Increasing Team Collaboration by Implementing Shared Leadership

A case study of the soft-side of project management

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PREFACE

This research is the result of a genuine interest in the way people and projects are managed. This is also related to my fascination for people's behaviour. Thus, how people react in certain situation. And how people deal with changes and other interpretations (different way of thinking) and how this results in a certain kind of behaviour.

My interest in this research subject comes from the work experience I gained when I worked for two years for the electrical engineering company Croon, which had introduced a digital system to manage the maintenance of installations in public buildings. They were the first company to adopt such an innovative system in the maintenance industry in the Netherlands. I followed the introduction of this system within the company from the start. After two years, the outcome of this system had not been assessed with satisfaction, because of not considering the errors and flaws of introducing such a new way of working within a company. The digital system was well thoughtful and optimized but it did not work within the department and for the teams who worked with this system. I started thinking what could be the problem and realized it could be linked to how this entire project is managed. I observed that a successful project is not only related to the content and strategy. An important factor in this is the team that works on it as well and the way it is managed by the responsible managers. I got interested in, how management style is linked to the way a team performs and how leadership styles could be managed to improve team collaboration to get better results. I started looking more in depth into the soft skills of such a team and managers and how this is related to the performance.

The development of this research was at the same time a thrill and a challenge. I enjoyed the journey with all the ups and downs as I learned a lot from the difficult times as well. Therefore, I firstly want to profoundly thank my parents for their abiding support in all my endeavours. Thank you to my brothers and sister for always being very supportive and made the journey fun and inspiring.

That being said, it could not have been concluded without the guidance and support of my supervisors, Jelle Koolwijk and Clarine van Oel. Thanks for sharing your knowledge along the way and your input and being optimistic and enthusiastic about the research. Furthermore, I want to thank my supervisors at the engineering company, Jeroen van Dorst and Daniël Schiffelers. Thank you for guiding me with the practical knowledge and long discussions about the research subject.

I would like to thank all the interviewees and the team members of the two cases, which I have observed within the research. It was through the understanding of different points of view on the discussed subjects that this work came to completion.

Special thanks go to all my friends, who have helped me make a very pleasant journey out of this challenge all the long talks and support are deeply appreciated.

Fatimah Syed
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ABSTRACT

Aim: This research focuses on aims to explore the concept of shared leadership in integrated design teams in the construction branch. The exploration is conducted by addressing the question of whether leadership styles and tasks are solely performed by the project manager of a design team, or whether leadership styles and tasks are also performed by other team member of the design team. The intention is to increase understanding of the interrelatedness of tasks, leadership style and communication using an inductive approach.

Research question: *What are the main tasks that need to be addressed in project teams with Shared Leadership and is the way a task was performed dependent on certain leadership styles?*

Methodology: The concept is explored by using a comparative case study design. Two case studies were executed to collect data. First, the team members and the project manager were interviewed by using a semi-structured interview at the beginning of the research. Second, an observational study is done by observing the design team meetings to identify which members are contributing to shared leadership and could there be tasks and roles recognized on the basis of their behaviour and communication flow. Third, the team members and the project managers were asked to fill in a questionnaire, which are used to understand the interpersonal side of team collaboration.

Findings: Shared leadership can be measured by making observations and applying communication labels as developed during the research. There is not a relationship to be recognized between the formal role of a person and the shown behaviour. Furthermore, Shared leadership is dynamic as it is not linked to specific leadership styles. Furthermore, a new definition of shared leadership appeared from this study: Shared leadership consists of multiple dynamic leadership behaviours to maximize team effectiveness.

Limitations of the research: Qualitative research is always subject to bias due to the interpretation of the qualitative information. Subsequently, the modest number of samples that is investigated in this research are not intended to adequately represent the behaviour and communication flow. To date, this is among the first observational studies to result in an inductive result.

Practical implications: This research raises awareness on the concept of shared leadership and how this is outlined in corresponding tasks. This research recommends to train the project managers in a way where there is an increased focus on the people-oriented approach. Furthermore, reflections on the collaboration process should be built in the standard project checks every month.

Scientific relevance: This research tries to make an addition to the current literature about shared leadership. By introducing specific communicative qualities and link these to tasks performed in teams with shared leadership.

Originality/value: Limited literature is available on the practical implication of shared leadership; this research increases the insight of this concept.

Keywords: *Shared Leadership, leadership style, tasks, multidisciplinary design teams, communication labels.*

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GLOSSARY

Line management
A line manager is a person who directly manages other employees and operations of a business unit while reporting the results to a higher-ranking manager. The main responsibilities are managing employees and resources in pursuit of achieving a specific functional or organizational goal.

Project management
From a traditional point of view the project manager is the person who has the overall responsibility for the successful initiation, planning, design, execution, monitoring, controlling and closure of a project. The project manager is responsible for the contract and scope.

Team
Teams are units of two or more individuals who interact interdependently to achieve a common objective (Baker & Salas, 1992).

Team performance
Team performance is defined as the extent to which a team accomplishes its goals or mission. Because team members interact interdependently in order to be successful, team members must engage in a number of team processes or interdependent acts that convert inputs to outcomes through cognitive, verbal, and behavioural activities directed towards organizing tasks to achieve collective goals (Devine & Philips, 2001).

SUMMARY

Problem statement
Construction project are becoming more complex, as new technology is implemented with complicated systems and new configurations or geometry. Much more work is collaboratively accomplished, which require people to work together across disciplines and other boundaries to accomplish project goals (Edmondson & Lei, 2014). In these design teams, team members work together on an equal basis. The base of equality within teams is important for innovation as well (Crawford et al., 2006).

In this thesis, the focus is on the design team within a construction project. A design team is a group of high educated people with different backgrounds who collaborates to achieve one common goal. This team consists of the following roles: project manager, design manager, architect, lead engineer construction, lead engineer electrical, lead engineer mechanical, lead engineer building physics and lead engineer fire & safety.

Research has shown that creative solutions are mainly found in bottom-up team processes (Bergman et al., 2012). Bottom-up approaches contrast with traditional management. Bottom-up, self-managed teams make more use of the available human capital, and thus contribute to the innovative strength of a company (Crawford et al., 2006). In self-managed teams, there are more team members who may take the leadership role. The latter indicates the occurrence of shared leadership. Shared leadership occurs when two or more members engage in the leadership role of the project team to influence the direct fellow members to maximize team effectiveness (Bergman et al., 2012; Pearce, 2004). In these teams, traditional, top-down project management, where a project manager is in charge of the entire process and social environment, is not applicable. This results in the shift from traditional leadership to a new kind of leadership, and raises the question: what kind of leadership is more appropriate for this new team-based environment? (Pearce & Sims Jr., 2002).

Research aim
This thesis aims to explore the concept of shared leadership in integrated design teams in the construction field. The exploration is conducted by addressing the question of whether in a design team leadership tasks are solely performed by the project manager, or not and what leadership styles were performed by other team members of the design team.

Research question
Much research has been conducted into the differences in general leadership and shared leadership. However, research has mainly focused on the general interpretations of the concept of 'shared leadership'. Furthermore, there is only little exploration of the roles and tasks that are present in shared leadership.

The shift from traditional teams to bottom-up teams and shared leadership brings along a compelling question for (future) project managers. What is left for them in self-managed teams? Project managers are used to target certain tasks and therefore the aim here was to gain insight into the roles that can be distinguished in teams and the way self-managing teams fulfil the required tasks. This resulted in the following:

Main research question:

What are the main tasks that need to be addressed in project teams with Shared Leadership?

Sub-questions:

1. Do team members have specific tasks and are these tasks aligned to specific roles?

2. Is the way a task was performed dependent on a leadership style?

To answer the research question, the following structure is used. First, a theoretical framework is developed which describes the leadership styles and tasks. The concepts from theoretical framework

are used as sensitizing concepts to guide data collection, analysis and guide the observations with design teams who works on complex projects. The data which results from the observations was analysed to identify whether leadership was performed by only one or more than one team member. In addition, an investigation is done on whether specific tasks can be recognized, and whether the leadership roles are persistent over time.

Theoretical framework

All the theory discussed in this chapter has been combined in a theoretical framework summarized in figure I. First, the leadership styles are summarized by their representative behaviours. Second, the leadership styles which were applicable within this research and form shared leadership are combined. Third, characteristics of team functioning are listed. The project team with the project manager and the other team members are the input side (left). The process, which is the central focus of this thesis, will be focusing on shared leadership, the corresponding leadership styles, and how this affects in certain tasks and roles, to identify whether team members have specific roles; whether these roles are aligned to specific tasks in order to analyse whether the way a task was performed depending on a leadership style.

Methodology

A deductive approach is the relationship between theory and research with a top-down logic in which general conclusions are made from the particular. This is reflected in the current research, by using the theory of Pearce and Sims (2002) and Bergman (2012) on shared leadership and leadership styles to frame the theoretical framework and conceptual model. When this research is completed, the possible links between the roles, tasks and shared leadership has been investigated. This resulted in aa addition to the theory of shared leadership, and in this way, a mixture of deductive and inductive reasoning is obtained. The focus in this research, is the implementation of shared leadership and whether it is related to specific roles and tasks. To gain insight in these developments during the case studies, it is important that the researcher witnesses the interactions between the participants of the research.

For this research four different methods will be used: a context analysis, a semi-structured interview, a questionnaire and participant observation. Each of these methods will be used for each of the two selected cases.

Participant observations

During a period of 6 months, data was collected from the cases by participant observations. With this method, a researcher gains access to a group and spends a considerable amount of time with that group with the aim of uncovering its culture. This is done by watching and listening to what people say and do. The observations were recorded with and audio recorder to analyse it afterwards (Bryman, 2012).

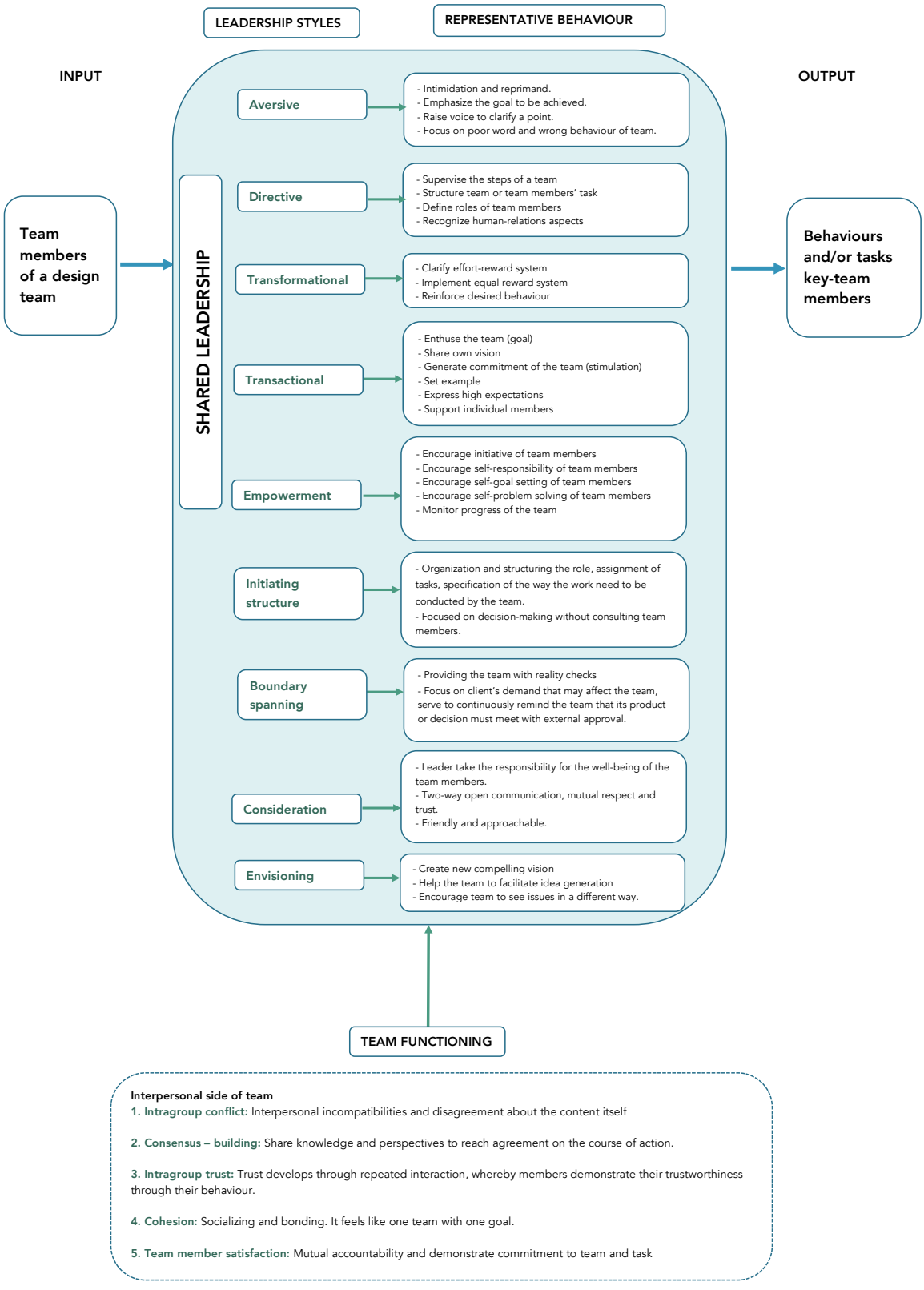


Figure I. Theoretical framework.

