2: Literature Review**

In Chapter 2 (Literature Review) is deeply explore the theoretical background of the management and leadership, and their techniques. This chapter provides the necessary background and shows the distinction between manager and leader. It outlines significant techniques that influence collaboration in projects, and provides an understanding of the theoretical view of the themes.

PMI (2017) includes very extensive guidelines to manage traditional project phases with roles and responsibilities, and is extended with the agile approach (up to edition six) as well as build the basis for an official standard certification (PMP®). Sanghera (2018) offers the basic knowledge and focus on the exam of the PMP® certification. PMI (2017) and Sanghera (2018) are offers the theoretical aspects of the management. Drucker (2010) and Drucker (2012) focus on the

practical aspects of the management, and Furman (2014) on the common questions and answers about management.

Chugh (2011) and Peters (2015) mainly support the statements about the new leadership approach. Rock & Schwartz (2006) and Peters (2015) are useful sources for neuroleadership. Robert K. Greenleaf is the father of the servant leadership approach, set its cornerstone, and is a key source for the development of modern leadership practices (Greenleaf et al., 1998; Greenleaf, 2012a; Greenleaf, 2012b). Over the past 50 years, many authors, such as Laub (2018) and Peters (2015), have shaped, grown, refined, and advanced Greenleaf's servant leadership theory as well as developed their own approaches. Bennis (2009) offers the theoretical knowledge of leadership. Northouse (2018) and Peters (2015) connect the theoretical knowledge with the practice.

Laub (2018), Englund & Bucero (2019), and Milosevic (2003) are the focal literature to underpin this study for the examination of management and leadership. Englund & Bucero (2019) offers a theoretical view on management with a highlighting of leadership aspects. Laub (2018) has a close relation to the approach from Greenleaf, and offers theoretical formulas for management and leadership. That formulas are use in this study to structure the examined techniques for management and leadership. Milosevic (2003) focuses on management tools and activities in practice. Canty (2015) focuses on the differences between traditional and agile practices with agile examples.

This chapter is examines in consideration of Chapter 3, and builds the basis of understanding through the argumentation presented in Chapter 4, and supports the line of argument about the connections mentioned in Chapter 5. This chapter offers the theoretical impact for this research.

**Chapter 3: Research Methodology**

The research methodology combines basic research of the literature review with research philosophy in connection with research approach, design and strategy. This chapter is the construction plan of the research process to achieve the research purpose. The research philosophy includes a critical analysis of the ontology, epistemology, and axiology. Then follows the focused view of the research approach – the theory of generating and verifying findings through deductive reasoning. Furthermore, the research method is considered to collect and analyse the collected data. The research methodology is mainly influenced

from Gray (2014), Williams (2016), Crotty (2015), Dudovskiy (2018), Dickstein et al. (1998), Laub (2018) and Will et al. (1996).

**Chapter 4: Data Collection and Analysis**

This chapter focuses on the experiences of project members in an agile project environment to identifying possible personal obstacles, and influence aspects for collaboration. A conceptual framework is applied and structured for the data collection and analysis. The data collection includes preparatory actions and an interview schedule plan to proceed the semi-structured interviews. Then follows the data analysis along with a thematic analysis to analyse the codes and themes (categories). This chapter offers the practical impact for this study based on Miles et al. (2014) and Remenyi (2013).

**Chapter 5: Discussion of the Connection Between the Literature and Data Analysis**

Chapter 5 provides the theoretical and practical perspective together with a focus on the research objectives. It explores the relationship between techniques and the influence of management and leadership to promote teamwork in a positive way and can be adopted in any project. The Chapter 5 is mainly supported by the argumentation presented forward by Englund & Bucero (2019), Furman (2014), Laub (2018), Milosevic (2003), Canty (2015), Chugh (2011), Greenleaf et al. (1998), Lyngso (2017), Peters (2015), Sanghera (2018), Scharff (2011), ScrumGuides (n.d.), and Warren (2011). Current reports on management and leadership are published via Gallup (2018), Gallup (2019), and MIT Sloan Management Review (2019).

**Chapter 6: Conclusion**

The conclusion chapter associates the research aim and objectives with the research findings, offers the research limits of this study and highlight further research areas. This chapter present the contribution to theory and practice that this study provides, and focusing on the influence of joint working in a project from the management perspective (Annex 10), leadership perspective (Annex 11), and both perspectives (Annex 12).

## 1.6 Summary of chapter 1

### 1.6.1 Introductory remarks

Chapter 1.1 offers a short overview of this chapter and an introduction about the focus of this study.

### 1.6.2 Research aim and objectives

Chapter 1.2 specifies the research aim, offers a short overview of the keywords, and describes the research objective, and the research gap to points out the direction of this study.

### 1.6.3 Research context

Chapter 1.3 examines the context for this study as a common understanding of the complexity to combine the key themes of leadership and management in conjunction with collaboration in a project. Annex 1 is an overview of the traditional process models with waterfall and V-Model®, Annex 2 the agile process model with Scrum, Annex 4 agile scaled frameworks and Annex 3 the project and their relations.

### 1.6.4 Research limitations and ethical consideration

Chapter 1.4 defines the limitations and ethical issues for this research. The research focuses on possible influence aspects for management and leadership techniques in conjunction with teamwork in a project. The ethical issues are mainly based on changes in working style.

### 1.6.5 Structure of this thesis

Chapter 1.5 outline the structure of this thesis and points out the relevant literature that is examined, analysed, used, and reviewed for this study.

The next chapter clarify the terms management and manager, examine the mentality and characteristics as well as focus on techniques that can be use in the management (Drucker, 2010; Drucker, 2012; Furman, 2014; PMI, 2017; Sanghera, 2018). Then the clarification of leadership and leader with the specification of the mindset and the techniques for leadership (Bennis, 2009; Greenleaf et al., 1998; Northouse, 2018; Peters, 2015). Following by the comparison and combination of techniques for management and leadership with focus on aspects to influence the collaboration in a project (Englund & Bucero, 2019; Milosevic, 2003; Laub, 2018).

# 2 Chapter 2: Literature Review

## 2.1 Introductory remarks

Chapter 2 starts with the characterisation and distinction of management and the manager, leadership and the leader, and their techniques to offer a similar understanding of this study.

The traditional management and leadership style is changing. Today's management and leadership style is influenced by technology, tools and complex requirements. Project management is a process that refers to the accumulation of several procedures with defined phases. Moreover, leadership is deemed as a process with distinct procedures, while leaders and managers are the executive organs of such processes with different approaches. Manager and leaders use various techniques to proceed relevant procedures in keeping with their own approaches. The manager applies, combines, and follows procedures to manage and control the execution of a project with different techniques. The leader focuses on procedures relating to people and human needs. Taken together, these influences all project members in knowing the project goal(s), responsibilities, and commitments, thereby paving the way for consistent and structured work, and increase the social feeling and connection. These give the project a professional authority and culture (Englund & Bucero, 2019; Drucker, 2012; Milosevic, 2003).

Lots of management and leadership topics have come up in the last few years. A brief overview has been given in Chapter 1 about the historical development. Hence, this chapter refers only to views on management and leadership approaches, and their techniques. These are generally defined and not as special techniques to influence the joint working. But the literature gap is connections that are focus on techniques to enhance teamwork in a project, and that will be closed with the discussion (Chapter 5) in consideration of the introduction (Chapter 1), research methodology (Chapter 3), and data analysis (Chapter 4).

This chapter aims to generate the background knowledge of (project) management, leadership, and their techniques; it also examines the effects of the techniques to collaborative working in a project.

A brief recap is included at the end of Chapter 2.

## 2.2 Management and manager

### 2.2.1 The mentality of management

Each business needs is a management process orientated on the economic performance dimension in conjunction with every decision, action, and problem because management 'is a practice, rather than a science or a profession, through containing elements of both' (Drucker, 2012, pos. 357). Management is 'the attainment of organizational goals in an effective and efficient manner through planning, organizing, staffing, directing, and controlling organisational resources' (from Draft, 2008 as cited in Laub, 2018, pos. 1413) to resolve 'problems of order, structure, motivation and leadership in the business enterprise' (Drucker, 2010, pos. 111). Northouse (2018) adds budgeting, control and solving of problems, while Hughes et al. (2014) adds consistency, paperwork, procedures, and regulation. Management procedures are unique in terms of the principles of economics, and not of morality. Mainly, 'management is about making things run well and stabilizing them to work more efficiently' (Laub, 2018, pos. 1423). Drucker (2012) argues that the management 'elements and requirements can be analysed, organised systematically, and learned by anyone with normal intelligence' (pos. 349). He argues:

> Management is a social function, embedded in a tradition of values, customs, and beliefs, and in governmental and political systems. Management is […] culture-conditioned; […] management is an organised body of knowledge and as such applicable everywhere, it is also 'culture'. It is not 'value-free' science (pos. 372).

Culture refers to organisational aspects, such as the work environment, style of the management, policies, values, and vision, and project aspects like the selection of the project, style of the management, assessment of the team performance, project policies and procedures (Sanghera, 2018).

Moreover, 'management is work […] As work, management has its own skills, its own tools, its own techniques' (Drucker, 2012, pos. 113). Further, 'management is tasks. Management is a discipline. But management is also people' (Drucker, 2012, pos. 107). Laub (2018) offers a management formula with *Planning* (P) + *Organising* (O) + *Directing* (D) = *Stability* (S). These means:

> The function begins with planning towards the vision, creating a pathway towards the vision the group is pursuing followed by organizing people and things so that movement towards the vision can be pursued in the most efficient and effective way possible (pos. 1441).

Drucker (2010) offers a simple categorisation with three dimensions of the management job: 'Managing a business, managing managers, and managing worker and work can be analysed separately, studied separately, appraised separately' (pos. 16). The *first dimension* refers to the economic performance and includes 'every act, every decision, every deliberation of management' (pos. 525). The *second dimension* enables the resources and increases the productive work by considering that the employee is a professional and have 'personality, citizenship, control over whether they work, how much and how well, and thus requiring responsibility, motivation, participation, satisfaction, incentives and rewards, leadership, status, and function' (pos. 554). The *third dimension* is all about 'managing the social impacts and the social responsibilities of the enterprise' (pos. 579).

The responsible person of the management is described in the next chapter.

### 2.2.2 Characterisation of a manager

The manager is an integral part of management and introduces the management process. Drucker (2012) says that a manager is 'responsible for the work of other people' (pos. 203), 'works with a specific resource: people' (pos. 319), and 'calls for the function of directing or supervising the work of others' (Laub, 2018, pos. 1446). Bennis (2015) argues that the manager is majorly orientated to the organisational procedures of the (company) structure with planning and controlling systems; the manager also 'focuses on systems and structure' (Bennis, 2009, pos. 1066). Hunter (2008) describes the manager's orientation with 'planning, budgeting, organizing, being tactical or strategic' (pos. 148). The manager can be characterised by administration, maintain, control, a short-term view; they also 'ask how and when' (Bennis, 2009, pos. 1069), 'what you do' (Hunter, 2008, pos. 155), and accept the status quo (Hughes et al., 2014).

Drucker (2010) argues that the manager must know different systems to develop the project outcome with an overview of the business by treating it as an entire environment. He also believes that the manager must 'see economic, political and social developments on a world-wide scale and to integrate world-wide trends' (pos. 372) inside and outside domestic markets and countries. The manager needs competencies to increase and measure the performance of the people, and the whole organisation by 'finding the right answer rather than the right question' (Drucker, 2010, pos. 351). The manager has mainly the task to

manage a team by focusing on the controlling of planning and budgeting, organising and staffing, and solving of any problem that may arise (Englund & Bucero, 2019). The management 'needs concrete, tangible, clear practice' (Drucker, 2010, pos. 146).

> Every achievement of management is the achievement of a manager. Every failure is the failure of a manager. People manage, rather than 'forces' or 'facts'. The vision, dedication, and integrity of managers determine whether there is management or mismanagement (Drucker, 2012, pos. 107).

The manager needs diverse techniques to manage a project; this has been outlined in the next chapter.

### 2.2.3 Techniques for the management

Lemos & Scur (2012) analysed data that collected by World Management Survey (WMS), and described that better management tends to exist in organisations with more than 5 competitors and when manager have a higher education (at least university degree). These managers are able to identify best practices and implement them, but also that 'managers are often unaware that they are not following best practices' (Lemos & Scur, 2012, p. 19). The knowledge over the practice in the management is an important factor to valuate obstacles (Bloom et al., 2011). Lemos & Scur (2012) identify to 'creating incentives for continuing education of managers as well as employees is a policy action point' (p. 18). Skill and knowledge development should always be encouraged in order to have a positive influence on each project member (Lemos & Scur, 2012).

The manager can use 'five basic operations' (Drucker, 2010, pos. 343) to their own skills and performance for a systematic work. Only the manager's experience enlivens the operations. *Objectives* refer to the aspired goal through effective communication to all people in the company who perform activities to reach the outcome. The manager defines and manages the objectives by balancing 'business results and realization of the principles; […] immediate needs of the business and those of the future; […] desirable ends and available means' (Drucker, 2010, pos. 345). *Organise* includes the analysis of necessary activities, decisions, and relations; the classification of the work in manageable activities such as jobs; the grouping of the classified jobs into a structure; and then, assigning people to perform the jobs in an integrated team. The manager must have a view on the needs to maintain proper work–life balance, and to prevent a burn out. *Motivate and communicate* means that the manager builds a

team of people for jobs, promotes a policy, and draws up a constant communication structure. *Measurement* is the job to set benchmarks of factors to measure the performance of the organisation, and work in conjunction to achieve the common goal. The manager communicates the meaning and findings of the measurement to support self-control rather than to control people with a dominant style. *Developing people* refers to the part that the manager supports the strengths of the people to unfold the potential of one's own skills and competencies as well as to motivate people to develop their own skills. Principles overlap the economy and 'integrity is of much greater importance than analytical ability' (Drucker, 2010, pos. 345) (Drucker, 2010; Laub, 2018).

The importance of these five operations was confirmed inter alia by the survey of White & Fortune (2002). They are verifying that the view of the literature and management fully concur with the success criteria on-time, budget and specification. Success factors are the conjunction of project with organisation, and the impact of the project on the performance of the organisation. Garousi et al. (2019) proven a correlation of organisational culture and management style that are influence the project planning and monitoring, and these have a significate impact on top-management satisfaction.

#### 2.2.3.1 Techniques to define the project scope

The business case is coordinated to the needs – it is a key artefact for the project. Uikey & Suman (2012) defined the project scope with 'the project aims and objectives' (p. 389), and the project scope has a greater attention as project schedule or budget (Garousi et al., 2019). White & Fortune (2002) has analysed that management has constraints or handicaps with 'methods, tools, or techniques' (p. 10), among others the hurdles are 'inadequate for complex projects', 'difficult to model "real world"', and 'too heavy in documentation, too time consuming' (p. 9). Uikey & Suman (2012) confirmed that 58% are using an own customised methodology and 30% an existing to attain the objectives in a project as well as that 'the methodology, customer collaboration, teams and documentation play an important role in project management' (p. 390) and 'requirements are identified iteratively, but are not accurate in the initial phase' (p. 390). These empirical studies showed why a clear definition is required for the project scope and the use of methods, tools, and techniques. In order to achieve the highest benefit, methods should be adapted to one's own specific

needs, taking into account the particular context (Alexandre et al., 2020). The following techniques can promote joint working in a project.

A feature of an agile project is the focus on activities with values. Canty (2015) defined activities for the agile management: 'create agile charter, assign the project staff, develop project backlog, create estimates, develop road map with story mapping' (chapter 8). He also released plan activities: 'breakdown epics, estimate stories with poker planning, create release plan' (chapter 8). It is possible to react in a 'flexible, transparent, and adaptive' (chapter 8) manner through necessary project changes and requirements via these techniques. Furman (2014) argued that the project plan is the baseline for the project, and include the scope definition that can be define, visualise, and communicate via the *project charter* (refers to strategic and tactical plans for the project), *SWOT* analysis (analyse the critical success factors and follow-up actions to reduce the gaps), *scope statement* (describes the project strategy and is the baseline for the WBS), work breakdown structure (*WBS;* essential integral part and grouping the artefacts to organise the structure with orientation on the scope*)*, or *scope baseline* (includes the scope statement, WBS, and WBS dictionary). Garousi et al. (2019) confirms with their empirical study that a 'more careful planning would lead to a more controlled schedule and project's on-time delivery' (p. 458). The *project vision* or *vision statement* can be derived from the success factors – it describes a future situation and can inspire the team members to achieve a common project goal. White & Fortune (2002) analysed that the management are 'most commonly used project management tool (77%, 182)' (p. 7) to organise require activities, and used Gantt charts (64%, 152) and Cost Benefit Analysis (37%, 88 response) for the measurement (p. 9). Is management defining as technology then *gross domestic product* (GDP) or *total factor productivity* (TFP) are possible practices of measurement (Lemos & Scur, 2012). Generally, all measurement factors and techniques should be clarified and communicated to each project member because any poor result can be demotivating if nobody knows the measurement sources. Additional techniques are activity list, activity attributes, power/interest grid, project glossary, process improvement plan, RACI chart/organisational chart, resource breakdown structure, or resource histogram (Canty, 2015; Englund & Bucero, 2019; Furman, 2014; Juli, 2010; Lyngso, 2017; Milosevic, 2003).

#### 2.2.3.2 Techniques to handle changes, risks, and issues

Change management exerts an important influence through the scope and cost planning. It does the cost planning for the customer and thereby influence the team performance and motivation because such relations must be analysed and evaluated to define adequate requirements. The relevant techniques include the *change coordination matrix* (systematic flow of each action and responsibility to proceed a change), and the *project change request* (the statement to submit a change). Professional is to provide a template for the submission of the request. The *project change log* is a report to monitor the requested changes; it includes a summary, the current status, all relevant aspects and information of the request. The log can be used in meetings to discuss and prioritise the development of the changes, reduce misunderstanding, and support cooperative working. Risk and issue management is a highly important theme, and the handling of the *risk log (or risk register)* and the *issue log* is similar to that of the change log, but with a different focus. In the traditional management is defining that 'risks involved in the project are well managed by risk management, whereby the teams identify possible risks and analyse and quantify them according to the project' (Uikey & Suman, 2012, p. 389). White & Fortune (2002) confirms that 'only a small number of project managers use risk assessment tools because only a few of the tools provide support for the management of risk' (p. 9). The highest ranked risk assessment tools are probability analysis (PA), life-cycle cost analysis (LCCA), in house risk assessment tools, and reliability analysis (p. 8). The *summary progress report* is a one-page documentation of the current status in conjunction with the baseline; it includes risks, issues and their impacts; offers the evolution; and eventually closes with required actions. This technique is used for proactive control, assisting the involvement of all stakeholders, recording the progress and supporting a disciplined report structure. The *post-mortem review* is about the essential learning process; it shows what works well and what does not. This review helps to learn from past mistakes, and can be used for each review. An open culture is essential without blaming anyone – the focus is on facts to improve processes and performance for a successful work style. The *risk workshop* identifies and captures the risks together with the stakeholders; it determines common activities to reduce or control the risks. White & Fortune (2002) analysed that 52% use no decision techniques in the management – the most frequently used decision-making techniques are 'cost benefit analysis

(CBA), expressed preferences, and sensitivity analysis (SA)' (p. 8). Further techniques are the decision tree, Monte Carlo analysis, risk breakdown structure, or risk response plan (Englund & Bucero, 2019; Furman, 2014; Lyngso, 2017; Milosevic, 2003; Sanghera, 2018).

#### 2.2.3.3 Techniques to increase the quality

Uikey & Suman (2012) defines that 'quality management ensures that the expectations of the customer and the objectives of the project are achieved' (p. 389). The aspect of *quality* is gaining in importance and should be identified, benchmarked, prioritised, monitored, and considered as a proactive measure to eliminate or reduce influences. These required a plain scope and focus on the quality aspects to the handling of problems and causes. Hence, quality is a high influence factor behind the motivation and improvement efforts; it supports an increasing level of acceptance of the project outcome (Milosevic, 2003). Garousi et al. (2019) confirms with their empirical investigation that the 'overall quality of the products/ services perceived by project members' (p. 450). Lyngso (2017) argues that the agile sequence for quality management comprised of people, communication, process, standards, and documentation, while the team members must have processes; documentation is a required fixed component; standards are necessary for the execution of the project work; and the communication must focus on the performance.

The *quality improvement map* focuses on problem solving and improvements with an accurate and logical analysis of the problem. This is based on data, and not on opinions 'to direct the team to the core problems instead of peripheral ones' (Milosevic, 2003, chapter 14). Rasiel & Friga (2001) defines a 'team must be properly assembled, motivated, and develop' (pos. 155) to keep the client 'informed, involved, and inspired' (pos. 155) in the process and solution. Problems are based on causes and effects – this can be identified via existing data or brainstorming and communicated via a *problem statement*. The problem statement clarifies questions about the imperative, situation, justification, handling, known affects and advantage to solve a problem. 'The Five W's and the One H questions (who, what, why, when, where, and how)' (Canty, 2015, chapter 8) can be used for solving problems. Moreover, the visualising techniques include the Pareto chart and the cause-and-effect diagram. The *Pareto chart* is a histogram with a ranking and an identification of the highest impact on the project and stakeholders. The *cause and effect diagram* is a hierarchical

structure via a fishbone diagram, requiring a good knowledge of the implemented and usage of the project processes, and including the team members to 'a collective view that inspires commitment to solving the problem' (Milosevic, 2003, chapter 14). Problems may arise because of misunderstanding of the behaviours and objectives or through a missing definition of prioritisation, responsibilities, or roles. Face-to-face meetings or video conversation technologies can prevent or reduce the hurdles of language and culture, thereby reinforcing an empathic listening and improving the communication (Canty, 2015; Englund & Bucero, 2019; Furman, 2014; Lyngso, 2017; Rasiel & Friga, 2001; Sanghera, 2018).

The *control chart* can be used for the statistical control of a project process (or procedure) as a monitoring technique. The decisive planning factors are selected for the chart and procedure, and then the measuring process is performed along with the sampling process. This can be used to recognise and enhance the procedures as well as to discuss the performance via a common language. This is helpful to customise the procedure as suitable measures or to prevent unreasonable actions (Milosevic, 2003).

#### 2.2.3.4 Techniques to manage the stakeholders

A clear structure is necessary to integrate any stakeholder in the project for increasing the motivation and the knowledge of their own responsibilities and relations. As relevant, Garousi et al. (2019) analyses a very high significance of 'customer experience in its own business domain' (p. 447), the skills and actuality of the customer's education and training as well as the support and participation of the customer in the course of the project. The *customer roadmap* follows a systematic objective and gives the customer a voice, thereby involving the customer in the project and supporting an open, transparent communication as well as a feedback culture for the project. Customer feedback is important for the development process and the motivation. Targeted communication is necessary because the customer is not always available (Uikey & Suman, 2012). The *focus statement* describes the purpose, effort, and handling of the contact along with the usage of the stakeholder information. The *communication matrix* is a plan for the communication to managing effective communication over the project activities and procedures – it includes the methods, medium/ technologies, and fields of application. Furman (2014) suggests that most managers do not build a communication matrix, even though this is a great

technique to prevent miscommunication and support managing communication and performance reports. The *performance (or status) report* should be created and submitted to communicate any discrepancies to vital stakeholders. Discrepancies can be identified via index or value techniques. The *discussion guide* asks target-oriented questions (structured interview) while focusing on the requisite information and how to capture these with the right type of questions (Milosevic, 2003; Sanghera, 2018).

The *quality function deployment (QFD*, known as house of quality) is a technique to assign the customer's voice to the project requirements in a strategic, tactical WBS to visualise the process steps with low-level chucks. Uikey & Suman (2012) defines requirements management as 'an aspect of collecting and defining the customer's needs for the project' (p. 387). At the centre of QFD is a relationship matrix comprising associate project requirements (how), customer requirements (what), target values, competitive benchmarking, and assignment of a correlation matrix with positive and negative relationships. The structuring of the standards of quality and increasing the involvement of the team point out what comes from the customer; they also support a customer-driven culture. The advantages are a conceptual transformation into simplicity and the communication based on the visualisation. An efficient usage is realisable to 10 QFDs – more presents a follow-up challenge (Lyngso, 2017; Milosevic, 2003).

Garousi et al. (2019) confirms with their empirical investigation that 'almost all team factors […] are correlated with all variables describing satisfaction of various stakeholders' (p. 458), and that 'project monitoring and controlling […] is significantly and positively correlated with all variables describing project success in product characteristics and stakeholder satisfaction categories' (p. 458).

#### 2.2.3.5 Techniques to manage collaboration

The following techniques support the project for efficient teamwork and taking actions to prevent possible disruptive factors, as these point out possible barriers and most probable causes. The focus is on the human side, including complex interactions, behavioural variables, culture aspects, balance of climate, and offered possible conflict situations (Milosevic, 2003).

Garousi et al. (2019) identifies as team factors with a very high priority for 'pure-agile and pure plan-based methodologies' (p. 470): the expertise in tasks, the

commitment, the internal team communication, the experiences with methodologies, and the general expertise of the team. They are analysing, that with a high-quality team communication is achieving an increase in team building and team dynamics in the project. Respect these aspects to enhance 'terms of cohesion, team sense, harmony, and respect among team members' (p. 447), and consequently that improve the collaboration in the team.

The *four-stage model* is based on Tuckman's approach – a common practice for agile projects –, known as '*forming, storming, norming, and performing*' (Milosevic, 2003, chapter 10) with several forms of variation. That is used to 'identifying critical success factors, skill profiles, and potential team members' (Milosevic, 2003, chapter 10); it is also a roadmap for the team development process in conjunction with the requirements of the organisational and project environment (Furman, 2014; Milosevic, 2003; Tuckman & Jensen, 1977).

The *stakeholder matrix, stakeholder engagement assessment*, or *influence mapping* visualise the influences of the project members; they show the living relationships and dependencies of the key persons or roles in the project. These are used for large complex projects to support a systematic, transparent development process of each member as well as to influence the project success with respect to the 'goals, needs, and ambitions of the many parties and individuals' (Milosevic, 2003, chapter 10). The advantages are an aggregate template of the project parameters, while the relationships offer a framework of the organisational structures in the project environment, prepare an outline of the potential situations with problems and conflicts, and support a team and organisational development process. The manager can use this technique as a reference point to match team performance with organisational needs. Englund PMC (n.d.) has published an example (Englund & Bucero, 2019; Canty, 2015; Furman, 2014; Lyngso, 2017; Milosevic, 2003; Sanghera, 2018).

Alsaqaf et al. (2019) findings of their empirical study are underline that 'agile teams that lack maturity need a senior management role to coordinate the collaboration between the teams' (p. 54).

#### 2.2.3.6 Techniques to manage skills

The level of education is important for each project members, because education is a key element for good practice and this influences the project. That is verified in the studies of Bloom et al. (2011) and Lemos & Scur (2012). Bloom et al. (2011)

examined a 'strong correlation […] between better management practices and measures of manager and worker education' (p. 6), identified a 'lack of manager and worker skills as a constraint on their management practices' (p. 6), and 'a scarcity of managers with the right skills turned out to be the most important factor that respondents believed held back managerial improvements' (p. 26).

The *skill inventory* or *business skill analysis* specifies the skills for each project role, the required tools/ applications, the skills to use these tools, their relationships with other stakeholders, and an action plan to achieve the required skills. This is a simple technique for determining the required skills, serves to define a framework for the expected skills and proficiencies., and can be visualised with a workflow diagram or wireframe. This can be used to recruit new team members (Englund & Bucero, 2019; Milosevic, 2003).

The *commitment scorecard* is a fast, highly efficient performance evaluation technique for capturing stakeholder engagement and feedback in relation to project objectives over the entire project lifecycle, and the strategic and organisational objectives. The technique can be used to perform a qualitative analysis of the teamwork and performance; it builds a bridge 'between the operational focus of the project environment and the strategic focus of the' (Milosevic, 2003, chapter 10) organisation (Milosevic, 2003).

The *commitment-based project management* records a joint plan obligation. This is a short-term obligation that should be discussed and monitored in a weekly meeting to obtain an estimate of the schedule and to support the continuous monitoring process over a long time. This technique can be extended to plan innovations for development of cultural aspects (Englund & Bucero, 2019).

Chapter 2.2.3.1 to 2.2.3.6 presented various techniques that management can apply to influence teamwork, but the aspects should 'differ as company size, project size, and development methodology change. The practitioners should be aware of this situation, and carefully select the factors for their projects' (Garousi et al., 2019, p. 471). The effects of leadership and their techniques are explored in the next chapter.

## 2.3 Leadership and leader

### 2.3.1 Mindset of leadership

According to Northouse (2018), leadership is about turning visions into reality and providing opportunities to develop, motivate and inspire people. Englund & Bucero (2019) defines motivation as a 'formal and informal system of incentives and consequences that reinforces new behaviours' (chapter 1). Hughes et al. (2014) associates leadership with the words 'risk taking, dynamic, creatively, change, and vision' (p. 8). Rasiel & Friga (2001) argues that leadership is the 'nexus of solution and implementation' (pos. 165).

Lange & Hernandez-Bark (2020) identify in their empirical study that 'Positive Leadership Behaviors […] are positive predictors of critical employee attitudes and business targets like Identification with Manager, subordinates' Trust and Loyalty, and Employee Satisfaction' (p. 56) and that 'work context, operationalized as in-house vs. sales personnel, significantly impact some leadership-consequences relationships, i.e. leadership's relationship with Trust and Loyalty is significantly moderated by work context (with a stronger effect in the study population of sales force)' (p. 57). Moe's et al. (2009) final result is 'for improving teamwork we needed a way to describe and diagnose the status of teams and a means of tracing and engaging with change processes' (p. 121) – 'leadership is key in organizations' strive for long-term success and financial performance' (Lange & Hernandez-Bark, 2020, p. 46).

Laub (2018) offers a leadership formula with *Vision (V) + Action (A) + Mobilisation (M) = Change (C)*. It means that the leader explains the vision, that relates to the construction of a real future – 'action without a positive powerful vision can do more harm than good' (pos. 1297). 'Action guided by vision is purposeful and powerful' (pos. 1299). An action requires mobilisation so that people move enthusiastically and voluntarily 'from being inactive to becoming active, from non-leading to leading' (pos. 1277). This results in a change that is achieved through mobilisation with common actions to attain the real future of the aspiration – the vision (Laub, 2018).

### 2.3.2 Definition of a leader

Leadership is a process, while a leader is part of that process and initiates it, 'but they are not all that is involved in leadership' (Laub, 2018, pos. 1136). A leader focus on the humans along with human feelings and ethical aspects (Bennis,

2015). The leader gives an impression of vocation and charisma, having the knowledge to execute a mission, and the belief of correctness and necessity relating to objectives and visions (Peters, 2015). The leader 'is the person you are and the influence and impact you have upon the people you come into contact with' (Hunter, 2008, pos. 155).

Charisma is not innateness, but everyone can learn small things e.g., see in every person the good side, show interest on the concerns of others, and think about each the best. Hope is a gift that inspires others, and they follow it with thankfulness. Sharing of knowledge is powerful and increases the personal connection, which is a cornerstone for establishing a relationship with other people. Charisma should prevent qualities such as ego, uncertainty, mood swings, perfectionism, or cynicism (Englund & Bucero, 2019).

A leader has some desirable characteristics (Northouse, 2018) such as a talent for planning and organising in relation to 'a long-range perspective' (Bennis, 2009, pos. 1068), self-confident appearance, thinking on behalf for others, finding good decisions, the ability to 'ask what and why' (Bennis, 2009, pos. 1069), trustworthiness, inspiring people, and increasing morale and team harmony. Besides, this needs skills on technology, communication, coaching, conflict management, and proactive trouble management (Graham, 1997; Hughes et al., 2014). Furthermore, 'leaders can be moral or immoral, ethical or unethical, good or evil' (Laub, 2018, pos. 1578), and the focus can be summarised with: 'Leaders focus on people' (Bennis, 2009, pos. 1067).

> The leader works with ever-changing situations, markets, and environments while dealing with the most uncontrollable factor of all: people. Therefore, the leader must be able to effectively handle high levels of ambiguity at any given time while keeping the team moving in the right direction (Laub, 2018, pos. 5154).

A leader has mainly the task to lead by focusing on setting a direction, aligning people, and influencing and inspiring others (Englund & Bucero, 2019). The leader can positive affect the teamwork with various techniques and some are present in the next chapter.

### 2.3.3 Techniques for leadership

The Hawthorne Study (1950) was the start point to the evolution of a behavioural approach for leadership (Franke & Kaul, 1978; Hughes et al., 2014; Jones, 1992). The three approaches new leadership (Bryman, 1992),

neuroleadership (Rock & Schwartz, 2006) and servant leadership (Greenleaf et al., 1998) are considered as possible techniques that influence collaborative work and can be related to the agile values (Beck et al., 2001).

#### 2.3.3.1 New leadership approaches

The agile value 'customer collaboration over contract negotiation' (Beck et al., 2001) refers to activate the team members with actions and that is in conjunction with the *new leadership* approach of Bryman (1992). That approach focusses on the personal connections on the emotional level to reach the desired actions as leader (Laub, 2018).

Li et al. (2016) argues in their empirical study that the information technology (IT i.e., cloud computing, social media, internet of things (IoT), or big data) changing the required skills, and the virtual market place requires new business models (Oluwafemi et al., 2019; Xie et al., 2018). A finding is that agile leadership qualities (with agile culture, agile strategy, pro-activeness and e-readiness) is crucial 'to quickly execute business strategy linked with digital technologies in the ever-changing market' (Li et al., 2016, p. 200). Another perspective is the usage of e-leadership via WhatsApp in the Navy with the identification that the articulation is complicate, and conflicts results from the combinations of '(1) technology–communication, (2) communication–trust, and (3) trust–technology' (Ch et al., 2020, p. 180). These conflicts can be minimising with ethical leadership approaches (Hoch et al., 2018) that relate to behaviour, charisma and trust that is influenced by culture and organisation (e.g., Herold et al., 2008; Liangding et al., 2007; Mahdi et al., 2014; Nemanich & Keller, 2007; Pasricha et al., 2018; Pratelli, 2019; Rogiest et al., 2018; Sosik, 2005). Groves & LaRocca (2011) analysed in their empirical study that 'leader's beliefs in selflessness, treating followers, and teammates as ends rather than means, and viewing leadership practices as having ethical significance regardless' (p. 523).

Emotional leadership impacts the project work. Peters (2015) characterises this with the following notion: The leader uses emotional intelligence, appropriate situation responses, and flexible responses with a particularly suitable style. The key competencies include empathy, motivation, self-reflection, self-regulation, and social skills. Chugh (2011) defines primer as the 'capabilities: self-awareness, self-management, social awareness, and social skill' (pos. 160). Englund & Bucero (2019) define the term 'emotional quotient' (chapter 2) with

the core of self-awareness, self-management, and relationship management (Jing et al., 2013; Luthans et al., 2007). Relationship management refers to a constructive and positive outcome of interactions. The term empathy defines 'the ability to put one's self in the shoes of another and to identify with what the other person is feeling' (Englund & Bucero, 2019, chapter 1) (Goleman, 2003).

*Self-awareness* is all about recognising and understanding emotions. It evaluates the impact of emotions on work performance and relationships (*emotional self-awareness*). Accurate *self-assessment* is a realistic valuation of one's own strengths and limitations, and it brings *self-confidence* with 'a strong and positive sense of self-worth' (Chugh, 2011, pos. 167) (Canty, 2015).

*Self-management* refers to the skills of monitoring closely one's own adverse emotions and stimulus (*self-control*), conclusive behaviour of sincerity and integrity (*trustworthiness*), administering oneself and one's own responsibilities (*conscientiousness*), conquering altered conditions and hurdles (*adaptability*), having the ambition to comply with internal quality conditions (*achievement orientation*), and the willingness to take the opportunities (*initiative*). Canty (2015) argues that an agile approach requires 'self-control, flexibility, motivation and ambition, and carefulness' (chapter 11). Further self-management techniques are describing in Chapter 2.4.4 (Chugh, 2011; Peters, 2015).

*Social awareness* capabilities are defined with *empathy* (to detect and interpret others' emotions, to grasp others' perspectives, and to show an active attention for others' considerations), *organisational awareness* (to pick up the topical of company lifestyle to generate decision networks and to direct politics), and *service orientation* (to identify and reach the customer requirements). Canty (2015) offers 'compassion, organisational consciousness, and understanding of surroundings' (chapter 11) for an agile approach (Chugh, 2011; Peters, 2015).

*Social skill*s are related to *visionary leadership* (to take the responsibility for a convincing version that happens to be motivating), *influence* (to utilise a series of effective tactical measures), *developing others* (to enhance the skills of others through feedback and guidance), *communication* (to hear and to convey explicit, powerful, and well-articulated messages), *change catalyst* (to start with current ideas and influencing others with a new tendency), *conflict management* (to dissolve differences in opinions and defuse the situation through acceptable solutions), *building bonds* (to establish and conserve a network of relationships),

and *teamwork and collaboration* (to encourage joint working and establish a team). Canty (2015) defines the skills with 'self-control, motivating leadership, developing other people, alliances and teamwork' (chapter 11) for an agile approach (Chugh, 2011; Peters, 2015).

The emotional leading competencies can be deployed via a mix of the affiliative style, authoritative style, coaching style, coercive style, democratic style, or pacesetting style (Chugh, 2011; Goleman, 2003; Peters, 2015).

The *affiliative leader* fully concentrates on the subordinates. The subordinate's stay in the first position, and the leader expresses only positive feedback to them. This style can be used to boost the morale of the team or enhance team spirit; it does not convey bad workmanship from subordinates (Chugh, 2011; Peters, 2015).

The *authoritative leader* claims to have a vision and offers the freedom to subordinates to reach the vision with their own approaches. The subordinates are motivated to break new ground and take calculated risks (Chugh, 2011; Peters, 2015).

The *coaching leader* focuses on the guidance by keeping an eye on the personal development of the subordinates for the future. Here the leader works with the subordinates in such a way that they are willing to develop their own skills (Chugh, 2011; Peters, 2015).

The *coercive leader* style is similar to the dominant style – the subordinates must follow the leader's orders. This style is useful for unwilling subordinates, reorganisations, or critical situations (Chugh, 2011; Peters, 2015).

The *democratic leader* forms a consensus through the involvement of the subordinates. The leader develops flexibility; increases the subordinate's own responsibilities and picks up ideas from them. Sometimes, however, this leadership style may seem confusing with endless meetings (Chugh, 2011; Peters, 2015).

The *pacesetting leader* assumes a high standard of performance for themselves and their subordinates. These standards are only available over an efficient operation. This style is suitable for motivating leaders and subordinates. They define themselves along the performance and work in a self-coordinated way

with highly qualified specialists and performance-oriented employees (Chugh, 2011; Peters, 2015).

These open up various positive leadership approaches and, in addition, the empirical studies underline the influence of working together in terms of 'determination, openness, and decision making' (Peters, 2015, pos. 321).

#### 2.3.3.2 Characteristics of neuroleadership

The agile value 'responding to change over following a plan' (Beck et al., 2001) refers to building a vision for and with the project members, that requires a conception and hierarchy to solve problems, communicate and working in a project, that can be achieved with the *neuroleadership* approach (Rock & Schwartz, 2006). Basically, neuroleadership is the combination of neurosciences with leadership, and is defined with bond, self-esteem, self-protection, pleasure, prevention of reluctance, orientation, and control (Laub, 2018).

Grawe (2012) argues that the basic leadership needs – bond, orientation and control, self-esteem, self-protection, pleasure, and prevention of reluctance – must be satisfied for successful neuroleadership. The human brain tries constantly to maximise the reward, and minimise the threat (Peters, 2015, pos. 1399). Lee et al. (2012) offers that neuroleadership 'is the study of the relationship between mind and brain' (p. 214) and 'is a multilayered approach' (p. 214). Nordlund & D'Amato (2017) specifies that 'neuroscientific knowledge can now be used to inform and influence theory and practice regarding a wide spectrum of leadership disciplines, such as leadership development, management training, change management, productivity and perseverance, education, consulting, psychology, and coaching' (p. 1). Lee et al. (2012) argues that 'brain activity is just one part of an incredibly complex puzzle that must be placed into a particular social context for the appropriate interpretation' (p. 215). Nordlund & D'Amato (2017) argues that 'the field of neuroleadership can inform neuroscientific research in four leadership-related domains: (1) decision-making and problem-solving, (2) emotional regulation, (3) collaborating with and influencing others, and (4) facilitating change' (p. 2).

Cognitive neuroscience is a part of neuroleadership and is examining i.e., as fundamental research from Gazzaniga (2009); with an organisational perspective from Butler & Senior (2007) and Senior et al. (2011); and with a psychological perspective from Ochsner & Lieberman (2001). The current

brisance of neuroleadership is shown by the investigations of e.g., Benetka (2020), Lieske (2020), and Pittman (2020). Lieske (2020) examine the leadership in a digital, virtual working environment, and analysed that a transformational leadership style in combination with neuroleadership empowering the employee with freedom and self-determination, and that is mainly required to lead younger generations (e.g., Generation Z and Y) (Haynes, 2011; Lieske, 2020; Twenge & Campbell, 2008).

Different approaches exist and can be used to respond adequately as the leader – for example, the SCARF model (Rock, 2010a; Rock, 2010b), the AKTIV model (Peters & Ghadiri, 2014) or the approach developed by Elger (2013).

The SCARF model can influence joint working in a project. SCARF stands for 'status, certainty, autonomy, relatedness, and fairness' (Peters, 2015, pos. 1418). *Status* comprises the status of subordinates among each other; it relies on constructive feedback and recognition of achievements. It is necessary to activate the reward system. *Certainty* comprises foreseeable estimation of situations to activate the reward system; this requires a transparent approach and communication of each change. *Autonomy* comprises the minimisation of the threat, for example, by avoiding stress situations and by paying acute attention to the self-responsibility of each subordinate. *Relatedness* comprises the strengthening of interpersonal relationships because social relationships enhance the sense of belonging to various programmes like coaching or mentoring that can positively influence it. *Fairness* refers to providing equal treatment for all. The brain identifies unconscious injustices or threats, and then the human brain works with a defensive attitude (Peters, 2015; Rock, 2010a; Rock, 2010b).

