EXPLORING GENERATIONAL DIFFERENCES ON COLLABORATION WITH Q-METHODOLOGY

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EXPLORING GENERATIONAL DIFFERENCES ON COLLABORATION WITH Q-METHODOLOGY

By
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Preface

In the context of my studies for the Master of science in Construction management and Engineering (CME) at the Delft University of Technology, I conducted this research as my final graduation project. For the past six months, I have been exploring generational differences on collaboration in the project team. The engineering company Sweco in De Bilt granted me the opportunity to investigate this topic. Throughout my research I had the possibility to talk to many professionals from different generations and domains. My investigations have made me realize that generations in general share the same opinion on collaboration. Nevertheless, differences exist and exactly these differences can be related to generational influence. With this in mind, I proudly present my graduation research, in which I hope to contribute to an enhanced awareness concerning generational differences at work.

Throughout the whole research process, I could rely on the help of my graduation committee and my thesis would not have been half as refined and detailed without their help.
I would like to thank my first supervisor, Marian Bosch-Rekveldt, for guiding me through this graduation process. She structured my ideas, gave me constructive feedback, challenged my ideas and thereby had the biggest impact on the quality of my research. Marian never gave me more than 30 minutes, but that taught to be prepared and we had very productive sessions. Next, I would like to thank my second supervisor, Ronald van Warmerdam, who helped me especially in the beginning of my research to structure my thoughts and find a suiting topic. Next, I want to thank my professor, Marcel Hertogh, who is one of the busiest people I know. Nevertheless, his sharp and constructive feedback during meetings was always very helpful and helped me to zoom out to look at my thesis in the broader perspective.
I am also very grateful to conduct this research in collaboration with Sweco. Working at a Dutch company provided me with new insights which were very helpful for my thesis. Thanks to my team manager and supervisor Stephan Laaper, I had a very good start at the company. He always introduced me to the right people and helped me to organize my report within Sweco. Stephan was always there if I needed anything and the way he trusted me in doing my work was reassuring and enhance my confidence in what I was doing.
Last but not least, I want to thank Jella Jongerius, my second company supervisor. Throughout the whole process, Jella read my work, gave me critical feedback and helped me to organize my ideas. Her enthusiasm and concern for my graduation project was extremely motivating and stimulated me to improve myself. She contribute a big part to the structure of this research, thus I was very grateful that I had her in my team.

Next to acknowledging my graduation committee, I would like to express my gratitude to all the interview and validation talk respondents, who took the time to talk to me about their experiences. They provided me with the information I needed to conduct this research and their interest in my research was very reassuring and reflected the currency of the topic.
Also I would like to thank my colleagues from Sweco, in particular the Team Projects, for supporting me during this process. You were a great help and facilitated my Dutch learning process.
Finally, I would like to thank my friends, my family, my girlfriend and my coach, who supported me throughout the process of my graduation project. Their comforting words and gestures provided me with the energy and positivity needed to face and overcome doubts and challenges along the way.

Moritz Kraus

EXECUTIVE SUMMARY

In collaboration professionals must deal with professionals from other generations. Since the start of this decade four generations are working in organizations. Each generation believes in a different value system, work ethic and management style. Such generation-related differences can create tensions which have a negative effect on the collaboration in the project team.
In the Netherlands, the construction industry is trying to improve its performance. Several scholars argue that more attention should be paid to human interaction and the social dynamics within a project. It is the people who deliver projects, not processes and systems. Following this trend, this thesis eaxmines if generational behaviour influences collaboration in the project team. Thereby, it provides new insights about human interaction in the project team. In this context, a main research question is formulated as follows:

> *What influence does generational behaviour have on collaboration in project teams in the construction industry?*

The main methodology used in this research is called Q-methodology. The first step starts with the definition of a concourse. The concourse is a broad selection of viewpoints regarding (in this case) on collaboration in the project team in the construction industry. To gather the viewpoints a literature study, based on 13 articles is conducted. This study concentrates on best practices and success factors to improve collaboration. Additionally, 20 semi-structured interviews with "young" and "old" professionals are conducted to provide an up to date impression of what forms of collaboration are currently applied in the construction industry. With the help of coding, practices are identified and ranked according to how many times they are listed. This results in a broad collection of best practices of collaboration. In the end, 35 aspects are determined to be the most important aspects. These elements are translated into statements and further categorized as presented below:

Relational Attitude	Team working	Communication	Planning	Contract & Capability	New Approaches
Commitment	Team building activities	Honest communication	Alignment of goals	Responsibilities are documented	BIM application
Willingness to find a compromise	Multidisciplinary project teams	Informal communication	Mutual consent on usage of tools	Mutually sharing risks and benefits	Curiosity to try out new things
An environment of mutual trust	Prior experience with the project team	Sharing of information	Regular meetings of stakeholders	Top management support	Encourage new techniques
Easy to approach	Joint project office	Transparency	Front-End planning	Sufficient resources	Usage of historical data
Respect for each other	Stimulate own thinking	Mutual understanding	Mutual objectives	Joint dispute resolution	Long-term orientation
Flexibility	Reflection		Benchmarking	Capable workforce	Enhance personal development

Table 1 Framework: best practices of collaboration in the project team

In the next step of Q-methodology – the Q-sorting – a group of 40 employees from four different generations, rank the statements from *Table 1,* with respect to the question: "To improve collaboration within a project team, it is necessary to….". The ranking of each respondent results in a data set which is analysed with the help of computer software. Additionally, reflexive explanations from the research participants are used to interpret the data. Due that it is possible to translate a data set into a common perspective. A perspective presents a opinion a group of like-minded participants share on collaboration in the project team.
In total, four perspectives can be derived from the analysis – the last step of Q-methodology. Based on the ranking of the statements, a name is assigned to each generation to show what type of collaboration they appreciate. The established perspectives are:

Transparent communication (P1); Strategic planning (P2); Joint capabilities (P3); Informal pioneering (P4).

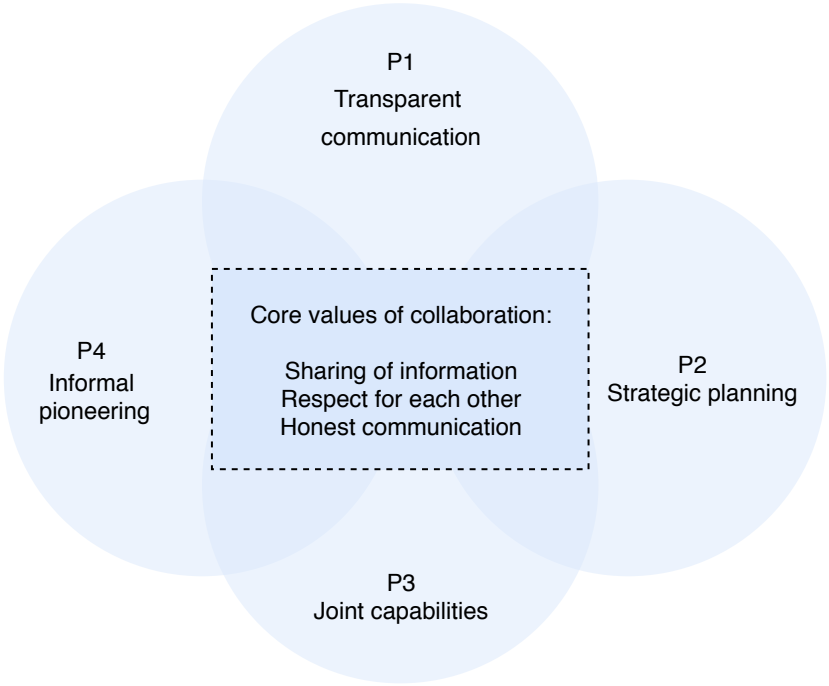

Figure 1 Visualization of the correlation between perspectives

As presented in *Figure 1*, the derived perspectives show a strong correlation with each other. This indicates that the research participants in general favour the same principles for collaboration in the project team. Those are soft factors from the categories Communication (Honest communication, Sharing of information) and Relational Attitudes (Respect for each other). To note, these three statements are also ranked high in the literature study and the semi-structured interviews. For this reason, these aspects are essential for good collaboration and very important.
Nevertheless, each perspective has their own certain preferences. As the name indicates, (P1) emphasizes on a transparent communication. (P2) is focused on the setup of work structures and goal alignment in the project team. (P3) has a reluctance for too many meetings in persons but focuses on a joint approach. (P4) prefers an informal working style and is willing to try out new things.

Thereafter, a literature study on the generation theory is conducted and norms and values of generations are collected, concluding in four generational profiles (see *Table 2).*

Babyboomers generation (1940 – 1955)	Generation X (1955 – 1970)
• **Protest:** Rebellious attitude • Focused on work structures • Passionate and idealistic • Strong belief in equality & democracy • Pioneers and hard workers • Consensus based collaboration	• **Connecting** qualities and viewpoints • Modest • Sober and cautious • Realistic and patient • Comfortable with change and diversity • Success orientated and result driven
Generation Y (1970 – 1985)	**Einstein (1985 – 2000)**
• **Pragmatic**: Concrete results and fast decision making • Strive for independency • Personally, open, direct and interactive • Very adaptive to technology • Strong networking skills	• **Authentic:** Be yourself and do what you think is best • Informal workplace & good relation to colleagues • Fast with technology & Multi-tasking • Prefer a transparent environment • Optimistic & confident to accept responsibility • Flexible & comfortable with diversity • Creative & entrepreneurial • Self-focused & feel entitled

Table 2 Overview of generational characteristics derived from the literature study

In the next step, the age of the research participants is considered and the P-set is divided in four generations. *Table 3* shows how many members of which generation load on which perspective.

Generation	Einstein	Generation Y	Generation X	Babyboomer
P1- Transparent communication	**5**	1	2	0
P2- Strategic planning	2	**4**	**8**	1
P3- Joint capabilities	0	**5**	3	2
P4- Informal pioneering	**4**	1	0	2

Table 3 Distribution of generations loading on perspectives

It can be observed that members of the same generation tend to load on the same perspective. Consequently, they share the same preferences of collaboration which distinguish them from other

generations. As a result, different generations have a different perspective on collaboration, although the outcome of the Q-study indicates that these differences are rather small.
Each perspective is linked to the generational profile which loads greatest on it (highlighted bold in *Table 3)*. Thus, Einstein is linked to P1 or P4. Generation Y with P2 and P3. Generation X to P2. For the Babyboomers, it is not possible to draw any conclusion, since too few Q-sorts are obtained and the loadings are too distributed. Consequently, they are excluded from the further analysis.

Next, it is examined to what extent the generation theory explains the outcome of the Q-study. For this reason, the rankings of each perspective are compared with the generational profile (established in *Table 2*) of the assigned generation. In order to determine a relation between the outcome of the Q-sort and the generation theory, three different linkages are determined. These are highlighted in three different colour codes: Clear linkage (green), moderate linkage (yellow), no linkage (red). *Figure 2* presents the outcome of this analysis.

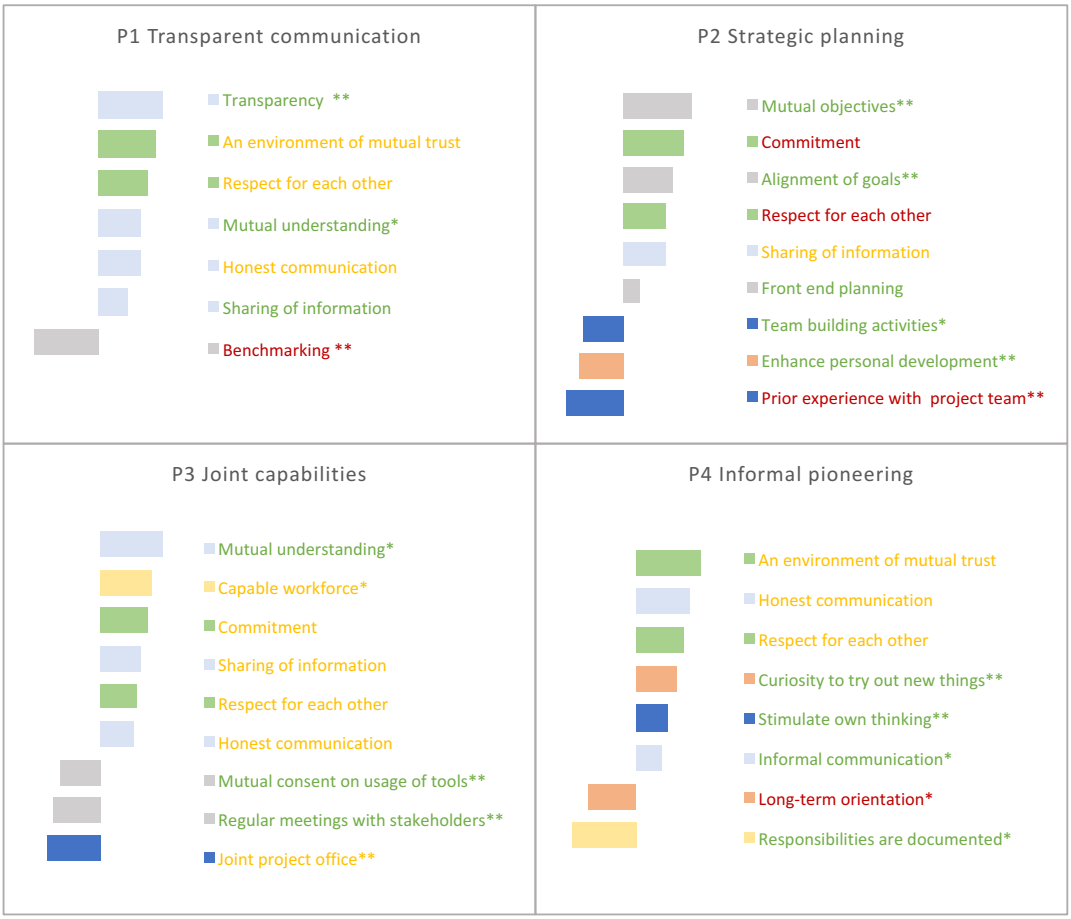

Figure 2 Overview of the Q-sort rankings. The colour codes indicate a linkage with the generation theory

The visualizations of the Q-sort demonstrate that multiple statements from the Q-sort can be explained with the generation theory. The perspectives P1, P3, and P4 show a high overlap with their compared generation. Also, several elements are matching between P2 and Generation X, but only few between P2 and Generation Y. It is assumed that a connection between P2 and Generation Y shows only little overlaps, because Generation X has more members loading on P2. As a result, Generation X has a prevailing influence on the ranking of this Q-sort.

Table 4 presents the implication which are elaborated upon for this research. The implications only focused on high ranked and distinguishing statements from the Q-sort (e.g. Mutual understanding, Transparency) which have a clear link to the generation theory. In addition, a recommendation how to deal with these implications is given in brackets behind the statement.

All Generations All generations appreciate *Sharing of information, Respect for each other* and *Honest communication* I: The implementation of these statements has an enhancing effect on collaboration in the project team. (Promote these statements, they are the essence of good collaboration).
Babyboomer 63 – 78 years I: They don't like to be skipped from the decision-making process. (Include or consult with them beforehand). I: Babyboomers have a strong opinion (in team meetings). (Consult beforehand and ask to hold back opinion).
Generation X, 48 – 63 years I: They feel more comfortable in an environment where they can exert control. (Assign them planning tasks.) I: Generation X has no desire for Enhance personal development and team building activities (Raise awareness among Generation X that these statements are very important for younger generations.)
Generation Y, 33 – 48 years I: The presence of a mutual understanding has an enhancing effect on the productivity of Generation Y. (Provide opportunities to build up a mutual understanding, such as team building activities.) I: Long and unstructured meetings have a negative effect on this Generations productivity. (Avoid these kinds of meetings and make meetings more efficient. Set up a structure for meetings. Assign pre-work for meetings.) I: Generations Y prefers to work autonomous. (Don't prescribe them how to work.)
Einstein, 18 – 33 years I: The presence of a mutual understanding has an enhancing effect on Einstein's productivity. (Provide Generation Y with opportunities to build up a mutual understanding.) I: A high transparency leads to a high motivation and engagement. (Increase transparency at work) I: Some have a cautious attitude; some are curios to try out new things. (Distinguish two different working styles and assign the appropriate task) I: Some are willing to accept responsibility, some are not. (Distinguish two different working styles and assign the appropriate task. Control that Einstein is not too optimistic and takes over too much responsibility) I: Some prefer an informal way of working - and communication style with less documented responsibilities, the others not. (Distinguish two different working styles and assign the appropriate task).

Table 4 Implications based on the outcome of the Q-sort with respect to the generation theory

After answering all of the sub-research questions, this research shows that, generations have a similar opinion how one should collaborate with each other. For this reason, one could argue that the influence of generational behaviour might not be that significant. Nevertheless, this research also reveals that peers rank statements about collaboration in a similar way. That means they share the same preferences which distinguish them from other generations.
By answering sub-question 3, a total of 13 statements from the Q-study can be clearly linked to the generation theory. In order to answer the main research question - *what influence does generational behaviour have on collaboration in the project team?* - one should therefore focus on exactly those 13 statements.

The 13 statements could be categorized in three groups:

Communication	Working style	Working attitude
• Transparency • Mutual understanding • Informal communication	• Mutual objectives • Alignment of goals • Front-end planning • Mutual consent on usage of tools • Regular meeting with stakeholders • Responsibilities are documented	• Curiosity to try out new things • Stimulate own thinking • Enhance personal development • Team building activities

Table 5 Overview of statements influenced by generational behaviour

Table 5 presents the statements which are identified to be influenced by generational behaviour. This research indicates, that each generation has their own preferred way of communication. Furthermore, different working styles and working attitudes can be distinguished among generations.

If the above-mentioned elements are considered and implemented in the project team, each generation feels more comfortable at the work place. This has a positive effect on the motivation and engagement of a person and leads to a higher productivity of the project team. Thus, the generation theory helps to get the best out of every generation.

This research shows that generational behaviour has an influence on collaboration in the project team. It might not be that big a large influence, but every generation has their own preferences how they want to collaborate. For this reason, it is recommended to deepen research in this domain.
It is also recommended to use a more controversial Q-set (the statements used for the ranking). The results of this research indicate that the generations in general agree how one should collaborate with each other. One reason for this could be, because the chosen statements for the concourse are all the very best aspects of collaboration. However, in many projects there are not only the best practices applied. There are also a lot of bad practices or other issues where generations might have a different opinion upon. Thus, for following research, it would be good to have a more diverse Q-set. This could show more distinct perspectives and provide more insights.

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1. INTRODUCTION

1.1 Introduction to the subject

Generations can be seen as natural forces that foster the evolution of social systems. There are two ways to deal with this process – one can block or support it. Whilst blocking creates all kinds of negative effects and leads to lower energy at work, supporting it creates opportunities (Bontekoning, 2011).
In recent years, there is a growing attention for collaboration between members of different generations (Platteau & Hondeghem, 2010). Although more attention is paid to other dimensions, such as gender and race, its importance for organizations is increasing (Shore et al., 2009). The main reason for this can be attributed to the demographic structure within organizations. Due to increased life expectancy, age diversity is greater than ever before. In addition, most western European countries encourage people to work longer to counteract the financial challenges of an ageing population. Effective January 2018, the target retirement age in the Netherlands will increase from age 67 to 68 (WTW, 2018). In the upcoming years, the demographic evolution will lead to a higher rate of age diversity and a higher rate of older workers.
One possibility when interpreting the differences between age groups is refer to the concept of generations (Platteau & Hondeghem, 2010). This concept is first outlined by Karl Mannheim in 1923 who states, that each generation has its own characteristics and values. These differences in values and behaviours create tensions which can have a negative effect on project performance (Bontekoning, 2007). Subsequently, this has been a hot topic for discussions, criticism and research, especially when it comes to collaboration at the workplace (Bontekoning, 2011). However, in the context of the construction industry this topic has not received much attention thus far.

1.2 Context of this thesis – The construction industry

The construction industry includes general construction and construction activities for buildings and civil engineering works such as motorways, tunnels, bridges, railway etc. (Prosser, 2007). As an industry it accounts for 6% of global GDP and is the largest global consumer of raw materials (WEF, 2017). Over the past decades projects in the construction industry have become increasingly complex, making project management more challenging than ever before (Suprapto, 2016). In spite of a broad range of tools and systems now available and the professionalization in project management, cost overruns and time delays are persisting and a majority of construction projects fail to meet their targets (Flyvbjerg, 2011; KPMG, 2015; Merrow, 2011). As one of the most fragmented industries in the world the construction industry relies on an interplay of all participants along the value chain (WEF, 2016). In the Netherlands, the number of construction companies increased from 63.380 to 162.530 between 2000 – 2017 (Bouwend Nederland, 2018). The high fragmentation leads to adversarial relationships where poor collaboration, ineffective communication and limited trust are negative side effects (Cheung, Ng, Wong, & Suen, 2003; Eriksson, 2008).
Problems of project failure have been known for many years and the construction industry has received a lot of criticism. Some of the cited shortcomings are of technical, managerial or political nature (Cantarelli, Molin, Van Wee, & Flyvbjerg, 2011; Lindahl & Rehn, 2007; Sauser, Reilly, & Shenhar, 2009). Others say that a lack of attention is paid to the social dynamics and that most of the mistakes are created by faulty human interaction (Morris & Pinto, 2007; Smyth & Pryke, 2009b). Following the rather soft management trend, the human factor in a project will also be the centre of this thesis.

1.3 Problem statement

In collaboration professionals must deal with professionals from other generations. Each generation believes in a different value system, work ethic, and management style (Anantatmula & Shrivastav, 2012). Of course, these characteristics are stereotypes and do not apply to everybody. Nevertheless, researchers believe that certain characteristics apply to specific generations (Mannheim, 1928; Bontekoning, 2007). To name a few (this will be elaborated in more detailed in Chapter 8), the oldest generation whom hold positions of influence and authority in workplaces have a high need for work satisfaction (Anantatmula & Shrivastav, 2012), they are competitive and live to work (Cruz, 2007). In contrary, the succeeding generation works to live (Cruz, 2007), prefers non-hierarchical structures (Anantatmula & Shrivastav, 2012) and is very pragmatic (Krywulak & Roberts, 2009). The youngest generation shows an extraordinary presence in social networks (Liu, Pasman, & Stappers, 2014), they lack loyalty towards employers (Anantatmula & Shrivastav, 2012), they do not blindly conform to organization standards (Srinivasan, 2012) and are willing to work at any time and in any place (Hays, 2014; Schullery, 2013). To conclude, intergenerational differences in collaboration lead to tensions at the workplace.

The rapid development of information and communication technology in the past decade introduced multiple highly engaging tools in everyday life, such as instant messaging, podcasting, blogging and social networking (Liu et al., 2014). These tools provide new ways of human interaction, enabling the creation and collection of an enormous amount of digital information in a very short time (Cruz, 2007). As a result of this perpetual exposure, people (especially younger generations) are socially very active and quickly exchange information on several social networks with a large community of “friends” (Turner & Turner, 2013). In the public work context, the more formal way of communication is still dominant and the rich interactions that these new technologies are offering are not applied to a great extent (Blain, 2008; Felix, 2007). These new ways of communicating could possibly be more than just a trend and enhance collaboration. At the same time, they could also lead to a more inaccurate way of communication and have a negative impact on collaboration. In what direction this new way of communication will develop is unclear, but in any case it deserves more attention.

The youngest generation recently graduated or will be graduating in the coming years and entering the workforce. Per Bontekoning (2007), they are the most technologically-skilled generation. Consequently, one could assume they would be the most suitable generation to integrate and apply the latest technologies in the construction sector. However, they are often unaware of their own capabilities or perhaps too afraid to speak out (Srinivasan, 2012; Bontekoning, 2017). In addition, they are often too comfortable to challenge or question the existing working structures. Instead, they rather adapt to their working environment.
To conclude, if the youngest generations fail to challenge the older generations and if the older generations fail to integrate the youngest generations, a lot of potential could get lost.

In this context, a problem statement is formulated as follows:

> *In the construction industry, intergenerational differences regarding collaboration are only rarely explored. Different generations might have different viewpoints on collaboration. Yet, it is unclear how and if these perspectives differ amongst generations and if there is a better way to deal with generational behaviour in the project team.*

Figure 3 presents that each the three research domains which are combined in this chapter. Although the separate elements of this research, collaboration in construction and intergenerational differences at the workplace, have been studied intensively, research into the combination of these two constructs has not received much attention yet, and therefore will be the focus in this research.

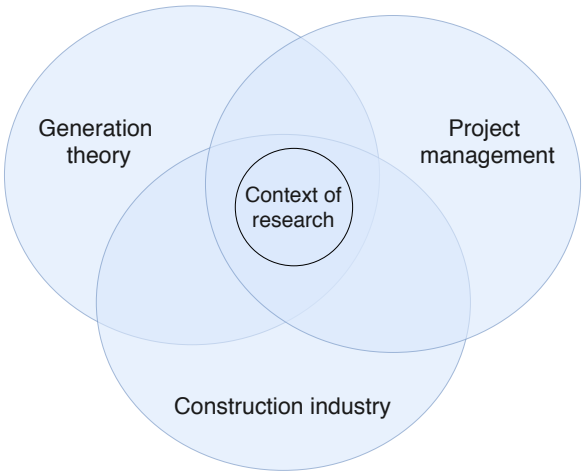


Figure 3 Research domains and context for this thesis

1.4 Research goal & research question

This research has the overall aim to identify how generational behaviour affects an individual's perspective on collaboration. Thereby, this research contributes to the understanding of human interaction in the field of project management. In this context, a main research question has been formulated as follows:

> *What influence does generational behaviour have on collaboration in the project team in the construction industry?*

Sub-questions:

In order to answer the main research question the following sub-questions have been formulated.

1. What are the most important aspects and practices of "good" collaboration currently applied in construction projects?

   The answer to this question will be found in two parts. First, a literature study is conducted. This study concentrates on the best practices and success factors improving collaboration within the construction industry. Additionally, semi-structured interviews are conducted to provide an up to date impression of the current forms of collaboration used in practice.

2. What perspectives can be derived from ranking aspects of collaboration?

   Next, people from different generations are asked to rank the findings of sub-question 1. Each ranking of a participant represents a data set which is analysed. With the help of reflexive explanations the resulting factors are interpreted and translated into perspectives.

3. To what extent can the generation theory explain the outcome of the Q-study?

This question leads to a discussion based on the quantitative and qualitative results of Q-methodology, enhanced by insights on generational differences. Thus, a literature study on the generation theory is prerequisite. In this course, characteristics, norms & values of each generation are collected. These are compared to the findings of sub- question 2.

4. What are the implications for collaboration in the project team with respect to the concept of generations?

Next, the established perspectives from sub-question 2 will be further analysed according to their implications, with respect to the generation theory.

1.5 Scope

The scope defines the boundaries of this research and determines what can be considered and what not. The following boundaries are established for this research:

First, this research takes place in the Dutch construction industry. Although the theoretical part of the thesis is based on international literature, the empirical part of this investigation takes place within the borders of the Netherlands. For this reason, the chosen literature and interviewed professionals are all selected from the environment of the construction sector, with a special attention to the Dutch construction market.

Second, this thesis is conducted in collaboration with the company Sweco. With over 14 500 employees and several branches in the Netherlands, Sweco is one of the largest engineering consultancy companies in Europe. Since all the research participants for the main study - Q-methodology – stem from the company's branch in De Bilt, the outcome is mainly applicable to employees from the company's branch. More information about the company and its businesses can be found in Appendix A.

Third, this research focuses on the collaboration within the project team. In the context of this research, the project team is a group of individuals, who are assembled to achieve a certain goal. This project team consists of employees from Sweco but also of other parties from the sector they collaborate with daily. Depending on the type of project, several types of actors are required, such as: designer, engineer, project manager, et cetera. Consequently, the focus is not on collaboration on an organizational level but on a personal level within the project team.

Fourth, according to Bontekoning (2007), each generation consists of 15 consecutive years. At this moment, several generations exist in the Netherlands. However, this research focuses on the working population. Therefore, the following generations are included in this research:

- Babyboomers 63-78 years
- Generation X 48-63 years
- Generation Y 33-48 years
- Einstein 18-33 years

This excludes the oldest generation (78–93 & 93- 108 years) and the youngest generation (3- 18 years) for this research.

2. RESEARCH DESIGN

A research design is set up to find an answer on the proposed research question. In this section a description of all methodologies used is presented. The main research method in this thesis is called Q-methodology. Additionally, a literature search and semi-structured interviews are conducted.

2.1. Type of Research

The overall objective of this study is to gain insight and understanding about generational perspectives on collaboration. Thus, the overall research is an exploratory study and is conducted to determine the nature of the problem. Exploratory research is the initial research which forms the basis for more conclusive research (Singh, 2007).

2.2. Q-Methodology

Q-methodology or Q-study was invented by William Stephenson in the 1930s and can be used in any research field to study subjectivity (Stephenson, 1935, 1965). Subjectivity can be described as a person's communication of a point of view on any matter of personal or social importance (McKeown & Thomas, 2013). By using Q-methodology, different opinions and attitudes of individuals can be summarized and expressed in collective perspectives (Brown, 1993).

For this research Q-methodology was chosen because the assessment of collaboration is associated with subjectivity. The question - *what is good collaboration?* – is of a highly subjective nature since it can be perceived differently per person and generation. Thus, the great contribution of Q-methodology is to establish perspectives on a topic of interest and express what aspects are important for which participants. In this case, it is intended to identify which aspects of collaboration are important for different generation.

Approach of Q-methodology

Q-methodology is a method where a set of respondents (P-set) is ranking aspects (Q-sort) according to a predetermined scale, based on their viewpoint. The approach of Q-methodology can be divided in four steps (McKeown & Thomas, 2013):

(1) Sampling of the concourse (Q-sample)
(2) Selection of research participants (P-set)
(3) Ranking of statements (Q-sort)
(4) Analysis of data

2.2.1. Sampling of the concourse

The concourse refers to the flow of communicability surrounding any topic and is a collection of all possible information about the topic of interest (Brown, 1993). The information can be obtained from primary sources (interviews, group discussions) or secondary sources (literature, newspapers) (Du Plessis, 2005). In this research, both ways of gathering information (a literature study and semi-structured interviews) are used. This type of sampling is called a hybrid type, a combination of naturalistic and ready-made sampling (Groenewegen, 2013).
From the concourse a subset of statements is drawn, which is called the Q-set (Exel & Graaf, 2005). A

subset is taken because the entire amount of aspects gathered in the concourse is in most cases too large to execute the Q-sort. The researcher can choose between a structured or an unstructured sample. In a structured sample the researcher selects statements widely different from each other to make the Q-set broadly representative applied (Du Plessis, 2005; Exel & Van Graf, 2005). However, in this research unstructured sampling is applied. Thus, statements which are presumed to be most important (mentioned most frequently in the interviews and literature study) are selected from the concourse. This bears the risk to over- or under sample certain issue components. However, Brown (1980) states that the Q-set remains "more an art than a science". Since every researcher has his own perspective, different researchers may come up with different Q-sets, but this is acceptable (Brown, 1993). The Q-set is the final set of (in this case) aspects influencing good collaboration which are ranked by the interviewee.

2.2.2.Selection of research participants

In a Q-study, individuals are chosen purposefully to ensure the inclusion of all viewpoints. This part is referred to as the P-Set (McKeown & Thomas, 2013) or the person-sample (Du Plessis, 2005). Participants are selected with the expectation that they hold different viewpoints on the topic. According to Brown (2002), one should intend to obtain as much diversity as possible on variables such as gender and age.

In Q-methodology either an intensive or an extensive person-sample is used. The choice is based on the condition of instruction to participants (Du Plessis, 2005). In an intensive person-sample interviewees execute the Q-sort individually under many conditions of instructions. A small number of participants (not more than 30) or even only one person can be examined in depth. In an extensive person-sample 40 – 60 participants sort the aspects under identical conditions of instructions in small groups. Due to the limited time of this research, the Q-sort is conducted in a workshop in team meetings at Sweco. Therefore, an extensive person sampling, where several respondents conduct the Q-sort at the same time is selected for this research.

2.2.3. Ranking of statements

Q-sorting is the process of sorting selected statements (Q-Set) from the concourse in the respondent´s preferred order of preference (Exel & Graaf, 2005). The selected statements are printed on cards and handed to the respondents. With the help of a score sheet (see *Figure 4)* respondents are asked to answer a question of interest, having a range from most disagree to most agree. In between a gradually, (quasi-)normal distribution is formed. The shape of the distribution is a choice of the researcher and depends on the controversial of the topic and of the number of statements selected from the concourse (Exel & Graaf, 2005). However, it always needs to be vertically symmetrical around the middle (zero).

The process of sorting consists of several parts and can be execute in several ways. The procedure of the workshop is described in Appendix B. In addition, it is essential for the researcher to understand why the participant ranked the aspects high or low. For this reason, the interviewees were asked to fill out a questionnaire, which can be found in Appendix C. This enables to explore the underlying reasons of the choices made in the Q-sorting and to check if the respondent fully understood the aspect. Furthermore, it supports the qualitative interpretation of the respondents' Q-sorting

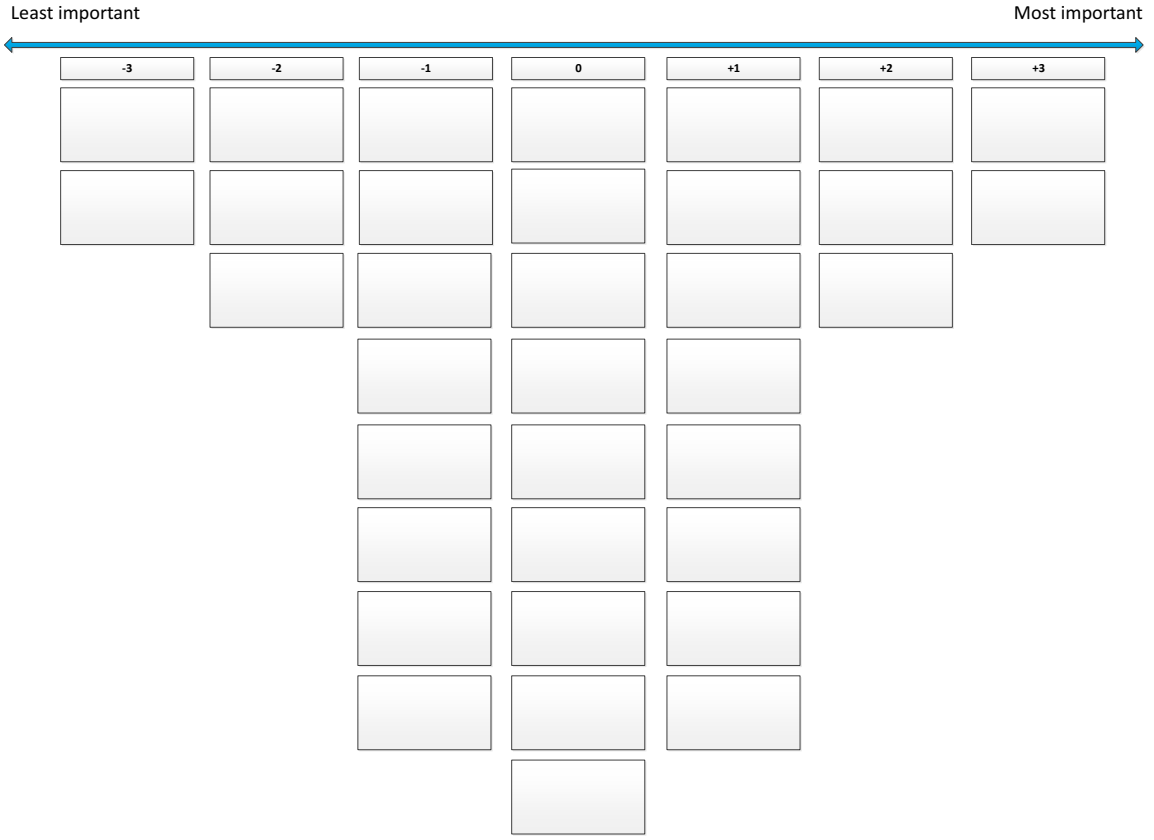


Figure 4 Score sheet for a Q-sort with 35 statements

2.2.4. Analysis of data

The data analysis is a purely technical procedure and therefore often referred to as the scientific base of Q-methodology (Exel & Graaf, 2005). Each completed Q-sort is a data set, representing the respondents' perspective on collaboration and forms the raw data used for the analysis. Each respondent has a different preference. Due to the data analysis, it is possible to reveal the underlying explanations for patterns in the data set and like-minded groups

First factors are generated by the software program. A factor presents the purely quantitative output of the analysis. Next, the factor is qualitative interpreted and translated into a perspective. A perspective presents a collection of like-minded research participants. Each perspective is characterized by the ranking of statements and distinguishing of statements. Distinguishing statements provide a crucial discussion for the interpretation and are of high interests because they differentiate perspectives from each other. In addition, the respondents are asked for their reasoning to rank certain aspect very high or very low. Their reasoning provides reflexive explanations and supports the qualitative analysis.