The goal of this method was to analyse shared leadership by observing the team members. The data of the observations were used to analyse the communication flow during the project team meetings. The communication flow was structured by applying communication labels by listening to the audio file afterwards.

Cases

Case study 1
Observations of case 1 indicates that the project manager is performing almost all the labels when he joined the meeting, except for fragment four, as this meeting was not attended by the project manager. Furthermore, there is a remarkable difference to be seen between the fragment 2 where the senior project manager has joined the meeting and the other fragments. As in fragment 2 a high amount of performed labels can be seen and more diversity in the performed labels by the team members. Is not just the fact, that the senior project manager is performing all the labels, but also other team members are performing more labels in fragment 2. Moreover, the project manager is performing the labels Reflection, Set goals and Planning relative more in fragment 2 compared to other fragments.

The design manager is performing a high number of communication labels in all the fragments and especially in fragment 4 where the design manager unsurprisingly steered the meeting. It can be noted, that the project manager performed the labels Reflection, Set goals, Ask questions and Take responsibility by decision making in extensively high amount in fragment 4.

Finally, it can be mentioned that engineer constructions performed a high amount and various labels in fragment 2, where the senior project manager joined the meeting, and fragment 4 where the project manager is not present.

Case study 2
Observations of case 2 indicates that the project manager is very open to input from his team and asks a lot of feedback of the team whether he is taking the right direction. This also resulted in the answer of the interview with the engineer mechanical, where he indicates that the project manager contacted him to discuss about the project process and how the project is going. This indicates the project manager reflects on the process outside the design team meetings as well.

It can be concluded that the project manager is verifying his performance by the team members, as he is the third project manager on this project. Verifying his performance is visible in the observations as well as in the project manager performing in a high extent the communication labels Ask for feedback, Ask questions and Reflection.

Main findings
The most important findings within this research are that shared leadership can be measured by executing observations for which communication labels are developed during the research. It can be concluded that there is not a relationship to be recognized between the formal role of a person and the shown behaviour. Furthermore, it can be said that shared leader is dynamic as it is not linked to specific leadership styles. Because certain circumstances, (e.g. the topic to be discussed or the formation of the team) could lead to different kind of behaviour by the team members.

Furthermore, a new definition of shared leadership can be added to the literature. Bergman et al. (2012) defines shared leadership as follows; when two or more members engage in the leadership role of the project team to influence the direct fellow members to maximize team effectiveness. However, from this research it can be concluded that a new definition for shared leadership can be defined as the following: *Shared leadership is a dynamic way of shifting leadership roles which are dominated by behaviours.*

Discussion

Relationship leadership styles, behaviours and communication labels

Leadership styles are connected to leadership behaviours (Pearce & Sims Jr., 2002). These behaviours are derived from theory and are the specific tasks which are related to the leadership styles. By conducting the observations for the two cases, different behaviours and communication labels are identified. The communication labels performed by the team members analysed as "leaders" are placed next to the behaviours of the leadership styles, to identify a relationship. Nevertheless, the observations and the analysis of the interview have shown that a team member cannot be identified with just one leadership style. A team member performs a set of leadership styles. Furthermore, the leadership style can be changed according to the situation at hand.

A leadership style is in particular seen as behaviour that is shown by one person who leads the team (Yukl, 2010). These behaviours are linked to different leadership styles. Bergman, Rentsch, Small, Davenport, & Bergman (2012) and Pearce & Sims Jr. (2002) have categorized the leadership styles with the corresponding behaviours. First, observations in this research have shown that certain behaviours which are linked in theory to a certain leadership style A, are also performed by persons who were identified with leadership style B. Second, a person is not performing only one leadership style, since the situation at hand determines the behaviour of a person. Additionally, the behaviour of a person is also influenced by former experiences and situations. For example, an individual's personality could change when a situation in the past have influenced the wellbeing of a person in a negative way. This leads to a change in approaching situations and controlling the personality in the future to prevent a certain situation from happening again.

Yukl (2010) have classified the leadership styles into three broad categories: task-oriented, person-oriented and change-oriented. This is criticized by Bergman et al. (2012) as frugal. However, the interviews have shown that people simply have knowledge of the categories: person-oriented and task-oriented. It is worth mentioning that classification and categorization of leadership styles and behaviours can use a completely new light on this matter.

It can be assumed that a leadership style reflects the dominant factors of a team member's personality but it is not the complete set of behaviours which a person could perform. Additionally, by following different training programs a person learns skills which can be applied in a position where a team need to be steered. And these tools are not a reflection of the personality but only used when the situation asks for it. Furthermore, leadership styles are not significant for choosing a person to be in the lead. As these leadership styles are not a one-on-one reflection of a person's personality. And the personality plays an important role on which behaviours are visible. As leadership is a dynamic role which cannot be fitted in classifications of styles.

This is supported by the collected data, from which it can be concluded that the team members identified with the same leadership style or a set of leadership styles are not performing the same communication labels. There is no relationship to be recognized between leadership styles, their linked behaviours and communication labels.

Conclusion

The aim of this research was to give an answer on the research question, *'What are the main roles and/or tasks that need to be addressed in project teams with Shared Leadership?'*.

This research has resulted in a new definition of expressing tasks within shared leadership. This is done by developing a set of communication labels which are developed during the observations, whereby these labels were defined as tasks. Furthermore, these communication labels could be addressed as the main tasks of shared leadership whereby some of the communication labels are more dominant than others. The dominance of the communication labels has resulted in the way the team members has performed these labels and the according behaviours. As the behaviour of the team members is the key within the context of shared leadership.

Shared leadership is a context where a different team member steps upfront to take the lead according to the situation at hand. This is related to avoiding hierarchy and where the focus is on people rather than tasks. Focus on people is related to being aware of what the team members are going through, by paying genuine interest to how other people think, what their motives are and that they all feel heard.

The underlying question of this research was to identify the role of the project manager. As the world of building projects is changing because of the increasing complexity of multidisciplinary projects. The complexity of projects results in new technology and complex technical programs. This also results in a change of the role for a project manager. The traditional project manager was used to have checklists for the deliverables. And the checklists were one of the guidelines to steer the project. Today, the use of the BIM tool/technologies requires a different approach. As BIM is much more complex and that requires another decision mechanism.

In the past, changes could be made within the design until the drawings went to the contractor. Using BIM, that is not possible anymore, because certain design decisions should be made at the latest in the final design. And after that phase no changes are possible in the technical design phase. Because BIM cannot implement the changes automatically in an integral way, which means that the effect of a change should be controlled manually. In other words, a design has two phases: conceptualization and development. First, general decisions are made about the concept, then the details are worked out. This is referring to the development phase, which cannot be adjusted anymore, when the execution plan (Dutch: uitvoerings-gereed ontwerp) is sent to the contractor. This requires a different decision-making process by the project manager. That is the reason, this research has tried to put the role of the project manager in a complete new light by focusing on the behavioural side instead of the static classification.

The main conclusion which can be withdraw from this research; within shared leadership there should be a focus on the behaviour of the project manager, in other words, manner of conducting oneself more than the tasks to be done. A behaviour where the team members should be observed to check the wellbeing of the team members and how they are feeling. This can be done by asking questions to these team members. As feeling heard is a factor which increases the commitment of the team. And the commitment of a team will lead to taking responsibility for their own tasks. And that is what shared leadership comes in.

The project manager is not assigned with a specific role or tasks, but with certain behaviour with a larger focus on people-oriented approach. It is important to mention here, that the personality of an individual plays a significant role in this. The communication labels can support to custom the needed behaviour within shared leadership. To manage a fluent process, it is needed to understand Why the team members are taking certain steps. To get that information it is important to ask questions about the What, Why, Who, When and How. By asking these kinds of questions there is interest shown in the person how is doing it and it becomes clear how the different relations are between the team members and their deliverables.

Like I mentioned before, by asking the Why-questions people get the feeling that they are heard and interest is shown in the way things are done. Because that increases the commitment of that person. Because by asking the W-questions and one How-question there is also payed attention whether a person performed an extraordinary job. This is the moment when giving compliments comes along, which is also part of the people-oriented approach. As all the interviews, have shown that the team member experienced getting compliments not that often. Furthermore, this question created a vulnerable moment for the person during the interview, as the person started talking about how the project is experienced from out their sensitivity. This shows, that giving compliments plays an important role within the people-oriented approach as well, because this increases the wellbeing of a person within the team.

By applying shared leadership, team members are encouraged to get the best out of themselves. As they are motivated to take the lead when it is needed. This would stimulate people to show their leadership skills which will also support the project manager and improves the efficiency of the process as well. As shared leadership takes away the hierarchy and motivate the team to step up and take the lead when it is needed. By taking away the hierarchy the team members feel much more comfortable in sharing their opinion based on their expertise. Involving the team members is the key for having a smooth process.

Recommendations

This research has concluded with a positive outlook on increasing team collaboration by implementing shared leadership. As such, there are some recommendations for practice.

First, there are dominant communication labels recognized during the design team meetings, **Reflection, Set goals, Ask questions and Take responsibility by decision making**. The conclusions of these research have shown that the performance of the labels: **Ask questions** and **Set goals** has a relationship with the clarity of the project goals, tasks and roles of the team members. When these labels are observed during the design team meetings, it is recommended to check with the team members whether the project goals are well-defined together with the corresponding tasks. This comes along with applying soft skills to gain this kind of information within the team. No certain order of the communication labels can be implemented as people tend to go back and forth, because a design process is an iterative process

Second, it is recommended to practice and train the soft skills of the team members. This will start by hiring project managers. During the hiring process, there should be more focus on the soft skills of the candidates. These soft skills can be identified by asking specific questions and analysing the answers and the behaviour. As concluded before, these soft skills will play a big role when the candidate is asked to perform a project manager's role. The focus should be on the person's behaviour with other people.

Third, the project managers should be trained differently, currently the project managers are trained with the focus on the task-oriented side of project management. It is recommended to train the people-oriented side of the project management as well. This could be executed by designing the training in a way where role play was performed. Certain situations which occur within a design team meeting can be acted out with for example a team of five people. Where everyone gets a short script. By applying role play the team members are trained to show empathy for their role and other team members. Furthermore, the fictive situations can be used to look at the design team meetings objectively, where the team members are confronted with the situation at hand. Furthermore, the project managers should be trained how to ask *the What, Why, When, Where* and *How*-questions. As this research, have shown that these questions play a big part in the soft side of project management and these questions are needed to gain better insight of the team members. Since interest is shown in the person and it becomes clear how the different relations are between the team members and their deliverables.

Fourth, as the communication label **Reflection** and **Set goals** were performed the most during the observations, it needs more focus during the project process. Projects have an obligatory check every month where among others the planning and budget are checked. It is recommended to include a different category reflection. Where a reflection is executed on the soft side of the project team. When this become obligatory, the team members will get conscious and the importance of the people-oriented side of project management

SAMENVATTING

(Nederlands)

Probleemstelling
Bouwprojecten worden steeds complexer en multidisciplinair. Complex vanwege de implementatie van nieuwe technologie met ingewikkelde systemen. Multidisciplinair in termen van samenwerking van diverse stakeholders, taken en rollen. Dit vereist dat teamleden over hun disciplines heen kijken en de grenzen te verleggen om het overkoepelende doel te bereiken (Edmondson & Lei, 2014).

In deze scriptie lag de focus met name op de ontwerpteams. Een ontwerpteam is een groep van hoogopgeleide personen met diverse expertise achtergronden die samenwerken om een gemeenschappelijk doel te behalen. Dit team bestaat onder andere uit de volgende rollen: projectmanager, designmanager, architect, discipline leider constructies, discipline leider bouwfysica en discipline leider brandveiligheid.