Neuroleadership can be indirectly influence project scope and quality when used in conjunction with a project's method and roadmap for problem solving, communication and work in a project.

#### 2.3.3.3 Servant leader concept

The concept of a servant leader influences the work in a project; it is relevant for leaders and manager and is mainly concerned with the agile value: 'individuals and interactions over processes and tools' (Beck et al., 2001). That value relates to the mobilisation of the project members with Greenleaf's *servant leadership* approach (Greenleaf, 2012a; Greenleaf, 2012b; Greenleaf et al., 1998), and that

approach focusses on servant first (Laub, 2018) to empowering the followers and strength the teamwork (Farling et al., 1999).

In 1990, public interest increased in practising servant leadership. Greenleaf et al. (1998) describes the basic idea: It is 'a more team-oriented approach to leadership and management' (pos. 2); it is also a 'long-term, transformational approach to life and work' (pos. 5). He also says that its principles are fundamental and timeless, and their relevance is increasing with the global economy, and with the increasing focus on quality at low cost. This changes the dominant styles to cooperate style and further to a new leadership style, thereby changing turning the boss to the superior (as members of management) and changing the superior to the leader (with leadership personality) (Peters, 2015).

Greenleaf et al. (1998) defines the features of servant leadership as 'listening, empathy, healing, awareness, persuasion, conceptualization, foresight, stewardship, commitment to the growth of people, and building community' (pos. 5ff). These 10 features are crucially important for successfully working together and for the evolution of this approach (Greenleaf et al., 1998).

Laub (2018) highlights that 'leading and following are functions (not positions) and are both critical to the leadership process' (pos. 1377) as well as 'both leaders and followers work enhance this mixture by facilitating an understanding and appreciation of their shared purpose' (pos. 1383). Laub (2018) streamlines the 10 features of servant leaders to a model with six disciplines and the four principles of 'Listen, Don't Talk' (pos. 5864), 'Ask Employees, What Do You Need?' (pos. 5872), 'Set Aside Time Every Week for Foresight and Planning' (pos. 5882), and 'Do Those Served Grow as Persons?' (pos. 5889). Laub (2018) includes the six disciplines in the instrument *Organizational Leadership Assessment* (OLA), that can be used to measure leadership. Giambatista et al. (2020) uses OLA as instrument in their study and published the findings: 'servant leadership may have the potential to rise in prominence as one of the most indispensable and value-adding leadership ideas of our time' (p. 12), and 'servant leadership is ready for the "big time" as a leadership theory' (p. 12).

According to Laub (2018), 'Leading others can be quite meaningful. Serving others is better yet' (pos. 138) and 'servant leadership is best understood not as a competing theory of leadership but as an underlying mindset of leadership theory and practice' (pos. 2700). But servant leadership is not based on being

friendly and making friends of others. Barter (2018) argues that 'servant leadership is a mindset, and transformation from one mindset to another only occurs through consistent communication that creates an understanding about the value that mindset brings' (pos. 204).

Van Dierendonck & Nuijten (2011) analysed that Servant Leadership Survey (SLS) 'is a valid and reliable instrument to measure servant leadership' (p. 263), 'empowerment, accountability, and forgiveness appear to be essential factors for effective leadership' (p. 264), and, in addition, 'explicitly giving followers responsibility is an essential element of effective and positive leadership' (p. 264). Further they are analysed that 'courage is a crucial characteristic of servant leaders' (p. 264), and 'leaders who are able to forgive, can be more open, objective and supportive of all their followers. It is not an excuse for continuous mistakes and flaws' (Van Dierendonck & Nuijten, 2011, p. 265). That encouraged Eva et al. (2019) published empirical study, and their definition of servant leadership: '(1) other-oriented approach to leadership (2) manifested through one-on-one prioritizing of follower individual needs and interests, (3) and outward reorienting of their concern for self towards concern for others within the organization and the larger community' (p. 114). There is much criticism of servant leadership, but according to Eva et al. (2019) 'have arisen from poor construct clarity, poor measurement, and poor design' (p. 129). Qiu et al. (2020) has analysed that 'employees' service quality was higher when both perceived level of servant leadership and self-efficacy were higher' (p. 9). Further 'servant leaders empower and develop followers, which would enhance the feelings of self-efficacy among organizational members' (Qiu et al., 2020, p. 9), and 'also act as a role model to increase employees' vicarious experience, resulting in followers who hold the belief that they can possess the capabilities to successfully perform the work activities' (Qiu et al., 2020, p. 9).

Eva et al. (2019) 'demonstrated that the servant leadership field has made progress in the last 20 years […] and continue to offer significant insights to the leadership field over the next 20 years' (Eva et al., 2019, p. 129). Several studies are examining the servant leadership approach in conjunction with i.e., culture aspects (Giambatista et al., 2020; Liden et al., 2014; Mittal et al., 2012), organisational commitment (Cerit, 2010; Laub, 2000; Sendjaya & Sarros, 2002), organizational citizenship behaviour (Amah, 2018; Ehrhart, 2004; Graham, 1995; Kwak & Kim, 2015; Newman et al., 2017; Walumbwa et al., 2010), or difference

of transformational and servant leadership (Parolini et al., 2009; Smith et al., 2004; Stone et al., 2004; Van Dierendonck et al., 2014).

A servant leader should 'use verbal persuasions to convince employees they can possess capabilities through learning to complete difficult work' (Qiu et al., 2020, p. 9), which encourages cooperation and mobilisation of followers. Qiu et al. (2020) sees as the most important characteristic that 'servant leaders excel in healing employees when employees have various emotional problems such anxiety, stress, and fear' (p. 9) in order to strengthen the culture of cooperation in a project and thus create a pleasant climate for sharing knowledge.

## 2.4 Comparison and combination of techniques

### 2.4.1 The basic confusion regarding mindsets

The terms leadership and management are not clear with their objectives and use because some management courses 'still present leadership as one of the four aspects of management' (Laub, 2018, pos. 954). The aspects are 'planning, organising, commanding, coordinating and controlling', according to Robbins & Coulter (2002 as cited in Laub, 2018, pos. 954). Leadership replaces the term 'commanding' – this helps students at the beginning but does not underline the distinction between the different approaches (Laub, 2018).

An executive has an exemplary function and convinces other people of their own visions, objectives, values, or procedures. The executive is often used interchangeably with the leader or the manager, but both are members of management – albeit with different orientations and 'leading and managing promote different functions that people choose to do or not to do' (Laub, 2018, pos. 1436). In short, 'the manager does things right; the leader does the right thing' (Bennis, 2009, pos. 1074), 'leaders are thought to *do the right things*, whereas managers are thought to *do things right*' (Hughes et al., 2014, p. 8) or 'people need to be led and work needs to be managed' (Canty, 2015, chapter 11).

Project work is the work with people, and a project needs the touch of people management, which requires leading skills. It is not surprising that management includes leadership – for instance, the PMP® describes a 'combination of 1) technical project management skills; 2) leadership skills; and 3) strategic and business management skills' (Sanghera, 2018, chapter 2). Laub (2018) suggests 'leadership is not a subset of management. It is a separate

process altogether with different functions and outcomes' (pos. 1402), and 'leading and managing are both essential processes in any organisation and one is not more valuable than the other' (pos. 1423). Drucker (2010) argues management 'is no substitute for leadership. But management cannot create leaders. It can only create the conditions under which potential leadership qualities become effective; or it can stifle potential leadership' (pos. 159).

### 2.4.2 Techniques to solve problems

Problem-solving and elimination of barriers is a key skill and thus the manager / leader should be 'honest, direct, straightforward, and knowledgeable in all dealings with people and with the project' (Englund & Bucero, 2019, chapter 2). They 'knows how to work hard and have fun, and this approach is contagious' (Englund & Bucero, 2019, chapter 2), and a positive attitude is always necessary irrespective of whatever happens. A manager / leader should formulate clear expectations (spoken and written) and obtain the assent of each project member – this should work as a preventive measure for any problems that might arise. They should be work in a thoughtful, considerate and respectful manner as well as give the project members time to process any theme / feedback (Englund & Bucero, 2019; Lyngso, 2017).

A different approach and simultaneously a motivating factor (for each team member) is to share and rotate leadership 'to the person with the key knowledge, skills, and abilities for the particular issues facing the team at any given moment' (Moe et al., 2009, p. 116). However, the management should remain under the control of the manager, and for the 'team members should be allowed to lead when they possess the knowledge that needs to be shared or utilized during different phases of the project' (Moe et al., 2009, p. 116). This opens up the possibility of perceiving different perspectives and thus adapting one's own behaviour and creating a culture that supports working together.

Moe et al. (2009) analyses that the team radar is useful to 'pointed out the most critical areas to improve' (p. 120) over the 'five dimensions: shared leadership, team orientation, redundancy, learning and autonomy' (p. 116) – this can be a contribution to avoiding or minimising problematic situation. Another powerful technique is the 360-degree assessment to manage the multi-rater feedback, to collect various sources and evaluate the performance perspectives of one's own behaviour at work and the workplace (Schwetschenau et al., 2016).

Pieterse et al. (2019) defines that 'shared leadership occurs when there is equal and mutual influence among team members and leadership behaviours are performed by multiple members of the team' (p. 10) and point out that 'shared leadership and self-management are distinct constructs, as self-management may be conducive but not sufficient for shared leadership to occur' (p. 10). Shared leadership is only effective in teams with a common objective (Pieterse et al., 2019).

### 2.4.3 Techniques to handle communication

The manager is responsible for handling and dissolving conflicts. But the leader is closer to the team members and should be able to identify conflicts; they should be working closely with the manager to dissolve conflict situations. Each situation should be analysed to reveal the source of the conflict. All the resources and their needs should be considered in relation to 'personal beliefs, principles, historical precedence, or identity' (Englund & Bucero, 2019, chapter 5). The leader should support the team members to identify that they should find their own solutions for the conflict or identify a proposed solution. The manager should be involved in a recurring problem or a proposed solution. Various situations are the spring of conflicts, resulting in 'disputes, competition, sabotage, inefficiency or low productivity, low morale, poor communication, strained relationships' (Englund & Bucero, 2019, chapter 5). Otherwise, no conflicts can be based on 'disinterest, lowered motivation, and indifference' (Englund & Bucero, 2019, chapter 5). Conflict situations show a certain interest and should be solved in cooperation with the manager, leader and influenced persons (Englund & Bucero, 2019).

Canty (2015) offers an overview of the effective communication tools with the ranking: paper (very low effect), audio tapes, emails, and video tapes as options for documentation; continue with phone conversations, video conversations, face-to-face conversations; and finally, face-to-face talks at the whiteboard as options for the modelling (very high effect). The visualisation is target-oriented as a table or overview offers a complete outline and is a traceability system for the project. Furman (2014) argues: 'One of the secrets of success in communications is choosing the best medium for your message' (chapter 11). He offers a study result that project managers should be 'viewed communications as an on-going deliverable of the project' (chapter 11), but this viewpoint (two-way communication) could be lost, and misunderstandings

could increase with the one-way communication such as over emails, Twitter, or instant messengers (see the investigation of Ch et al. (2020) with WhatsApp and Chapter 2.3.3.1). The manager and leader must find a way to communicate in the increasing globalisation working area. A *communication culture* of blaming can be avoided by focusing on facts and future improvements; the basic principal should be to indulge in direct and open communication with a positive attitude (Canty, 2015; Furman, 2014; Sanghera, 2018).

*Effective meetings* can be set up via objectives, rules, time, and assistance. This requires clear, understandable, and complete information. The effectiveness is influence of the choice of the media/ tool, the style of writing, spoken words and gestures, techniques to manage a meeting (i.e., agenda, preparing, time-boxing), techniques of the presentation and facilitation, and listening techniques like active, effective, or empathic listening (Canty, 2015; Furman, 2014; Sanghera, 2018).

The communication style determines how information is received, as Ugboro's & Obeng's (2000) empirical study confirms with the finding 'employees' involvement or participation [...] is facilitated by employee satisfaction with communication at lower organizational levels, availability of job requirement information, enhanced promotion, and development opportunities, and availability of information about the organization's values, vision, and strategies' (p. 263). They are analysed that a pleasant working environment is required because otherwise team members cannot communicate friendliness during interactions with others and thus the common work is disturbed (Ugboro & Obeng, 2000).

### 2.4.4 Techniques to work in a project

Working management is important for managers and leaders to know what quality is acceptable – this requires a standard quality – and to define the culture for the project, because 'positive […] culture is suitable to stimulate relevant employee actions that contribute significantly to corporate success' (Lange & Hernandez-Bark, 2020, p. 56). To reach this approach, the following techniques can be used: *affinity diagram* (ranking facts and ideas), *flowchart* (visualising the working steps and tasks, and their relations), *information requirements study* (combining the project architecture standards with the stakeholder requirements in conjunction with the WBS), *object lifecycle analysis* (focusing on

the definitions and documentations for the implementation and development procedures), *object-oriented functional design* (concentrating on a consistent design of the system architecture and the adaptability to the business conditions), *project quality programme or process quality assurance* (an action plan for quality), *system management* (ensuring the necessary functionalities), *technical design* (usability of the out-of-the-box integration of technologies to the solution elements), or *tests* (testing on each level the acceptance) (Lyngso, 2017; Milosevic, 2003).

It is the responsibility of managers and leaders to inculcate respect (individual, team, organisation), a sharp sense of responsibility and commitment, and empathy (to listen and understand stakeholders). They should offer an open approach (alternative approaches, new capabilities, possible improvements), positive influence, and self-confidence as well as build trust among subordinates (into organisation and others); they should also motivate subordinates to participate (solution-oriented and permanent information to the stakeholders), and orient them to the team, customer, and business. There should be respect for the three P's (passion, persistence, patience), and there should be encouragement for creativity and innovation (Englund & Bucero, 2019).

*Empathy* should be based on the human factor as well as on businesses, processes, and procedures, all of which are not negligible for a manager or leader today. Traditionally, empathy is not needed from manager, but today the manager must see, perceive, and respect the team members as humans with emotions, and not only as a resource, number, or thing (Chapter 2.3.3). Emotional intelligence is equally important for managers and leaders (Englund & Bucero, 2019; Furman, 2014).

A manager or leader should be able to manage their own *emotions*, *time*, *priorities*, *energy* and *thinking*. They should be able to control emotion in each situation for a harmonic atmosphere. In this respect, time management refers to time-box meetings and the working hours of others. Since most people are employees with a contractual agreement of daily working hours, they must follow labour laws. It must be remembered that they too are humans with personal needs besides their work. Priority should be given to finishing first the task with the most impact; this requires specific prioritisation for clear and structured work

such as delegating tasks. This supports the management of one's own and others energy and has the power to realise important things. Proper time management helps people not to waste time with irrelevant activities. The focus should on important business things, with that being the main thinking process. A manager / leader should be able to delegate activities to others – the time to control all and everything is over. Delegation is a sign of putting faith in others and helps involve others to all processes, procedures, and decisions (Englund & Bucero, 2019).

*Self-organising* inside the teams can be related to self-management from the emotional leadership key competencies. This refers to a proactive approach and is based on a complementary and mutually supportive work inside the team. If any weakness is identified through the team, then the team tries to handle these such as via pair-programming to strengthen the knowledge of code programming and quality. The manager / leader must respect and support the self-organising inside the team without which it would be running into failures. A failure is a learning process and is necessary for continued improvement that supports to find a solution, increases the morale, and motivation inside the team. On the other hand, demonstrating trust in the team, the manager / leader must support if the team needs any help to close knowledge or resource gaps (Furman, 2014). Lange & Hernandez-Bark (2020) confirms with their empirical study that 'supports transparency and one of error tolerance would be very beneficial to establish [..] positive employee attitudes and behaviors' (p. 58). Self-organising and self-management only work under certain conditions, which have to be set by the manager with a coordinated framework of task objectives and strategies for the entire project, and supported by the leader (Lange & Hernandez-Bark, 2020; Pieterse et al., 2019). This includes specifications of the structures with inter alia the roles and the responsibilities of each role in the project, but 'only 26% organizations have well defined roles and responsibilities assigned to their team members' (Uikey & Suman, 2012, p. 387). The structure can be differentiating into 'structural distance can be defined as physical structure (i.e., physical distance between leader and subordinate), organizational structure (e.g., hierarchical level, span of control), and supervision structure (i.e., frequency of leader-subordinate interaction)' (Lange & Hernandez-Bark, 2020, p. 49). 'Self-management may be more damaging than helpful' (Lange & Hernandez-Bark, 2020, p. 8) without a framework.

A manager needs *charisma* to manage and work with people. Traditionally, charisma is a leadership theme, but it has also become relevant for a manager these days. It is an example of the influence of leadership techniques through management techniques. Today, this is a highly explosive theme, and the borders have blurred between managers and leaders (Englund & Bucero, 2019).

All the used techniques should adopt the *SMART approach* (Specific, Measurable, Achievable, Realistic, Time bound) to affect the teamwork with a positive attitude (Beck et al., 2001; Lyngso, 2017; Pete, 2017).

### 2.4.5 Techniques to collaborate with others

Essential is a collaborative team work, because Uikey & Suman (2012) analyses that the customer is only available 13% of the project time and in 6% of this time is the customer able to make his own decisions. The study makes it clear that 40% of cases are not handled with a collaborative working style. Only 32% of the managers confirm that agile methods are useful to work flexibly and to meet the constantly changing customer requirements (Uikey & Suman, 2012). Canty (2015) combines the management technique of the *four-stage model* for team building with situational or adaptive leadership stages, and assigns supporting to forming, delegating to storming, directing to norming, and coaching to performing. That should support the initiative 'to lead others based on certain conditions and team characteristics' (Canty, 2015, chapter 11).

The collaborative team work is supported with a common documentation style over the entire project. Uikey & Suman (2012) point out that 'documentation constitutes the collective knowledge of the organization, facilitating knowledge transfer and historical information and assisting in the product evolution and maintenance' (p. 389). 68% make it clear that documentation is require for the maintenance and operation of the product. Documentation is a useful technique that enables new team members to understand the project and supports an easy introduction to project-specific topics (Uikey & Suman, 2012). Uikey & Suman (2012) analyses that project managers (32%) find the agile documentation sufficient, as the team members work on the features together, but in only 25% of the cases will be document future references in retrospective meetings at the end of the sprint. Canty (2015) argues that documentation is 'concise and simple […] clear, essential, and immediate' (Canty, 2015, chapter 6), and each time target-orientated by an agile project approach. Only short documents should be

created with less words and use of maps for more detailed information. A best practice is to build one-page documents, and only create any documentation requested by the stakeholder with a defined value. A quality work principle is that the definition of a decent location is important to save the documentation, and displays important information, for example, via a website or whiteboard (Canty, 2015).

Ideas can be collected and managed via a *corkboard* with sticky notes because it is an interactive, fast, flexible, and time-saving technique, and all necessary stakeholders can be easily involved without large instructions. This technique can be combined with a dot voting to *prioritise* the ideas. The participants get one or two dots and put the dots on the notes with the highest influence in keeping with the prioritisation technique via monopoly money, 100-point model, or MoSCoW prioritisation scheme. After the prioritisation, begin the discussion about the notes. That technique can be used for different purposes as well as the corkboard can replace with a technical solution, such as Mural (Canty, 2015; Furman, 2014).

The manager can support the collaboration of a team with agile games – for instance, start your day, product box, or me and my shadow. The team communication can be strengthened via visualisation techniques i.e., statistics of burn-down / burn-up charts, defect data, product features, retrospective data, risk charts, task assignments, task board, team velocity, or work in progress (WIP). To prevent any misunderstanding and miscommunication with stakeholders, techniques can be used in combination with tools for the visualisation of modelling techniques in relation with whiteboards, use cases, data models, or screen mock-ups; personas to characterise the stakeholder; wireframe in relation with Microsoft PowerPoint and Visio for technical visualisations; or wireframe tools to visualise product mock-ups, product prototypes, or team plans. Most lifecycle management applications offer the visualisation of these out-of-box via integrated functions (Canty, 2015).

It is important to support the connection of the term's *fun* and *work* to the daily business because 'humor in the workplace can improve the efficiency and effectiveness of a project team […] Humor is a great asset to effective communication' (Englund & Bucero, 2019, chapter 7). Humour can be used to break the ice at the start of the meeting or critical situations. It can help to change

your own style from a task-oriented to relationship-oriented style while respecting the various diversity themes like culture or the different approaches of humour (Canty, 2015; Englund & Bucero, 2019; Graham, 2006).

Furman (2014) argues that organised team-building activities increase the cooperation and morale of team members. Such activities include a lunch or dinner, 'group painting, dragon canoe racing, writing an article or white paper as team, study groups, or corporate-sponsored charity events' (chapter 12).

The manager is responsible for selecting adequate electronically and collaboration technologies as well as for preparing feedback forms, especially for working with virtual teams, but the leader should support the manager (Englund & Bucero, 2019).

### 2.4.6 Techniques to skill management

A project requires a process for developing skills that should be supported by the manager and leader to ensure a daily continuous further development and to encourage a self-improvement of each team member. Because every project offers a learning process in every phase and with every activity. The main target is to learn from others, focus on facts, analyse the facts, and deduce improvements from the facts – these count for managers, leaders, team members, and any stakeholder. All these increase the motivation and improve joint working in the entire project (Englund & Bucero, 2019).

It is important to offer an incentive for further development. Uikey & Suman (2012) analyses that there was a lack of technical skills, knowledge and experience in agile projects by team members, leaders, and managers as well as that agile software developers were tight, but with their study, they showed that skills and the contribution of prior experiences are essential to develop high-quality products (Uikey & Suman, 2012).

A manager or leader does not underestimate the influence of other people, and the interaction while working with individual people. A manager / leader should support the development process of each team member; this requires them to know the team members and their needs. Networking is the best technique to become more familiar with the team members, listen to them, assist problem-solving, support the work of other people, and to generate positive feelings via feedback by focusing on strengths in the way of building trust. Additional techniques are involving the team members to decisions over project

goals and sharing target-oriented, continuous communication, delegating activities through team members, and supporting them in conflict situations. Decision making is essential to resolve conflict situations and to motivate each project member, but only 25% of the projects are able to take swift decisions (Uikey & Suman, 2012). Managers have the final say: They make decisions for the entire project and must control this, while a leader should be supporting the managers and make decisions in the line with the manager's decision for the responsible team. One key technique is to implement interpersonal skills in daily work (Englund & Bucero, 2019). Strong interpersonal communication skills are essential to take decisions, communicate and negotiate directly with the client. However, Uikey & Suman (2012) has analysed that 12% do not have these skills. PMI (2020) published that the most important team skills go far beyond the usual technical area and includes 'collaborative leadership, empathy for the voice of the customer, risk management, innovative mindset, and methodology or framework governance' (chapter: The Must-Haves).

### 2.4.7 Techniques to knowledge management

Alsaqaf et al. (2019) analysed in their empirical study that challenges in knowledge management can arise when relying on the knowledge of other teams, knowledge is transferring from one to another team member, restricted knowledge access to certain information, too minimalistic documentation, loss of the overall picture occurs, or making decisions on the basis of limited knowledge. Experienced members of a team 'build a solid theoretical and practical knowledge that enable [...] them with making right decisions' (Alsaqaf et al., 2019, p. 50), but inexperienced team members 'do not have that tacit knowledge' (Alsaqaf et al., 2019, p. 50), they have only the knowledge from their apprenticeship. In this context, self-management – which is associated with a greater sense of responsibility and ownership – can be used to motivate team members to contribute and share information (Pieterse et al., 2019). The manner of cooperation and knowledge transfer is changing, which is increasingly influenced by digital factors.

MIT Sloan Management Review (2019) has published four hurdles about the handling of different techniques for digital leaders.

1) If a vision or purpose is published, then the possibility of performing the vision should be advocated. A deep technical background is not required,

but the (exceedingly digital) environment must be understood for the development of that vision or a purpose.

2) Experiment is a powerful technique to try out ideas and trends as well as test potential new solutions. Since nobody knows the further development of such trends and their effects, experiments with new solutions are helpful to test whether the solution is suitable or not and they also prevent any communication misunderstanding.
3) Thinking, especially other trains of thought should be supported because that can offer possible opportunities.
4) Collaboration hurdles are referred to as 'culture, mindset, and silos' because 'the digital world both demands and enables collaboration beyond simple intraorganizational communication'.

(MIT Sloan Management Review, 2019, chapter: Common traits of the best digital leader)

MIT Sloan Management Review (2019) published the result that a lack of talented digital leaders for an effective leadership exists in the current market. It has pointed out that the focus is on new business environments in the digital climate and technology is not in the focus. Personal difficulty is orientated on changes and transformations, but this is a recurring human attitude when it comes to learning new things. The research has identified that leaders need to change their skills to lead others into the unknown future and therefore it is interesting for managers and leaders because tasks are constantly changing, and because they need to work with people using new techniques rather than via control and command (MIT Sloan Management Review, 2019).

A procedure is to define the handling of knowledge that supports a continuous development process and prevents that 'people reinvent the wheel again and again' (Englund & Bucero, 2019, chapter 6). This includes how and what is to be documented, where is the common source, and who is responsible for a review (Englund & Bucero, 2019). Rau et al. (2019) examines collaborative learning methods in their empirical study and analysed that 'only 18% […] stated that collaborative knowledge acquisition via the Wiki has a positive effect on their motivation to learn' (p. 282) and that 'over 78% […] felt "highly motivated" to "motivated" to complete the subsequent knowledge unit when receiving a digital learning badge' (p. 281). Further that 'social and collaborative forms of learning are regarded by students as significantly less motivational' (p. 282), and the 'lowest learning motivation […] is achieved with self-directed forms of learning, such as explanatory videos or learning cards' (p. 282).

Another important aspect is the learning. MIT Sloan Management Review (2019) argues that 'many managers think they can create better products just by improving the development process or adding new tools. But it's skilled people, not processes, that create great products' (chapter: Why learning is central to sustained innovation). This includes the activities to activate your own reward system (see Chapter 2.3.3), integrate the learning in your own everyday business, design and redevelop standards for the procedures (i.e., use problem-solving standards to reduce gaps), work with the leader, and focus 'more on instructing and improving' in terms of assignment of work and decision-making (MIT Sloan Management Review, 2019).

The manager should create and reflect each day as a *legacy vision* to capture the daily activities and results as well as show to the future. This is because 'all managers should think about the legacy they wish to leave' (Haneberg, 2019, chapter 10). The technique is to reflect – for a maximum of five minutes each morning and evening. The legacy vision should include management aspects with the points 'results and contribution to the business; team health and development; peer partnership and collaboration; creativity and innovation; processes and practices; workplace culture; systems and structure; change and agility' (Haneberg, 2019, chapter 10, Worksheet 10-1). That vision should be captured in a table because 'visualization is a powerful tool that will seep into your daily choices, actions, and conversations' (Haneberg, 2019, chapter 10). The legacy vision can help to improve one's own line of actions and to remember at period the following: The manager has the exemplary function for the project and is the connection between the customer (if applicable), organisation, and the project. The leader can customise this technique and use this for their own targets (Haneberg, 2019).

Alsaqaf et al. (2019) found out that 'the success of agile projects relies on the tacit knowledge embedded in the teams' (p. 44), and 'agile development is an ongoing learning process that involves tacit knowledge' (p. 50), but a lack of knowledge can lead to wrong decisions and possibly to the failure of a project. Traditional projects have 'usually predefined procedures for knowledge sharing and communication' (Alsaqaf et al., 2019, p. 51), but this is not 'the case in agile teams that rely on tacit knowledge and face-to-face communication' (Alsaqaf et al., 2019, p. 51).

## 2.5 Summary of chapter 2

### 2.5.1 Introductory remarks

The introduction points out that it is important to define the differences between leadership and management. Besides, leaders and managers need suitable techniques to reach the project goals together with the project team. The leader emphasises the team member while the manager emphasises budget, strategic, structure, systems, planning, and additionally needs a view of the entire business environment and global development as well as trends inside and outside their own functional areas. Management and leadership topics have become more and more complex, and the necessary skills are changing because of rapidly developing technologies and the constantly growing relationships between government, suppliers, customers, and employees. The employee is viewed nowadays as a highly skilled professional with human and social needs.

The literature review produces the background knowledge of management, leadership, their techniques, and the combination thereof.

### 2.5.2 Management and manager

Today's view is changing management, managers, and the business working culture in conjunction with global relationships. Management work is universal, but it is influenced by national characteristics, traditions and history. A manager should be defining the structure and principles to make strategic decisions; they should be able to draw up a vision for a common objective. A manager should be promoting high standards for the execution that supports the morale and integrity of the subordinates. The manager should understand the internal organisation, the team (work) structure, the defined and assigned roles, and individual jobs in the project (Drucker, 2012). A management process needs the selection of relevant techniques in conjunction with the project and business environment (see Figure 1, p. 3). The manager is mainly responsible for defining the project environment to support the collaboration. The results of the empirical studies emphasise why management techniques should be used to affect the teamwork and for this purpose were use: Garousi et al. (2019), Uikey & Suman (2012), and White & Fortune (2002).

### 2.5.3 Leadership and leader

Leadership concentrates on the leading procedures, and the leader is responsible to transpose the procedures and work with the team members as human beings. The leader needs a selection of relevant techniques to lead others – this should support the leader in working with any project member. Therefore, the techniques concentrate only on new leadership, neuroleadership, and servant leadership.

New leadership concentrates on the emotional side by stressing the competencies empathy, motivation, self-reflection, self-regulation, and social skills. These would be deployed via a mix of several leadership styles.

Neuroleadership is defined with bond, orientation and control, self-esteem, self-protection, pleasure, and prevention of reluctance – the leader can use the SCARF model for an adequate response.

Greenleaf et al. (1998) defined 10 features of servant leadership relevant, this are used as the basic characteristics of leadership. For the measurement can be use e.g., OLA or SLA.

The results of the empirical studies emphasise why leadership techniques should be used to affect the teamwork. The following empirical studies are used for the mindset (chapter 2.3.1): Lange & Hernandez-Bark (2020); for the new leadership approach (chapter 2.3.3.1): Ch et al. (2020), Groves & LaRocca (2011), Herold et al. (2008), Hoch et al. (2018), Li et al. (2016), Liangding et al. (2007), Mahdi et al. (2014), Nemanich & Keller (2007), Oluwafemi et al. (2019), Pasricha et al. (2018), Pratelli (2019), Rogiest et al. (2018), Sosik (2005), and Xie et al. (2018); for the neuroleadership approach (chapter 2.3.3.2): Lee et al. (2012) and Lieske (2020); and for the servant leader approach (chapter 2.3.3.3): Amah (2018), Cerit (2010), Eva et al. (2019), Farling et al. (1999), Liden et al. (2014), Qiu et al. (2020), and van Dierendonck & Nuijten (2011).

### 2.5.4 Comparison and combination of techniques

This chapter demonstrates the various techniques that can be used for management and leadership to affect the teamwork. The field of application in a project is examined in Chapter 5 and based on the collected, analysed and described requirements from Chapter 4. Each technique should be used to improve the common appearance. Managers and leaders can control the processes, but not all of them. This implies the requirement to standardise

techniques for common collaboration in a project. The results of the empirical studies emphasise in what manner management is associated with leadership for the teamwork and for this purpose were use: Alsaqaf et al. (2019), Lange & Hernandez-Bark (2020), Moe et al. (2009), Rau et al. (2019), Ugboro & Obeng (2000), Uikey & Suman (2012).

These chapters (2.2 to 2.4) provide an understanding of the techniques and possible aspects influencing teamwork. The literature research shows the gap, that an investigation is missing about the combination of management techniques and leadership techniques to enhance teamwork in a project – only individual procedures are examined. This gap will be closing with this study and the plan to close the gap is offers in the Chapter 3. Table 1 provides an overview of the literature with the highest impact to explore the topics of leadership, management, and their combination. A more detailed presentation is given in Annex 6 with additional sources on agile, the practical implications (reports), and the influences of a constantly changing world (innovations) – that view exclude the used empirical studies (see Table 4). The theoretical view insists on empirical studies that refer to results in practice. These studies were employs to indicate entry points why management and leadership techniques should be used to influence teamwork, and in what way management could be associated with leadership to enhance joint working (Annex 5, Table 4).

**Table 1 Overview of literature used in this thesis**

| **Literature** | **Leader-ship** | **Manage-ment** | **Management / leadership** |
|---|---|---|---|
| Canty (2015) | | ● | |
| Drucker (2010) / (2012) | | ● | |
| Englund & Bucero (2019) | | | ● |
| Furman (2014) | | ● | |
| Greenleaf et al. (1998) / Greenleaf (2012a) / (2012b) | ● | | |
| Laub (2018) / (2000) | | | ● |
| Milosevic (2003) | | | ● |
| Peters (2015) | ● | | |
| Rock (2010a) / Rock (2010b) / Rock & Schwartz (2006) | ● | | |

# 3 Chapter 3: Research Methodology

## 3.1 Introductory remarks

The research methodology structures the research and includes the research philosophy, research approach, research design, and research strategy; it describes the research process to achieve the research objectives (Crotty, 2015). The research objectives are to examine techniques for management and leadership that affect teamwork, and in what manner management is associate with leadership for collaboration in a project.

The research philosophy is a critical analysis of the ontology (the researcher's reality as objectivist), epistemology (the researcher's knowledge as critical realist), and axiology (the personal values). This is linked to a theoretical perspective, which defines as research approach. Based on the research philosophy and research approach builds the research method consists of research design and strategy. The research design collects the data for this study and is proceeds via a semi-structured interview. The gathered data evaluates through an analysis. The data analysis occurs via a coding to generate codes and themes (patterns) as coding method, and this is the research strategy.

This chapter aims to generates the understanding for the course of actions to explore the research objectives. For this purpose, the philosophy of the researcher and the research approach explains and links. That is the basis for the research method and the approach for the research methodology, so that in chapter 4 the data can collect and evaluates in a targeted manner, and thus the research objectives enable to be examining.

Finally, a summary of Chapter 3 will be offered.

## 3.2 Research philosophy

Research philosophy is the spreading structure for the research design aspect and helps the researcher to gather evidence for academic research in keeping with their intentions. According to Dudovskiy (2018), a research philosophy is a 'belief about the ways in which data about a phenomenon should be collected, analysed and used' (p. 33). It includes ontology, epistemology, and axiology.

Ontology is the one's own view of reality with the focus on objectivism or subjectivism. Epistemology is the set of acceptable knowledge for this research

and reflects the nature of the study from a theoretical perspective. In the research world there exists various epistemology approaches, but this research focuses on critical realism and offers an overview of the opposite approaches' positivism and interpretivism for the line of argumentation. Axiology is focused on the values and intention of this research.

### 3.2.1 Critical analysis of the researcher's reality (ontology)

Hudson & Ozanne (1988) defined ontology with the nature of reality. According to Gray (2014), ontology 'is the study of being, that is, the nature of existence and what constitutes reality […] what is' (p. 21) the reality. Simply put, ontology is how the researcher views the world – this is differentiated into subjectivism and objectivism.

Subjective research is aligned to achieve direct social changes, or changes in individual and collective values. It considered influences arising from personal feelings; asked the how and why questions; or examined direct changes relating to gender, ethical, or political topics (Gray, 2014; Williams, 2016). Gray (2014) said that 'social science often deals with the actions of the individual' (p. 23). Williams (2016) specified that 'social science is concerned with discovering and explaining different kinds of connections in the social world. These connections indicate relationships, some would say causal ones' (pos. 544).

The arguments are objective, based on facts, and focused on universal principles and qualifications in this research. This focus is on natural sciences, and the approach is to look for 'consistencies in the data in order to deduce "laws"' (Gray, 2014, p. 23). Williams (2016) argued that the world is a liberty of 'moral and cultural values' (pos. 2997). These criteria, as well as exclusions of one's own feelings and any values, are important for objectivism.

PMI (2017) described that business activities organised via a project 'to create value and benefits in organisations' (pos. 1140), while the strategic planning 'consider varied values' (Almubarak, 2014, pos. 64) for business activities. Drucker (2012) explicitly defined that management is not a 'value-free science' (p. 372). Kraemer (2011) developed a value-based leadership by focusing on the identification of sentimental values. Barter (2018) argued that the 'servant leadership […] creates an understanding about the value' (pos. 204). Laub (2018) included the facts: 'Trusting and believing in people […] serving other's needs […] receptive, non-judgmental listening' (Laub, 2018, pos. 1611).

It can be concluded from the argumentation presented above that the reality tends on a subjectivist ontology with an investigation on influences of individual and collective values and personal feelings. Any influence on social changes can indirectly influence 'individual and collective values' (Williams, 2016, pos. 3002) e.g., trust, belief, serve, non-judgmental listening. This can be done through the use of management or leadership techniques and represented a humanistic position that a manager or leader can take to affect the teamwork. Since management and leadership history (see 1.3 and 2) shows that each project members is a people with human feelings and needs of real problems, it is hard work for every individual to change the work procedures, culture and techniques. In this study is the truth limited by a project (with project methodology, processes, procedures and techniques) as well as by the skills, knowledge and experiences of the project members. From the subjectivism perspective are the questions "How can influence joint working in a project?" and "Why is collaboration in a project essential for the work of a manager and leader?".

This research has no influence on personal feelings (the researcher's point of view) and is aimed at an objective view. This research explores and refers to facts (management and leadership techniques), these techniques require qualifications (knowledge, skills and experiences about the techniques) and these are established as general principles to explore a combination of management and leadership in conjunction with techniques to affect teamwork.

'We can study peoples' subjective views (their values, attitudes and beliefs)
but we must do so objectively'
(Bunge, 1993 as cited in Gray, 2014, p.22).

This is a strong argument for objectivist ontology in conjunction with the research objectives and the researcher's reality. Objectivism characterised an examination of facts (i.e., techniques), qualifications (i.e., knowledge, skills, experiences), and universal principles (i.e. facts and qualification in conjunction with project members) with exclusion of personal feelings. But the subjectivism perspective is to be respected with its influence on the value changes, because this had an effect on the teamwork.

Therefore, the researcher's reality corresponds to objectivism with an exploration of people's subjective view.

### 3.2.2 Critical analysis of epistemology (knowledge)

Easton (2002) explained 'researchers make assumptions about how the world is (ontology) and how we can come to know it (epistemology)' (p.108). Martin (2014) elucidated the origin of the word epistemology by 'pertaining to the study of knowledge; while "epistemic" means pertaining to knowledge' (pos. 108). Dudovskiy (2018) defined that 'epistemology in a business research […] deals with the source of knowledge. Specifically, epistemology is concerned with possibilities, nature, sources and limitations of knowledge in the field of study […] Epistemology focuses on what is known to be true' (p. 36) – 'what kind of knowledge are legitimate and adequate' (Gray, 2014, p. 21). Crotty (2015) argued in the same direction: 'Epistemology […] is a way of understanding and explaining how we know what we know' (pos. 127). Carson et al. (2001) said epistemology (acceptable knowledge for the research) is associated with ontology (researcher's reality). Crotty (2015) connected epistemology with 'the theory of knowledge embedded in the theoretical perspective and thereby in the methodology' (pos. 113).

Epistemology have various characteristics. The most contrary and dominant characteristics are positivism and interpretivism. Positivism is used by researchers with a pure objectivist view of reality to produce empirical evidence as facts pertaining to natural sciences. Gray (2014) defined positivism with the 'assumption that the purpose of theory is application, that the truth can be distinguished from untruth, and that the truth can be determined' (p. 668). Palmer (2007) argued 'that all truths can ultimately be stated in terms of scientific laws' (pos. 1243), and the scientific law referred to natural science – that is the main criteria for positivism. Opposite to positivism, the interpretivism throve on cultural and historical interpretations of the social life-world with a subjectivism view of the reality (Crotty, 2015; Gray, 2014; Saunders et al., 2015).

The 'natural necessity explains the dynamic relations between states, power and natures of things in the world […] and is usually seen as fundamental to a realist theory of causality' (Williams, 2016, pos. 590) – that meant 'there is necessity in the world' (Easton, 2002, p.104). A critical realist argued that it 'is the natural necessity in the social world as much as the physical world' (Williams, 2016, pos. 546), the object is the researcher's world for the study, and the 'objects necessarily have particular powers or ways of acting and particular susceptibilities' (Easton, 2002, p.104). An object can be defined as a unit of

analysis, and is 'the set of objects (individuals, organisations or events) on which the research is focused' (Gray, 2014, p. 691). The object are the techniques for management and leadership of team members in a project for this research. A critical realist delimits necessity in the course of their analysis and 'allows for weaker modulation of causal powers or liabilities' (Williams, 2016, pos. 592), and comprehends 'causal relations as existing as power or tendencies' (Williams, 2016, pos. 3998); these interoperate with others and constitute causes. The causal relationships or liabilities are established by the managers or leaders, and their interaction with each other and with project members.

Critical realism used 'subjectivity in the production of knowledge' (Gray, 2014, p. 26), tended to that 'the world exists independently of our knowledge of it' (Easton, 2002, p.104), and meant that the 'science or the production of any kind of knowledge is a social practice' (Easton, 2002, p.105). The project existed independently of the knowledge about the management and leadership techniques, but how can techniques be used to positively influence teamwork and why is knowledge about the techniques important to promote positive cooperation in a project. Easton (2002) argued that the 'concepts of truth and falsity fail to provide a coherent view of the relationship between knowledge and its object' (p.104). The concept of truth is restricted on the coherent view of a project with methodology, processes, procedures, and techniques. The management techniques are used to manage the project members and get the best out of it, and the leadership techniques are used to get the best out of each team member, of their skills, knowledge and experiences. This 'causal explanation is one that identifies the objects and their mechanisms and the way they combine to cause events' (Easton, 2002, p.105) and these relationships between objects are of central importance for a critical realist (Easton, 2002).

Easton (2002) reasoned that 'social phenomena such as actions, texts, and institutions are concept-dependent' (p.104), and Kempster & Parry (2011) argued that 'critical realism assumes that phenomena exist independent of an individual' (p. 107). Easton's' (2002) argument in relation to the concept-dependent phenomena can be related to management and Kempster's & Parry's (2011) argument in relation to the independent phenomena to leadership. Kempster & Parry (2011) explained that 'leadership is for example a phenomenon that is socially real […] in the sense that if humans did not exist it would not exist' (p. 107), but the critical realist perceives 'phenomena […] at the

level of events and experiences but also at a deeper level that may not be observable' (p. 107) e.g., 'leadership cannot be seen […] only its effects are observed and perhaps felt' (p.107).