To conclude, in this step descriptions and explanations are used to give a factor a meaning and translated into shared perspectives. A comprehensive overview of the analysis of the Q-sorts is provided by Brown (1980, 1993). However, nowadays many software's are available to perform the analysis. In this research PQMethod version 2.35 is used. A concise overview of the data analysis is presented in Appendix E.

2.3. Structure of the research & Research framework

The structure of the research results in a research framework which is described below and presented on the next page in *Figure 5*.

The introductory chapter explains the context, the problem and the research question of this thesis. In Chapter 2 the research design and the approach are presented. The theoretical basis for the research is put forward in Chapter 3. Here, the best practices of collaboration in the construction industry are presented from different conceptual angles. In addition, interviews with professionals are conducted to capture latest trends, presented in Chapter 4. Together these chapters present the concourse, the first step of Q-methodology. In Chapter 5, a subset (=Q-set) is drawn from the concourse. This is a final set of 35 aspects which will be used for the next step of Q-methodology and at the same time provides an answer for sub-question 1: "*What are the most important aspects and practices of "good" collaboration currently applied in construction projects? "*. Also, the research participants (=P-set) and the process of empirical gathering (=Q-sort) is explained. This is followed by Chapter 6 and 7, which deals with the quantitative analysis and qualitative analysis of the Q-sort. Thereby an answer can be given to sub-question 2: *"What perspectives can be derived from ranking aspects of collaboration?"*. Chapter 8 introduces the theory of generations and four generational profiles are established. In Chapter 9, the generational profiles are compared to the perspectives of chapter 6 & 7 and an answer is given to sub-question 3: "*To what extent can the generation theory be linked to the outcome of the Q-study?*" After exploring the perspectives of each generation quantitative and qualitative it is possible to answer the last sub-question 4: "*What are the implications for future forms of collaboration with respect to the concept of generations?*", presented in Chapter 10. Finally, it is possible to answer the main research question: "*What influence do different generations have on collaboration in project teams in the construction industry?"* and draw a conclusion in Chapter 11. Last, Chapter 12 contains the discussions of the research results, limitations and recommendations for further research.

Figure 5 presents the sub-questions 1. - 4. and the chapters on the left side of the framework. This provides the reader an overview of how the structure of the report relates to the content. The approach of Q-methodology is presented on the right side. It can be observed how the structure of this research is adapted to the structure of Q-methodology.

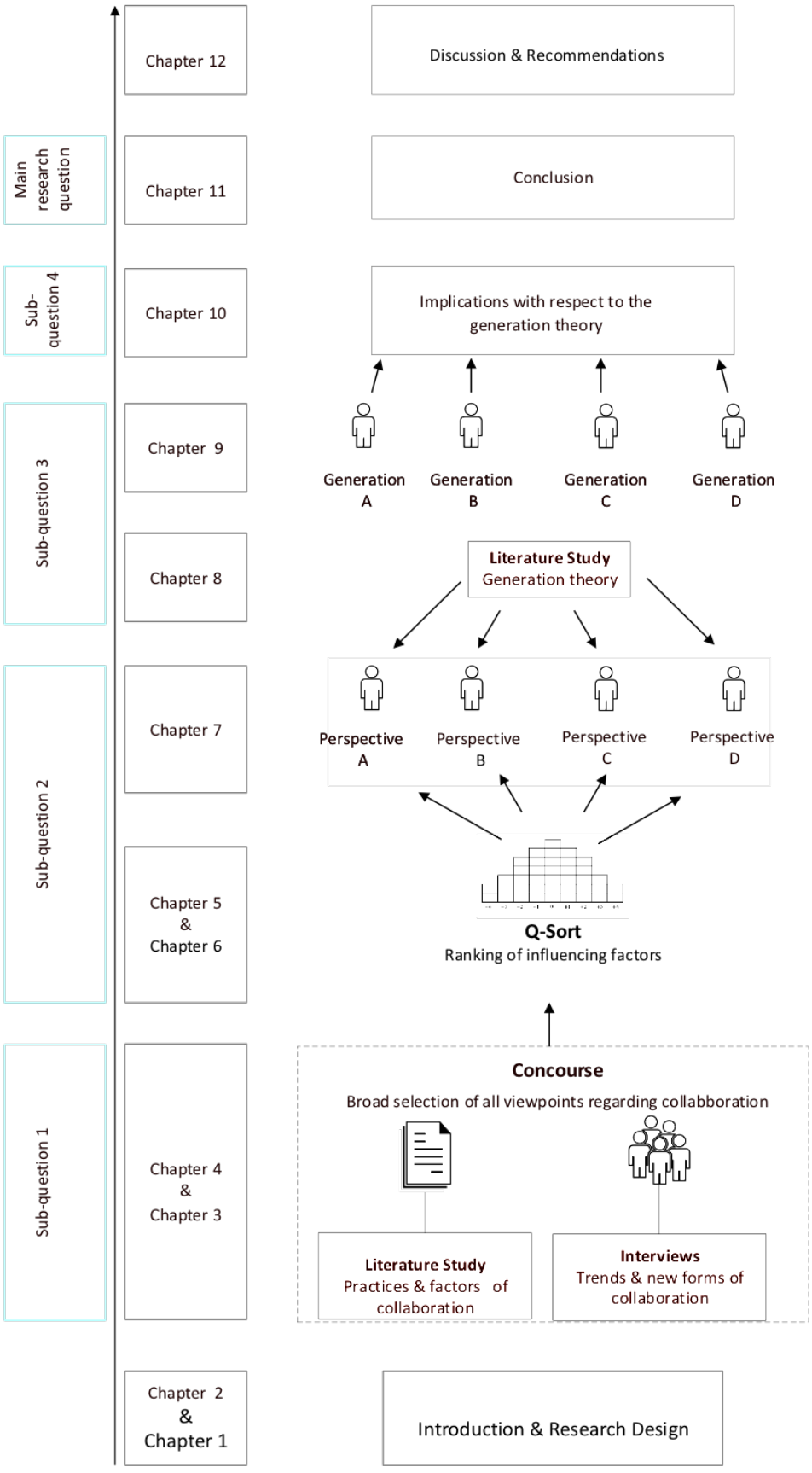


Figure 5 Research design

3. SAMPLING THE CONCOURSE - A LITERATURE STUDY ON BEST PRACTICES IN COLLABORATION

By summarizing, classifying and comparing prior research studies, literature and theoretical articles, this chapter builds up knowledge on the best practices of collaboration. Based upon this the concourse, the first step of Q-methodology, is sampled. By this means, an answer is elaborated on for the first sub-question: *What are the most important aspects and practices of good collaboration?* A literature study provides information on forms of collaboration that are currently applied in the construction industry and what approaches are preferred. Based on selection criteria, 13 articles are chosen and analysed resulting in a framework of 43 aspects which describe best practices of collaboration.

3.1. What is collaboration?

In a typical construction project several actors, for instance the project owner, stakeholders, designers, contractors or other actors in the supply chain are working together to deliver a certain outcome (Winch, 2002). It has become common knowledge, that the way in which they work together could be improved. With this intention, various forms of working together have emerged over the past decades and scholars use different terms to describe this phenomenon. Among the most common terms used to describe this phenomenon is the word "*collaboration*". Collaboration describes activities done on a daily basis, for instance if two persons are preparing a meal – one person is cooking and one person is setting up the table. In the most essential words "*Collaboration is the situation of two or more people working together to create or achieve the same thing. "(Cambridge Dictionary, 2014).*
In the context of the construction industry collaboration is used as an umbrella term for several processes and project management aspects (Hughes, Williams, & Ren, 2012). Many scholars also differentiate the terms collaboration and cooperation (Koops, 2017), but this distinction will not be made in this research. As a matter of fact, in Dutch both terms have the same meaning: *samenwerken.*

3.2. Set up of the literature study

A lot of effort has been spent on finding the so called "best practices" of collaboration for certain industry sectors (CII, 2009; Bosch-Rekveldt, 2011). As a result, there are frameworks listing numerous best practices, but it is difficult to decide which practices are relevant since almost every project is unique (Bosch-Rekveldt, 2011). Departing from this, the focus of this research is on the essential elements which improve collaboration in the project team. For this purpose, a literature search in academic publications, using Google Scholar and Scobus as a database, is conducted. For the searching process, keywords such as "best practices collaboration", "success factors collaboration" or "project performance" in combination with "construction projects" and "Netherlands" are used. Subsequently, several approaches promoting collaborative relationships are searched, using keywords such as "partnering", "alliancing", "integrated teams", "relationship management" or "collaborative working". With respect to the boundaries formulated in Section 1.5, articles are selected in order to

(1) receive an up to date overview,
(2) capture the latest trends,
(3) gather the most important aspects
(4) and receive a broad collection of viewpoints.

To obtain an up to date overview (1), only articles from the previous two decades (1998 – 2018) are scanned. Given the fact that articles base their work on findings of older literature, it is assumed that older practices are adapted, improved and developed in more recent literature. The main source of information are journal articles, but information is also gathered from industry agendas, forecasting future trends and practices of collaboration, to capture the latest trends of collaboration (2).
Special attention is paid to journals which are frequently cited by other scholars. It is assumed that these contain the most important aspects on collaboration (3).
Gathering a broad collection of viewpoints (4) is a requirement from Q-methodology. Thus, articles are selected from the viewpoints of contractor, client, consultant, engineer, etc., dealing with different forms of partnerships (partnering, alliances, etc.) from different countries (Netherlands, UK, US, Sweden, et cetera) on a personal and an organizational level.
In total 13 articles are selected for an in-depth analysis. The articles analysed contain 8 survey studies, 4 case studies and 1 industry agenda, presented in *Table 1.* The first column shows the author and year of publish. The second column describes the focus of the study and the third the method chosen.

Author	Focus	Method
Schäfer et al. (2001)	Collaboration between contractor and sub-contractor	Survey with 152 respondents from the Dutch construction industry
Cook-Davies (2002)	Critical success factors (CSF) in large construction projects	Survey with 70 large multinational construction companies.
Nguyen et al. (2004)	CSF in large construction projects	Survey with 109 respondents from 42 construction companies in Vietnam
Chan et al. (2004)	CSF for partnering projects	Survey with 78 respondents in Hong Kong
Löfgren & Erikson (2009)	Usage of collaborative tools to improve project performance	Survey with 106 Swedish construction client organizations
Baiden & Price (2011)	The impact of integrated teams on project performance	Case study of 9 construction projects in the UK
Meng (2011)	The effect of relationship management on project performance	Survey with 105 respondents from UK construction practitioners
Bosch-Rekveldt (2011)	The application of value improving practices during FED	Case study of 5 engineering projects in the Dutch process industry
Hughes et al. (2012)	Key aspects of collaboration	Survey with 52 respondents from the UK
World Economic Forum (2016)	State of the industry, global trends and future forms of collaboration	Report written in collaboration with multiple companies from the industry
Hairstans & Smith (2016)	Key aspects of collaboration	Case study of an industry university collaboration in an R&D project in the UK
Österreich & Teuteberg (2016)	Explore state of art for the industry 4.0	A literature study & case study
Erikson (2018)	Hard management tools	Survey with 2175 respondents from 109 Swedish construction companies

Table 6 Overview of the selected articles for the literature study

The selected articles present a diverse collection. On the one hand, scholars such as Cooke-Davies (2002) or Nguyen et al. (2004) mainly contribute "hard" factors of project management on an organizational level. On the other hand, scholars such as Löfgren & Erikson (2009) or Baiden & Price (2011) emphasize the "soft" factors of project management on a personal level. Other scholars such as Chant et al. (2004) or Hughes (2012) present a mixed framework of success factors and practices improving collaboration. In addition, Österreich & Teutenburg (2016) and the WEF (2016) present trends and opportunities for collaboration.

In the next sections, a short overview is provided what forms of collaboration exist within the Dutch construction industry. To have a logical sequence we go from broad to specific. First, collaboration in the Dutch construction industry is presented. This is followed by a section about collaboration on an organizational level and a section about collaboration on a personal level. The chapter concludes with a framework of best practices on collaboration.

3.3. Collaboration in the Dutch construction industry

In the Netherlands, the construction industry is trying to improve its performance. In this context, companies realized the urge to agree on common goals, enhance coordination and cooperation across the value chain and jointly define standards. In 2004, the PSIB (Proces- en systeeminnovatie in de bouw) initiative brought together major stakeholders in the Dutch construction industry: clients, contractors, suppliers, consultants, research institutes and universities, with the aim to modernize the industry through process and system innovation (PSIB, 2004). Additionally, the RVB Marktvisie: Samenwerken op basis van vertrouwen (=Collaboration based on trust), was established (Rijksvastgoedbedrijf, 2017). Most recently, a more extensive program was published called the Bouwagenda. In contrast to previous initiatives, the Bouwagenda is supported by the largest sector associations, three ministries and influential political and industrial people (Bouwend Nederland, 2018). This broad support makes it more likely that collaboration and co-creation will improve across the sector. These approaches (PSIB, RVB, Bouwagenda) show the efforts of the industry to improve collaboration on an organizational level. Furthermore, they highlight the relevance of this research. As stated in the introduction, the state of the industry complicates collaboration. Therefore, it is required that stakeholders of the industry come together and jointly elaborate on practices and processes to improve collaboration.

3.4. Collaboration on an organizational level

In addition to the critique of being fragmented and conservative, several researchers criticize the industries adversarial relationships which are dominated by poor collaboration, ineffective communication and limited trust (Cheung et al., 2003; Duy Nguyen, Ogunlana, & Thi Xuan Lan, 2004; Eriksson, 2008). As a result, a global trend towards more collaborative and long-term relationships can be observed and various forms of collaboration emerged to align all project party's interests (Smyth & Pryke, 2009a; Xue, Shen, & Ren, 2010).

As a major form of collaboration on an organizational level "partnering" or "alliancing" projects received growing attention over the past three decades (Hughes et al., 2012; Xue et al., 2010). The Construction Industry Institute (CII) describes partnering as a long-term commitment by two or more organizations for the purpose of achieving specific business objectives by maximizing the effectiveness of each participant's resources (CII, 1991). Although many scholars like the idea of a long-term approach, several

question, to what extent it can be materialized in the one-off nature of construction projects (Ng, Rose, Mak, & Chen, 2002). Therefore, multiple scholars perceive partnering as an attempt to focus on relationship aspects in traditional contracts (Cowan & Davis, 2003). In a partnering project, "*the relationship is based on trust, dedication to common goals and an understanding of each others individual expectations and values"* (Himes, 1995). Under those circumstances partnering is seen as a mean to improve adversarial relationships, lack of client satisfaction and low quality of construction (Cheung et al., 2003).
Remarkable about Himes´ statement (1995) is the fact, how much emphasise is put on the soft factors of collaboration, in this case trust, dedication and an understanding for each other. This is also stated by Cook-Davies (2002). In the research "the 'real' success factors on projects" he identifies 12 factors that are in one way or another critical for project success. All of the factors describe how hard aspects such as risk or portfolio management, are implemented in large organizations. However, in his conclusion Cook-Davies (2002) states: "*It may appear curious that none of these 12 critical success factors is directly concerned with ''human factors'', although it is fast becoming accepted wisdom that it is people who deliver projects, not processes and systems. When it comes to project management, it's the people that count*.''

To summarize, approaches as partnering or alliancing present a broad concept of practices, attitudes or techniques on an organizational level. However, many scholars argue that over the past decades the industry was mainly concerned with improving collaboration on an organizational level. As a result, the human factor and aspects relating to it were neglected. Several scholars (Alzahrani & Emsley, 2013; Cooke-davies, 2002; Duy Nguyen et al., 2004; Morris & Pinto, 2007; Smyth & Pryke, 2009b) argue, that more attention must be paid to the social dynamics of a project to improve project performance. Following this trend, the next section explores collaboration on a personal level.

3.5. Collaboration on a personal level

Besides working together on an organizational level, collaboration can be also considered on a personal level. This shifts the focus from the overall organizational structures towards the "soft side" of the project, namely the people who actually work on the project and the way how they interact.
The complex nature of construction requires multi-disciplinary teams in which activities are executed by people from different disciplines within and across organizations (Baiden & Price, 2011). Therefore, the project team is selected based on the competition, but not on their compatibility (Tarricone & Luca, 2002). Quite often, the project team is formed by people who have never worked together before (Black, Akintoye, & Fitzgerald, 2000; Dubois & Gadde, 2002). But simply bringing people of multiple disciplines together does not ensure that they also work together in an efficient way and too often, the existence of teamwork is taken as granted (Hayes, 2002).
A frequently chosen tool to improve teamwork is a team building session. Team building sessions help to create a group identity and encourage a collective ownership (Bresnen & Marshall, 2000). It can also be beneficial to have a joint project office. This facilitates the (informal) communication between the team members and makes it easier to establish a common project culture and strengthen collaborative behaviour (Bresnen & Marshall, 2000).
Besides it is also important to consider the team effectiveness and project performance. With respect to this, Baiden & Price (2011) suggest the set-up of an "integrated team". In an integrated team different disciplines or organizations with different goals, needs and cultures merge into a single cohesive and

mutually supporting unit (Baiden, Price, & Dainty, 2006). In the context of the construction industry, integration often refers to collaborative working practices, methods and behaviours that promote an environment where information is freely exchanged between various parties (Baiden & Price, 2011). Integrated teams particularly seem to contribute to project success as they increase the efficiency in decision making (Bosch-Rekveldt, 2011).

3.6. Framework of best practices of collaboration

To analyse the selected articles and establish a framework, it is helpful to establish codes. In the context of this research the term coding is defined as the process of organizing and sorting the results of the literature study. By linking data collection and interpreting data, coding becomes the basis for developing the analysis (Impact, 2018). A description how coding is applied in this research and which codes were established can be found in Appendix F. For this literature study, 43 aspects are codified as presented on the next page in *Table 7*. The overall outcome of the framework is a diverse gathering of practices and success factors on collaboration. To find the most important aspects of collaboration, each aspect is ranked according to how many times it has been cited in the empirical studies.

Elements from the literature	Schäfer et al. 2001	Cook-Davies 2002	Nguyen et al. 2004	Chan et al. 2004	Baiden et al. 2011	Meng 2011	Bosch-R. 2011	Löfgren et al. 2011	Hughes et al. 2012	WEF 2016	Hairstans et al. 2016	Oesterreich 2016	Erikson 2018	Total
Transparency			x	x	x	x			x		x			6
Sharing of information				x	x	x			x	x			x	6
Mutually sharing risks and benefits						x	x	x	x	x				5
An environment of mutual trust				x	x	x	x		x					5
Benchmarking				x		x	x		x	x				5
Mutual objectives				x		x	x		x					4
Joint disput resolution				x	x	x		x						4
Responsibilities are documented		x	x	x										4
Longterm orientation				x			x		x					3
Sufficient ressources			x	x							x			3
Encourage new techniques			x						x	x				3
Regular meetings of key stakeholders			x						x		x			3
Capable workforce	x		x	x										3
Alignment of goals					x			x	x					3
Honest communication				x		x			x					3
Top management support			x	x										2
Respect for each other					x			x						2
"no blame" culture					x	x								2
Commitment					x				x					2
Adequate education on risk-management		x						x						2
Informal communciation			x							x				2
Multidisciplinary project teams			x						x					2
Early involvement of key stakeholders				x					x					2
Existance of team spirit	x								x					2
Willingness to solve problems together	x								x		x		x	2
Team motivation											x		x	2
Flexibility									x		x			2
Continous operational monitoring				x									x	2
BIM application												x		1
Cloud-based collaboration with BIM in the whole value chain												x		1
Stronger usage of historical data ("Big data")												x		1
Curiousity to try out new things									x					1
A team consisting of multiple viewpoints									x					1
Joint project office								x						1
Team-Building activities								x						1
Willingness to find a compromise	x													1
Reflection					x									1
Prior relationship experience											x			1
Comprehensive contract documentation			x											1
Front-end planning										x				1
Mutual consent on tool usage										x				1
Enhance personal development									x					1
Rigorous time planning													x	1

Table 7 Framework: Best practices and success factors of collaboration in the project team. The statements are ranked according to how many times they have been mentioned.

The two most listed elements are “Transparency” (= Make it easy for the other party to see what actions are performed) and “Sharing of information” (=Willingness to actively share knowledge, experience and information with each other). This shows how important communication between the project parties is. Besides, it reflects the importance of the way how you communicate, which is in this case open and transparent. Next, aspects such as “Mutually sharing risks and benefits”, “Joint dispute resolution” and “Responsibilities are documented “are listed. These aspects emphasize on the hard side of project management together with a common or joint approach. In addition to this, with “An environment of mutual trust” and “Long-term orientation”, the top ten listed elements present a mixture of soft and hard factors of collaboration.

3.7. Conclusion

The literature study shows that collaboration is a broad concept of practices and factors. In order to get a better understanding several articles are scanned and collaboration is observed from different conceptual angles. To structure the searching process a classification has been made between collaboration on an organizational and personal level. In both cases, literature indicates that people are the essential factor which make a project successful. For this reason, special attention is paid to soft factors of project management. While the first sections provide an overview of what types of collaboration exists, the literature study identifies practices and factors which may improve collaboration. The result is a framework containing 43 aspects as explained above. Thereby, this chapter elaborates on the concourse of Q-methodology.

Although a comprehensive literature study revealed multiple practices improving collaboration, only a few articles were written later than 2012. It can be assumed that latest trends and technologies might not be captured by the literature yet and a literature gap exists. To find currently applied practices interviews are held with professionals from the industry. This will be presented in the next Chapter 4.

4. SAMPLING THE CONCOURSE – INTERVIEWS ABOUT BEST PRACTICES IN COLLABORATION

In the previous chapter, several factors are derived from the literature to sample the concourse – the first step of Q-methodology. However, the discovery of knowledge and the time it takes to put that information into practice is often lacking behind. Thus, semi-structured interviews are used to explore what practices are applied in the field and contribute to a diverse concourse.

4.1. Set up semi-structured interviews

The intention of the interviews is to generate a diverse, up-to date and comprehensive concourse of aspects on collaboration. For this reason, a basic set of questions is worked out before, presented in *Table 8*. Those questions are intended to be conversational, general and open-ended. Other questions are created during the interview providing both parties flexibility to probe for details or discuss issues (Keller, 2018).

Category	Indicative question
A) Profile of respondent	1.) Position & responsibilities 2.) Profile of the company 3.) Experience & expertise
B) Key practices for good collaboration	4.) What type of practices are important to achieve good collaboration? 5.) What type of practices are important to achieve a long term relationship? 6.) What new forms of collaboration will emerge in the future? 7.) What is the role of BIM in your organization?
C) Key success factors for good collaboration	8.) What are the key success factors for good collaboration? 9.) What are the key success factors for long term relationships? 10.) To what extent are the practices of good collaboration prescribed by the team leader – stem from an internal frame?
D) Generational differences	11.) Do you see differences in working together with different generations? 12.) What are the challenges of working together nowadays?

Table 8 Protocol for semi-structured interviews

4.2. Interview participants

Prior research reveals that several studies on best practices on collaboration rely their data on respondents, which have had a working experience of more than 15-20 years. This is a logical choice, because in most cases it is the older generations who determines how to collaborate. They have the most experience and access to resources (Srinivasan, 2012). However, this results in a bias outcome since it excludes the opinion of the younger colleagues. In addition, Q-methodology suggests to gather a broad collection of viewpoints. For this reason, the interviews are held with “young” and “old”

professionals. These groups are further divided into professionals from the field and professionals from Sweco to increase the diversity of the concourse (see Section 1.5). Despite the years of working experience, young and old professionals are selected randomly. This results in the following classification for the interview participants:

(1) experienced professionals with more than >15 years of experience

(2) young professionals with less than < 10 years of working experience.

An overview of the interviewed persons can be found in Appendix G. After 13 interviews, it seemed as if interviewees do not reveal new aspects or practices, after 17 data saturation was reached and after 20 interviews the data gathering was terminated.

4.3. Analysis and results of interviews

Following the interviews, the same procedure as described in Section 3.4 – coding – is used to organize and interpret the data. In this case, multiple codes from the literature study can be used to describe findings from the interviews (29 codes are overlapping). In total 20 professionals (12 experienced and 8 young professionals) are interviewed. This reveals 43 distinct practices and success factors for good collaboration. Again, each code is ranked according to how many times it is mentioned in the interviews.

Identified codes	Experienced Professionals (#12)	Young Professionals (#8)	Total
Honest communication	xxxxx x	xxxx	10
Regular meetings with key stakeholders	xxxxx x	xxx	9
Informal communication	xxxx	xxxx	8
Transparency	xxxxx xx	x	8
Curiosity to try out new things	xxxxx	xxx	8
An environment of mutual trust	xxxx	xxx	7
Enhance personal development	xxxxx	x	6
Top management support	xxxxx	x	6
Mutual understanding	xxx	xx	5
Flexibility	xxx	x	4
Team building activities	xx	xx	4
Stimulate own thinking	xxxx		4
Encourage new techniques	x	xx	3
Joint project office	xx	x	3
Respect for each other	xxx		3
Commitment	xx	x	3
Easy to approach	xx	x	3
Mutual objectives	x	x	2
Sharing of information	x	x	2
Balance traditional & innovative contracts	xx		2

Front-End planning	x	x	2
Usage of historical data ("Big data")	x	x	2
See the context around a problem	xx		2
Willingness to find a compromise	x	x	2
Responsibilities are documented	x	x	2
Reflection	x	x	2
Do not measure success by the iron triangle	x	x	2
Capable workforce	x	x	2
Low hierarchical structures	xx		2
Continuous improvement	x		1
Lead by example	x		1
Capture cornerstones in a contract	x		1
Lean management	x		1
Joint dispute resolution	x		1
BIM application		x	1
Sufficient resources		x	1
Sense of urgency	x		1
Multidisciplinary project teams	x		1
Long-term orientation	x		1
Good atmosphere	x		1
Work according to ethical standards & law		x	1
Mutual consent on tool usage		x	1
Prior experience with the project team	x		1

Table 9 Findings of the semi-structured interviews

The outcome of the interviews show that young professionals and experienced professionals have a very similar perception about "good" collaboration. The most mentioned codes from experienced professionals are also the most mentioned codes of young professionals: *Honest communication*, *Regular meetings with key stakeholders*, *Informal communication* or *Curiosity to try out new things*. Interesting are the distinguishing aspects: *Top management support*, *Enhance personal development* or *Stimulate own thinking*. These are aspects are mainly mentioned by older professionals and seem not to be too important for younger professionals. Considering that none of these aspects has a direct influence on collaboration in the project team, one could argue that young professionals do not have enough farsightedness to value these aspects sufficiently. Another conclusion, which can be drawn from *Table 9* is the importance of soft factors, since most of the highest ranked elements are human-related.

4.4. Trends observed from the interviews

Furthermore, the interviews confirm several trends which are identified in the literature study. One respondent describes the trend and the need towards more collaborative projects: "the market nowadays requires more cooperation along the whole value chain. This is especially due to integrated contracts which force the design team, the contractor and the sub-contractor to collaborate more

closely together" (Interview ID# 10). Thus, many parties who have not collaborated before are brought together and face new challenges.

A general consent among the interviewees exist. Accordingly, the construction industry is conservative and sometimes lacking innovation. This criticism was especially brought up by young professionals, who were often dissatisfied with the way how older generations work. This became visible during the crisis in the construction sector in 2008. "Many members of the top-management were from the oldest generation, not willing to adapt to the fast-changing environment and to the new technologies. As a result of the crisis in 2008, a new management style and a new project culture was implement" (ID#16). Younger, as well as older people emphasize how important it is to stay open-minded and curious to try out new things. With respect to this, it is important to have "a balance between traditional and innovative management styles" (ID# 4). For this reason, those values are also implemented in the company vision (code of conduct) of several companies, however they are often not realized. "Everybody knows the vision and the culture of the company, but everybody is struggling with the question: What should I do tomorrow? They understand that the world is changing, but they don't know how they can make a difference" (ID#10).

4.5. Comparison of interview and literature findings

Table 10 presents the ten most frequently listed aspects of the literature study and of the interviews – further categorized in Young Professionals and Experienced Professionals. The total collection of the 57 identified elements from the interviews and the literature will be further processed in the next chapter.

Rank	Literature Study	Young Professionals	Experienced Professionals
1	Transparency	Informal communication	Transparency
2	Sharing of information	Regular meetings with key stakeholders	Honest communication
3	Mutually sharing risks and benefits	Honest communication	Regular meetings with key stakeholders
4	An environment of trust	Curiosity to try out new things	Curiosity to try out new things
5	Benchmarking	An environment of trust	An environment of mutual trust
6	Mutual objectives	Mutual understanding	Top management support
7	Joint dispute resolution	Encourage new techniques	Informal communication
8	Responsibilities are documented	Team building activities	Stimulate own thinking
9	Long-term orientation	Transparency	Mutual understanding
10	Sufficient resources	Commitment	Commitment

Table 10 Findings of the literature study and the interviews

Based on the selected articles and the conducted interviews *Table 10* presents the overall most cited aspects for good collaboration. Therefore, these aspects are considered essential for collaboration on an organizational and on a personal level.
Informal communication is a casual form of information sharing typically used in personal conservations, and is ranked highest for young professionals. Considering the high importance of communication this aspect could lead to tensions with the older professionals, even though they also have it ranked high.
Most remarkable about this table is the high overlapping between young and experienced professionals. In total eight elements are overlapping which indicates that older and younger people have a very similar opinion on collaboration in the project team. With respect to the problem statement of this research this is different than expected.
While there is a high coincidence in the interviews, only the terms *Transparency* and *An environment of trust* are listed in both the interviews and the literature study. This shows that not all of the perceived elements of "good" collaboration are captured by the literature, or vice versa that not all of the elements which are prescribed by literature are perceived as good by professionals in the field. Furthermore, this reflects the subjectivity when it comes to the assessment of good collaboration.

4.6. Conclusion

In this chapter, semi-structured interviews are conducted to contribute an up to date impression to the concourse. Again, coding is used to analyse the interviews and rank the found elements according to how many times they are mentioned. As anticipated, the interviews reveal several elements (14) which are not captured by the literature.
Comparing the top ten answers of young and old professionals indicates that both groups have very similar preferences for collaboration and value the same practices.
The combination of the interview and the literature findings results in a comprehensive concourse. It is a collection of 57 elements aspects which improve collaboration on a personal and on an organizational level. Since this collection is too broad to be used for the Q-sort (the next step of Q-methodology), the concourse is narrowed down. This process is described in the next chapter.

5. FROM THE CONCOURSE TO THE Q-SORT

The concourse – the first step in the research of Q-methodology - is a collection of all possible information about the topic of interest. In the previous two chapters a comprehensive collection of practices of collaboration is gathered. In this chapter this collection will be scoped down to the final Q-set. Additionally, this chapter describes the second and third step of Q-methodology, namely the selection of research participants (P-set) and the ranking of viewpoints (Q-sort). Since most of the methodology is already explained in Chapter 2, this chapter only provides a brief overview and shows how the methodology is applied in this research.

5.1. Creating the Q-set

From the concourse a subset of statements is drawn, which is called the Q-set (Exel & Graaf, 2005). This is the final set of (in this case) factors influencing good collaboration which will be ranked by the interviewee. As explained in Section 2.3 it is chosen to use an unstructured Q-sample. Therefore, the following criteria are determined:

An aspect will be included in the final Q-set if one of the following apply:

(1) It is listed in three literature sources.

Aspects which are listed in the literature are classified as proven. If an element is listed in three independent literature sources, it is classified as proven and relevant.

(2) It is listed in the literature and in the Interviews.

Aspects which are produced in interviews with professionals from the Dutch construction sector are classified as relevant, but not proven. Thus, if it is therefore listed in the literature and mentioned in an interview, it is classified as proven and relevant.

(3) It is listed in three interviews. .

Aspects only mentioned in the interviews are not proven – not yet captured in the literature - but might be relevant. Therefore, if an aspect is mentioned in three interviews, it is classified to be relevant enough to be included it in the final Q-set.

After applying these criteria, the concourse is narrowed down from 57 to 35 elements, excluding 22 elements. This process is presented in *Table 11.* The "x" in the second and the third columns from the left indicate if an element is listed in the literature study or in the interviews. If it is listed more than three times it is marked with "≥ 3". Based on the criteria determined above, the last two columns indicate if an element is included in the final Q-set.

Code	Mentioned in literature study	Mentioned in interviews	Included in the Q-set	Not included in the Q-set
A team consisting of multiple viewpoints	X			x
An environment of mutual trust	≥ 3	x	x	
Adequate education on risk-management	X			x
Alignment of goals	≥ 3		x	
Balance traditional & innovative contracts		x		x
Benchmarking	≥ 3		x	
BIM application	X	x	x	
Capable workforce	≥ 3	x	x	
Capture cornerstones in the contract		x		x
Cloud-based collaboration with BIM	X			x
Commitment	X	x	x	
Comprehensive contract documentation	X			x
Continuous improvement		x		x
Continuous operational monitoring	X			x
Curiosity to try out new things	X	x	x	
Do not measure success by the iron triangle		x		x
Early involvement of key stakeholders	X			x
Easy to approach		≥ 3	x	
Encourage new techniques	≥ 3	≥ 3	x	
Enhance personal development	X	≥ 3	x	
Existence of team spirit	X			x
Flexibility	X	≥ 3	x	
Front-end planning	X	x	x	
Good atmosphere		x		x
Honest communication	≥ 3	≥ 3	x	
Informal communication	X	≥ 3	x	
Joint dispute resolution	≥ 3	x	x	
Joint project office	X	x	x	
Lead by example		x		x
Long- term orientation	≥ 3	x	x	

Code	Mentioned in literature study	Mentioned in interviews	Included in the Q-set	Not included in the Q-set
Lean management		x		x
Low hierarchical structures		x		x
Multidisciplinary project teams	X	x	x	
Mutual consent on tool usage	X	x	x	
Mutual objectives	≥ 3	x	x	
Mutual understanding		≥ 3	x	
Mutually sharing risks and benefits	≥ 3		x	
No blame culture	X			x
Prior experience with the project team	X	x	x	
Regular meetings of key stakeholders	≥ 3	≥ 3	x	
Reflection	X	x	x	
Respect for each other	X	≥ 3	x	
Responsibilities are documented	≥ 3	x	x	
Rigorous time planning	X			x
See the context around a problem		x		x
Sense of urgency		x		x
Sharing of information	≥ 3	x	x	
Stimulate own thinking		≥ 3	x	
Sufficient resources	≥ 3	x	x	
Team-Building activities	X	≥ 3	x	
Team motivation	X			x
Top management support	X	≥ 3	x	
Transparency	≥ 3	≥ 3	x	
Usage of historical data ("Big data")	X	x	x	
Willingness to find a compromise	X	x	x	
Willingness to solve problems together	X			x
Work according to ethical standards & law		x		x
Total	**43**	**43**	**35**	**22**

Table 11 Narrowing down the concourse to the Q-set

5.2. Categorization of interview and literature findings

After scoping the concourse, a collection of 35 statements is forming the Q-set. To analyse the obtained data (examined in next chapter), it is helpful to categorize the statements. For this reason, the statements were printed on little cards and moved around to recognise patterns. First, aspects which are relating to each other (e.g. communication aspects: Honest communication, Informal communication) are grouped. Furthermore, it is aimed to distinguish aspects who influence collaboration on a personal or on an organizational level. After moving the statements around, matching aspects could be categorized in six groups. Based on the content of each group a representative name is assigned to it. The result of this is presented in *Table 12*.