Voorgaande onderzoek heeft aangetoond dat creatieve oplossingen voornamelijk worden ontwikkeld wanneer team processen bottom-up plaatsvinden (Bergman et al., 2012). De leiderschapsrol is anders verdeeld bij zelfsturende teams in tegenstelling tot traditioneel projectmanagement teams. Binnen zelfsturende teams zijn er meerdere teamleden die de leiderschapsrol vertonen. Het laatste wordt tevens aangeduid met gedeeld leiderschap (English: shared leadership). Gedeeld leiderschap vindt plaats indien twee of meer teamleden de leiderschapsrol op zich nemen binnen een projectteam om de andere teamleden zodanig te beïnvloeden om hiermee de team performance te verhogen (Bergman et al., 2012; Pearce, 2004). In zelfsturende teams is er geen sprake van traditioneel projectmanagement waarbij één persoon de leiding heeft over het gehele team het proces en de toebedelende taken. Het voorgenoemde verschijnsel heeft geleid tot een verschuiving van traditioneel leiderschap naar een nieuw soort leiderschap dat de volgende vraag oproept, namelijk 'welk soort leiderschap is geschikt voor de nieuwe vorm van samenwerken?' (Pearce & Sims Jr., 2002).

Doel
Het doel van deze scriptie is, het onderzoeken van het concept gedeeld leiderschap in multidisciplinaire ontwerpteams binnen de gebouwde omgeving. Het onderzoek is verricht door te focussen op de vraag of de leiderschapsrol binnen een ontwerpteam enkel is uitgevoerd door de projectmanager of niet. En zijn er leiderschapsstijlen te herkennen die door andere teamleden zijn uitgevoerd.

Onderzoeksvraag
Er is voorheen veel onderzoek uitgevoerd over de verschillen binnen algemeen leiderschap en gedeeld leiderschap. Echter, lag de focus meer op het algemene begrip 'gedeeld leiderschap'. Bovendien is tot op heden weinig onderzoek verricht naar rollen en taken die zichtbaar zijn binnen gedeeld leiderschap.

De verschuiving van traditionele teams naar bottom-up teams en gedeeld leiderschap brengt de volgende vraag met zich mee, 'hoe ziet de rol van de projectmanager eruit?'. Projectmanagers zijn namelijk vanuit het verleden gewend om taken te delegeren. Voortvloeiend hieruit is het doel van dit onderzoek geweest om inzicht te verkrijgen in de rollen die kunnen worden onderscheiden binnen teams en welke taken er worden vervuld door zelfsturende teams. Dit heeft geleid tot de volgende onderzoeksvraag:

Onderzoeksvraag:

Wat zijn de belangrijkste taken die binnen projectteams met gedeeld leiderschap worden vervuld?

Deelvraag 1:

Zijn er specifieke taken te herkennen bij de teamleden en zijn deze gekoppeld aan specifieke rollen?

Deelvraag 2:

Is er een koppeling te herkennen tussen de invulling van de taken en leiderschapsstijlen?

Om een antwoord te geven op de onderzoeksvraag is gebruik gemaakt van de volgende structuur. Als eerste is een theoretisch raamwerk ontwikkeld. De hieruit voortvloeiende concepten zijn gebruikt om data te verkrijgen en te analyseren. Vervolgens zijn er twee casussen geobserveerd, verkregen door een engineering en projectmanagement adviesbureau. De data die is verkregen door observaties is geanalyseerd om te herkennen of de leiderschapsrol door één of meerdere personen is uitgevoerd. Verder is er onderzocht of er specifieke taken te herkennen zijn en of de leiderschapsrollen veranderen in verloop van tijd.

Theoretisch raamwerk

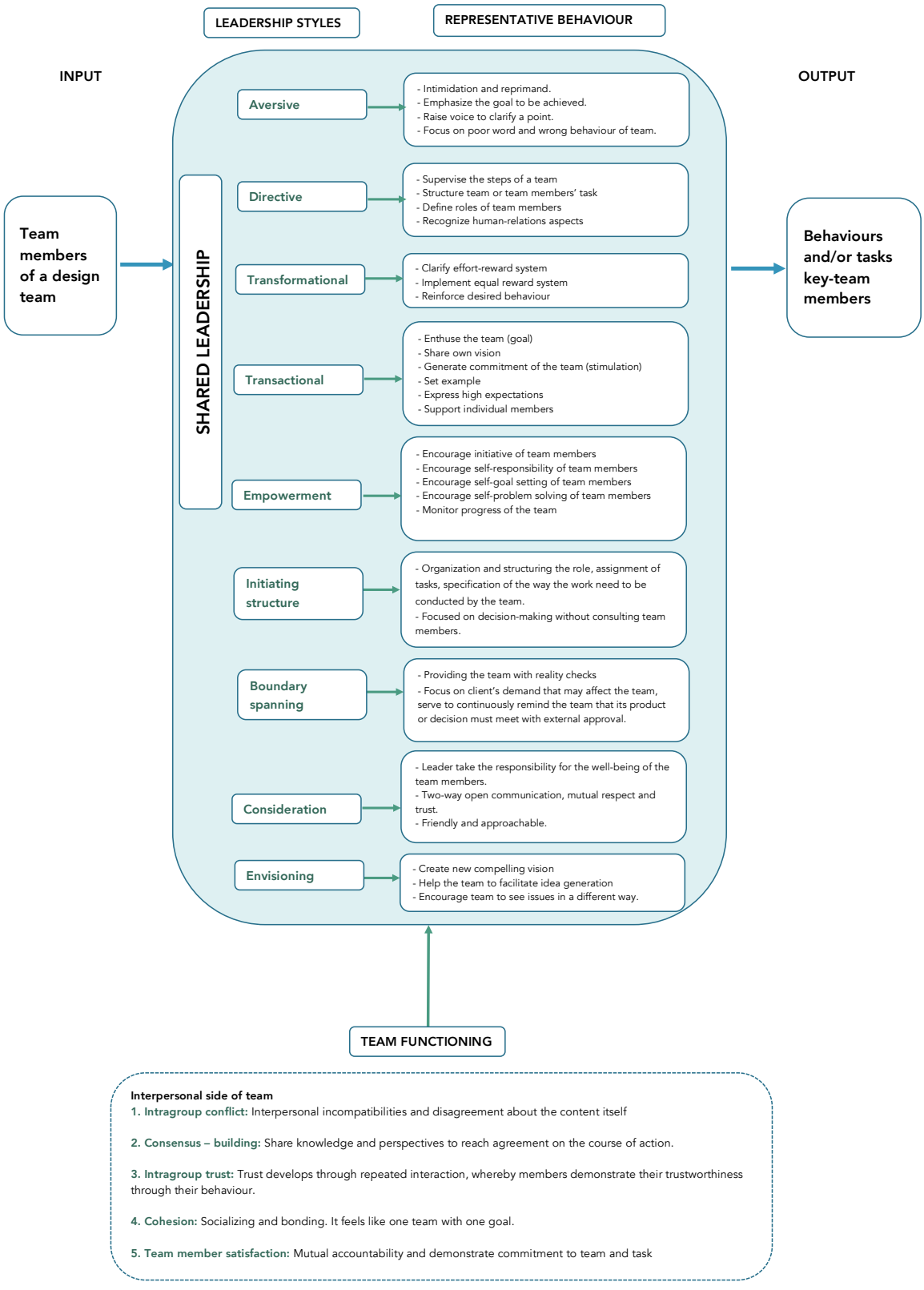
Als eerste zijn de diverse leiderschapsstijlen met de bijbehorende gedragingen afgeleid vanuit de theorie. Ten tweede, zijn de leiderschapsstijlen gecategoriseerd die bij gedeeld leiderschap horen en gebruikt binnen dit onderzoek. Ten derde, zijn de karakteristieken omschreven die het functioneren van een team omschrijven vanuit een zachte kant. Hieronder weergegeven in figuur I.

Het projectteam met de projectmanager en de teamleden zijn geplaatst aan de input-zijde (links). Het proces, de focus binnen dit onderzoek, was gericht op gedeeld leiderschap en de bijbehorende leiderschapsstijlen en hoe dit resulteert in de taken en rollen. Verder is er getracht om de specifieke rollen te herkennen en of deze rollen zijn gerelateerd aan specifieke taken en of deze afhankelijk zijn van bepaalde leiderschapsstijlen.

Methodologie

In dit onderzoek is er gebruik gemaakt van een deductieve aanpak; de relatie tussen theorie en onderzoek waarbij algemene conclusies worden afgeleid vanuit het bijzondere. Het hiervoor genoemde is uitgevoerd door gebruik te maken van de theorie van Pearce en Sims (2002) en Bergman (2012) over gedeeld leiderschap en leiderschapsstijlen om een theoretisch raamwerk en conceptueel model te vormen. Er is getracht om met dit onderzoek aan te tonen welke mogelijke relaties er bestaan tussen de rollen, taken en gedeeld leiderschap. Dit heeft geleid tot een nieuw toevoeging aan de bestaande theorie over gedeeld leiderschap, waarbij een samenstelling van deductief en inductief redenering is verkregen

De volgende vier methodes zijn uitgevoerd om data te verkrijgen: een context analyse, een semi-gestructureerd interview, een vragenlijst en observaties. Iedere methode is toegepast op de twee cases die zijn aangereikt door een engineering en projectmanagement adviesbureau.



Figuur I. Theoretical framework.

Observaties
Gedurende 6 maanden is er data verzameld door middel van observaties. De observaties zijn verricht door te kijken naar de gedragingen van de teamleden en te luisteren naar de communicatie. Vervolgens zijn de observaties opgenomen door middel van een audio recorder om de communicatiestroom achteraf te analyseren (Bryman, 2012). De data van de observaties zijn gebruikt om de communicatie labels te vormen.

Conclusie
Het doel van dit onderzoek was; een antwoord geven op de onderzoeksvraag, *'Wat zijn de belangrijkste taken die binnen projectteams met gedeeld leiderschap worden vervuld?'*.

Dit onderzoek heeft geresulteerd in een nieuwe definitie om de taken van gedeeld leiderschap uit te drukken door de ontwikkeling van communicatie labels. Deze communicatie labels zijn ontwikkeld gedurende de observatie door de gedragingen te observeren en zijn vervolgens uitgedrukt als taken. De gedraging vormen de sleutel binnen het kader van gedeeld leiderschap. Gezien gedeeld leiderschap optreedt indien teamleden de leiding nemen afhankelijk van de situatie op dat moment. Hierbij wordt de hiërarchie buiten beschouwing gelaten en is de focus op de personen en gedragingen in plaats van de taken. Focus op de persoon is gerelateerd aan het bewust zijn wat teamleden op dat moment of in die projectfase mee maken. De bewustwording van het hiervoor genoemde vindt plaats door oprecht interesse te tonen hoe teamleden denken, wat de achterliggende motieven zijn en dat teamleden zich gehoord voelen.

De onderliggende vraag bij dit onderzoek was de rol van de projectmanager. Door de complexiteit van projecten, de komst van BIM, wordt tevens de rol van de projectmanager op de proef gesteld en ondergaat deze rol een verandering. Deze verandering resulteert in de verschuiving van traditioneel management naar zelfsturende teams. De traditionele projectmanager was gewend om met checklists te werken. Door de complexiteit van BIM wordt een diverse aanpak van de projectmanager vereist dat tevens resulteert in een ander besluitvormingsproces vereist.

Vroeger konden wijzigingen in het ontwerp worden doorgevoerd tot en met de bestekfase. Door het gebruik van BIM is dit niet meer mogelijk, want per ontwerpfase worden de wijzigingen doorgevoerd. Dit houdt in dat wijzigingen in een andere ontwerpfase niet automatisch en integraal worden meegenomen.

De belangrijkste conclusie die uit dit onderzoek uit voortkomt, is dat de focus zich heeft verplaatst van taak-georiënteerd naar persoons-georiënteerd leiderschap. Persoons-georiënteerd wordt gedefinieerd als de focus op het gedrag dat resulteert in het observeren van gedrag van de teamleden. Dit kan worden gedaan door de juiste vragen stellen. Indien teamleden zich gehoord voelen, zullen zij meer commitment en toewijding tonen naar het project toe. Het stellen van de juiste vragen gaat gepaard met het begrijpen waarom het teamlid een bepaald besluit of stap neemt. Deze informatie kan worden verkregen door middel van de *Waarom-, Wat-, Wanneer-, Wie-* en *Hoe*-vragen te stellen. Door deze vragen te stellen wordt gedemonstreerd dat oprechte interesse wordt getoond in het teamlid en waarom het teamlid bepaalde handelingen doet en hoe dit vervolgens leidt tot bepaalde samenwerkingen tussen de diverse disciplines en de hieruit voortvloeiende producten. Het voorgaande leidt tevens tot de conclusie dat het geven van complimenten hierin een grote rol speelt. Namelijk, wanneer er oprecht interesse wordt getoond in de teamleden zal er tevens aandacht worden geschonken aan de prestaties die een compliment verdienen. Complimenten leiden tot motivatie om het beste uit de teamleden te halen. Indien dit laatste gaat plaatsvinden, zullen teamleden ook gemotiveerd worden om de verantwoordelijkheid nemen en afhankelijk van de situatie naar voren te stappen. Dat laatste schetst de aanleiding hoe gedeeld leiderschap kan optreden binnen zelfsturende teams.