This research examines the management and leadership techniques; their historical development was presented in Chapter 1 and examined as a limitation of acceptable techniques in Chapter 2. The research focuses on which techniques have a positive impact on collaboration in a project, and in what ways management and leadership are linked to influence collaboration. The investigation is not only influenced by the described objectivism reality (ontology) and the knowledge (epistemology) as critical realist, but also by the values of the researcher which are described in the following chapter. Reality, knowledge and values influence the way in which data collection is performed and data is examined in analysis.

### 3.2.3 Critical analysis of axiology (values)

The researcher has daily work experience in the consultant business for various projects as a senior consultant in the IBM GBS DevOps Centre of Competence (CoC) Europe. The researcher is specialised in business processes, people and tools and has more than 10 years of experience in process consulting (cross-industry) as well as in designing workshops and team enabling. The researcher work customer-oriented and support the management of the complete (product) lifecycle in agile and traditional projects. In 2016, the researcher worked as a business analyst in a major government project, where she was responsible for analysing technical requirements and coordinating these with the architects. In 2017, the researcher was responsible as Product Owner in an agile government project for the conception of the development topics of a Scrum team, in coordination with other Scrum teams (approx. 5), backlog maintenance, agile meetings (i.e., Refinement, Daily, Planning's) and represented the interface between processing (product use), conception (technical product specifications), and implementation (technical product development) including the design and implementation of Design Thinking Workshops with all affected stakeholders. Since 2018, the researcher has been working in the project management office (PMO) for a large Travel & Transformation Account project. The researcher was account responsible i.e., for the introduction and management of processes, Subject Matter Expert (SME) for the on- and off-boarding tool (BlueRoom), and Focal Point for topics of Data

Security & Privacy (DS&P) and General Data Protection Regulation (GDPR). This work includes the support of multiple projects in day-to-day business to meet project-specific requirements and to provide ongoing support for project members in the agile and hybrid projects as well as to fulfil the requirements of project guidelines and governance laws.

In the past, it was important to manage the activities and communication with tools. In fact, it was a major theme. Technologies are changing rapidly, and what remains is the human, who is working like a hamster in a wheel. A trend is to supply greater flexible project work to apply techniques and ensure better cooperation. The researcher thinks that it is not enough to use only a framework: human needs must be at the centre. Therefore, it is essential to concentrate on finding a combination of techniques for management and leadership. Hence, the researcher's intention is to examine a way to combine techniques and human needs so that they could work together in a project.

The necessity of this research is to ensure techniques for management and leadership to enhance teamwork, which can be used for projects (Annex 3) – an overview of the process model included Annex 2 for Scrum (for scaled agile framework Annex 4), and Annex 1 for waterfall and V-Model®. The outcome present management techniques (Annex 10), leadership techniques (Annex 11) and techniques they can used by managers and leaders (Annex 12), these techniques are affect collaborative work in a project. Management and leadership in terms of projects are explosive topics – these, in conjunction with joint working, constitute a topical theme for each project and organisation in future. A trend is that organisations mostly manage their activities in the form of a project, and this is perceptible in their everyday practice. The trends are offered in Chapter 1: Introduction and Chapter 2: Literature Review as well as the important literature sources are summarised in Annex 5 and Annex 6.

## 3.3 Research approach

Crotty (2015) defined the research approach from the theoretical perspective, with 'the philosophical stance informing the methodology and thus providing a context for the process and grounding it logic and criteria' (pos. 112). The research approach is divided into inductive and deductive aspects. Simply put, the perspective of the researcher is in conjunction with the line of argumentation for this research.

Dudovskiy (2018) said that 'inductive approach contributes to the emergence of new theories and generalizations' (p. 65). Williams (2016) said the inductive approach 'expects things to happen as they have in the past, assuming all others to be equal' (pos. 725). Gray (2014) stressed 'the establishment of facts on which theories or concepts are later built, moving from specifics to generalizations' (p. 684). Williams (2016) pointed out that 'in natural and social science, theories are corroborated by empirical evidence, but this is an inductive process that can never wholly confirm the correctness of a theory' (pos. 1300). Gray (2014) described the inductive approach with the progression of a theory 'or inferences from observed or empirical reality' (p. 684).

The opposite approach is deductive. Gray (2014) described deductive logic in general; by 'drawing logical conclusions through the process of reasoning, working from the general to the specific' (p. 682), and specified it as an 'experimental approach that uses a priori questions […] that the research will test' (p. 682). Dudovskiy (2018) argued that the 'deductive approach tests the validity of assumptions (or theories […])' (p. 65). Williams (2016) explained:

> Deductive logic is the basis of reasoning and is a foundation of science. It is an abstract concept, which requires symmetry between premises and a conclusion in an argument. The search for truth is an attempt to provide the content for that argument, but truth unlike logic is an elusive concept (pos. 2594).

Williams (2016) sophisticated the approaches with an 'inductive statement about the way the world is (all Xs are Ys) with the deductive one […] at least one X is not a Y' (pos. 1328). Gray (2014) said that 'induction moves from fragmentary details to a connected view of a situation' (p. 16), while 'deduction begins with a universal view of a situation and works back to the particulars' (p. 16). These processed 'are not mutually exclusive' (Gray, 2014, p. 18).

The focus is on management and leadership techniques with the manager and leader interactions of each other and with project members to influence positively the collaborative work in a project. It should be respected that values are changing in the world. The reality and acceptable knowledge (for this research) are the techniques (the facts) with their knowledge, skills and experience (the qualifications) and their conjunction with the project members (the universal principles). This is the basis for the realisation and accomplishment of a project – the open system. It is crucial to link a project with project methodology, processes, procedures and techniques, and the

management and leadership techniques that are used to get the best out of project and team for a greater level of collaboration. The reasoning in the research methodology makes it clear that was started with a general, universal view of a situation and this study ends with a specific view on management and leadership to improve teamwork. This indicates a deductive research approach.

The way to collect and analyse the data is describe in the following chapter.

## 3.4 Research method

The research method includes the research design and research strategy, this is the overall research plan to collect and analyse data to explore the research objectives. The research design is a strategic plan with a general structure and a defined method to collect data in conjunction with the research strategy, the defined method to analyse the collected data. A research objective is 'a specific formulation of the issues that a research project will address, often describing general relationship between and among variables that are to be tested' (Gray, 2014, p. 690). A research method distinguished between quantitative and qualitative approaches for research design and strategy; a mixed approach is also possible. The quantitative method focuses on cause and effect with the typical use of systematic and mathematical methods for data collection (i.e., survey or experiment) and/ or data analysis (i.e., univariate, bivariate, or multivariate analytical methods) with an inductive research approach. Disadvantages are that people can be forced into categories and this method cannot penetrate much deeper into subjects and issues. The qualitative method focuses on understanding phenomena in their social, institutional, political, and economic contexts with the typical usage of words for data collection (i.e., semi-structured interview) and/ or data analysis (i.e., thematic analysis) with a deductive research approach. The drawbacks are that it focuses on a few individuals, and therefore a generalisation is more difficult (Braun & Clarke, 2013; Gray, 2014; Miles et al., 2014; Will et al., 1996).

### 3.4.1 Research design to collect data

An interview can be used 'if the objective of the research […] the examination of feelings or attitudes' (Gray, 2014, p. 382). A semi-structured interview – a special form of an interview – captures more details of personal attitudes, values, opinions, preferences, knowledge, and experiences of the interviewee, and to determine variables and their connections as well as thus that is 'a valuable

philosophy for exploring human experiences in management studies' (Dudovskiy, 2018, p. 42). The semi-structured interview is often adapted as a method of qualitative data collection and contains a list of questions and issues that can be asked in any order depending on a particular interview. It is possible to skip some questions or to add questions to clarify the interviewee's intention. It is good practice to record each interview and take field notes with personal interpretations and comments. Field notes are written during the execution of an interview. The semi-structured interview includes a probe to clarify directly the response and intention. The probe is a questioning technique where the interviewer questions the answers of a respondent and thus enables new ways of interviewing questions. These questions were not originally considered or planned, but contribute to investigate the research objectives more closely (Gray, 2014; Miles et al., 2014; Will et al., 1996).

This is a phenomenological approach that 'in business research focuses on experiences, events and occurrences with disregard or minimum regard for the external and physical reality' (Dudovskiy, 2018, p. 41), and is intended for 'reflection on the study' (Dudovskiy, 2018, p. 42). Gray (2014) argued that 'this is vital when a phenomenological approach is being taken where the objective is to explore subjective meanings that respondents ascribe to concepts or events' (p. 386). Dudovskiy (2018) said that this interviewing technique is for a 'better understanding of meanings attached by people and its contribution to the development of new theories' (p. 42).

The semi-structured interview is applied as data collection method to explore the subjective meanings and to understand the personal attitudes, values, opinions, preferences, knowledge, and experiences of the interviewee with management and leadership in an agile project. This data collection method corresponds to the researcher's reality (ontology: objectivism), knowledge (epistemology: critical realist) and values (axiology) as well as to the deductive research approach. The semi-structured interview enables the examination of facts (i.e., techniques), qualifications (i.e., knowledge, skills, experiences), and universal principles (i.e. facts and qualification in conjunction with project members) with exclusion of personal feelings. As critical realist, the researcher assumes the concept-dependent phenomena (for management) and independent phenomena (for leadership) to collect the data with a semi-structured interview. The semi-structured interview provides an opportunity to

focus on techniques that affect collaboration in a project, and how management and leadership influence the collaboration.

A conceptual framework is used to ensure the quality of the data collection and data analysis – the framework is described in chapter 4 (Figure 3). The data collection is made by minimum of 10 semi-structured interviews, thus that is acceptable from the university perspective, and 6-10 interviews is noted in the literature as acceptable sample size (i.e., Braun & Clarke, 2013; Braun & Clarke, 2019; Braun et al., 2019; Terry et al., 2017). One part of the conceptual framework is the identification of potential interview partner. A potential interview partner was a person who worked in an agile project role at least one year. This criterion must be fulfilled to be considered as a potential interview partner. The potential interview partners were selected on the basis of existing relationships or via the online profile information they offered in social networks (e.g. internal network, LinkedIn, Xing, or Facebook). The invitation letter for the semi-structured interview was sent out after an informal conversation with the potential respondent. This served to ensure that the potential interviewee had practical experience of agility and wanted to support the study, as well as to clarify the framework and procedure for the interview.

Another part of the conceptual framework was the assurance that participation in the semi-structured interview is voluntary, anonymous and therefore without damage or consequences for the interviewee. Anonymised means that the participant information has been made unrecognisable, thus ensuring that personal identification is not possible. Another principle was that persons, projects or organisations were not mentioned by name during the interview. Anonymity was also ensured by the requirement that the semi-structured interview be conducted in a quiet environment without disturbance by others. These principles were ensured by the previous sending of the letter of consent and information to the participant. In addition, a formal statement discussing the letter of consent and the principles for the interview before the interview started (Braun & Clarke, 2013).

Each interview was recorded with the consent of the interviewed person and the interviewee was informed that this record is not shared, only used to create the transcript for the data analysis, and deleted after the study is completed. The interviewee told a story in the interview, this is captured in the transcript, but

the study is the researcher's story and the data analyse is the interpretation of each transcript, and the way to analyse the data is describe in the following chapter (Braun & Clarke, 2013).

The interviews were conducted in the native language of the researcher (German). This procedure allowed the researcher to focus on the interviewee and the facts in the interview, and the research was not influenced. This minimised the challenges of translation during the semi-structured interview and avoided multilingual transcripts. In addition, linguistic proximity to the text, meaning, and clarity for explanations, personal attitudes, opinions and terminology of the interviewee were maintained (Kull et al., 2019; Schittenhelm, 2017).

The specific procedure for data collection is described in Chapter 4.2.

### 3.4.2 Research strategy to analyse the collected data

The research strategy defined the criteria for the validation and analysis of the collected data i.e., for the qualitative approach via thematic analysis, grounded theory, or interpretative phenomenological analysis. A thematic analysis is used to clarify most types of qualitative studies, such as questions concerning perceptions, practical information and influencing factors (Alhojailan, 2012; Braun & Clarke, 2013). In this research, the systematic data analysis based on the thematic analysis because this corresponds to qualitative method for the data collection (semi-structured interview) and the researchers' acceptable knowledge as a critical realist.

Through thematic analysis, it is possible to determine the frequency of a content/ aspect, analyse its significance, understand its potential and relate it to research objectives. The identification, analysis and understanding of different aspects is necessary in qualitative research. Thematic analysis is used to illustrate and classify data in detail (with codes), and to assign these classifications (the codes) to different themes (the categories) (Alhojailan, 2012; Brough, 2018; Gray, 2014).

The data are the transcripts that are produced in the data collection phase. The code serves to identify certain aspects, 'consist of words or short phrases' (Brough, 2018, p.212) and refers to different parts (i.e., paragraphs or sentences) of the data. The definitions of the themes follow the definition of the codes. The 'theme captures something important about the data in relation to the research

question and represents a level of *patterned* responses or meaning within the data' (Gray, 2014, p. 609). Brough (2018) described 'the conclusion of the thematic analysis is the identification of a (hopefully) saturated set of themes' (p. 212) that is achieved by coding. Coding is 'the process of transforming raw data into a standardized format for data analysis' (Gray, 2014, p. 680) with the differentiation of the outcome. The quantitative outcome attaches 'numerical values to categories' (Gray, 2014, p. 680), and the qualitative identifies 'recurrent words, concepts or themes' (Gray, 2014, p. 680). A coding frame is built as 'a template of key coding instructions for each variable in a study' (Gray, 2014, p. 680), and includes core categories / themes. A core category is 'the central category that is used […] to integrate all the categories identified' (Gray, 2014, p. 681) (Alhojailan, 2012; Brough, 2018).

The thematic analysis supports the identification, analysis and understanding of different aspects, and is completed with a conclusion from the analysed codes and themes (categories). This method correlates the qualitative approach with the conclusion from a general to a specific aspect including the understanding of the different points of view. The thematic analysis focused on crystallising who influences the cooperation (positively or negatively) and what influence has a manager and leader in a project.

Transcriptions in the researcher's native language (German) minimised the coding challenges that have to be considered when analysing multilingual data. Phrases and words have a widely varying range of applications and can influence the character of the content when analysing multilingual data (Kull et al., 2019; Schittenhelm, 2017).

The specific procedure to analyse the data is described in Chapter 4.3.

## 3.5 Summary of chapter 3

### 3.5.1 Introductory remarks

Figure 2 showed the research philosophy, approach, and method for this study. The critical analysis of the research philosophy provided the reality of the researcher (objectivism) and the acceptable knowledge for this research (critical realist) as well as the personal values of the researcher (axiology). Based on this, a qualitative research method was analysed with a semi-structured interview (research design) and a thematic analysis (research strategy).

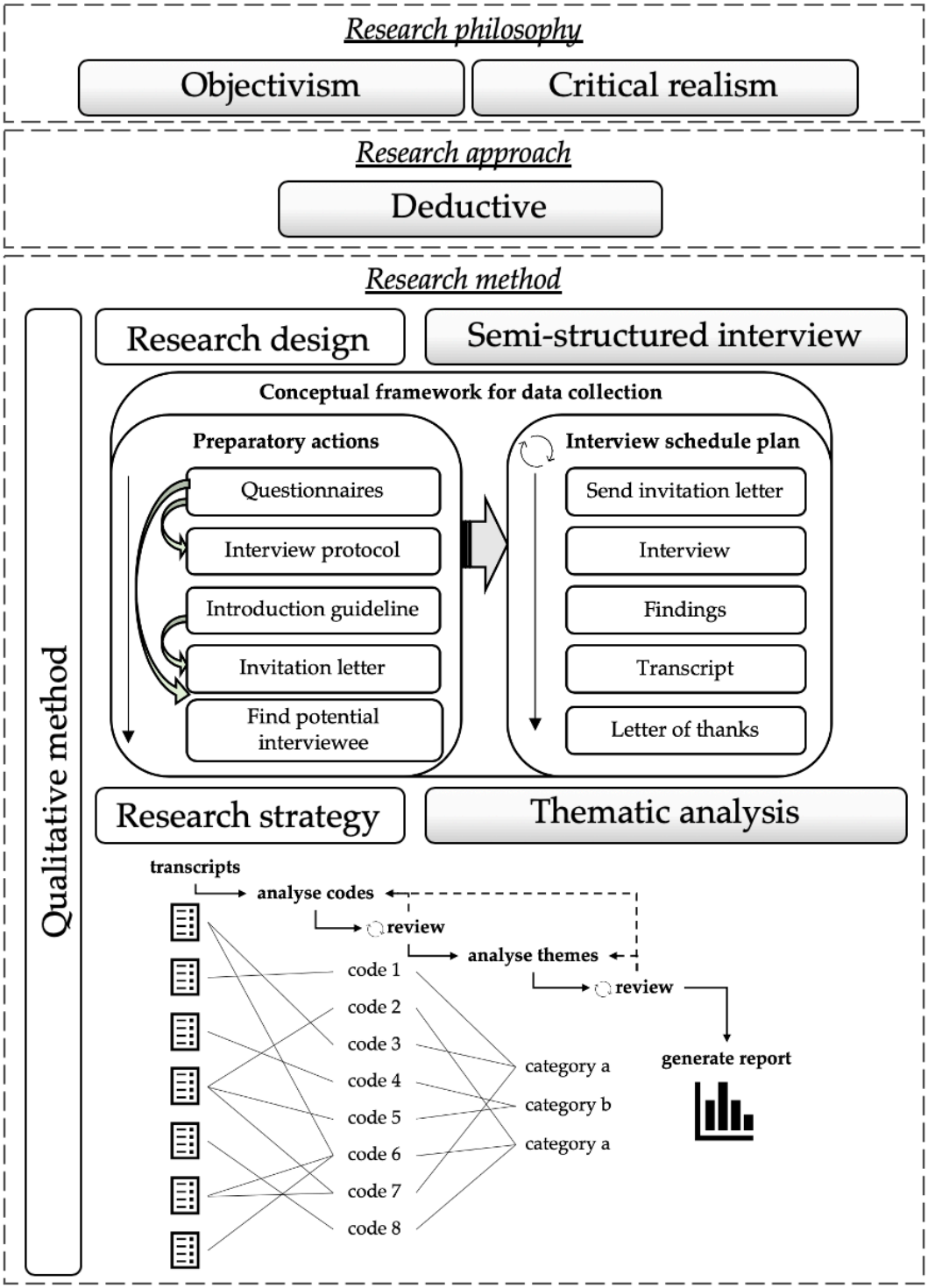


**Figure 2 Overview of research philosophy, approach, and method**

### 3.5.2 Research philosophy

The research philosophy is defined via ontology, epistemology, and axiology.

Ontology is the one's own view of reality, and the researcher's reality corresponds to objectivism with an exploration of people's subjective view. The objectivism criteria are characterised by examination of facts, qualifications, and universal principles as well as by the exclusion of personal feelings.

The object are the techniques for management and leadership of team members in a project for this research. The causal relationships or liabilities are established by the managers or leaders, and their interaction with each other and with project members. The project existed independently of the knowledge about the management and leadership techniques, but how can techniques be used to positively influence teamwork and why is the knowledge about the techniques important to promote positive collaboration in a project. The concept of truth is restricted on the coherent view of a project (Figure 1) and that the management techniques are used to manage the project members (realisation) as well as that the leadership techniques are used to get the best out of each team member (accomplishment). These relationships between objects are of central importance for a critical realist. The concept-dependent phenomena can be related to management (Easton, 2002) and the independent phenomena to leadership (Kempster & Parry, 2011). The acceptable knowledge, as critical realist, are the techniques their conjunction with the project members for this research. This is the basis for the realisation and accomplishment of a project.

### 3.5.3 Research approach

The reasoning in the research methodology makes it clear that was started with a general, universal view of a situation and this study ends with a specific view on techniques for management and leadership to improve teamwork. This indicates a deductive research approach.

### 3.5.4 Research method

The qualitative method focuses on understanding with the typical usage of words for data collection (design: semi-structured interview) and data analysis (strategy: thematic analysis) with a deductive research approach.

The semi-structured interview is applied to explore the subjective meanings and to understand the personal attitudes, values, opinions, preferences, knowledge, and experiences of the interviewee with management and leadership in an agile project. That enables the examination of facts, qualifications, and universal principles with exclusion of personal feelings. The semi-structured interview provides an opportunity to focus on techniques that affect collaboration in a project, and how management and leadership influence the collaboration. The interviews are to be conducted in German in order to capture this, support the data analysis, and prevent obstacles.

The interviewee told a story in the interview, this is captured in the transcript, and the systematic data analyse is the interpretation of each transcript and is based on the thematic analysis. The thematic analysis is used to illustrate and classify data in detail (with codes), and to assign these classifications (the codes) to different themes / categories (Alhojailan, 2012; Brough, 2018; Gray, 2014). This analysis supports the identification, analysis and understanding of different aspects, and is completed with a conclusion from the analysed codes (to illustrate and classify data in detail) and the assigned themes. This method correlates the qualitative approach with the conclusion from a general to a specific aspect including the understanding of the different points of view. The thematic analysis focused on crystallising who influences the collaboration and what influence has a manager and leader in a project.

The research methodology forms the basis for the data collection and analysis in the following chapter. This is the basis for the discussion in Chapter 5, which overviews management techniques (Annex 10), leadership techniques (Annex 11) and techniques can apply by managers and leaders (Annex 12).

# 4 Chapter 4: Data Collection and Analysis

## 4.1 Introductory remarks

Figure 3 shows the conceptual framework, the procedure research design to collect the data with a semi-structured interview and the research strategy to analysis the data with a thematic analysis.

The data collection is separates into the preparatory actions and the interview schedule plan. The preparatory actions require to prepare the interview phase and ensure a high quality; they determine the permanent structure of all semi-structured interviews. The interview schedule plan uses and ensures a consistent execution and quality for all semi-structured interviews. During the interview uses a probe to add spontaneously questions to gain a deeper understanding of the interviewee's experiences, meanings, and motivations. Each semi-structured interview records with audio and video, and writes down as transcript (an example is in Annex 8). The transcript transfers to a suitable program to analyse the collected data (Harrell & Bradley, 2009; King et al., 2019; Miles et al., 2014; Remenyi, 2013).

The collected data examines through a thematic data analysis, which includes the analysis of codes and themes as a method of coding. All codes used to organise the text of the transcripts. One code summarises similar text fragments in terms of a subject matter. A theme (termed as category) groups the described techniques and important aspects in a project (the codes) and represents a specification of the text fragments, these are the themes (categories). The codebook presented an overview of the analysed codes and themes (categories), and forms the basis for the related references (summarised in Annex 9). The related references are essential for a weighting and the discussion (Chapter 5): which aspects have an influence, how these aspects affect teamwork and what can be influenced by managers and leaders. The thematic analysis method correlates to the qualitative approach with the conclusion from a general to a specific aspect including the identification and understanding of the different points of view. The thematic analysis focused on identifying who influences (positively or negatively) the collaboration and what influence who has in a project. This method is related to the method of data collection (semi-structured

interview) and the acceptable knowledge of the researchers as critical realists (Harrell & Bradley, 2009; Miles et al., 2014).

The focus is on obstacles on work of project members to show possibilities to working together and to identify practical solutions for manager and leaders. In detail, this study highlights the personal obstacles with the approach of agile (Scrum) and hybrid (Scrum, and V-Model® or waterfall) methodologies (see Annex 1 for V-Model® / waterfall; Annex 2 for Scrum) in a project (Annex 3).

A summary of Chapter 4 will be offers at the end of this chapter.

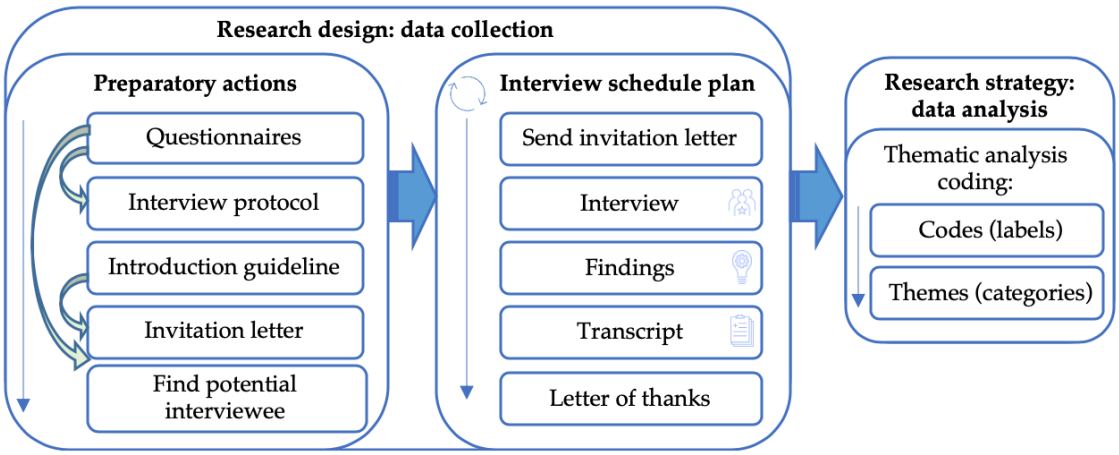


**Figure 3 Conceptual framework for research design and strategy**

## 4.2 Data collection with semi-structured interviews

Figure 3 shows the main steps for the research design to collect the data, and these were highlighted with ***bold and cursive*** typeface in chapter 4.2.1 and 4.2.2.

### 4.2.1 Preparatory actions for the data collection

The preparatory actions included a design of the questionnaires, development of an interview protocol, preparation of an introduction guideline for an interview, an invitation letter for the interviewee, and the process to find potential interviewees. These 'five possible dimensions' (Remenyi, 2013, pos. 615) have a directly influence to the success or failure of an interview with a clear expectation that the researcher would think over the interview questions in connection to the research objectives, and ensure that the interviewee can answer the questions. These dimensions flow into the preparatory actions to support a successful interview phase as well as to ensure the same structure and quality for all semi-structured interviews (Harrell & Bradley, 2009; Miles et al., 2014; Remenyi, 2013).

The preparatory actions started with the definition of the questions (***questionnaires***). The interview questions are designed with the focus to fathom the experiences, meanings, and motivations of the interviewee as well as to uncover the techniques and effects on teamwork in an agile project. The structure of the questions included a general part to open the interview and to gather the experiences with an agile project; the second part referred to the research objectives and captured the effects and influences on an agile project; and the third part at the end of the interview referred to the personal obstacles for working in an agile project. The questions were structured and detailed in a text document (Annex 7).

A template is created for the ***interview protocol*** with information about the interview (i.e., date, time, location), the interviewee (i.e., anonymised name, company, position, and approval to record), points to clarify the criteria and ethical responsibility, and the prepared interview questions (the questionnaires). The prepared interview questions were transferred from the text file to the interview protocol. The interview protocol contains the essential information and key points of each interview and was generated as a table in Microsoft Excel. This table was copied for each semi-structured interview and used for field notes, rapid preparation, and a similar structure. This document was used for various weightings during the data analysis (see Chapter 4.3) and to underline the discussion (see Chapter 5). Annex 7 gives an overview of the essential points of the interview protocol and questions (questionnaires) (see Figure 3). These were grouped by the impact and purpose of the activities and provided with an approximate time schedule.

An ***introduction guideline*** is prepared and contained a description of the research focus and the interview process. The introduction guidelines were structured and detailed in a text document, and is used to prepare the invitation letter (see Figure 3).

An ***invitation letter*** for the interview was prepared as a template. This template contained a speech to the invited interviewee with a thank you, followed by the prepared introduction guidelines (see Figure 3), and an explanation of the required letter of consent. The letter of consent must be signed by the interviewee, this is a formal requirement of the university regulations. The last section of the invitation letter contains the prepared questions for the interview.

This invitation letter supported the same structure and information for each interviewee and provides a quick way to send the invitation. The invitation letter was prepared and detailed in a text document.

A crucial characteristics criterion for a ***potential interviewee*** is that they are working in an agile project role at least one year. The potential interviewee is selected based on existing relationships from the researcher's own contact list or about their online profile information they offered in social networks (e.g., LinkedIn, Xing, or Facebook). An agile project process model is used in functional areas such as information technology (IT), software / product development, operations, or finance (ScrumAlliance, 2017). Thus, the industry sector is not pivotal. Another criterion is that potential interviewees are invited from different companies and with different project roles. Figure 4 shows the agile team roles: Product Owner, Scrum Master, or team member(s) (e.g., business analyst, developer, or tester). All these are the most known project roles in agile process models. The project manager and agile coach are not defined roles in the agile approach, but these roles are required to identify the influence aspects for the manager and leader, that is the reason to include these roles and use the term Project Lead for the project manager and leader role in this chapter (Chapter 4). Electronic communications (i.e., telephone or e-mail) were used for initial contact with a potential interview partner. Before the invitation letter was submitted, it was clarified if they had the require knowledge and would like to support an interview. The preparatory activities were concluded with the identification of the potential interview partners and then began the *interview schedule plan* phase (4.2.2).

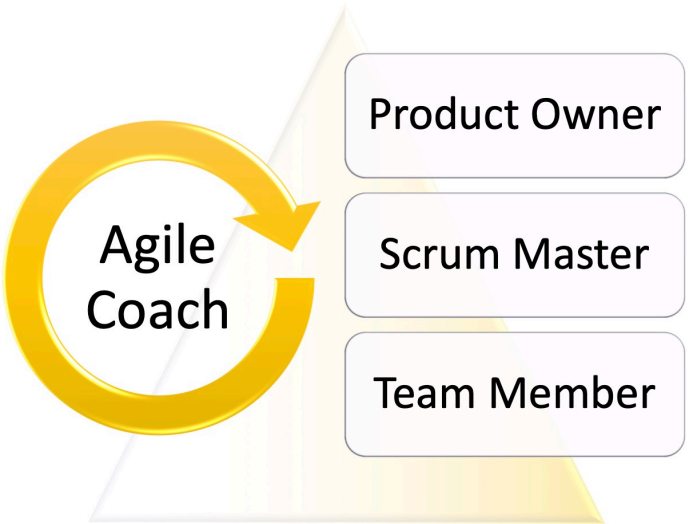


**Figure 4 Most known project roles in an agile project process model**

### 4.2.2 Interview schedule plan to continue with data collection

The data collection was planned with 10 semi-structured interviews, which is an acceptable sample (Braun & Clarke, 2013; Braun & Clarke, 2019; Braun et al., 2019; Terry et al., 2017). 18 people were identified as potential interviewees, but an interview was only conducted with 15 people due to time constraints and holiday periods. The electronic ***invitation letter*** was sent to 15 people by calendar invitation or e-mail. The invitation letter contained a specific date, time, location, and the prepared invitation letter from the preparatory actions. Video communication systems were used for the semi-structured interview, as a personal meeting was not possible because the interview partners were spread all over Germany. The use of video communication systems was not an obstacle, as this is a common communication tool in agile work and anyone can use this communication tool with internet access (Gill et al., 2008; Harrell & Bradley, 2009; King et al., 2019).

The semi-structured ***interview*** lasts approximately 60 minutes, communication language was German, and was conducted via a video communication system (e.g., Skype, WebEx, Zoom). Before the semi-structured interview started, it was important to clarify the requirements for the interview. This process included a formal explanation of the research focus, checking if the letter of consent has been signed (as university requirement), answering questions of the interviewee, gathering the approval to record the semi-structured interview with audio and video (via a recording function of the video-communication system), and elucidating to the interviewee that the participation would be voluntary, anonymous, with no personal identification and without damage or consequences. Next, the interview recorded, and the prepared interview questions asked based on the interview protocol. As probe added questions on unclear statements or questions for a detailed explanation of the meaning and intention. During the semi-structured interview, the prepared interview protocol used for the field notes, and to noted key words for the probe (Annex 7). The semi-structured interviews were conducted in German to focus on the interviewee, the facts in the interview, and minimised the challenges of translation during the interview (Kull et al., 2019; Schittenhelm, 2017).

After the semi-structured interview, the researcher took 30 minutes and wrote down a short summary of the interview to recapitulate important points of the conversation and to emphasise the interviewee's intention. These notes are

included in the interview protocol and was the work to captured the ***findings*** of each semi-structure interview.

The ***transcript*** is an integral part as the result of each semi-structured interview. The process of creating the transcript is very time consuming, but it provides an opportunity to reflect on one's own interview skills and culture. During transcription, acronyms were used to ensure the anonymity of the participants, and the transcript was created with an appropriate program (e.g. Microsoft Word). Transcriptions in the researcher's native language (German) avoided multilingual transcripts, preserved the character of the content, and minimised the coding challenges that have to be considered when analysing multilingual data (Kull et al., 2019; Schittenhelm, 2017). The transcript is an essential component for the data analysis (see 4.3) and an example of transcript is in Annex 8.

The ***letter of thanks*** to the respondent contained a thank you for the time and provided information, and the transcript was attached as text file with a request to review the transcript within three days. Only three interviewees reviewed the transcript without any requests for adaptation. The other respondents considered that review was not an essential part, but each interviewee demonstrated interest in the study results. The letter of thanks was sent by e-mail.

The data analysis begins after all semi-structured interviews are executed; this is described in Chapter 4.3.

## 4.3 Data analysis with thematic analysis

Figure 3 shows the main steps for the research strategy and Figure 5 shows the detailed steps to analyse the collected data. These main steps were the analysis of codes and themes (termed as categories) and the results were highlighted with ***bold and cursive*** typefaces in the Chapter 4.3.

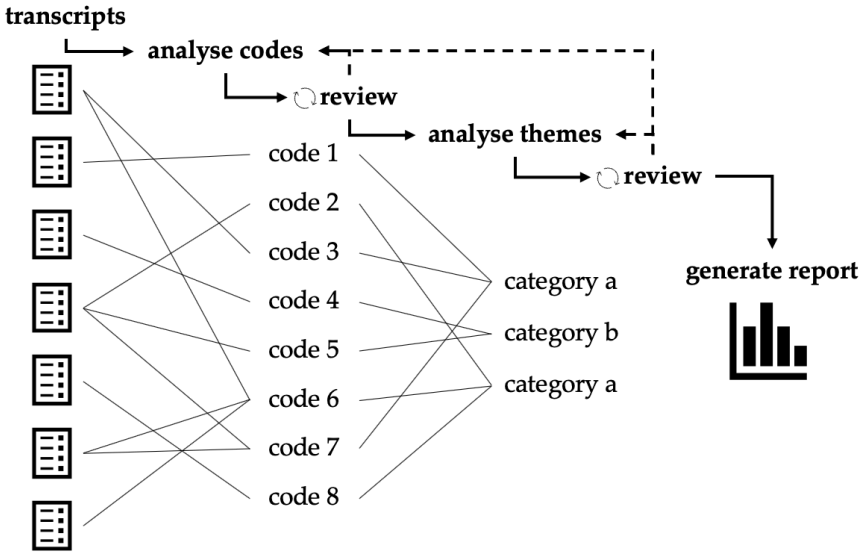


**Figure 5 Detailed steps to analyse the collected data**

### 4.3.1 Analysis of the codes from the collected data

The researcher knows the collected data through the transcription process – an example of transcript is in Annex 8. This process was essential for the analysis of the data so that the researcher has an understanding of the formulation and meaning of the terms. The analysis began by checking the transcripts to ensure a consistent and uniform format. Then all transcripts are transferred to the suitable software NVivo, that is a common tool for a thematic data analysis. NVivo supported the qualitative research process of coding, and the coding involved identifying similarities and differences from the raw data – using NVivo to split the answers of the interview questions with coherent paragraphs, sentences, or clauses. These data chunks are assigned systematically to different codes and thus the data is connected to the codes to summarise the interviewee experiences, meanings, and motivations to similar topics about collaboration and techniques in agile projects. This data analysis is mainly inductive, but the deductive approach became clear with the completion of the coding and the discussion (Chapter 5). The codes are encoded in several passes to gathering all codes. Each code has an assigned label (code name) and a definition of its purpose. These definitions provided criteria to ensure that each code was reliably applied in the analysis of the raw data. These definitions are in the codebook and were exported to a spreadsheet format over NVivo. This codebook was reviewed before starting another coding pass. NVivo was powerful for the analysis of raw data, but not for further analysis. This was done in another tool, such as Microsoft Excel. In Microsoft Excel, an extract from the

codebook was added and analysed, and the processed data formed the basis for the *Report of the data collection and analysis* (Annex 9, Table 9). The collection of the codes was completed as soon as no new codes analysed and it was possible to assign the codes to possible themes (categories). The thematic analysis revealed the codes: conception, culture, customer, hierarchy, knowledge, method, motivation, Project Lead, Product Owner, restrictions, roadmap, skills, Scrum Master, structure, team member, and working (Figure 6). In the following, the codes are outlined only with the associated experiences, meanings and motivations of the interviewees (Alhojailan, 2012; Bazeley & Jackson, 2013; Castleberry, & Nolen, 2018; Harrell & Bradley, 2009; Miles et al., 2014).

The code ***conception*** referred to statements about the project schedule, visions regarding the project phases and the team and what is still missing for the work in a project.

The semi-structured interviews point out that ***culture*** covered via an attitude of each analysed codes, and referred to the values and principles in a project.

The ***customer*** is outside the project roles, but they are an integral part of the project working with a high level of influence over the project goal, and the whole project. Normally, a customer is a sponsor with the money for the project, or the end user working with the product of the project. The customer points out ideas and requirements for the project objective as Epics and Features.

The code ***hierarchy*** included short direct ways of communication and finds solutions between all stakeholders via Design Thinking. The impediments referred to as positions of power and traditional hierarchies of companies. These referred to the management level, the overall structure and environment.

The code ***knowledge*** included the handling of errors and failures in the project work as well as topics around learning and reflection processes, communicate over impediments and emotional intelligence. The emotional intelligence is necessary to interpret, understand, and influence one's own and others' feelings.

The code ***methods*** referred to a combination of various project methodologies (traditional, agile, hybrid), the process model (i.e., V-Model®, SCRUM, RUP), and diversified topics revolving around the use of frameworks (i.e., SAFe or LEAN), project practices (ceremonies), and methods (e.g., Design Thinking, DevOps, or AppOps).

The code ***motivation*** referred to very controversial opinions on the relationship between organisation and self-determination.

The ***Project Lead*** is responsible for creating, setting up, managing, and supporting the appropriate conditions, rules and guidelines for the project. It is necessary for the work in a project as well as for leading, managing, and reacting on open discussions about each relevant project topic.

Specialist knowledge of the business is essential for working as the ***Product Owner***. The Product Owner is responsible for creating and prioritising the User Stories as the translation result of customer ideas (Epics) and requirements (Features). The Product Owner fills the Product Backlog, thereby enabling the team members to work on the User Stories.

The code ***restriction*** included the necessary limitations for the project work and offers various discussions over project quality verses project boundaries, like budget, environment and working conditions, or project objectives.

The interviewees' valuation comprised topics about vision, objectives, and planning over the entire company, program, product, project, and team that are covered by the code ***roadmap***.

The ***Scrum Master*** enhances the team to work with and on the project methodology and process model, that is its strength. They help to understand the theoretical agile background, but normally has not the technical, professional, or specialist know-how of the topics in the project.

The code ***skills*** included the qualification for further personal development via continuous learning and indicated necessary competencies for work in a project.

The code ***structure*** covered subjects like improvements of team collaboration and highlighted important criteria regarding roles and responsibilities.

The semi-structured interviews revealed that the ***team members*** have the most power in agile project work. This is a result of the interviewees' statements and the topic team member was the most frequently identified and linked reference in the analysis phase. In order for team members to develop this power, they need support from the management and the customer as well as mutual encouragement from each other.

The code ***working*** referred to relevant rules for the working, necessary and desirable conditions for the working environment (i.e., co-located, remote, or a mix), and estimates of applied technologies for the project work.

All these codes used to analyse the themes (categories) and to examine which aspects are important and how these aspects influence the collaboration and uncover the possible influences opportunities to enhance joint working.

### 4.3.2 Analysis of the themes (categories) from the codes

The analysis of the themes (categories) following the analysed codes with the aim of grouping the codes into similar themes. A theme corresponds to the same coding rules as the criteria of a code. The application of the coding rules for a theme represented a refinement. This refinement affected the existing coding rules, which required verification steps by using the codebook (Annex 9, Table 9 and Table 10) and a return to coding of themes and/or codes (Figure 5). This technique was used to ensure that all data was examined in the same way with the same coding rules. The process of refinement was only completed as no new themes were identified, at least one code was grouped to each theme and all codes were assigned to the identified themes. Figure 6 shows a schematically presentation of the results from the data analysis with the analysed categories and codes. These results are traceable via the data collection and analysis report (Annex 9) (Alhojailan, 2012; Bazeley & Jackson, 2013; Castleberry, & Nolen, 2018; Harrell & Bradley, 2009; Miles et al., 2014).

The thematic analysis revealed the three themes (categories) accomplishment, realisation, and roles. The important category is *realisation* with the work arrangement in the project methodology (agile/hybrid), and the various process models. Realisation is followed by the category *accomplishment*, with the execution of project work. The categories accomplishment and realisation have an intersection that is reflecting in the category *roles*. The themes (categories) and assigned codes only outlined with the associated experiences, meanings and motivations of the interviewees in the chapters 4.3.2.1 (realisation), 4.3.2.2 (accomplishment), and 4.3.2.3 (roles). The Chapter 5 Discussion connect the literature with the analysed data.