Relational attitude	Team working	Communication	Planning	Contract & Capability	New approaches
Commitment	Team building activities	Honest communication	Alignment of goals	Responsibilities are documented	BIM application
Willingness to find a compromise	Multidisciplinary project teams	Informal communication	Mutual objectives	Mutually sharing risks and benefits	Curiosity to try out new things
An environment of mutual trust	Prior experience with the project team	Sharing of information	Regular meetings of stakeholders	Joint dispute resolution	Encourage new techniques
Easy to approach	Joint project office	Transparency	Front-End planning	Sufficient resources	Usage of historical data
Respect for each other	Stimulate own thinking	Mutual understanding	Mutual consent on usage of tools	Top management support	Long-term orientation
Flexibility	Reflection		Benchmarking	Capable workforce	Enhance personal development

Table 12 Framework: Best practices of good collaboration in the project team currently applied in the construction industry

The categories present different conceptual angles on practices on collaboration. An overall distinction is made between soft (on the left side) and hard factors (on the right side). Furthermore, the aspects are categorized in collaboration on a personal level (Team working & Communication) and collaboration on an organizational level (Planning &Contract).

Relational Attitude

In each project different attitudes and viewpoints exist. In the course of a project, specific norms, values or routines are developed to govern the relationship between the involved parties (Suprapto, 2016). For this research, “Relational Attitude” is used to reflect each party´s relational norms and attitudes towards collaboration.

Team working

According to Baiden and Price (2011), team working can be defined as the extent to which members in a team work together on the basis of synergies in their interactions. The more team working quality

exist within a project team, the higher are the chances for a successful project outcome, in particular for innovative projects (Hoegl & Parboteeah, 2007). Thus, all statements relating to team working are grouped in this category.

Communication

Communication is a two-way process of reaching a mutual understanding in which participants not only exchange information, news, ideas and feelings but also create and common opinion (Business dictionary, 2018). According to Meng (2011), it is also characterized by open exchange of information, ideas and visions. A lack of open communication is identified as a main reason for the failure of construction partnering (Ng et al., 2002).

Planning

Planning is a basic management function involving the formulation of one or more detailed plan to achieve an optimum balance of needs or demands with the available resources. The planning process identifies the goals or objectives to be achieve (1), formulates strategies how to achieve them (2) arranges the means required (3) and implements all steps in their proper sequence (4) (Business dictionary, 2018).

Contract & Capability

Generally stated, a contract determines responsibilities, payment terms and phases, incentives, distribution of risk, dispute resolution and conflict settlement (Turner, 2003). In addition, capability is included. It is widely recognized that certain basic capabilities are perquisite for delivering a successful project. In literature, project management capability (Turner, 2009) or financial strength (Black et al., 2000) are listed. With contract and capability two hard factors are combined in this category.

New Approaches

This category covers collaboration forms dealing with relatively new techniques or practices such as BIM or usage of historical data. In addition, other impacts which do have a direct impact on collaboration, but in the long-term can be beneficial are grouped in this category.

For several elements, it is difficult to determine a distinct category. For instance, the term “An environment of mutual trust” is required for collaboration on a personal level and on an organizational level. The same accounts for “Reflection” or “Sufficient resources”. All these terms can be applied for collaboration on a personal or organizational level, or even determined in the contract. However, other elements such as “Encourage new techniques” or “Mutually sharing risks and benefits” can be clearly categorized.

To conclude, the collected statements are the result of the literature study including 13 articles and Semi-structured interviews with 20 professionals from the industry. With the help of coding, the statements are ranked and the most important ones are determined. Thus, *Table 12* presents a collection of best practices and factors which possibly improve collaboration within the project team. Furthermore, it provides an answer to sub-question 1: *What are the most important aspects and practices of “good” collaboration currently applied in construction projects?* In the next step this collection of best practices is shown to a group of people which rank them according to their own preferred order.

5.3. Definition of the P-Set & Q-sorting process

In a Q-study the research participants are chosen to ensure the inclusion of all viewpoints. This part is referred to as the P-Set (Brown, 1993; McKeown & Thomas, 2013) or the person-sample (Du Plessis, 2005). For this research a P-set of 40 persons participates in the Q-sort, which is in line with an extensive person-sample. To obtain a high diversity in viewpoints, participants are selected from different departments within Sweco. In addition, research participants are selected based on their age. With regards to the generation theory, it is aimed to include ten to twelve persons of each generation.

During the Q-sorting process the research participants are sorting the selected statements (from *Table 12*) in their preferred order of preference (Exel & Graaf, 2005).

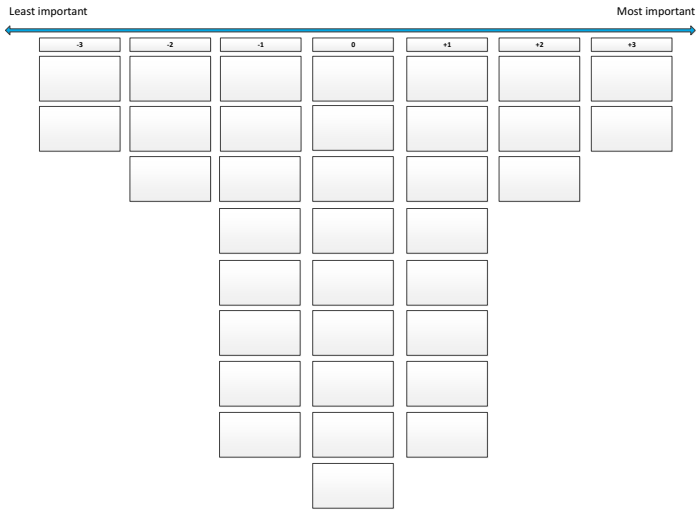


Figure 6 Score sheet for a Q-sort with 35 statements

With help of a score sheet respondents are confronted with the question: "*To improve the collaboration within a project team it is necessary to ….".* Having this question in mind respondents are asked to rank the statements, printed on cards, in relation to each other having a range from "most important" on the left end until "least important" on the right end. *Figure 6* shows the distribution selected for this research. The distribution´s shape is a choice of the researcher and depends on the controversy of the topic and of the number of statements (Exel & Graaf, 2005). The literature study indicates that a lot of knoweledge exists on best practices of collaboration and it is assumed that respondents have a strong opinion on it. As a result, it is chosen to aim for a rather flat distribution, as presented in *Figure 6.*

5.4. Conclusion

In this section, unstructured sampling is used to scope the concourse down to the Q-set. According to the literature study, the interviews and the criteria determined in this research, the Q-set is a collection of the most important and current aspects which improve collaboration in the project team. Hereby, an answer to sub-question 1 is provided.
In the next step, employees from Sweco rank the Q-set statements according to their preferred order and the outcome of this ranking is analysed.

6. QUANTITATIVE ANALYSIS OF THE Q-SORT

This chapter presents the results of the data analysis obtained during the Q-sort. In total 40 employees from Sweco conducted the Q-sort. This results in 40 raw sets of data, each representing a respondent's perspective on collaboration. As a starting point for the quantitative analysis the data is entered in the software PQMethod. Thereafter, the number of meaningful factors is considered followed by the factor analysis. Based on this, common perspectives are derived. These perspectives will be described in the next chapter.

For privacy reasons, the names of the interviewees or of their projects are not published, as it would make the respondent identifiable. Each Q-sort received a code which enables to see from which generation each Q-sort is stemming from (see Appendix H).

6.1. Characteristics of the P-set

After finishing the Q-sort, the research participants were also asked to answer a questioner. These questions are asked to obtain background information about the respondents (in total 40). *Figure 7* till *10* show the division within generations, working experience, educational background and current function.

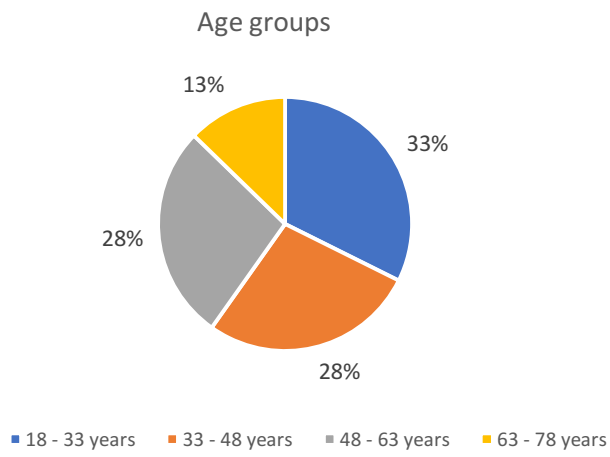


Figure 8 Distribution of age groups

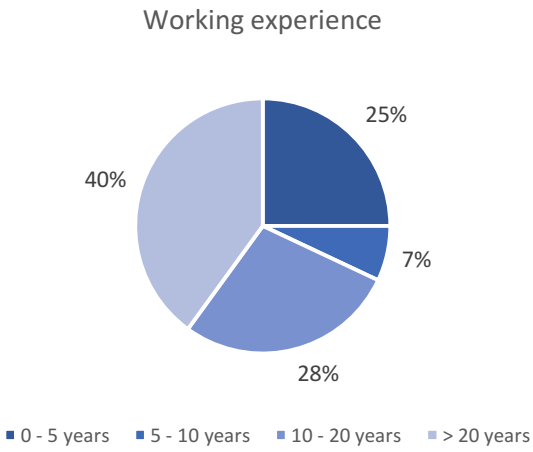


Figure 7 Distribution of working experience

The figure on the left demonstrates that the P-set has a balanced distribution consisting of four age groups with 33%, 28% and 28%. The oldest age group (63 – 78) has the smallest share with 5%. It turned out to be difficult to find enough "old" people in the working population of Sweco who are willing to participate in the workshops. The age group 48 - 63 contains three people (62, 62, 61) who almost belong to the oldest group.

The figure on the right shows that the respondents have a lot of working experience. 40 % of the P-set have more than 20 years of experience and 28% have worked between 10 – 20 years. 25 % of the P-set are young professionals with 0 - 5 years of working experience and 7% have worked 5 – 10 years

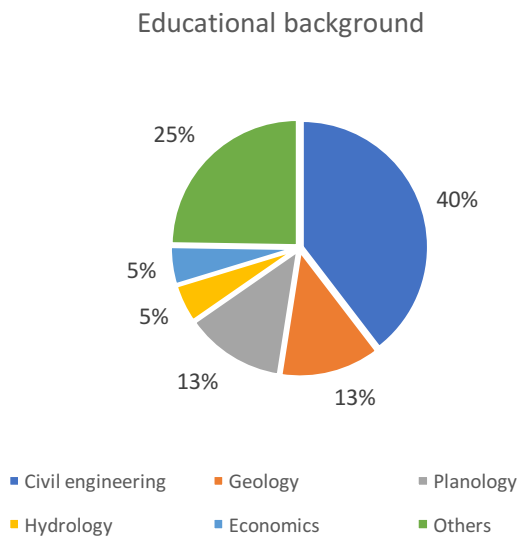


Figure 9 Educational background of the P-set

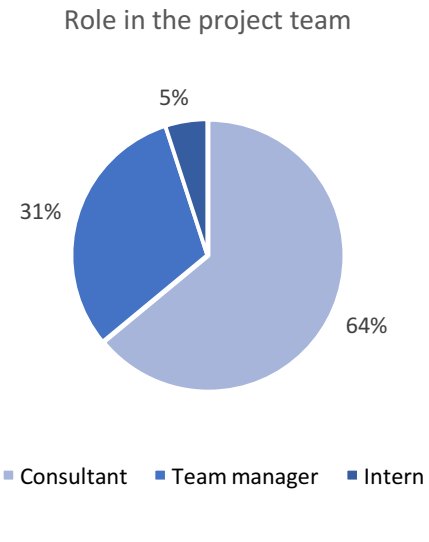


Figure 10 Different roles in the project team

The majority of respondents has a background in civil engineering. Also other backgrounds such as geology, planology (spatial planning), hydrology or economics are represented. The respondents are also asked about their role in the project team. Here a distinction between a team manager and a consultant and an Intern is made. Additional information about the P-set is presented in Appendix H.

6.2. Number of meaningful factors

To reveal factors from the data set, a factor analysis is conducted using the software PQMethod version 2.35. The software initially generates eight factors, which are all not rotated. In order to obtain a structure, it is necessary to rotate and extract factors. For this research, the methods *Principal component analysis* and *Varimax rotation* are used to achieve this. In the next step, it is necessary to determine how many factors should be selected for the interpretation. For this, the results of different consecutive factor rotations on 2- to 8 -factor solutions are analysed and compared. For each factor solution, two significant Q-sorts should define a factor to be accepted (Brown, 1980), whereby:

(1) A Q-sort *x* is significant loaded at p<0,05 on a factor *y* if its loading f_{xy}> 0,33 (calculated from $f = x/\sqrt{N}$, where N=35, number of statements and x = 1,96 (Van Exel & De Graaf, 2005)),

(2) Its highest square factor loading explains more than half of the common variance, $f^2 > h^2/2$ where h^2 is the sum of the squared factors loadings of a Q- sort.

Furthermore, only factors are accepted which meet Humphrey´s law (Brown, 1980):

(3) "The cross-product of its two highest loadings exceeds twice the standard error (SE)". Therefore, f > 0,338 (calculated from SE is 0,169 x 2)

In addition, Webler et al. (2009) determine four criteria which help to find the final set of factors and are also considered in this research. These are:

(4) Simplicity. Fewer factors makes it easier to understand certain viewpoints, if circumstances stay the same. However, one should be careful that the number of factors is not minimized at all costs as this bears the risk that viable information on distinct viewpoints is getting lost.

(5) Clarity. In the best case, each respondent loads highly on only one factor. Thus, it is intended to reduce the number of "con founders" (=people who load on multiple factors) and "non loaders" (=people who do not load on any factor). A factor can be only determined as significant, if it has a certain loading on it. In *Table 13* this criterion is presented as "Defining sorts".
By using the SE, and N as the number of statements (35), the significance can be calculated as follows: SE = $\frac{1}{\sqrt{35}} = 0{,}169$; Furthermore, it is possible to consider several significance levels

These induce: P < 0.01 : 0,169 x 2.58 = 0,436 or P< 0.05: 0,169 x 1,96 = 0,331

Because a higher loading is desired, the outcome is first tested on a P<0.01 Level.

(6) Distinctness. Two factors can be either high or low correlated. While low correlations are more desired, it is not necessary bad to have high correlations. It might be that two factors agree on many statements, but the statements where they disagree on are particularly important. In *Table 13* this criterion is expressed as "Min. /Max. Corr. Between factors".

(7) Stability: Comparing the results of different numbers of factors, enables to cluster certain groups together. This indicates that a group of individuals shares a common viewpoint.

Table 13 presents the 2- to 8-factor solutions, which are assessed according to above mentioned criteria listed on the left side. Critical columns are indicated in red.

Criteria	2-Factor	3-Factor	4-Factor	5-Factor	6-Factor	7-Factor	8-Factor
Cumulative explaining variance	44	51	56	61	65	69	73
Defining sorts	38	35	34	31	27	23	27
Acceptable factors	2	3	4	5	6	5	6
Distinguishing statements per factor	28	14-17	8 - 12	4-7	1 - 5		
Min. correlation between factors	0.594	0.522	0.372	0.182	0.094		
Max. correlation between factors	0.594	0.551	0.606	0.5814	0.564		

Table 13 Overview of the two – to eight factor solutions

The data of the Q-sorts supports a maximum of 6 factors (see "*Acceptable factors*"), excluding the 7- and 8-factor solutions from the further analysis. The 2-Factor solution is excluded because of a *Cumulative explaining variance* below 50% (only *44%)*. The 6-factor solution is not considered because of its low amount of *Defining sorts* (*27* out of 40) and *Distinguishing statements per factor (1-5)*.

The remaining 3- 4- and 5- factor solutions are very like each other and could be considered. With 51%, *56%* and *61%* respectively, all have an acceptable *Cumulative explaining variance* compared to other Q-studies (Suprapto, 2016; ten Klooster, Visser, & de Jong, 2008).
The 5-factor solution has with *61%* the highest *Cumulative explaining variance,* a reasonable amount of *Defining sorts (31)* and a low correlation between the factors. However, only two persons load on this factor which fulfils the minimum requirements for a factor to be accepted (Brown, 1980). With respect to the criterion (4) – the fewer factors the better– the 5-factor solution is therefore rejected.
The remaining 3- and the 4-factor solution are both suitable for the data analysis, since all the decision criteria apply. Therefore, the ranking of all statements is compared and considered more closely. This reveals that the 3-factor solution closely relates to three factors of the 4-factor solution. The additional factor is a hybrid version of one large perspective. Thus, they are very like each other, but differ quite a lot from the other two factors (0,397; 0,371; 0.60). In total, five Q-sorts are significantly loading on it.
Again, criterion (4) is taking into account: One should not try to minimize the number of factors at all costs, because viable information might get lost. In this case, the fourth perspective contains viable information. To conclude, a 4-factor solution is the preferred choice and is used in the next steps.

6.3. Factor analysis

The results of the Varimax rotation with four factors is displayed below in *Table 14.* The first column shows the identification number of the analysed Q-sort. The next columns show the factors, presented as *F1, F2, F3* and *F4.* When a Q-sort has a significant loading on one factor the column is highlighted with an "X" (for P<0,01) or "x" for (P<0,05). If a Q-sort is loading on two factors or more factors, the Q-sort is labelled as a con founder and marked with an Asterisk (*).

Q-sort	F1	F2	F3	F4
1	0,2622	0,2477	X 0.5322	0,2352
2	X 0.7211	0,1796	0,2749	0,411
4	0,2634	0,0735	X 0.6783	-0,0902
4	X 0.6838	0,1179	0,3828	0,1973
5	0,0857	X 0.8385	0,057	0,2566
6	X 0.7528	0,353	-0,0245	-0,0618
7	X 0.7589	0,0353	0,2703	0,2376
8	0,1002	-0,1563	X 0.5939	0,1589
9	x 0.3844	0,2172	0,2601	0,1747
10	0,4312	0,4114	0,1587	X 0.5499
11	0,1947	0,0503	0,128	X 0.4869
12	0,5479	0,088	0,0875	X 0.5967
13	0,3801	0,2512	X 0.6131	0,1821
14	0,2144	0,2398	X 0.4666	0,3273
15	0,0445	-0,0755	0,0104	X 0.8168
16	X 0.7191	0,3035	0,0159	0,3273
17	0,3477	X 0.6245	0,119	0,3566
*18	-0,0159	X 0,5633	0,3484	X 0,5214

*19	X 0,5081	X 0,4868	0,1521	0,1047
20	0,4099	X 0.5377	-0,2099	-0,165
21	0,0358	X 0.7362	0,2876	-0,1954
22	X 0.5421	0,0932	0,4777	0,3349
23	0,1252	X 0.5386	0,2119	0,2473
*24	0,0676	0,0955	X 0,4581	X 0,4589
*25	0,252	0,0123	X 0,5593	X 0,5101
26	0,2772	0,2215	X 0.5787	0,2217
27	0,3651	0,3755	X 0.5486	0,2711
28	-0,1541	0,4864	X 0.6313	0,0433
29	0,2247	X 0.6423	0,3528	0,2454
30	0,3261	X 0.6256	-0,0897	-0,0698
31	0,3031	0,1685	0,18	X 0.6428
32	-0,1741	0,1986	X 0.5883	-0,0419
33	0,0962	X 0.6023	0,2001	0,0609
34	0,2855	X 0.3702	0,0827	0,0493
35	0,1396	X 0.4512	0,2745	0,2885
36	0,0433	X 0.5180	-0,0103	0,0516
37	0,2852	X 0.5203	0,3228	-0,3951
*38	0,0903	0,5673	0,0917	0,5561
39	0,2795	X 0.6634	0,2911	0,1725
*40	0,1682	x 0,4303	0,2676	X 0,5221

Table 14 Results of the varimax rotation with 4 factos

The result shows that seven respondents load significantly on F1, thirteen on F2, nine on F3 and five on Factor 4. In all cases the factors are significant at a P<0.01 level, indicating that the respondents strongly identify with the perspective. However, also six con-founders exist (Q-sort:18, 19, 24, 25,38, 40). This indicates that respondents have a hybrid opinion on collaboration. Nevertheless, we decided to include the con founders and flag them on the factor on which they rank highest. It is also remarkable that all Q-sorts have a high loading on the factors and that no non-loader exists. This shows that all participants have a strong opinion on collaboration.

6.4. Conclusion

In the quantitative analysis, factor rotation and extraction is used to achieve a structure in the data set. Based on the criteria of Brown (1980) and Webler et al. (2009), it is determined that the 4-factor solution is most optimal. This factor solution has a cumulative explaining variance of 56% and contains 34 defining Q-sorts which all significantly load on a P < 0.01 level.

It can be concluded that the respondents have a strong opinion on collaboration. This is confirmed by the fact, that no non loader exists. A high correlation between the factors and a high number of con-founders indicates that the respondent's opinions are very like each other. In the next chapter, this data will be interpreted and further explained.

7. EXPLORING PERSPECTIVES ON COLLABORATION

The data analysis of the previous chapter revealed that a 4-factor solution is most suitable to describe the obtained data set. In this chapter, each factor is translated into a common perspective on collaboration. With the help of the quantitative output of the factor analysis – factor arrays, scores and distinguishing statements – information is attributed to each factor. This is supported by the respondent's reflexive explanations which show the reasoning to consider aspects´ importance. In combination with the quantitative analysis, this chapter also provides an answer to the second sub-question: *What perspectives can be derived from ranking aspects of collaboration?*

Visualization of perspectives

In the next sections, four idealized Q-sorts are presented – one for each factor. The idealized Q-sort present the average ranking of statements from like-minded persons´ loading. In other words, each factor presents a perspective on collaboration that multiple people share within the project team.
This perspective is visualized by the ranking of the statements according to their factor score ranging from +3 to -3. The aspects which are of most importance to a certain group of people are therefore ranked at the top, and aspects of least importance are at the bottom. Since not all of the 35 collected statements can be presented, the explanation focuses on the extreme scored statements – the highest and lowest ranked statements

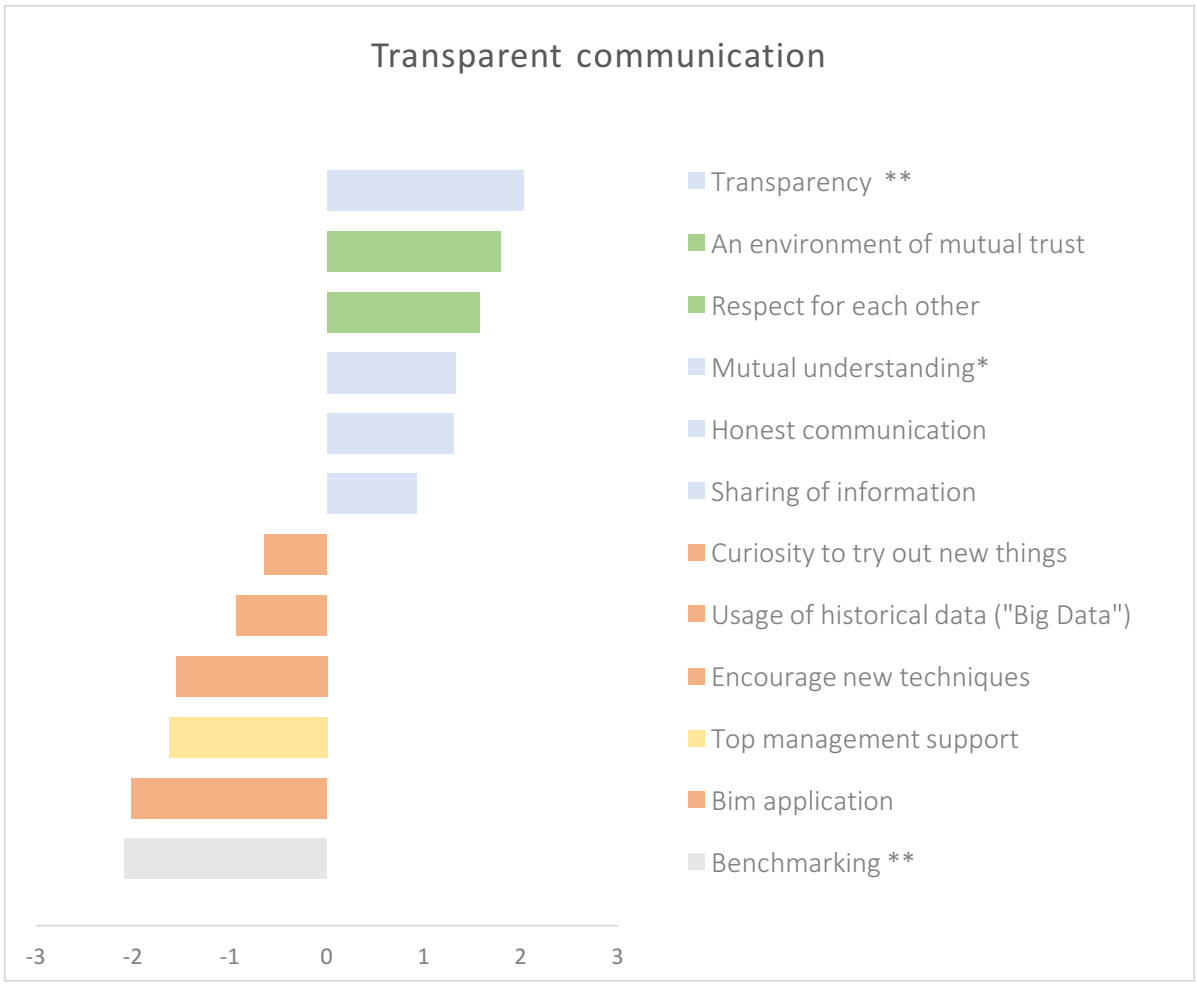
Furthermore, the distinguishing statements are of great interest. Those are statements which are ranked significantly different by one group of participants compared to all other participants. They make them characteristic and thereby help to define one factor. One asterisk (*) marks a difference at a $P<0.05$ level, two asterisks (**) at a $P<0.01$ level.
Throughout the ranking of the statements, the respondents were asked to justify why they placed a statement very high or low. These reflexive explanations help us to understand the rationale of the respondents and provide further insights into their interpretation. Each explanation is marked with a hashtag and a corresponding identification number, e.g. #17.

As explained in section 5.3, the statements for the Q-sorting are classified in the categories "Relational Attitudes", "Team Working", "Communication", "Planning", "Contract" and "New Approaches". It is important to note that those categories are established to portray different aspects of collaboration. Respectively, the first three categories are soft factors relating to collaboration on a personal level, the latter three are hard factors, describing collaboration on an organizational level. Each category is displayed with a different colour code. This makes it possible to further analyse, if a group of people has certain preferences with regards to certain types of collaboration.

Furthermore, qualitative information is attributed to each factor and then interpreted. As a result, a factor is translated into a perspective – a shared view that a group of people have on collaboration in the project team. Therefore, a factor is from now on referred to as a perspective.

7.1. Perspective 1 –Transparent communication

The first perspective, labelled *Transparent communication* accounts for 14% of the explained variance in the data set. In total, nine respondents (including one con founder) share this common view on collaboration. *Figure 11* shows the ranking of the statements as well as the characterizing statements (marked with an * or **).



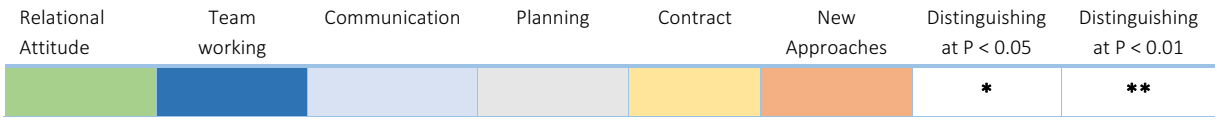


Figure 11 Perspective 1 – Transparent communication

High ranked statements

The highest ranked statement for respondents loading on this perspective is *Transparency*. At the same time, it is a distinguishing statement (see **) which makes it a very important characteristic. *Transparency* involves making it easy for the other party to see what actions are performed, what goals exist and what their motivations are. According to the respondents, "it is always good to know what actions are undertaken" (#27). "One should never hesitate to address surprises, mistakes information or problems" (#2). *Transparency* also helps you "to build up mutual trust. This is the basis of

collaboration" (#12). Furthermore, "you can disagree with each other, as long it is clear why the other parties want to have specific things" (#5).
In a similar way, respondents assess *Mutual understanding,* which is also a distinguishing and high ranked statement: "It is not necessary to always agree with each other, as long as you understand what the other person wants and why he wants it, you can continue working together" (#5). Furthermore, it "makes it nicer to work together" (#27) and it "provides insights of each other's desires" (#14).
The work environment is also important for this perspective. This should be *An environment of mutual trust* where everybody has *Respect for each other*. "When people trust each other there is a good and open communication. This is a key aspect for success" (#24). In combination with *Honest communication* this makes it easy for each other to talk about problems.
Lastly, *Sharing of information* is also ranked high among the important elements. Just like the high ranking of *Transparency* and *Honest communication,* this statement indicates that members of this perspective emphasize an open working environment with a free exchange of information.

Low ranked statements

On the contrary, the measurement of performance (=*Benchmarking*) is ranked lowest. Respondents explain the low ranking as follows: "Measurements are not necessary for good collaboration. Often negative things are revealed, but you should rather stimulate the good things" (#2). Furthermore, "*Benchmarking* is a content statement which contributes to the result but not to collaboration. First of all, collaboration is about the persons, not the content" (#15).
In addition, statements from the category "New Approaches" such as *BIM application*, *Usage of historical data*, *Curiosity to try out new things* and *Encourage new techniques* are ranked low. Practitioners of this perspective agree that those statements are good to have, but do not have a direct influence on collaboration in a project team. "Of course, this (*Encourage new techniques*) provides new opportunities, but good collaboration requires first of all other aspects, such as communication, respect, honesty, etc." (#2). Therefore, the *Usage of historical data,* "is not a factor which has a direct impact on good collaboration" (#2). Also, "People always say, that every project is unique. Therefore, you do not need it. Big data might even reduce creativity" (#5). The same accounts for *BIM application,* which is almost as low ranked as *Benchmarking*: "You can also collaborate (even more) creative without a digital software. It might also stimulate own thinking*."* (#2).

Conclusion

This perspective is determined to be *Transparent communication*. First, Transparency is ranked very high and distinguishing. Additionally, several elements of the category "Communication" are ranked high. Furthermore, this category emphasizes on "Relational attitudes" and ranks "New Approaches" low. Thus, Transparent communication emphasizes collaboration on a personal level. A good example is the quote from respondent (#15): "First of all, collaboration is about humans".
As a result, other statements which might enhance collaboration in the long-term or have a secondary contribution (in their opinion) are ranked low. This is reflected in the low ranking of statements from the category "New Approaches". In particular, the low ranking of the statements *Curiosity to try out something new* and *Encourage new techniques* show a cautious attitude towards change and indicate a rather conservative behaviour.

7.2. Perspective 2 – Strategic planning

The second perspective, labelled *Strategic planning* accounts for 17% of the explained variance and is defined by fifteen (including two con-founders) respondents. *Figure 12* shows the factor score of the characterizing and distinguishing statements of this perspective.

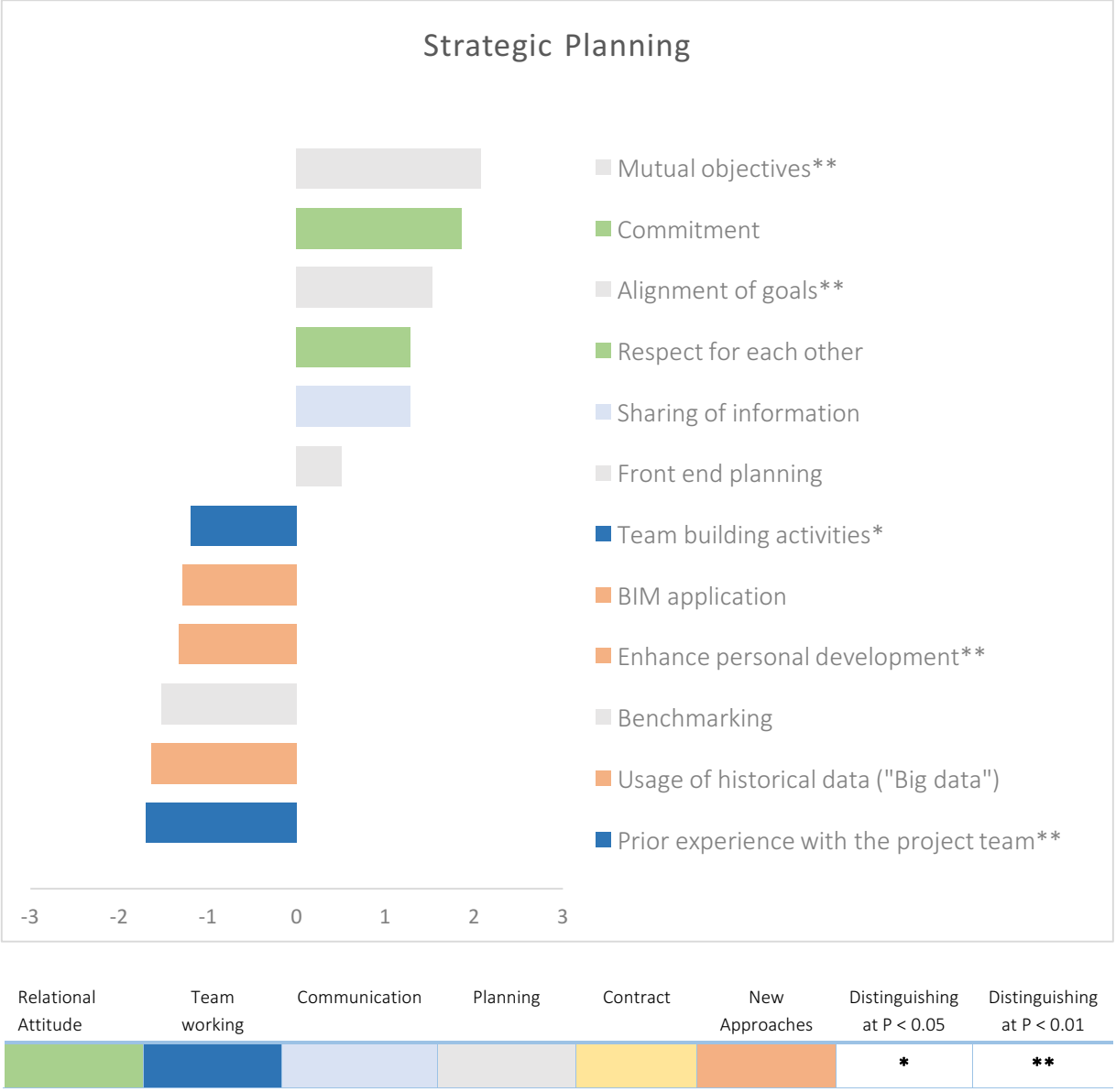


Figure 12 Perspective 2 – Strategic planning

High ranked statements

For practitioners of this perspective, statements which relate to the category "Planning" are ranked high. Thus, it is very important that parties develop and agree on common objectives (*Alignment of goals*) unless they already have a shared vision (*Mutual objectives*). In addition, it is important to determine the crucial points in the very first phase of a project (*Front-end planning*). According to the respondents, the "alignment of goals is essential for collaboration, because it provides the same direction" (#7). Furthermore, "Without a clear alignment of goals, every project is condemned to fail"

(#35) and "without front-end planning, a project cannot be realized" (#35). Besides the high ranking, *Mutual objectives* and *Alignment of goals* are also distinguishing statements.
In line with this is also the high ranking of *Sharing of information,* which is seen as an important element for the communication in the project team.
Practitioners also appreciate *Respect for each other* and *Commitment* to the process. The latter is required because "being part of the project team against your own will, will results in bad collaboration" (#35).