Aanbevelingen
Uit dit onderzoek zijn een aantal aanbevelingen naar voren gekomen die in de praktijk kunnen worden toegepast.

1. Er zijn dominante communicatie labels herkend binnen de ontwerpteam vergaderingen gedurende de observaties**, Reflection, Set goals, Ask questions** and **Take responsibility by decision making**. Uit het onderzoek is naar voren gekomen dat de labels **Ask questions** and **Set goals** een relatie hebben met helderheid van de doelen, taken en rollen. Indien de hiervoor genoemd twee labels veelvuldig worden geobserveerd, dient er te worden gecontroleerd bij de teamleden of de projectdoelen wel duidelijk gedefinieerd zijn met de bijbehorende taken. Het nagaan bij de teamleden gaat gepaard met het inzetten van de soft skills.

2. De soft skills van projectmanager dienen te worden getraind. Dit proces begint bij het aannemen van nieuwe kandidaten. Gedurende de sollicitatieprocedure is het van belang dat er meer nadruk wordt gelegd hoe de omgang is tussen de kandidaat en andere personen. De soft skills van een kandidaat kunnen tevens worden geïdentificeerd door te analyseren hoe antwoord wordt gegeven op specifieke vragen. De focus moet liggen op de gedragingen die de soft skills uitdragen.

3. De projectmanagers dienen op een andere manier getraind te worden. Waarbij het niet enkel van belang is dat de focus ligt op de menselijke kant van het sturen van een team, maar ook de manier waarop de trainingen worden gegeven. Zo kunnen de trainingen worden opgezet waarbij een rollenspel wordt uitgevoerd. Hiermee kan worden aangetoond wat voor situaties de teamleden ervaren gedurende de ontwerpteam vergaderingen. Verder is het belangrijk dat projectmanager leren hoe zij de *Waarom-*, *Wat-*, *Wanneer-*, *Wie-* en *Hoe*-vragen kunnen stellen en in wat voor context. Want door deze vragen te stellen wordt er aangetoond dat er interesse wordt getoond in de teamleden en ontstaat er een beter begrip tussen de teamleden en de projectmanager en over de producten die horen te worden opgeleverd.

4. Projecten dienen vaste reflectie momenten op te nemen in de verplichte controle fase die maandelijks plaatsvindt. Een reflectie die zicht richt op het samenwerkingsproces tussen de teamleden en tevens een moment om duidelijk te hebben of de projectdoelen helder zijn bij iedere teamlid.

INTRODUCTION 1

This section provides the background of a research proposal by defining a problem statement, the research aim and a set of research questions.

1.1 Problem statement

Construction project are becoming more complex, as new technology is implemented with complicated systems and new configurations or geometry. Much more work is collaboratively accomplished, which require people to work together across disciplines and other boundaries to accomplish project goals (Edmondson & Lei, 2014). In these design teams, team members work together on an equal basis. The base of equality within teams is important for innovation as well (Crawford et al., 2006).

In this thesis, the focus is on the design team within a construction project. A design team is a group of high educated people with different backgrounds who collaborates to achieve one common goal. This team consists of the following roles: project manager, design manager, architect, lead engineer construction, lead engineer electrical, lead engineer mechanical, lead engineer building physics and lead engineer fire & safety.

Research has shown that creative solutions are mainly found in bottom-up team processes (Bergman et al., 2012). Bottom-up approaches contrast with traditional management. Bottom-up, self-managed teams make more use of the available human capital, and thus contribute to the innovative strength of a company (Crawford et al., 2006). In self-managed teams, there are more team members who may take the leadership role. The latter indicates the occurrence of shared leadership. Shared leadership occurs when two or more members engage in the leadership role of the project team to influence the direct fellow members to maximize team effectiveness (Bergman et al., 2012; Pearce, 2004). In these teams, traditional, top-down project management, where a project manager is in charge of the entire process and social environment, is not applicable. This results in the shift from traditional leadership to a new kind of leadership, and raises the question: what kind of leadership is more appropriate for this new team-based environment? (Pearce & Sims Jr., 2002).

1.2 Research aim

This thesis aims to explore the concept of shared leadership in integrated design teams in the construction field. The exploration is conducted by addressing the question of whether in a design team leadership tasks are solely performed by the project manager, or not and what leadership styles were performed by other team members of the design team.

1.3 Research question

Much research has been conducted into the differences in general leadership and shared leadership. However, research has mainly focused on the general interpretations of the concept of 'shared leadership'. Furthermore, there is only little exploration of the roles and tasks that are present in shared leadership.

The shift from traditional teams to bottom-up teams and shared leadership brings along a compelling question for (future) project managers. What is left for them in self-managed teams? Project managers are used to target certain tasks and therefore the aim here is to gain insight into the roles that can be distinguished in teams and the way self-managing teams fulfil the required tasks. This results in the following:

Main research question:

What are the main tasks that need to be addressed in project teams with Shared Leadership?

Sub-questions:

1. Do team members have specific tasks and are these tasks aligned to specific roles?
2. Is the way a task was performed dependent on a leadership style?

To answer the research question, the following structure is used. First, a theoretical framework is developed which describes the leadership styles and tasks. The concepts from theoretical framework

are used as sensitizing concepts to guide data collection, analysis and guide the observations with design teams who works on complex projects. The data which results from the observations was analysed to identify whether leadership was performed by only one or more than one team member. In addition, an investigation is done on whether specific tasks can be recognized, and whether the leadership roles are persistent over time.

THEORETICAL FRAMEWORK 2

This section provides a literature review of the relevant academic sources on the theme and specific topics that follow the research questions. The literature review is closed with a theoretical framework.

2.1 Integrated project teams

Today's project management environment is getting complex and multidisciplinary in terms of different stakeholders, tasks and interrelations between team members.

The traditional structured project management approach is a method in which managers plan each aspect of a design after another, allowing different tasks to be accomplished separately by specialists in separate phases, linking specialists at crucial moments. This has become too time consuming and lacks integration of the different fields (Edmondson and Nembhard, 2009). It has become too complex for one single project manager, to comprehend all different aspects of the design and to see all possible trade-offs that are needed or can be made. As a result, the need of specialized professionals to collaborate more closely together from the early design phases has increased the last decades. Where success depends on effectively integrating the knowledge of skilled professionals in complex environments, it is becoming increasingly inconceivable that a single vertical leader will possess all the knowledge, abilities and skills required to carry out all the leadership behaviour necessary for overall team effectiveness. A team's performance may depend on its ability to settle on the leadership skills of its members. Members must emerge as leaders as they are needed, when their relevant skills, knowledge, and expertise are required by the team according to the relevance of the task or situation at hand.

2.1.1 Collaboration model - integrated project teams

Integrated project management means that the owner, the architect or engineer and the contractor all functioning as a collaborative team to design and construct the project (Pishdad-Bozorgi & Beliveau, 2016).Team members in a successful collaborative construction project are, "…equally committed to a common purpose, goals and a working approach for which they hold themselves mutually accountable" but also "deeply committed to one another's personal growth and success" (Katzenbach & Smith, 1993).

Integrated project management differs from traditional project management by sharing risks and rewards, responsibilities and liabilities by the means the project is organised and steered. The collaboration model within integrated project management has the incentive to accomplish goals by the project team which are best for the entire project, rather than what is best for the individual stakeholders. The core team members manage and share the risks (costs and time of completion) in the outcome of the project. For example, under a traditional project management, the team members may use the maximum period allowed for their tasks under their concerning contracts for individual benefit (Kent & Becerik-Gerber, 2010). However, in integrated project management, all team members gain an incentive, to perform quickly for the best of the overall project performance. Furthermore, the schedules are not solely developed by the project manager, but jointly developed by the core team members. This in turn results in a more flexible schedule, and adjustments could be made later in the process if required. There is two-way communication between

different team members, instead of the project manager leading the design team meetings. Which allows the team members to solve problems together internally when they arise. The project deliveries are planned for every week and frequent discussed in daily stand-up meetings where the work of yesterday is discussed and the plan of today. Additionally, the ownership is shared within the entire project team.

Integrated project teams require another steering approach then top-down management, where one project manager leads the entire project. This leads to shared leadership where project teams are self-managed. It needs to be researched how shared leadership is related to the collaboration of the team and whether the team will perform better by bottom-up steering.

2.2 Leadership styles – Top - down management

Several studies have shown that the leadership style is critical to project success. Throughout decades, several leadership styles are developed for project managers in an attempt to achieve the goals of a project (Yang, Huang, & Wu, 2011). A leadership style is in particular seen as a behaviour that is shown by one person who leads the team. However, in recent years, more understanding of shared leadership has emerged. The concept of shared leadership is a phenomenon whereby leadership roles and influence are distributed among members (D'Innocenzo, Mathieu, & Kukenberger, 2016). This form of shared leadership is particularly applicable in teams where experts from different backgrounds work together to achieve a goal. Teams with members from different backgrounds and expertise are also known as heterogeneous teams (S. Mohammed & Dumville, 2001), where team members need each other to reach a common goal. In such teams a mental model will develop, which includes shared representations of tasks, equipment, working relationships, and situations (S. Mohammed & Dumville, 2001)

A lot of research on leadership is done from a functional approach where the leader's main job is to do or get done anything which is not being adequately handled for group needs. This approach requires the leader to be effective if there is ensured that all functions, critical to the task and team, are completed (Burke et al., 2006). However, this does not imply that the leadership position should be accomplished by a single person, because leadership roles may be distributed throughout the team.

Fleishman et al. (1991) identified a classification system for leadership behaviour, which can be divided into two categories: those dealing with task accomplishment (task-focused) and leaders which facilitate team interaction and development (person-focused). Task-focused behaviour relates to leaders who facilitate the understanding of task requirements, operating procedures, and the acquiring task information. Person-focused leaders are those who provide behavioural interaction within the team and with the leader, cognitive structures, and attitudes that must be developed before members can work effectively as a team (Fiore et al., 2010).

In the literature, different leadership styles can be distinguished. The most important leadership styles and their characteristics will be further explained.

Aversive – Leadership style

An aversive leader uses a top-down approach to force others to comply. This leadership style includes bullying behaviour such as, threats, intimidation, reprimand and punishment. By applying the aversive leadership style, the leader is shown to mainly focus on the poor work and wrong behaviour of the team members.

Arvey and Ivancevich (1980) described the aversive leadership behaviour that primarily relies on coercive power and emphasizes punishment. Punishment in this context is described as the presentation of an aversive event or the removal of a positive event following a response which decreases the frequency of that response (Kazdin, 1981). If a situation happens or a behaviour occurs that is not desired, a penalty could help in preventing this to occur again.

Directive – Leadership style

The directive leadership behaviour describes leadership that primarily relies on position power, which has at times been referred to as legitimate power (Pearce et al., 2003). Directive leadership also relies on coercive power. This includes giving the team direction, commands and assign goals. The position of authority is used to guide the team in a kind way, but still top-down, expressing leadership through directions and instructions. Sims et al. (2009) states that this leadership style mainly emerges when the goals of the team are clear and the leader has considerable more experience than the other team members. In this situation, short-term goals, learning and compliance are more important than the team members' development.

Transactional – Leadership style

The three dimensions of transactional leadership are contingent rewards, management by exception-active, and management by exception-passive (Burke et al., 2006). Contingent reward is the degree to which the leader sets up constructive transactions with their team members. Transactional leaders create clear structures that clarifies what is expected of their team and establishes rewards for meeting these expectations. Management by exception is the degree to which the leader takes corrective actions based on the results of the team performance. Management by exception-active implies that the leader is active and will take intervention by monitoring the behaviour of the team member, anticipate problems and take corrective actions before the specific behaviour will escalate and create serious problems. Management by exception-passive implies that the leader will take action after the behaviour of the team member has created a problem (Judge & Piccol, 2004).