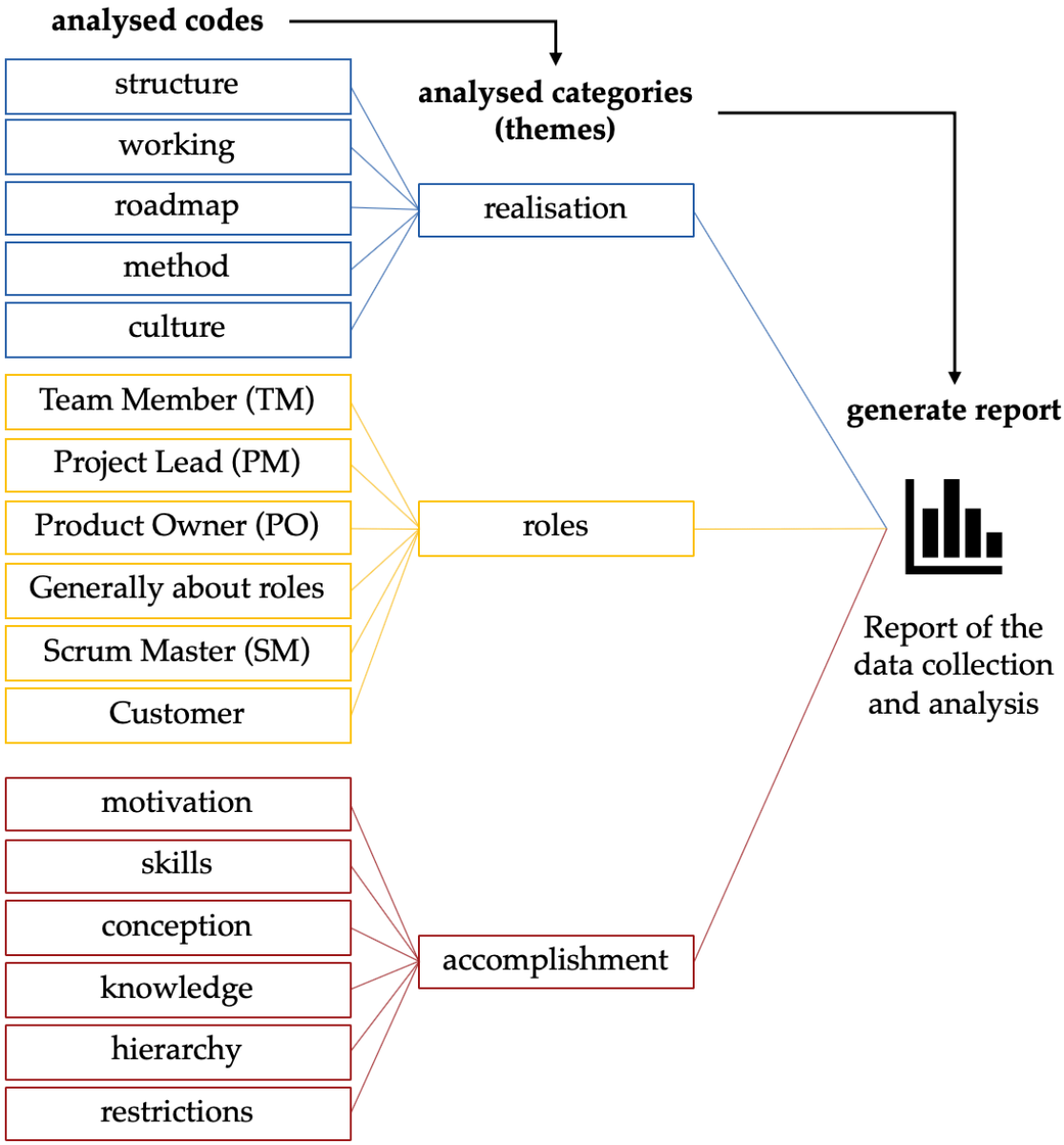


**Figure 6 Overview of the analysed categories (themes) and assigned codes**

#### 4.3.2.1 Analysis results of the category realisation

Figure 7 shows the data analysis results of the category ***realisation***. The category realisation is most impacted from the code structure, followed by working, roadmap, method, and culture (Figure 18), but the logical flow is method, roadmap, structure, working, and culture. The logical flow is used to show which management techniques can be used to affect the collaboration (Annex 9, Table 9 and Table 10).

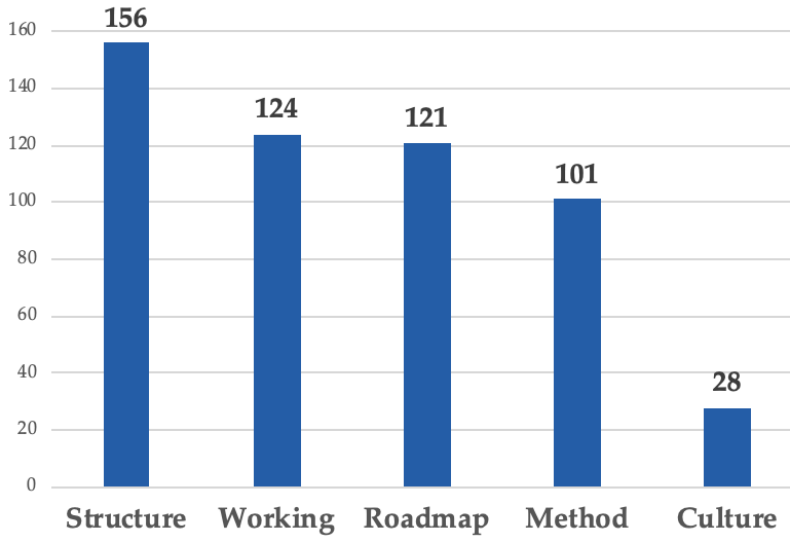


**Figure 7 Code references in the category realisation**

The Project Lead influenced the work arrangement for each project member. The control of the work arrangement starts with the setup of the ***method*** with respect to the entire environment (inside and outside the project), and the possible methodology (agile, or hybrid approach) for the project. The methodology decision stressed that the methodology considers the project approach (business), the organisational management approach (the environment, the company culture), and the project management approach. Some interviewees do not trust any provider who follows a traditional approach to project work. However, other were the opinion that an agile approach is only reasonable for complex adaptive systems with adaptive processes for working in the project. For example, you would like to bake a cake based on a simple recipe. This idea can be transferred into a customised application that is easy to configure (via a simple recipe), where customisation is configured with a checklist and then runs the application (e.g., in most areas SAP or other products). Then it is not necessary to work with an agile approach and implement adaptive processes with expensive control algorithms or automate something. The same applies for tasks with easy reproducing or with few actions to complete the tasks.

It is essential to define a ***roadmap*** for the project that includes the objectives, vision, and planning components as the complexity increases with the project size. A roadmap enables the team to work in a self-organised and self-determined way, because everybody knows the project's approach and short and long-term goals. The vision is closely linked with the overall objective as a common goal – this is connected with the planning components. The vision is

practicable for rapidly adapting systems and cross-team collaboration as interdisciplinary teams i.e., teams working together on a single goal as well as for products and services across a portfolio of various products. The planning refers to the common product planning, and concerns topics like quality, scope of work, supply, time, cost focus and the (final) result. A missing roadmap affects the teamwork that the team did not know the route to the destination, and is incapable of designing solutions.

The Project Lead should set up a clear ***structure*** to support the values, principles, and practices for the project work. Self-determination and self-organisation need a framework of conditions, and a concrete plan with limits and uniformity. Also, clearly-defined team responsibilities, roles and stakeholders as well as a definition of significant dependencies, the collaboration of the teams (interdisciplinary or multidisciplinary teams) and the required communication channels are indispensable. The project structure must be coordinated with the external world (organisation, stakeholder).

The project setup should include definitions for ***working*** with descriptions of the environment requirements, rules to be followed and technologies to be used. That supports a common understanding in the team and project, which is a positive motivating aspect. Guidelines should describe the required project working information about the project (i.e., methodology, model, framework, practices, methods, structures), technologies (i.e., systems, platforms, programs, access data, tools, applications), and rules. Examples of project rules (Annex 8): (A) defined communication channels (i.e., How will we communicate? What information will be communicated through which channels? What meetings are important for us? How will we conduct these meetings?); (B) defined quality (i.e., How do we define quality for this project?); (C) dealing with improvements (i.e., How should we deal with improvements? What do we need to do to improve and make progress?). The setup is a process to introduce automatism for habits. These habits do not proceed over tools; this process should be included in the working day. It is normal that after some time nobody thinks about this meeting or conversation rule – everybody lives that, and so the work is set up as automatism. A rule should be referred to the setup of a timeframe for undistributed work. That is essential for the team members to work without any interrupts, work efficiently on the Stories, or to develop new ideas for the

project objectives. The rule can be proceeding via a local note on the door, or via a status in any online tool.

***Culture*** flows in all codes and has a close connection with themes about communication, feedback, meetings, and working. The defined aspects should be accepted, and followed by everybody to support collaboration.

#### 4.3.2.2 Analysis results of the category accomplishment

Figure 8 shows the result of the data analysis for category ***accomplishment***. This is influenced by the codes motivation, skills, conception, knowledge, hierarchy, and restrictions (Figure 18), and stated which leadership techniques can be used to affect the teamwork (Annex 9, Table 9 and Table 10).

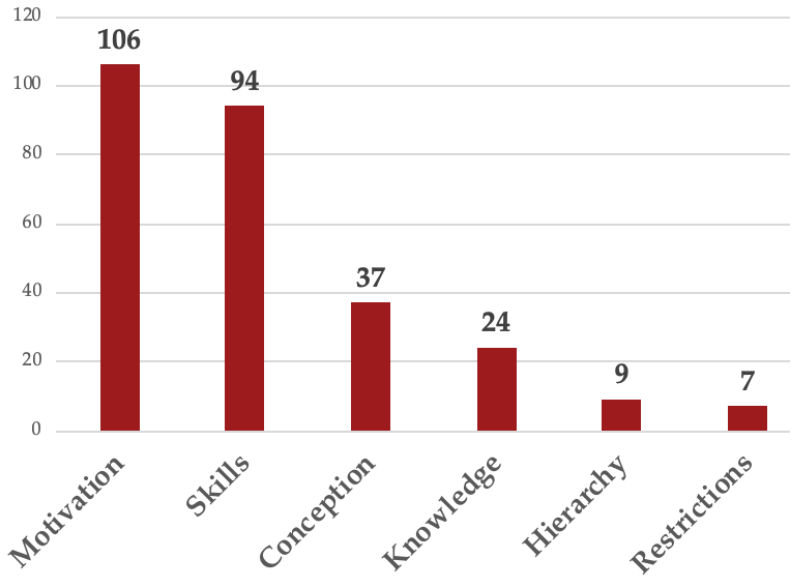


**Figure 8 Code references in the category accomplishment**

The working ***motivation*** increases with self-determination, which offers the opportunity to freedom and responsibility, and utilises the full individual potential for everybody in a project. It is required to eliminate impediments with a clear and open feedback culture to enable team members to do the work with solution-oriented small cycles e.g., to deliver a Minimal Viable Product (MVP). The interviewees pointed out that it is important to learn new things in the project (i.e., over technologies or the business), that the environment should match the setup (i.e., all team members like to work on the own role and did not sleep at the workplace, all team members attend the necessary meeting with interest), and capable colleagues have a positive effect on everybody with a high level of professional, technological, and methodical know-how that they share.

The interviewees wish a clear setup and communication over the methods, roadmap, structure, and working for efficient teamwork in the project; they also want a culture of reflection. The project needs conditions that are working in cooperation with the entire system (the organisation). It should be possible to discuss the project condition to clarify the purpose and value. If a project condition is valueless, then it should be changed. The motivation is positive influence with the free choice to select educations; to test new things (i.e., experiments, PoCs), and increases with trust and appreciation. Another aspect is the personal motivation via small joint events that support personal relationships and inspire i.e., eating together, ice-cream after lunch, or an event with dinner and entertainment. It is not important to stage big events every time – small things are helpful for individual and team motivation. The celebration of events should be influenced by the realistic view about the delivered solution. An interview statement emphasised the significance of motivation with: 'If a team member loses motivation, the project is lost'. Motivation is a balancing act between request and encouragement. One interviewee recommended the TED Talk van Dan Pink as a good source about motivation.

Self-motivation is an essential prerequisite for developing one's own ***skills*** and supporting others in taking necessary learning steps. These skills are often insufficiently developed and support is needed. This support can take the shape of feedback in order to identify gaps, to learn to reflect on the feedback and thus to take appropriate steps as independently as possible. The learning process can be supported by a wide range of sources and a culture that allows constructive criticism of all obstacles. That required a certain emotional intelligence. The Project Lead should support the team to close gaps. The identification of skill gaps is hardly a failure; on the contrary, it shows the understanding of the principles. The skills should be developed on the project-relevant content via user groups (i.e., Communities of Practices - CoPs), talking with other professionals, use of chat channels, going to present training (i.e., for soft-skills), and use of online courses (i.e., professional or theoretical know-how). Also important is the view beyond the horizon of one's own profession which can be developed by going to and organising conferences, community meetings and meet ups, establishing continuous personal interaction with social exchange, discussing several topics, reading news / books / papers, using social networks (i.e., Facebook, LinkedIn, Twitter, Xing, YouTube), supporting young talents,

and / or working as trainer/ mentor / tutor. It is important to use a large variety of sources (outside one's own business) to form one's own opinion. Some interviewees recommended reading books on psychology (i.e., SCARF Model, Growth Mindset by Carol Dweck) or buying any book under 10 euros.

The interviewees offered necessary and desirable ideas for the ***conception*** of a project. Interviewees with a role as team members describe the unacceptable situation of a missing schedule itinerary. It is necessary to plan phases to pursue and adapt relevant topics in a project. Interviewees with the role Project Lead or Scrum Master report that the schedule itinerary is clear and understandable for everyone. Interviewees with the role coaches confirm gaps of the project conception and that these impede project collaboration.

The agile culture allows making a mistake, but the same repetitive faults are forbidden and should be avoided. It is a learning and reflection process, which must be accepted by everyone. This ***knowledge*** has a close connection with the conception and working; it is influenced by the culture of uncovering errors, communicating them, and finding a solution without blaming. It is important that responsible persons should react on the communication of failures with respective emotional intelligence. Moreover, these disruptive factors are sometimes necessary to catapult stakeholders out of their comfort zone.

A ***hierarchy*** in the project enables a direct communication culture and creates transparency over the project. A fast, professional answer to each question supports the development of an appropriate solution, and that is a motivation factor. Design Thinking allowed feedback from the end user as to whether a solution is acceptable; this increases motivation. Responsibilities must be defined for specific project phases or topics. The mix of traditional and agile management hierarchies should be respected in the setup of the project structure – otherwise a mix are counterproductive for teamwork. An example is, one person has the role of a Product Owner and is the direct superior of an assigned team member. The team member cannot follow agile principles because the team member depends on the direct superior.

Each project has ***restrictions*** that can be minimally influenced by the project, but these have a great impact on the teamwork and the entire project. Possible changes are to be attempted to plan (e.g., legal changes at a determined time, or technology changes, that a necessary system sunset). Some restrictions can be

absorbed with a proactive working style, and others need a flexible working style. The prerequisite is that the planning included a timeframe for restrictions and possible influences. The Project Lead is responsible for setting up a guideline to handle restrictions for the working to estimate the possible restrictions and support the team by materialised restriction that would strengthen the motivation, and having a positive influence on teamwork.

#### 4.3.2.3 Analysis results of the category roles

Figure 9 shows the data analysis results of the category ***roles***. The category roles is most impacted on the code team member, following by Project Lead, Product Owner, Scrum Master and customer (Figure 18), but the logical flow is customer, Project Lead, Product Owner, Scrum Master and team member. The logical flow is used to show which management techniques and leadership techniques can be used to affect the joint working (Annex 9, Table 9 and Table 10).

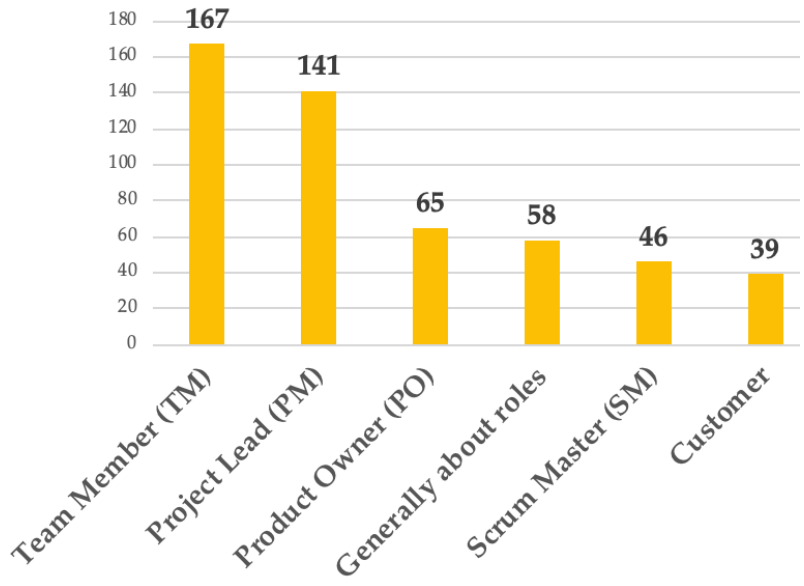


**Figure 9 Code references in the category roles**

It is important that the ***customer*** understand the agile project setup, and trust that the ideas (i.e., Epics / Features) are delivered with an optimal solution for the agreed Story Points as well as that the teams – and nobody else – deliver the solution. The Story Points can be translated into a budget, which is a communication between the customer, Project Lead, and Product Owner. It is important that the customer is willing to attend agile rituals (i.e., review the Sprint findings, support Design Thinking workshops), and is open to the transparent feedback culture (e.g., working proactive and react on hurdles; give a feedback for solutions). The customer should be supporting time to test new

things, continuous learning, and trainings for everybody in the project. The customer must understand the agile culture; otherwise, it will be a disruptive factor with a high level of influence on the entire project. The customer understands that the findings are delivered as MVP with a value-driven approach. It means the Product Owner translates the Features to User Stories and prioritises the User Story with the most value for the customer. The team is working on the high-priority User Stories. The customer does not change each time the path, as each change has an influence on the teamwork. The customer knows that each User Story and change must be paid for, since it is "not Christmas every day" – statement from an interviewee. Highly important is the active enforcement to proceed the project methodology, and the specific process model on the customer side, otherwise it would be very hard to deliver any. Each project works with another setup, but this should be discussed, documented, and communicated to everyone to enhance the collaboration.

The interviewees countered that the role of ***Project Lead*** did not exist in agile frameworks, but most associated this role with the primary project manager / leader across all teams who would act as a responsible person for the entire project. Its main responsibilities are the elimination of obstacles to ensure the daily work, the establishment of definitions for the entire project, and the communication between the different layers. The various layers are including sponsors, customers, clients, each project role, and each person with any interest about the project. The Project Lead should not break down the traditional approach into the agile approach. They must be a paragon of the values, principles and practices. The Project Lead trusts the teams to produce a satisfactory solution about the task and goal definition. The Project Lead enables all layers to follow the project conditions as well as creating a basis and space for trust, continuing learning, no blaming, freedom of curiosity, environment without buzzword gaming, and events. The Project Lead should be accepted by the customer and requires specialist know-how about the business, professional expertise, theoretical knowledge and use of different technologies. They must take into account and weigh each of the various personal views and interests.

The ***Product Owner*** is responsible for the product solution: They know the need of the customer and the dependencies of change requirements, fill the Product Backlog and respect the value of a User Story (as cost and benefit considerations). The Product Owner defines and prioritises a User Story with a

comprehensible description, measurable targets (i.e., SMART), and acceptance criteria in coordination with the customer. A User Story includes what is to be realised without a solution. These support the transparency for each team member and form a basis for the team decisions. It is desirable that all expertise is shared with everybody, reactions are given to professional questions, and the team is supported with a degree of freedom to create a solution. The Product Owner is present for the agile rituals, communicates its own faults, works only for one agile team, work coordinate with other Project Owners, and respect dependencies with other themes and resources e.g., technologies, human competencies or availabilities. A requirement is that the Product Owner is independent without influences from any organisational company manager (i.e., personal manager, supervisor), and is not the leading of any team member from his own assigned agile team.

The ***Scrum Master*** is responsible for teamwork, team spirit and the working atmosphere. The Scrum Master ensures that the team lives with a continuous daily view, as well as improve and moderate each team topic e.g., meetings are time boxed for a specific purpose, transparent working style, any topic can be addressed, each feedback is shared. The Scrum Master ensures that all necessary information is available for the team decisions, and the solution findings for the User Stories. The Scrum Master should be enabling the team to find autonomously the solution. The Scrum Master can give additional indications – and the team can respect these – but the team is responsible to find a solution. It is a high motivation factor and shows appreciation for each team member. A theoretical base is an education with a Scrum Master certification but working, as a Scrum Master needs more than a certificate. They must have the personality and courage to protect the team from outside influences (Annex 8). For example, the direct superior or Project Lead delegates some traditional management tasks to the team. At this point, the Scrum Master must intervene and protect the team independent of any outside influences. On the other side, the Scrum Master needs a feeling for the team members to react on disruptive factors. For example, a mandatory standard team meeting is at nine a clock, and one team member does not attend this meeting. The Scrum Master must show incredible sensitivity to discuss this with the team member and needs convincing arguments the team member understands as to why the meeting was important and its merits. The interviewees expressed concerns that a Scrum Master is

absolutely necessary for a new agile team. Over time, this role becomes obsolete for small agile projects, but over 10 agile teams the role is essential and it is possible that several teams share one Scrum Master.

The ***team members*** become animated through the cooperation (i.e., pair programming) with transparency (i.e., over the product, working, and the current status) to deliver sustainable products via small supply packages (i.e., MVP) with top quality. It is assumed that all team members have the necessary transparency. They ask questions over uncertainties and hurdles, receive quick answers, and react fast to current facts. These require short communication ways through responsible persons as a basis for decisions as well as a clear vision of short and long-term goals of working. A necessary condition is the opportunity to discuss unclear project conditions. The team member needs the willingness to work flexible and self-organise as well to give, receive and accept feedbacks.

## 4.4 Summary of chapter 4

### 4.4.1 Introductory remarks

The conceptual framework (Figure 3) supported a high quality and a similar approach throughout the process of data collection and data analysis. The result showed obstacles and opportunities for practical cooperation and offers practical approaches for managers and leaders.

### 4.4.2 Data collection with semi-structured interviews

The scheduled number of semi-structured interviews was 10 as an acceptable sample size (Braun & Clarke, 2013; Braun & Clarke, 2019; Braun et al., 2019; Terry et al., 2017), but the response obtained from potential interviewees was very high, leading to 15 semi-structured interviews with four coaches (27%), two Project Leads (13%), one Product Owner (7%), three Scrum Masters (20%), and five team members (33%) (Annex 9, Table 8 and Figure 15). That mix was perfect to receive an understanding of the experiences, meanings, and motivations with and for an agile project.

For each interview, a prepared protocol was used for the interviewer's notes, which also included the questions. These questions were supplemented with a probe in the interview in order to record the intention of the statements as precisely as possible (Annex 7). The interview was recorded with audio and

video with the consent of the interviewee. This recording was used to produce the transcript – an example is in Annex 8. The process of data analysis began after all interviews had been conducted.

### 4.4.3 Data analysis with thematic analysis

The thematic analysis was used to analysed themes (categories) and codes that are only outlined the experiences, meanings and motivations of the interviewees. The results are traceable via the report in Annex 9.

The interviewees had diverse answers and perspectives through the interview questions that offered a starting point to analyse the influence of teamwork. The interviewees demonstrated what enhance, impede, and influence teamwork with reference to (agile) values, principles, and practices. The interviewees are mostly influenced by topics that are related to the code 'team member' and 'structure'; they are least influenced by topics related to the code 'restriction' (Annex 9, Table 9). An analysis of the themes (categories) offered the three categories: accomplishment, realisation, and roles. The category realisation captures topics around work arrangement, while the category accomplishment captures topics on the execution of project work and the intersection is captured in the category roles (Annex 9, Table 10).

Project work is influenced by the environmental setup (project methodology and process model). The roadmap influences the work arrangement with the setup of the vision, objective, and planning as control aspects of the project work. The setup of a similar project structure supports the interdisciplinary teams for structured working and communication with each stakeholder. Guidelines for working are enhancing teamwork. These setups provide a framework for the project culture, and all these, taken together, influence the work arrangement. The category *realisation* captures topics around work arrangement and examined management techniques that affect collaboration in a project with a practical standpoint.

Joint working can influence the accomplishment of a project and the motivation of team members. That is influenced by the conditions and culture of the project. The motivation for the work increases with a continuous exchange of current and (project specific) content. It is essential to know the definition of conceptions and respect topics of knowledge management. A hierarchy in the project positively influences the direct contact of everyone, but a hierarchy does not

automatically mean (very) good cooperation. The positive influence of any accomplishment is a result of the definitions and guidelines for the execution. The category *accomplishment* captures topics on the execution of project work and examined leadership techniques that affect teamwork with a practical standpoint.

The intersection of the categories realisation and accomplishment are reflected in the category *roles* with significant interviewee statements in such a way that each agile project role is necessary – each role must play its own defined role in the agile project context, and each project member can use leadership techniques to support others with the defined management techniques for the agile project.

Figure 6 shows a schematically overview of the data analysis resulting from the report (Annex 9). This report contains schematically prepared data based on the exported codebook of NVivo (Table 9 and Table 10), the presentation of the reference distribution of codes (Figure 17) and themes (categories) (Figure 18 a detailed overview and Figure 19 only the categories). This data analysis is mainly inductive, but the deductive approach became clear with the completion of the coding and the discussion to associates the literature with the analysed data in Chapter 5.

# 5 Chapter 5: Discussion of the Connection Between the Literature and Data Analysis

## 5.1 Introductory remarks

This chapter discusses the relationship between Chapter 1 (Introduction), Chapter 2 (Literature review) and Chapter 4 (Data collection and analysis) in conjunction with Chapter 3 (Research methodology) to examine management and leadership techniques to enhanced joint working in a project.

The Introduction (Chapter 1) specifies the basic context and general purpose of this study. The context is that the management is responsible for the realisation, and the leadership for the accomplishment of a project. Managers and leaders are the executive organs; they work with different approaches, and need various techniques for these. The research objectives are:

1. to examine management techniques that affect collaboration in a project.
2. to examine leadership techniques that affect teamwork.
3. to examine in what manner management is associated with leadership for collaboration in a project.

Chapter 5.2 outlines the consolidation of the research objectives (Chapter 1) with a reference to the literature review (Chapter 2) – the theoretical views – and to the analysed data (Chapter 4) – the practical views with the personal attitudes, values, opinions, preferences, knowledge and experience of the interviewees. This chapter provides the basics of the connection and serves as a starting point for the discussions in Chapter 5.3 on management techniques, Chapter 5.4 on leadership techniques and Chapter 5.5 on roles and their influences in a project.

The aim of this chapter is to examine the association of the possibilities for management techniques and leadership techniques in conjunction with the contribution and the relationships to enhance joint working. The purpose is to identify aspects that influence the project, with a focus on the techniques that most influence the project and should be adopted as a basis in every project.

Finally, a summary of Chapter 5 is given.

## 5.2 Consolidation of the literature review with the data analysis

Chapter 2 provided theoretical knowledge about different techniques for management and leadership in projects to improve cooperation.

The chapter 2.2.3 and 2.3.3 examined in a structured way the theoretical view of different procedures in the management and leadership. The manager is primarily responsible for defining the project environment and must identify relevant techniques that work in the context of the project and the business environment to enhance project collaboration (see Figure 1, p. 3). The leader is primarily responsible for continuing collaboration with all project members and relates to human relations. The chapter 2.4 examined procedures that can be used by both managers and leaders to enhance teamwork.

Figure 10 shows the examined categories of management and leadership with the procedures and the connection with the formulas of Laub (2018). The literature review (chapter 2.2 to 2.4) provided a theoretical understanding of the procedures and possible techniques, and highlighted the gap over the lack of a combination of management techniques and leadership techniques to enhance collaboration in projects in the practice. Cooperation is influenced by issues of agility and a constantly changing world (innovations) (Annex 6, Table 5). The practical implications are shown by various reports (Annex 6, Table 5) and underlined by corresponding empirical studies (Annex 5, Table 4).

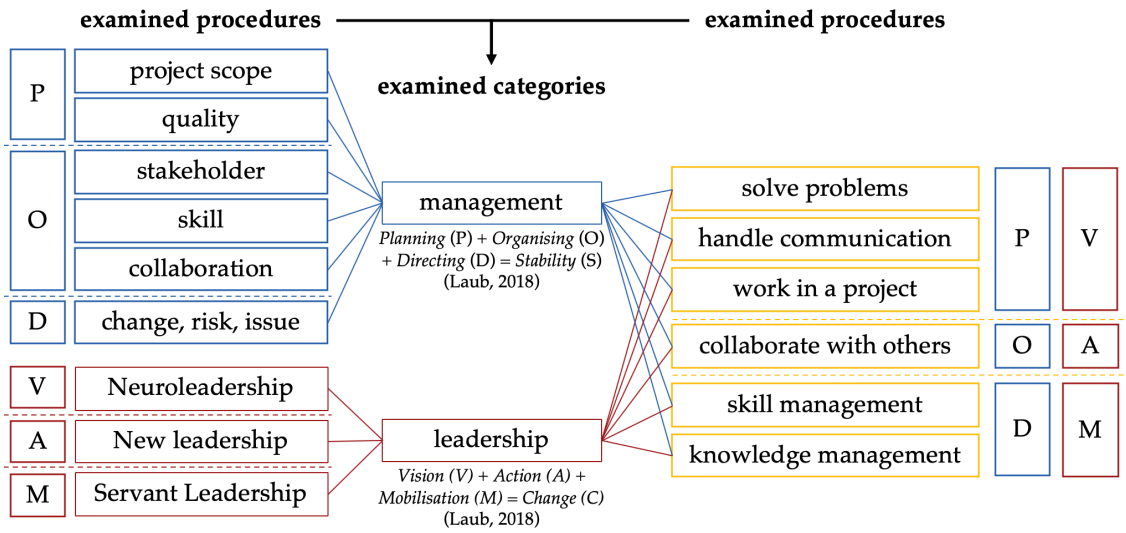


**Figure 10 Overview of the explored aspects**

Figure 6 shows the results of the thematic analysis (Chapter 4) with the schematically analysed categories (themes) and codes that are based on the data collection and analysis report (Annex 9). These results are only outlined the experiences, meanings and motivations of the interviewees with a practical standpoint – example transcript in Annex 8.

1. The category **realisation** capture topics around work arrangement and examined management techniques that affect collaboration in a project.
2. The category **accomplishment** capture topics on the execution of project work and examined leadership techniques that affect teamwork.
3. The category **roles** represent the intersection between realisation and accomplishment, and shows aspects related to the connection between management and leadership for collaboration in a project and team.

The data analysis was mainly inductive, but the deductive approach becomes more obvious with the consolidation of the research objectives (Chapter 1), literature review (examined procedures and techniques, Figure 10), and data analysis (analysed categories (themes) and codes, Figure 6). Table 2 clarifies this relationship and provides the framework for the structure of the chapters 5.3 (management), 5.4 (leadership), and 5.5 (intersection). Each chapter (5.3, 5.4, and 5.5) is summarised in the Annex 10 (Influences on project work from the management perspective), Annex 11 (Influences on teamwork from the leadership perspective), and Annex 12 (Influences on project and teamwork from the management and leadership perspective).

**Table 2 Consolidation of the research objectives with the literature review and data analysis**

| Laub (2018) management formula for Stability (1) | Codes from category realisation (2) | Examined procedures for management (3) | Examined procedures for management and leadership (3) | Codes from category roles (2) | Examined procedures for leadership (3) | Codes from category accom-plishment (2) | Laub (2018) leadership formula for Change (1) |
|---|---|---|---|---|---|---|---|
| Planning (P) | Method, Roadmap | Project scope, Quality | Solve problems, handle communication, work in a project | Project Lead (PM)<br>Product Owner (PO)<br>Scrum Master (SM)<br>Team Member (TM)<br>Customer<br>Generally about roles | Neuroleadership e.g., SCARF model (4) | Conception, Hierarchy, Restriction | Vision (V) |
| Organising (O) | Structure | Stakeholder, Skill, Collaboration | Collaborate with others | | New leadership with emotional leading styles (5) | Motivation | Action (A) |
| Directing (D) | Working, Culture | Changes, risks, issues | Skill management, Knowledge management | | Servant leader concept (6) | Skill, Knowledge | Mobilisation (M) |
| Research objective 1:<br>To examine management techniques that affect collaboration in a project. | | | | Research objective 2:<br>To examine leadership techniques that affect teamwork. | | | |
| Research Objective 3:<br>To examine in what manner management is associated with leadership for collaboration in a project. | | | | | | | |

Description of the table numeration:

1) Formulas based on Laub (2018): management with P+O+D = Stability (S) and leadership with V+A+M = Change (C) - Figure 10.
2) Source is Chapter 4.3 (Data analysis) with the analysed categories (themes) and codes (Figure 6), which are based on the report (Annex 9).
3) Source is Chapter 2 (Literature Review) with the examined procedures for the management and leadership techniques (Annex 6, Table 5; Annex 5, Table 4). The most significant sources were:
    a. for management: Canty (2015), Drucker (2010), Drucker (2012), and Furman (2014) as well as Bloom et al. (2011), Garousi et al. (2019), Lemos & Scur (2012), Uikey & Suman (2012), White & Fortune (2002);
    b. for leadership: Greenleaf et al. (1998), Greenleaf (2012a), Greenleaf (2012b), Peters (2015), Rock (2010a), Rock (2010b), and Rock & Schwartz (2006); and
    c. for the combination of management and leadership: Englund & Bucero (2019), Laub (2018), Laub (2000), and Milosevic (2003) as well as Alsaqaf et al. (2019), Lange & Hernandez-Bark (2020), Moe et al. (2009), Pieterse et al. (2019), PMI (2020), Uikey & Suman (2012).
4) Neuroleadership (Grawe, 2012; Haynes, 2011; Lee et al., 2012; Peters & Ghadiri, 2014; Rock & Schwartz, 2006; Twenge & Campbell, 2008) e.g., SCARF model (Rock, 2010a; Rock, 2010b)
5) New leadership (Bryman, 1992; Chugh, 2011; Englund & Bucero, 2019; Hoch et al., 2018; Li et al., 2016) with emotional leading styles (Goleman et al., 2003; Peters, 2015)
6) Servant leadership concept (Eva et al., 2019; Greenleaf et al., 1998; Greenleaf, 2012a; Greenleaf, 2012b; Qiu et al., 2020; van Dierendonck et al., 2014; van Dierendonck & Nuijten, 2011)

## 5.3 Management techniques with consideration of codes and procedures

Drucker's (2010) categories 'Managing a business, managing managers, and managing worker and work' (pos. 16) can be mapped to planning (P), organising (O), and directing (D) from Laub's (2018) management formula (these result in stability – S). The manager is the main responsible person for the work arrangement in the project (theoretical perspective) (Chapter 2) and these

were analysed in the category *realisation* from the practical perspective of the interviewees (Chapter 4). It is important for a manager to know the business and project environment (Figure 1) to understand the problems in the project. That is necessary for the planning, and before activities are implemented. Englund & Bucero (2019) state that more than 75 % of business activities and operations are projects, and that the manager must keep political out of the project environment.

The following relationships arise in the connection of Laub's (2018) formula (P + O + D = S) with the analysed codes from the category (theme) realisation (Chapter 4.3.2.1 summarised in Figure 6), and to the examined procedures and techniques for the management (Chapter 2.2.3 summarised in Figure 10):

- **Planning** refers to the codes *method* and *roadmap* (4.3), and to the procedures *project scope* (2.2.3.1) and *quality* (2.2.3.3).
- **Organising** refers to the code *structure* (4.3), and to the procedures of *stakeholder* (2.2.3.4), *skills* (2.2.3.6), and *collaboration* (2.2.3.5).
- **Directing** refers to the codes *working* and *culture* (4.3), and to the procedure *changes, risks, and issues* (2.2.3.2).

Annex 10 summarised the exploration of Chapter 5.3.

### 5.3.1 Management techniques for planning

A project uses a project methodology that requires a process model to organise procedures (Figure 1) which establishes the vision, objectives and planning for the entire project. This is reflected in the code *method* and is directly associated with the code *roadmap* (Chapter 4; Figure 6), and these applies techniques of the procedures *project scope* (2.2.3.1) and *quality* (2.2.3.3) (Chapter 2; Figure 10) to capture topics around work arrangement and examine management techniques that affect collaboration in a project (Table 2).

The project methodology is the main framework of the project, and includes the decision and setup with an agile, or hybrid project approach. The project approach must be coordinated with the organisational approach – the organisation environment and culture (Goldman, 1995; KPMG,2017; Rikkilä et al., 2013; Shams et al., 2020; Yusuf et al., 2019). The project methodology can be extended with i.e., an (scaled) agile framework as SAFe, LeSS, or Nexus (Annex 4) as well as with various project practices (ceremonies) and methods e.g.,

Design Thinking, DevOps, or AppOps (Figure 1; ScrumAlliance, 2018). It is essential that the team can work together on the (physical or digital) project environment, and as an interdisciplinary team (Chapter 1.3). In a project, the manager is responsible for defining the project environment, and for each project member. The leader should support the decisions of the project manager and is the main interface with the team members (Chapter 4; Furman, 2014).

The process model (i.e., waterfall, V-Model®, or Scrum – Annex 1 or Annex 2) must be selected in conjunction with the process methodology and the entire environment, with a focus on activities with a value for the project (Alexandre et al., 2020; Canty, 2015). This defines the project scope and thus ensures quality. The quality of the project is ensured by defining a project vision and the required objectives as well as by knowing the communication channels and the involved project members in the entire environment (Candy, 2015; Furman, 2014).

Complex project environments can be handled with techniques for tracking values or indexes i.e., DANCE or SRAA to amend the SPEC of project procedures (Englund & Bucero, 2019). It was found that the project requires planning techniques for the scope of work, supply, time, cost focus, quality, and the (final) result. The project scope and quality procedures deliver techniques to capture and define the project plan with a baseline, scope, and strategy definitions (Juli, 2010; Lyngso, 2017;). Every project should use a technique for the strategic and tactical planning of a structured project strategy e.g., agile / project charter, scope statement, scope baseline, or work breakdown structure (WBS) (Chapter 2). The interviews stated that a description of the project artefacts is required for structured and organised working (i.e., WBS) and the identification of critical success factors (e.g., SWOT analysis) (Furman, 2014; Garousi et al., 201). The manager should be familiar with the necessary requirements within the framework of the project and should define a realistic vision statement to inspire the team members towards a common goal and to create a common course for the project (Canty, 2015; Sanghera, 2018). The interviews revealed that while managers and leaders know the strategic and tactical plans for the projects, team members often do not know these. These are avoidable hurdles and a main reason to create, update, and control the project plan and the measurement of the success factors to minimise gaps with follow-up actions at all times. The roadmap becomes enormously important with an increase in the project size while simultaneously considering the complexity.

Further, the roadmap is required by the team for a self-organised and self-determined way of working. Additionally, the project must offer an option to discuss project procedures to enhance collaboration (Chapter 4).

The technique control chart used to control and measure project procedures / phases, to derive necessary actions, to prevent unreasonable actions and to encourage the quality of the project. The interviews revealed that a procedure is required to handle problems, including a definition of the term problem (Chapter 4). For this, the technique quality improvement map should be used in conjunction with the problem statement, and a form of a visualisation should be published via project boards e.g., Pareto chart or cause-and-effect diagram (Milosevic, 2003).

This becomes the basis for the analysed codes method and roadmap, which influence and enable the control of the project scope and quality assurance (summarised in Annex 10). The next important step for the manager is to organise the project structure.

### 5.3.2 Management techniques for organising

The organising of the project is the continuation of planning (Laub, 2018), and includes the definition of a clear structure to support the values, principles and practices for the project work. This is reflected in the code *structure* (Chapter 4; Figure 6) and these applies techniques of the procedures *stakeholder* (2.2.3.4), *skills* (2.2.3.6), and *collaboration* (2.2.3.5) (Chapter 2; Figure 10) to capture topics around work arrangement and examine management techniques that affect collaboration in a project (Table 2).

The interviews stated that a clear structure and information about the stakeholders, their relations, and communication techniques is mostly missing in a project (Chapter 4). The manager should use techniques (2.2.3.4) to provide a structure for the project artefacts; this is a highly influential aspect for the motivation and teamwork, and encourages working in interdisciplinary teams rather than in multidisciplinary teams (Chapter 4; Yusuf et al., 2019). The customer roadmap is a technique to involving the customer and giving them a voice (Garousi et al., 2019). The communication matrix provides project members with a clear structure for communication and encourages collaborative working (Furman, 2014; Uikey & Suman, 2012). The dependencies should be visualised i.e., QFD this based inter alia on the customer roadmap and

communication matrix (Lyngso, 2017; Milosevic, 2003). The stakeholder matrix captures the complexity of the project, and provides a systematic and transparent process for the manager. This helps the leader to communicate with the project members in an efficient and goal-oriented manner (Milosevic, 2003).

The interviews revealed that skills should be structured (Chapter 4) with i.e., a skill inventory to capture the required business skills for each project role; this supports a development process for each project member. This offers opportunities for a development process according to the needs of each individual, and should be provided with a visualisation (i.e., workflow diagram, wireframe) – that provides easy access, orientation, and further steps to the project (Bloom et al., 2011; Englund & Bucero, 2019; Lemos & Scur, 2012; Milosevic, 2003). The interviews revealed that these techniques are an important motivational factor, but the skills must be practicable, tailored to one's own needs, goal-oriented and related to one's own role and the needs of the project (Chapter 4).

The collaboration is characterised by the framework conditions of the organisation and complemented by the planning framework conditions. The interviews showed that Tuckman's Four-Stage Model (forming, storming, norming, and performing) is a feasible technique (Chapter 4; Milosevic, 2003; Tuckman & Jensen, 1977).

The interviews stated that the manager should define a template for the performance assessment and reporting technique (i.e., commitment scorecard) and appoint responsible persons to fill in this report on an ongoing basis (Chapter 4; Englund & Bucero, 2019; Milosevic, 2003).

A clear and transparent structure is required for the entire project, which supports the cooperation of the individual project members, as all speak with the same language and use efficient communication techniques and channels. The manager is responsible for establishing the structural conditions, that provides the basis for the joint work of the individual project members and support the values, principles, and practices for the project work. This is the basis for the analysed code structure, which has an influence on the stakeholder, skills and collaboration (summarised in Annex 10). The next important step for the manager is to direct the project working and culture.

### 5.3.3 Management techniques for directing

Directing is closely related to planning and organising (Laub, 2018) and thus refers to relevant rules for work, necessary and desirable conditions for the working environment (i.e. at a common location, remote or mixed), applied technologies, and the values and principles in a project. This is reflected in the codes *working* and *culture* (Chapter 4; Figure 6), and these applies techniques of the procedure *changes, risks, and issues* (2.2.3.2) (Chapter 2; Figure 10) to capture topics around work arrangement and examine management techniques that affect collaboration in a project (Table 2).