Low ranked statements

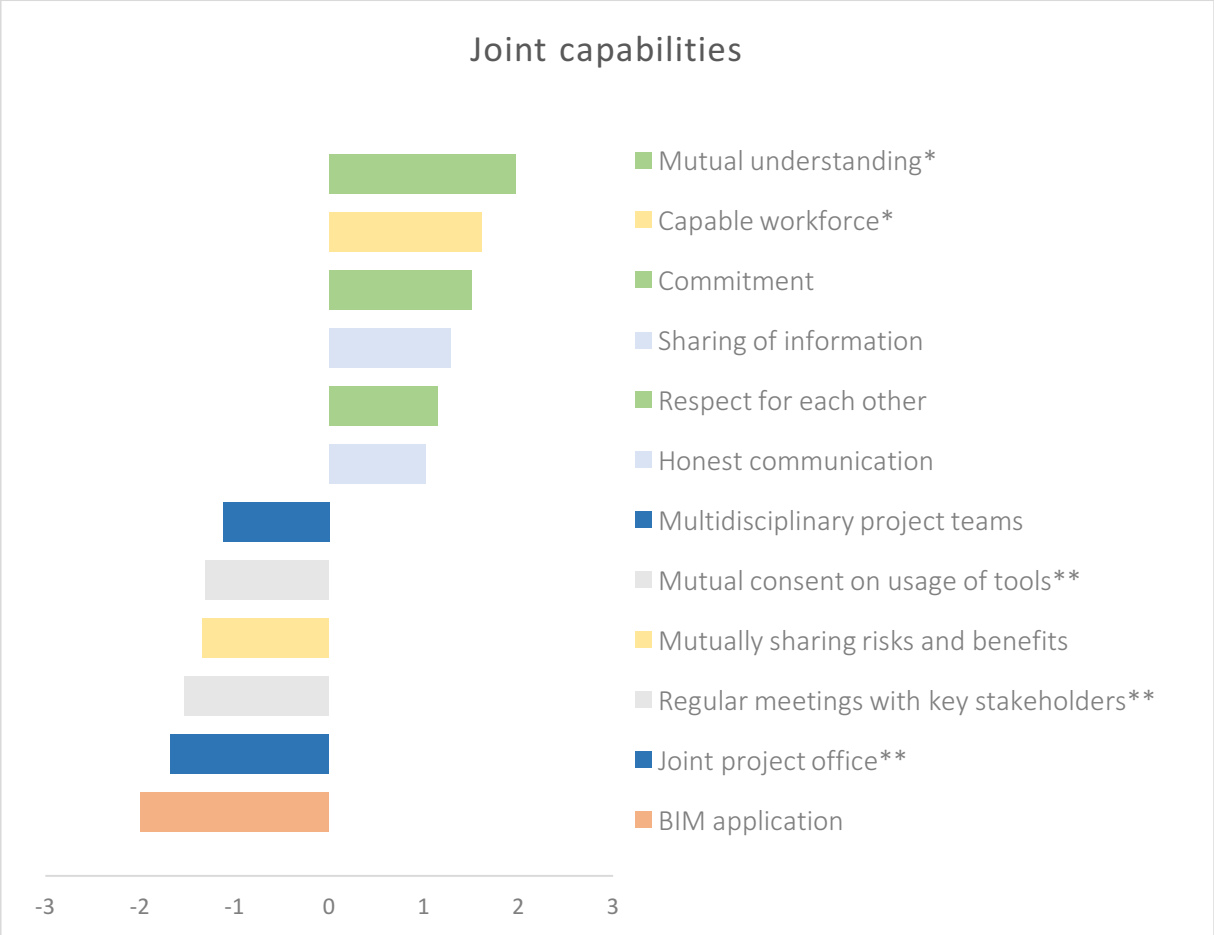
Compared to other perspectives, members of this perspective believe it is less important to have a *Prior experience with the project team* or to have *Team building activities*. Thus, both statements are ranked low and are distinguishing. Practitioners state that: "Prior experience does not guarantee good collaboration" (#7). Also "a new compiled team can reach a lot" (#26) and might even "create new opportunities" (#7). *Team building activities* are ranked low because practitioners find that "the initiative should rather come from the employees themselves" (#38). Furthermore, "if there is an open communication within the team, team building activities are not necessarily required. A good atmosphere within the team is good, but not key to success" (#35).
In addition, *Enhancing personal development* is also less seen as less important, because "personal goals can interfere with collaboration in the project team" (#26). This low ranking is furthermore very characteristic for this perspective.
Again, the *Usage of historical data*, *BIM application* and *Benchmarking* are ranked low. Respondents see them as "tools" (#28) which have mainly an indirect impact on collaboration.

Conclusion

While reading through the high and low ranked statements of this perspective, one can observe that members of this perspective focus on collaboration on an organizational level. This is reflected in the high ranking of statements from the "Planning" category (*Alignment of goals*, *Mutual objectives*, *Front-end planning)*. At the same time, collaboration on a personal level is subordinated and statements especially from the category "Team Working" (*Team-building activities, Prior experience with the project team)* are ranked low. In the opinion of the author this combination of statements reflects several elements of strategic planning. Strategic planning focuses on the planning of the entire organization. For this, it translates a vision into broadly defined goals or objectives, and provides a sequence of steps how to achieve them (Business Dictionary, 2018). This can be observed in the visualization of this Q-sort.
A closer look into the respondent's background information revealed that nine of the fifteen people loading on this perspective stated to be working as project managers. This coincides very good to the name of this perspective, since it is the responsibility of a project manager to give a direction for his project team. For this, strategic planning is necessary.

7.3. Perspective 3- Joint capabilities

The third perspective, labelled *Joint capabilities* accounts for 13% of the explained variance. A total of ten respondents (including one con founder) share a common view with this perspective. *Figure 13* shows the factor score and the characterizing statements of this perspective.



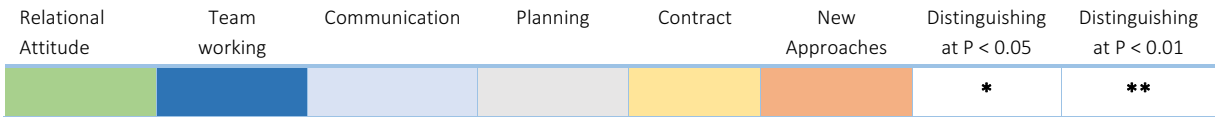


Figure 13 Perspective 3 -Pragmatic relationship

High ranked statements

The highest ranked statement of this perspective is *Mutual understanding.* The respondents state: "Mutual understanding is essential for good collaboration. How am I supposed to work with my colleague, if I don't know what he wants?" (#1). One needs to "Be aware of each other's needs and desires. This leads to a better collaboration, a better project outcome and a better atmosphere in the project" (#18).

The second highest ranked statement (*Capable workforce*) demonstrates how high this perspective values a skilled workforce. "Without enough capability, it is not possible to reach a high quality" (#30).

Thus, for members of this perspective it is important to have the human resource. Both statements are distinguishing statements.
Also, relational attitudes such as *Commitment* and *Respect for each other* are valued. Thus, member on this perspective value Relational attitudes high.
Last, practitioners rank the *Sharing of information* and *Honest communication* high. Again, it can be observed that communication is important for everybody. "My colleagues need to know what I do and why I do it. That's why a good communication and sharing of information is essential for good collaboration" (#1).

Low ranked statements

This perspective perceives *BIM application* as least important for collaboration. In the opinion of the respondents this statement has no direct effect on the collaboration within the team. Furthermore, many stated that they haven't used it so far.
Respondents also value a *Joint project office* which enhances face- to face meetings with colleagues as less important. "Instead of a Joint project office we use 'Skype for business'. That's a very good alternative to see each other from time to time" (#4). Especially the last part of the sentence: "from time to time" is characteristic because members of this perspective seem to have a reluctance towards face-to-face meetings. This is in line with the low ranking of the statement *Regular meetings with key stakeholders.* Here the respondents perceive meetings "only necessary when they are necessary" (#31). Both are distinguishing statements.
Next, *Mutually sharing risks and benefits* is rank low. This is a contractual agreement that allows parties to share profits or cost savings and to share losses due to errors or cost increases.
This perspective also perceives it less important that parties agree on software, interfaces & communication used in the project (*Mutual consent on usage of tools*). Here it is emphasized that "everybody should have the freedom to decide, with which tools he is working" (#1). Also, "everybody uses tools in his own way" (#4). Similar comments are stated about the application of BIM: "There are better alternatives to share your information" (#6). Furthermore, "I don't find it good that everybody nowadays wants to apply BIM in the projects. I do not see how it should improve collaboration, I think it rather reduces the creativity" (#1).
Last, *Multidisciplinary project team* is also ranked low. According to the respondents, they do not have a direct influence on collaboration and are "not necessarily good for the project" (#4).

Conclusion

In the visualization of this perspective a peculiar combination can be observed. On the one side, the high ranked statements contain mainly soft factors and this perspective emphasizes on a "Joint" approach. Thus, it is very important to have a good relation (*Mutual understanding*) and communication (*Sharing of information, Honest communication)* with the colleagues. On the other side, statements which enhance seeing their colleagues in person (*Joint project office, Regular meetings with key stakeholders)* are ranked low. But how is it possible that one wants to have a good relation with his colleague without seeing him? In such a case, it helps to look at the reflexive answers. Here several respondents state to have a dislike against too many face-to face or unstructured meetings. In the opinion of the researcher, this indicates that they had bad experiences with meetings. They know that it is very important to get along good with their colleagues (*Mutual understanding)* and to have the right people to get the job done (*Capable workforce*). Thus, this perspective emphasizes *Joint capabilities*.

7.4. Perspective 4 – Informal pioneering

The fourth and last perspective, labelled *Informal pioneering* accounts for 12% of the explained variance. A total of seven respondents (including two con-founders) share a common view on this perspective. *Figure14* shows the factor score of the characterizing and distinguishing statements of this perspective.

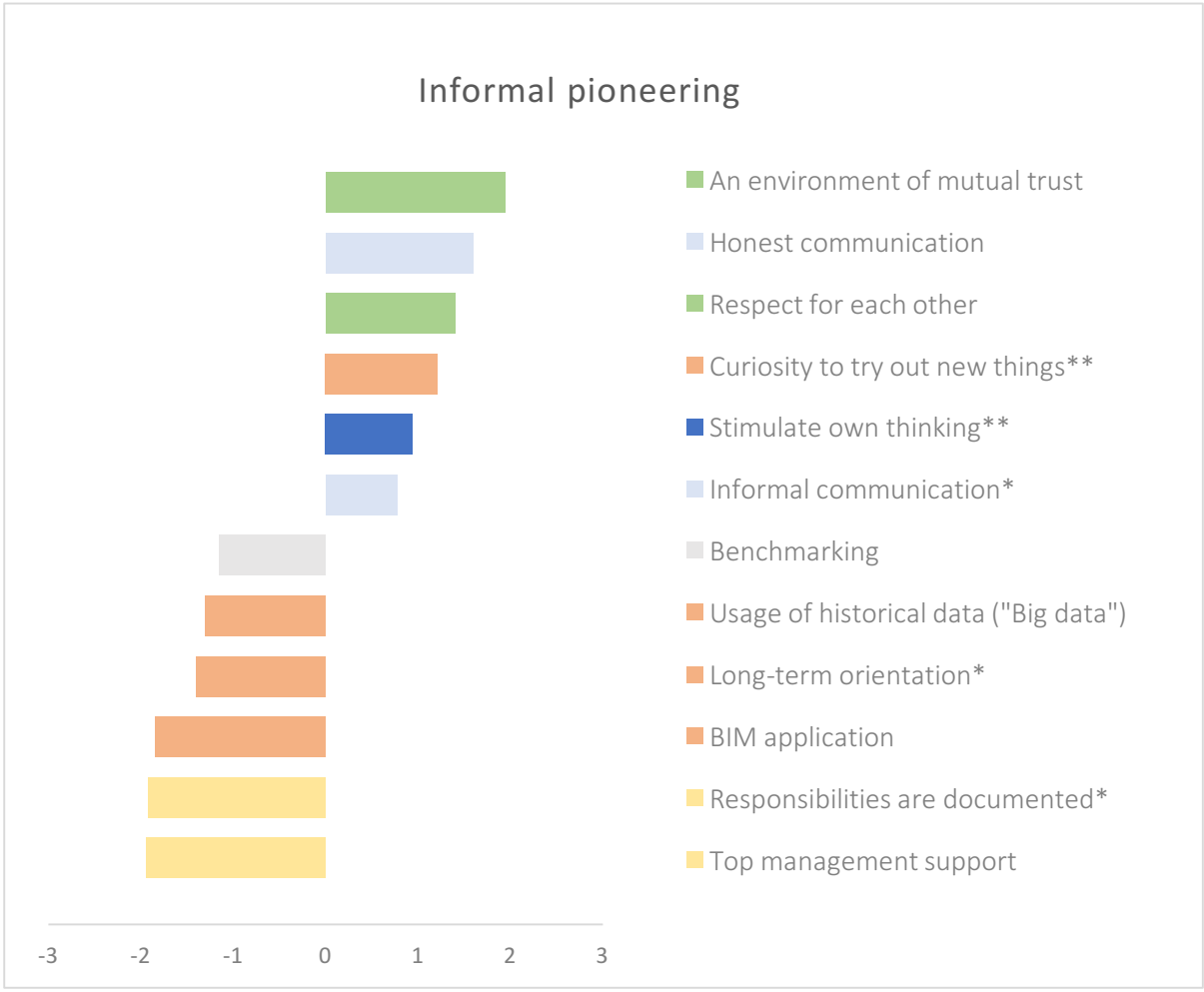


Figure 14 Perspective 4 – Informal pioneering

High ranked statements

The most important statements from this perspective are *Honest communication* and *An environment of mutual trust* where you have *Respect for each other*. "This way (*Honest communication)* you have an optimal way of transparency. This is the essence of collaboration" (#16). Furthermore, "Trust is required to do your work good. It also gives you a better feeling to try new things out" (#20).

Characteristic is the high ranking of *Curiosity to try out new things*. According to the respondents, "You need to have an open mind, be willing to try out something new and look for opportunities" (#3).

Additionally, this perspective finds it very important to transfer responsibility to the employee (*Stimulate own thinking)*. If employees are frequently told what to do, they simply follow the commands without thinking on their own. Members of this perspective state: "People need to be challenged and get the chance to use their own brain" (#16).
Last, this perspective also appreciates *Informal communication.* "This provides a nice working environment where you get to know each other as a person" (#20).

Low ranked aspects

On the contrary, *Top management support* is ranked lowest. Respondents find, that this statements has a secondary influence on collaboration: "Nice if it is there, but not required" (#36). Respondents believe that the top management has only little influence on the direct communication within the project team.
Also, *Responsibilities are documented* is ranked very low. Members of this perspective are afraid of an environment with too many constraints. "If you determine too many things, people only do what they are told to do, and not more" (#20). Thus, they do not think on their own.
This is followed by the low ranked statements *BIM application, Usage of historical data* and *Long-term orientation*. Latter is even described as a waste of time: "To think about everything what shall be? A waste of time! Do more and act!" (#20). Other state again, that they have not been working with yet or that they don't find it necessary for the collaboration in the project team.
Last, the statement *Benchmarking* is ranked low. Respondents state: "Benchmarking does not have a direct influence on collaboration. It deals with the result, not the process (#16).

Conclusion

With respect to the high ranked aspects, this perspective is very sensitive to the working environment and the way how people treat each other (*An environment of mutual trust, Respect for each other, Honest communication*). Furthermore, in this environment one should be able to communicate informal with each other. This is in line with the low ranking of *Responsibilities are documented*. Both statements indicate that members of this perspective feel more comfortable at work, if their environment is rather informal with less responsibilities documented. This provides them more room to try out something new or reconsider their ideas. Under those conditions this perspective is willing to accept responsibility (*Stimulate own thinking*) and open to try out new things (*Curiosity to try out new things*). However, these statements also contradict with the low ranking of *Long-term orientation.* In the opinion of the researcher, this combination can be related to a pioneer. A pioneer is willing to take over responsibility and try out something new. Thus, he has a vision but is not necessarily long-term orientated. Important to note is that simply a curios attitude to try out something new, does not make a person a pioneer. However, it is the first time that statements from the category "New Approaches" are ranked (distinguishing) high. In addition, *Encourage new techniques* (0.41) is ranked relatively high. This makes this perspective compared to the other perspectives more experimental. Thus, it is labelled *Informal pioneering.*

7.5. Correlation of perspectives

So far each perspective is analysed individually. This section observes to what extent the perspectives relate to each other. The correlation between each perspective is presented in *Table 15*.

Perspective	P1 Transparent communication	P2 Strategic planning	P3 Independent communication	P4 Informal pioneering
P1	1,00	**0,54**	**0,55**	**0,61**
P2	**0,54**	1,00	**0,55**	0,37
P3	**0,55**	**0,55**	1,00	0,39
P4	**0,61**	0,37	0,39	1,00

Table 15 Correlation between perspectives; strong correlation is highlighted in bold

According to Cohen (1988), the size of correlation between 0,3 and 0,5 can be seen as *moderate*, and higher than 0,5 as *strong.* In this case, a strong correlation can be observed between the perspectives P1 - P2, P1 - P3 and P2 - P3 (presented in bold). Also, a strong correlation can be observed between the perspectives P1 - P4. Only the correlation between P2 – P4 and P3 – P4 is moderate. This indicates that all perspectives share a very similar view, how the project team should collaborate.

P1 & P4

In the section *7.2 Number of meaningful factors* it is discussed whether a 3- or a 4- factor solution should be applied. The analysis showed that the difference is a hybrid group of a larger perspective (in this case P4 and P1). This explains the strong correlation between P1 and P4 (0,61). Both perspectives stress the soft factors of collaboration. The main difference is their attitude towards change and innovation, which is reflected in the ranking of the statements *Curiosity to try out something new* and *Encourage new techniques*. While members of P1 have a rather cautious attitude, members of P4 are willing to try out something new. This curious attitude makes P4 quite different from P2 (0.37) and P3 (0.39). With 12% cumulative explaining variance P4 presents the smallest sample of the participants, but it entails an interesting perspective. For this reason, it is good that it is decided to include this perspective in the analysis.

P2

Compared to the other perspectives, P2 – Strategic planning emphasizes on the hard factors of collaboration. This shifts the focus from a strongly human based way of collaboration towards a more structure oriented approach. As the name “strategic planning” indicates, members of this perspective believe, that the hard factors of project management are of more importance than the soft factors. Here especially elements from the category “Planning” are ranked high, while elements from the category “Team working” are ranked low.

P3

With respect to the high ranked elements, P3 – Joint capabilities - has several overlapping statements with P1 and P2. This is also reflected in the correlation of 0.55 and 0.54 respectively. What differs them from the other perspectives are the low ranked aspects, which are identified as a reluctance towards regular meetings with stakeholders and a joint project office.

With respect to the strong correlation between the perspectives it can be concluded, that the respondents share a very similar view how members of the project team should collaborate. This is also reflected in the number of consensus statements revealed from the Q-sort. Consensus statements are characterized by a low magnitude of difference between the factor scores. That means those are the statements on which every perspective has the same opinion. A strong correlation between the perspectives indicate that a high consensus exists. One can classify three different types of consensus statements:

(1) All perspectives score high on a statement.
(2) All perspectives score low on a statement.
(3) All perspectives score medium on a statement.

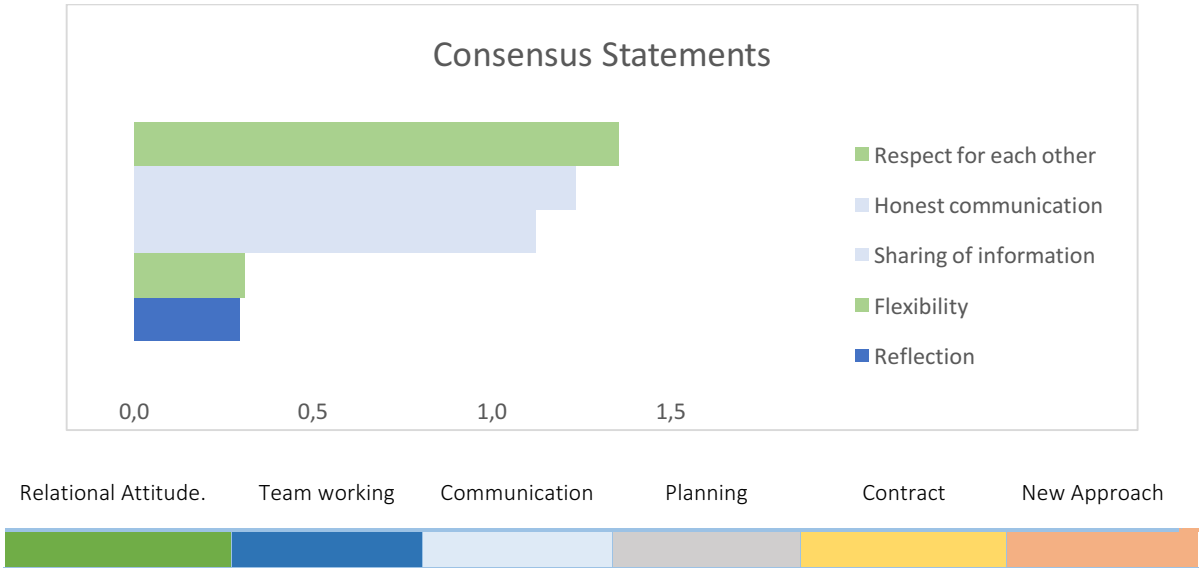


Figure 15 Consensus statements

The strong correlation of the perspectives already indicates that a high consensus exists among the respondents. This is reflected in *Figure 15.* It can be observed that all respondents find that the statements *Respect for each other, Honest communication* and *Sharing of information* are important aspects to improve the collaboration in the project team. Thus, those statements are of very high importance, because everybody perceives them as required. This is also confirmed by the findings of the literature study and the semi-structured interviews. Consequently, one can see and use them as a basic for all forms of collaboration in the project team.
Besides the terms *Flexibility* and *Reflection* are commonly seen as slightly important. Nevertheless, also these statements are perceived the same by all research participants.
An overview how the other statements are ranked across perspectives can be found in Appendix I.

7.6. Conclusion

In this chapter the quantitative output of the factor analysis and the reflexive explanations of the respondents are used to arrive at four perspectives. The analysis shows, that those perspectives have a strong correlation to each other. This indicates that they share in general the same opinion how one should collaborate in the project team. Thus, an open and honest communication, respect for each other and the sharing of information are crucial aspects. In combination with Chapter 6 it is possible to answer the second sub question: *which perspectives can be derived from ranking factors influencing collaboration?*

Four perspectives are derived from the ranking. These are: *Transparent communication (1), Strategic planning (2), Joint capabilities (3) and Informal pioneering (4)*.

(1) Transparent communication is a perspective, which is very sensitive about the direct collaboration within the project team. For members of this perspective it is important to know what´s going on. Therefore, one should know what the colleagues are thinking and try to understand them. A key ingredient for this is a very open communication were information is exchanged. Practices which might enhance collaboration in the long-term are subordinated.
(2) Strategic planning is a perspective, which cares first about the planning of the process. It is important to define the goals for the project team, set up a guideline how to achieve them and align the involved parties. Thereby, the interest lays rather on the entire organization than of the individual. Consequently, personal interests in the project team are subordinated. Also, team building activities are seen as less important for collaboration.
(3) Joint capabilities is a perspective, which focuses on the human aspects and on a joint approach. An essential ingredient for collaboration is therefore a mutual understanding for each other. Furthermore, one needs to have the right people to do the right job. At the same time, members of this perspective value meetings in person low. They believe virtual meetings like skype are a good substitution instead.
(4) Informal pioneering is a perspective, very similar to Transparent communication. Again, soft factors of collaboration are ranked high. Key for a good collaboration is a trustful environment where everybody respects each other. A mean to achieve this is an open, honest and informal communication, where not all the responsibilities are clearly documented. Under those circumstances members of this perspective are willing to accept responsibility and try out something new.
Consensus statements All perspectives perceive the statements *Sharing of information*, *Respect for each other* & *Honest communication* as very important.

Table 16 Summary of the analysed perspectives

8. THE THEORY OF GENERATIONS

To observe collaboration in the project team from a different perspective, this chapter provides an excursion about the theory of generations. First, the essence of generation research is explained. Next, the focus is set on generational research in the Netherlands and its effect on Dutch organizations. Based on the theory of Bontekoning, four generations are described and characteristics are collected.

8.1. A literature study on the concept of generations

The purpose of this literature study is to provide the reader a new perspective for looking at collaboration in the project team. The search term "generation theory" is used to reveal the basics of the theory as a starting point.

Over the course of the past two centuries multiple famous historians, philosophers and sociologists have contributed to the development of a generational theory. The Hungarian-German sociologist Karl Mannheim (1893-1947) is widely considered as the founder of generational thinking (Bontekoning, 2011; Platteau & Hondeghem, 2010). According to Mannheim (1928), people who are born in the same period share the same perception of a surrounding "Zeitgeist". Due to that they build up a connection with their peers, share a similar psychological and physical development and a certain destiny in life. Mannheim calls this the "Entelechy" of a generation. Manheim´s idea that people who are born in the same time period share certain characteristics which differ them from other generations is the main theory which has influenced the author of this paper to conduct this research.

Next, the term "generations" is searched in combination with the terms "workplace", "collaboration" and "construction". This reveals that research in the context of organizations is relatively new and unexplored (Becker & Budrich, 2008). While multiple sources describe the generational differences at work in general, nothing can be found in the specific context of construction projects. Most of the literature is written after the year 2000 and origins from the human resource domain. Consequently, those journals describe characteristics of generations at the workplace and possibilities to integrate them. Especially the youngest working generation (born between 1980 – 2000) receives a lot of attention. However, most of the found literature origins from the United States or other Western European countries. Since Western Europeans share multiple values with each other, this research has interesting insights, but the concept of generations is very culture-specific and therefore differs for every country. For this reason, it is decided to incorporate Dutch literature and the terms: "generaties" in combination with "samenwerken" and "werk" are searched.

This reveals that generational research in the Netherlands is quite limited. In the early 1990s, the Dutch professor Dr. Henk Becker of Utrecht University was the first to carry out a sociological study of generations (Diepstraten, Ester, & Vinken, 1999). Based on Mannheim´s work he determined five generations in the Dutch population (Becker, 1992). This classification was later confirmed by the Dutch Institute for Social research (2010) and is used up to this point. One of the most famous researchers for Dutch generation theory is Dr. Aart Bontekoning from the University of Tilburg (RWS, 2011). Over the past 20 years he has researched the evolutionary power of generations in organizations and wrote his dissertation on this subject. Bontekoning developed his own generation theory based on Mannheim`s and Becker´s research. The literature search shows that his definitions reflect the most recent state of art. For this reason, most of the content of this chapter is based on his work, complemented by research from Dutch Universities and public authorities such as Rijkswaterstaat (RWS).

8.2. Generations in the Netherlands

Several definitions exist in literature to classify birth cohorts. In this research the names Babyboomer, Generation X, Generation Y and Einstein are used to describe the four generations, which are active in the current workforce. Additionally, a describing adjective, e.g. “protesting” is added to show the main characteristic of a generation.
The classification, combining the birth years which form a generation and the describing adjective, is based on Becker´s (1992) and Bontekoning´s (2007) research. Thus, the following cohorts are relevant for this research:

- The protesting Babyboomer Generation (1940-1955)
- The connecting X Generation (1955-1970)
- The pragmatic Y Generation (1970-1985)
- The authentic Einstein Generation (1985-2000)

Figure 16 presents the expected population pyramid of the Netherlands in 2020.

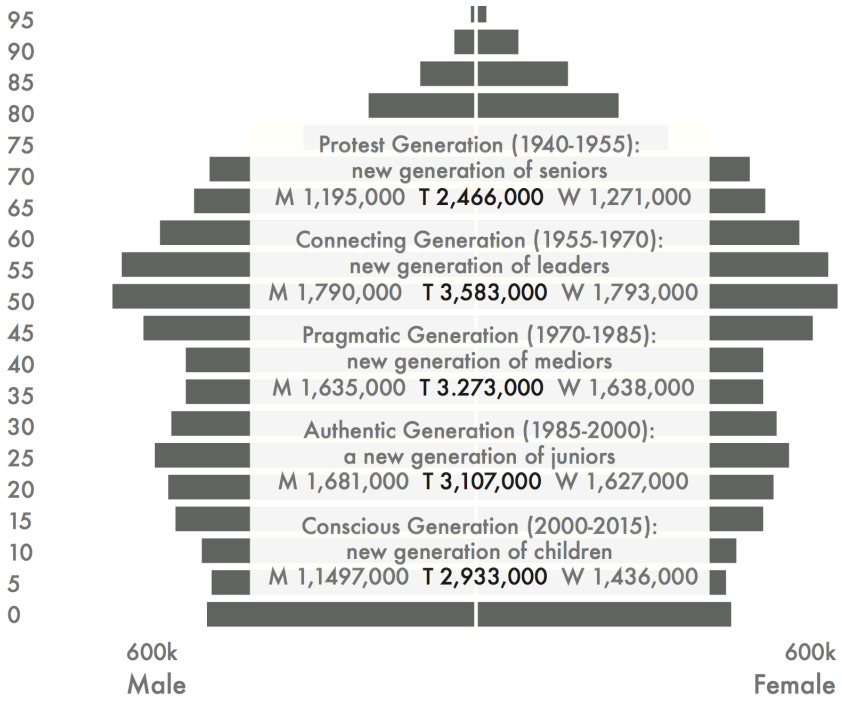


Figure 16 Age population of the Netherlands (Bontekoning, 2017)

Here the size of each generation and its distribution structure can be observed. The largest portion of the current workforce is represented by the connecting X Generation. The protesting Babyboomer generation is quickly approaching retirement. With an increasing retirement age of 68 from 2019 onwards (WTW, 2017), they will be represented in the Dutch workforce for about five more years. As a result, their impact on the culture of organizations is slowly degrading. This provides space for a new

generation of leaders (Connecting generation) with a new leadership style. In addition to that, a new generation (Authentic Einstein Generation) is entering the workforce.

It can be also observed that the Netherlands is challenged by a rapidly aging population. By 2050 the number of those who are older than 65, is projected to be 52% measured as a proportion to the population aged between 20-64 (Smits, Van Den Beld, Aartsen, & Schroots, 2014). To compare, in 2012 it was 27% (Smits et al., 2014). Consequently, the retirement age will keep increasing, and more seniors are expected but also required to stay in the active work force in the upcoming years. Due to the retirement of the Babyboomer Generation and a coming lack of younger employees, a huge employment gap is to be expected in the coming years (Ropes, 2013). This leads to a change of the demographic structure within companies and will have consequences for organizations and the individuals who work in them. Thus, the topic of several generations at the workplace will receive more attention in the upcoming years. So far mainly the integration of the youngest generation is in the focus of human resource policies. But with respect to the aging workforce, organizations should focus on the integration of all employees, not just the youngest ones.

8.3. The evolutionary impact of generations

Every family, relationship, institution, team or organization create their own unique culture and behavioural patterns. This can be portrayed with the example of a soccer team. The coach determines the tactic how his team is playing. He adapts his ideas to the compilation of his team and the players follow his instructions. Based on the opponent the tactic patterns change over time. To keep the team culture in a good and healthy condition, certain tactic patterns need to be adapted, removed or exchanged, because at some moment they are not appropriate anymore. If this is not the case, the team performance is decreasing, players become unhappy or the coach is getting dismissed.
The same accounts for working patterns in organizations. They also need to be adapted, exchanged or removed over time. But compared to a soccer team this does not happen that quickly and especially aging organizations are at risk of not keeping their organizational culture up to date (Bontekoning, 2010; RWS, 2011). Bontekoning (2007, 2010, 2017) claims that this is a big problem which can be found in many Dutch organizations: the existence of outdated working patterns. Outdated working patterns have a negative effect on the vitality of organizations, lead to a massive drain of energy and thereby decrease the efficiency of the work force. Generations play an essential role in this process, in fact they are the key driver for this evolutionary culture-updating process (Bontekoning, 2010). Due to their natural tendency to update the surrounding culture, each generation has an impact on each life phase (Hofstede, 2001). Thus, a renewing effect is caused which updates the culture of an organization.

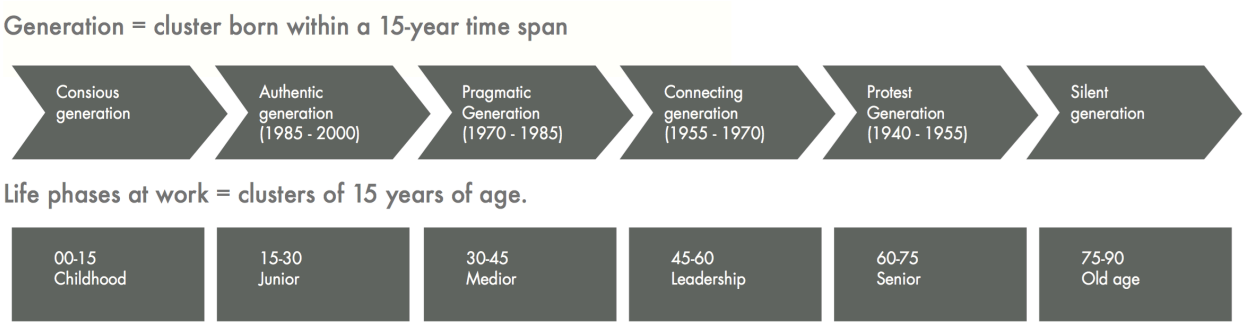


Figure 17 Generations in different phases of life (Bontekoning, 2017)

A culture refreshing is caused through the generational shift. Depending on how old a person is, he or she is in a certain stage of life. Bontekoning (2017) distinguishes six life phases, as presented in *Figure 17*. When the oldest working generation is leaving the leadership phase, their impact on the organization is slowly decreasing. This provides space for a new generation of leaders which is taking over and has the opportunity to realize their ideas. At the same time a new generation is entering the work force. These demographic shifts create a new constellation of age groups and leads to an evolutionary culture-updating process which keeps organizations fresh and healthy and is therefore desired (Bontekoning, 2017). This section shows that such a culture updating process cannot be taken for granted and in many older Dutch companies it is unknowingly supressed. Thus it requires a higher awareness and active support.