Transformational – Leadership style

The four dimensions of transformational leadership are charisma, inspirational motivation, intellectual stimulation and individualized consideration. With charismatic behaviour, the leader shows strong conviction of his decision, take stands and appeal to the team members on an emotional level. Inspirational motivation is having a clear vision that is appealing and motivates the team to work together towards a common goal. A leader with inspirational motivation which challenges the team with high standards, communicate in an optimism way about future goal achievement and provide meaning for the task at hand. Intellectual stimulation, means that the leader challenges the team to come up with new ideas and stimulate and encourage the team to be creative in finding solutions. Individualized consideration is the level of support and coaching, listening to the individuals' concerns and needs within the team (Aga, Noorderhaven, & Vallejo, 2016; Judge & Piccol, 2004).

Empowerment – Leadership style

Empowerment is defined as the act of giving the team the opportunity to make workplace decisions by expanding their autonomy in decision making and giving supporting tools. (Nauman, Mansur Khan, & Ehsan, 2010) . Furthermore, empowerment has often been referred to breaking down the hierarchical structure of managing a team. The leader is considering suggestion of team members and solve problems based on consultations and joint discussions. By offering the team members to share their ideas it influences the other team members as well, which increase the willingness to contribute and promoting team members to be proactive, where a leader create mutuality (Buengeler, Homan, & Voelpel, 2016).

Characteristic for empowering leadership is that the leader does not give out orders, but encourages initiative, self-responsibility, self-confidence, goal orientation, positive opportunity thinking and self-problem solving (Sims et al., 2009). It is the leader's challenge to let team members discover their own potential by taking the responsibility of decision making and determine the tasks. Empowerment gives the team member freedom to accomplish the project goals. This style could be summarized as "the leader leads others to lead themselves''.

2.3 Additional leadership behaviours

Together with the leadership styles, different behaviours are distinguished. These are additional behaviours which were performed by leaders. These behaviours and their characteristics will be further explained.

Initiating structure - Behaviour

Initiating structure behaviours are task-oriented (Barry, 1991) and are aimed at increasing efficiency and coordination among team members. Initiating structure consist of two sub-divisions: directive and autocratic leadership. This includes organization and structuring the role, assignment of tasks, specification of the way the work need to be conducted by the team members toward achievement of the team's goal (Keller, 2006). Moreover, this leadership style consists of making decisions without consulting team members. Initiating structure is mainly oriented towards task accomplishment on the long-term and keep the team on details and deadlines (Burke et. al., 2006).

Boundary spanning - Behaviour

Boundary spanning involves scanning the environment and collaborating with others outside the team to gain information by negotiating resources which can used in their own team. Spanning behaviours that occur within the team, help members to develop a common understanding of the needs and demands of the client (Bergman et al., 2012; Burke et al., 2006). Behaviours such as providing the team with reality checks and focusing attention on the clients demand that may affect the team, serve to continuously remind the team that its product or decision must meet with external approval (Bergman et al., 2012).

Consideration – Behaviour

Consideration behaviours are relations-oriented and involve developing and maintaining the socio-psychological functioning of the team (Barry, 1991). The extent to which a leader takes the responsibility for the well-being of the team members. This leadership is characterised by two-way open communication, mutual respect and trust being friendly, supportive, respectful and generally showing concern for the team and their needs of the employee (Burke et al., 2006). By being friendly and approachable as a leader and treat the team members as his/her equally by monitor the team's energy levels and emotional states (Burke et al., 2006). Furthermore, consideration behaviours include resolving conflicts, providing encouragement and ensuring that all members' opinions are heard (Bergman et al., 2012).

Envisioning - Behaviour

Envisioning behaviours are oriented towards change in terms of improving strategic decisions, how the team members adapt to changes and fostering commitment to goals (Barry, 1991). Such envisioning leaders create new compelling visions that help the team to facilitate idea generation, define their all overall project goals and encourage other team members to view issues in a different way. They draw others into the envisioning process and foster group ownership of central ideas (Bergman et al., 2012).

2.4 Shared leadership

Shared leadership means that, two or more members engage in the leadership of the team to influence the direct fellow members to maximize team effectiveness (Bergman et al., 2012; Pearce, 2004).

Empirical research suggests that shared leadership is an important predictor of effective team outcomes. Pearce et. al (2004) demonstrated that shared leadership team effectiveness was higher in teams with shared leadership than traditional vertical leadership.

Shared leadership is leadership that is broadly distributed within the team, such that people within a team lead each other. Leadership was performed by key team members which is not formally defined. Depending on the individuals' behaviours the core team members are defined. Thus, the leadership styles were performed by different individuals within the team.

This requires a better understanding of the roles and tasks of the team itself. Therefore, in addition to the formal appointed leaders that are frequently seen as the main leader, the team itself is an important potential source of leadership too (Bergman et al., 2012).

According to the literature, shared leadership could be defined by the following four leadership styles: Directive, Transformational, Transactional and Empowerment. The mentioned leadership styles includes the skills and characteristics which are described in the literature as elements of shared leadership (Bergman et al., 2012).

The difference of leadership styles and additional behaviours which is visible in table 1 is not significant. However, shared leadership has wide variety of behaviours which can be appeared

2.5 Summary leadership styles

Table 1 provides an overview of the leadership styles and behaviours mentioned before. Furthermore, the categorization whether the respective leadership style belongs to a task-focused or person-focused leadership style. This research will focus on the leadership styles: directive, transactional, transformational and empowerment. Because former studies have shown that Aversive leadership style is not performed a lot at present (Pearce & Sims Jr., 2002).

	#	Leadership style	Representative behaviours	Task focused	Person focused
LEADERSHIP STYLES	1	Aversive	- Intimidation and reprimand. - Emphasize the goal to be achieved. - Exercising coercive power. Occasionally raise voice to clarify a point. - Focus on poor word and wrong behaviour of team. - Low flexibility within the team, resistance from the team dissatisfaction which can lead to unsatisfactory results.		
	2	Directive	- Give the team direction, instructions and commentary on a friendly way. - Controlling and rigid approach for obtaining deliverables. - Distribution of tasks and responsibilities of the individual team members. - Leader has more experience than other team members.		
	3	Transactional	Contingent reward: leader clarifies what is expected from team → reward if expectations are met. - The result of a good performance, will repeat itself when the team member gets a compliment for his/her performance. - Unwanted behaviour is influenced by reinforcing desired behaviour. A team member is accountable for his / her good performance to compensate for the weaker sides.		
	4	Transformational	- Display charismatic and exemplary behaviour. - A clear vision (think in new possibilities) and communicate this in a motivating and inspiring way to the team to enthusiasm them to work together toward a common goal. - Strong conviction by decision-making. - High expectations set for performance and focus on goal achievement. Support and encouragement. Focus on the personal side and development of team members. - More focus on mutual understanding and respect.		
	5	Empowerment	- Encourage the team to autonomously come up with solutions by not giving orders - Encourage collaboration within the team. - Encouraging self-development of individuals teammates. - Set independent goals and achieve them. - Let the team develop its own potential.		
BEHAVIOURS	6	Initiating structure	- Organization and structuring the role, assignment of tasks, specification of the way the work need to be conducted by the team. - Focused on decision-making without consulting team members.		
	7	Boundary spanning	- Providing the team with reality checks - Focus on client's demand that may affect the team, serve to continuously remind the team that its product or decision must meet with external approval.		
	8	Consideration	- Leader take the responsibility for the well-being of the team members. - Two-way open communication, mutual respect and trust. - Friendly and approachable.		
	9	Envisioning	- Create new compelling vision - Help the team to facilitate idea generation - Encourage team to see issues in a different way.		

Table 1. Representative behaviour of leadership styles and categorization in task focused and person focused.

2.6 Leader and follower

A team member can be classified as a *leader* or *follower* based on their behaviour. In professional practice, it is thought that the difference between a leader and a follower is characterized by the one who talks the most and thus stands out. However, the literature has a different view on this.

Wang et al. (2016) sets out the personality as the main factor which defines a person in a leader or follower. This is not about being shy, modest or being a calm person, but about having a proactive or passive personality. The latter refers to one's behavioural tendency to take action to influence their environment. Leaders seek to improve the current circumstances and identify opportunities and act on them, show initiative, take action and stay persistent until meaningful changes occur. On the other hand, followers are described as people with a passive personality who do not challenge the status quo, do not try to identify opportunities and show a little initiative. Followers only take action within their own task and are satisfied with the decisions which are made by other people within the team.

Coding	
Leaders	**Followers**
Proactive personality: tendency to take action to influence their environment	*Passive personality: passively adapt to their work environment*
Actions	
- Improve current circumstance	- Do not change status quo
- Identify opportunities and act on them	- Do not try identify opportunities
- Show initiative	- Show little initiative
- Take action	- Only take action in their own task
- Persevere until meaningful changes occur	- Agree with decisions making of team

Table 2. Characteristics for leaders and followers (Zhang, Wang, & Shi, 2012).

2.7 Team functioning

Team functioning emphasizes the interpersonal side of the team. As the interpersonal characteristics of a team influences the way how team members work together and how this impacts the outcome of a project.

The relationship between shared leadership and intermediate team processes may delineate how shared leadership impacts the interpersonal team processes. Exploring intermediate team processes, such as intragroup conflict, consensus building and emergent states, such as trust, cohesion and satisfaction will contribute to an understanding of the effects of shared leadership on teams and their behaviour and their performance of the concerning tasks. Team collaboration consists of the following characteristics and is based on Bergman et al. (2012):

2.7.1 Characteristics of team functioning

1. *Intragroup conflict* has two dimensions; socio-emotional dimension and a task dimension. The socio-emotional dimension involves interpersonal compatibilities and have been associated with reduced productivity and satisfaction, because it reduces the ability to reach consensus and thus decreases decision-making quality

Task dimension involves disagreement about the task itself which is negatively related to performance, because if affects the way team members work. Misinterpretations, through poor communication are thought to be one of the core reasons for the development of conflicts. Team members may interpret the behaviours

and communications, which are needed to integrate different ideas, in a different manner than it is meant. In turn, new ideas or adaptations by other team members, may be interpreted as personal criticism or rejection.

2. *Consensus-building*. Team members must share and integrate diverse knowledge and perspectives from their expertise and eventually reach agreement on the best course of action. Consensus does not always directly relate to the decision quality, but consensus among team members within a project team is the final decision which will benefit project success.

3. *Intragroup trust.* Trust develops through repeated interaction in which team members demonstrate their trustworthiness through their behaviour. If a team member is willing to share power and responsibility, he is signalling trust in someone else. Increase of trust is thought to positively influence participative decision-making. In addition, trust is underlying the power of decision making with the team at large.

4. *Cohesion* is defined as the tendency for a team to be in unity while working towards a common goal with satisfying the emotional needs of its members. It is the degree to which the individual team members want to contribute to the team's ability to continue as a functioning working unit. Cohesion will lead to interaction between team members and socialization.

5. Team member satisfaction refers to the affective reactions of the individual members to their experiences within the team, the way the process of the project is experienced and how working with other team members is accomplished. This will result in mutual accountability and demonstrate commitment to team and task.

Team functioning	**Related tasks/actions**
1. Intragroup conflict	Interpersonal incompatibilities and disagreement about the content itself
2. Consensus-building	Share knowledge and perspectives to reach agreement on the course of action.
3. Intragroup trust	Trust which develops through repeated interaction, whereby members demonstrate their trustworthiness through their behaviour.
4. Cohesion	Socialization and bonding. It feels like one team with one goal.
5. Team member satisfaction	Mutual accountability and demonstrate commitment to team and task

Table 3. Characteristics of team functioning (Bergman e.a., 2012).

2.8 Theoretical framework

All the theory discussed in this chapter has been combined in a theoretical framework summarized in figure 1. First, the leadership styles are summarized by their representative behaviours. Second, the leadership styles which were applicable within this research and form shared leadership are combined. Third, characteristics of team functioning are listed. The project team with the project manager and the other team members are the input side (left). The process, which is the central focus of this thesis, will be focusing on shared leadership, the corresponding leadership styles, and how this affects in certain tasks and roles, to identify whether team members have specific roles; whether these roles are aligned to specific tasks in order to analyse whether the way a task was performed depending on a leadership style.