The interviews stated that a massive intervention results from changes, risks and issues. Changes come with decisions of the customers, or with the demands of the outside world (e.g., new laws / requirements, or no-longer-supported software for the project realisation). Risks are all known and unknown hurdles within and outside the project environment (i.e., insufficient experience with customers business, power struggles, imprecise estimates, inexact requirements, stakeholder conflicts, lack of change management / stakeholder involvement / resources / mobilisation, knowledge or competence gaps). Issues are the systematic handling of risks and problems (Chapter 4). A systematic approach consists of setting up a change coordination matrix, providing a template for change requests, discussing changes / risks / problems with the relevant stakeholders via a change / risk / problem log and documenting the project progress via a (summary progress) report (Chapter 4; Furman, 2014; Uikey & Suman, 2012; White & Fortune, 2002).

The interviews revealed that the manager must make time and room for the learning, feedback, and reflection processes (i.e., post-mortem review), and for capturing changes and risks together with the required stakeholders (e.g., risk workshops) (Chapter 4; Englund & Bucero, 2019; Milosevic, 2003).

The interviews stated that the work influences the cooperation in the project. It is necessary to establish a framework, plans, and rules and to point out dependencies, so that each team member is able to work autonomously (i.e., self-sufficient, self-determined, self-organised) in a project. The interviews revealed that the important factor is that everything can be discussed without blaming, and the focus is on the facts to enhance the processes and performance for a successful working style e.g., with reviews. The cultural aspects have a

significant influence on the joint work and are incorporated into each part of the project (e.g., communication, feedback, meetings, and working). It is therefore important to define rules and guidelines as project conditions in connections with the values and principles. The manager should promote and push the culture aspects in cooperation with the leader and the project members (Chapter 4; KPMG, 2017; Lyngso, 2017; PMI, 2017).

Each of these aspects supports an open and transparent project culture with relevant values and principles, and a working style with relevant project rules, desirable conditions, and applied technologies. This becomes the basis for the analysed codes working and culture, which has an influence on the handling of changes, risks, and issues. Stability results from the interrelated aspects planning, organising, and directing, and this exploration is summarised in Annex 10. The focus was on the required work arrangement to realise a project and to enhance teamwork from the management perspective. The manager does not handle the examined aspects alone; they need the leader as backup, who in turn needs backing from the team members, who in turn need encouragement from the leader and manager (Drucker, 2012).

The next important step in enhancing collaboration is to explore the leadership perspective.

## 5.4 Leadership techniques with treatment of codes and procedures

The leader is mainly responsible for leading a team to the project-specific direction, and for inspiring and influencing the team members (Englund & Bucero, 2019). The focus is on humans – their feelings and ethical aspects (Bennis, 2015). To achieve this, the leader creates an impression of vocation and charisma (Peters, 2015), and ensures trustworthiness, morale and team harmony (Graham, 1997). The leader is the main responsible person for the execution of the project (theoretical perspective) and these were analysed in the category *accomplishment* from the practical perspective of the interviewees. It is important for a leader to know and understand the team members with their individual needs and problems. These conditions can be connected with Laub's (2018) leadership formula (Vision + Action + Mobilisation = Change). This formula can be mapped to the analysed codes of motivation, skills, conception, knowledge, hierarchy, and restrictions from the category (theme) accomplishment (Chapter

4.3.2.2 summarised in Figure 6), and to the examined procedures and techniques for the leadership (Chapter 2 – 2.3.3 summarised in Figure 10).

- **Vision** refers to the codes *conception*, *hierarchy*, and *restriction* (4.3), and to the leadership procedure *neuroleadership* (2.3.3.2).
- **Action** refers to the code *motivation* (4.3), and to the leadership procedure *new leadership* (2.3.3.1).
- **Mobilisation** refers to the codes *skill* and *knowledge* (4.3), and to the leadership procedure *servant leadership* (2.3.3.3).

Annex 11 summarised the exploration of Chapter 5.4.

### 5.4.1 Leadership techniques for the vision

Vision is the arrangement of the real future and personal power activities (Laub, 2018), and thus refers to schedules, visions and conditions for working on a project with a precise statement about the hierarchical structures as well as the limits and boundaries of the working environment. This is reflected in the codes *conception*, *hierarchy* and *restriction* (Chapter 4; Figure 6) and these applies techniques of the procedure *neuroleadership* (Chapter 2.3.3.2; Figure 10) to capture topics on the execution of project work and explore leadership techniques to affect teamwork (Table 2).

The leader working in different project phases and procedure with several techniques; they need different competencies for this demanding job just as the neuroleadership needs bond, orientation and control, self-esteem, self-protection, pleasure, and prevention of reluctance (Grawe, 2012). This can be achieved by using the SCARF model (Rock, 2010a; Rock, 2010b) in conjunction with the SMART approach (Pete, 2017). The interviews revealed that this model and approach has a significant impact in practice (Chapter 4).

The interviews stated that a conception is necessary to define the border of the work, and this is essential for teamwork. It was also stated that most projects lack planning of the project phases as well as tracking and adaption of relevant themes within the project (Chapter 4). The leader should encourage each project member to address any anomalies and support in finding a solution – for this purpose neuroleadership can be used. The two domains are suitable for this: working with and influencing others, and facilitating change (Chapter 2.3.3.2; Nordlund & D'Amato, 2017).

The interviews revealed that restrictions are required for the teamwork. It is important to set clear guidelines (e.g., for communication and meetings to implement a working culture). Some restrictions can be influenced by the organisation and the project environment, while others are influenced by legal, technological, or other regulatory requirements. Requirements that cannot be influenced need more attention that they do not create impediments for joint working in a project (Chapter 4). The leader can support the digital, virtual project work environment with a transformative leadership style in combination with neuroleadership to give the team members freedom and self-determination in dealing with constraints (Chapter 2.3.3.2; Lieske, 2020).

The interviews revealed that teamwork is essential to achieve the defined endpoint of the project and this required that each project member knows and works in their own roles, knows the hierarchy for each situation (contact and responsible persons), and provides support to others in situations that require it (Chapter 4). The leader can inform and influence with leading disciplines from the neuroscientific knowledge (which offer a broad spectrum) - towards the team members (i.e., through coaching, consulting, psychology, training, productivity and endurance), and towards the management through e.g., change management and management training (Chapter 2.3.3.2; Nordlund & D'Amato, 2017).

The interviews stated that by the most projects lack dedicated hierarchies in form of responsibilities, tasks, and relationships as prerequisites for efficient collaborative work. A hierarchy of responsibilities is important, as it allows for rapid feedback to track the results to the best solution (Chapter 4). In these cases, the leader can use the neuroleadership domains of emotional regulation, decision making and problem solving (Nordlund & D'Amato, 2017) as well as the SCARF model to identify weaknesses together with the project members (Peters, 2015; Rock, 2010a; Rock, 2010b).

This is the basis for the analysed codes conception, hierarchy, and restriction, which influence and enable the vision of the project (summarised in Annex 11). The next important step for the leader is to activate the project members.

### 5.4.2 Leadership techniques for the action

Action is the guidance by a purposeful and powerful vision (Laub, 2018), and thus refers to support the relationship between organisation and self-

determination in a project. This is reflected in the code *motivation* (Chapter 4; Figure 6) and these applies techniques of the procedure *new leadership* (Chapter 2.3.3.1; Figure 10) to capture topics on the execution for project work and explore leadership techniques to affect teamwork (Table 2).

The new leadership approach (Bryman, 1992) is based on the use of emotional intelligence, with the key competencies of empathy, motivation, self-reflection, self-regulation, and social skills (Peters, 2015). Chugh (2011) adds to these the capabilities of self-management, self-awareness, and social awareness. Englund & Bucero (2019) define emotional quotient with self-awareness, self-management, and relationship management. These are applied via a mix of affiliative style, authoritative style, coaching style, coercive style, democratic style, and pacesetting style (Chapter 2.3.3.1). Motivation is the result of the interplay of different approaches, styles and competencies with a focus on emotional intelligence. These should be used to motivate team members and to tackle the following themes of the interviewees from Chapter 4.

The interviews stated that if the leader is constantly in a bad mood, entrusting one of the team members with all the work, changing priorities from time to time, and thinking that the work of the team members is inappropriate and the leader does all the work himself, such a leader is demotivating for the team and a bad example of leadership qualities. An effective working technique is to deal one's own emotions, time, priorities, energy, and thinking and to use the powerful technique of delegating to involve others. The human perspective is an important aspect of collaboration and is usually underestimated alongside business, processes and procedures (Chapter 4).

The interviews revealed that if the leader identifies a task, that they can solve to relieve someone else then this is a proactive approach and an important aspect to inspire others to do the same. This means self-organising, which is characterised by complementary work and arises from a strengthening of self-esteem. If a team member self-organises a task, then the team member must receive positive feedback, regardless of the solution. If the solution is a failure, then it must be analysed as a part of the learning process to achieve improvement for the future (Chapter 4).

The interviews stated that a project framework and conditions are necessary for a team member to attempt self-management. This includes a clear setup and

communication about the methods, roadmap, structure, and working for an efficient teamwork in the project as well as a culture of reflection that enables a common working. There must be the possibility to discuss and, if necessary, adjust conditions in order to recognise and understand the value of the conditions, and to stand behind them. The project environment should be in line with the structure of the company and organisation. This supports the fact that new things can be learned and knowledge can be exchanged at a high professional level, which requires a free decision in the selection of training programs, and test of new ideas and methods during project work (Chapter 4).

The interviews stated that obstacles can be removed through a clear and open feedback culture and solution-oriented small cycles, which helps to increase motivation in the team as well as small joint events inspire, motivate and promote personal relationships, but this should be influenced by a realistic view of the provided solution (Chapter 4).

The interviews revealed that trust is a strong motivational aspect that cannot be forced, but is established over time and limited by the size of the project team (Chapter 4).

These approaches and techniques provide an opportunity to promote the development of each person's full individual potential while respecting that motivation is a balancing act between challenge and encouragement. As one interviewee put it very aptly: 'If a team member loses motivation, the project is lost'. This is the basis for the analysed code motivation, which influence and enable the activation of the project members (summarised in Annex 11). The next important step for the leader is to mobilise the project members.

### 5.4.3 Leadership techniques for the mobilisation

Mobilisation refers to the activation of team members to be enthusiastic and willing to move from one point to another to become proactive, and to move from the non-leader to the leader (Laub, 2018). Thus refers to qualification for further personal development, and the handling of topics around learning and reflection processes. This is reflected in the codes *skills* and *knowledge* (Chapter 4; Figure 6) and these applies techniques of the procedure *servant leadership* (Chapter 2.3.3.3; Figure 10) to capture topics on the execution of project work and explore leadership techniques to affect teamwork (Table 2).

Greenleaf's et al. (1998) servant leadership is characterised by 'selflessness, humility, authenticity, integrity […], developing people, empowerment, […] relationships, stewardship, valuing people, […] and providing leadership / vision / influence' (Laub, 2018, pos. 2598) with the features i.e., listening to others, offering empathy to other needs, healing, awareness, persuasion, conceptualisation, foresight, stewardship, commitment to the growth of people, and building community (Greenleaf et al., 1998) for efficient communication and cooperative working. The interviews revealed that servant leadership should be use to mobiles each project member to share their own skills and knowledge, but this required support of the entire environment.

The interviews stated that skill development and knowledge sharing are time-consuming and extensive work, but remain the best investment to develop creative solutions from motivated team members, who have an increasing interest in high-quality solutions. It is very hard to get free time for regular learning. Most projects give lip service that they support continuous learning but do so only in free time outside working hours. Another side is that the interviewees are demotivated by standard learning's without any personal value. The motivation increases with the freedom to select any learning topic of interest or with information about why a training session is important for the recipient (Chapter 4).

The interviews stated that the leader should encourage the team members to look beyond the horizon of their own profession. The leader should create opportunities to discuss conferences, meetings, news and books, but also encourage team members to talk about their own personal interaction with others. This includes a commitment by team members to support young talents or to work as trainer/mentor/tutor. The leader should provide the space for active participation in user groups, training sessions or online courses in order to continuously develop professional or theoretical know-how. The leader should encourage team members to think about feedback and catapult them out of their comfort zone to form their own opinions (Chapter 4).

The interviews revealed when the leader identifies a lack of skills or knowledge to perform an action, the leader should talk to the team member to analyse the gap and determine the reason. The focus should be on facts to avert possible risks. This is not an act of blame, but a way to improve quality and find a goal-

oriented solution. For example, the leader may ask all members to support each other, or ask one member to act as a direct contact person for questions and future reviews. Another possibility is to ask the manager to reserve time for training. This shows that the principles for cooperation have been understood. The leader should promote a culture that allows to be made mistakes, and encourage the team to discuss this openly as well as that this culture is accepted and supported by every project member (Chapter 4).

These aspects show that servant leadership is a team-oriented approach and that the leader must have the courage to encourage the cooperation and mobilisation of followers, focusing on healing the team members for various emotional problems such as anxiety, stress and fear. Servant leadership has the focus to strengthen the culture of cooperation in a project and thus create a pleasant climate for the exchange of knowledge. Servant leadership can be measured with OLA or SLS (Chapter 2.3.3.3).

This is the basis for the analysed codes skills and knowledge, which influence and enable the mobilisation in a project. Changes results from the interrelated aspects vision, action, and mobilisation, and this exploration is summarised in Annex 11. The focus was on the execution of project work to activate the project members and to enhance teamwork from the leadership perspective.

The next important step in enhancing collaboration is to explore the intersection of the management and leadership perspective.

## 5.5 Intersection of techniques for management and leadership

The data analysis (Chapter 4) identified the three categories (themes) realisation (management; Chapter 4.3.2.1), accomplishment (leadership; Chapter 4.3.2.2), and roles (Chapter 4.3.2.3) that are summarised in Figure 6. Category roles described other members that influence the agile project besides manager (5.3) and leader (5.4), and represent the intersection between realisation and accomplishment that is summarised in Figure 10 and listed in Table 2. This chapter outlines the influences of other members (Annex 1; Annex 2), but focuses on techniques and their manner in which the management is associated with the leadership for collaboration in a project.

Laub's (2018) formulas do not foresee an intersection of management (Planning + Organising + Directing = Stability) and leadership (Vision + Action + Mobilisation = Change), therefore the formulas are merged in this chapter and the following structure results to examined the procedures and techniques for the management and leadership (Chapter 2 – 2.4 summarised in Figure 10).

- **Planning and vision** combines the procedures *solve problems* (2.4.2), *handle communication* (2.4.3) and *work in a project* (2.4.4).
- **Organising and action** combine the procedure *collaborate with others* (2.4.5).
- **Directing and mobilisation** combines the procedures *skill management* (2.4.6) and *knowledge management* (2.4.7).

Annex 12 summarised the exploration of Chapter 5.5.

### 5.5.1 Techniques for planning and vision

Planning is about structuring the project from the management perspective and vision refers to the shaping of the real future and personal power activities from the leadership perspective. For this combination, the procedures *solve problems* (2.4.2), *handle communication* (2.4.3) and *work in a project* (2.4.4) were examined to cover aspects related to work organisation and the execution of project work, and techniques were examined that affect the way in which management is associated with the leadership for cooperation in a project.

The interviews revealed that the Agile Manifest is a kind of dogma and shows a path with many junctions that one can or cannot follow (Chapter 4). An agile project (with four values, 12 principles, and several practices) is not faster than a traditional project (with 47 processes in five groups), mathematically speaking (Canty, 2015; PMI, 2020). The focussed path must be customised to the specific requirements and conditions of the environment and the ecosystem project (Chapter 1; Figure 1).

The interviews pointed out techniques that support the daily agile collaborative working, like common rituals (i.e., daily stand-up, planning, reviews, retrospection, showcases or demos), usage of kick-offs and events to develop personal relationship, usage of Design Thinking, DevOps, or AppOps. The interviews uncovered that all agile roles are necessary and each role must play its own role. Moreover, a Sprint always have the same length and it takes courage to carry over incomplete User Stories into the next Sprint. It has to be

accepted that the best solution is usually not covered by the budget, but a step-by-step approach to an optimal user-oriented solution. Techniques such as experiments or PoC should be used to find the solution. These approaches require continuous feedback, e.g. 360º and personal feedback (Englund & Bucero, 2019; Lyngso, 2017; Moe et al., 2009; Schwetschenau et al., 2016). It is important to be open to constructive criticism and comments, and to think about situations in order to test limits and identify disruptive factors. Transparency is essential as a basis for autonomous decisions and interaction. This requires a proactive working style, the courage to take personal and joint responsibility within the team and the willingness to accept the consequences of decisions. All this requires a vision to work on a goal-oriented, user-oriented solution and to deal with the conflicting requirements of the various stakeholders (Pieterse et al., 2019). Leaders and managers need emotional intelligence to clarify issues in a targeted manner and the courage to enforce culturally agile aspects and to release involuntary team members from the agile project (Chapter 4; Englund & Bucero, 2019).

The interviews revealed that the role manager and leader does not exist in an agile project (Chapter 4), but Canty (2015) offers a list of different management forms to the agile approach. Furman (2014) states that 'waterfall PM is the scrum master' (chapter 14) but also says that a Scrum Master is more of a facilitator than a project manager (PM), because the Scrum Master helps by removing barriers, and improving the team productivity (Furman, 2014). The interviews stated if a project moves from a waterfall approach to an agile Scrum approach, major confusion over responsibilities arises (in relation to Chapter 2.4.1). The paradox is to define a Scrum Master as leader and the Product Owner as manager. Because the Scrum Master is responsible to enable the team to develop productive deliverables. The Product Owner is mainly responsible for the deliverables (interaction to capture and manage the requirements, accept or reject the Sprint deliverables, and present the team performance for the Sprint), and the interface between team members and customer is secondary. In relation to waterfall and agile, 'the biggest common ground is that both the sponsor (waterfall) and the Product Owner (scrum agile) are the primary liaison to the customer' (Furman, 2014, chapter 14). The two main differences are that the sponsor has the financial responsibility and in Scrum the Product Owner does not assume this responsibility and that the Product Owner is responsible for the

deliverables (strategy, prioritisation, assignment, decision-making, budget of the deliverable) while the sponsor does not assume this responsibility in the waterfall approach (Furman, 2014). This is one reason why clear definitions are essential for the work organisation and the execution of project work.

The interviews stated that the manager should have a close connection with the customer to illustrate the agile working, that the customer understands the agile project setup and the possible influencing options as well as the handling of changes and the delivery of a solution via a value-driven approach. Because the customer has a high influence on the entire project, and the motivation of team members. The manager is the tour guides for the agile project journey, need a wide range of knowledge about the business, (agile) methods, and technologies, and must be accepted by all project members (Chapter 4).

The interviews revealed that the hierarchy is dependent on the project and environment, but each hierarchy should be described with the use of the SMART approach to define the roles and their responsibilities (Lyngso, 2017; Milosevic, 2003; Pete, 2017). This allows quick feedback to track the findings for the best solution. The interviewees confirm that i.e., Design Thinking is a good opportunity to establish direct contact with the end user to exchange and discuss preferred solution ideas and to optimise the solution. The interviews stated that these hierarchical conditions are unclearly or ambiguously communicated in most projects and that the (traditional) management structure of the company must be respected when setting up the structure. Otherwise, the hierarchy would strongly influence the structure of dependencies of the (agile) team members to the (traditional) direct superior (Chapter 4). This can be ensured by setting a high-quality standard with the use of techniques like the affinity diagram, information requirements study, object lifecycle analysis, object-oriented functional design, project quality program, process quality assurance, system management, technical design, or testing (Chapter 2.4.4; Lyngso, 2017; Milosevic, 2003).

The interviewed coaches mention an existing gap between the management (manager and leader) and team member perspectives, which can be reduced with a clear handling of planning and vision for the project (Chapter 4). The interviews stated that the leader should observe the entire environment in order to identify situations with problems, conflicts, or any relevant hurdles for the

project at an early stage. This also includes encouraging team members to solve the situation themselves, and to involve the leader only when this is impossible. For this, the team needs clearly formulated expectations and feedback from the leader (Englund & Bucero, 2019). These should be recorded and processed to avoid misunderstandings. The leader needs knowledge and honesty in order to remove obstacles with an attachment to the team members and the entire environment. If a solution with the team members is not possible, then the leader must contact the manager to clarify the situation and to achieve a satisfactory result for all project members (Englund & Bucero, 2019). These problems can be minimised with e.g., schedule management, pre-/ post-mortem review, team radar, or 360-degree assessment (Chapter 4; Moe et al., 2009; Schwetschenau et al., 2016). The schedule management can be used to eliminate problems, coordinate scope and cost, and to assist in 'team, quality, and procurement planning' (Milosevic, 2003, chapter 6).

The manager should create a culture and style that focuses on facts, future improvements and goal-oriented information (Canty, 2015; Furman, 2014; Sanghera, 2018; Ugboro & Obeng, 2000). An important part is the culture of communication, which enables friendly understanding and dealing with conflict situations in the increasing field of work in globalisation (Ch et al., 2020; Englund & Bucero, 2019). The manager should provide targeted visualisation tools, and the leader should encourage continuous use in the project. This has a high added value and supports communication (Furman, 2014). One-way communication (i.e., e-mail, instant messenger, WhatsApp) require special attention to avoid misunderstandings and conflict situations. The interviews revealed that there should be project rules for this e.g., for direct and open communication with a positive attitude and focus on facts (no blaming) as well as for effective meetings. Meeting required rules for proceeding (i.e., agenda, preparing, time-boxing), techniques of the presentation and facilitation, and listening techniques like active, effective, or empathic listening (Chapter 2.4.2; Chapter 2.4.3; Chapter 4; Canty, 2015; Furman, 2014; Sanghera, 2018; Ugboro & Obeng, 2000).

Another important aspect concerns the culture of the working environment, for this the manager should select the most advantageous techniques with advice from the leader, so that necessary techniques are selected with a value for the project and the team. These techniques and their use must be communicated

continuously with the project members (Chapter 2.4.4; Chapter 4; Lyngso, 2017; Milosevic, 2003).

The interviewees confirm that respect, an open approach, positive influence, a strong sense of responsibility and commitment, and empathy are the most important competencies of the manager and leader. This also conveyed trust and motivated each project member. As a technique, the three P's (passion, perseverance, patience) were to be used to promote creativity and innovation (Englund & Bucero, 2019). Project members are more motivated when they are approached with empathy and charisma, when appropriate tasks are delegated to them, and when the manager and leader can be managing their own emotions, time, priorities, energy and thinking (Englund & Bucero, 2019; Furman, 2014). The manager and the leader should give an example of self-organisation and self-management if they expect this from the team, that includes the acceptance of a failure as learning process (Furman, 2014; Lange & Hernandez-Bark, 2020) as well as the specification of the planning conditions and vision for the project (Chapter 2.4.4; Chapter 4; Lange & Hernandez-Bark, 2020; Pieterse et al., 2019; Uikey & Suman, 2012).

Fact is a project needs a responsible person to manage the entire project requirements and sets up the project framework as well as a team needs a responsible person who lead the team and its work, focuses on people and their human needs and protects the team from influences that impede teamwork (Chapter 4). That required a clear definition of the project planning and vision. These can be obtain with the usage of techniques from the management procedure *project scope* (2.2.3.1) and *quality* (2.2.3.3), the leadership procedure *neuroleadership* (2.3.3.2), and the overlapping procedures *solve problems* (2.4.2), *handle communication* (2.4.3) and *work in a project* (2.4.4) to define the *method* and *roadmap* (4.3), and manage the *conception*, *hierarchy*, and *restriction* (4.3) as well as that is summarised in Annex 12. The next important step for the manager and leader is to organise the working environment and activate the project members.

### 5.5.2 Techniques for organising and action

Organising is the continuation of planning, and includes the definition of a structure for the project work from the management perspective and action support the relationship between organisation and self-determination in a project from the leadership perspective (Laub, 2018). For this combination, the

procedure *collaborate with others* (2.4.5) was examined to cover aspects related to work organisation and the execution of project work, and techniques were examined that affect the way in which management is associated with the leader for cooperation in a project.

The interviews stated that the joint working is supported by the usage of agile practices for the working and the joint cooperation of each role. The working is influenced by the practice and business know-how of each stakeholder. Every agile project role is necessary and equally important. The agile project has a fragile construct of three parties, which is different from a traditional approach. The three parties are the Product Owner (define the what), the Scrum Master (enhance the self-organised team), and the team (define the how). Each stakeholder inside and outside the agile project must accept this ecosystem with the agile culture (Chapter 4).

The interviewees confirmed that a Product Owner can do a lot, but not without a working team. Similarly, a well-functioning team needs a well-functioning Product Owner, who is strong and target oriented. The Product Owner is responsible to deliver requirements (as User Stories) to the team, that the team can work with the User Stories to receive a solution in a Sprint (Chapter 4).

The interviews stated that the Scrum Master protects the team against outside influences. If the Scrum Master does a good job, the team can work autonomously and alone on the values, principles, and practices, while the Scrum Master supports his own fade-out. It is a high motivation to see the team progress, to see how fast the team members assume responsibility, to enhance the team phases, and to work productively with real results. Some interviewees consider the Scrum Master to be a counterpart to the Product Owner; they relieve the Product Owner from reporting tasks and supports the Product Owner, so that the Product Owner can work on the professional specialist know-how, create User Stories and fill the Product Backlog (Chapter 4).

The interviews revealed that the manager should call continuously all project members for a short, effective briefing, taking into account the necessary factors e.g., time, rules, media, or assistance. This requires an appealing design (i.e., media, style of writing or speaking, gestures, meeting / presentation / facilitation techniques, charisma) and the support of the leader (Chapter 4; Canty, 2015; Furman, 2014; Sanghera, 2018).

The interviews stated that the manager should organise actions to strengthen cooperation and the leader should motivate all project members to participate in the actions and communicate the reason and value for participation. Common activities increase collaboration such as via networking (i.e., lunch, dinner, or events), workshops, user groups (i.e., CoP, or write an article / paper), or other team-building activities (i.e., games, races, or sport). In order to collect the ideas, suggestions or concerns of the project members passively and anonymously, a box can be set up in which slips of paper can be deposited. For this purpose, an evaluation must be carried out in which all project members are involved (Chapter 4) i.e., via corkboard with sticky notes, and prioritisation e.g., via dot voting, monopoly money, 100-point model, or MoSCoW prioritisation scheme (Canty, 2015; Furman, 2014). This supports the combination of fun and work in the daily business (Bucero & Englund, 2019; Graham, 2006) as well as team-building activities to increase motivation and collaboration (Furman, 2014), and can be combined with agile team games e.g., start your day, product box, or me and my shadow (Canty, 2015). If the team is co-located, other creative group activities can be found, because where is a will there is a way. Important is to change the style from a task-oriented to relationship-oriented style (Canty, 2015; Englund & Bucero, 2019; Graham, 2006).

The interviews revealed that it is important to know why you do what and not proceed blindly with any ceremonies like a zombie. Thus, it is essential to start the conversation with critical questions about the why. This is important because people and not robots design solutions, and if the people understand why they are doing something, then they are motivated, work creatively, and have fun while working in a project. A personal relationship between the project ecosystem and the external environment is essential for a successful project.

The interviews stated that everyone is motivated to improve their own daily work independently through self-reflection. This intellectual processing is underestimated by each project member, but is essential for a joint value-adding work with the agile values and principles (Chapter 4).

The interviews revealed that teamwork is often not done appropriately and the possible results (i.e., conflicts, misunderstandings, missing hierarchy structures) are often underestimated. The interviewees point out that team building should start with the use of Tuckman's Four-Stage Model (Canty, 2015; Milosevic, 2003;

Tuckman & Jensen, 1977) and can be combine with the situational leadership (2.3.3.1). That is an essential technique to support, delegate, direct, and coach team members to build and guide a team as its leader and manager (Chapter 2). The defined management techniques (i.e., plans, structures, templates) should be communicated to each stakeholder for clear, structured, and transparent working (Chapter 4). These techniques should be supported with the use of maps and documented with fewer words – the best practice is one-page documents or visualisation techniques. The interviews revealed that each project requires a specific description of roles and responsibilities, and the requirements for what needs to be documented e.g., which protocol is necessary in a particular situation (Chapter 4). Only necessary and requested documents with a defined value are to be provided, thus generating added value for the entire project. Techniques can be used in combination with tools for the visualisation i.e., personas, prototypes, or team plans are visualising via whiteboards, use cases, data models, or screen mock-ups. Quality increases with a suitable location and a shared use of techniques, principles and tools (Canty, 2015; Uikey & Suman, 2012).

The interviews stated that the working environment and project culture have a significant influence on the motivation of the individual team members and this influences the cooperation between them as well as every project member should know the background of emotional intelligence and the importance of empathy for a better common work (Chapter 4). The manager is responsible for the selection of appropriate principles and techniques as well as electronic and collaboration technologies, especially for working with virtual teams. The leader should support the manager and encourage the team to use all principles, techniques and technologies in their daily work (Englund & Bucero, 2019). These can be obtain with the usage of techniques from the management procedures *stakeholder* (2.2.3.4), *skills* (2.2.3.6), and *collaboration* (2.2.3.5), the leadership procedure *new leadership* (2.3.3.1), and the overlapping procedure *collaboration with others* (2.4.5) to define the *structure* (4.3), and manage the *motivation* (4.3) as well as that is summarised in Annex 12. The next important step for the manager and leader is to direct the working environment and mobilise the project members to improve the teamwork.

### 5.5.3 Techniques for directing and mobilisation

Direction refers to relevant rules for work, necessary and desirable conditions for the project working environment from the management perspective and mobilisation refers to the activation of team members from the leadership perspective (Laub, 2018). For this combination, the procedures *skill management* (2.4.6) and *knowledge management* (2.4.7) was examined to cover aspects related to work organisation and the execution of project work, and techniques were examined that affect the way in which management is associated with the leader for cooperation in a project.

The interviews stated that an open and transparent culture enables team members to communicate skill gaps to a leader or manager. This is not placing blame; rather, it is a cultural aspect to learn from each other over the complete lifecycle of the project, leading all stakeholders to improve and help each other. It is also important that positive (strength) and negative (weakness) facts should be communicated factually and without personal feelings. Failures are possible and a kind of a learning process, but repeated failures should be avoided (Chapter 4). Servant leadership characteristics support a common basis for communication and transfer of notes to others and listening to what others say. The leader should take particular care to ensure that the team members have regular time to give and receive feedback, reflect on situations, carry out networking and communication, and test ideas (Eva et al., 2019; Greenleaf, 2012a; Greenleaf, 2012b). New ideas can be received in light of current developments in the market; a large variety of sources are needed to keep their own skills current. The manager should plan free time (i.e., 30 minutes each week) for these activities. This could lead to a continuous updating of the skill inventory, business skill analysis, and regular activities to improve skills and knowledge (Englund & Bucero, 2019; Milosevic, 2003; MIT Sloan Management Review, 2019). Agile in the practice life from the connection with other, each option should be used to keep current the own knowledge e.g., via meetups (WeWork Companies, n.d.), Agile On The Beach (Agile on the Beach, n.d.), agile conferences, agile communities, podcasts, webinars, or social media (e.g., LinkedIn, Instagram).

The interviews revealed that the importance of knowledge transfer becomes clear when a manager or team member is prevented from working (e.g. heart attack, accident, illness, vacation). This is not an obstacle if decisions have been

worked on together and things have been documented in such a way that the tasks can be carried out without research. This is a reason to involve others in decision making, exchange targeted information and delegate activities – this is an interpersonal skill and a way of sharing knowledge (Chapter 4; Englund & Bucero, 2019; Uikey & Suman, 2012).

The interviews stated that normally, a command and control structure is obsolete for a project, but sometimes this is necessary to handle critical situations or unwilling team members. The command is a kind of responsibility for the decision or is necessary to catapult the stakeholders out of their comfort zone. Self-management is acceptable and possible to a certain extent, which increases with a defined framework and conditions, and encourages self-sufficiency (Chapter 4; Alsaqaf et al., 2019; Uikey & Suman, 2012).

The interviews revealed that each project member should be willing and open to work transparently, communicate risks and impediments without blaming others, give and accept feedback (feedback circles), do self-reflection (i.e., legacy vision – Haneberg, 2019) and act flexibly, motivate themselves and others, support continuous learning, and be open to new ideas – that is a kind of servant leadership technique (Chapter 4). Servant leadership can only be understood with a clear definition of leadership (Eva et al., 2019; Greenleaf et al., 1998; Greenleaf, 2012a; Greenleaf, 2012b; Qiu et al., 2020; van Dierendonck et al., 2014; van Dierendonck & Nuijten, 2011).

Peters (2015) stated that the *Gallup Engagement Index* measures and points out the importance of emotional intelligence and mentions studies about working environment and management styles (Annex 5; Gallup, 2018; Gallup, 2019).

The manager is responsible for the selection of appropriate principles and techniques that are support the directing and mobilisation. The leader should support the manager and encourage the team to use all principles and techniques. These can be obtain with the usage of techniques from the overlapping procedures *skill management* (2.4.6) and *knowledge management* (2.4.7) to define the *working* and *culture* (4.3), and manage the *skill* and *knowledge* (4.3). This exploration is summarised in Annex 12 with the focus on techniques and their manner in which the management is associated with the leadership for collaboration in a project from the management and leadership perspective.

## 5.6 Summary of chapter 5

### 5.6.1 Introductory remarks

The focus was on the relationship between Chapter 1 (Introduction), Chapter 2 (Literature review) and Chapter 4 (Data collection and analysis) in conjunction with Chapter 3 (Research methodology) to examine management and leadership techniques to enhanced joint working in a project and to examine in what manner management is associated with leadership for collaboration in a project.

### 5.6.2 Consolidation of the literature review with the data analysis

Figure 11 shows the combination of the procedures (theoretical view – Figure 10 based on Chapter 2) with the analysed categories (themes) and codes (practice-oriented view – Figure 6 in Chapter 4) in connection with the research objectives (Chapter 1), and structured in Table 2 with Laub (2018) formulas.

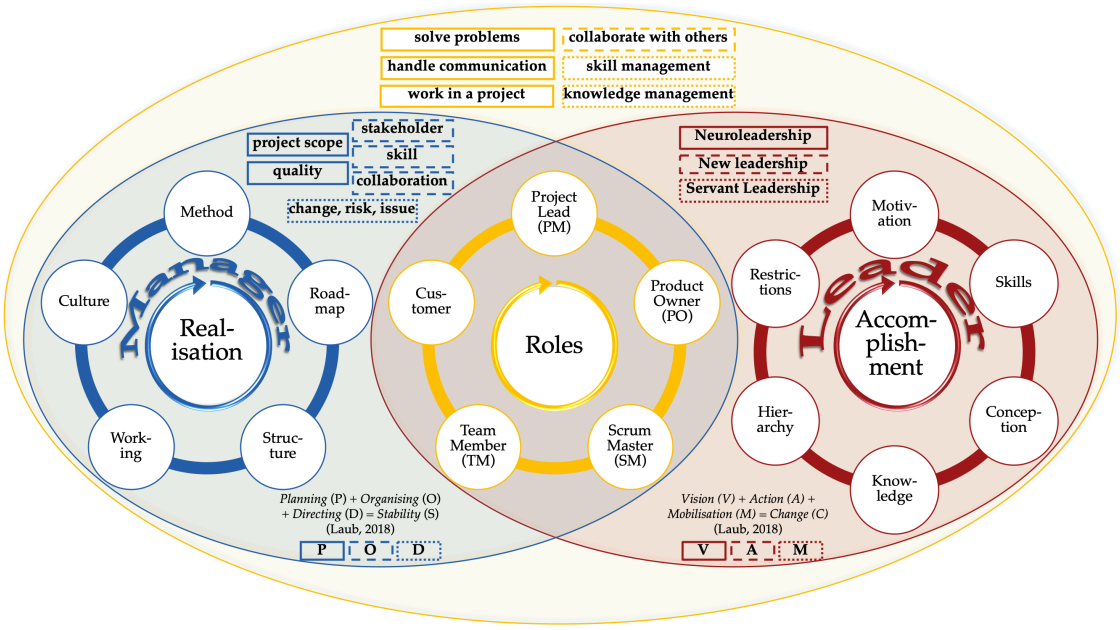


**Figure 11 Consolidation of procedures and analysed codes and categories**

### 5.6.3 Management techniques

The *realisation* (Figure 6) of the project is influencing by aspects of planning, organising and directing to obtain a stability in the project, and the manager is main responsible person for the work arrangement. This chapter based on Laub's (2018) formula Planning + Organising + Directing = Stability (Chapter 2) to examine management techniques (Figure 10) that affect collaboration in a

project (Chapter 1). Figure 11 shows the overview of the consolidation (Table 2), and the management techniques are summarised in Annex 10.

*Planning:* The manager knows the business and project environment (Figure 1) to understand problems, to implement required practices, and set a path for the entire project.

*Organising:* The manager establishes the conditions for a structured approach throughout the project (i.e., guidelines, communication techniques and channels) in order to enshrine values, principles and practices for project work.

*Directing:* The manager establishes the framework with the relevant project rules, principles and desirable conditions for the working environment (i.e., applied technologies, at a common location, remote or mixed) and for an open and transparent project culture.

*Stability:* These setups provide a framework for the working and project culture, and all these, taken together, enhance or impede the work arrangement for the realisation of a project.

### 5.6.4 Leadership techniques

The *accomplishment* (Figure 6) of the project is influencing by aspects of vision, action, and mobilisation to obtain changes in the project, and the leader is main responsible person for the execution in the project. This chapter based on Laub's (2018) formula Vision + Action + Mobilisation = Changes (Chapter 2) to examine leadership techniques (Figure 10) that affect teamwork (Chapter 1). Figure 11 shows the overview of the consolidation (Table 2), and the leadership techniques are summarised in Annex 11.

*Vision:* The leader inspires and influences the team members via a personal bond in the project-specific direction in order to respect the concepts, hierarchies and constraints and improve them together.

*Action:* The leader encourages the development of the full individual potential of each person and motivates with the respect between challenge (project, organisation) and encouragement (self-determination).

*Mobilisation:* The leader encourages a team-oriented approach, personal development, learning and reflection processes and the healing of team members with various emotional problems.

*Changes:* The leader encourages a culture of collaboration and provides a pleasant climate for an active and motivating exchange of skills, knowledge and project-specific aspects, because if a team member lacks motivation, the project is doomed.

### 5.6.5 Intersection of techniques

This chapter outlines the influences of project members (category roles in Figure 6), but focuses on techniques (Figure 10) and in what manner management is associated with leadership for collaboration in a project (Chapter 1). Laub's (2018) formulas do not foresee an overlap between management and leadership, therefore the formulas are merged (Figure 11 based on Table 2), and the techniques are summarised in Annex 12.

*Planning and vision:* Clear definitions are essential for solve problems, handle communication and work in a project, therefore the manager to set the project framework and manage all project requirements, and that the leader is able to lead the team and its work, focus on human needs and protect the team from (obstructive) influences.

*Organising and action:* The manager must provide a suitable selection of principles, techniques and technologies, supported by the leader, so that collaboration on the project can be a structured and motivating. The leader encourages the team to apply all of these in their daily work.

*Direction and mobilisation:* The manager shall define appropriate actions for the direction of the project and the mobilisation of the team members. The leader encourages the team members to develop a work culture in which skills and knowledge are shared to jointly tackle the challenges of the project.

The manager does not handle the project alone; they need the leader as backup, who in turn needs backing from the team members, who in turn need encouragement from the leader and manager.

# 6 Chapter 6: Conclusion

## 6.1 Introductory remarks

This chapter outlines the main findings of this study, which have been examined in conjunction with the research objective and research goals of this study to examine management and leadership techniques to enhanced joint working in a project. It also briefly defines the problem and the purpose of the research and what was explored in this study. This is followed by the restrictions that impact the findings and offers themes as well as areas for further research.

This study highlights possible improvements in a project. A project must be managed and leaded in such a way that the project work of the members is possible. The *management* applies, combines, and follows systematic procedures to manage and control the execution of the project scope (project management), while the *leadership* focuses on humans, human needs, and motivating and inspiring the members in a project. The manager is responsible for the management (realisation), and the leader for the leadership (accomplishment), and the team members work in a project (Drucker, 2012; Laub, 2018; Northouse, 2018). A project is influenced by several aspects e.g., by the organisation, or by the application of different approaches. The manager and leader use several techniques to promote activities to achieve various approaches in a project. This formed the basis for exploring the influence of techniques that improve collaboration in projects based on the research objectives. This was explored because the combination of management and leadership techniques with a project orientation in practice and a focus on collaboration within a project has not yet been investigated.

The aim of this chapter is to highlight the aspects that influence the joint work and to present the contribution to theory and practice that this study provides.

Finally, a summary of Chapter 6 will be offered.

## 6.2 Bottom line of research

The background knowledge was required to define management and leadership, and to examine possible techniques that can influence teamwork (Chapter 2). This knowledge was used to examine the research objectives with the described research methodology Figure 2 (Chapter 3). The findings were

generated with the described conceptual framework for the data collection and analysis (Chapter 4; Figure 3). The data collection was carried out with semi-structured interviews and analysed with thematic analysis. The results were presented in categories (themes) and codes with a practice-oriented view (Figure 6), and summarised in Annex 9. This formed the basis for the discussion in Chapter 5. Figure 10 (based on Chapter 2) outlined a theoretical view of the explored procedures in connection with Laub's (2018) formulas for management and leadership. The categories, codes, procedures, and Laub's (2018) formulas were structured to the research objectives (Chapter 1) and summarised in Table 2 for the discussion. Figure 11 captured the explored information in a graphical view that can be used as an entry point for practical work with the findings.

Table 2 has been summarised in Table 3, but without the allocation of research objectives. Table 3 serves as a clear contribution to the theory. For each formula (Laub, 2018) it was identified the examined procedures and the analysed categories (themes) and codes to explore the aspects that are influence the collaboration (about research objective 1 and 2; question: *Which aspects influence collaboration in a project?*). Furthermore, the data analysis results indicate how to influence these aspects (about research objective 1 and 2; question: *How can one influence these aspects to enhance the teamwork in a project?*). These was described in Chapter 4.3 and discussed in Chapter 5.3 and 5.4. The possible influences of the manager and leader are discussed in Chapter 5.5 (about research objective 3; question: *What possible influence do the manager and leader have?*).