In the beginning of their working career the Einstein generation basically has no experience. For this reason, they observe and work according to the processes and structures at work. To note, it is even a strength of the Einstein generation to quickly adapt to their working environment (SPRe, 2006). As a result, many working structures are simply overtaken, instead of renewed. Another cause for the blocking of cultural renewal is social group pressure. This phenomenon belongs to the research domain of group psychology and occurs in larger groups. Because of social group pressure it happens that people are not able to express their characteristic behaviour (Dencker, Joshi, & Martocchio, 2007). Consequently, they change their behaviour or belief to fit in the group. Thus, divergent understandings and interpretations come up and conflicts occur.

In the context of organisations such conflicts are often task-related. For instance, co-workers have different opinions about how a job should be done, about the values and strategies of the organisation (Anantatmula & Shrivastav, 2012), about the working styles (RWS, 2011; Bontekoning, 2007) or different problem solving approaches (Platteau & Hondeghem, 2010). Modern communication and information technology such as laptops, smartphones or the internet, are the source for many of such conflicts (Liu et al., 2014).

In the long term, employees start feeling uncomfortable at work and become unhappy. Important intuitive signals are changes in the mood and a drain of energy (Bontekoning, 2017). These indicators show whether a generation is living and working in congruence with their core values (Bontekoning, 2017). If a person does not feel comfortable, he or she often doesn't express it but simply decides to work at another company. Research in Dutch companies has shown that about 15% of a generation leaves when their generation is not supported (Bontekoning, 2011).

This sections shows that in every organization certain working patterns exists. These patterns need to be updated over time. Naturally this updating process is enhanced by the generational shifts. However, in many cases this evolutionary process is disturbed or delayed. As a result, especially younger generations feel less comfortable at work and a drain of energy can be observed (Bontekoning, 2010). Conflicts can arise and lead to a bad working atmosphere. For this reason, it is suggested to actively support the cultural updating process.

8.4. Generations and related characteristics

In the following, each of the generations is presented in more detail. A retrospective shows which events influenced them during their childhood and which circumstances shape their character. Furthermore, their behaviour at the workplace is portrayed.

8.4.1.The protesting Babyboomer Generation

The generation of the Babyboomer is the oldest in the active workforce and is born in between 1940 – 1955. At this moment, they are 63 - 78 years old. Even though the last members of this generation will "officially" leave the active working force in the next five years, many members wish to stay active and plan to keep working also after their retirement. In fact, many members of the Babyboomers feel very vital and want to continue participating actively in the workplace (Bontekoning, 2017).

History

The Babyboomers grew up in a post-war period where the economy of the Netherlands experienced a steady growth. A spirit of modernism and progress strengthened the sense of the young generation and gave them a feeling that the world is makeable (CBS, 2012). Remarkable events in their youth happened in 1952, when the first TV show was broadcasted. In 1959, the first subway line was built in Rotterdam, the first issue of the Dutch football magazine (Voetbal international) was published and the first nude scenes appeared on public television. Especially television had a strong impact on the young Baby boomers and enlarged their outlook on the world (Anantatmula & Shrivastav, 2012): The civil rights movement in the United States, Martin Luther King, John F. Kennedy, the first humans in space and especially rock n' roll music had an impact on the Dutch society (CBS Statisitics Netherlands, 2012). Artists like The Rolling Stones, The Beatles, Bob Dylan or Elvis Presley became famous among the young people who were rebelling against authoritarian leaders, social institutions and the lifestyle they were standing for (Cruz, 2007). This rebellious attitude grew with the aging process and as students the Babyboomers started organizing demonstrations for more democratization, emancipation and secularization (Becker, 1992; Jones, 2015). For this reason, they are also described as the Protest Generation (Becker, 1992; Bontekoning, 2017). To note, it was only in 1956 that women gained full legal capacity in the Netherlands (Eekelaar & George, 2014).

Characteristics at the workplace

In the 1960s the first members started entering the workforce. Many of them kept their rebellious attitude and the Babyboomers strived for a democratization of organizations (Bontekoning, 2017). As a result, the gap between employees and leaders was reduced and the famous polder model was introduced (Bontekoning, 2017). Traditionally the Dutch polder model is characterised by an active and constructive dialogue between trade unions and employers´ organisations (Dekker, 2017). This is often accompanied by relatively flat organisational structures, where all parties are invited to contribute to the outcome. In meetings all individuals are expected to share their opinion since all of them could have valuable information (Hays, 2014). By using this approach, a high consensus can be reached but decision-making can be very slow (Jonker, 2014). The polder model is symbolic of the efforts and the ideology of the Babyboomer generation, which was focused on democratizing our society and creating working structures and decision making policies (Bontekoning, 2017).

In the early 1990s younger generations began to perceive the polder model and its accompanying habits as slow and vague. They criticized this approach as too time consuming, too vague and not producing enough concrete results. They believed the leaders of the Babyboomers to be too idealistic and less open-minded, however their critique wasn't heard (Bontekoning, 2017). The closed attitude of the Babyboomers discouraged many juniors to address their concerns (Bontekoning, 2017; Srinivasan, 2012). Based on their own experience the Babyboomers thought: if they do not protest, I guess everything is all right. But as the next section shows, it was not in the nature of the following generations to open their mouth and protest. This misinterpretation of each other lead to several

misunderstandings. In the long term, it also resulted in many outdated working patterns, because too many leaders of the protest generation stayed in a leadership position for a very long time, and too many of them were too convinced in their own conceptions (Bontekoning, 2017). The impact of this generation becomes apparent when looking at an article published by de Volkskrant in 2010: From the top 200 most influential persons in the Netherlands, 72 % belong to the Babyboomers and 90% are male (Bontekoning, 2017).

Conclusion

The driving, rebellious and polarizing attitude of the Babyboomers has made them accomplish a lot of things in their long life. Characteristic for them is their strong desire for democracy and equality. By realizing their ideology, they created new working structures which have had a long-lasting impact on the society and organisations (polder model). However, they also might have been too ideological, which made them less open-minded for feedback and impose their ideas on younger generations. This has led to several outdated working-patterns, which have had a negative influence on the younger generations. In order to work together in harmony with the younger generations, the Babyboomers need to let go of several outdated working patterns, such as long explanations and vague discussions. If this is possible, their experience can be of very high value for the collaboration in the project team.

8.4.2. The connecting Generation X

Born between 1955-1970, the connecting Generation X is now 48 - 63 years old and is slowly taking over the leadership positions in companies and organizations. Contrary to several believes, this generation is the largest in the Dutch population.

History

Compared to the Babyboomers, Generation X was facing more difficult times in their childhood. After the economic boom in the 1960s a recession followed, lasting from around 1974 till 1984. Thus, there was a high youth unemployment (17% in 1984) and budget cuts at universities (Bontekoning, 2017). This limited the study possibilities and many members from Generation X could not study what they intended to. Due to the bad condition on the job market, many accepted a position below or not related to their educational level. These circumstances negatively influenced this generation and had a lasting adverse effect over their life course (Diepstraten et al., 1999). At some point, newspapers even wrote articles about the “Lost Generation”, since nobody really knew what was going to happen with them (Diepstraten et al., 1999). Perhaps this is the reason why modesty became the most characteristic attitude of this generation (Diepstraten et al., 1999; Bontekoning, 2017). Due to that, Generation X learned how to preserve and make the best out of the few possibilities which exist. Furthermore, it made them realistic and patient (Bontekoning, 2017).

Another impact factor was the high immigration flow in the 1970s. In this period many people from Suriname, Morocco or Turkey moved to the Netherlands (Zorlu & Hartog, 2002). Having many new people live in the country, Generation X learned how to deal with persons from other countries (Bontekoning, 2017).

Characteristics at the workplace

Compared to the other generations, the Generation X is a very modest working generation (Becker, 1992; RWS, 2011; Bontekoning, 2017). This characteristic makes it often difficult for them to obtain their position as a leader (Warner & Sandberg, 2010). Many people rather see a strong leader as

someone from the Babyboomer generation – a loud polarizing person who seems very convincing in the public. But Generation X rather stays in the second row. This does not make them a bad leader - not at all - it is just not what we are used to. Generation X shows themselves when it is really needed (Bontekoning, 2017).
In literature, good management skills are often attributed to Generation X because of their ability to focus on working together (Verhiel, 2017; Warner & Sandberg, 2010, Bontekoning, 2017). At the same time, they are very success-oriented (BZK-SKO, 2004) and result-driven (RWS, 2011). Because they are very skilled in connecting different viewpoints and qualities, Becker (1992) and Bontekoning (2017) also describe them as the connecting Generation.
Taking this information also enables to see the conflict with the Babyboomer generation from another perspective. On the one side the Babyboomers were not receptive for critique. On the other side, the connecting Generation was too cautious and sober. Due to their modesty, they were unable to open the Babyboomer generation's eyes for change and renewal. This blocked or at least delayed the updating process of the new junior generations and caused several outdated patterns in organisations (Bontekoning, 2017).

Conclusion

A youth during times of recession and a high youth unemployment had a strong impact on the connecting Generation X. Unlike their predecessors, they have a modest character and spin the threads from the second row. However, they are very good in connecting different viewpoints and qualities which makes them great team mangers.

8.4.3. The pragmatic Generation Y

Born between 1970-1985, Generation Y is 33-48 years old and in the mediator stage of their working life. In the following years their influence is expected to peak when they start entering the leadership phase.

History

When Generation Y was in their youth, the economy started to improve gradually and simultaneously the number of vacancies started to increase (from 1985 onwards). In 1988, the Dutch national soccer team won the European championship in Germany. The 1990s saw a rapid development in the information technology and the internet made its big breakthrough. The first computers were introduced at the workplace. Boybands, house music and mobile telephones became popular. For the first time, a huge amount of information was accessible due to the introduction of internet search engines. The steady economic growth created a sense of positivity in the Western world with the economic peak in 1997 (Verhiel, 2017).
Generation Y was also influenced by their parents, the Babyboomer generation. Just like the previous generation, they wanted their kids to be independent (Becker, 1992). They encouraged them to get a good education and had high expectations towards their children (Becker, 1992; Bontekoning, 2017). This could be a reason why many members of Generation Y have a high desire for perfection and independence (Bontekoning, 2017; Becker, 1992; Warner et al. 2010). More definitely, it led to a sharp increase of women striving for a higher education. For the very first time, the average level of education of women is better than of its members in one generation (CBS, 2014). Consequently, the number of female leaders will rise and lead to more equality at work.

Characteristics at the workplace

At work the generation developed a strong focus to improve and concretize the processes of gathering and sharing, knowledge and decision-making (Jeekel, 2005; BZK, 2004; Bontekoning, 2017). For this reason, Bontekoning (2017) also describes them as the pragmatic generation. Due to their working attitude, Generation Y was struggling a lot with the polder model and its accompanying habits. They felt uncomfortable with the working style and this led to a massive drain of energy (Bontekoning, 2017). Especially the slowness and the vagueness of many meetings were difficult to accept for them. They addressed that issue and they wanted to improve the outdated working structures, but their concerns were hardly heard (Bontekoning, 2017). To note, roughly 15 billion euros is spent yearly for meetings in the Netherlands. At the same time, excessive meetings are are among the top 3 biggest workplace energy drains in older Dutch generations (Bontekoning, 2017). Due to the strength of the pragmatic generations, it would be possible to half the amount of meetings (Bontekoning, 2017).

Nevertheless, Generation Y spread their ideas via their networks with colleagues. Many pragmatists have constructed networks of young employees with the intention to share their stories. Nowadays, such networks can be found in many bigger Dutch organization in form of young professional organizations. Thereby, this Generation made a valuable contribution to renewal of working patterns.

Conclusion

Generation Y is focused on the arrangement of productive, quick, concrete and interactive meetings and decision making processes. Consequently, the pragmatic Generation was not comfortable with the consensus-based collaboration approach of the older generations. Generation Y furthermore likes to share their knowledge via networks, also across the organizational boundaries. They also know how to take responsibility and be an independent employee.

8.4.4. The authentic Einstein

Generation Einstein is born between 1985-2000 and is 18-33 years old at this moment. Just like in many other European countries, this generation is in numbers the smallest of all generations in the Netherlands. Due to the aging workforce and the expected workforce gap, their limited number makes them very popular and welcome at most organizations. Maybe this is also the reason why this generation receives so much attention from the society and media. Many studies, articles and books have been written about them, calling them Millennials, Digital Natives, Nexters, Generation ME or as in referred to in this paper, Einstein.

History

In the period between 1995 and 2001 this generation witnessed the economic crisis and a high youth unemployment. In 2001, two airplanes were hijacked and flown into the Twin Towers in New York, leaving the world in shock and fear of terrorism. In 2002, the euro was introduced. At the same time, the internet has become an indispensable part of their lives. Online shopping and online banking are becoming a standard. Facebook, Amazon, Google and Wikipedia have become household names. Smartphones and smartwatches have become a fixed part of our outfit.

Around 2012, youth unemployment peaked at 16% in the Netherland (CBS, 2018). This brought many members of the Einstein generation into the same situation as their parents during the recession in 1984. Since they couldn't find a job, several members went travelling to e.g. Australia or took an extra year to complete their studies. By the end of 2015 the situation improved and the youth unemployment rate dropped to eleven percent (CBS, 2018).

Another great influence on this generation have been their parents, who are mainly members of Generation X. Compared to the parents of the previous generation, they spend twice as much time with their children (Verhiel, 2017). The parents stimulated their children to be themselves and make their own decisions. For this reason, Bontekoning (2017) describes Generation Einstein as the authentic generation.
Furthermore, Generation Einstein adapted other characteristic features from their parents. Due to that they are very open-minded to different perspectives (Bontekoning, 2017).

Characteristics at the workplace

Generation Einstein has quite different needs and aspirations at the workplace. According to the Hay research (2014) the most important aspects of the work environment are interesting work and autonomy in work. Monetary aspects are also important, but other aspects such work-life balance are ranked higher (Hays, 2014). In fact, Generation Einstein values it very high to achieve self-realization and a high job satisfaction in their career (Hays, 2014). Thus, it is very important for them to know what significance their role has and how they contribute to the success of their organization. This has a major impact on intrinsic motivation and engagement (Bontekoning, 2017). As a result, they very much appreciate feedback. Of high importance for generation Einstein is mutual connection to their colleagues, because it creates team spirit and energizes Einstein (Bontekoning, 2017). This is confirmed by the Society for Human Resource Management (SHRM, 2014). Their survey states that members of generation Einstein feel more engaged when they understand as much as possible about their workplace.
The literature describes Generation Einstein sometimes as the entitlement generation. Transferred to the workplace this means this generation is very focused on their personal development and wants to climb the career ladder at a high speed. If their expectations are not fulfilled, Generation Einstein does not hesitate to move on to new opportunities (Cruz, 2007). Especially in international literature, they are accused to be egoistic and disloyal towards their employees (Anantatmula & Shrivastav, 2012; Brown et al., 2009).
Generation Einstein is also very flexible at work. In fact, all variations in terms of work, working hours, locations and teams are welcomed (Anantatmula & Shrivastav, 2012; Verhiel, 2017). This makes them also more spontaneous, which is often expressed in an informal and open way (Bontekoning, 2017). As their name indicates, their unstructured working style sometimes reminds one of the scatter-brained professor Albert Einstein.
Thus, they work best and most creative when they can determine their own working. According to Bontekoning (2017), Einstein strikingly often sees possibilities to handle things differently than what is normal. They are not satisfied by simply checking things off a to-do list, instead they want to be challenged to develop a new solution to a problem. That makes them entrepreneurial by nature (Forbes, 2017). This could be because they are more creative (Bontekoning, 2017), or because they are from an evolutionary perspective smarter and better educated than the older generations (Swaab, 2014).

Conclusion

In literature, several opinions are found about Einstein. While optimists speak of very smart, multitasking, networking and technological skilled people, pessimists describe them as selfish young people who are easily distracted and tied up with their mobile phones. Since this generation is still very young, one must wait to see how they will develop in the next decades. However, there are several promising aspects in their characteristics which could improve collaboration in the project team.

8.5. Conclusion

This chapter provided an excursion into the theory of generations. The literature study has shown that generational research has existed for quite some time. However, only recently more attention has been paid to different generations in the context of organizations, in particular to the Einstein generation. Nevertheless, in the Netherlands generational research is quite limited and more attention should be paid to generational differences at the workplace. The literature indicates that generational shifts have an updating and refreshing effect for the culture of an organization. For this reason, it is recommended to actively support them.

Furthermore, this chapter describes four generations in more detail: Babyboomers, Generation X, Generation Y and Einstein. Events which have an influence on them and shaped their character are presented. Furthermore, several work-related characteristics are listed. A summary of this is presented below in *Table 17.*

In the following, the Q-sort participants are distinguished based on their age and assigned to one generation. Next, the perspectives on collaboration from chapter 8 will be compared to the generational profiles. This enables to conduct, to which extent the concept of generations can explain the outcome of the Q-study.

Babyboomers generation (1940 – 1955) • **Protest:** Rebellious attitude [1,2,7,8,12] • Focused on work structures [1,2,7] • Passionate and idealistic [1,2,7,12] • Strong belief in equality & democracy [1,2] • Pioneers and hard workers [5,7,12] • Consensus based collaboration [1,2,12]
Generation X (1955 – 1970) • **Connecting:** Linking qualities and viewpoints [1,2,5,6,9] • Modest [1,2,3,5,9] • Sober and cautious [1, 2, 5, 9] • Realistic and patient [1,3] • Comfortable with change and diversity [1,9,12] • Success orientated and result driven [5,6]
Generation Y (1970 – 1985) • **Pragmatic**: Concrete results and fast decision making [1,5,6,9,10] • Strive for independency [1,2,6,8] • Personally, open, direct and interactive [9] • Very adaptive to technology [1,5] • Strong networking skills [1,6]
Einstein (1985 – 2000) • **Authentic:** Be yourself and do what you think is best[1] • Informal workplace & good relation to colleagues [1,5,7,8,11] • Fast with technology & Multi-tasking [5,7,9,] • Prefer a transparent environment [1,4,8,14] • Optimistic & confident to accept responsibility [5,7,8,11,12] • Flexible & comfortable with diversity [1,5,7,9,11,13] • Creative & entrepreneurial [1,5,13] • Self-focused & feel entitled [7,13]

Table 17 This table is based on the literature search of (1) Bontekoning (2017), (2) Becker (1992), (3) Diepstraten et al. (1999), (4) Hays (2014), (5) Rijkswaterstaat (2011), (6) BZK (2004), (7) Anantatmula & Shrivastav (2012), (8) Warner & Sandberg (2010), (9) Verhiel (2017), (10) Jeekel (2005), (11) Srinivasan (2012), (12) Cruz (2007), (13) Brown et al. (2009), (14) SHRM

9. ANALYSIS WITH RESPECT TO THE GENERATION THEORY

In this chapter the established perspectives from chapter 8, namely Transparent communication, Strategic planning, Independent communication and Informal pioneering are compared to the generational profiles from Chapter 9, namely Generation Einstein, Y, X and Babyboomer.
For this, we first analyse how many members of which generation load on which perspective. Based on the highest loading, each perspective is assigned to one generational profile. Next, the characteristics of the generations are compared with the perspectives and it is observed, *to what extent can the generation theory explain the outcome of the Q-study*. Thereby, an answer is given to sub-question 3.

9.1. Analysis with respect to the generation theory

Next to the Q-sort, respondents are asked about background information such as: year of birth, educational background and working experience. Of most importance is the year of birth. This enables to classify each Q-sort and assign it to one certain generation. The result of the age-related analysis can be seen in *Table 18*.

Generation	Einstein	Generation Y	Generation X	Babyboomer
P1- Transparent communication	**5**	1	2	0
P2- Strategic planning	2	**4**	**8**	1
P3- Joint capabilities	0	**5**	3	2
P4- Informal pioneering	**4**	1	0	2

Table 18 Generations loading on perspectives

Table 18 demonstrates that generations tend load on the same perspective. Einstein is mainly loading on P1 and P4. Members of Generation Y and X almost exclusively load on P2 and P3 (20/24). For Generation Y, a slight majority prefers P3 over P2, while for Generation X a clear majority prefers P2. The Babyboomers are equally distributed loading on three different perspectives.

With respect to this analysis, one can conclude that different generations have a different opinion on collaboration. The previous chapter shows that the differences might not be that big, and *Table 18* indicates a tendency rather than a clear result, however it can be observed that people from the same age load on similar perspectives. Thus, they share the same preferences of collaboration what distinguish them from other generations.

Based on this conclusion, a generation is assigned to a perspective on which it has a high loading. Thus, Einstein is assigned to P1 and P4, Generation Y to P2 and P3 and Generation X to P2. For the Babyboomers, it is not possible to draw any conclusion, since too little Q-sorts are obtained and the loadings are too distributed. As a result, they are excluded from the further analysis.

9.2. Comparison of perspectives and generations

After linking each generation to a perspective, it is analysed to what extent characteristics from the generation theory can explain the outcome of the Q-study. This is a very subjective process, since it strongly depends on the interpretation of how certain things are related or not. Thus, three different types of linkages are distinguished.

(1) Clear linkage
(2) Moderate linkage
(3) No Linkage

A clear linkage (1) is determined if there is a clear overlap between the outcome of the Q-study and the findings of the generation theory. This can be found for instance at the Einstein generation. The generation theory findings indicate that Einstein likes to communicate informal. This is confirmed in the outcome of P4 where informal communication is ranked high. Thus, a clear linkage can be drawn here.
A moderate linkage (2) is determined if the findings of the generation theory can be related to the outcome of the Q-sort, but no clear connection can be drawn. For instance, P1 has a high desire for a mutual understanding with his colleagues or a transparent communication. For both aspects, a clear linkage can be drawn to the findings of the generation theory. However, in this perspective also an environment of mutual trust, respect for each other, honest communication or sharing of information are ranked high. It makes sense that those aspects are ranked high, because they relate strongly to the other proven findings. Nevertheless, they cannot be clearly linked and therefore a moderate linkage is applied.
No linkage (3) is determined if there is no connection between the findings of the generation theory and the outcome of the Q-sort.

In the following, only the highest ranked and the distinguishing statements are presented. This is done for the following reason: In the Q-sort respondents are asked to rank the statements in relation to each other. Therefore, a low ranked statement does not mean that it is disliked by the respondent. It is only seen as less important compared to the other ones. This makes it difficult to assesses whether a perspective dislikes something or simply finds it less important. Since all the aspects are “best practices” of collaboration latter is assumed. Nevertheless, distinguishing statements are elaborated, because they are characteristic for an perspective and differ the from each other. It would have been possible to investigate more connections between the outcome of the Q-sort and the generation theory. However, it is decided to limit the number of comparisons. The intention is to find rather fewer but stronger linkages than many weak linkages.

In the following, the highest ranked and distinguishing statements of P1, P2, P3 and P4 are presented. Distinguishing statements are marked with an Asterisk (*), (**). The statements are coloured green, yellow or red if there is a clear linkage, a moderate linkage or no linkage.

9.2.1. Einstein versus Transparent communication

The majority of loaders on this perspective are members from the Einstein generation (5/8). Thus, P1 is compared to the characteristics of Einstein.

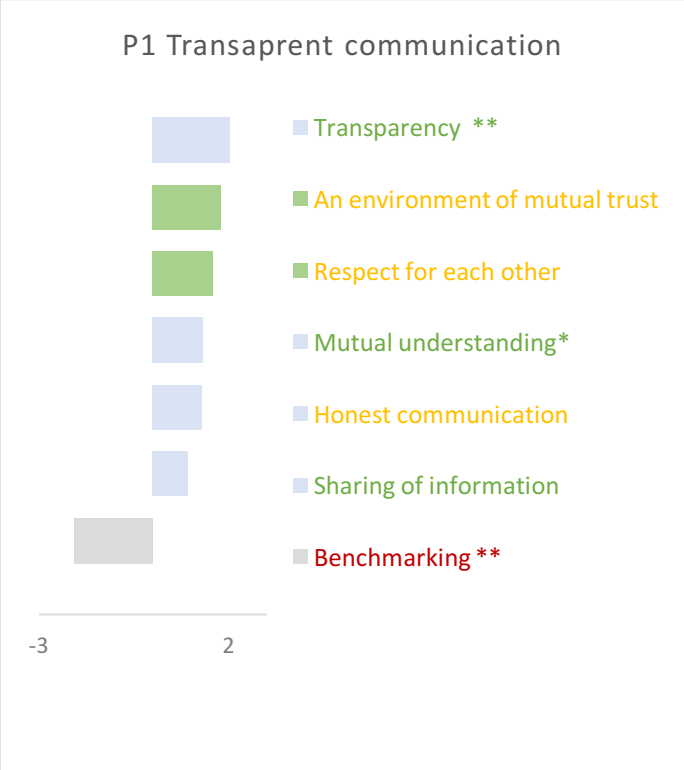


Figure 18 P1 vs. Einstein

The highest ranked aspect of P1- *Transparency* - is a well-known characteristic of Generation Einstein. It is very important for Einstein to know what significance their role in a team is and how they can contribute to the success of their organization (Hays, 2014; SHRM, 2014). Thus, they have a high desire for Transparency (Hays, 2014). This gives them a better understanding for their environment, which has a major impact on their motivation and their engagement (Bontekoning, 2017). Furthermore, transparency produces trust (Norman, Avolio, & Luthans, 2010). When the team manager shares for instance also critical information with his team, Einstein sees that the manager trusts and respects them. This is a very motivating for them because it gives them the feeling that they are valued and have an important position in the team (SHRM, 2014). Furthermore, this explains the high ranking of *Sharing of information.* Both aspects emphasize on an open and transparent communication, which is valued by generation Einstein (Warner & Sandberg, 2010).

In line with this is also the high ranking of *Honest communication,* but it is not possible to draw a direct link. Therefore, a moderate link is determined.

Furthermore, *Mutual understanding* is ranked very high. This coincides strongly with the findings of the literature study. Generation Einstein appreciates the social aspects of work and have a high desire for a good connection with their colleagues (RWS, 2011; BZK, 2004; Verhiel, 2017). This creates team spirit which energizes Einstein (Bontekoning, 2017). This might also be a reason why Einstein perceives *An environment of mutual trust* and *Respect for each other* very important. Both aspect emphasize on the direct relationship with the colleagues, nevertheless no clear connection is found and a moderate link is determined.

No connection could be found with the distinguishing statement *Benchmarking.* According to the literature findings, Einstein is very curious about his or her own performance and would therefore rather welcome it. The overview below shows for which statements from the Q-sort, an explanation can be derived from the conceptualism of the generation theory.

Comparing the generational characteristics with the high ranked statements of this perspective enables to draw many connections. Six of seven statements show a strong or moderate linkage and can therefore explain the ranking of this perspective.

9.2.2. Einstein versus Informal pioneering

With 0,61 the Informal Pioneering has a strong correlation with the Transparent communication. This is also reflected in the generations, loading on it. Again, majority of people coming from the Einstein generation (4/7).

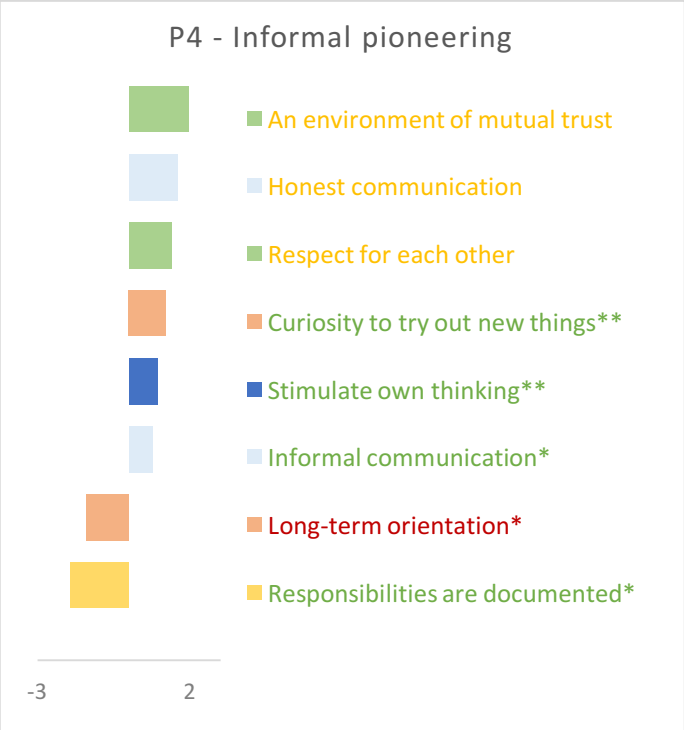


Figure 19 P4 vs. Einstein

Due to the high correlation to P1, multiple statements are ranked similar. For instance, the terms *Honest communication*, *An environment of mutual trust* and *Respect for each other* are ranked high and are already determined to have a r moderate linkage with the Einstein generation in the previous section.

What differs in this perspective with respect to other ones is the distinguishing statement *Curiosity to try out new things*. While this statement is rank low in Transparent communication, Informal pioneering appreciates it. In the literature Einstein is described to be curious and an entrepreneurial by nature (Bontekoning, 2017, Brown et al., 2009). Thus, a clear linkage can be drawn.

Furthermore, *Informal communication* can be linked to the generational characteristics. Multiple researcher´s claim that Einstein very much enjoys the social aspects of work, which entail a good relation and informal communication with their colleagues (RWS, 2011; Anantatmula & Shrivastav, 2012; Srinivasan, 2012; Verhiel, 2017; Warner & Sandberg, 2010). In line with this is the low ranking of the statement *Responsibilities are documented*. The literature describes that Einstein appreciates an informal and unstructured way of working, where not too many rules are prescribed. This makes their workplace more comfortable and enables them to be more creative (Bontekoning, 2017).

Also, the term *Stimulate own thinking* can be linked. This fits the description of Einstein who has the desire to be challenged at work and is willing to accept responsibility (Anantatmula & Shrivastav, 2012; Cruz, 2007; Srinivasan, 2012; Warner & Sandberg, 2010).

The second distinguishing statement – *Long-term orientation* – cannot be directly linked, but explained. Looking at the factor scores of all the statements shows, that Einstein mainly rates aspects high, which have a direct impact on collaboration. As a result, statements which benefit collaboration in the long-term, such as long-term orientation are subordinated. Nevertheless, it is decided to not determine any linkage.

Comparing P4 – Informal pioneering with the Einstein generation reveals, that several statements have a strong connection to the generational characteristics. To conclude, P4 and Einstein show a strong relation.

9.2.3.Generation X versus Strategic planning

With fifteen Q-sorts loading on it, P2 is the most popular perspective. The majority of loaders are from Generation X (8/15). Thus, Strategic planning is compared to Generation X.

Figure 20 P2 vs Generation X

Most characteristic for this perspective is the high ranking of elements from the planning category, for instance *Alignment of goals, Mutual objectives* or *Front-end planning*. This can be clearly linked to the generational characteristic of Generation X, which is often described as a good team manager and called the connecting generation. This name is given to them because they are very skilled in connecting different viewpoints and qualities (Bontekoning, 2017; Becker, 1992; RWS, 2011; BZK, 2004; Verhiel, 2017). It also explains the high ranking of the statement *Sharing of information.* Just like the previous elements those are statements which enhance the communication in the team, and important for somebody, who focuses on the project control. Therefore, a moderate linkage is determined.
In the literature, Generation X is described as success oriented and result driven (RWS, 2011; BZK, 2004). This is reflected in the high ranking of elements from the "Planning" category, and the subordination of elements from the "Team working" category *(Enhance personal development* and *Team building activities).* The ranking of those statements suits the description of Generation X who first emphasizes on hard factors and has a result oriented collaboration style. Furthermore, it reflects the preferences of a team manager who is in charge for the planning of the project team. In fact, most members (9/15) of Generation X are in a leading position and stated to be a team manager. Now, it can be argued whether those aspects are ranked high because of the leadership position or due to generational influences. However, research from the University of Tilburg confirms that members from Generation X prefer a so-called achievement-orientated leadership style (Zeist, 2010). This way of leading is characterized by setting goals, emphasizing on the achievement of tasks and setting challenging goals (House, 1971) – all aspects which are reflected in this perspective. Thus, a clear linkage is determined.
Besides that, no further observations can be drawn and no connection is determined for the statements *Commitment, Respect for each other* or *Prior experience* with the project team.

In this case, several connections between Generation X and P2 can be found. The combination of high ranked "Planning"- and subordinated "Team work"- statements indicate a linkage. However, it is assumed that other aspects also have a stronger impact. For this reason, it is only limited possible to explain the ranking of P2 with the generation theory.

9.2.4.Generation Y versus Strategic planning

On this perspective, also four members of Generation Y load. Even though more members of Generation Y load on a different perspective, it is observed how this perspective matches with Generation Y.

Figure 21 P2 vs. Generation Y

The high ranking of *Mutual objectives, Alignment* of goals and *Front-End planning* can partly be linked to a generational characteristic of Generation Y. The literature describes Generation Y to be very focused on optimizing working procedures and concretizing the decision-making process (Bontekoning, 2017; RWS, 2011). Therefore, it is important to have mutual objectives and align goals. However, those characteristics do not show a direct connection and more indications cannot be found. Therefore, a moderate link is determined.

Generation Y is furthermore described as a networking generation which is focused on the acceleration of data gathering and information sharing (Bontekoning, 2017; BZK, 2004). Thus, a clear link is found with the statement *Sharing of information.* Among other things, a good networker requires a good understanding for his colleagues (*Respect for each other*), and an active (*Commitment*) exchange of information and news (Anastasia, 2015). Thus, a moderate link is determined for statements relating to networking skills.

The next term, Team building measures cannot be explained with the generation theory. In fact, the generation theory states the opposite: Generations Y has a high desire to get to know their colleagues and socialize with them (Anantatmula & Shrivastav, 2012; Warner & Sandberg, 2010). Consequently, no linkage is determined. The same accounts for *Enhance personal development* and *Prior experience with the project team*. Also for these statements it is not possible to explain the outcome of the Q-study with findings of the generation theory.

With respect to the other comparisons, it is not possible to explain the outcome of the Q-sort with generational characteristics. One reason for this could be, that most of the members of P2 (8/15) are coming from Generation X. Thus, this generation has a stronger influence on the ranking of this perspective. Consequently, more linkages can be found between Generation X and P2 than between Generation Y and P2.

Furthermore, this shows that it is not possible to stereotype individuals in one generation. Four out of eleven people from Generation Y are loading on this perspective. This indicates that every person has its own preferences on collaboration which should be considered.

9.2.5. Generation Y versus Joint capabilities

From the nine Q-sorts loading on Joint capabilities, the majority is from Generation Y (5). As a result, this perspective is compared to Generation Y.