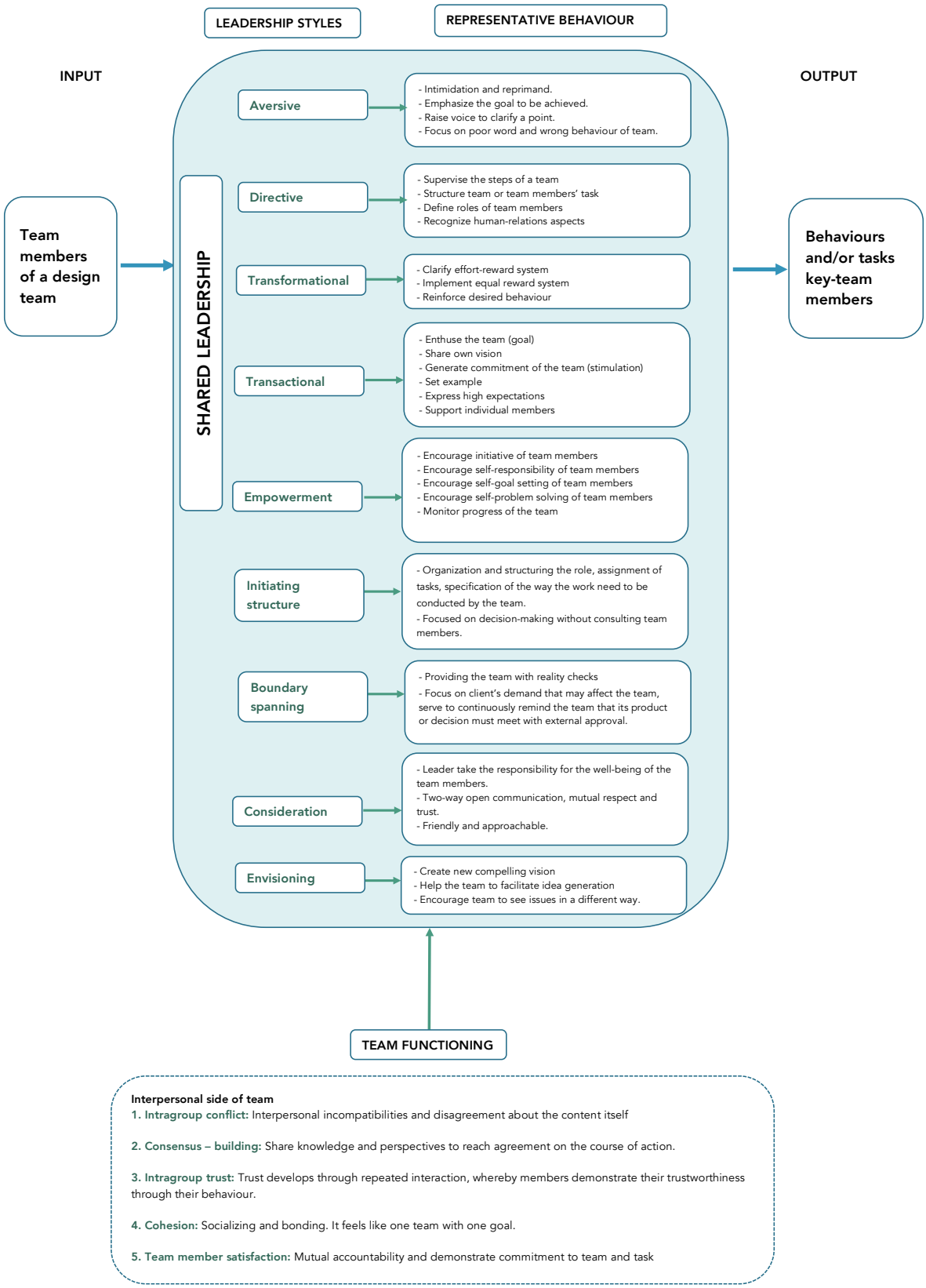


Figure 1. Theoretical Framework (illustration by author).

METHODOLOGY 3

This chapter describes the design of the qualitative research. First, the research strategy will be explained by elaborating the research and the theory. Subsequently, the research design will be explained which defines the framework in which the research has been done and the data was collected. This will be followed by the different research methods which will make it possible to collect the relevant data. Finally, a short description will be given on how the data will be processed.

3.1. Qualitative research strategy

Bryman (2012) describes, qualitative research emphasizes words rather than quantification in the collection and analysis of data. In this research the focus will be on the roles and tasks related to shared leadership and the influence of the leadership styles, implemented by the project managers and collaborative teams. As a research strategy, it is partly inductivist, interpretivist and constructionist (Yazak, 2011).

The relation between the theory and research can be classified as both inductive and deductive. An inductive approach is the relationship between theory and research with a bottom-up logic in which empirical research (specific observations) leads to generalization. On the other hand, a deductive approach is the relationship between theory and research with a top-down logic in which general conclusions are made from the particular. This is reflected in the current research, by using the theory of Pearce and Sims (2002) and Bergman (2012) on shared leadership and leadership styles to frame the theoretical framework and conceptual model. When this research is completed, the possible links between the roles and tasks and shared leadership has been investigated. This could result in a new model within the theory of shared leadership, and in this way, a mixture of deductive and inductive reasoning is obtained.

Another important element of a research strategy that it adopts, through deductive and inductive reasoning, a constructivist and interpretivist point of view. This requires understanding of the subjective meanings of answers and actions of the design team. At the same time, this implies that teams develop a

jointly constructed understandings of the world that form the basis of shared assumptions about reality (Bryman, 2012). This research attempts to understand the perspectives that the team members formulate about their collaboration, the project and the issues occur during the project. The focus in this research, is the implementation of shared leadership and whether it is related to specific roles and tasks. To gain insight in these developments during the case studies, it is important that the researcher witnesses the interactions between the participants of the research.

With different methods, which will be elaborated further on in this chapter, this research emphasis on the ways in which the team members interpret their own role and tasks and the implemented leadership styles.

3.1.1. Comparative case study research design

Bryman (2012) describes a research design as a framework for the collection of analysis of data. The research design used for this research was a comparative case study. A comparative case study entails the comparison of two or more cases in order to have a critical and analytical view on existing theories or generate theoretical insights as a result of contrasting findings uncovered through comparison (Bryman, 2012)

This shared or distinct findings across comparative case study resulted in multiple data. This data was compared with each other and analysed to identify across the selected cases. For this research, two different projects were selected as relevant cases, meeting the following conditions:

No.	Condition
1	The team should exist of various stakeholders (intern and extern) with different backgrounds of expertise.
2	The team needs to have a project manager.
3	The team should meet at least once every two weeks.
4	Everyone should accept the terms of data collection (observation, recording and filling a questionnaire)
5	The schedule should make it possible to observe 4 to 6 design team meetings.

Table 4. Conditions for selecting cases.

3.2. Research methods

The research methods are the techniques used to collect data. For this research four different methods will be used: a context analysis, a semi-structured interview, a questionnaire and participant observation. Each of these methods will be used for each of the two selected cases.

3.2.1. Practicing procedure

Before starting with the cases, another project is used to acquire experience with design team meetings, the environment and the background of the team members. Furthermore, the observation checklist of Wijnstra (2016) is used to test the participatory observation method.

3.2.2. Context analysis

In this research, the data was collected using three different methods. A context analysis is a starting point for all research methods. The context analysis gives a detailed description of the involved stakeholders, the history of the project, the role of the project manager within the team and the role of the team members within the project. By gathering this information, it will give an insight into the context wherein the team and the project manager operates. Furthermore, the relationships between the stakeholders, whether they have worked together in a former project. The context is an extra support in explaining the individual behaviour of team members and the way they interact with each other.

The context analysis for both cases consists of different subtopics. Every context analysis will start with a project description, by first describing a brief history and a timeline. This includes important decision making moments that influenced the process of the project. Furthermore, the planning of the project was described and important events that which will take place later in time. Other projects nearby the cases will also be explained if these have an impact on the planning of the concerning cases.

An Organisational Chart will show the involved stakeholders and the mutual relationships between the team members. To ensure the privacy of all stakeholders, full names of team members are not mentioned.

Most of the information needed for this analysis was be provided by an engineering company, who provided the cases for this research. Missing information was be collected by observing and contacting the involved stakeholders.

3.2.3. Semi-structured interview

The second method is the semi-structured interviews, which was held with the key team members and the project managers of the selected cases when the research started. In the interviews the project managers and selected team members gave their vision about the shift of methods for managing the projects and collaborating teams. Regarding to shared leadership, both project managers and team members were asked

about the way the team collaborated, the atmosphere within the team and background information about the team member themselves, and their experience with the other team members and the project manager. The questions for the interview are in Appendix 1.

The goal of this research method is to use these interviews to determine the "leader" and "followers" by implying the literature. Thereafter determine the according leadership styles which matches the "leaders" within the project team.

3.2.4. Questionnaire

The third method is a questionnaire which will be used to collect data about the interpersonal relations of the project team. This questionnaire contains questions about the performance of the team and mainly the interpersonal relations of the team and the project manager. Furthermore, the focus will be the soft-side of the project process. The questionnaire was used to gain a better understanding of the team collaboration in both cases.

3.2.5. Participant observation/Ethnography

The last method are participant observations. During a period of 6 months, data was collected from the cases by participant observations. With this method, a researcher gains access to a group and spends a considerable amount of time with that group with the aim of uncovering its culture. This is done by watching and listening to what people say and do. Furthermore, the observations were recorded with and audio recorder to analyse it afterwards (Bryman, 2012).

The goal of this method was to analyse shared leadership by observing the team members. The data of the observations were used to analyse the communication flow during the project team meetings. The communication flow was structured by applying communication labels when listening to the audio file afterwards.

For conducting the observations, an observation checklist was drawn up using an adoption of the observation list by Wijnstra (2016). This checklist is based on sensitizing concepts. Sensitizing concepts are part of qualitative research and draw attention to important features of social interaction and provide guidelines for research in specific setting (Bryman, 2012).

Before the actual observation started, a test run is done with a former checklist designed by Wijnstra (2016), to check whether the checklist has a logical design and was easy to keep track of the communication and actions performed by the team members. The observation checklist is adjusted (see figure 2).

Project								
Date (session)								
Location								
Attendees			**Timestamp (10 min.)**					
Name	**Function/ role**	**M/F**	**1a (0:00 - 0:10)**	**1b (0:10 - 0:20)**	**2a (0:20 - 0:30)**	**2b (0:30 - 0:40)**	**3a (0:40 - 0:50)**	**3b (0:50 - 1:00)**
1.....								
2.....								
3.....								
4.....								
5.....								
6.....								
7.....								
8.....								

Figure 2. Observation checklist (illustration by author).

3.3. Processing data

The data is processes by coding the observations by using communication labels. These were developed during the observations of the cases.

3.3.1. Communication labels

By listening to the audio file of the observations, the following communication labels are defined. Each communication label will be explained by linking the communication label to: literature, citation (audio file of the observations), and the behaviour symbol (observation checklist) which is assigned to this communication label during the observations of the project team meetings.

1. Evaluation and reflection

The concept of "evaluation" reflects discussing and sharing with other team members how the results, outcomes and collaboration process are experienced in the current project.

The concept of "reflection" indicates sharing knowledge about previous executed projects which took place before. This experience is used to show a successful or not successful action during the project. And how that experience can be used as a lesson learned for the current project.

The difference between the communication label "evaluation" and "reflect on process", is that evaluation is linked to the current project where the team is working on and "reflection" is linked to previous completed projects or other projects and enables the use of lessons learned for improvement in the upcoming projects.

Literature

Ferris et al. (2008) explains "evaluation" as a mechanism when people experience experienced something in the past regarding the social, emotional, cognitive, political and relationship context. The context is very important in the project environment because it helps framing the way that influence their perceptions and interpretations of other, which in turn own affect decisions and actions.

Citation

Evaluation

Senior-Project Manager - *"I can share with the team, that this is a well-known image within international projects. They do not work with advice, thinking together with the team and look for options and possibilities. Unlike what we are used to in the Netherlands, they start with a high conceptual level and then descending down and straightforward to the solutions."*

Design manager - *"For example, at the ON5 project we made a concept design and set of drawings for the building permits. And that led to a break in the approval procedure."*

Reflection

Project Manager - *"We did not receive a lot of comments on the schematic design. We have accomplished that without a fixed meeting cycle. We have applied less meetings than what we agreed on in the LEAN session. We had agreed a different method and we deviated from it during the process. Furthermore, I noticed that we got in time shortage before the deadline. And that we finally could deliver the report at 11.30 PM. And we had the idea that it was possible to deliver it before."*

Architect - *"It was a good experience that we could communicate directly with each other. I really think that is a good thing that we can communicate easily with the Project Manager and the lead engineers. And we didn't have to wait very long on each other's work/deliverables. Furthermore, I think it is good that we should stay consistent toward the client that we operate as one team. That is really important for us. We do this project together and we are aware of each others situations and about the agreements we made with each other about what will be send to the client and the whole team knows what is coming from the client."*

2. Set goals
Setting goals indicates clearly appointing the corresponding tasks. For example, a subject has been discussed from which tasks are been emerged. And these tasks are clearly appointed.