This research combined the theoretical perspective (procedures) and practical perspective (categories, codes) for a new perspective of management and leadership in projects to enhance teamwork. This is connected with recognised formulas (Laub, 2018) from the literature and enabled a systematic consolidation of the theoretical with the practical perspective. This exploration generated new knowledge by examining the existing literature in combination with practical knowledge and developing findings as new knowledge (Table 3). The contribution to theory is characterised by the establishment of this new knowledge that is describe in this study. The contribution to practice is characterised by the combination of the theoretical results with the analysis of the practical effects. Furthermore, this research presented a clear differentiation of project, management, manager, leadership and leader.

**Table 3 Combination of the examined procedures and analysed results**

| **Management formula for Stability (Laub, 2018)** | **Planning (P)** | **Organising (O)** | **Directing (D)** |
|---|---|---|---|
| **Procedures** | Project scope, Quality | Stakeholder, Skill, Collaboration | Changes, risks, issues |
| **Codes for realisation** | Method, Roadmap | Structure | Working, Culture |
| **Leadership formula for Change (Laub, 2018)** | **Vision (V)** | **Action (A)** | **Mobilisation (M)** |
| **Procedures** | Neuroleadership | New leadership | Servant leadership |
| **Codes for accomplishment** | Conception, Hierarchy, Restriction | Motivation | Skill, Knowledge |
| **Stability and Change** | **Planning (P) plus Vision (V)** | **Organising (O) plus Action (A)** | **Directing (D) plus Mobilisation (M)** |
| **Procedures for management and leadership** | Solve problems, handle communication, work in a project | Collaborate with others | Skill management, Knowledge management |
| **Roles** | Project Manager / Leader, Product Owner, Scrum Master, Team Member, Customer | | |

The **first research objective** referred to examine management techniques that affect collaboration in a project. That was explored with Laub's (2018) management formula Planning + Organising + Directing = Stability. Stability is a high influence aspect for the teamwork and the analysis confirmed that the construction and control of the work arrangement is crucial – the realisation of a manager-led project (Figure 6). That provided the influence aspects (Table 3), and that can be influenced with various techniques (Annex 10).

*Planning* includes the knowledge of the business and project environment (Figure 1) to implement required practices (code *method*), and set a path for the entire project (code *roadmap*). Method structure the methodology (Annex 1, Annex 2) with a suitable process model (Annex 3), and a (scaled) framework (Annex 4). The *roadmap* refers to the common project to the establishment of the vision, objectives, and planning components in consideration of the entire environment. Method and roadmap are essential for cross-team collaboration and form the basis for a self-organised and self-determined way of working. This is enabled by using the techniques of the procedures *project scope* (2.2.3.1) and *quality* (2.2.3.3) – Annex 10.

*Organising* provides the conditions for a structured approach (code *structure*) throughout the project to define values, principles and practices for project work. A structure comprises mandatory project criteria with conditions,

boundaries, significant dependencies, responsibilities, and communication channels. This is necessary to enable the establishment of a framework that includes and strengthens the person as a human with personality in the project. That each project member knows the areas of responsibility, is actively involved and can interact with others. A work culture is established with the help of predefined rules. This is enabled by using the techniques of the procedures *stakeholder* (2.2.3.4), *skills* (2.2.3.6), and *collaboration* (2.2.3.5) – Annex 10.

*Directing* ensures relevant project rules, principles, desirable conditions (guidelines) to be followed (code *working*), and an open and transparent project culture (code *culture*) for the working environment. The established guidelines should be accepted and followed by everyone; this requires an open culture based on facts – without blame. Best practice includes the automation of these guidelines as part of daily work habits. This is enabled by using the techniques of the procedure *changes, risks, and issues* (2.2.3.2) – Annex 10.

The **second research objective** referred to examine leadership techniques that affect teamwork. That was explored with Laub's (2018) leadership formula Vision + Action + Mobilisation = Change. Change is a high influence aspect for the execution and the analysis confirmed that a pleasant climate for an active exchange of project-specific aspects is crucial – the accomplishment of a leader-led project (Figure 6). Because if a team member lacks motivation, the project is doomed. This can be influenced with various techniques (Annex 11; Table 13).

*Vision* is the inspiration of the team members via a personal bond in the project-specific direction in order to respect the concepts (code *conception*), hierarchies (code *hierarchy*) and constraints (code *restriction*), and improve them together. Project members should be encouraging to share each idea that relevant themes can be followed up and adjusted as necessary. A clearly defined hierarchy with responsibilities enables a target-oriented communication, supports the exchange of knowledge and ensures transparency in the project. Restrictions can be addressed with a proactive or flexible working style. Foreseeable influences must be checked regularly and planned in time to reduce or eliminate them. This requires a guide for handling and estimation. This is enabled by using the techniques of the procedure *neuroleadership* (2.3.3.2) e.g., with SCARF model – Annex 11.

*Action* promotes the development of full individual personal potential and motivates with respect between challenge (project, organisation) and encouragement (self-determination) (code *motivation*). Motivation is influenced by every cultural aspect and is encouraged by trust and appreciation. This includes: that freedom and responsibility can be enjoyed; that obstacles are to be discussed in joint discussions with the aim of removing or reducing them; that goals are defined in small cycles in a solution-oriented manner; the opportunity to learn new things, to try out ideas and trends, and the freedom to test new things. The working atmosphere is positively influenced by personal relationships, (small) events, and gestures of thanks. The leader must promote the exchange of professional, technological and methodological know-how by responding to human, individual needs. This is enabled by using the techniques of the procedure *new leadership* (2.3.3.1) – Annex 11.

*Mobilisation* encourages a team-oriented approach, personal development, learning and reflection processes (codes *skill* and *knowledge*) and the healing of team members with various emotional problems. Focus is on strengthening the culture of collaboration and creating a pleasant climate for the exchange of experiences. Self-motivation can be exemplified by the leader e.g., through discussions about conferences, news, books, and anything else that enables to look beyond own's horizon. Project member must be enabling to participate actively and continuously in all activities. If there a lack of any obstacles, then measures must be taken to remedy this lack. This requires a culture that focuses on facts (without blame) – so that goal-oriented solutions can be found and implemented. The benefit for the project lies in the motivated, qualified members who create creative and high-quality solutions. This is a worthwhile investment for every project. This is enabled by using the techniques of the procedure *servant leadership* (2.3.3.3) – Annex 11.

The **third research objective** referred to examine in what manner management is associated with leadership for collaboration in a project. Laub's (2018) management and leadership formula were combined to determine the potential impact for the manager and the leader, as these formulas do not provide for overlap. The association refers to the combination of (1) planning and vision; (2) organising and action; and (3) directing and mobilisation. This is influenced by several procedures (Figure 10) and codes (Figure 11), and that can be influenced with various techniques (Annex 12; Table 14).

*(1) Planning and vision* include clear definitions of problem solving (2.4.2), communication (2.4.3) and project work (2.4.4) (Figure 10). The project must be adapted with guidelines to the environment. Different perspectives (manager, leader, project member) have to be considered to cover gaps. A clear planning and vision reduce possible gaps and supports a goal-oriented, user-oriented solution. Each project member should be ready for common interactions and take joint responsibility for decisions and consequences, but should also be able to act autonomously. Creativity requires constructive criticism, continuous feedback and freedom to evolve with a positive attitude. This requires openness and transparency, as well as the own will to accept and reflect. This is essential for finding solutions and for accepting failure as a learning process. This requires a culture that focuses on facts, improvements and targeted information, and is adapted to the working environment and digital working practices. The customer has a significant influence on the project and team motivation. Therefore, the customer must be continuously involved. The manager is the tour guide for the project trip, needs a broad spectrum of knowledge about the business, (agile) methods and technologies and must be accepted by everyone. All roles are necessary and everyone has to act in their own role. Managers and leaders are not specific roles in the agile work environment, but are essential for work organisation and project work. Each project needs its own project guidelines to create a pleasant working environment and establish a common working culture for the project. The guidelines should include all relevant aspects of planning and vision, be implemented using techniques, and only used if they create value for the project and the project members, and are provided regularly and effectively for everyone. Self-management is acceptable and possible to a certain extent, but requires defined framework conditions. Command and control are outdated, but sometimes necessary (e.g., critical situations or involuntary team members). Managers and leaders should exemplify self-organisation and self-management, communicate openly on every aspect, show respect for everyone, react appropriately, exert positive influence, and have a strong sense of responsibility and commitment. Managers and leaders must set a good example, use defined techniques, and must realise that the time is over to control all and everything. Delegation is a sign of putting faith in others, and it helps to increase the involvement. This creates trust, motivates each project member and encourages them to act in the same way.

*(2) Organising and action* include clear definitions to *collaborate with others* (2.4.5) (Figure 10). The manager is responsible for activities to strengthen the cooperation and for the regular information of all project members in order to provide fun and motivation. The leader must support all management activities, encourage participation and communicate the value of these activities. Project members must be supported and coached, and activities must be delegated. The cooperation is strengthened by joint rituals and events, so that personal relationships can develop. Actions for team building should be combined with situational leadership, these are preventive actions to recognise possible outcomes (i.e. conflicts, misunderstandings) at an early stage. The agile culture must be accepted. The Scrum Team consists of the fragile construct: Product Owner (defines what), Scrum Master (encourages the self-organised team) and the team (defines how). Product Owner and team are closely connected for a goal-oriented way of working. The Product Owner delivers the requirements - the technical know-how. The Scrum Master causes the team to work autonomously and alone on the values, principles and practices. Critical questions about why should be part of the daily business, since humans and not robots design solutions. That strengthens the personal relationship to the corresponding aspect, responsibility can be taken over, and motivation and enjoyment of the work is increased, but essential is self-reflection for a joint value-adding work. Documentation with fewer words, visualisation techniques and a defined value are essential. The quality of collaboration increases with the shared use of techniques, principles and tools. Working environment and project culture have a significant impact on motivation and influence the collaboration. This requires competences such as empathy, motivation, self-reflection, self-regulation and social skills.

*(3) Directing and mobilisation* include clear definitions of *skill management* (2.4.6) and *knowledge management* (2.4.7) (Figure 10). Important aspects of keeping one's knowledge and skills up to date are the consideration of continuous feedback for the development process, and a variety of sources is required to keep abreast of current market developments. Every project member should be ready and open to new ideas and to learn continuously. This requires an open and transparent culture to fill competence gaps (without blame) with mutual support and a common learning goal. For this purpose, facts should be communicated factually and without personal feelings. Knowledge transfer

must be established in daily business in order to continuously exchange knowledge. Servant leadership qualities support a common basis for communication and information transfer, but only works with a clear definition. This allows to strengthen collaboration.

## 6.3 Limitations and further research themes

Significantly limiting (for this study) are the exclusion of activities before the start of the project and any financial or human resource aspects. The project contract is important and influences the project – mainly the outcome of the project. This is accepted as a condition because most projects are on-going, and do not start on a green area. These conditions influence the workload, but have no direct influence on joint work in the project.

The restriction on agile projects are difficult, because in practice exists mostly hybrid approaches based on company restriction. A further possible research area is to examine the restriction and hurdles to move from a traditional to an agile company as Toyota with a focus on the effect to the joint working.

The basics of the project methodology, process models, and possible frameworks are examined to offer an overview of the complexity in a project, but each of these can be examined in several separate studies. The same also applies for various project roles and their differences. Not all techniques are called – that is not possible in one study – but some meanings are capturing from the interviewees (Chapter 4).

Moreover, the experience with the techniques for the data collection and analysis increases with the writing, examining, and analysis in this study because the research objectives broadly focus on techniques. Further studies should be chosen one by the procedures; the examination should be started in conjunction with teamwork. This study offers a high level of influence of the procedures working and collaboration; it can be used as the basis and red thread for further research. Other themes are the influence of the financial aspects with reference to the timeframe, requirements in an increasingly fast-paced society, the continuous developing environments with the industrial influences, and the needs of different generations, or the influences of ethical and professional decisions. That is set as the limit for this study, but these themes can also influence the teamwork and offer interesting themes for further research.

## 6.4 Summary of chapter 6

The enhancement of collaborative work is essential to capture the impact of constant changes, which requires the adaptation of the management and leadership techniques in projects – companies must drive changes. The mostly explored approaches have existed for several years, but now is the time to actively use them in the daily practice to enhance teamwork.

The most important findings are that a project needs a responsible person (the manager) who defines the framework conditions for the project. This includes the selection of appropriate principles, techniques and (electronic) technologies that support the working of local and virtual teams. The project team needs a responsible person (the leader) who leads the working methods, focuses on the people and their human needs, so that the team can develop freely. The leader should support the manager and encourage the team in their daily work.

The findings are structured in tables and can be used as a kind of checklist to determine the appropriate techniques as a practical contribution. The findings about management are summarised in the Table 12 (Annex 10). This appendix covers topics to the work arrangement (realisation), includes aspects of planning, organising and directing and the examined management techniques that affect collaboration in a project (research objective 1). The findings about leadership are summarised in the Table 13 (Annex 11). This annex covers topics to the execution of project work (accomplishment), includes aspects of vision, action and mobilisation, and the examined leadership techniques that affect teamwork (research objective 2). The findings about the management and leadership association are summarised in the Table 14 (Annex 12). This appendix covers appropriate techniques and procedures from the management and leadership perspective (research objective 3).

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# Appendices

## Annex 1: Traditional process models (Waterfall and V-Model®)

This appendix offers a short overview of the process models waterfall and V-Model®. Traditional methodology means the process models – i.e., waterfall or V-Model® – face hurdles relating to fixed sequentially phases, isolation of the work in each phase (silo working), the long response of the feedback on a solution, and rapidly changing requirements. A silo represents a barrier for communication with long-term conditions (Kemp, 2013). These models are very rigid with the phases and work products; they take a long time to reach a first version of a product (normally several years); and it is not unusual that the customer does not remember the initial idea, or the initial requirements may become obsolete. One criticism is that requirements are developed only with fixed conditions, and the feedback is received very late – after the testing or from the end user – thereby reducing the acceptance (Ahmed, 2017; Almubarak, 2014; Balaji & Murugaiyan, 2012; Balci et al., n.d.; Corbett, 2013; Plögert, 1996; Sommerville, 2018; Tarenskeen et al., 2015).

Royce (1987) defined the waterfall for the software development industry with extensive teams (Balci et al., n.d.; Corbett, 2013; Sommerville, 2018). In 1992, V-Model® was defined as a validation and verification model as a software lifecycle process. Subsequently, the German federal authorities adopted this under the name V-Model® XT. Plögert (1996) describes that the differences are the names, and licence fee for reproduction or use (Plögert, 1996).

These process models waterfall and V-Model® are nearly identical in terms of phases (requirements, work, and quality management), work products (definition, design, development, testing, and delivery), and roles (i.e., business analyst, architect, database manager, designer, developer, tester), while the project manager keeps everything together. These are supported by official standards like the *Deutsches Institut für Normung* (DIN- German Institute for Standardization) or *Institute of Electrical and Electronics Engineers* (IEEE) (IEEE, n.d.; ISO, 2008; ISO, n.d.). The workflow is visualised in Figure 12 for the waterfall and in Figure 13 for V-Model®.

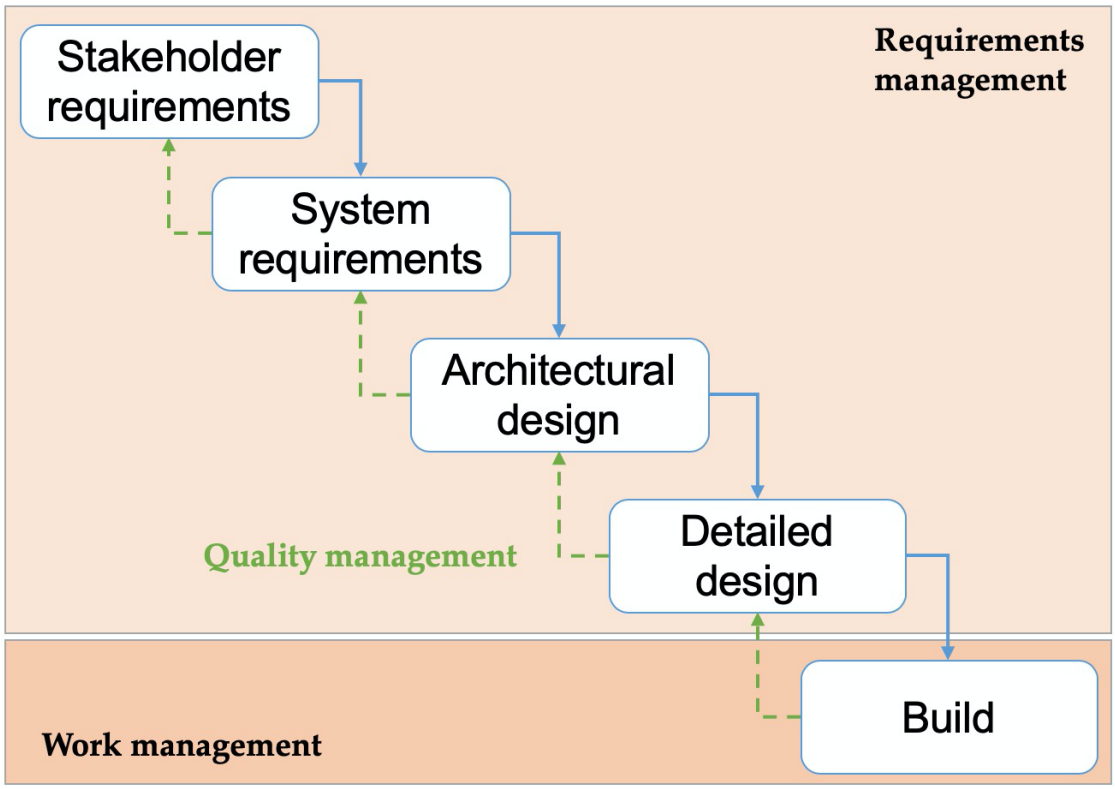


**Figure 12 Structuring and flow of waterfall**

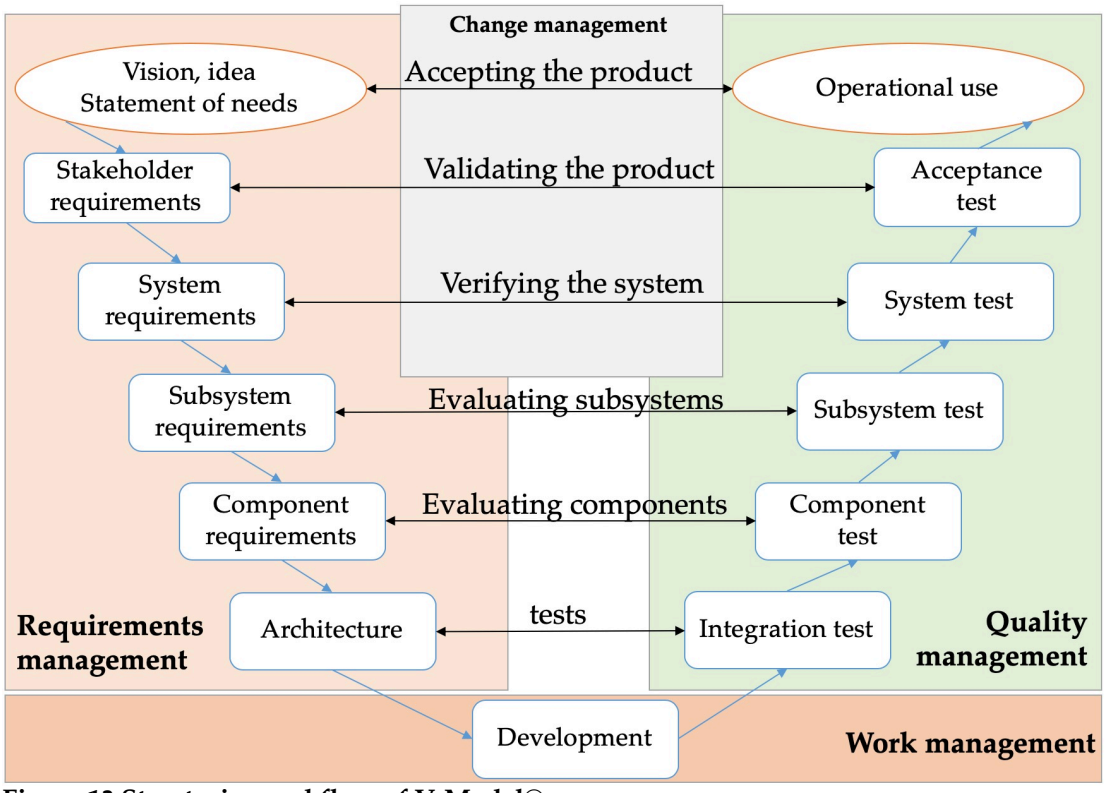


**Figure 13 Structuring and flow of V-Model®**

***Requirements management*** includes the definition and specification of the project requirements in consultation with the stakeholder, business analyst, designer, and the project manager.

Both models start with the work product's *stakeholder requirements* and *system requirements*. The stakeholder requirements phase starts with capturing the ideas or visions of any stakeholder. A stakeholder is a human or organisation with an interest in the project outcome (e.g., consumer, client, team member, manager, or government regulatory agency). The system requirement is based on the stakeholder's requirement and happens to be a top-level requirement that indicates what a system will do.

V-Model® divides the system requirements into *subsystem requirements* and *component requirements*. A subsystem requirement is a further derivation of the system requirement and a recognisable part of a higher-level subsystem. A subsystem can potentially contain multiple subsystems. The subsystem requirements are refined into component requirements. These are continuously refined and transferred to the *architecture* developed by the architect. The gradation of the architecture phase is split into the work product's architectural design and the detailed design for the waterfall process model.

Next, the architecture starts with ***work management,*** which includes the *development phase* (V-Model®)/*build phase* (waterfall). The developer produces the (software) code or the physical product.

V-Model® follows ***quality management*** with various *test* methods like integration, component, subsystem, system, or acceptance tests—these tests are mapped to a specific requirement and will be executed by the role of tester. In the waterfall process model, the test is included in each phase that only closes with a successful test.

The closure ensures that all defined requirements have been developed and the final product has the desired quality. An advantage is that each phase starts after completion of the previous phase, thereby providing a clear structure for the process with a high-quality documentation of the solution.

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# Annex 2: Agile process model (Scrum)

This appendix offers a short overview of the agile process model Scrum based on Beck et al. (2001), Cernuzzi et al. (2005), Canty (2015), Furman (2014), Martin (2013), Osvaldo et al. (2017), Pete (2017), Pinkston (2015), Roudias (2015), Scharff (2011), Scrum (n.d.), ScrumAlliance (n.d.), ScrumAlliance (2015), ScrumAlliance (2017), ScrumGuides (n.d.), and Sohi et al. (2016).

Since February 2001, agile is based on an agreement between 17 people who shaped the word *agile*. This agreement is manifested in the *Agile Manifesto*, published via AgileAlliance (2015) that consists of four values and 12 principles. The group *Agile Alliance* evolved from the *Agile Manifesto*; it is an agile non-profit organisation, and software community since 2001 (AgileAlliance, 2015; Beck et al., 2001). Agile is a lightweight construct for the software development industry, and unites several similar process models like Scrum (Mann & Maurer, 2006; Schwaber, 2004; Schwaber & Beedle, 2008), Rational Unified Process (RUP), Feature-Driven Development (FDD) (Palmer & Felsing, 2002), or eXtreme Programming (XP) (Beck & Andres, 2004; Sampaio et al., 2004; Sato et al., 2006).

In 1993, Jeff Sutherland constructed the process model Scrum and sensed that the word *scrum* was suitable. He read the word *scrum* in an article titled *The New Product Development Game,* in the section *Moving the Scrum Downfield*, which was published by Hiritaka Takeuchi and Ikujiro Nonaka in 1986. That article described the characteristics of the *rugby* product development process with built-in instability, self-organising project teams, overlapping development phases, multi-learning, subtle control, and organisational transfer of learning (Takeuchi & Nonaka, 1986). Rigby, Sutherland, & Takeuchi (2016) related both approaches in their article titled *The Secret History of Agile Innovation*. Scrum is an open process model for complex incremental product development (Pinkston, 2015); it is published via free communities such as ScrumAlliance (n.d.) or ScrumGuides (n.d.). Scrum offers a way to organise work products in a short lifecycle process and focuses on providing communication and collaboration. Scrum concentrates only on the engineering of the solution, and working with the main work products (Epics, Features, User Stories, tasks). These are organising in Product Backlog and Sprint Backlog and clocked in Sprints and Releases with fixed timeframes. The project work is performed by

the team (analyst, developer, and tester) under the leadership of the Scrum Master, and with inputs from the Product Owner (Mann & Maurer, 2006; Schwaber, 2004; Schwaber & Beedle, 2008; ScrumAlliance, n.d.).

Scrum aims to handle complex issues by using the high performance, and creativity of each team member. Its advantages include quick and continuous feedback, openness for changes, early recognition of problems or issues, flexible setting of priorities, and team goals. A criticism is that each stakeholder must support Scrum and live it instead of paying only lip service (Balaji & Murugaiyan, 2012; Beck et al., 2001; Martin, 2013; Pinkston, 2015).

Figure 14 shows an overview of the Scrum work products, phases, and roles. Scrum offers a way to organise work products (Epics, Features, User Stories, tasks) in a short lifecycle process, and focuses on providing communication and collaboration. The work products are organised in Product Backlog and Sprint Backlog; they are clocked in Sprints and Released with fixed timeframes. Scrum should be set up with one team and includes a Product Owner to define the requirements; it also includes a Scrum Master to lead the team comprising a business analyst, developer, and tester. The project manager as well as other team members (i.e., database manager, architect, designer, project office members) are not defined in Scrum because this agile process model concentrates only on the engineering of the solution.

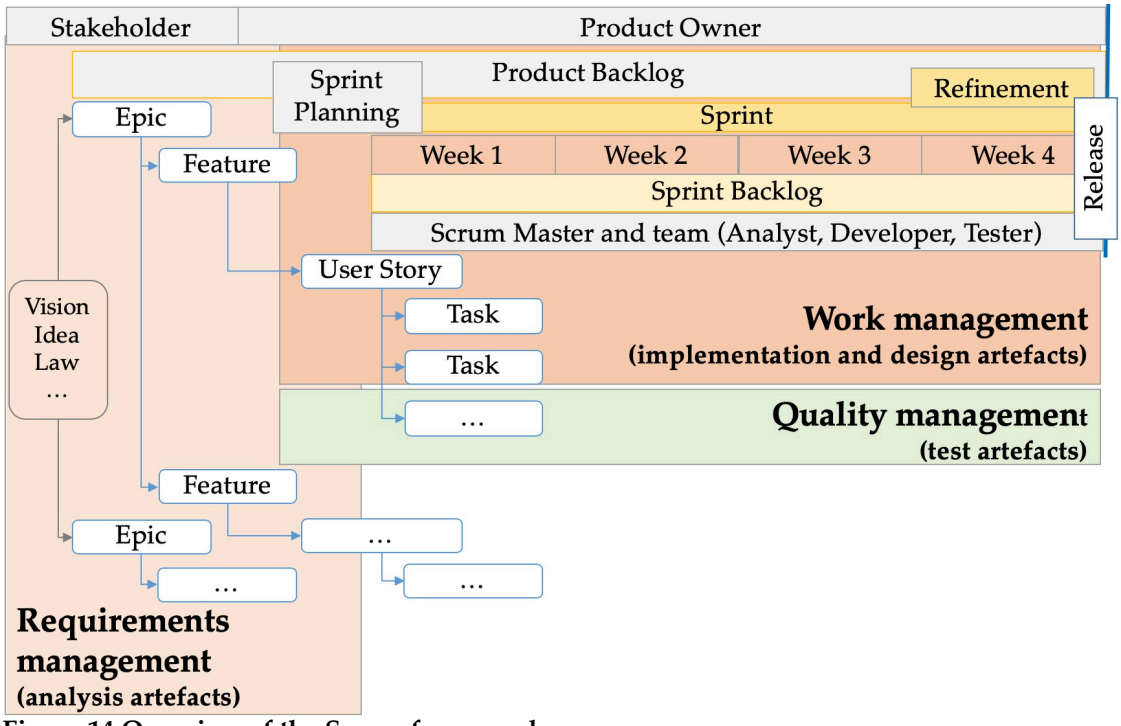


**Figure 14 Overview of the Scrum framework**

The Scrum lifecycle starts with some ideas and requirements of the customer or stakeholder. The *Product Owner* works with the customer to translate the idea into an *Epic* as a written version of the stakeholder's requirement – it is a very non-specific high-level description. An *Epic* is split into one or more *Features*, which is a bit more specific and described from the *Product Owner*. The *Product Owner* splits the *Feature* into one or more *User Stories*.

The *User Story* is a well-defined description; it is a very small piece of the solution for product increments and can operate in a maximum of one *Sprint*; it describes what is needed and is gathered in the *Product Backlog* with a prioritisation of relevance. Canty (2015) defines that the *User Story* is equivalent to a requirement and should be defined in terms of the approach INVEST (**I**ndependent, **N**egotiable, **V**aluable, **E**stimable, **S**mall, **T**estable). Pete (2017) constitutes that the documentation could be substituted with *User Stories*, which should be presented to the team in case of refinement.

The *Refinement* is a meeting that is used to mediate all about the upcoming work and clarify questions and dependencies; it is held in the last week of the current Sprint.

Pinkston (2015) says: 'Scrum divides a project into sprints, or short periods of duration' (pos. 16) normally for two or four weeks. The *Sprint* starts with *Sprint Planning*, which is a meeting to fill the *Sprint Backlog* with *User Stories* and includes the definition of tasks as concrete work for each *User Story*. A *Task* describes how to realise the *User Story,* and includes design, specifications to implementation, and tests. The team works only with the *Sprint Backlog*.

The User Story is removed with the *Definition of Done* (DoD) criteria from the *Product Owner*. The DoD includes criteria that bind the team to consistent work and quality. The team reaches the sprint goal if it delivers all planned *User Stories* in the *Sprint*.

The *Sprint* should end with a potentially shippable product because a *Release* should be delivered after one or two *Sprints* to the customer—it is a piece of the solution for the target product.

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# Annex 3: Definition of project and the relations

Sanghera (2018) argues that 'a *project* is a work effort made over a finite period of time with a start and a finish to create a unique product, service, or result' (chapter 1) and to 'produce deliverables of a social, economic, material, or environmental nature' (PMI, 2017, pos. 1091). Roudias (2015) uniquely defines a project as 'a specific set of activities designed to accomplish a singular goal' (chapter 1). Projects are usually used to organise any *business activities* because that is the 'key way to create value and benefits in organisations' (PMI, 2017, pos. 1140), while organisational leaders are enabled 'to manage […] tighter budgets, shorter timelines, scarcity of resources, and rapidly changing technology' (PMI, 2017, pos. 1140) as well as to handle the constant changing business environment.

The economic world comprises the public and private *sectors.* Each of these sectors has various functional approaches termed as departments with group activities; they assist the overall business, for example, through accounting, administration, customer service, engineering, finance, human resources, marketing, production, R&D, or sale. The functional area approach is reflected in various forms of the management, breaking down a department into a business model and setting up the specific processes between the departments. A *business model* should be supported to understand, analyse, and communicate the key factors of the success and failure of the business (Carysforth & Neild, 2000; Lienert, 2009; Tomlinson, 2000).

*Lifecycle management* is a business model approach; it is differentiated in several management forms for service, lifecycle and solution that can be a physical product (i.e., ball, cup, air mattress), software solution (i.e., Microsoft Office, a website like Amazon, a weather app for phone), or a product that contains software packages (e.g., PlayStation, laptop, car). The lifecycle includes different phases (i.e., strategy, design, construction, test, or run) in different departments with different business models that are assigned to different processes; these depend on the type of lifecycle management as a form of the management (McGolphin, 1996; Miller, 2015; PMI, 2017).

*Project management* is a part of the management, and a process to realise a project with the goals and objectives; it includes 'knowledge, skills, tools and techniques'' (PMI, 2017, pos. 1106) with the result of project activities being in

conjunction with requirements and appropriate processes. Sanghera (2018) suggests that '*processes* are the heart of project management. In other words, processes are atoms, the smallest functional units, of project management […]. Almost everything in the world of project management is done through processes' (chapter 1), and a process is 'a set of related tasks performed to manage a certain aspect of a project […] Each process belongs to a knowledge area and corresponds to a process group' (chapter 1). The process groups 'are technical names for the project stages'; and the knowledge area 'is defined by the knowledge requirements related to managing a specific aspect of a project […] by using a set of processes' (Sanghera, 2018, chapter 1). These processes (stages) are defined in the PMBOK® (PMI, 2017) about integration, scope, time, cost, quality, HR, communication, risk, procurement, and stakeholder. The process groups comprise initiating, planning, execution, monitoring, and closing; and these are organised in procedures. A *procedure* is 'a fixed, step-by-step sequence of activities […] that must be followed in the same order to correctly perform a task' (BusinessDictionary, n.d., chapter: procedure). A *technique* is 'a systematic procedure, formula, or routine by which a task is accomplished' (BusinessDictionary, n.d., chapter: technique). The manager is an integral part of the management, and proceeds this by using techniques and methods (Drucker, 2012). A *method* is 'an established, habitual, logical, or prescribed practice or systematic process of achieving certain ends with accuracy and efficiency, usually in an ordered sequence of fixed steps' (BusinessDictionary, n.d., chapter: method). The *Declaration of Interdependence* (DOI) is added in the PMBOK® for the agile approach with the 'principles that tie together people, projects, and value' (Canty, 2015, chapter 1). A *process model* supports the project for any structural work with defined phases for a process; it is possible to combine different process models, but each model should be customise to its own needs (Angermeier, 2013a; Angermeier, 2013b; Englund & Bucero, 2019; Canty, 2015; PMI, 2017; Roudias, 2015; Sanghera, 2018; Saulson, 2006; Schwartz et al., 2010).

*Project methodology* is defined as 'a system of practices, techniques, procedures, and rules used by those who work in a discipline' (PMI, 2017, pos. 1022). It is coarsely differentiated into traditional, agile, hybrid, bimodal, or a more specific form: 'adaptive lifecycles are […] iterative, […] incremental […] or change-driven life cycles' (PMI, 2017, pos. 1286). The special feature of adaptive

lifecycles is that the particularised scope is defined and approved before starting iteration. Hybrid is a combination of traditional and agile methodologies, and bimodal is a combination of agile and traditional methodologies (PMI, 2017).

Managers and leaders should know and respect the 'code of ethics and professional behaviour' (Canty, 2015, chapter 11) that was defined from PMI. The 'four main areas are responsibility, respect, fairness, and honesty' (Canty, 2015, chapter 11). Furman (2014) describes that each ethic code is differentiated into two categories (aspirational and mandatory), and all four areas are described over eight pages plus appendix. PMI develops the tool *Ethical Decision-Making Framework* (EDMF), supported by ethical decisions with a set of questions that should be answered with yes or no.

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# Annex 4: Scaled frameworks based on Scrum

Scrum is designed for one team. The solution for more teams is the usage of a scaled framework. Scrum.org (2019) analysed a distribution of 23% SAFe (Scale Agile Framework), 10% Nexus, 9% LeSS (Large Scale Scrum), 7% other, 2% DAD (Disciplined Agile Delivery), and 49 % with no scaling framework. Popular is the usage of one framework (71%) or two frameworks (23%). VersionOne CollabNet (2019) analysed 30% SAFe, 19% don't know, 16% Scrum of Scrum, 8% internally created methods, 7% DAD, 5% Spotify Model, 3% LeSS, 3% Enterprise Scrum, 3% Lean Management, 3% APM (Agile Portfolio Management), 2% Nexus, and 1% RAGE (Recipes for Agile Governance in the Enterprise). These reports offer that the most common scale frameworks are SAFe, LeSS, or Nexus (Schell, 2019; Scrum.org, 2019).

*SAFe* is a framework to embed and promote agile development in an organisation. It is differentiated into four variations; it integrates traditional business areas over a basic portfolio with a team, programme, and portfolio area. SAFe supports large organisations with a high number of teams, and various dependencies; they offer a possibility of non-agile organisations. Its disadvantage is reflected in the structural top-down approach with several areas and roles (e.g., lean-agile leadership manager), resulting in inflexibility, and a little bit of humanity. A frequent disadvantage is the lack of end-to-end responsibility, which makes it difficult for fast and customer-centric implementation. The issue is that the team products are not synchronised, and not related to the strategic overall objective (Schell, 2019).

*LeSS* was designed for eight teams, and for more as eight teams to thousand persons use the framework *Hugh LeSS*. The (Hugh) LeSS framework based on working Scrum team level of has a limited complexity; it has a strong agile orientation and an easy structure, with one Product Owner for the eight teams and one Area-Product-Owner for four to eight teams from Hugh LeSS. LeSS has the three basic elements: principles, rules, and experiments. The LeSS integration is difficult in large organisations because the scaling is limited to the Scrum teams: LeSS offers no guidelines or rules about the architecture, strategy, or portfolio (Schell, 2019).

*Nexus* is a slim extension of Scrum with a maximum of nine teams. The extension is the Nexus-Integration-Team with the responsibility of all a consistent

understanding, and application of required practice and tools in the Scrum teams. The advantage is the minimalist approach, and a low degree of formalisation. Nonetheless, Nexus is rarely used in the practice, and has no guidelines or rules over the conjunction of agile processes (Schell, 2019).

It is necessary to apply management and leadership for a successful realisation, and accomplishment of a process model, as described in Chapter 2.

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# Annex 5: Overview of empirical studies

The theoretical view insists on empirical studies that refer to results in practice. Table 4 provides an overview of the empirical studies, and the influence on this study was highlighted with ○ low, ● medium and ● high. These studies were employs to show why management and leadership techniques should be used to influence teamwork, and in what way management is associated with leadership to enhance joint working.

**Table 4 Overview of the empirical studies and their influences in this thesis**

| Empirical study | Agile | Manage-ment | Leader-ship | Management / leadership |
|---|---|---|---|---|
| Alsaqaf et al. (2019) | | | | ● |
| Amah (2018) | | | ○ | |
| Cerit (2010) | | | ○ | |
| Ch et al. (2020) | | | ○ | |
| Clauss et al. (2019) | ○ | | | |
| Dybå & Dingsøyr (2008) | ○ | | | |
| Eva et al. (2019) | | | ● | |
| Farling et al. (1999) | | | ○ | |
| Garousi et al. (2019) | | ● | | |
| Groves & LaRocca (2011) | | | ○ | |
| Herold et al. (2008) | | | ○ | |
| Hoch et al. (2018) | | | ○ | |
| Jing et al. (2013) | | | ○ | |
| Lange & Hernandez-Bark (2020) | | | | ● |
| Lee et al. (2012) | | | ○ | |
| Li et al. (2016) | | | ○ | |
| Liangding et al. (2007) | | | ○ | |
| Liden et al. (2014) | | | ○ | |

| Empirical study | Agile | Manage-ment | Leader-ship | Management / leadership |
|---|---|---|---|---|
| Lieske (2020) | | | ○ | |
| Liu et al. (2018) | ○ | | | |
| Lu & Ramamurthy (2011) | ○ | | | |
| Mahdi et al. (2014) | | | ○ | |
| Mann & Maurer (2006) | ○ | | | |
| Moe et al. (2009) | | | | ● |
| Nemanich & Keller (2007) | | | ○ | |
| Oluwafemi et al. (2019) | | | ○ | |
| Pasricha et al. (2018) | | | ○ | |
| Pratelli (2019) | | | ○ | |
| Qiu et al. (2020) | | | ● | |
| Rau et al. (2019) | | | | ○ |
| Roberts & Grover (2012b) | ○ | | | |
| Rogiest et al. (2018) | | | ○ | |
| Sampaio et al. (2004) | ○ | | | |
| Sato et al. (2006) | ○ | | | |
| Sosik (2005) | | | ○ | |
| Udokporo et al. (2020) | ○ | | | |
| Ugboro & Obeng (2000) | | | | ○ |
| Uikey & Suman (2012) | | | | ● |
| van Dierendonck & Nuijten (2011) | | | ○ | |
| White & Fortune (2002) | | ● | | |
| Xie et al. (2018) | | | ○ | |
| Yusuf et al. (2019) | ○ | | | |

# Annex 6: Overview of certain literature

Table 5 provides an overview of the literature used to examine the topics of agile, leadership, management, and their combination as well as to underscore affects in practice (reports) and to emphasise the influences of a constantly changing world (innovations) – that view exclude the used empirical studies (see Table 4, Annex 5). The influence on this study was highlighted with ○ low, ● medium and ● high.