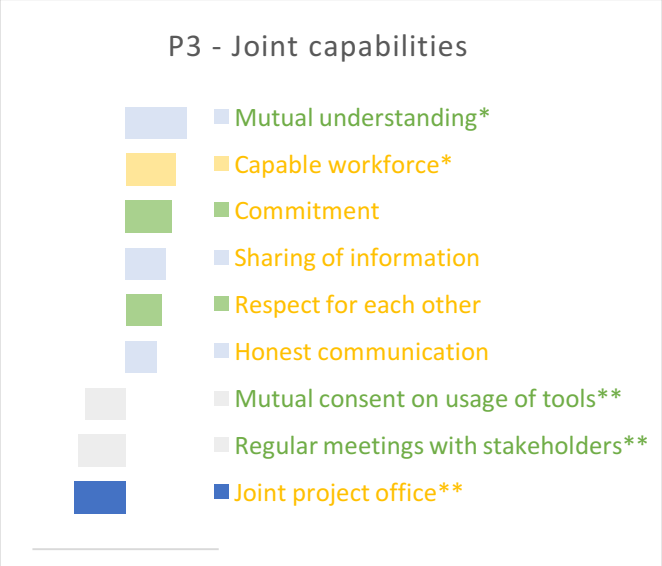


Figure 22 P3 vs Generation Y

The highest ranked statement of this perspective - *Mutual understanding* – can be clearly linked. Generation Y has a high desire to understand, but especially to be understood (Becker, 1992). Just like the Einstein generation, Y appreciates a good relationship with colleagues. Thus, they also value a high *Respect for each* other.

The second highest statement - *Capable workforce* – can be link as well. Generation Y is described as the pragmatic generation (Bontekoning, 2017; Becker, 1992) and it is a pragmatic though to rank capable workforce high. Nevertheless, it only indicates a moderate link.

As mentioned, Generation Y is described as a networking generation (Bontekoning, 2017; BZK, 2004). Among other things, a good networker requires a good understanding for his colleagues (*Mutual understanding*), and an active (*Commitment*) and open exchange of information and news (*Honest communication, Sharing of information*) (Anastasia, 2015). Thus, a moderate link is determined for statements relating to networking skills.

This perspective has a strong focus on communication with the colleagues, but not necessarily face-to-face. With the advent of the internet, many relations are often maintained and developed over virtual platforms. This coincides with the low ranking of *Regular meetings with key stakeholders.* It indicates, that members value it less to see their colleagues in person. Additionally, Generation Y is attributed a pragmatic nature who develop a strong focus to improve and concretize decision making. Thus, they were struggling with the polder model and its accompanying habits of long discussions (Bontekoning, 2017). This reluctance is reflected in the low ranking of *Regular meetings with key stakeholders.*

Besides that, Generation X is also described to have a strong desire for independency (Bontekoning, 2017; BZK, 2004; Warner & Sandberg, 2010). On the one side, this explains a reluctance to many team meetings. On the other side, it explains the low ranking of the statement *Mutual consent on usage of tools*. Here this perspective emphasizes that "everybody should have the freedom to decide, with which tools he is working".

A moderate link is determined for the statement *Joint project office.* It is assumed that Generations Y dislike against too many face-to face meetings and their strive for independency explains the ranking, but the connection is not clear enough.

Also in this perspective, several connections could be identified between the ranking of the Q-sort and the findings of the generation theory. Therefore, the ranking of Joint capabilities can be explained with the characteristics of Generation Y.

9.3. Conclusion

This chapter investigates whether the generation theory could explain the outcome of the Q-sort. To do so, the researcher first observes which generations are loading on which perspective. Next, the high ranked and distinguishing statements are compared to the generational characteristics. The results are summarized below and enable to answer Sub-research question 3: *To what extent can the generation theory explain the outcome of the Q-study?*

The visualizations of the Q-sort demonstrate that multiple statements from the Q-sort can be explain with the conceptualism of the generation theory. The perspectives, P1, P3, and P4 show a high overlap with their compared generation. Also, several elements are matching between P2 and Generation X, but only few between P2 and Generation Y. It is assumed that a connection between P2 and Generation Y shows only little connection, because Generation X has more members loading on P2 and therefore prevails Generations Y influence. Furthermore, one can observe that in particular the distinguishing statements can be explained by the generation theory. Those are the statements which are most characteristic for a perspective.

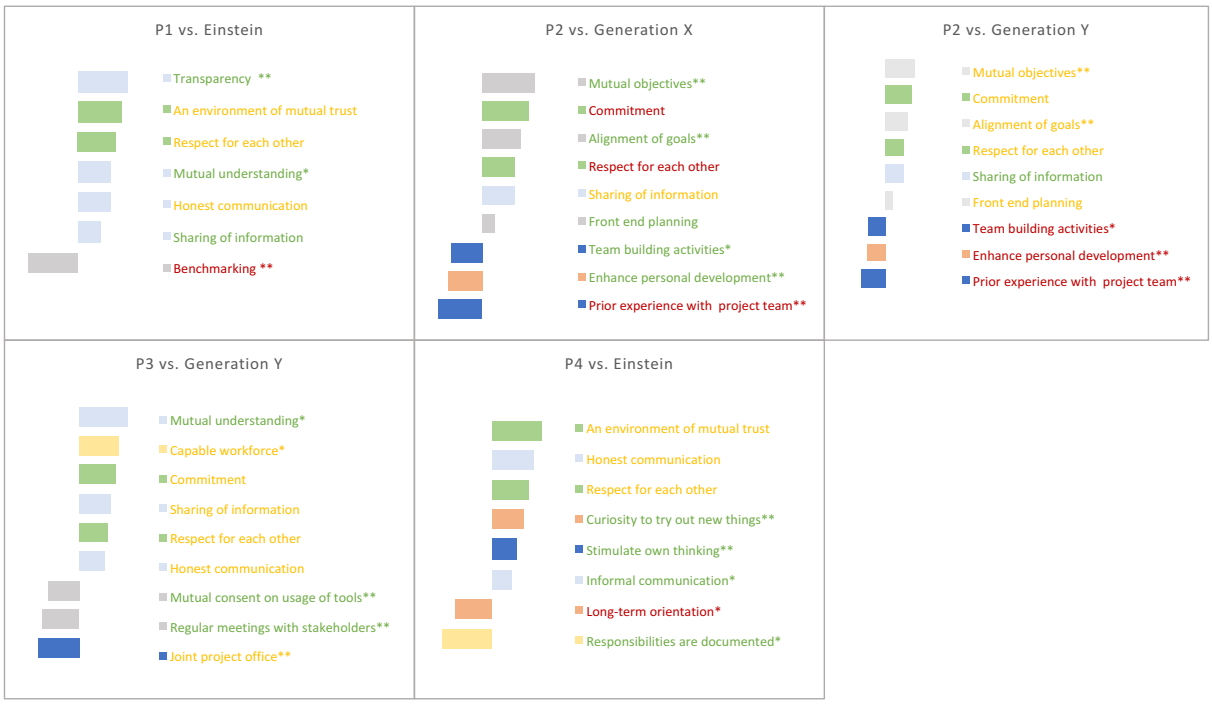


Figure 23 Overview of perspectives

To conclude, this chapter shows that members of the same generation tend to have the same perspective on collaboration. These perspectives do not differ much, nevertheless they have their certain preferences and tendencies, how they like to collaborate. This section shows that many of these tendencies on collaboration in the project team can be explained with the generation theory. As a result, the concept of generations might provide new insights to enhance collaboration in the project team and should therefore be taken into account.

10. IMPLICATIONS

In this section, it is intended to provide implications on the outcome of the Q-study and give recommendations with respect to the generation theory. Thereby elaborates on the last sub-research question: *What are the implications for collaboration in the project team with respect to the concept of generations?*

10.1 Considerations

Since it is possible to present multiple implications, the following considerations are listed to scope the outcome down to the most important results. As stated in Section 1.4, "The goal of this research is to identify how generational differences affect an individual's perspective on collaboration. For this reason, the following criteria are determined to be important:

(a) Statements which are ranked remarkably high or low in the outcome of the Q-sort
(b) Distinguishing statements of the Q-sort
(c) Statements of the Q-sort which are "clearly" explained by the generation theory

Criteria (a) and (b) are already considered in the previous chapter where links are drawn only between the most remarkable statements of Q-study and the generation theory. Only taking (a) and (b) into account would result in seven to ten implications for each perspective. To narrow this number, it is decided to focus furthermore only on statements which are clearly explained by the generation theory (c). Thus, only the most important and characteristic statements are listed in this chapter.

The results van be considered being of interest for several actors:

(1) Team manager

The team manager must ensure that the project team is working efficiently. He should be aware of the different characters which exist in his team and know how to steer them in the best possible way.

(2) Human resource department (HR)

This section focuses on maximizing the employee´s productivity and protects the company from issues that may arise at the workplace.

(3) Team member

It is beneficial for the individual member of the project team to understand his or her colleagues. For this reason, an awareness about generation-related differences can improve the atmosphere of the project team.

10.2 Implications, Evaluation & Recommendations (for Sweco)

As described in the scope for this research, the outcome has the highest applicability to the engineering company Sweco, more particular to the business division Waterbouw, Rail and Wegen within the company's branch in De Bilt. This research is not aimed to be a consulting report for a specific case, which causes a limitation of specific practical feedback. Nevertheless, the implications and recommendations are formulated for an organization as used in the context of this thesis.

First, the ranking of a statement from the Q-sort is presented and it is briefly explained how a generation perceives a statement. Thereafter, an implication is formulated with respect to the generation theory.

Next the implications are evaluated. Hereby it is intended to increase the applicability of the results and to receive a more general outcome. This strengthens the basis of the implications and increases the generalizability of the results (Yin, 2009). The evaluation is based on the opinion of a group of professionals from the field (referred to as experts). In total three evaluation sessions are held. In these sessions, the experts are confronted with the implications of this research (as presented below). They are asked to critically review the implications and assess, whether they apply in their work environment. Due to that, it is possible to get a different perspective on the results. The first session is conducted with a team manager from another department (outside the scope) within Sweco De Bilt and an employee from the Human resource department. The second session is held with a team manager from Sweco in Groningen and a third one with two project managers from the Havenbedrijf of Rotterdam. A summary of the evaluation is provided in Appendix J.
It was considered whether professionals from all generations should be included. Younger generations might have been more accurate to assess peers of their own. But it was decided against it, because people with more experience are assumed to have a better judgement and more experience. Thus, all experts are professionals with at least 15 years of working experience.

After the implications and the evaluation, recommendations are given with respect to the theory of generations.

This leads to the following structure of the coming chapters: Statement from the Q-sort - Implication - Evaluation – Recommendation.

10.2.1 All generations

First, the statements which are perceived as important by all generations are presented. These are the consensus statements, presented in *Figure 24*

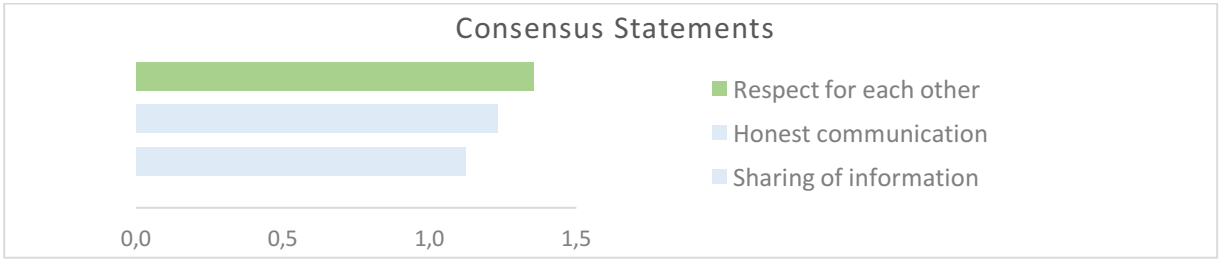


Figure 24 Consensus statements

Ranked high: Respect for each other, Honest communication, Sharing of information

Everybody might have a different perspectives and outlook on how a project should be executed. However, it is of high importance for the research participants that you treat each other respectful.

Honest communication is essential, because it creates an environment where people can comfortable express their ideas, address problems or ask "stupid" questions. This enables employees to say what they really mean. It furthermore helps to build up trust and create a more enjoyable workplace.

In line with this is also the sharing of information. An active sharing of information is a crucial part of communication and therefore very important.

To note, the three statements are also ranked high in the literature study and the semi-structured interviews. For this reason, these aspects are the essence for good collaboration and very important.

Implication: The implementation and promotion of these statements has an enhancing effect on collaboration in the project team.

Evaluation: The experts agree that those elements are very important for collaboration. They understand that everyone ranks them high and point out that all aspects relating to communication are important for collaboration in the project team.

Recommendation:

One opportunity to enhance respect for each other is to address the topic anger management. Employees should not become fixated or stressed by things out of their control (Martinelli, 2018). This can lead to a bad mood and overhasty comments to colleagues. In such cases anger management techniques help to overcome a stressful situation and maintain a respectful treatment among colleagues (Martinelli, 2018). One should also emphasize to communicate in a polite manner. A respectful treatment furthermore has a positive impact on the communication (Brooks, 2018).

In order to enhance the sharing of information one should provide possibilities to exchange information by using cloud management services (e.g. STAX) or communication platforms (e.g. Skype for Business) . Even though many companies have an open-door policy, some team members find it easier to address their concerns in 1-to 1 meeting (Brooks, 2018). Thus, private sessions with the employees help people to voice any concerns they have and improve the sharing of information and honest communication.

Another recommendation is to lead by example. With respect to honest communication, it is good if the team manager admits that he made a mistake or if he doesn't know the answer to a question. This motivates the project team to imitate his behaviour (Brooks, 2018). Furthermore, a team manager can steer the flow of a conversation. Thus, he can interrupt if one member in the team is reacting overly aggressive and provide every team member enough space to express his opinion. Thereby, he can promote respect for each other and honest communication.

10.2.2 Generation Einstein

Generation Einstein is born between 1985 and 2000 and at this moment 18- 33 years old. The first members of this generation already started working and others will be following in the coming years. Like no others before, generation Einstein received a lot of attention in literature. This enables to elaborate on a comprehensive description of Einstein. The outcome of the Q-sort showed, that two perspectives exist within this generation, the so called *P1 - Transparent communication* and *P4 - Informal pioneering.* Both show a strong correlation (0.61) to each other and can be linked to the generational profile of Einstein.

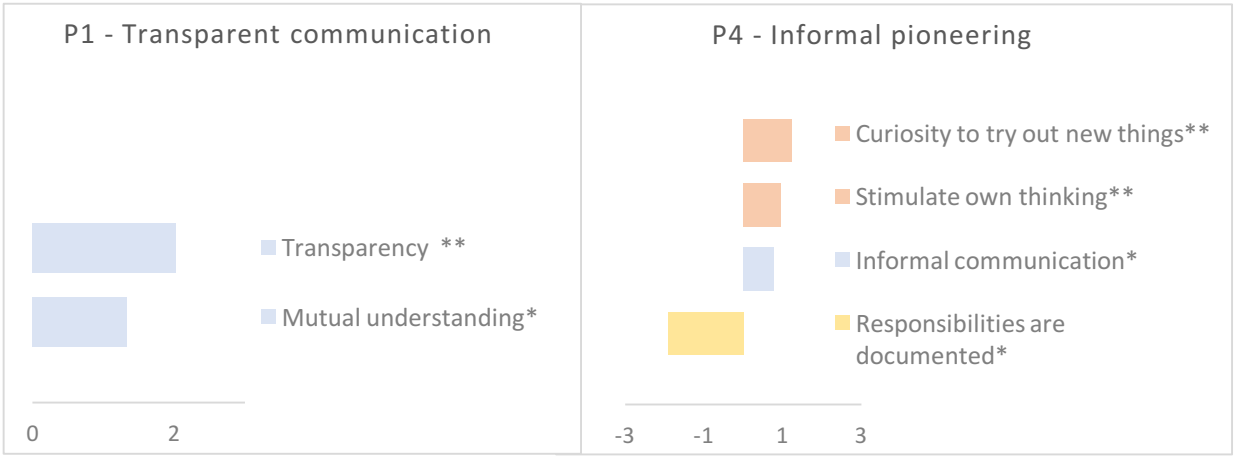


Figure 25 Distinguishing statements for generation Einstein

Ranked high: Mutual understanding

Generation Einstein is very sensitive about the direct collaboration within the project team. Therefore, it is very important understand colleagues and their line of reasoning. Furthermore, the social aspects of the working life and a good relationship to their colleagues are appreciated.

Implication: The presence of an environment with a high mutual understanding has an enhancing effect on the productivity of this generation.

Evaluation: All experts agree that Einstein has a high desire to understand their colleagues. However, they see it as an age- rather than generation-related characteristic. Furthermore, they state that when they were younger they also socialized after work with their colleagues, but now they have families and other responsibilities. Nevertheless, they agree that events in which young people can connect with their colleagues are important.

Recommendation: Provide Einstein with opportunities where they can build up a mutual understanding with their colleagues. This could be team building activities, fitness course, site visits, company excursions or regular coffee & cake get-togethers. Enhance an active exchange among the project team. To note, many Dutch companies established organization in particular for young professionals. At Sweco several divisions have a program especially for young employees. Jong Waterbouw organizes an activity for young professionals from the hydraulic engineering division every month. Here young professionals can connect and exchange their ideas.

Ranked High: Transparency

Transparency is the basis for all types of communication and collaboration and leads to a better understanding of each other.

Implication: A transparent workplace has a positive effect on the motivation and engagement of generation Einstein.
Evaluation: Everybody agrees that Einstein values *Transparency* very high, even though most people see this is as a rather age- than generation-related characteristic. The experts state, that if one is young or in a new environment one feels automatically more comfortable in a transparent environment.
Recommendation: Try to increase transparency at both the workplace and within the project team. For this, one could consider to incorporate transparency as a part of the company's policy. It is also helpful to provide employees access to more information. If for instance the team manager shares critical information with Einstein, Einstein sees that the team manger values and trust him. This has a major impact on Einstein´s motivation and their engagement. Again, the team manager can lead by example and encourage an open communication in the company. Furthermore, the team manager can increase the transparency in his decision-making process. By involving or discussing his decisions with the team, the team gets a better understanding of his reasoning and feels more included.

Ranked high & Low: Curiosity to try out something new

Within this generation two different working styles exist.
Implication: While members from *Transparent communication* have a rather cautious and conservative attitude, members of *Informal pioneering* are curious to try out something new. This has an impact on the way how Einstein wants to work and their attitude towards certain tasks.
Evaluation: The high ranking of *Curiosity to try out something new* is an age-related characteristic – young people are simply curious to try out new things and explore their environment. However, the experts also state this has the side effect that Einstein is getting bored very quick, if a task is too monotonous. As a result, the Einstein generation loses the focus very easy. This is also backed-up by various literature sources (Anantatmula & Shrivastav, 2012; Brown et al., 2009).
Recommendation: The project manager should be aware that within this generation at least two main characters exist. Depending on the type of project, he can assign the right character to the right job. A member from *Informal pioneering,* who tends to lose his focus easy, feels more comfortable in innovation projects with diversified or temporary work. *Transparent communication* is more suitable when precise and detailed work is required.

Ranked high: Stimulate own thinking (and take over responsibility)

If the team manager transfers responsibility to the employee, he stimulates him or her to think on their own. Again, two different characters exist. While members from *Transparent communication* value it low, *Informal pioneering* appreciates it.
Implication: Some of generation Einstein are willing to take over responsibility and work independently, others are less keen. This has an impact on the way how Einstein wants to work and their attitude towards certain tasks.
Evaluation: The high ranking of *Stimulate own thinking* is perceived as age- and generation-related. According to the experts, it is normal for younger people to be willing to take over responsibility and grow in their job. Nevertheless, they see it as a generational characteristic that Einstein actively is looking for possibilities to challenge themselves. While the older generations used to observe and learn, Einstein is actively searching for a task to do. Here it often happens that they are overly confident about their own skills. As a result, they set very ambitious goals but cannot live up to them.

Recommendation: Transfer responsibilities to Einstein but watch out, they are very optimistic and lack of realistic goal-setting. Assign short-term tasks, so they can find out where they are good at and where not. In addition, have regular feedback sessions and discuss the recent progress.

Ranked high: Informal communication & Rank low: Responsibilities are documented

Again, two different working attitudes exist within this generation.

Implication: While members from *Informal pioneering* appreciate an informal working - and communication style where less responsibilities are documented, *Transparent communication* is ranking the opposite and prefers a more structured way of working. This has an impact on the way how Einstein wants to work and communicate.

Evaluation: *Informal communication* is the first characteristic which the experts clearly see as a generational characteristic. The experts criticize that written communication via emails or instant messaging is often very concise. This bears the risk that important details are not documented. But also the informal working atmosphere is new at the workplace. This is criticized by the experts who argue that the younger generation is missing the right balance between formal and informal communication.

Recommendation: For projects where a precise and detailed work is required, the team manager should assign a member from *Transparent communication*. For innovation projects where out of the box and creative thinking is required, the *Informal pioneering* perspective seems to be the better choice. These characteristics, together with the high ranking of *Curiosity to try out something new* and *Stimulate own thinking* occur to be appropriate.

Additional insights from the generation theory

Implication: As described in the problem statement of this research, Generation Einstein is easy to influence and adapt to their surrounding working patterns.

For this reason, one should consider to stimulate the development of generation Einstein. If they are missing the right balance between informal and formal communication, the team manager can interfere and show them the appropriate mix. And as the previous point showed, Generation Einstein is very optimistic and prone to overtake themselves. Thus, it would be good to keep track of their action.

Recommendation: A good way to steer the development of Einstein is to assign them a mentor. According to several researchers, the Babyboomers click very well with generation Einstein (Forbes, 2017; Bontekoning, 2017; Anantatmula & Shrivastav, 2012; Cruz, 2007; Srinivasan, 2012; Volk & Dawidowski, 2010). Both generations have a passionate and straightforward attitude in common which makes them a good team that can mutually benefit from one-another. The Babyboomers value the entrepreneurial attitude and receive new energy from Einstein's working attitude. Vice versa, the Einstein generation is very keen on learning from the experienced Babyboomers to compensate their knowledge gap. This tandem or mentor relationship has a lot of potential and is often described as beneficial (Anantatmula & Shrivastav, 2012; Brown et al., 2009; Srinivasan, 2012). However, this is only working if the Babyboomers can let go of their outdated-working patterns. Furthermore, one should be also careful to not suppress the working style of a generation, since it can have a negative effect on their productivity.

10.2.3 Generation Y

Born between 1970- 1985 Generation Y is between 33 and 48 years old and in the mediator stage of their working live. In the following years (2015-2030) their influence is expected to peak when they start entering the leadership phase.

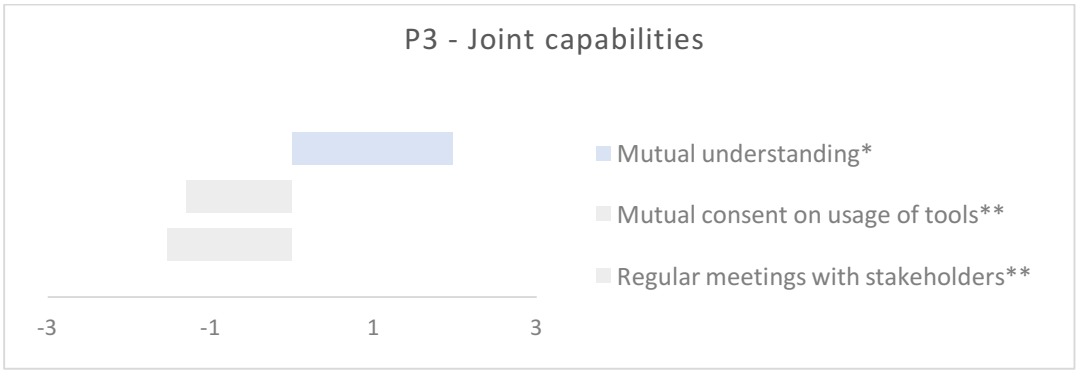


Figure 26 Distinguishing statements for Generation Y

Ranked high: Mutual understanding

Just like the Einstein generation, Generation Y strives for a good relationship with their colleagues. They want to understand them, and more importantly, they want to be understood. This leads to the same implications as for Generation Einstein.

Implication: The presence of such an environment has an enhancing effect on the productivity of this generation.

Evaluation: Most experts argue, that this is rather an age-related characteristic, however others related it to generational properties. They also mention, that 20 – 30 years ago, a mutual understanding with colleagues was not seen as that important. As a result, less opportunities such as team building activities were provided.

Recommendation: Provide Generation Y with opportunities where they can build up a mutual understanding with their colleagues.

Ranked low: Regular meetings with key stakeholder

In the literature, Generation Y is attributed a very pragmatic attitude which develops a strong focus on improving and concretizing the processes of gathering knowledge and decision making (Bontekoning, 2017; Becker, 1992). For this reason, Generation Y was struggling a lot with the polder model and its accompanying habits of long discussions with a vague outcome. This is interpreted as the reason for the low ranking of *Regular meetings with key stakeholders*. Members of this generation stated that they have a dislike against too many meetings which take too much time and are often not necessary.

Implication: Long and unstructured meetings have a negative effect on Generation Y´s productivity. Furthermore, this generation perceives it less important to talk with each other in person. Instead of face-to face meetings, they prefer to communicate virtually over platforms such as Skype.

Evaluation: The experts argue, that everybody dislikes time and excessive meetings with a vague outcome. Nevertheless, they agree that in particular Generation Y has a reluctance against too many meetings. They also agree that Generation Y is the most structured Generation and understand their desire to have other ways of communication such as skype meetings because they are more efficient.

However, they also see this development towards more virtual communication very critical. They argue that nowadays many people rather write an email or a WhatsApp instead of having a face-to face conversation. Furthermore, the experts see the trend towards more virtual meetings very critical. They claim that especially for a client-oriented companies such as Sweco, regular meetings with key stakeholders are crucial.

A Sweco manager claims, that a lack of general project management skills exists within Sweco and is convinced that many managers need to provide a better structure in a meeting. Important to note, this problem is also found by Jong Waterbouw, an organization within the hydraulic engineering department. In one of their meetings they discussed that too often Sweco employers are not well enough prepared for meetings. As a result, they designed posters which they placed in all meetings rooms. An example of such a figure is presented below in *Figure 27*. It is asking: Do you know why you sit in this meeting?

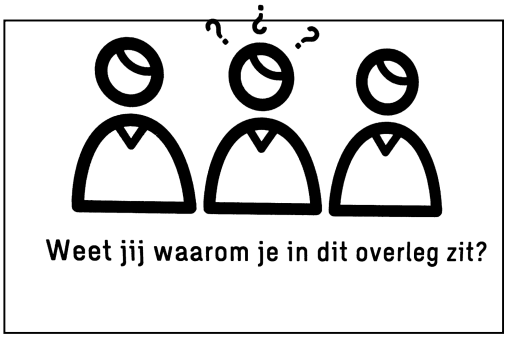


Figure 27 Example design. Translated: Do you know why you are sitting in this meeting? (Jong Waterbouw, 2018)

Recommendation: Avoid time-consuming meetings when dealing with members of this generation. Instead try to arrange them short and productive. The team manager can assign a member of Generation Y (or other generations) to prepare materials for the meeting e.g. set up an agenda. Send these materials out beforehand so the participants can prepare themselves. Furthermore, arrange specific trainings for employees where team meeting practices are being taught. Enhance on meetings in person.

To note, in the Netherlands roughly 15 billion euros is spent for meetings on a yearly basis. According to Bontekoning (2017), it is possible to half this amount due to the strength of the pragmatic nature of Generation Y.

Ranked low: Mutual consent on usage with tools

The outcome of the Q-study and the literature also indicates that Generation Y has a tendency to work independently and select their own way of working. Thus, they do not like it, if somebody prescribes them how to work.

Implication: Generation Y prefers to work autonomously.

Evaluation: The experts assess that this is the same for every age group. Everybody is acquiring his own way of working over the years. The longer one is used to one's own working style, the less eager one is to change it.

Recommendation: Don´t prescribe Generation Y what tools they should use and leave them the necessary freedom to make their own choices.

10.2.4 Generation X

Generation X is born between 1955 – 1970 and is 48 – 63 years old. At this moment, they are in the leadership phase of their working life. Consequently, this generation has a lot of influence on collaboration.

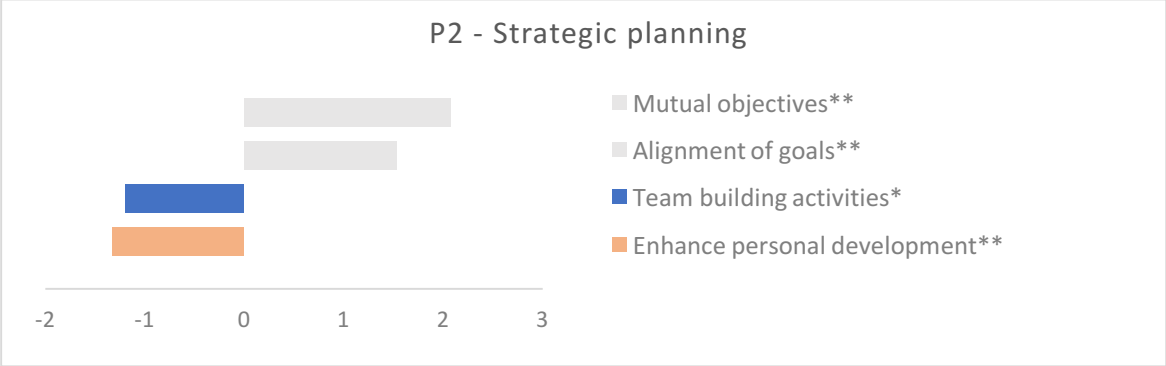


Figure 28 Distinguishing statements for Generation X

Ranked high: Alignment of goals & Mutual objectives

Generation X focuses on the bigger picture, the entire organization, not on the individual. That makes them rather success orientated and result driven.

Implication: Their tendency to planning makes them feel more comfortable in an environment where they can exert control.

Evaluation: In general, the experts agree that it is characteristic for this generation to be rather result driven. But they also say this is because they are project managers and have a certain responsibility. Thus, one must set the structure first, then one can worry about the team compilation and its dynamics. Furthermore, it depends on the experiences you make. One expert states that the older generation would also like to emphasize more on soft factors. But it also depends on the experiences you have had in collaboration. Due to bad experiences in collaboration one loses trust in people. Consequently, one emphasizes rather on hard factors.

Recommendations: Generation x has the desire and the experience to set up a structure for the project team. Let them do so and assign them planning tasks.

Ranked low: Enhance personal development & Team building measures

As explained, due to the high ranking of factors which enhance collaboration on an organizational level, aspects such as *Enhance personal development* or *Team building measures* which promote collaboration on a personal level are subordinated. This can be explained with the leading position of Generation X, nevertheless the low ranking must be addressed.

Due to their natural tendency to update the surrounding culture, each generation has an impact on each life phase (Hofstede, 2001). Every demographic shift creates a new constellation of age groups and leads to an evolutionary culture-updating process which keeps the working structures in organizations fresh and healthy and is therefore desired (Bontekoning, 2011).

Implication: By subordinating the statement *Enhance of personal development*, the evolutionary-updating process is endangered and the risk exist that this statement is underestimated. The same accounts for *Team building measures*, which are important for younger generations.

Evaluation: In both cases the experts understand, that members of Generation X rank *Team building measures* and *Enhance personal development* low. However, they defuse the considerations that the importance of these statements is underestimated and say such a risk does not exist. Generation X does not have a high desire for *Enhance of personal development,* because they already gained a lot of experience and expertise. In fact, they very much promote the development of young colleagues and support *Team building activities,* even though they themselves do not see them as important for collaboration.

Recommendation: Remember this generation that team-building activities are important for younger colleagues. Enhance the personal development of the individuals, in particular of the younger generations who haven't fully developed their own way of working. Here it is up to the team manager to provide time and space for the individual. Of course, good working patterns should be assumed however one should also enhance to try out something new. For this online over platforms such as Good Habitz can be used. Provide trainings or tutorials about new approaches or technologies. Provide a yearly budged which can be used exclusive for personal development.

Additional insights from the generation theory

This is a win-win situation: The employer is able to develop his own expertise and build up knowledge, the company benefits from this knowledge. Furthermore, it makes the company more attractive to employees. In the coming years, a workforce gap is expected and companies must fear a scarcity of young professionals. Thus, it is in their interest to have an appealing workplace. Since Einstein has a high desire for self-realization, they seek a workplace where they can develop and improve their skills (Hays, 2014). A company which promotes this is therefore very attractive. Additionally, it increases the employee's loyalty towards the company. In the long run this ensures that employees constantly seek for improvement and try to update the existing working patterns.

10.2.5 Generation Babyboomers

With 63 to 78 years old, the Babyboomer generation is the oldest working generation occupying senior positions in companies. While many of the Babyboomers have already retired, the remaining still feel very vital and plan on actively participating in the workplace.

Unlike the other perspectives, it was not possible to find enough members of this generation to participate in the Q-sort. For this reasons, it is not possible to link their generational characteristics to the outcome of the Q-study, which limits the validity of the implications. For this reason, there is also no outcome which can be evaluated. Nevertheless, recommendations are given based on the findings of the literature study and observations from the author.

The Babyboomers are a driving, rebellious and polarizing generation. Their strong desire for democracy and equality had a large impact and changed many working structures in Dutch organizations. For this reason, they are also called the protesting generation - a generation which is not afraid to voice their concerns and express their opinion.

During this research, the author of this paper talked to several professionals and asked them about their experiences with the Babyboomers. One professional gave an example about a generation related conflict:

> A team manager from the Generation Y was assigned to a project team with several members from the Babyboomer generation. In a meeting, the manager was discussing a decision by him which influenced the project team. The team manager had already made up his mind, but he still wanted to inform his team about it and hear their opinion. In the meeting, especially older members objected against the team manager and argued that it is not a good idea. The team manager took their concerns into account, but remained with his decision. A few days later, the project manager found that his decision from the meeting was not implemented by his team. When he confronted his team, they argued that the team manager did not have enough experience to make such a decision, that they furthermore disagree with him and therefore do not accept the new implementation. This lead to several conflicts in the team and ended with the team manager leaving the team.

This is an extreme example, but it shows what can happen, if you do not deal with a Babyboomer an appropriate way.

Implication: The babyboomers do not like to be skipped at the decision-making process.

Recommendation: In team meetings, it can be helpful to consult with the Babyboomers in advance. This enables to already get a feeling, how the team might react on a certain issue.

Furthermore, interviewed project managers stated that they ask members of this generations to hold back in meetings, to give also younger generations the opportunity to express their opinion. Many younger generations have a lot of respect for the older generations and let themselves influence too easy. That means they are too shy to contradict with the opinion of the older people, if they are not fully convinced about their own.

10.3 Conclusion

This chapter combines the results of the entire research and formulates implications. This enables to answer the fourth and last sub-research question: *What are the implications for future forms of collaboration with respect to the concept of generations?*
This table presents a summary of the implications and gives recommendations, marked in brackets.