Literature
According to De Meuse (2009) a team should always begin with a team level goal. After the goal is defined, the roles and responsibilities will become clearer. As individual team members will work together, they will see that goals and responsibilities often are not sufficiently clear (De Meuse, 2009). This results, in redefining the goals. Setting goals consists of the following elements:

- Clarity about the main purpose and tasks of the team
- Agreement on the desired results
- Understanding of the main tasks and individual tasks
- Agreement on the standards and expectations
- Clarity of priorities and deadlines
- Understanding of boundaries

Citation
Architect – *"We also like to have more contact with the client and we should do that more structurally and also ask the client to structurally join us in our meetings."*

Mechanical engineer – *"We are totally not ready for the estimation. We have to make an estimation for the final design."*

Mechanical engineer – *"We must take a step now."*

3. Define shared conceptual framework
Forming a combine framework of knowledge related to task and roles by sharing information from their expertise. Defining a shared conceptual framework (Dutch: gezamenlijk begrippenkader) is used to get the same understanding of what the information which is shared in the team to prevent misunderstandings.

Literature
A shared mental model refers to an organized understanding or mental representation of knowledge that is shared by team members (Susan Mohammed, Klimoski, & Rentsch, 2000). Shared mental models are compared to a shared conceptual framework which refers to a shared representation of the shared knowledge, tasks, equipment, working relationships and situations (S. Mohammed & Dumville, 2001).

Citation
Project Manager – *"The way how I understood is the following, that the cost estimation will be your task until the end of the project. And that is an additional assignment that has been given to you. That is the way how I understood it…"*

Design manager – *"I do not have a clear picture what is exactly in that dossier and I think that we should take a closer look at it together."*

Mechanical engineer – *"Just for the clarity, there is conscious choice to continue this project despite all the external influences you just appointed?"*

4. Ask for feedback
Ask the team whether you are taking the right step. Whether the team agrees about the next step to be taken within the project process.

Literature

Feedback is defined as the information given to individuals regarding the quantity or quality of their action. Feedback about the actions to be taken is seen as essential for learning and motivating team members (Westerholt, 2014). In this context feedback refers to informal feedback which occurs within the daily interaction by direct verbal communication.

Citation

Senior - Project Manager – *"Can we not discuss this with the customer? Because, these are the sensitivities which we see and recognize and we also understand that, but how do we discuss it and how do we do it to get consensus?"*

Senior – Project Manager – *"Can we arrange that in a way where we schedule an appointment with the client?"*

Project Manager – *"Are there any questions about this part, until now?"*

5. Appoint external influences

External processes influencing the project are considered. Like political changes, and organizational changes, approval procedures from the municipality for getting building permits.

Literature

Often the process of external influences will make the team aware of seeing into issues or challenges and opportunities which results in changes for the current project. External representatives can also prompt changes with a consequence that new questions and ideas will arise and can be shared (Webber & Webber, 2015).

Citation

Architect – *"I've been in contact with the governmental agency, and what he actually said is that we do not need a wellness judgement for this property. So that is nice and it saves us time."*

Lead engineer construction – *"It is true that a conceptual design in Belgium is much more developed which resembles with a preliminary design which we know in the Netherlands. For Dutch terms we can speak of a final design."*

Senior – Project Manager – *"In Belgium, it is also the case that it is governed by the law. If the documents are handed in, the must respond within 14 days and they feel obliged to it."*

6. Relation management

Managing the relations between the team members to make sure that the atmosphere is not ruined and team members will not have misunderstandings about each other's thinking and actions.

Literature

By improving communication and manage the relations among the team members can enable their tasks to be better coordinated and completed. Minimizing miscommunication among a team should result in better outcomes for the project and the team collaboration (Brewer & Holmes, 2016). The role of managing personalities are related to team-related behaviour which includes communication, decision-making, collaboration, managing leadership and conflicts (Reilly, Lynn, & Aronson, 2002).

Citation

Project Manager – *"My apology for the chaos which has arisen."*

Project Manager – *"Once again, this is not an insult."*

Senior – Project Manager – *"I think, trusting each other is an important concept. Because it can cause for a lot of trouble if you do not understand each other's language. Then you have a mismatch and get a dent in your trust."*

Senior – Project Manager – *"Do you feel that you become more aware of the need of the client. Not only business wise, but also emotionally? That you better understand the client and that you can follow him better. That you are now walking more side by side with the client?"*

7. Ask questions

Ask questions to better understand the content. Asking questions is possible when people feel secure within the environment of the team and there is high level of trust within the team.

Literature

A communication exercises have shown that listening lessons are a good way to emphasize the effectiveness of the tasks to be executed which also improves communication by avoiding miscommunication. One of the attributes which indicates that the listening is going well within the group is by proposing questions. Ask questions to clarify something which is not clear (Brewer & Holmes, 2016).

Citation

Architect – *"Just to be sure for our cost expert. Do we have to execute another step or have he done his work now and we can finish it with him? Because you have just said that we have an installation concept."*

Senior Project Manager – *"The lighting plan concerns the lamps, right?"*

Architect – *"I have several questions, but I not sure whether I can ask them now?"*

8. Take responsibility by decision making

Sharing information is implemented by all the members of the team. But there are several team members who take the responsibility to decide which results in concrete actions. The focus is making things happen. By not only saying, but doing.

Literature

'Take responsibility by decision making' is similar with 'team decision making' which refers to a team process that involves gathering processing, integrating and communicating information in support of arriving at a task-relevant decision. Team decision making does not require that a consensus is reached among members, nor does it suggest that all team members are involved in all aspects of the decision. Instead team decision making requires

process data, apply individual expertise, communicate relevant information and take responsibility by taking the decision and defining relevant concrete tasks (Castellan, 2013).

Citation

Design manager – *"Is it not smart to periodically sit with the design team by the client with someone from there who is responsible for the spatial planning and someone from the technical service. And monthly discuss this kind of subjects and that we are also good represented and that we can respond adequately to everything."*

Design manager – *"But that is difficult about these topics. That is why I think we should be able to discuss these things here and think about it how can we handle this in a clever way."*

Senior – Project Manager – *"Initially, by making consensus first and discuss with the client how we can deal with that. And such a demonstration is then in support of the agreed communication."*

9. Preventive action

Preventive actions are defined as taking actions to prevent the occurrence of certain activities in the future.

Literature

Preventive action is in the literature known as risk management. Risk management is a form of decision making within project management. Risk management is not about predicting the future. It is about understanding the project and making a better decision by making use of previous experiences and risk (Smith, Merna, & Jobling, 2009).

Citation

Lead engineer building physics – *"I think it is good to have technical people involved during the meetings with the users. Because, at one point you have to deal with electrical connections and plugins."*

Architect – *"But that is also our strategy. To deliver things beforehand, otherwise they will not deliver it by themselves."*

Lead engineer construction – *"We need to be careful that we are not on a certain track and when we are almost finished and someone will come and ask, "Why did you guys not do that or this?" And if there is a chance that does things can occur, then we have to take some decisions now."*

10. Planning

Show input for the scheduled of the project to have a coherent process.

Literature

Projects are becoming progressively larger and more complex in terms of physical size and cost. Managing the schedule is the core competence of the discipline of project management (Winch, 2010). As projects are becoming complex and there is certain form of ownership, the schedule is not only defined by the Project Manager. But the all the team members show input from their expertise and discipline.

Citation

Project Manager – *"Let's look at the planning. We had actually said that important decisions will be taken this month about the concept for the installations. And then we said that we want to bring that forward in the planning, because the lead engineer construction also have to take a look on it from his perspective."*

Project Manager – *"We have two hours today for this meeting. This is just a short draft of the agenda. I want to look at the contractual obligations…"*

Architect – *"When is the permit scheduled? Will it be this year or next year?"*

Communication labels	
1a. Evaluation	Share knowledge of previous executed projects
1b. Reflection	How did the team experienced results and outcomes of the project and the collaboration process
2. Set goals	Clearly appoint the corresponding tasks
3. Define shared conceptual framework (Dutch: gezamenlijk begrippenkader)	Form a combine framework of knowledge related to tasks/roles by sharing information
4. Ask for feedback	Ask the team whether you are taking the right decision or step.
5. External influences	External processes influencing the project
6. Relation management	Make sure that the atmosphere is good without misunderstandings
7. Ask questions	Ask questions to better understand the content
8. Take responsibility by decision making	Focus on making things happen
9. Preventive action	Take actions to prevent the occurrence of certain activities in the future
10. Planning	Show input for the schedule of the project.

Table 5. Communication labels.

3.4. Research process

Figure 4 presents the flow chart for this research, it summarizes the different subject that are part of the process. The first part of the framework is all about the initiative phase and the preparation for this research. The second part includes the actual research. During the case studies the four described research methods were applied. The results from this part of the research is processed. The interviews were transcribed and labelled and the participant observations are analysed together with the results of the questionnaires.

With this processed data, a conclusion is drawn and the main research question and sub-questions are answered. This also includes a reflection on the research process and recommendations for future research connected to this subject.

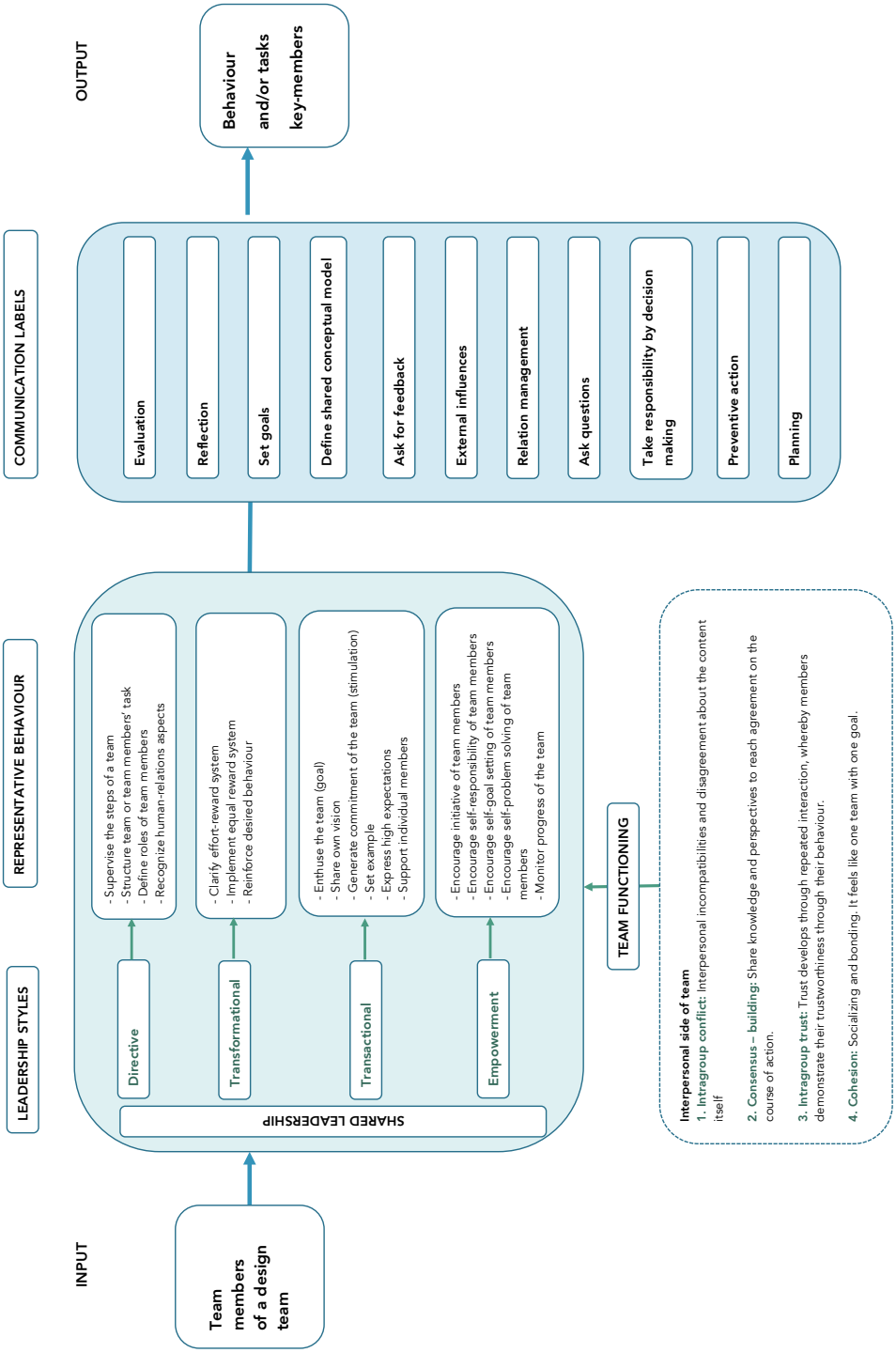


Figure 3.Conceptual model (own illustration).