**Table 5 Overview of literature used in this thesis**

| Literature | Agile | Leader-ship | Manage-ment | Manage-ment / leader-ship | Re-ports | In-nova-tion |
|---|---|---|---|---|---|---|
| AgileAlliance (2015) | ○ | | | | | |
| Beck et al. (2001) | ● | | | | | |
| Bennis (2009) / (2015) | | ● | | | | |
| Berman et al. (2012) | | | | | | ○ |
| Bloom et al. (2011) | | | ○ | | | |
| Bryman (1992) | | ○ | | | | |
| Canty (2015) | | | ● | | | |
| Cao et al. (2013) | ○ | | | | | |
| Cheng et al. (2018) | | | | | | ○ |
| Chugh (2011) | | | ● | | | |
| Drucker (2010) / (2012) | | | ● | | | |
| Englund & Bucero (2019) | | | | ● | | |
| Furman (2014) | | | ● | | | |
| Gallup (2018) / (2019) | | | | | ○ | |
| Garrison et al. (2015) | | | | | | ○ |
| Greenleaf et al. (1998) / Greenleaf (2012a) / (2012b) | | ● | | | | |

| Literature | Agile | Leader-ship | Manage-ment | Manage-ment / leader-ship | Re-ports | In-nova-tion |
|---|---|---|---|---|---|---|
| Haynes (2011) | | ○ | | | | |
| Hughes et al. (2014) | | ● | | | | |
| KPMG (2017) | | | | | ○ | |
| Laub (2018) / (2000) | | | | ● | | |
| Lee et al. (2015) | | ○ | | | | |
| Lemos & Scur (2012) | | | ● | | | |
| Li & Zhao, 2018 | | | | | | ○ |
| Lyngso (2017) | ● | | | | | |
| Marston et al. (2011) | | | | | | ○ |
| Milosevic (2003) | | | | ● | | |
| MIT Sloan Management Review (2019) | | | | | ● | |
| Northouse (2018) | | ● | | | | |
| Peters (2015) | | ● | | | | |
| Pieterse et al. (2019) | | | | ○ | | |
| Pinkston (2015) | ○ | | | | | |
| PMI (2017) | | | ● | | | |
| PMI (2020) | | | | | ○ | |
| Pulse of the Profession (2019) / (2020) | | | | | ○ | |
| Rigby, Sutherland & Takeuchi (2016) | ○ | | | | | |
| Rock (2010a) / Rock (2010b) / Rock & Schwartz (2006) | | ● | | | | |
| Sanghera (2018) | | | ● | | | |

| **Literature** | **Agile** | **Leader-ship** | **Manage-ment** | **Manage-ment / leader-ship** | **Re-ports** | **In-nova-tion** |
|---|---|---|---|---|---|---|
| Schwaber (2004) / Schwaber & Beedle (2002) | ○ | | | | | |
| ScrumAlliance (2017) / (2018) / (2019) | | | | | ● | |
| ScrumGuides (n.d.) | ○ | | | | | |
| Takeuchi & Nonaka (1986) | ○ | | | | | |
| Twenge & Campbell (2008) | | ○ | | | | |
| van Dierendonck et al. (2014) | | ● | | | | |
| Warren (2011) | | | ● | | | |
| Xu et al. (2018) | | | | | | ○ |

# Annex 7: Extract of the prepared interview protocol

Table 6 outlines the prepared elements and questions for the semi-structured interview with the purpose of each activity and a timetable for each action in the interview.

**Table 6 Interview protocol with prepared questions**

| **Purpose of the activity** | **Key point or interview question** | **Time** |
|---|---|---|
| **Essential points of the interview protocol and interview** | | |
| Collection information for data analysis<br>*Collecting background information* | Date and time | Not applic-able; prepare |
| | Location | |
| | Video / telephone conference, face to face | |
| | Anonymised name | |
| | Company | |
| | Position | |
| Criteria and ethical responsibility for data collection and analysis<br>*Introduction to clarify the criteria and ethical responsibility* | Clarification if there are any questions regarding "Participant info and consent form" and if this form has been signed. | 10 minutes |
| | Clarification how the interview is conducted and what is observed by the researcher. | |
| | Clarification if there are any questions about the interview procedure. | |
| | Clarification if the interview allowed to be recorded. | |
| | Clarification if the e-mail address may be saved for sending the transcript. So that the interviewee can check the transcript. | |
| | Clarification that all questions relate to the working methods of agile projects. | |

| **Purpose of the activity** | **Key point or interview question** | **Time** |
|---|---|---|
| **Questions for the semi-structure interview** | | |
| Background question about own experiences | Question 1: What does an agile project mean to you? How would you describe an agile project? | 45 minutes |
| Which aspects influence collaboration in a project?<br>*Collaboration affect by own working, general, and agile techniques* | Question 2: What underpins agile working processes?<br>**Examples of probe from Annex 8**<br>• What do you mean by mindset?<br>• What do you mean by culture?<br>• You've just mentioned hierarchies and company structures. For you, a hierarchy is where there are different levels of responsibility at different levels within the hierarchy and different names for the positions. Is that a fair statement?<br>• How important is the role of the leader and what should it entail?<br>• What procedures influence working processes?<br>• With respect to working processes, which methods and tools do you find essential and feel really support the way you work? | |
| | Question 3: What factors influence project results? | |
| | Question 4: How do you tackle any weaknesses in agile working processes?<br>**Examples of probe from Annex 8**<br>• What are the pinch points that create the greatest problems?<br>• What is the learning process at the start? Is it something along the lines of: "You've now had your training in agile management, you know what it is to be agile and so you can now work in an agile way? Go ahead and do it". | |

| **Purpose of the activity** | **Key point or interview question** | **Time** |
|---|---|---|
| What possible influence do the manager and leader have?<br>*Techniques that influence the cooperation of management, leadership or other stakeholders* | Question 5: What is important when it comes to the work of a Project Lead or Lean-Agile Leadership Manager? Depending on which model we are talking about?<br>**Examples of probe from Annex 8**<br>• What is the bulk of their work? What is it fundamentally? | |
| | Question 6: Who is the most important person in an agile project and why?<br>**Examples of probe from Annex 8**<br>• Who does the team encompass? | |
| How can one influence these aspects to enhance the teamwork in a project?<br>*Techniques that influence cooperation through experience, experience or knowledge* | Question 7: How do you know that your team has the skills, knowledge and experience for an agile project?<br>**Examples of probe from Annex 8**<br>• How do you get a feel for what kind of talent, knowledge and experience is present in an agile environment?<br>• Which project rules are key? Can you name 3 of the most important ones?<br>• So, you mean that trust must be a given and that over time you can see whether it is well-founded?<br>• You've mentioned that a leader should care about people. How might they show that? Or what counts as caring? | |
| | Question 8: What conditions must be met for self-directed work to be successful? | |
| | Question 9: What motivates you and helps you get through your everyday work?<br>**Examples of probe from Annex 8**<br>• By visualisation, you mean hanging up boards on the walls?<br>• How does agile working function with dispersed or international teams? | |

| Purpose of the activity | Key point or interview question | Time |
|---|---|---|
| | • And make sure that there is a certain level of documentation?<br>• Or in case someone has an accident and they're suddenly incapacitated?<br>• Does using things like video chats also help increase trust levels? | |
| | Question 10: How do you keep up to date with skills and project trends?<br>**Examples of probe from Annex 8**<br>• So, you're not keen on the latest trend for collecting digital awards?<br>• I see, I didn't realise that. Getting an award for everything is great but I also ask myself what it's all for. | |
| How can one influence these aspects to enhance the teamwork in a project?<br>*Techniques that influence the way of work* | Question 11:<br>What has the biggest influence on you in changing your working processes?<br>For agile coaches: What has the biggest influence on agile teams in changing their working processes? | |
| General question and open dialogue with interview partner<br>*Techniques that influence the way of work* | Question 12: You've got one last wish: What would you change in your daily working processes?<br>**Examples of probe from Annex 8**<br>• Curiosity for new subjects or simply being curious about everything, like a small child? | 5 minutes |
| Closing comments | Question 13: Is there anything else you'd like to add that you think I should consider? | |
| Future usage | Question 14: May I use this interview as a basis for future studies after my DBA? | |

# Annex 8: Example of a transcript

This semi-structured interview was conducted and recorded via Skype video call. The transcript of the conversation has been translated from the German so that it can be included as evidence in the study.

**Interview transcript of TN008**

**Question 1: What does an agile project mean to you? How would you describe an agile project?**

My understanding of an agile project is a project where one expressly prepares for and is expecting changes to occur along the way – not because change might happen but because change will happen. And where we are then able to respond quickly to these changes through new knowledge and a shift in our thinking.

**Question 2: What underpins agile working processes?**

I think there are various factors at play. One of them, very clearly, is the mindset that every person working in an agile situation must bring to the table. In turn, this requires a work culture that allows this mindset to flourish. And in turn, it also requires the kind of leadership that is prepared to support both the culture and mindset. Then, there are all the processes and, if possible, a commitment that goes beyond ordinary work parameters. And finally, all the methods and tools that support the whole process.

***Follow-up question: What do you mean by mindset?***

The mindset is my personal attitude towards something. It includes answers to questions like: What standard of quality am I expecting my work to be? What level of knowledge sharing do I aspire to? What do I imagine by error management culture? What are my expectations of collaborative work? What do I hope for from continuous improvements and from issues such as lifelong learning, openness, transparency and individual factors?

***Follow-up question: What do you mean by culture?***

The culture is the company's mindset. But it is also the values that I personally hold in my own mindset. Ideally, these values are shared with the company, so that there is no conflict. In other words: "How do we deal with errors in the company? How do we allow and encourage employees to grow as people? How do we approach self-organisation? How do we achieve participation and

responsibility?". There's a great pyramid diagram about responsibility, process etc. that illustrates it well. It's all part of it. Am I allowed to give feedback within the company, and across hierarchy levels within the company? What is our company structure? Personally, I don't think we need to do away with hierarchies. But is that hierarchy simply the way a company is structured? Or is it actually a configuration that prevents me from upwards feedback? Or is it necessary for me to work my way up through all the levels of that hierarchy? Am I allowed to communicate and give feedback across various levels? That kind of thing. In principle, an individual mindset applied to what the company hopes to achieve. How do we treat each other? How do we support one another? How do we react when things go wrong? How do we learn as a company? Is that openness which an individual is expected to have also present within the company? Is a company willing to collaborate/share knowledge with others? Exchanging ideas between companies, close ranks? Do we encourage knowledge sharing within the company but put up a barrier to the outside?

***Follow-up question: You've just mentioned hierarchies and company structures. For you, a hierarchy is where there are different levels of responsibility at different levels within the hierarchy and different names for the positions. Is that a fair statement?***

Yes. There can be various levels of management, depending on the size of the business – sometimes more, sometimes fewer. It depends on whether it's a flatter structure or a classic hierarchy structure. I am not of the opinion that agile projects won't work within a hierarchy, and equally that a flatter management structure will mean that agile working is successful. People often confuse the two issues. Some say: "We have very few hierarchy levels, and so we are incredibly agile." But the one does not necessarily follow the other, nor the other way around. Again, it's about the processes involved and the mindset of the individuals that perform a role within these various levels. For me, someone's position is less important than the role they occupy and how they fulfil that role. The difference concerns the position – it is one I am appointed to, and I am then given a title that sounds good. A role however, is something I can realise and take responsibility for, and I find that much more important.

***Follow-up question: How important is the role of the leader and what should it entail?***

A leadership role? That's an interesting one. It's one that I always struggle to define – a leadership role. A leader must be able to establish very good relationships with people. They must be able to see where requirements are. I am a fan of the servant leadership model. It's about truly recognising what my team needs, what the individual people within the team need, in order for them to achieve their aim. So, the person, or the role, requires someone who can communicate, who is observant, and someone who can grant others their moment of glory too. They must be able to take a back seat and not always be the most important person in the room. And then, there's the usual mentoring and coaching, and everything that goes with that. To me, a leadership role is definitely not one that has to be held by the cleverest person in the room, and also not necessarily the person with the greatest expertise either. The role might be shared, because taking on a leadership role is very time-consuming. As a leader, I will not be able to contribute that much to the actual project in any case.

***Follow-up question: What procedures influence working processes?***

All of the procedures that are in place within the company. Starting with the issue of "I need a pen" and which forms I need to fill out in order to obtain that pen. And if we're looking at software development, right the way through to: Who is allowed to write code reviews? Who is allowed to merge anything? Who do I get my remit from? All of these procedures have an influence, depending on what sector I'm in. That's why I find it really interesting when people say: "Yeah, we've started a new project, and such-and-such department is going to be agile." It is very rare that procedures within a company don't cross over from one department to another. They usually start in one department and end up seeping into other departments too. And then, when we're in the midst of it all and we're being really agile, we end up hitting a stumbling block and don't achieve what we want, because we've crossed the boundary into another department where procedures are done by the book, or something like that. And that's when I really have to check what kind of value it's bringing, if only one part of the company is revolutionised. Or should we actually be looking at our wider procedures and overhauling everything, right the way through. And eliminating time-wasting procedures where three different forms have to be filled in so that you can claim 50 Euros in travel costs.

***Follow-up question: Oh yes, I'm all too familiar with that.***

Last year, there was an event that some companies wanted to send their employees to, and we saw how it can happen, because some of the companies had such a complex set of procedures to get through. If I was working in a company like that, it would put me off going. It would require too much effort on my part. If you think about it, the purpose is to gain knowledge and better ourselves, but if there are these procedures that impede the person's will to attend, then that really doesn't help anything.

***Follow-up question: Yes, I agree. That's a real problem. With respect to working processes, which methods and tools do you find essential and feel really support the way you work?***

It always depends on how far into a project a team is, how advanced they are and what the project is. What would actually help them. I find that if you are not sure, because it's your first contact with them perhaps, then I find the Kanban method very useful. Kanban looks at people as they stand – right at that moment - no matter how bad the process might be in that moment, and it helps ascertain: What are our weaknesses? Where are the bottlenecks? And then I can start to build on that in a targeted way and start to improve things. I find it incredibly helpful when I'm working with teams that are new to agile work. I've seen how it can produce really fast results.

**Question 3: What factors influence project results?**

The people. They are the most important factor. There are other factors of course, but if the people don't understand why and how they are doing what they are doing, the effect on the outcome is huge. However, if they have an understanding of why they are doing what they are doing, and why it needs to be done in that way, and why decisions were made, perhaps within the team even, then it is much easier to achieve success and to focus on that success. That's because I can base every decision I make during the working day on that outcome, and that's because I know why we are doing what we're doing, I know what the goal is, and I understand what is involved. And so, I can gear each individual little decision I have to make towards that. If I am not in possession of that knowledge, then it's difficult. Which is exactly what happens when employees object and are not willing to try new things. Infighting is simply a waste of time. It means the result is at too great a cost. That's why I think it's so

important to have people onside. I have to involve them, and win them over. I cannot make decisions over their heads. Ultimately, that's the aim of agile teams. It's so that people can have a say and be part of the decision-making process with the aim of achieving better results. The people are absolutely pivotal in the process. Once that's established, we might find that we have procedures and tools that don't work, but that is secondary in my opinion. We first have to make sure that people are onside.

**Question 4: How do you tackle any weaknesses in agile working processes?**

That varies.

***Follow-up question: What are the pinch points that create the greatest problems?***

Definitely the learning process at the start. I can't simply go into work and say: "From tomorrow, we're going to be agile". It could work, but on the whole, it won't. One really tricky issue is time. If the project is going smoothly, then we're all over the whole agile thing. And then suddenly something happens, everything is up in the air and we all fall back into old behavioural patterns. We wait for someone to show us what to do. And I do find that difficult. To have someone in that situation who can say: "People, think about the ideas we've had. Think about how we want to work", and who doesn't fall into the role of dishing out commands. I think that's one of the greatest challenges. There are times during every project where it gets hectic and things are critical. Being able to remain calm and say: "Come one, we've learnt so much. Now let's put it into practice."

***Follow-up question: What is the learning process at the start? Is it something along the lines of: "You've now had your training in agile management, you know what it is to be agile and so you can now work in an agile way? Go ahead and do it".***

No. I might have theoretical knowledge at that stage, but I haven't put it into practice. I haven't learned what it feels like to do it. In theory, it all sounds great; we're always going to give each other feedback really well etc. Then I get on with my work and suddenly somebody comes and tells me plainly: "Ok, so what you've just done, is somewhat substandard." Then it all seems silly. Self-organisation also sounds really great, but it isn't that straightforward either. I recently witnessed an example of what I mean here. In one company, we said:

"Okay, you no longer have to get holidays authorised, you can work it out within your teams." We announced it at a meeting. There was silence following the announcement. And then people began to make comments like: "What? So we're going to have to say to each other: 'No, it's not possible for you to take a holiday at that time?'" and, "But it's always been the boss who did that!". It was easier to blame things on the boss, but now people had to sort things out amongst themselves. Even such a simple matter, and one that's for their wellbeing: holidays. So, if you apply self-organisation to other areas, then it could get messy. It is up to us now to deal with these issues; we can't gang up against the enemy leader, who made all the decisions and forbade things. No, suddenly we have to do it ourselves, and then one of my colleagues might come along and say: "Listen up. This is how we want to do things, so can you please also stick with the plan?" That's pretty silly too. You have to want it and to take on the responsibility for it, and that might not be popular with everyone. It's not that comfortable.

***Follow-up question: Comfortable is a good word. I've not heard responsibility being described as uncomfortable.***

No, responsibility is not comfortable. I can't just sit back and shift the responsibility and say: "But he/she said I should do it." That's not an option any more. Now, I have to stand to attention and say: "Yes, I will deal with it".

**Question 5: What is important when it comes to the work of a Project Lead or Lean-Agile Leadership Manager?** ***Depending on which model we are talking about?***

Do you mean what qualities or skills they should have?

***Follow-up question: What is the bulk of their work? What is it fundamentally?***

I think they must be good at asking questions, and the right questions, like: "Explain why you are doing that?" You've just introduced the word 'Lean' which is about minimising or avoiding waste. If someone comes and tells you what they want to do, then questioning them more deeply: "Why do you want to do it that way?" Questions have to be put in such a way that the team has the opportunity to come up with the answers themselves. So that the solution isn't presented to them, but they are led to it through questions. And so that the team comes to their own conclusions. I think it's great because when they aren't given the solution, but are led to it through questions, it really improves the team's

motivation and in particular its self-confidence. The leader must still be able to question and scrutinise when it's less comfortable though – in other words, when things have gone wrong. The '5 whys' model. Looking at why something happened, and delving deeper into the reasons, not simply accepting the apparent reasons – or as I say, not being content with the superficial symptoms. But to really scrutinise: "What actually led to this?" Questioning the issues and leading the team through questioning is really important for a Lean-Agile Leader. As is motivation, but not in the sense of always doing things that motivate others. But rather, that they should create the space for people to be able to things that motivate them. More along the lines of intrinsic motivation: Creating the space for me to have the opportunity to do my work in a way that motivates me. I'm not a fan of these extrinsic awards you see, especially not in agile environments and individual awards. If anything, these should be team awards. Nevertheless, the issue of self-motivation must be addressed, particularly when it comes to white-collar workers. We're all grown-ups and shouldn't really need someone to hand out sweeties all the time, to make us feel happy. It would be better if we could achieve that ourselves.

**Question 6: Who is the most important person in an agile project and why?**

The whole team. All of them. I wouldn't want to highlight a particular role, because it only works if everyone works on an equal footing. It starts with the client I'm working with and stretches to the person who takes on the tasks, and to the team, and after that to the management. And I think it is wrong to highlight a particular role.

***Follow-up question: Who does the team encompass?***

Everyone who contributes to the work process. If I take it to its widest meaning, even the people who make sure that the working environment is presentable. But I don't want to take it that far just now. The project team, and not the development team, includes the client (or at least a representative of the client) and goes right the way through to anyone who administers the project or who creates an organisational framework for the project, depending on what the project constitutes. It might be more people for one project and fewer in another. If, however, we're talking about a software project, then we'd also include the operations department, and we would include DevOps (Development &

Operations). But the project team can also encompass accounting, the legal department or anyone who has an influence or is a stakeholder in the project.

**Question 7: How do you know that your team has the skills, knowledge and experience for an agile project?**

I don't understand the question. Do you mean how I would measure whether they have enough experience and knowledge etc? Or how do you mean?

***Follow-up question: How do you get a feel for what kind of talent, knowledge and experience is present in an agile environment?***

For knowledge, there is a simple method. I could, for example, create a map for Jurgen Appelo (Appelo, 2010; Appelo, 2012; Appelo, 2016; Appelo, 2019; Cockburn, 2019). This map would simply show what knowledge is required for this project and which skills each individual team member brings to bear. That would give us a relatively good overview of the knowledge and skills we have at our disposal, and where we might be lacking or where it could be improved. I can arrange it according to various categories. And the rest? Well, you can get a feel through talking together. When you talk to people, you can hear how they are doing, what they are thinking. And then, we have to set out the rules for our project, no matter what project it is. And try to implement these rules. In other words, we can categorise knowledge a bit and then for the rest, we need to set rules, so that we can get a feel for it. I would say that's important.

***Follow-up question: Which project rules are key? Can you name 3 of the most important ones?***

Are we talking about software projects or what are we talking about?

***Follow-up question: Would you make a distinction?***

Well, for some of them I would.

You could establish project rules around communication: "How will we communicate? What information will be communicated through which channels? What meetings are important for us? How will we conduct these meetings?". And another angle is: "How do we define quality for this project?". And thirdly, I would address issues such as: "How should we deal with errors, or better put, improvements? What do we need to do to improve and make progress?" Those are three of the most important properties. And then further to those, there is always the issue of trust, but that is hard to pin down in rules.

It would have to be a condition that's simply there from the start. But I think if we are able to communicate openly, if we can deal with mistakes openly etc. then trust is usually established anyway. It's hard to determine a rule for it. I can't say: "We must trust each other". That doesn't make any sense.

***Follow-up question: So, you mean that trust must be a given and that over time you can see whether it is well-founded?***

Trust is something that develops. I can, of course, adopt measures that promote open communication and where we establish rules and live by them. For example: "What happens when we've made a mistake? What do we consider a mistake, and how do we deal with it?". For me, that's a really important indicator that we can trust each other. We know that mistakes are going to happen. We know that it is completely normal. We discuss them, but not in order to chastise someone, but because we want to learn from them and become better. If we manage to apply these rules from the very first instance and do so consistently, then it establishes trust. To start with, it's somewhat of a leap of faith. It's an advantage that would be nice, but it cannot be imposed. We have to try to make it happen through actions and measures. We have to try not to keep things from people but to talk about them openly: "What are the goals?". Having a leader, or someone in the role of leader, who cares about people and is interested in them, and is not interested in presenting him or herself in the best light. These are all little building blocks that establish trust. When it comes to team size: If I'm working on a project with 30 team members, I can't expect there to be trust throughout. It might come over time, but I can't expect it to be there from the start. Research has been carried out that shows it is possible up to a certain size of group but that beyond that, it's more of an ideology than a reality.

***Follow-up question: You've mentioned that a leader should care about people. How might they show that? Or what counts as caring?***

Showing interest in what people are doing and what they are interested in. Asking questions like: "Tell me, what are you up to right now?" or "Tell me about it, I'm interested". Being aware of a change in someone is also a really important skill to have. If someone usually comes into work with a smile on their face and now, they're sitting there frowning for the third day in a row, it might be time to say: "Hey, everything okay with you? Is something bothering

you?". Essentially, letting them know that I see them not only as a worker but also as a human being. And to be aware of how each individual reacts to being addressed in a certain way. Everyone is different. Not everyone likes to be greeted with a friendly 'hello' first thing in the morning. Some might prefer a simple raised hand, cheers, bye. And I have to accept that. A good leader will know their team members and, it might sound mean, but they will know which ones to nudge in order to achieve a certain outcome. Not to aggravate them but to generate a positive reaction. In my experience, people react well when they realise that someone remembers something that they were talking about a couple of weeks ago. When they say: "Your child was poorly last week. Are they feeling better now?" or something like that. It costs nothing and it's not something I can necessarily learn. I can try to learn it, but it's not something I can attend a course on, sit an exam in and am then able to do. It's really something that has to develop. I have to have a feel for it and a sensitivity for it. Also, I can't make everyone tick using the same incentives. One person might be more competitive, so I can say to him/her: "Hey, if you get that done by tomorrow, then we'll go out and grab a coffee or something together in the evening". For another, it might be the wrong approach entirely. They might need a shout-out in the morning meeting: "Hey look, so-and-so solved the issue we had yesterday. Yeah! Let's have a round of applause." These are the things that make for a good leader. But they don't always have to be nice, they can also be demanding and ask difficult questions, because that's also part of their role.

**Question 8: What conditions must be met for self-directed work to be successful?**

The framework has to be in place. I have to be able to recognise the framework within which I am able to take responsibility and self-direct. If I don't know what the framework is, then that's hard. Without a framework, everything gets out of whack, and then instead of making a mistake I'd prefer not to do anything at all. It has to be acceptable for me to take on responsibility and self-direct my work. If I envisage the team doing the following, and then from above the word is: "Yes, yes, yes, that's all very nice, but we're now going to do it completely differently", then you've destroyed any good intentions that existed. That means of course, that the leadership must accept that mistakes will happen and things will not always run smoothly. I have to grant that freedom. From the outside, it can be hard to observe a wrong decision being made, but within their

framework they are allowed to make that decision and I have to let them. I can ask questions, but I have to let them decide, otherwise it's meaningless. Granting such freedoms also means being able to let go. It already starts from when they are self-organising and they say: "We are going to decide who does what work when, within our own framework." If someone comes along from the outside and says: "No, I don't want to run things that way", then I can crush the process. You can't cherry-pick which parts you want.

***Follow-up question: So, like deciding they're all going to work from 6:00 to 10:00 in the morning?***

Well, it depends how I've established the framework. If I've set a framework, that stipulates you can work in whatever way you want, but our core working time is from 10am to 2pm, and you must be available then. And then, let's say, somebody works online from 10am to 2pm and is available via Skype or something, and the rest of their working time is in the evening when their kids are in bed, then this complies with the guidelines. We either have to discuss whether we've outlined our framework wrong, or I have to say if that's OK with the team then that's the way it is. Even if I don't agree with it personally.

**Question 9: What motivates you and helps you get through your everyday work?**

There are loads of little visualisation techniques that help. For example, a door calendar, where important dates are really clearly marked and visible. Those dates can be managed in a shared online calendar, but pinned up on the door, they are easy to see. I think little stand-ups (or scrum meetings) are really great, no matter what style you use. It's coming together once a day, to communicate – but only if they are kept short and to-the-point. I think methods like pairing are good and helpful too – so completing tasks in pairs like pair programming. I think that retrospective meetings are a really, really important feature. If things have gone wrong, carrying out a post-mortem is really important, so that you can get to the bottom of things together: "How did the whole thing happen?". These days, we no longer consider a mistake to be a stand-alone event, but rather the culmination of various decisions along the way. And we can only improve if we've understood the sequence of events. I also think that pre-mortems are extremely helpful and really important. If we are starting a new project, we should sit down and think about what could go wrong, so that we can say:

"Okay, those are unlikely scenarios, but we have considered them, and now we can forget about them." So that we don't start to think about every single eventuality during the project and in doing so, inflate the situation to the extent that it's no longer manageable. And then, for agile projects, I find the delegation board approach really cool. Because I can use it to clearly communicate to my team which areas, they can make decisions in and how. I think it's a really lovely approach. If we're heading in the direction of a self-directed team, to move away from having to run and ask somebody, let's say, a more senior person, whether what we're doing is okay. Gradually learning how to make decisions for themselves. I think things like 'value points' or 'story points' are fantastic to give an impression of how big or important certain work units are. I am a real fan of things like story mapping to understand issues like: "What are we looking to achieve here? What do we want the process to look like?" And anything that uses visualisation or visual aids.

***Follow-up question: By visualisation, you mean hanging up boards on the walls?***

Yes, if possible. As many boards as the wall can take. Because digital tools have the disadvantage that I have to seek them out in order to see what's happening. But if it's on the wall, then it's right in front of me. But we might have a situation where not all employees in an agile team are present in the same office, and we then need to rely on those tools – and so be it. But, if you have an office, I would nevertheless still uphold the tangible version and then basically transfer it to the digital tool. Boards and tools have two different functions in my opinion. I think that a physical board on the wall is a means of communication. It's visualisation and communication. You can stand in front of it and discuss it. Digital tools are excellent for running statistics and metrics. It's much easier than on a physical board. With one single tool, I can press a button and there I have the analysis.

***Follow-up question: How does agile working function with dispersed or international teams?***

Yes, I've spoken to some who've worked together in offices as well as in remote teams. Funnily enough, they said that the rules they set out within teams, actually work better in remote teams, because they know they need those rules for it to work. For teams in offices they might say: "We see each other all the time anyway so everything's just fine." They don't feel the need to stick to the

rules so much. Nevertheless, it's very important for remote teams to stay in touch through video sessions – that's something I always recommend to the teams I work with, when they have remote workers among them – always carry out your meetings with video conferencing so that you can see the other people. Always plan to meet in person throughout the year, as well. The digital realm should never fully replace personal interaction. You have to make sure that they occasionally meet face-to-face. And then again, we want to be able to rely on digital tools to be able to hand over work to someone else, especially if we're 'following the sun'. And if so, then we must have very clearly outlined rules on how to document progress etc., all that sort of stuff. It's actually really important how we structure our work so that we can hand it over to someone else.

***Follow-up question: And make sure that there is a certain level of documentation?***

Yes, absolutely. If I have something like a tracker tool where I can see when the last time was that I spoke to the client or the product owner or whoever, so that the next person can take over without having to go over the same issues.

***Follow-up question: Or in case someone has an accident and they're suddenly incapacitated?***

Yes. Interestingly, this is always an issue that we have with on-site teams. And I always say: "Come on people! You always have to assume that something might go wrong, and it would be good if you left your work in such a way that someone else can take it on without having to carry out lengthy detective work. There's always the temptation to think it's not that important and I can just shout to the other side of the desk or pop into the office next door and then the matter's sorted. When people aren't working in close physical proximity, they know how important it is, especially when they're working in different time zones. They know they can't just pick up the phone and ask someone, and that they're all in the same situation. They might neglect it on one or two, maybe three occasions, and then they realise just how important it is, even if working remotely is often seen as a disadvantage. The discipline required for it, is much more obvious and therefore more readily implemented. However, we've also had reports that once people meet in person, trust levels are greatly improved.

***Follow-up question: Does using things like video chats also help increase trust levels?***

Yes, I think they are important, because there is more to communication than just words. Being able to see the other person and get a feel for who I am talking to and some of their surroundings is important. There are some great exercises you can use with remote teams to get to know the others on the team, such as: Show me the view from your window. What can you see right now? Tell me a bit about your workspace? I feel that video communication is extremely important. Furthermore, it creates a space where we can go off-topic and talk about random stuff that's nothing to do with work. We are human beings and it's important for us to have these kinds of interactions.

**Question 10: How do you keep up to date with skills and project trends?**

I get out there and speak to people, we meet up, have conferences etc. Ideally, in areas that I'm not entirely au-fait with the topic and it forces me to deal with new issues. That's a good point actually: "What are other folk chatting about?" If we only ever do things our way, we might be under the illusion that we're up-to-date, but there might be someone out there doing things completely differently. I find social media very useful because there are so many different approaches, and you can see all the conflicting comments. I think that's important. I don't think it's all great though. It's important to be critical. Social media can recommend lots of articles or books, and reading is one of the most important means of gaining a good oversight, I feel. The most important, however, is discussion – direct and fact-to-face – to learn from others' experiences. "What did they do about such and such?" and then form your own opinions. I'm not a big fan of taking some course and getting a certificate. I know that German businesses are very keen if someone has one of these on their CV. But to me, all they mean is that someone was prepared to spend 3 or 5 days doing it and spend 'x' amount of money on it. But it doesn't by any means tell us if that person has any ability in that field.

***Follow-up question: So, you're not keen on the latest trend for collecting digital awards?***

If somebody is really excited about engaging with a topic because they think it's really cool to get some kind of award's (batches) or something, then fine. Or when businesses say we're going to gamify things a bit and set some challenges,

and people engage with it, then that's fine too. It will definitely not suit everyone and not everyone will enjoy it. As I said, what I really don't like is this issue of certification. Someone goes and completes a 3-day Scrum Master's training course and then they believe they are a Scrum Master. But the duties of a Scrum Master are so many and so varied. It's one thing to learn the theory and quite another to have the personality to be able to put it into practice. But here I come after my 3 days of training, full of great ideas and say: "I'm now a Scrum Master and I'll take care of things." But then someone from the leadership ranks comes along and wants to join my team, and I say, "That's not possible, they are in the middle of a Sprint," and they respond by saying "But I insist on joining it!" They've not learnt how to deal with that kind of thing in their seminar. That comes with time and with practice. It's all well and good having a certificate, but it doesn't mean an awful lot in reality. That's the problem with these awards. I work quite a lot with young people from India. Their universities and businesses have a lot of these awards. Where there's this and that award for teamwork and suchlike. It's much more prevalent there. For German firms it's hard to get to grips with, especially when these are listed in their CVs. German firms often say: "Awards for what? What is it about?" It's a cultural difference.

***Follow-up question: I see, I didn't realise that. Getting an award for everything is great but I also ask myself what it's all for.***

At universities, for example, they can get awards for some kind of programming and then when they're working in a company, an award for team support etc. They are hugely proud of them and it's almost comparable to what we'd think of as a job reference. We, on the other hand, are only familiar with job references and don't know where to start with these awards. I recently had a chat with a young Indian woman, and I said: "You have to make sure you get a reference from your manager", and she said "Really, why? I have these awards."- in other words, what do I need a reference for, when I have these awards. So, I said: "Nobody recognises those awards here. They don't mean anything to them."

***Follow-up question: Right, so now I understand what the awards mean to them.***

**Question 11 was modified during the course of the conversation from "What has the biggest influence on you in changing your working processes?" to "What has the biggest influence on agile teams in changing their working processes?" – change TN008 made by agile coach.**

Generally speaking, I'd say it was having a good coach who can allow the team to come to the conclusion that there is a need for change. So that they will carry these changes out and realise what they personally have to gain from the changes. Because we accept change when we recognise what we have to gain from it.

***Follow-up question: So, you mean you shouldn't leave the team members to self-direct themselves in such a case, but rather install a coach to say: "Here are where the difficulties lie, now let's see why."***

It depends how far into the process the team is. If they are doing well and have come to grips with it, then they will probably come to those conclusions themselves. It always depends on how drastic the changes are that are required. If they are new to the process, they will need someone to help guide them. It's entirely irrelevant however, whether that person is in a leadership role, it's someone else internal or it's an external coach. It could also be someone from within the team, who might have acquired experience elsewhere, and who is trusted by the team – they could also take on the role of coach. If you take coaching: You might have a lighthouse team, which then splits up into smaller groups and where information is disseminated. Someone from that lighthouse team could take on the role of coach. If a team is very established in its agile processes – self-organisation etc – then they will often come to that conclusion on their own. But it doesn't always follow that they will come to it on their own. And then, they must also have the freedom to say they need help or support.

**Question 12: You've got one last wish: What would you change in your daily working processes?**

I'd allow more space for curiosity. That's what I'd wish for. So that there's really the space to allow curiosity to flourish and to be able to follow up on that curiosity. Essentially allowing more space for curiosity.

***Follow-up question: Curiosity for new subjects or simply being curious about everything, like a small child?***

That would be the ideal case. But being able to question what's going on with this or that product, or the curiosity to tackle other subjects. The curiosity to find out: "How do other teams deal with this?" Ensuring there is the space, so that I'm not worried that it might seem silly if I join another team or something like that. Or if I've seen a cool article about something on Twitter last night, and I think it could really be helpful for me, so I sit down and give it a go. That would be ideal and would require two different conditions. On the one hand, it would take the employees to develop this kind of curiosity, and on the other hand, it would be having the opportunity to develop that curiosity and fulfil it. I've just been to a workshop where I'd never met anyone before, and I was a participant. The purpose of the workshop was to develop new ideas for a festival in Kiel. I always find it fascinating that people can come together who have never met before. And you are given this funny little piece of paper at the start, with something written on it, where you say "Whah? What am I meant to do with that?" But then, by discussing it, you suddenly have a cool idea. I think that companies miss out on opportunities by not allowing that to happen. By not providing the space to develop curiosity, to discuss and to discover. There is one company, a big tool supplier in Australia, where they really encouraged that within the company, and some really cool product ideas were developed as a result of events that they organised for their employees. As a business you have to see the benefits.

**Question 13: Is there anything else you'd like to add that you think I should consider?**

It's been interesting.

**Question 14: May I use this interview as a basis for future studies after my DBA?**

Yes, of course.

# Annex 9: Report of the data collection and analysis

Table 7 shows the prepared semi-structured interview questions with an identifier for each question. Table 6 (Annex 7) outlines the prepared elements and questions for the semi-structured interview with the purpose of each activity and a timetable for each action in the interview.

**Table 7 Prepared semi-structure interview questions for the data collection**

| ID | Interview question |
|---|---|
| Q1 | What is an agile project for you? |
| Q2 | What supports the way you work in an agile project? |
| Q3 | What influences the project result? |
| Q4 | How do you handle the weaknesses of the agile approach? |
| Q5 | What is essential for the work of a project manager / Lean-Agile Leadership Manager? |
| Q6 | Who and why is the most relevant person for you in agile project work? |
| Q7 | What is crucial that you can say: The team has enough talent, knowledge and experience for agile project work? |
| Q8 | What prerequisites must be met to enable self-responsible work? |
| Q9 | What motivates you and thus supports your daily work? |
| Q10 | How do you keep your skills up to date with regard to project-relevant trends? |
| Q11 | What has the greatest influence to change the way at which you work? |
| Q12 | You have a free wish: What do you want to change in your daily work? |
| Q13 | Is there something you would like to tell me and which I should consider? |
| Q14 | Can I use the interview as a basis for future studies? |

Table 8 provides an overview of the anonymised names of the interviewees with their main role in an agile project, and the page numbers of the transcript.

**Table 8 Overview of the interviewees and page numbers of the transcript**

| Interviewee | Role | Count of transcript pages |
|---|---|---|
| TN001 | Coach | 4 |
| TN002 | Team Member | 10 |
| TN003 | Project Lead | 7 |
| TN004 | Scrum Master | 9 |
| TN005 | Coach | 12 |
| TN006 | Project Lead | 14 |
| TN007 | Coach | 16 |
| TN008 | Team Member | 15 |
| TN009 | Team Member | 7 |
| TN010 | Scrum Master | 9 |
| TN011 | Team Member | 9 |
| TN012 | Scrum Master | 10 |
| TN013 | Coach | 14 |
| TN014 | Team Member | 11 |
| TN015 | Project Lead | 9 |

Figure 15 shows the graphical evaluation of the respondents and their agile project roles. This shows how the project roles are distributed in the interviews.

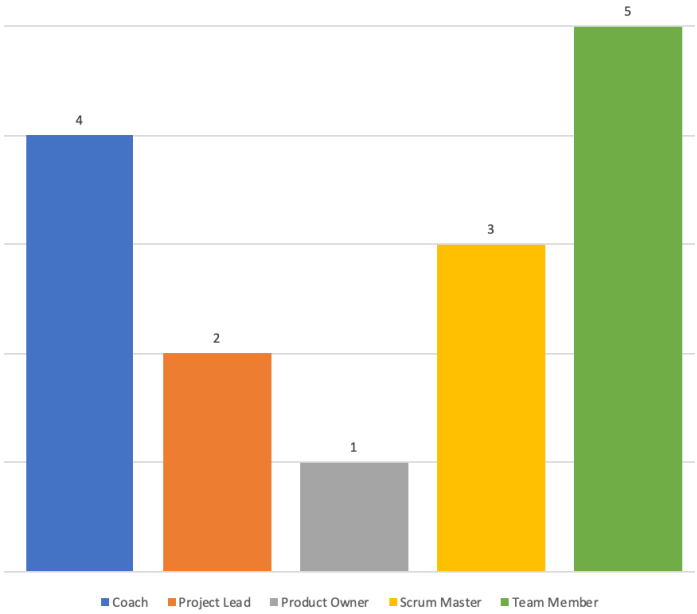


**Figure 15 Graphical evaluation according to agile project roles**

Figure 16 shows the number of transcript pages generated in the interview, grouped by the (agile project) role.

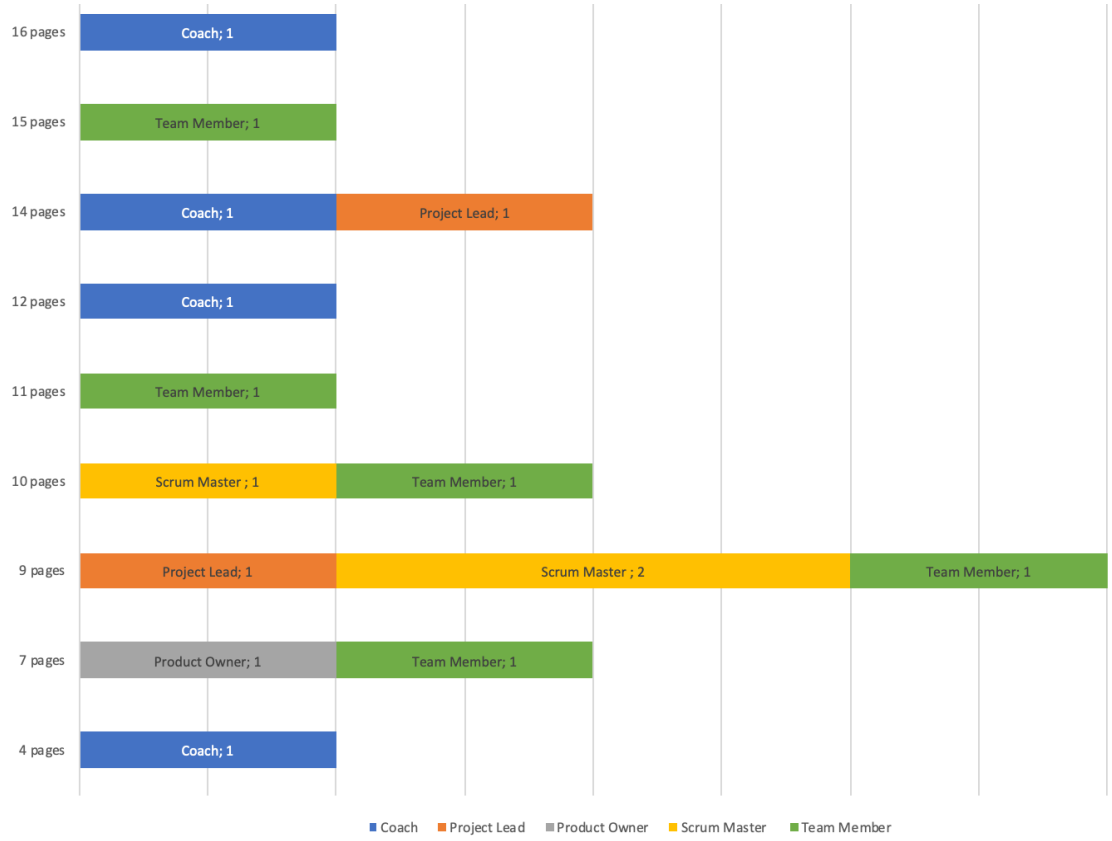


**Figure 16 Evaluation of the agile project roles and page numbers of the transcript**

Table 9 shows the exported codebook for the analysed codes in NVivo. The codebook contains the columns code name, coding criteria (the description of the code), and the number of links is presented in the column files and references. The code criteria ensured that each code was reliably applied in the analysis of the raw data and that the codes only reflect the experiences, meanings and motivations of the interviewees.