All Generations All generations appreciate *Sharing of information, Respect for each other* and *Honest communication* I: The implementation of these statements has an enhancing effect on collaboration in the project team. (Promote these statements, they are the essence of good collaboration).
Babyboomer 63 – 78 years I: They don't like to be skipped from the decision-making process. (Include or consult with them beforehand). I: Babyboomers have a strong opinion (in team meetings). (Consult beforehand and ask to hold back opinion).
Generation X, 48 – 63 years I: They feel more comfortable in an environment where they can exert control. (Assign them planning tasks). I: Generation X has no desire for Enhance personal development and team building activities (Raise awareness among Generation X that these statements are very important for younger generations).
Generation Y, 33 – 48 years I: The presence of a mutual understanding has an enhancing effect on the productivity of Generation Y. (Provide opportunities to build up a mutual understanding, such as team building activities). I: Long and unstructured meetings have a negative effect on this Generations productivity. (Avoid these kinds of meetings and make meetings more efficient. Set up a structure for meetings. Assign pre-work for meetings). I: Generations Y prefers to work autonomous. (Don't prescribe them how to work).
Einstein, 18 – 33 years I: The presence of a mutual understanding has an enhancing effect on Einstein's productivity. (Provide Generation Y with opportunities to build up a mutual understanding). I: A high transparency leads to a high motivation and engagement. (Increase transparency at work). I: Some have a cautious attitude; some are curios to try out new things. (Distinguish two different working styles and assign the appropriate task). I: Some are willing to accept responsibility, some are not. (Distinguish two different working styles and assign the appropriate task. Control that Einstein is not too optimistic and takes over too much responsibility). I: Some prefer an informal way of working - and communication style with less documented responsibilities, the others not. (Distinguish two different working styles and assign the appropriate task).

Table 19 Summary of the implications and recommendations with respect to the generation theory

11 CONCLUSION

This research has the overall aim to provide new insights how generational behaviour influences the collaboration in the project team. This objective translates to the following research:

> *What influence does generational behaviour have on collaboration in project teams in the construction industry?*

Sub-question 1: *What are the most important aspects and practices of "good" collaboration currently applied in construction projects?*

Sub-question 2: *What perspectives can be derived from ranking aspects of collaboration?*

Sub-question 3: *To what extent can the generation theory explain the outcome of the Q-study?*

Sub-question 4: *What are the implications for collaboration in the project team with respect to the concept of generations?*

This chapter presents the main conclusions for each sub-question and concludes with answering the main research question.

Sub-question 1:

Based on a literature study and 20 semi-structured interviews, 35 aspect were determined to be the most important ones. These elements are further categorized and grouped as presented below:

Relational attitude	Team working	Communication	Planning	Contract & Capability	New approaches
Commitment	Team building activities	Honest communication	Alignment of goals	Responsibilities are documented	BIM application
Willingness to find a compromise	Multidisciplinary project teams	Informal communication	Mutual consent on usage of tools	Mutually sharing risks and benefits	Curiosity to try out new things
An environment of mutual trust	Prior experience with the project team	Sharing of information	Regular meetings of stakeholders	Top management support	Encourage new techniques
Easy to approach	Joint project office	Transparency	Front-End planning	Sufficient resources	Usage of historical data
Respect for each other	Stimulate own thinking	Mutual understanding	Mutual objectives	Joint dispute resolution	Long-term orientation
Flexibility	Reflection		Benchmarking	Capable workforce	Enhance personal development

Table 20 Framework: Best practices of collaboration in the project team

This framework presents a broad collection of best practices of collaboration. The left side of the framework shows soft factors which are important for collaboration on a personal level, furthermore divided into Relational Attitude, Team Working and Communication. The right side of the framework presents hard factors which are important for collaboration on an organizational level, further divided into Planning, Contract & Capability and New Approaches. This framework is valid for all type of collaboration in the construction sector.

Sub-question 2:

The results from sub-question 1 are ranked in relation to each other by the research participants. Based on this, four perspectives on collaboration in the project team are established and qualitatively interpreted. The analysis shows that the derived perspectives are highly correlated with each other.

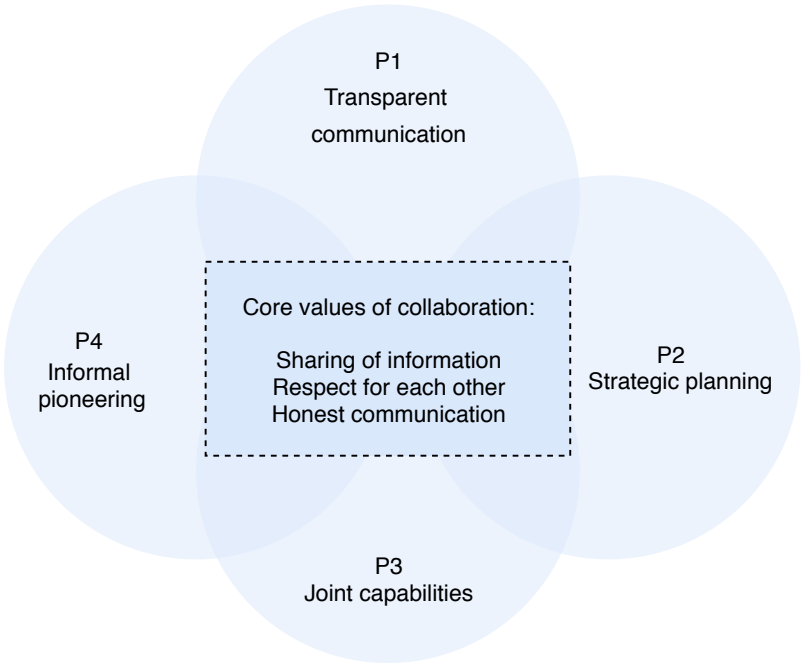


Figure 28 Visualization of the correlation between the perspectives

As presented in *Figure 28*, the derived perspectives show a strong correlation with each other. This indicates that the research participants in general favour the same principles for collaboration in the project team. Those are soft factors from the categories Communication (Honest communication, Sharing of information) and Relational Attitudes (Respect for each other). To note, these three statements are also ranked high in the literature study and the semi-structured interviews. For this reason, these aspects are essential for good collaboration and very important.

Nevertheless, each perspective has their own certain preferences. As the name indicates, (1) emphasizes on a transparent communication. (2) is focused on the setup of work structures and goal alignment in the project team. (3) has a reluctance for too many meetings in persons but focuses on a joint approach. (4) prefers an informal working style and is willing to try out new things.

Sub-question 3:

In the next step, the age of the research participants is considered and the P-set is divided in four generations. *Table 21* shows how many members of which generation load on which perspective.

	Einstein	Generation Y	Generation X	Babyboomer
P1- Transparent communication	**5**	1	2	0
P2- Strategic planning	2	**4**	**8**	1
P3- Joint capabilities	0	**5**	3	2
P4- Informal pioneering	**4**	1	0	2

Table 21 Generations loading on perspectives

This analysis indicates that members of the same generation tend to load on the same perspective. Consequently, they share the same preferences of collaboration which distinguish them from other generations. As a result, different generations have a different perspective on collaboration, although the outcome of the Q-study indicates that these differences are rather small.

Next, it is examined to what extent the generation theory explains the outcome of the Q-study. For this reason, the rankings of each perspective are compared with the generational profile of the assigned generation. In order to determine a relation between the outcome of the Q-sort and the generation theory, three different linkages are determined. These are highlighted in three different colour codes: Clear linkage (green), moderate linkage (yellow), no linkage (red). The visualizations of the Q-sort (see *Figure 29)* demonstrate that multiple statements from the Q-sort can be explained with the generation theory. The perspectives P1, P3, and P4 show a high overlap with their compared generation. Also, several elements are matching between P2 and Generation X.

Figure 29 Overview of the Q-sort ranking

Sub-question 4:

Based on the outcome of sub-question 3, implications were identified and formulated with respect to the generation theory. Furthermore, recommendations are provided in brackets behind the implication.

All Generations All generations appreciate *Sharing of information, Respect for each other* and *Honest communication* Implication: The implementation of these statements has an enhancing effect on collaboration in the project team. (Promote these statements, they are the essence of good collaboration).
Babyboomer 63 – 78 years I.: They don't like to be skipped from the decision-making process. (Include or consult with them beforehand). I.: Babyboomers have a strong opinion (in team meetings). (Consult beforehand and ask to hold back opinion).
Generation X, 48 – 63 years I.: They feel more comfortable in an environment where they can exert control. (Assign them planning tasks). I.: Generation X has no desire for Enhance personal development and team building activities (Raise awareness among Generation X that these statements are very important for younger generations).
Generation Y, 33 – 48 years I.: The presence of a mutual understanding has an enhancing effect on the productivity of Generation Y. (Provide opportunities to build up a mutual understanding, such as team building activities). I.: Long and unstructured meetings have a negative effect on this Generations productivity. (Avoid these kinds of meetings and make meetings more efficient. Set up a structure for meetings. Assign pre-work for meetings). I.: Generations Y prefers to work autonomous. (Don't prescribe them how to work).
Einstein, 18 – 33 years I.: The presence of a mutual understanding has an enhancing effect on Einstein's productivity. (Provide Generation Y with opportunities to build up a mutual understanding). I.: A high transparency leads to a high motivation and engagement. (Increase transparency at work). I.: Some have a cautious attitude; some are curios to try out new things. (Distinguish two different working styles and assign the appropriate task). I.: Some are willing to accept responsibility, some are not. (Distinguish two different working styles and assign the appropriate task. Control that Einstein is not too optimistic and takes over too much responsibility). I.: Some prefer an informal way of working - and communication style with less documented responsibilities, the others not. (Distinguish two different working styles and assign the appropriate task).

Table 22 Overview of the implications and recommendations with respect to the generation theory

Answer to the main research question

This research indicates that generations have a similar opinion how one should collaborate with each other. For this reason, one could argue that the influence of generational behaviour might not be that significant. Nevertheless, this research also reveals that peers rank statements about collaboration in a similar way. That means they share the same preferences which distinguish them from other generations.

By answering sub-question 3, a total of 13 statements from the Q-study can be clearly linked to the generation theory. In order to answer the main research question - *what influence does generational behaviour have on collaboration in the project team?* - one should therefore focus on exactly those 13 statements.

The 13 statements could be categorized in three groups. Behind each statements a letter indicates which generation is relating to the statement.

Communication	Working style	Working attitude
• Transparency (E) • Mutual understanding (E, Y) • Informal communication (E)	• Mutual objectives (X) • Alignment of goals (X) • Front-end planning (X) • Mutual consent on usage of tools (Y) • Regular meeting with stakeholders (Y) • Responsibilities are documented (E)	• Curiosity to try out new things (E) • Stimulate own thinking (E) • Enhance personal development (X) • Team building activities (X)

Table 23 Categorization of statements which are influenced by generational behaviour. Letters behind each statement indicate to which generation the statement can be linked. Abbreviations: Generation Einstein (E), Generation Y (Y), Generation X (X)

1.) Communication.

How one chooses to communicate has an influence on that the message is perceived and understood. Each generation has their own preferred way of communication: Some of the Einstein generation have a rather informal communication style. Contrary, older people are used to a more formal approach. Generation Y likes virtual communication, while Generation X sees the value of meeting in person. This shows that generational behaviour is reflected in the way how people communicate. If generations understand each other's communication style, it is possible to improve the communication within the project team.

2.) Working style

Each generation has certain preferences how they want to collaborate and different working styles can be distinguished. Generation X is focused on the hard factors of collaboration and prefers to work in a structured way. Generation Y prefers to work autonomous and has a reluctance against inefficient meetings. Some of the Einstein generation do not like it if too many responsibilities are documented.

It can be concluded, that generational behaviour has an influence on the way that people want to work and collaborate in the project team.

3.) Working attitude

Some of the Einstein generation are very keen on trying out new things and are willing to accept responsibility, the others are not. Generation X does not perceive team building activities as important. In contrary, Einstein appreciates them because they help to build up a mutual understanding with the colleagues. The same accounts for the enhancement of personal development. Again, Generation X does not value it high for collaboration in the project team, while it is very important for the Einstein generation. To conclude, each generation has a different attitude towards certain tasks or practices which come up within the project team. If they like their surrounding working structure, it has a positive effect on their motivation and engagement.

This can be also related to the working style, however this category is meant to present the rather soft factors, which have an impact on the intrinsic motivation and perception of generations.

If the above-mentioned elements are considered and implemented in the project team, each generation feels more comfortable at the work place. Thus, the generation theory helps to get the best out of every generation and it shows how you can foster a certain behaviour. This has a positive effect on the motivation and engagement of a person and leads to a higher productivity of the project team.

12 DISCUSSION

This chapter will discuss different parts of the research and its findings. Limitations are identified and recommendation for future research are formulated.

12.1 Review on problem statement

In the problem statement, it was argued that *intergenerational differences regarding collaboration are only rarely explored. Different generations might have different viewpoints on collaboration. Yet, it is unclear how and if these perspectives differ amongst generations and if there is a better way to deal with generational behaviour in the project team.*

This research confirms that different generations have different viewpoints on collaboration. However, as the outcome of the Q-study shows those viewpoints have a strong correlation with each other. This indicates that they share the same core values on collaboration in the project team. Thus, generational influence has not a large impact, at least smaller than they were assumed at the beginning of the research.

Consequently, one could argue that the influence generational behaviour is handled in an appropriate way and that there is no need for improvement. Although this may be true, this research also indicates that an awareness of generational behaviour leads to a higher working motivation. In the context of this thesis, it seemed as if Sweco has an awareness of generational behaviour. But during the exploratory phase several professionals from the sector stated to have problems which can be related to intergenerational difficulties. Therefore, a good way to deal with generational influences is to raise awareness about generational behaviour in the project team.

12.2 Review on methodology

Formulation of Q-sort statements

The formulation of the Q-sort statements it is also important and is therefore addressed at this place. It is aimed to describe the statements clear and easy to prevent misinterpretations. Therefore, complex statements are broken down to address each statement by only a single issue. This bears the risk that certain factors might be interpreted wrongly, however this risk is accepted.

With this in mind, it was also considered to translate the terms into Dutch, since this is the native language of the research participants. However, test runs showed that it was not possible to translate the terms, maintain their original meaning and keep them concise at the same time. The translation changed the significance of several statements and several terms were misinterpreted. For this reason, it is decided to present the statements in English, and provide an English and a Dutch definition for each term (see Appendix D).

Linking the outcome of the Q-sort to the Generation theory

In Chapter 9 perspectives are linked to generations based on the criterion, how many members of one generation loaded on one perspective. This revealed that on every perspective at least 50% of the loading is stemming from one generation. Thus, each perspective is compared to the generation which has the highest loading on it. In addition, P2 is compared to Generation Y, because almost half of Generation Y is loading on it. To conclude, a perspective on which only 50% of a generation is loading is compared to the generational characteristics. Therefore, using this criterion must be considered critical.

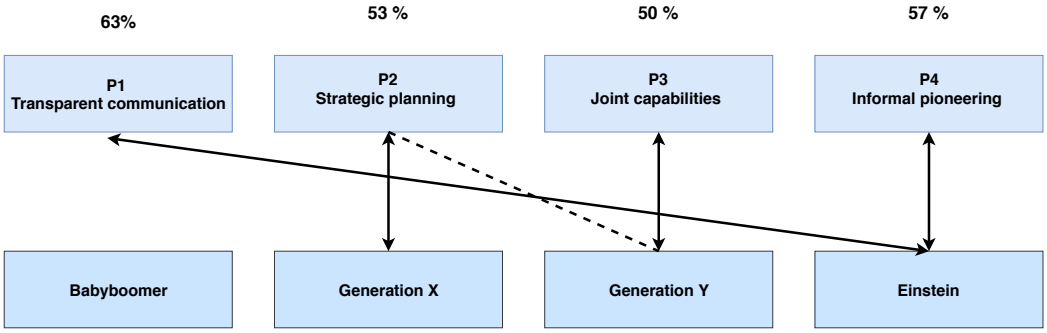


Figure 30 Linking generations to perspectives

Compared to other research, a loading of minimum 50% seems to be a good result. Bontekoning (2011) observed, that typically only 15% of a generation show congruent generational behaviour. 65% are followers with less congruent behaviour and for 20% the concept of generations does not apply at all. These difficulties are also mentioned by other scholars who argue, that all generations have similar values, just express themselves differently (Deal, 2007). Therefore, 50% is taken as an acceptable result and the generations Einstein, X and Y are further assessed while the Babyboomers are excluded.

Next the perspectives were compared with generational characteristics. At this point, it was decided to only compare the distinguishing statements and the highest ranked aspects of each perspective. As respondents rank statements in relation to each other, a low ranked statement does not mean that somebody dislikes it; he might only perceive it as less important compared to other ones. This makes it difficult to assess whether a statement can be linked to literature findings of the generation theory, because generational characteristics mainly express whether something is liked or not. The outcome of the Q-sort only indicates if something is liked or not liked that much in relation. Since all of the statements are best practices of collaboration, it is decided to only compare the distinguishing and high ranked statements, not the low ranked statements.

12.3Review on research results and implications

The high correlation of the perspectives indicates that generations in general share the same opinion. This is also confirmed by the outcome of the semi-structured interviews. Here eight from ten statements where overlapping between “young” and “old” professionals. Nevertheless, there are differences and the outcome of the Q-sort indicates that those differences could be meaningful. Construction projects depend on a great number of factors. And on a great number of factors research has been conducted upon. Thus, it might the small things which are missing and the difference between generations could be such a thing. Furthermore, the literature indicates that more and more attention is paid to the soft factors of project management and that the human factor is key. Awareness about generational behavior can lead to a better atmosphere in the project team and improve the project performance.

A similar and more popular approach to identify age-related characteristics is by looking at different age groups. This is called the age effect and can be described as a variation due to physiological growth, progression through developmental stages and accumulation of experience (Kowske, Rasch, & Wiley, 2010). In other words, characteristics can be attributed to certain age groups. In the evaluation of the implications in our study, several experts argue that some statements are age-related characteristics,

not generation-related. To distinguish: generation-related characteristics are constant throughout that generation's life and yet differ from other generations. Age-related characteristics are assumed to influence each generation in a similar manner (Papenhausen, 2006). For instance, "Transparency" could be rather age-related than generation-related. Thus, these two approaches are very like each other but a distinction between age- and generational characteristics is not considered in this research.
The generation theory seems to be more comprehensive since each generation is considered over the course of their whole life span. This enables to observe trends which influence our society. With respect to the advent of technology, computers and smartphones have a huge impact on the way how we communicate with each other. The younger generation are growing up in a world of virtual communication. Compared to their parents they have not nearly spend as much time socializing face-to-face (Venter, 2017). Most of their social interactions are conducted while they are sitting alone in front their laptop. As a result, this influences the way how generations want to communicate (Venter, 2017). These different preferences are reflected in this research. Generation Y shows a tendency towards virtual communication and Einstein likes informal communication. On the other hand, older generations prefer a more formal way of communication.
Compared to age-related characteristics, the generation takes the development of a generation over its complete life span into account. Thus, the generation theory helps to explain what impacts (such as technology) have on the society.

12.4 Research limitations

This research bears several limitations.
First, the whole generation theory is based on stereotypes and all of the attributed characteristics are generalizations. Therefore, one cannot take the implications given for granted for everybody. Every person is unique and might have a different perception. Thus, one must be careful when the implications of this research are considered.
Second, the results of this research are only limitedly generalizable. Since all the research participants from the Q-sort stem from Sweco in De Bilt, the results have the highest applicability for the three departments from which the research participants are stemming. A higher diversity in the P-set could have resulted in a higher generalizability for the outcome of this research.
Third, the same accounts for the included generations. It was not possible to find enough members of the Babyboomers to participate. After the first three Q-sorting session, mainly members from Generation Y and Einstein participated. On the one side, this is due to the rather young age structure, on the other side this also indicates that older people are not that keen on participating in the workshop. Thus, the outcome is limited to employees ranging from 18-63 years old. With respect to an increasing retirement age and in increasing age diversity, it is strongly recommended to also take the oldest generation into account.
Fourth, it is difficult to determine that the drivers which have an effect on collaboration are clearly relating to generational behaviour. Also, other factors, such as the divisions or project teams own working culture could have a bigger influence. Again, this limits the generalizability of the results.
Fifth, research about the generation theory in the context of (Dutch) organizations is still emergent. A lot of the findings about generational behaviour (Chapter 8) is based only on the work of Aart Bontekoning and Henk Becker, two Dutch professors. Therefore, the collected characteristics are not as profound as the findings on best practices of collaboration. This has a limiting effect on the implications given, since the research about the generation theory

12.5 Recommendation for further research

This research shows that generational behaviour has an influence on collaboration in projects. Thus, it is recommended to deepen research in the context of the construction industry. In the following recommendation are given, how and in what field such research could be conducted.

First, it is recommended to use Q-methodology, if it is intended to conduct generational differences. Compared to other generational research, the results of this research indicated quite a clear tendency of generational differences (on every perspective at least 50% of loadings were coming from one generation). This tendency would have been probably even higher, if more controversial statements would have been chosen. Thus, Q-methodology seems to be an appropriate methodology.

Second, it is recommended to use a more controversial Q-set. The results of this research show that the generations in general agree how one should collaborate with each other. One reason for this could be, because the chosen statements for the concourse are all best aspects of collaboration. Thus, opinions on best practices do not differ that much. But how could they, since none of them is not important? However, in many projects there are not only the "best" practices applied. There are also a lot of "bad" practices or other issues where generations might have a different opinion upon. Thus, for following research, it is recommended to use a more diverse Q-set and one statements. This could lead to more distinct perspectives and provide more insights.

Third, it is recommended to research, if the suggested implications actually lead to an improved collaboration in the project team. It is assumed that a higher comfort and integration of generations in the project team leads to a higher efficiency. Further researcher could therefore investigate, how these aspects relate to each other, and if the suggested implications of this research improve collaboration.

Fourth, with respect to the scope of this research one could conduct whether the outcome of this research also applies to other companies in the construction industry.

12.6 Personal reflection

Looking back on the process of this thesis, one might observe that the author was prone to several characteristics of his generation (a testing round revealed that the author is an Informal pioneer).

The motivation to write about this topic, is based on the authors desire to learn more about the human interaction in the project team (Mutual understanding).

In the beginning of this research the author strongly believed, that his Generation (Einstein) is not integrated properly in the project team and that intergenerational differences exist. It was difficult throughout the thesis to stay objective and the graduation committee suggested the author several times to be more objective, and not try too hard to find results.

Next, the author is very curious to try out something new and is very optimistic that he can also achieve what he planned to do (stimulate own thinking). With respect to the research methodologies used, the effort for this thesis was quite intensive. Besides the Q-sort, which was conducted with 40 people, 13 literature sources and 20 interviews were conducted for the gathering of the concourse. This provides a very profound basic, but it has to be questioned, if it not would have been better to shorten that part. By this more capacity would have been available and the quality of other sections could have been higher.

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APPENDIX A – THE ENVIRONMENT OF SWECO

This thesis is conducted in collaboration with Sweco. For the main empirical data gathering of this research, namely the Q-sorting process (see chapter 6 & Appendix B), all of the research participant are working for the branch of Sweco in De Bilt, the Netherlands. Under those circumstances, this appendix provides a brief description about the company.

Sweco is a European engineering consultancy company, working in the fields of construction, architecture and environmental engineering. With over 14 500 employees it is the leading engineering and architecture consultancy in Europe, having a net sales of SEK €16.9 billion in 2017 (Sweco, 2018). Sweco vision is to be Europe´s most respected knowledge company in the fields of consulting engineering, environmental technology and architecture (Carlson, 2018).

In the Netherlands, the market has been challenging for several years following the country´s property and financial crisis, but the market is to recovering (Carlson, 2018). In 2015, Sweco acquired the Dutch engineering consultancy Grontmij. Founded in 1915 Grontmij itself was the third largest of its kind in Europe and had almost 300 offices across the continent (Bloomberg, 2018). The headquarter of Grontmij remained also the headquarter of Sweco Nederland and is located in De Bilt. Nowadays, Sweco Netherlands has 1800 employers in the Netherlands in 8 offices (Sweco, 2018b). Since this acquisition a change programme is integrating Sweco´s business models to improve customers focus, leadership and collaboration. Sweco is a decentralized company, with a flat organizational structure and a minimum of management levels (Sweco,2018). Each employee therefore, has considerable amount of responsibility for his projects and customers. In the Netherlands Sweco delivers a variety of consulting services to the public and private setcors, in the areas of: Planning /Landscape, Building Services / Systems, Structural Engineering, Energy, Environment, Water / Flood Protection, Industry, Project Management, Position / GIS, Civils / Roads, Transport Systems, Ports / Harbours and Rail (Grüter,2018).

The annual Sweco Report 2017 writes, that Sweco employees feel very happy at work. Seven out of ten employees feel a high level of satisfaction in their job and about 80 per cent believe that they have a very good manager (Sweco, 2018).

Figure 31 The images show different parts of the branch in De Bilt: The canteen (top left); the manor Houdringe (top right); the headquarter (bottom left); an office space (bottom right); (Van Wijnen, 2018; Vastgoedmarkt, 2018)

APPENDIX B – WORKSHOP PROCEDURE

The Q-sort was held in form of a workshops at the company Sweco. Each workshop took about one hour and was conducted in team meetings consisting of 7-15 people. Although all respondents were doing the sorting exercise in the same room, at the same time, they all completed the task individually. The workshop was held in four steps:

(1) The respondent is explained how to conduct the Q-sort. Therefore, the rank sheet and a set of cards, where all the Q-set statements are printed on, are handed over to the respondent.

(2) The actual Q-sorting process by the respondent follows. Now, the respondent has to rank each statement, having the question in mind: In order to achieve "good" collaboration in a project team, it is necessary to…. . Here it is helpful to first do a pre-sorting. For this reason, the fields "Belangrijk" (=Important), "Niet belangrijk" (=not important) and "Neutral" are provided on the score sheet as well.

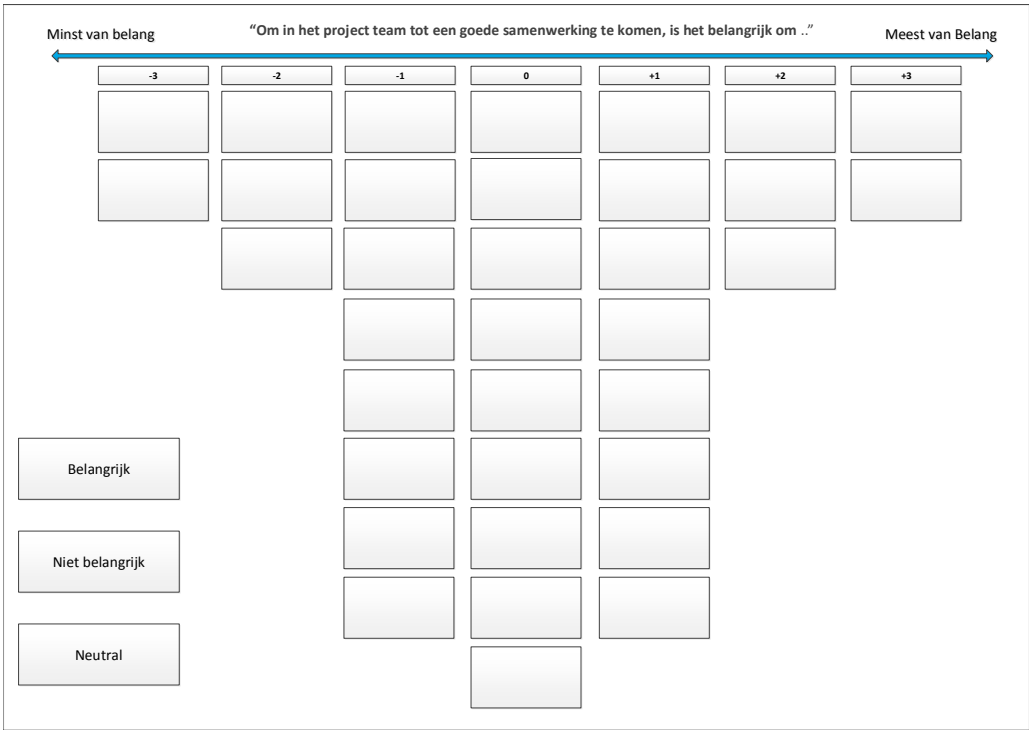


Figure 32 Score sheet for Q-sort with 35 statements

(3) After finishing the Q-sorting every respondent is interviewed on his placements in form of a questionnaire (see Appendix C). This enables to explore the underlying reasons of the choices made and to check if the respondent fully understood the aspect. These questions support the qualitative interpretation of the respondents' Q-sorting. Most interesting for this part are the statements placed in the extremes of the distribution "-3", "-2", "+3", "+2". In addition, the questionnaire contains questions regarding the background of the respondent such as date of birth, gender and education.

(4) In the end a short presentation about the research topic – intergenerational differences on collaboration - is given to the respondents. This is irrelevant for the data analysis, however it is important to mention that no information on the topic was provided before. Such information could influence the participant in the Q-sorting and was therefore prevented.

APPENDIX C - WORKSHOP QUESTIONE

Samenwerking in projectteams!

Hartelijk dank voor uw deelname aan ons onderzoek naar “goede” samenwerking in projectteams. Om dit subjectieve fenomeen te onderzoeken maken we gebruik van de Q-methodologie, waarbij we deelnemers vragen om factoren te prioriteren volgens een vastgesteld format. Verzamelde gegevens worden anoniem behandeld. Eventuele toekomstige publicaties zijn nooit herleidbaar naar individuen of organisaties.

Vragen n.a.v. dit onderzoek? Stel ze aan Moritz Kraus, M.M.Kraus@student.tudelft.nl

In deze Q-studie vragen we uw mening over de belangrijkheid van verschillende aspecten van samenwerking. Volg daarbij de volgende stappen:

1. We hebben 35 aspecten van samenwerking op losse kaartjes geprint. U heeft een setje kaartjes gekregen en een sorteerblad (A3).

2. Lees alle kaartjes en vraag u steeds af: “**Om in het projectteam tot een goede samenwerking te komen, is het belangrijk om (te hebben / toe te passen)..**”.
   Sorteer de kaartjes in 3 stapeltjes: “belangrijk voor samenwerking”, “niet belangrijk voor samenwerking”, “neutraal”. Zie de bijlage voor een overzicht van alle factoren.

3. Nadat u alle kaartjes heeft gesorteerd in 3 stapeltjes neemt u de kaartjes van het stapeltje “belangrijk voor samenwerking”. Selecteer uit dit stapeltje de twee aspecten die volgens u het meest hebben bijgedragen aan het samenwerking in een projectteam. Deze plaatst u in de kolom “+3”. Vervolgens selecteert u uit de overgebleven kaartjes de drie samenwerkingsfactoren die daarna het meest hebben bijgedragen; deze kaartjes plaatst u in de kolom “+2”. Hiermee gaat u door tot alle kaartjes op zijn (ook als u daarmee aan de linkerkant van het scoreblad uitkomt; het gaat in dit onderzoek om relatieve belangrijkheid). Let op: u moet de indeling op het papier respecteren; d.w.z. u kunt de kaartjes alleen op de hokjes leggen.

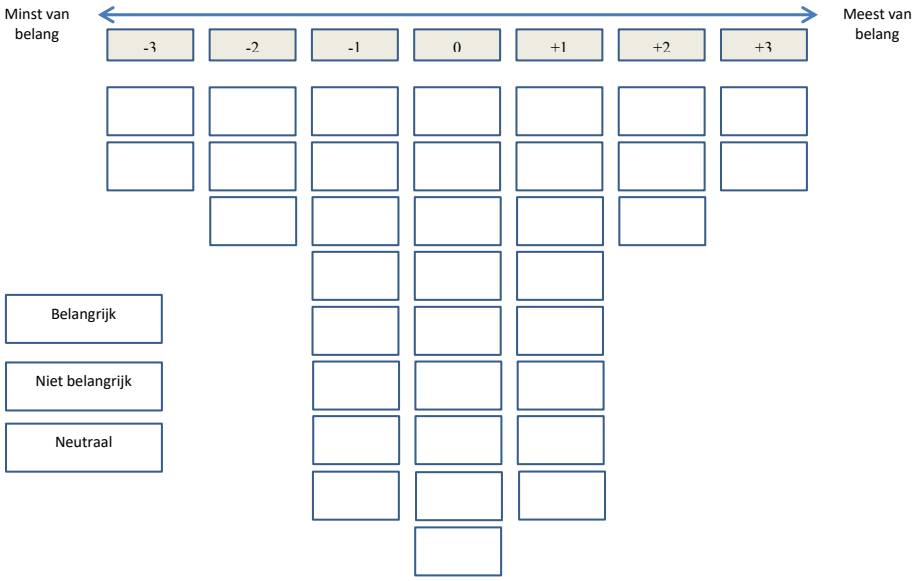
4. Doe nu hetzelfde voor de kaartjes van de stapel “niet belangrijk voor samenwerking”. De factoren die u het minst belangrijk vindt, plaatst u in kolom “-3”, etc.

5. Tot slot neemt u het “neutrale” stapeltje en plaatst de kaartjes op de lege plaatsen van het scoreblad.

6. Bekijk na het plaatsen van alle kaartjes nogmaals het scoreblad, en herschik waar nodig.

7. Als u klaar bent met sorteren, noteert u hieronder de nummers van de kaartjes op de plek waar u ze heeft gelegd:

“Om in het projectteam tot een goede samenwerking te komen, is het belangrijk om (te hebben/ toe te passen)..”



A1] Kunt u nader toelichten waarom u juist deze factoren op **"+3"** heeft geplaatst?

Kaart nr.: ___, uitleg:
Kaart nr.: ___, uitleg:

A2] Kunt u nader toelichten waarom u juist deze factoren op **"+2"** heeft geplaatst?

Kaart nr.: ___, uitleg:
Kaart nr.: ___, uitleg:
Kaart nr.: ___, uitleg:

A3] Kunt u nader toelichten waarom u juist factoren op **"-3"** heeft geplaatst?

Kaart nr.: ___, uitleg:
Kaart nr.: ___, uitleg:

A4] Kunt u nader toelichten waarom u juist deze factoren op **"-2"** heeft geplaatst?

Kaart nr.: ___, uitleg:
Kaart nr.: ___, uitleg:
Kaart nr.: ___, uitleg:

A5] Zijn er naast "onze" 35 samenwerkingsfactoren nog andere factoren die van belang zijn voor samenwerking? Zo ja, wilt u deze hieronder noteren, inclusief waar u deze factor geplaatst zou hebben op het eerder gebruikte spectrum "-3", "+3"?

B1] Hoeveel jaar relevante werkervaring heeft u?

- 0 - 5 jaar
- 5 - 10 jaar

- 10 - 20 jaar
- meer dan 20 jaar

B2] U bent: man / vrouw *(a.u.b. doorstrepen wat niet van toepassing is)*

B3] Uw opleiding (*richting en niveau*)…….

B4) Wat is uw rol in een project team ……

B5] Uw geboortejaar…….....

Tenslotte

Mogen we u eventueel benaderen voor vervolgonderzoek? Zo ja, wilt u dan uw e-mail adres met ons delen:

…….

Hartelijk dank voor uw medewerking.

Het onderzoeksteam,
Moritz Kraus
Ir. Stephan Laaper
Ir. Jella Jongerius
Dr. Ir. Marian Bosch-Rekveldt
Prof Dr. Ir. Marcel Hertogh
Ir. Ronald van Warmerdam

APPENDIX D – OVERVIEW & EXPLANATION OF STATEMENTS

The questioner with the Q-sort contained three extra pages which are displayed below. The first is an overview of the statements. The second and third provide an explanation in English and Dutch.