**Table 9 Codebook of the analysed codes**

| Code name | Coding criteria for the code | Refer-ences | Files |
|---|---|---|---|
| Conception | The code *vision* relates to milestones or team topics with the idea / introduction of the project journey plan, its implementation, tracking, and adjustment. | 37 | 14 |
| Culture | The code *culture* indicates any topic where a way of acting or thinking has been addressed in connection with communication, feedback, meetings, or work. | 28 | 10 |

| Code name | Coding criteria for the code | Refer-ences | Files |
|---|---|---|---|
| Customer | The code *customer* was used for all statements that specifically referred to the customer or a stakeholder. | 39 | 11 |
| Generally about roles | The code *generally about roles* was used when the statements were focused on project roles and no specific role was highlighted. | 58 | 15 |
| Hierarchy | The code *hierarchy* referred to the levels of the overall structure in the project, customer environment and organizational environment. | 9 | 5 |
| Knowledge | The code *knowledge* related to topics of the learning process, dealing with errors and influencing the working environment e.g., finger pointing. | 24 | 11 |
| Method | The code *methods* related to topics of project methodology and process models with the frameworks, practices, methods, processes and procedures. | 101 | 15 |
| Motivation | The code *motivation* applied to topics that influence the team member, manager or leader, such as self-determination, personal involvement, freedom, time pressure, cost pressure, delivery results (MVP) and organizational characteristics. | 106 | 15 |
| Product Owner (PO) | The code *Product Owner* was used for all statements that specifically referred to this agile role. | 65 | 11 |
| Project Lead (PM) | The code *Project Lead* was used for all statements that specifically referred to the manager or leader, that are sometimes termed as project manager, PM, lean-agile leadership manager (SAFe), or project lead. | 141 | 15 |
| Restrictions | Code *restriction* refers to topics associated with any restrictions, standards ,or limitations, and refers to keywords such as budget, requirements, hardware/ software products, quality, or working conditions. | 7 | 4 |
| Roadmap | The code *roadmap* referred to topics for setting goals, planning, and vision for the entire project or program, and is characterised by the key words quality, scope, time, cost, focus, or end result. | 121 | 15 |
| Scrum Master (SM) | The code *Scrum Master* was used for all statements that specifically referred to this agile role. | 46 | 12 |

| Code name | Coding criteria for the code | References | Files |
|---|---|---|---|
| Skills | The code *skills* related to topics of self-reflection and the intelligence needed to discover and improve one's abilities and to develop oneself; to everything that requires and supports continuous learning; and to possible sources with which this can be achieved. | 94 | 15 |
| Structure | The code *structure* focused on the responsibilities of managers, leaders and teams and their roles in the daily project routine. | 156 | 15 |
| Team Member (TM) | The code *Team Member* was used for all statements that specifically referred to the members of the project, that are sometimes termed as i.e., architect, business analyst, developer, tester, or database manager. | 167 | 15 |
| Working | The code *working* covered the environment (project, organisation, company), the working rules and the technologies for working in a project. | 124 | 15 |

Figure 17 shows a graphical analysis of the reference distribution to the codes.

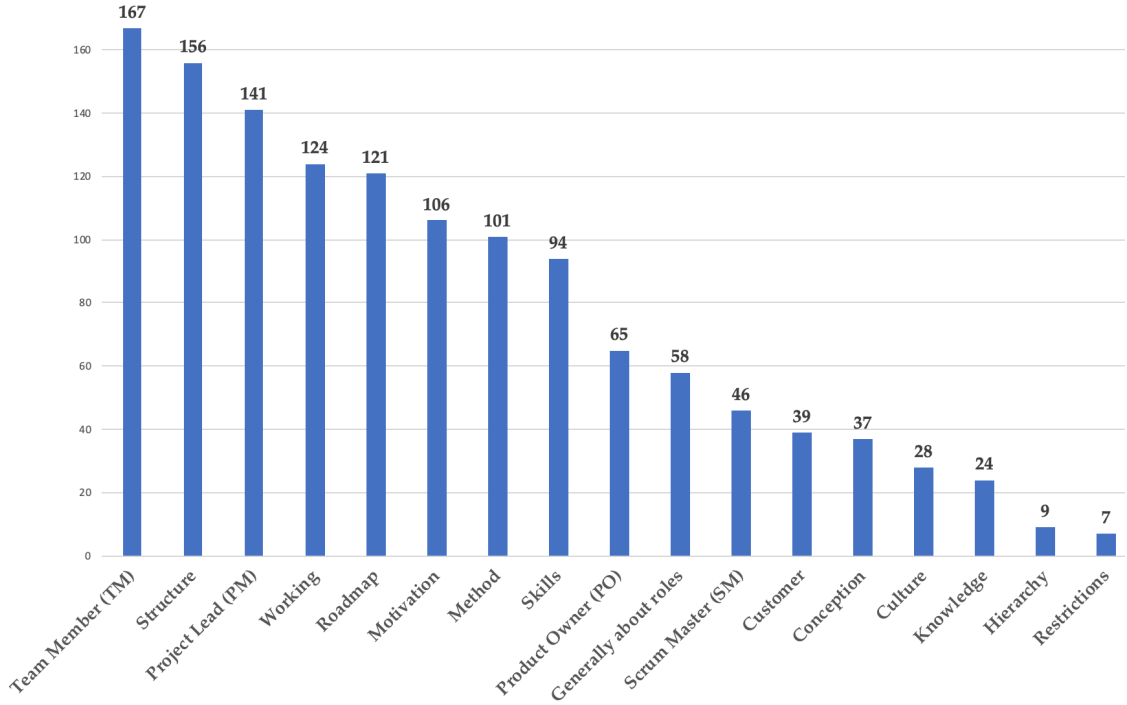


**Figure 17 Graphical evaluation of the reference distribution to the codes**

Table 10 shows the exported codebook for the analysed categories (themes) in NVivo. The codebook contains the columns category name, coding criteria (the

description of the category), and the number of links is presented in the column files and references. Below the line with the category, the codes are listed with their links. The categorisation criteria ensured that each code was reliably assigned to a category in consideration of the criteria and thus the categories and codes only reflect the experiences, meanings and motivations of the interviewees.

**Table 10 Codebook of the analysed categories with assigned codes**

| Category name | Category criteria and assigned code | References | Files |
|---|---|---|---|
| **ACCOM-PLISHMENT** | **The category *accomplishment* captures topics on the execution of project work and is related to leadership techniques.**<br>**This category examined leadership techniques that affect collaboration in a project with a practical standpoint.** | **277** | **15** |
| | Conception | 37 | 14 |
| | Knowledge | 24 | 11 |
| | Motivation | 106 | 15 |
| | Restrictions | 7 | 4 |
| | Skills | 94 | 15 |
| | Structure | 9 | 5 |
| **AGILE MANIFEST** | **The category *Agile Manifest* includes the agile values and refers to agile principles and practices for the daily project work e.g., common rituals.**<br>*Note to the coding process:*<br>*At the beginning, Agile Manifest had three subcodes (values, principles, practices), which were resolved in the coding process of the categories (themes), because the direct reference of the statements to the research objectives was missing. The term agile is a necessary limitation to refer to a project methodology for this study.* | **71** | **15** |
| **REAL-ISATION** | **The category *realisation* captures topics around work arrangement and is related to management techniques.**<br>**This category examined management techniques that affect collaboration in a project with a practical standpoint.** | **530** | **15** |
| | Culture | 28 | 10 |
| | Method | 101 | 15 |

| Category name | Category criteria and assigned code | Refer-ences | Files |
|---|---|---|---|
| | Roadmap | 121 | 15 |
| | Structure | 156 | 15 |
| | Working | 124 | 15 |
| ROLES | The category *roles* is the intersection of the accomplishment and realisation. | 516 | 15 |
| | Generally about roles | 58 | 15 |
| | Customer | 39 | 11 |
| | Product Owner (PO) | 65 | 13 |
| | Project Lead (PM) | 141 | 15 |
| | Scrum Master (SM) | 46 | 12 |
| | Team Member (TM) | 167 | 15 |

Figure 18 shows the graphical evaluation of the code reference distribution with grouping by categories.

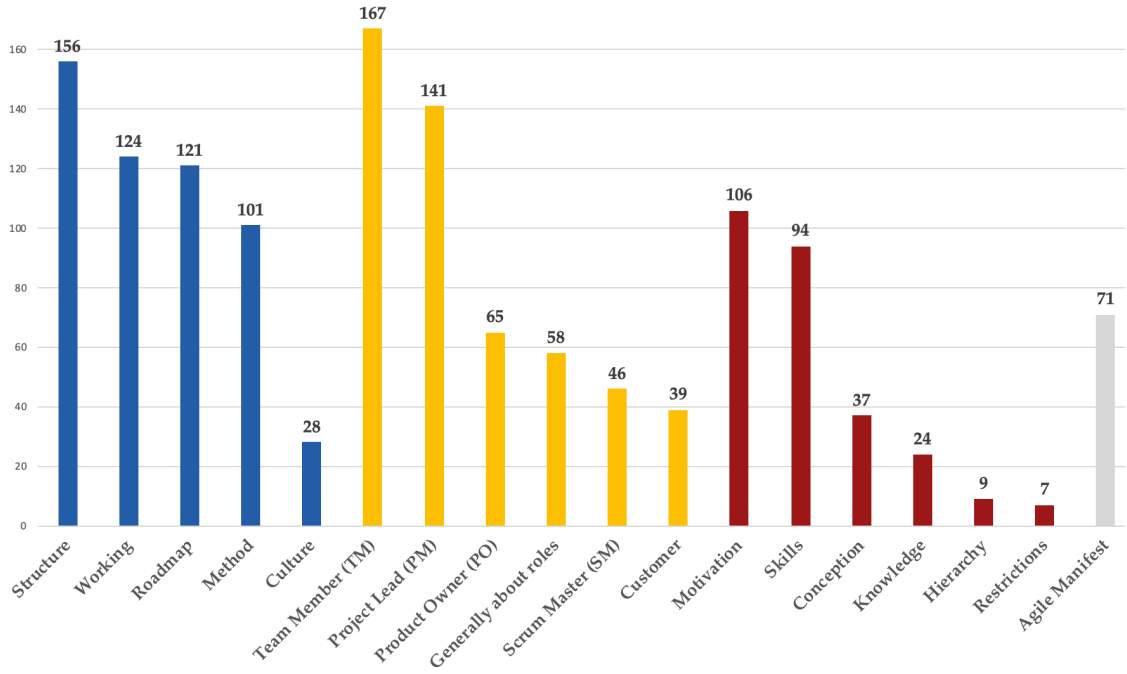


**Figure 18 Graphical evaluation of the code reference distribution with grouping by categories**

Figure 19 shows a graphical analysis of the reference distribution to the categories (themes).

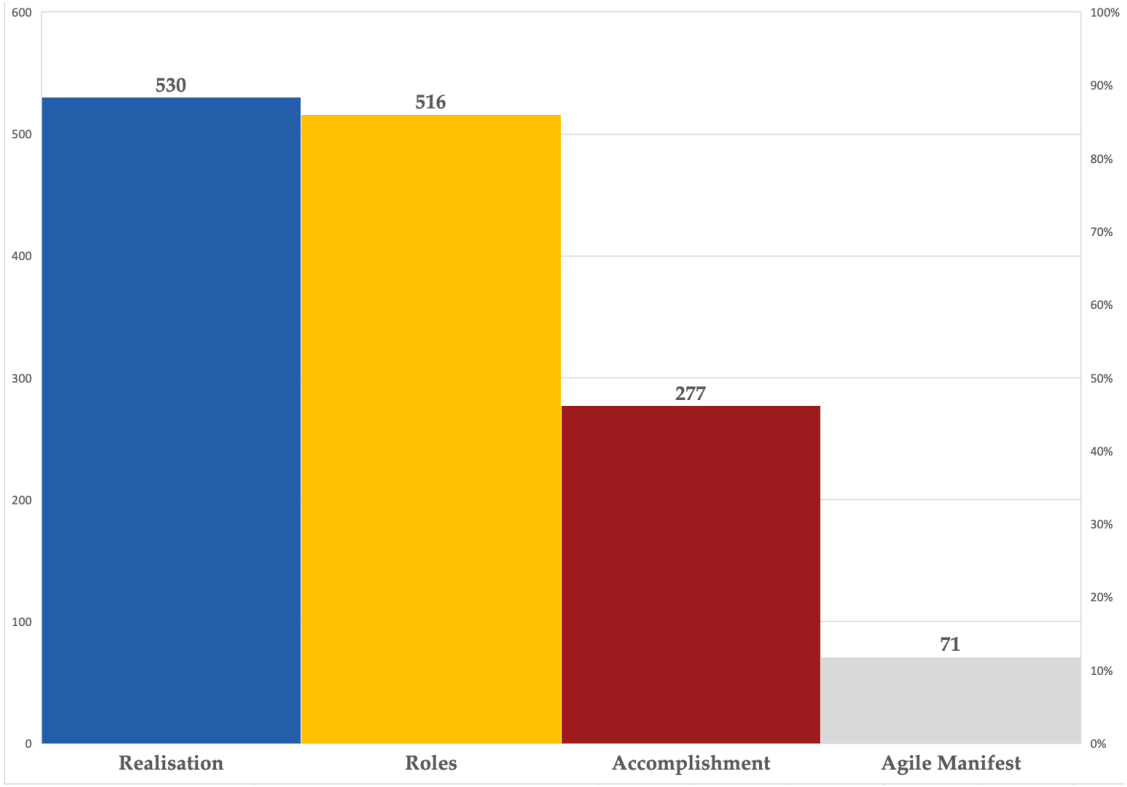


**Figure 19 Graphical evaluation of the reference distribution to the categories (themes)**

Table 11 shows the analysed codes with an assignment to the interview questions (Q01 to Q13) and Figure 20 illustrates the corresponding graphical evaluation.

**Table 11 Evaluation of the analysed codes to the interview questions**

| | Q01 | Q02 | Q03 | Q04 | Q05 | Q06 | Q07 | Q08 | Q09 | Q10 | Q11 | Q12 | Q13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Culture | | x | x | x | x | x | x | x | | x | | x | x |
| Method | x | x | x | x | x | x | x | | x | | x | x | x |
| Roadmap | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Structure | | x | | x | | | x | x | x | x | x | x | x |
| Working | | x | x | x | x | | x | x | x | | x | x | x |
| Manifest | x | x | x | x | x | x | x | | | | | | |
| Roles | x | x | x | x | | x | x | x | x | x | | | |
| Customer | x | x | x | x | x | x | | x | x | x | | x | |
| PO | x | x | x | | x | x | x | x | x | x | x | x | |
| PM | x | x | x | x | x | x | x | x | x | x | x | x | x |
| SM | x | x | | x | x | x | x | x | x | x | x | x | |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TM | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Conception | x | x | x | | x | | x | | | | x | | |
| Knowledge | | x | x | x | | | x | x | x | x | x | | x |
| Motivation | x | x | x | x | x | x | x | x | x | x | x | x | |
| Restrictions | x | x | x | x | x | x | | | | | | | |
| Skills | | x | x | x | x | x | x | x | x | x | x | x | x |
| Hierarchy | | x | x | x | x | x | | x | | | | | |

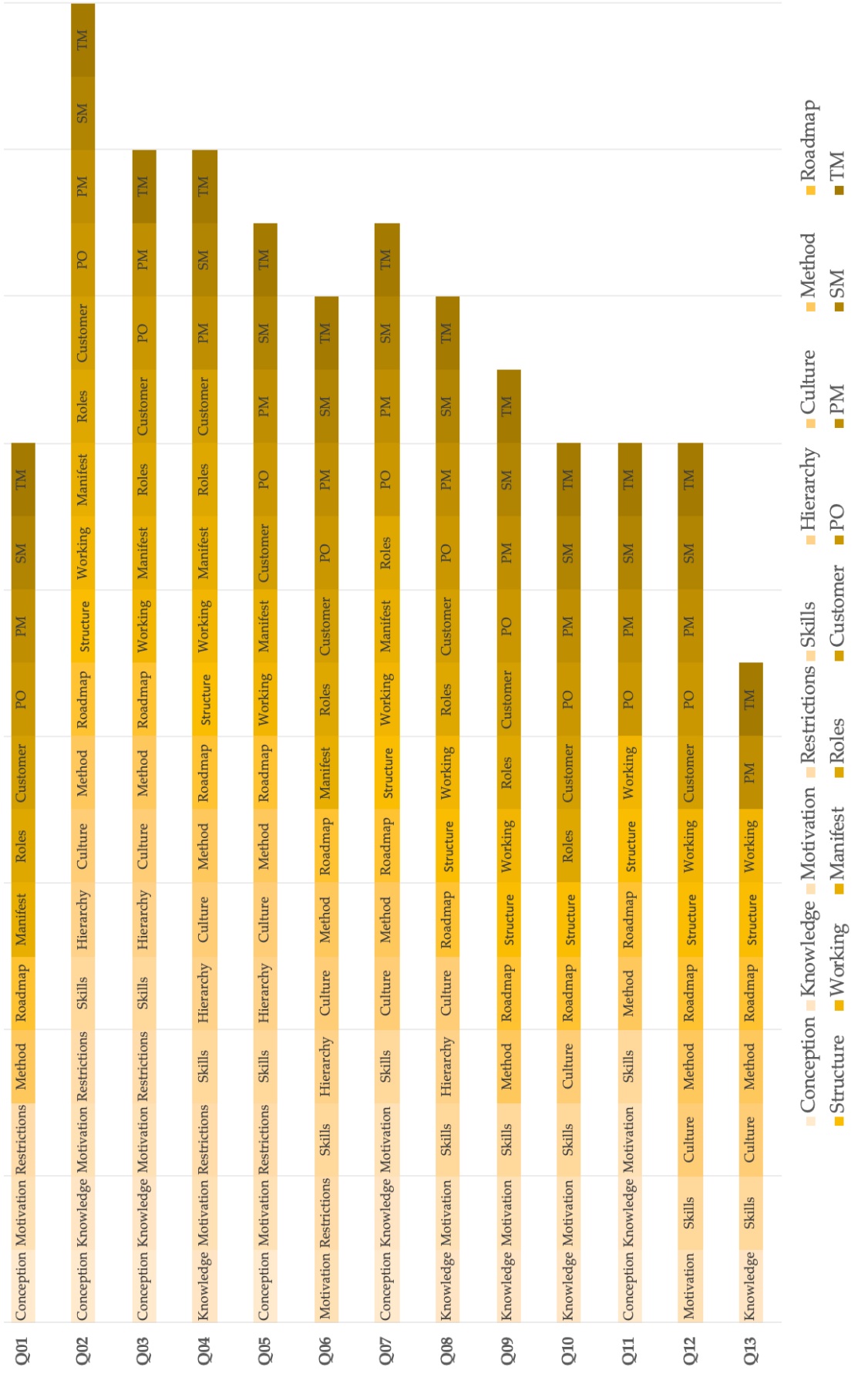


**Figure 20 Graphical evaluation of the analysed codes to the interview questions**

# Annex 10: Influences on project work from the management perspective

The following table is structured in accordance with Laub's (2018) management formula, the assigned procedures (Chapter 2: Literature Review), and the analysed labels (Chapter 4: Data Collection and Analysis). The labels point out that the analysed facts should be considered with respect to enhance teamwork, and the ranking of the labels should be noted in the brakes. The procedure offers an extract of possible techniques to enhance joint working in the project team, and with each stakeholder.

*) Laub's (2018) management formula:

*Planning* (P) + *Organising* (O) + *Directing* (D) = *Stability* (S).

**Table 12 Collection of the influences from the management perspective**

| **Procedure / Label** | **Description of the focus, criteria, and techniques from the management perspective based on Chapter 2 Literature Review (Procedure) or Chapter 4 Data Analysis (Label [with Ranking])** |
|---|---|
| **Planning (P)*** | |
| Label:<br>Method [4] | - The *method* considers the project approach (business), the organisational management approach (the environment, the company culture), and the project management approach.<br>- The project setup is in conjunction with the whole environment (inside and outside the project) and includes possible methodology (traditional, agile, or hybrid approach) with a suitable process model (waterfall, V-Model®, SCRUM, RUP), (scaled) framework (SAFe, Less, Nexus), project practices (ceremonies), and methods (Design Thinking, DevOps, AppOps).<br>- The agile approach is only possible for complex adaptive systems with adaptive processes. |

| **Procedure / Label** | **Description of the focus, criteria, and techniques from the management perspective based on Chapter 2 Literature Review (Procedure) or Chapter 4 Data Analysis (Label [with Ranking])** |
|---|---|
| Label: Roadmap [3] | - The *roadmap* points out the route to the goal and includes the project approach with short and long-term goals (vision and objectives), and measurements (planning components: e.g., quality, scope of work, supply, time, and cost focus) in consideration of the entire company, programme, product, project, and team.<br>- A roadmap enables the team to work in a self-organised and self-determined way. |
| Procedure: Project scope | - The procedure *project scope* includes techniques to cover common project goals, and requirements as well as the handling of changes.<br>- Scope definition techniques: project charter, SWOT analysis, scope statement, work breakdown structure (WBS), or scope baseline.<br>- Releases plan techniques: 'breakdown epics, estimate stories with poker planning, create release plan' (Canty, 2015, Chapter: 8)<br>- Vision techniques: project vision or vision statement<br>- Agile techniques: 'create agile charter, assign the project staff, develop project backlog, create estimates, develop the roadmap with story mapping' (Canty, 2015, Chapter: 8)<br>- Additional techniques: activity list, power/interest grid, project glossary, process improvement plan, RACI chart/organisational chart, resource breakdown structure, or resource histogram<br>(Canty, 2015; Englund & Bucero, 2019; Furman, 2014; Juli, 2010; Lyngso, 2017; Milosevic, 2003) |

| **Procedure / Label** | **Description of the focus, criteria, and techniques from the management perspective based on Chapter 2 Literature Review (Procedure) or Chapter 4 Data Analysis (Label [with Ranking])** |
|---|---|
| Procedure: Quality | - The procedure *quality* includes techniques to identify, benchmark, rank, monitor, and consider a proactive measurement to eliminate or reduce project influences; it supports an increasing level of acceptance of the project outcome.<br>- The quality includes the plan scope and handling of problems/causes.<br>- Problems based on the missing definition of prioritisation, responsibilities, roles, causes, or effects that can be identified via existing data, or brainstorming to communicate a problem statement.<br>- Quality techniques: problem statement, quality improvement map<br>- Visualising techniques: Pareto chart (histogram), cause-and-effect diagram (fishbone diagram)<br>- Monitoring technique for project processes/procedures: control chart<br>- Agile sequence for quality management: people, communication, process, standards, and documentation<br>- Supporting techniques: face-to-face meetings or video conversation technologies prevent or reduce the hurdles of language and culture<br>(Canty, 2015; Englund & Bucero, 2019; Furman, 2014; Lyngso, 2017; Milosevic, 2003; Rasiel & Friga, 2001; Sanghera, 2018) |

| **Procedure / Label** | **Description of the focus, criteria, and techniques from the management perspective based on Chapter 2 Literature Review (Procedure) or Chapter 4 Data Analysis (Label [with Ranking])** |
|---|---|
| **Organising (O)*** | |
| Label: Structure [1] | - *Structure* is the setup of a clear structure to support the (agile) values, principles, and practices for the project.<br>- The structure highlights important criteria regarding roles and responsibilities in conjunction with methods and roadmap.<br>- The structure points out a framework for self-determination and self-organisation which includes conditions, concrete plans, limits, clear responsibilities (teams, roles and stakeholders), significant dependencies, collaboration of the teams (interdisciplinary or multidisciplinary teams), and communication channels in conjunction with the external world (organisation). |
| Procedure: Stake-holder | - The procedure *stakeholder* includes techniques to integrate any stakeholder with their responsibilities that should be used to increase the motivation and to set up a feedback culture.<br>- Techniques: customer roadmap, focus statement, communication matrix, performance (or status) report, discussion guide, quality function deployment (QFD - house of quality)<br>(Furman, 2014; Lyngso, 2017; Milosevic, 2003, Sanghera, 2018) |
| Procedure: Skill | - The procedure *skill* includes techniques to analyse and manage the development of skills.<br>- Techniques: skill inventory or business skill analysis, commitment scorecard, commitment-based project management<br>- Visualising technique: workflow diagram or wireframe<br>(Englund & Bucero, 2019; Milosevic, 2003) |

| **Procedure / Label** | **Description of the focus, criteria, and techniques from the management perspective based on Chapter 2 Literature Review (Procedure) or Chapter 4 Data Analysis (Label [with Ranking])** |
|---|---|
| Procedure: Collabo-ration | - The procedure *collaboration* includes techniques to focus on the human side, handle complex interactions, respect culture aspects, provide balance of climate, or offer possible conflict situations.<br>- Techniques: four-stage model, stakeholder matrix, stakeholder engagement assessment, or influence mapping<br>(Canty, 2015; Englund & Bucero, 2019; Furman, 2014; Lyngso, 2017; Milosevic, 2003, Sanghera, 2018) |
| **Directing (D)*** | |
| Label: Working [2] | - *Working* includes definitions of desirable conditions for the working environment (e.g., co-located, remote, or a mix), working information about the project (framework, methods, structures), use of (IT) technologies (e.g., systems, platforms, programs, tools, and apps for each working day), and introduction of automatism for habits on the working day.<br>- The working conditions include definitions and rules to be followed for the working– e.g., channels of communication, definition of quality, handling of errors and disruptive factors, timeframe for undistributed work.<br>- Working includes a description; it sets up applied technologies for the project work that supports a common understanding and ensures fast start in the project for new team members. |

| **Procedure / Label** | **Description of the focus, criteria, and techniques from the management perspective based on Chapter 2 Literature Review (Procedure) or Chapter 4 Data Analysis (Label [with Ranking])** |
|---|---|
| Label: Culture [5] | - *Culture* aspects flow in all activities and have a close connection with themes of communication, feedback, meetings, and working.<br>- It is essential to have an open culture by focusing on facts, and without blaming anyone or pointing fingers at somebody.<br>- The defined setup should be accepted and followed by everybody (management, customer, team, stakeholder) to enhance joint working. |
| Procedure: Change, risk, issue | - The procedure '*change, risk, issue*' includes techniques to identify and manage changes, risks, and issues.<br>- Techniques: change coordination matrix, project change request, change log, risk log (or risk register), issue log, summary progress report, post-mortem review, or risk workshop<br>- Additional techniques: decision tree, Monte Carlo analysis, risk breakdown structure, or risk response plan<br>(Englund & Bucero, 2019; Furman, 2014; Lyngso, 2017; Milosevic, 2003; Sanghera, 2018) |

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# Annex 11: Influences on teamwork from the leadership perspective

The following table is structured according to Laub's (2018) leadership formula, the assigned procedures (Chapter 2: Literature Review) and analysed labels (Chapter 4: Data Collection and Analysis). The labels point out the analysed facts should be considered with respect to enhance collaboration, and the ranking of the labels should be noted in the brakes. The procedure offers an extract of possible techniques to enhance joint working in the project team and with each stakeholder.

**) Laub's (2018) leadership formula:

*Vision (V) + Action (A) + Mobilisation (M) = Change (C).*

**Table 13 Collection of the influences from the leadership perspective**

| **Procedure / Label** | **Description of the focus, criteria, and techniques from the leadership perspective based on Chapter 2 Literature Review (Procedure) or Chapter 4 Data Analysis (Label [with Ranking])** |
|---|---|
| **Vision (V)**** | |
| Label: Conception [3] | - The *conception* includes the planning of phases and conditions to work together on the visions as well as to track and customise relevant themes and ideas in a project.<br>- The conception enhances the communication to each stakeholder e.g., via emotional intelligence. |
| Label: Hierarchy [5] | - The *hierarchy* includes a communication structure to communicate each theme that supports knowledge sharing, and to create transparency over the project.<br>- A flat hierarchy enables a direct and fast culture of communication.<br>- Fast-professional answer to each question supports the development of an appropriate solution.<br>- Design Thinking allows fast feedback from the end user or any stakeholder and increases the acceptance.<br>- A mix of traditional and agile management hierarchies should be considered regarding the setup of the project structure. |

| **Procedure / Label** | **Description of the focus, criteria, and techniques from the leadership perspective based on Chapter 2 Literature Review (Procedure) or Chapter 4 Data Analysis (Label [with Ranking])** |
|---|---|
| Label: Restriction [6] | - Each project has *restrictions* that can influence the project, and impact collaboration.<br>- Restrictions can be absorbed with a proactive working style, and others need a flexible working style.<br>- Set up a guideline to handle restrictions.<br>- Check regularly the restrictions, and plan timeframes for predictable restrictions as well as possible influences.<br>- The team should be supported by materialised restrictions. |
| Procedure: Neuro-leadership | - Neuroleadership is defined with bond, orientation and control, self-esteem, self-protection, pleasure, and prevention of reluctance<br>- Neuroleadership approaches: SCARF model, AKTIV model, or the approach developed by Elger<br>(Elger, 2013; Grawe, 2012; Peters & Ghadiri, 2014; Rock, 2010a; Rock, 2010b) |

| **Procedure / Label** | **Description of the focus, criteria, and techniques from the leadership perspective based on Chapter 2 Literature Review (Procedure) or Chapter 4 Data Analysis (Label [with Ranking])** |
|---|---|
| **Action (A)**** | |
| Label: Motivation [1] | - *Motivation* is a balancing act between request and encouragement. However, if a team member loses the motivation, the project is lost!<br>- Motivation needs an environment to learn new things and influences the elimination of impediments; it is supported by a clear and open (feedback) culture.<br>- Motivation increases with …<br>o a project setup and the conditions in conjunction with the whole system (the organisation).<br>o the possibility of discussing the project condition.<br>o solution-oriented goal in small cycles (e.g., MVP).<br>o an opportunity of freedom and responsibility to utilise the full individual potential (self-determination).<br>o the possibilities of a free choice to select education and to test new ideas (e.g., experiments) and methods (e.g., PoC).<br>o small joint events that support personal relationships and uplift the atmosphere. The celebration of events should be influenced by a realistic view about the delivered solution.<br>- Motivating is to share professional, technological, and methodical know-how with others. |

| **Procedure / Label** | **Description of the focus, criteria, and techniques from the leadership perspective based on Chapter 2 Literature Review (Procedure) or Chapter 4 Data Analysis (Label [with Ranking])** |
|---|---|
| Procedure: New leadership approaches | - The procedure *new leadership* includes techniques to inter alia lead a team.<br>- New leadership capabilities are self-awareness, self-management, social awareness, social skills, and relationship management.<br>- New leadership concentrates on the emotional side by stressing the competencies self-reflection, self-regulation and motivation, empathy, and social skills. These would be deployed via a mix of several leadership styles – affiliative style, authoritative style, coaching style, coercive style, democratic style, and pacesetting style.<br>(Chugh, 2011; Englund & Bucero, 2019; Peters, 2015) |

| **Procedure / Label** | **Description of the focus, criteria, and techniques from the leadership perspective based on Chapter 2 Literature Review (Procedure) or Chapter 4 Data Analysis (Label [with Ranking])** |
|---|---|
| **Mobilisation (M)**** | |
| Label: Skill [2] | - *Skill* development assumes self-motivation as an essential prerequisite; it is supported by a culture of constructive criticism to all impediments (requires a certain level of emotional intelligence).<br>- Implement a lifecycle to identify and reflect the skill gaps to improve the qualification, and everybody should enhance others to close gaps.<br>- Skill development on project-relevant content via 'Communities of Practices' (CoPs) or other user groups, talking with other professionals, use of chat channels, going to present training (e.g., for soft-skills), and use of online courses for professional or theoretical know-how.<br>- Support others about learning– e. g., supporting young talents and working as a trainer, mentor, or tutor.<br>- Use a large variety of sources (e.g., outside one's own business, project environment, or company) to form one's own opinion – e.g., read books on psychology (e.g., SCARF Model, Growth Mindset by Carol Dweck) or buy any book under 10 Euros.<br>- View beyond the horizon of one's own profession. This can be developed by organising or attending conferences, community meetings, and meet ups, as well as by establishing a continuous personal interaction with social exchange, discussing several topics, using social networks (e.g., Twitter, LinkedIn, Xing, YouTube, TED Talk), and reading news, books, and papers. |

| **Procedure / Label** | **Description of the focus, criteria, and techniques from the leadership perspective based on Chapter 2 Literature Review (Procedure) or Chapter 4 Data Analysis (Label [with Ranking])** |
|---|---|
| Label: Knowledge [4] | - *Knowledge* is influenced by the culture of uncovering errors, communicating them, and finding a solution without any finger pointing. This culture should be allowed to make a mistake, but the same repetitive faults are forbidden, and should be avoided. The persons responsible should react on the communication of failures with emotional intelligence.<br>- The organisation, programme, project, and each stakeholder should accept learning and reflection processes.<br>- Knowledge is closely connected to conception and work. |
| Procedure: Servant leader | - The procedure *servant leadership* includes techniques to inter alia lead a team.<br>- Servant leadership forms clarify an understanding and are used as the basic characteristics of leadership.<br>- 10 Features: awareness, building a community, commitment to the growth of people, conceptualisation, empathy, foresight, healing, listening, persuasion, and stewardship<br>- Instrument: organisational leadership assessment (OLA)<br>(Greenleaf et al., 1998; Laub, 2018) |

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# Annex 12: Influences on project and teamwork from the management and leadership perspective

The following table is structured in keeping with Laub's (2018) management and leadership formula and the assigned procedures (Chapter 2: Literature Review). The procedure offers a summary of possible techniques to enhance joint working in the project. The Table 14 is an intersection of the management and leadership perspectives.

*) Laub's (2018) management formula:

*Planning* (P) + *Organising* (O) + *Directing* (D) = *Stability* (S).

**) Laub's (2018) leadership formula:

*Vision (V) + Action (A) + Mobilisation (M) = Change (C).*

**Table 14 Collection of the influences from the management and leadership perspective**

| **Procedure** | **Description of the focus, criteria, and techniques based on Chapter 2 Literature Review (Procedure)** |
|---|---|
| **Planning (P)* and Vision (V)**** | |
| Solve problems | - The procedure *solve problems* includes techniques to handle, prevent, minimise, or eliminate problems/barriers.<br>- Team members need a paragon and contact person to communicate problems.<br>- Formulation of clear expectations (spoken and written) and obtaining the assent of each team member.<br>- A positive attitude is necessary irrespective of whatever happens along with the enhancement of the thoughtful, considerate, and respectful manner.<br>- Prevention of problems is enhanced with the following motto: work hard and have fun.<br>- Preventive measures for any problems that might arise.<br>- Team members need time to process any theme and feedback.<br>(Englund & Bucero, 2019; Lyngso, 2017) |
| Handle commun-ication | - The procedure *handle communication* includes techniques to set up and manage structures, rules, and guidelines for the |

| Procedure | Description of the focus, criteria, and techniques based on Chapter 2 Literature Review (Procedure) |
|---|---|
| | communication in conjunction with the project and whole system.<br>- Communication is an on-going aspect, and everyone must find a way to communicate in an increased globalised world.<br>- Effective meetings can be set up via objectives, rules, time, and assistance. This requires clear, understandable, and complete information. The effectiveness is influenced by the choice of the media/tool, the style of writing/spoken words/gestures, how to manage a meeting (e.g., agenda, time-boxing), the style of presentation and facilitation, and listening techniques (active, effective, or empathic listening).<br>- The communication culture should focus on facts, and future improvements with a positive attitude.<br>- The communication is necessary to handle and dissolve conflicts. Englund & Bucero (2019, Chapter 5):<br>o A conflict situation shows a certain interest. All the resources and their needs should be considered in relation to personal beliefs, principles, and historical precedence to analyse each situation and to reveal the source.<br>o The spring of conflicts can result in disputes, competition, sabotage, inefficiency or low productivity, low morale, poor communication, or strained relationships.<br>o No conflicts can be based on disinterest, lowered motivation, or indifference.<br>- A solution-oriented communication strengthens the team. The leader supports the team to identify and find a (proposed) solution. The manager should be involved in resolving recurring problems or deciding a proposed solution.<br>- Effective communication tools: paper (very low effect), audio tapes, emails, and video tapes as options for documentation; |

| Procedure | Description of the focus, criteria, and techniques based on Chapter 2 Literature Review (Procedure) |
|---|---|
| | continue with phone conversations, video conversations, face-to-face conversations; and finally, face-to-face talks at the whiteboard as options for the modelling (very high effect).<br>- Remember that visualisation is target-oriented.<br>(Canty, 2015; Englund & Bucero, 2019; Furman, 2014; Sanghera, 2018) |
| Working | - The procedure *working* includes techniques relating to work management and the quality acceptance criteria to support the team in each situation.<br>- The management of work includes<br>o to inculcate respect (individual, team, organisation).<br>o to sharp a sense of responsibility and commitment.<br>o to offer empathy (to listen and understand stakeholders).<br>o to offer an open approach (alternative approaches, new capabilities, possible improvements).<br>o to influence each stakeholder with positive attitude.<br>o to support self-confidence.<br>o to build trust among subordinates.<br>o to motivate subordinates to participate.<br>o to provide solution-oriented and permanent information to each.<br>o to respect for the three Ps (passion, persistence, patience).<br>o to encourage creativity and innovation.<br>o to support if anyone needs any help.<br>- Empathy should be based on the human factor – humans with emotions and not as resources, numbers, or things.<br>- Emotional intelligence is equally important to manage and lead.<br>- Manage your own emotions, time, priorities, energy, and thinking.<br>- Delegate activities to others because delegation is a sign of putting faith in others – it helps to involve others with all processes, procedures, and decisions. |

| Procedure | Description of the focus, criteria, and techniques based on Chapter 2 Literature Review (Procedure) |
|---|---|
| | - Self-organisation inside teams can be related to self-management – it refers to a proactive approach and is based on complementary and mutually supportive working inside the team.<br>- A failure is a learning process and happens to be necessary for continued improvement, which increases the morale and motivation inside the team.<br>- Charisma is helpful to manage, lead, and work with people.<br>- Techniques: affinity diagram (ranking), flowchart (visualising), information requirements study, object lifecycle analysis, object-oriented functional design, project quality programme or process quality assurance, system management, technical design, or tests<br>- Adopt the SMART approach to each technique.<br>(Beck et al. 2001; Englund & Bucero, 2019; Furman, 2014; Lyngso, 2017; Milosevic, 2003; Pete, 2017) |
| **Organising (O)* and Action (A)**** | |
| Collabo-ration | - The procedure *collaboration* includes techniques to build a team, define criteria for documentation, working responsibilities, and to work strong and have fun.<br>- Team-building technique: four-stage model (forming, storming, norming, and performing) in conjunction with situational or adaptive leadership and with personas to characterise the stakeholders.<br>- Support the team collaboration, e.g., via start your day, product box, or me, and my shadow.<br>- Visualisation techniques for modelling: use cases, data models, screen mock-ups, or wireframe tools to visualise product mock-ups, product prototypes, or team plans.<br>- Strengthen the team communication, e.g., via statistics of burn-down/burn-up charts, defect data, product features, |

| Procedure | Description of the focus, criteria, and techniques based on Chapter 2 Literature Review (Procedure) |
|---|---|
| | retrospective data, risk charts, task board, team velocity, or work in progress (WIP).<br>- Use a cork board and sticky notes as interactive, fast, flexible, and time-saving technique, with easy installation for various purposes, and in combination with prioritisation techniques like dot voting, monopoly money, 100-point model, or MoSCoW prioritisation schema as well as making room for discussions.<br>- Set up the documentation criteria – e.g., target-oriented short documents (one-page) with less words and use of maps for more detailed information. Only requested documentation by the stakeholder with a defined value is necessary, but it is important to define a decent location to save these and to display important information (website, applications, or whiteboard).<br>- Assist fun and work in the daily business via humour as an effective communication technique that changes one's own style from a task-oriented to relationship-oriented style.<br>- Respecting various diversity themes such as culture or different approaches of humour at each time.<br>- Organise team-building activities to increase the morale of the team, such as through lunch or dinner, dragon canoe racing, eating an ice cream, events, group painting, or working together on an article or paper as a team.<br>- Select adequate electronic and collaboration technologies and feedback forms.<br>(Canty, 2015; Englund & Bucero, 2019; Furman, 2014; Graham, 2006) |
| **Directing (D)* and Mobilisation (M)**** | |
| Skill manage-ment | - The procedure *skill management* includes techniques to define the development process that should flow in daily business. |

| Procedure | Description of the focus, criteria, and techniques based on Chapter 2 Literature Review (Procedure) |
|---|---|
| | - Everyone needs a development process for self-improvement and continuous daily learning that increases the motivation and improve joint working in the entire project.<br>- The aim is to learn from others, focus on facts, analyse the facts, and deduce improvements for the facts.<br>- Other people and the interaction with individual people influence the project work.<br>- It is important to know the team members and their needs to support the development process.<br>- Networking is the best technique to become more familiar with the team members; it is also important to listen to them, assist problem solving, support the work of other people, and to give positive feelings as feedback by focusing on strengths by building trust.<br>- It is important to involve the team to make decisions over project goals, share continuous target-oriented information, delegate activities through the team, and support them in conflict situations.<br><br>(Englund & Bucero, 2019) |
| Know-ledge manage-ment | - The procedure *knowledge management* includes techniques to focus – it handles knowledge for the project work.<br>- A vision or purpose does not require a deep technical background, but the environment must be understood for the development.<br>- Use experiments to try out ideas and trends, as well as to test possible new solutions, because nobody knows further development.<br>- In particular, other trains of thought should be supported because they can offer possible opportunities.<br>- Minimise the differences between cultures, mindsets, and silos. |

| Procedure | Description of the focus, criteria, and techniques based on Chapter 2 Literature Review (Procedure) |
|---|---|
| | - Use an effective leadership to work with people via new technologies. Though the focus is not on technology, any technology change in each environment – orientation is on changes and transformations to learning new things.<br>- Define the handling of knowledge that supports a continuous development process and prevents the situation to reinvent the wheel again and again.<br>- Define how and what is to be documented, where is the common source, and who is responsible to save the project knowledge.<br>- Remember that skilled people produce the project outcome.<br>- Activate your own reward system, integrate the learning in your own everyday business, design and redevelop standards for the procedures (e.g., use problem-solving standards to reduce gaps), and focus on the assignment of work and decision-making.<br>- Everyday reflection technique: legacy vision<br>(Englund & Bucero, 2019; Furman, 2014; Haneberg, 2019; MIT Sloan Management Review, 2019) |

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