1. Respect for each other
2. Top management support
3. Alignment of goals
4. Mutual objectives
5.An environment of mutual trust
6. Sharing of information
7. Transparency
8. Honest communication
9. Mutually sharing risks and benefits
10. Responsibilities are documented
11. Informal communication
12. Front-end planning
13. Joint dispute resolution
14. Willingness to find a compromise
15. Mutual consent on usage of tools
16. Benchmarking
17. Commitment
18. Multidisciplinary project teams
19. Joint project office
20. Team-Building activities
21. Enhance personal development
22. Encourage new techniques
23. BIM application
24. Longterm orientation
25. Sufficient resources
26. Reflection
27. Curiosity to try out new things
28. Flexibility
29. Easy to approach
30. Mutual understanding
31. Regular meetings of key stakeholders
32. Stimulate own thinking
33. Capable workforce
34. Usage of historical data ("Big data")
35. Prior experience with the project team

1	Treat each other in a dignified manner.	Behandel elkaar op een waardige manier/ met respect.
2	The top-management supports the project.	Het topmanagement ondersteunt het project.
3	Parties commonly develop and agree on objectives and align their goals.	Partijen stemmen deze doelstellingen met elkaar af.
4	Parties have a shared vision and the same goals.	Partijen hebben een gedeelde visie en gedeelde doelen.
5	The willingness to rely upon each others actions and skills.	De bereidheid om te vertrouwen op elkaars acties en vaardigheden.
6	Willingness to actively share knowledge, experience and information with each other.	Bereidheid om kennis, ervaringen en informatie met elkaar te delen.
7	Make it is easy for the other party to see what actions are performed. This includes being transparent about your goals and motivations.	Het moet voor de andere partij gemakkelijk zijn om te zien welke acties uitgevoerd worden of reeds zijn uitgevoerd. Dit omvat bijvoorbeeld het transparant zijn over je doelen en motivaties.
8	Communicate with each other in an honest way - in order to make it easy for each other talk about problems and do not lie to each other about mistakes.	Communiceer met elkaar op een eerlijke manier - maak het elkaar gemakkelijk om over problemen te praten en lieg niet tegen elkaar over fouten. Wees direct en duidelijk als er een probleem is.
9	Is an contractual agreement that allows parties to share profits or cost savings and to share losses due to errors or cost increases.	Dit is een contractuele overeenkomst waarmee partijen winsten of kostenbesparingen delen en verliezen delen als gevolg van fouten.
10	Stakeholders understand their roles, rights and responsibilities since they are documented.	Belanghebbenden begrijpen hun rollen en verantwoordelijkheden, omdat deze gedocumenteerd zijn.
11	A casual form of information sharing typically used in personal conservations.	Een informele vorm van informatie-uitwisseling die meestal wordt gebruikt in persoonlijke conversaties.
12	Front end planning deals with the very first process of a project and decide the most important aims of a project (goals, risks..).	Front-end plannen gaat over de vroege project fase waarin bv de belangrijkste doelen van een project worden bepaald.
13	This is a process of seeking to reach compromise and hence an end to the dispute. This is often established by an agreement between the involved parties.	Dit is een manier om een compromis te bereiken en daarmee een einde te maken aan het geschil gerelateerd aan de overeenkomst tussen de betrokken partijen.
14	Willingness to try to understand the other person and to find a solution which might suit both parties.	Bereidheid om een compromis te vinden: de ander te proberen te begrijpen en om een oplossing te vinden die voor beide partijen geschikt zou kunnen zijn.
15	Parties agree on software, interfaces & communication used in the project.	Partijen zijn het eens over het gebruik van software, interfaces & communicatie in het project.
16	A measurement of the quality of an organization's policies, strategies, etc., and their comparison with standard measurements.	Een meting van de kwaliteit van het beleid, producten, programma's, strategieën, enz. van het project, en de vergelijking ervan met vergelijkbare projecten.
17	A willingness to give time and energy to something that you believe in or firm decision to do something.	Een bereidheid om je tijd en energie te geven aan iets waar je in gelooft, of een belofte of een vaste beslissing om iets te doen.
18	A team consisting out of differentiating disciplines.	Een team bestaande uit teamleden uit verschillende disciplines.

19	The project team sets up a joint project office from where they steer, control & monitor the progress.	Het projectteam heeft een gezamenlijk projectbureau opgezet van waaruit ze sturen, de voortgang controleren en bewaken.
20	Measures to improve the collaboration within project teams to improve the overall team performance.	Activiteiten om de samenwerking binnen projectteams te verbeteren en de algehele teamprestaties te verbeteren.
21	Provide employees space, time and resources to enhance the personal development of a person.	Geef werknemers ruimte, tijd en middelen om de persoonlijke ontwikkeling te verbeteren.
22	Provide resources and support to encourage innovation and development of new techniques.	Bied middelen en ondersteuning om innovatie en ontwikkeling van nieuwe technieken aan te moedigen.
23	Every engineering process across the entire value chain during all stages is executed digitally with softwares such as BIM.	Elk engineeringproces in de hele waardeketen in alle stadia van de bouw wordt digitaal uitgevoerd met behulp van digitale software, zoals BIM.
24	Working with the aim of having benefits in the long term.	Werken met een oog voor lange termijn effecten.
25	Existence of an adequate and consistent financial base to support operations.	Aanwezigheid van adequate en consistente middelen (mensen als materialen) om het project uit te voeren.
26	Being able to critically review and reflect on one's own performance.	Het kritisch kunnen reflecteren op het eigen gedrag en de eigen prestaties.
27	The willingness of an individual to stay open-minded and interested in new things.	Nieuwsgierigheid om nieuwe dingen uit te proberen.
28	Remain open to varied ways to accomplish work, even if it needs to change some major goals, members etcetera.	In staat om aan te passen aan veranderende omstandigheden.
29	Being easy to meet or deal with.	Toegankelijk, makkelijk benaderbaar.
30	Gain an understanding to grasp ones actions and line of reasoning.	Wederzijds begrip.
31	The most important stakeholders in the process should regularly discuss past performance and upcoming tasks.	De belangrijkste stakeholders op het moment in het proces komen regelmatig bij elkaar om de prestaties uit het verleden en aankomende taken te bespreken.
32	Transfer responsibilities to the employee to stimulate his own thinking.	Verantwoordelijkheden overdragen aan de werknemer om zijn eigen denken te stimuleren.
33	The project team is sufficiently qualified and has the technical know how to do the job to be done.	Het projectteam is voldoende gekwalificeerd en heeft de technische kennis om de klus te klaren.
34	In the project team a lot of data about previous projects exists. By analyzing this data it is possible to improve project performance.	In het projectteam is veel data van eerdere projecten beschikbaar. Door deze te analyseren, is het mogelijk om de projectprestaties te verbeteren.
35	Prior experience with the project team facilitates the process because parties are already familiar to each other.	Eerdere ervaring met het projectteam vergemakkelijkt het proces omdat partijen elkaar al bekend zijn.

APPENDIX E – DATA ANALYSIS OF Q-METHODOLOGY

The data analysis enables to explain and observe patterns in the data set. This appendix therefore explains the basic steps which are conducted.

(1) First, the relationship between all Q-sorts is calculated, also referred to as "correlation matrix". This shows the level of (dis)agreement between the individual respondents. The range of correlation reaches from +1 (=Q-sorts are exactly the same) till -1 (=Q-sorts the complete opposite). A low correlation between two respondents indicates they do not share a common point of view. High correlation indicates the opposite.

(2) Next, a factor analysis is applied. This is a statistical technique to simplify complicated data and to uncover the inner structure of a set of variables (Du Plessis, 2005). Therefore, the factors can be rotated in a number of ways. If two persons share a common view on a topic, they share the same factor. This can be seen in *Figure 26* where several Q-sorts have the same opinion on a certain statement and therefore load high on the Factor.

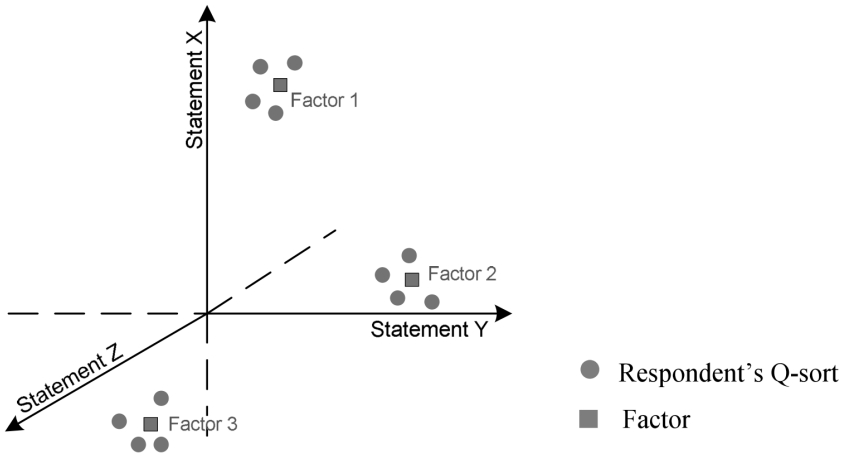


Figure 33 Visualization of a factor rotation (Groenewegen, 2013)

Again, this correlation is represented by a number between "-1" and "+1". The loading on a factor describes to which extent the Q-sort is related to the factor. If the Q-sorts are significantly loaded, a factor is formed and can be used for the next step (Van Exel & De Graaf, 2005). The significance can be calculated by using the standard error, a term which measures the statistical significance. According to Brown (1993) it can be calculated as follows:

$$SE = \frac{1}{\sqrt{N}}$$ where SE= Standard Error and N= Statements used in the Q-Sort

The resulting value can be either positive or negative. According to van Exel & De Graaf (2005) the following significance levels are usually considered:

(1) $P < 0.001$, using SE x 3,29

(2) $P < 0.01$, using SE x 2.58
(3) $P < 0.05$, using SE x 1,96

A factor rotation often generates Q-sorts with different loadings (Du Plessis, 2005). In the best case, a Q-sort only loads on a single factor. But in many cases, mixed Q-sort loadings which are regarded as "factorial impure" occur. This means a Q-sort has a significant loading on at least two factors, also described as Confounders. People who do not have a loading on any factor are classified as Non-loaders (Du Plessis, 2005). In the final solution, it is desired to include as many pure loadings as possible (Du Plessis, 2005).

The number of factors in the final set depends on the variability in the Q-sort. Nevertheless, it is recommended to take more factors than anticipated for the factor rotation to preserve as much of variance as possible (Van Exel & De Graaf, 2005). Brown (1980) states: "experience has indicated that 'the magic number 7' is generally very suitable". This set of factors is then rotated to arrive at a final set of factors. Each resulting final factor describes a group of individual points of view that are highly correlated with each other und uncorrelated with others (Van Exel & De Graaf, 2005). Rotating the factors enables researcher to observe the loadings from a different angel. New factors are formed which better represent common perspectives. In addition, the criterion which are described in the main body of the thesis have to be included as well.

(3) The final step is the calculation of factor scores. A statement's factor score is the normalized weighted average statement score (Z-score) of respondents that define that factor. Based on the Z-score, it is possible to attribute statements to the original distribution, resulting in a composite Q-sort for each factor (Van Exel & De Graaf, 2005). Consequently, each Q-sort has a different loading on different factors. Thereafter, one must decide whether a factor is accepted or rejected. According to Brown (1980), a factor should meet two criterions. He determined, that each factor should at least have two different respondents loading on it. Furthermore it should meet "Humphrey's rule", which considers a factor as significant, if the cross-product of its two highest loadings exceeds twice the standard error.

APPENDIX F – CODING STRUCTURE LITERATURE STUDY & INTERVIEWS

The establishment of codes was used to analyse the literature study and the interviews from Chapter 3 and 4. In the context of this research the term coding is defined as the process of organizing and sorting the results of the literature study and interviews. In linking data collection and interpreting data, coding becomes the basis for the analysis (Impact, 2018). The creation of codes was set up in various steps: First, focused coding was used to scan several articles from the literature. This involves searching for the most frequent listed codes appearing to develop the most prominent categories (Onwuegbuzie, Frels, & Hwang, 2016). It quickly became obvious that many of the listed items relate to each other and have a similar meaning, for instance the terms: open communication, direct communication, transparent communication, straightforward communication etc. For this reason, relating codes were combined and categorized to more general codes, also referred to as pattern coding (Onwuegbuzie et al., 2016). Pattern coding is a way of grouping summaries into smaller number of sets, themes or constructs. "This is how we get up from the diversity of data to the shapes data"(Richards & Morse, 2007). For instance, the codes "benchmarking", "performance measurement" and "performance assessment" were combined in the overall term "benchmarking". In addition, an explanation was created: "Benchmarking is a measurement of the quality of an organization's performance, policies, , et cetera., and their comparison with standard measurements, or similar measurements of its peers." Following this logic identified elements were summarized, defined as codes and described. In total 57 codes were established for this research. This table provides an overview and explanation for each code.

Code	Explanation
A team consisting of multiple viewpoints	Multiple viewpoints enable to observe an issue from multiple perspectives. This increases the chances for a better outcome.
An environment of mutual trust	The willingness to rely upon each others actions and skills.
Adequate education on risk-management	All members of the project team are familiar to the basic principles of risk-management.
Alignment of goals	Parties commonly develop and agree on objectives and align their goals.
Balance traditional and innovative contracts	The project manager applies the right mixture between traditional and innovative approaches, fixed in the contract.
Benchmarking	Benchmarking is a measurement of the quality of an organization's performance, policies, products, , strategies, etc., and their comparison with standard measurements, or similar measurements of its peers.
BIM application	Every engineering process across the entire value chain during all stages of construction is executed digitally with software such as BIM.
Capable workforce	The project team is sufficiently qualified and has the technical know how to do the job to be done.
Capture cornerstones in a contract	The most important parts which parties agree upon should be always documented.
Cloud-based collaboration with BIM in the whole value chain	Cloud-based collaboration allows different employees to work together on documents and other data types outside of the own company's firewall. On an online platform, such as BIM, different companies can share, edit and work together on projects.
Commitment	Each party contributes and participates equitable to the process.
Comprehensive contract documentation	Make a very comprehensive and detailed documentation of agreements.

Continuous improvement	Continuous improvement is an ongoing effort to improve processes and products.
Continuous operational monitoring	This is a process and technology, used to detect mistakes and risk issues associated with the ongoing project.
Curiosity to try out new things	The willingness of an individual to stay open-minded and interested in new things.
Do not measure success by the iron triangle	Include other factors besides the iron triangle (cost, quality, schedule) such as stakeholder satisfaction in the assessment of your project.
Early involvement of key stakeholders	Involve the most important stakeholders as early as possible in the process, e.g. involve the contractor in the design.
Easy to approach	Being easy to meet or deal with
Encourage new techniques	Provide resources and support to encourage innovation and development of new techniques.
Enhance personal development	Provide employees space, time and resources to enhance the personal development of a person.
Existence of team spirit	Team spirit is a feeling that exists among the members of a team that makes them want their team to do well.
Flexibility	Remain open to varied ways of organising itself and accomplish its work, even if it needs to change some major goals, member's etcetera in order to deal with changing conditions.
Front-end planning	Front end planning deals with the very first process of a project and decide the most important aims of a project (goals, risks..).
Good atmosphere	Having an overall good atmosphere within the project team.
Honest communication	Communicate with each other in an honest way - in order to make it easy for each other talk about problems and do not lie to each other about mistakes. Be direct and straightforward if a problem exists.
Informal communication	A casual form of information sharing typically used in personal conservations.
Joint dispute resolution	This is a process of seeking to reach compromise and hence an end to the dispute. This is often established by an agreement between the involved parties.
Joint project office	The project team sets up a joint project office from where they steer, control & monitor the progress.
Lead by example	Team leaders should always act according to the rules they prescribe.
Lean management	Lean management involves efforts to eliminate or reduce any activity that consumes resources without adding value.
Long-term orientation	Working with the aim of having benefits in the long term
Low hierarchical structures	Many companies consist of multiple structures, having a chain of command. In low hierarchical structures the differences between the leading group and the following group is rather low.
Multidisciplinary project teams	A team consisting out of differentiating disciplines.
Mutual consent on tool usage	Parties agree on software, interfaces & communication used in the project.
Mutual objectives	Parties have a shared vision and the same goals.
Mutual understanding	Gain an understanding of each other to understand ones actions and line of reasoning.

Mutually sharing risks and benefits	Is an contractual agreement that allows parties to share profits or cost savings and to share losses due to errors or cost increases. Mutual benefits are achieved through gain sharing, losses through pain sharing.
"No blame" culture	Parties do not waste resources on trying to find out who is responsible for a mistake. Instead blaming each other for it, one tries to find a solution to the problem.
Prior experience with the project team	If parties have worked together in the past, they have prior relationship experience. This can facilitate processes since they already dealt with each other.
Regular meetings of key stakeholders	The most important stakeholders at the moment of time in the process should meet on a regular basis to discuss past performance and upcoming tasks.
Reflection	Being able to critically review and reflect on one's own behaviour and performance. Use this knowledge to improve on upcoming tasks.
Respect for each other	Treat each other in a dignified manner.
Responsibilities are documented	Stakeholders understand their roles, rights and responsibilities since they are documented.
Rigorous time planning	Very detailed and extensive time planning.
See the context around a problem	Often a problem is not as simple as it seems. It is triggered by several factors and can not be simply solved. For this you need to be able to see the context around the problem, how it relates to other factors. Therefore, a lot of experience is required.
Sense of urgency	A sense of urgency could be a soon upcoming deadline which stimulates people to work harder and faster.
Sharing of information	Willingness to share knowledge and information with each other.
Stimulate own thinking	If employees are frequently told what to do, they simply follow the commands without thinking on their own. By transferring responsibilities to the employee own thinking can be stimulated.
Sufficient resources	Existence of an adequate and consistent financial base to support operations.
Team-Building activities	Measures to enhance the collaboration within project teams to improve the overall team performance.
Team motivation	The process of convincing employees to give their best effort to a task.
Top management support	The top-management supports the project.
Transparency	Make it is easy for the other party to see what actions are performed. This includes sharing information upward and downward and being transparent about your goals and motivations.
Usage of historical data ("Big data")	In construction a lot of historical data about previous projects exists. By analysing this data it is possible to improve project performance.
Willingness to find a compromise	Willingness to try to understand the other person and to find a solution which might suit both parties.
Willingness to solve problems together	A general willingness to solve a problem together.
Work according to ethical standards & law	This term applies e.g. often in a tender. But also besides it is always required to work according to law and ethical standards.

Table 24 Coding structure for the literature study and the interviews

APPENDIX G – CONTACT OVERVIEW INTERVIEWS

The table below provides an overview on the professionals which were interviewed.
(This table is not portrayed in the online version)

Table 25 Contact overview for the interviews

APPENDIX H – INFORMATION ABOUT THE P-SET

Number	Experience	Sex	Background	Role in team	Year	Age	Generation
1	10 - 20	M	Civil Engineering	Adviseur	1984	34	Y
2	0 - 5	V	Geology	Adviseur	1994	24	E
3	5 - 10	M	Hydrologie	Adviseur	1982	36	Y
4	0 - 5	M	Civil Engineering	Adviseur	1992	26	E
5	> 20	M	Geology	Team Manager	1964	54	X
6	0 - 5	M	Planologie	Adviseur	1986	32	E
7	5 - 10	V	Planologie	Adviseur	1986	32	E
8	> 20	M	Civil Engineering	Adviseur	1967	51	X
9	10 - 20	V	Economics	Team Manager	1976	42	Y
10	0 - 5	V	Civil Engineering	Stagiar	1992	26	E
11	0 - 5	V	Civil Engineering	Adviseur	1992	26	E
12	10 - 20	M	Geology	Adviseur	1978	40	Y
13	10 - 20	M	Civil Engineering	Adviseur	1981	37	Y
14	5 - 10	M	Industrial Engineerin	Team Manager	1984	34	Y
15	0 - 5	V	Environmental Eng.	Stagiar	1992	26	E
16	0 - 5	V	Civil Engineering	Adviseur	1993	25	E
17	0 - 5	M	Geo-ICT	Adviseur	1993	25	E
18	> 20	M	Electrotechniek	Adviseur	1955	63	BB
19	> 20	M	CIvil Engineering	Team Manager	1965	53	X
20	10 - 20	M	Biology	Adviseur	1976	42	Y
21	> 20	M	Planologie	Team Manager	1957	61	X
22	> 20	V	Planologie	Adviseur	1956	62	X
23	> 20	M	Civil Engineering	Adviseur	1961	57	X
24	> 20	M	Cultureel werk	Adviseur	1952	66	BB
25	> 20	M	Civil Engineering	Team Manager	1956	62	X
26	10 - 20	M	Civil Engineering	Adviseur	1974	44	Y
27	> 20	M	Planologie	Adviseur	1960	58	X
28	> 20	M	Bouwkunde	Adviseur	1955	63	BB
29	> 20	M	Landbouwwetensch.	Team Manager	1957	61	X
30	10 - 20	V	Civil Engineering	Team Manager	1969	49	X
31	> 20	M	Bouwkunde	Team Manager	1955	63	BB
32	> 20	M	Civil Engineering	Adviseur	1953	65	BB
33	0 - 5	M	Civil Engineering	Team Manager	1987	32	E
34	10 - 20	V	Civil Engineering	Adviseur	1965	43	Y
35	10 - 20	M	Civil Engineering	Team Manager	1974	44	Y
36	10 - 20	M	Economics	Team Manager	1983	35	Y
37	> 20	M	Werktuigbouwkunde	Adviseur	1961	57	X
38	> 20	M	Civile Techniek	Team Manager	1969	49	X
39	10 - 20	M	Waterbouw	Team Manager	1963	55	X
40	0 - 5	M	Civile Techniek	Stagiar	1990	28	E

Table 26 Information about the P-set

APPENDIX I – NORMALIZED WEIGHTED AVERAGE STATEMENTS

Table 26 shows the normalized weighted average statements scores (Z-scores) with a reach from "+3" to "-3". A high score, for instance the statements *1 Respect for each other*, *6 Sharing of information* or *8 Honest communication*, indicates that the statement is strongly compatible with the majority of perspectives. A high negative score on the other hand, such as the statements *2 Top-management support, 22 Encourage new techniques* and *23 BIM application*, can be classified as strongly incompatible with the common perspective. A neutral score around "0" means that a statement is classified as less relevant. The combination of the four factors covers 65% of the total variance (A=39%, B=10%, C=8%, D=8%). This indicates how far the factors are spread out in the set. However, only looking at the factor scores does not enable to derive patterns.

Q-Statements	A	Rank	B	Rank2	C	Rank3	D	Rank4
1 Respect for each other	1.7	3	1.08	7	0.94	7	0.97	5
2 Top management support	-1.65	33	-1.03	29	-0.03	17	-1.61	33
3 Alignment of goals	0.67	9	0.57	4	0.57	9	0.38	15
4 Mutual objectives	-0.23	20	0.32	3	0.32	11	0.20	17
5 An environment of mutual trust	1.93	1	-0.04	18	0.35	10	0.87	6
6 Sharing of information	0.93	6	1.15	6	2.03	2	0.78	8
7 Transparency	1.89	2	0.30	13	0.32	12	0.20	17
8 Honest communication	1.18	4	0.27	14	1.20	4	2.09	1
9 Mutually sharing risks and benefits	-0.73	28	0.18	16	-0.69	26	-2.19	35
10 Responsibilities are documented	-0.74	29	-1.01	28	-0.40	24	-0.20	24
11 Informal communication	-0.08	19	-0.55	25	-0.15	20	-1.17	31
12 Front-end planning	-0.05	18	43101	8	0.29	13	-0.00	20
13 Joint dispute resolution	-0.48	25	-0.13	20	-0.30	23	-1.75	34
14 Willingness to find a compromise	0.77	8	-0.45	23	-0.16	21	0.53	10
15 Mutual consent on usage of tools	-0.43	24	0.19	15	-1.98	34	0.44	11
16 Benchmarking	-2.12	35	-1.04	30	-0.78	30	-0.14	22
17 Commitment	0.87	7	2.22	1	1.17	5	0.43	12
18 Multidisciplinary project teams	-0.31	22	-0.42	22	-0.84	31	0.64	9
19 Joint project office	0.08	17	-0.73	26	-0.90	32	-1.07	28
20 Team-Building activities	0.62	10	-0.84	27	-0.14	19	-0.83	27
21 Enhance personal development	-0.28	21	-1.28	32	0.19	14	1.51	3
22 Encourage new techniques	-1.62	32	-1.07	31	-1.22	33	0.05	18
23 BIM application	-1.81	34	-1.33	34	-2.29	35	-1.11	29
24 Longterm orientation	0.18	16	-0.13	20	0.10	15	1.03	4
25 Sufficient resources	-0,54	26	0.41	11	0.02	16	-0.20	24
26 Reflection	0.33	14	1,22	5	-0.24	22	0.39	14
27 Curiosity to try out new things	-0.80	30	-0.39	21	-0.68	25	0.39	14
28 Flexibility	0.37	13	0.54	10	-0.12	18	0.83	7
29 Easy to approach	0.58	11	-0.01	17	1.38	3	-0.00	20
30 Mutual understanding	1,05	5	-0.51	24	2.47	1	-0.34	26
31 Regular meetings of key stakeholders	0.49	12	0.83	9	-0.76	29	-0.10	21
32 Stimulate own thinking	-0.31	23	0.38	12	0.59	8	1.81	2
33 Capable workforce	-0.59	27	1.65	2	42736	6	-0.30	25
34 Usage of historical data ("Big data")	-1.07	31	-2.01	35	-0.72	28	-1.36	32
35 Prior experience with t project team	0.20	15	-1.29	33	-0.71	27	-1.17	31

Table 27 Z-score -The four highest aspects (green) and the four lowest aspects (yellow) of each factor are marked

APPENDIX J – EVALUATION

For the evaluation it was first considered to include members of all generations. However, it is decided against it, because people with more experience have a better judgement and more knowledge, especially when it comes to the older generations. Therefore, it was aimed to validate the results with experience people outside of the initial scope. Therefore, professionals from the field were contacted. For privacy reasons, the names of the interviewees, as it would make the respondent identifiable. Each expert received a code (#) which enables to allocate a statement to a person.

- #1 Team manager Wastewater management, Sweco De Bilt
- #2 Senior Advisor HR, Sweco De Bilt
- #3 Team manager Gas, Sweco Groningen
- #4 Project manager, Havenbedrijf Rotterdam
- #5 Contract manager, Havenbedrijf Rotterdam

As presented below, the experts are confronted with the statements and the ranking of the Q-sorts. They are asked to critically, review the ranking and compare it to the stituation of their own working environment. The answers of the expert are marked with a hashtag and a corresponding identification number, e.g. #3

Findings for Generation Einstein (Junior, 18 -33 years old)

Ranked high: **Transparency**

- Yes,, that is true. They have less experience, but I think this is rather age related, if you are younger you are more curios. #1
- Yes, this is very recognisable. But I also think this is rather age related. Young people have a high desire to grasp the environment around them. #2
- Yes, that is true. They are very curios. #3
- Partly true, they ask a lot of questions but this is rather age related. That is a natural thing if you are young and new to the job. Besides I find it characteristic for Einstein that they ask a lot of questions, but they often do not know what they want. They are just hanging out, because they can't decide what to do. Sometimes you just must do stuff to find out if it is the right thing. #4
- Partly true, rather age related. #5

Conclusion: Everybody agreed that Einstein values Transparency very high, even though most people see this is as a rather age related then generation related characteristic. If you are young or in a new environment it is in the nature of a human to explore what is happening around him and to understand what is going on.

Ranked high: **Mutual understanding (with colleagues**)

- Yes, that is true, but this is also age related. When I was younger I had the same desire. #1
- Yes, but this is age related. However, there is a contradiction towards Generation X. #2
- Yes, this is very true. They go and have Pizza, go for Drinks, make use of young Sweco. They like to identify with work. #3

- True but also age related, they go to work for pleasure, but when I was younger I did the same. #4
- Partly true but rather age related. #5

Conclusion: Here all people agree that Einstein has a high desire to understand each other. More particular the social part of work is valued very high. However, this is also age -related rather than generation specific. Everybody agreed that when they were younger, they had also Pizza's and beers after work with their colleagues, but now they have families and other responsibilities. For this reason, it is ranked lower, however they still want to get along good with their colleagues.

Ranked high: Informal communication & Ranked low: Responsibilities are documented

- Informal communication: Yes that is true. Written communication is shorter. That might be more effective, but it also results in that younger people draw conclusion quicker, based on less information. #1
- Yes, young people really like informal communication. But this bears the risk that they miss out on the formal part of communication. Therefore, a right balance is important. #2
- Yes informal communication is very important for them. Responsibilities are low is partly true, that depends per person. #3
- Yes, they prefer informal communication, but they do not know that it does not work. #4
- Informal communiucation. yes. I think responsibilities are documented does not apply for everybody. I know a lot of young guys who like it rather structured. #5

Conclusion: Informal communication is the first characteristic which could was defined to be a characteristic for this generation. Written communication such as whats app messages or emails is often very short and concise. This bears the risk that important things might be reported not detailed enough and details are forgotten. But also, the rather informal working atmosphere is rather new at the workplace. This was criticized by the experts who argue, that the younger generation is sometimes missing the right balance between formal and informal communication.

Ranked high: Stimulate own thinking

- Yes, that is true. I also think this is because the difference between old and young employers is getting less. #1
- Yes! I think this is an outstanding characteristic of this generation. While the older generations where rather watching and observing their environment when they were younger, Generation Einstein is actively trying to inform themselves about it → link to transparency. They are also keen on trying things out, whit out knowing too much about it. The older generations are the other way around, they first want to have certainty, then try it out. #2
- Yes, they like to be very challenged, and they often overtake themselves too much. #3
- Also, their critical thinking is very valued, and their openness towards criticism. This is a very valuable input. #4

Conclusion: Once again this is seen as both age- and generation related. It is normal for younger people to be willing to take over responsibility and grow in their job. However, it has been seen as generation characteristic, that Einstein actively is looking for possibilities to challenge themselves. While the older generations rather passively observed and learned, Einstein is actively self looking for possibilities to execute. Here it often happens that they overtake themselves.

Ranked high: **Curiosity to try out something new**

- Yes, that is true, but I think this is on the one side age related, and on the other site there is also the difference between an engineer and a consultant. An engineer is rather focused on his own work, and he is willing to take less risk. Therefore, he is less curios to try smth new out. In fact, he has to be certain about things, that is his Job. The consultant on the other hand, has to try to sell and try out new stuff. #1
- Yes, that true. It depends on your job and on the person. However, I also realized that young person start losing their interest very soon. They are getting bored with a task very quickly and want to try out something new. That's also a generational difference. If you tell a person from generation X he is going to be a mechanical engineer for the rest of his life, he is cool with it. For a member of the Einstein generation this could be difficult to accept. #3
- Yes, totally. #5

Conclusion: Again, this is a age related fact, young people are curios to try out new things. However in combination with the previous statement, one can say that they are more willing to try out new things. However, this has also the side effect that they are getting bored very quick, if a task is to monotonous and that they lose the focus. This is also an often-mentioned criticism of this generation.

Findings for Generation Y (33 – 48 years old)

Ranked high**: Capable workforce (pragmatism)**

- Yes, I think that is true. But I realized here at Sweco that there is a lack of general project management skills. The managers should be able to bring more structure in a meeting. #1
- Yes, this is a strength of this generation. They work very structured. #2
- Yes. #3
- Yes, this generation is very pragmatic. I think nobody likes regular meetings which are long and excessive with a vague outcome. #4
- I think this generation is very structured. They grew up in the time where the integrated contracts became famous. Therefore, a lot of structure & reports were required and consequently, this generation was getting good in it. #5

Conclusion: Most of the experts believe that this is a generational characteristic of this generation. They also argued that the circumstances of work, which required more reports, more documents, more complexities required more structure. For this reason, they became like that.

Ranked low: Regular **meetings with key stakeholders & Joint Project office**

- I think regular meetings with key stakeholder are a key to get to an result, because we are very client orientated. And I see a trend towards a more virtual communication, people rather write emails than meeting another person in person. Therefore, I think it is very important to emphasize on the importance of this elements. #2
- Yes, that is true. #4

- I dislike regular meetings. I prefer a higher flexibility. But I do think that a joint project office is helpful for a big project. #5

Conclusion: Yes, several experts agreed upon the fact that this generation has a reluctance towards too many meetings. They also understood the desire to have skype meetings or other ways of communicating with each other. However, they also saw that very critical and argued that nowadays many people rather write an email or a what's app instead of having a face-to face conversation. This is especially for Sweco a very important thing to do. Besides, a joint project office however, has been rather accepted and liked.

Ranked high: **Mutual understanding**

- Yes, that is true, but age wise. #1
- Yes, that is true, but age wise. #2
- Yes, that's true. I think We were the first generation who started this. The Baby boomers were not that much into getting to know their colleagues. They had a lot of respect for age. That is different for me. I have respect if a person is skilled. #3
- Yes, I think this is less for older generations. I do not have a strong desire to have much social interaction with my colleagues, but that also depends on which stage in life you are. If you have a family at home, you have different interests. But on the other hand, I think Baby boomers do not have a strong interest in social contacts. #4
- Yes, I think so. #5

Conclusion: Here some people say this is age related, however other said that it is partly generation related. Conversations with older people revealed, that older people in general also tended to get an understanding for their colleagues… But one also has to take into account that they back then simply did not had the opportunities to get to know each other. There were less team building activities and opportunities provided where such getting to know actions can take place.

Ranked low: **Mutual consent on usage of tools**

- Yes that is true. They say: "lat mal gewoon werken", let me work this out by myself. They really value their own way of working and do not like it if somebody else prescribes them what to do. But this is in every age group, the older you get. Younger ones might be more open for change because they are more use to change. #3
- Yes, I think if the Havenbedrijf would tell us all what to do, we wouldn't like it, but again it is difficult to say this is generation specific. #5

Conclusion: This is not generations specific, this is the same for every age group. Everybody is acquiring his own way of working (working style) over the course of the years. The longer you are used to your own working style, the less eager you are to change it.

Findings for Generation X (48 – 63 years old)

Ranked high: **Alignment of goals & Mutual objectives**

- Yeah I think they are rather focused on the results , but probably rather because of their position. #1

- I think this depends on their experience. #2
- Yeah partly true. #3
- Yes, but it depends on the experiences you made (good or bad). Bad for me, this is the basis to keep on going with the rest (and I am also X). #4
- Yes, it is true that some people are very much focused on results, I think also especially from this generation. But it also depends on which role in the project team they have. #5

Conclusion: In general people agreed upon that it is characteristic for this generation to be rather result driven. But they also said this is since they are project managers, and that it strongly depends on the experiences you make. If you have good experiences you prefer the soft factors, however if you are responsible for the outcome, then you need to set the structure right.

Ranked low: **Team building measures & Prior experience with the project team**

- Yes, because they do not need it anymore. #1
- Yes, because they do not need it anymore. #3
- Yeah it fits that they rank Team building low. Same for enhance personal development, but I guess that's also because they are in the end of their career. They already developed quite much, so why should they rank this high. #4

Conclusion: Yes, they rank it low, but only because they do not have a desire for themselves.

Ranked low: **Enhance personal development**

- I think themselves they are not interested in personal development, but they totally promote personal development for younger persons. #3
- Yes they do not need it anymore. #5

Conclusion: Yes, they rank it low, but only because they do not have a desire for themselves.

Overall implications

Ranked High: **Sharing of information, Honest communication, Respect for each other**

- Yes, those statements are perceived important for every one. Communication in a project is the most important thing. On has to trust and respect each other. #1
- Yes, this is the basis.
- Yes, I agree those are the key elements.
- No surprise to find those statements ranked in this position.
- Yes, those aspects are very important.

Conclusion: Those statements are the most important ones, beause everybody perceives them as important.