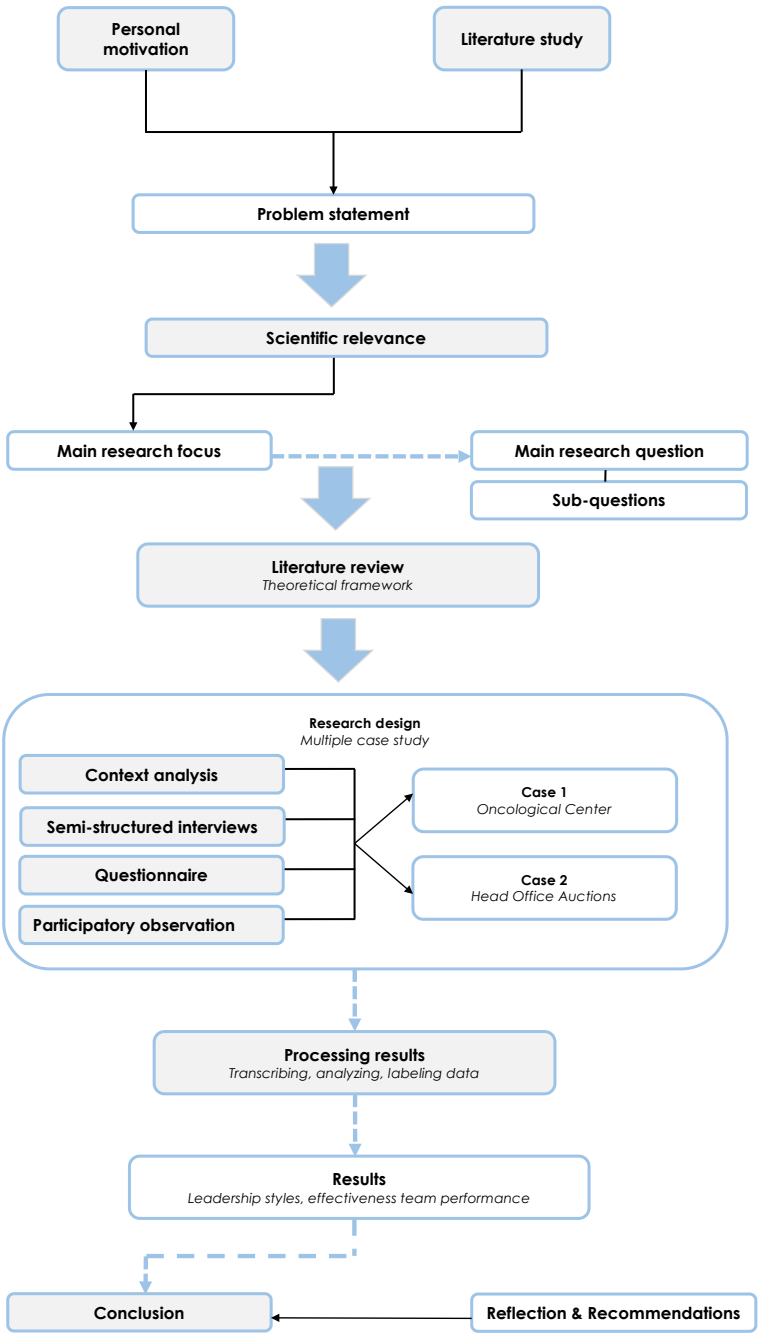


Figure 4. Flow chart (illustration by author).

Case 1 Oncological Centre 4

4.1. Context

This case is the development of the new hospital building. The university is developing a number of research facilities, a new department of first aid, new parking facilities, a care hotel and an oenological centre, which will also form the main entrance of the west zone.

4.1.1. Project description

In 2014, University Hospital has held a competition for the development of the oncological centre, Phase VII. For the tender of this project, an engineering company has formed a consortium with architect bureau I specialized in hospital design and architect bureau II who did the urban design. In 2016, the engineering company and the two architect bureaus were assigned as the design agency to design the hospital building. Within this consortium, engineer company is responsible for the hospital planning, constructions, building physics, and cost management. Architect bureau I was responsible for the architectural design and interior design. This consortium is enhanced by three subcontractors.

The design is determined by urban planning conditions and different users and their criteria they set for the built environment. Remarkable in this design is the diversity in functions and users.

The following users are distinguished: patient, medical professionals, researchers, experimental subjects, students and visitors. In the contest phase, it was already explored what the needs were of the different users, which is translated into spatial design criteria. The core values are as following:

- Overview and Orientation
- Routing
- Privacy and Rest
- Flexibility
- Multidisciplinary Cooperation
- Healthy Environment
- Perception of the space

4.1.2. Organization

Stakeholders

The organization of this project shows how a complex multidisciplinary team were composed. There are different parties involved within the consortium. The senior project manager and assistant project manager have worked closely together in an

international project before. Different lead engineers also collaborated together in previous projects. Architect bureau I is working on another project with the engineering company and they have also worked together in the past on three hospital projects. Some of the lead engineers of this team are also involved in that project.

Each stakeholder within the University Hospital project has its own team. Some team members of these teams were involved from the design contest and others joined later on. The following list consist of the roles involved in the Oncological Centre case:

- Senior project manager
- Assistant project manager
- Design manager
- Executive architect
- Cost manager
- Engineers (construction, technical installations, building physics, acoustics, fire & safety)
- Client
- Representative users (hospital staff)

Organisational Chart

Figure 5 shows the organization of the case Oncological Centre. It becomes immediately clear that it is a comprehensive and complex organization because of the total number of stakeholders.

This is mainly caused by the different sub-team and the consortium. The engineering company four sub-teams (engineering teams of constructions, installations, building physics and fire & safety). Architect bureau I has one entire team working on this project as well. The entire design team is also subdivided into a steering committee and a project team. The steering committee consists of the design manager and project manager and they attend the meetings with the client. The project team consist of the project manager, design manager and the lead engineers of all the disciplines. The project team takes care of the design and execution of the project.

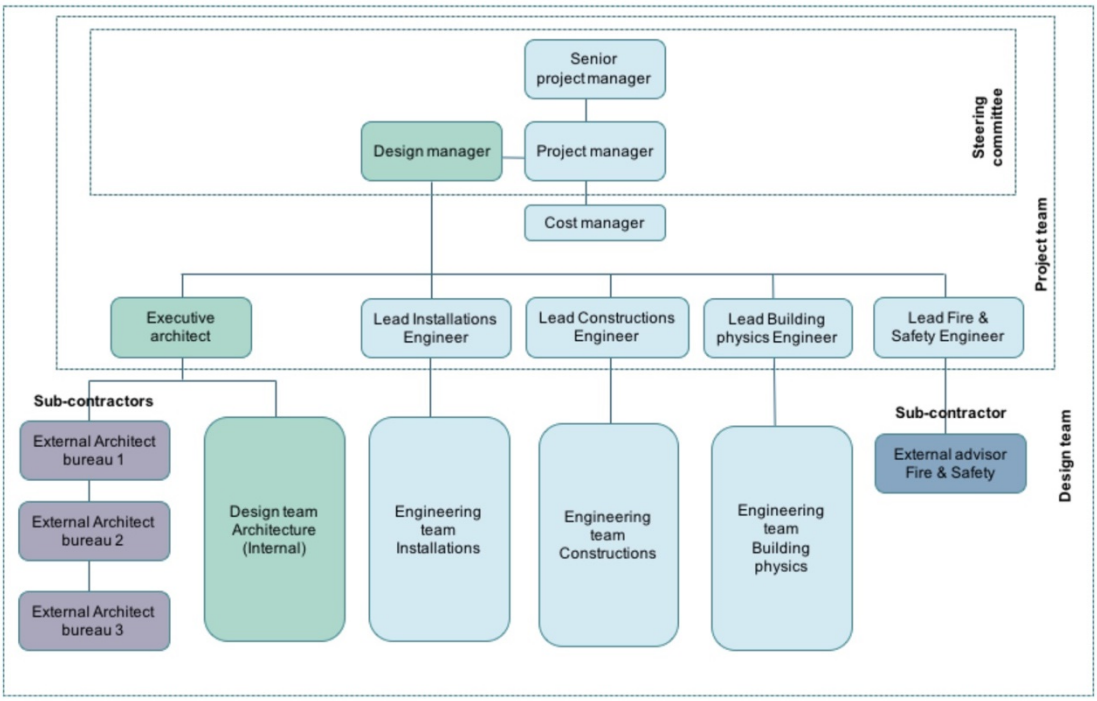


Figure 5. Organisational Chart organization structure Oncology Centre.

4.1.2 Meeting structure

The following table 6 shows which meetings take place and how frequently they are held.

Meeting	**Frequency**
Steering committee	Once every week
Project team	Once every two weeks
Design team Architect bureau I	Once every week
Engineering teams Engineering company	Once every week

Table 6. Meeting structure.

Since the research focuses on the project manager and the project team, only their meetings have been taken in consideration and used for observation. The project team meetings which were planned to occur every two weeks, are used for the observations. Representatives of the other stakeholders will also attend these if necessary.

4.2. Researcher's vision

It was immediately clear how big the entire design team was. The interesting question that results from this, is how such a team is structured and managed? The entire design team is managed by the senior project manager who does the formal meetings with the client and keeps an eye on the process and takes into account the external influences. Furthermore, the design manager and the assistant project manager, manage the rest of the design team. While, the design manager has her own team at architect bureau office and the assistant project manager functions as the operational project manager.

The kick-off meeting could not be attended as the graduation research started later. The first meeting which was attended was the project team meeting in December 2016. Before attending the meeting, I was introduced to the senior project manager and the assistant project manager. The first meeting was used as an opportunity to become familiar with the team members, how they behave with each other and how they experience the organization of the team.

4.3. Interview with team members

The interviews were held to get an insight how the team members experience the collaboration between the team members, the atmosphere within the team, background information about the team member themselves, and their experience with the other team members and the project manager. Subsequently, the interviews were analysed by using the theory of leaders and follower (see 4.3.1). The team members classified as leaders were related to the leadership styles by matching the citations of the interviews with the corresponding codes of the leadership styles (see theoretical framework).

4.3.1. Leaders and followers

The theory about "leader and follower" is used to define the leaders and follower within the team by analysing the interviews and tagging the actions of leaders and followers. The interviews were coded by using the codes in table 7. The results are shown in table 8 further on with the corresponding citations from the interview.

Leaders	Followers
Proactive personality: tendency to take action to influence their environment	*Passive personality: passively adapt to their work environment*
Actions	
- Improve current circumstance	- Do not change status quo
- Identify opportunities and act on them	- Do not try identify opportunities
- Show initiative	- Show little initiative
- Take action	- Only take action in their own task
- Persevere until meaningful changes occur	- Agree with decisions making of team

Table 7. Characteristics leaders and followers ((Wang e.a., 2016).

Below, the citations are given from the interviews. These are just few quotes which show whether the person within the team could be defined as a leader of follower. The questions in the interview (Appendix 3) give some background information about the person, experience in other projects and their role in the current project. The definition of leader or follower from the literature is compared with the answers from the interviews and the observations to appoint the right labels. In other words, the distinction between leader and follower is not only made by solely looking at the frequency of speaking or communicating in a dominant way.

Project Manager

"But I need to know that engineer construction has talked to engineer building physics and to the engineer acoustics. A lot of disciplines are coming together. You need to form that in an efficient way." - Leader - Identify opportunities and act on them

"I expect from my lead engineers that they guide their own team in the right way and they deliver good qualitative products." - Leader – Show initiative

Design manager

"Take the responsibility where I make sure that my team, who I work with on the project, do the right things." - Leader – Identify opportunities and act on them

"My role within the team as by the client is to ensure that we achieve a good integral design." – Leader – Improve current circumstances

Architect

"I expect from them, like myself to be critical on everything. And not only for their discipline. Personally, I think that they can have an opinion about everything and say what they is good or wrong." – Leader – Show initiative

"I think it is important to have a structured meeting with the team members. That is also something we have planned now. And try to cooperate to achieve a good product." – Leader – Persevere until meaningful changes occur.

Lead Engineer Construction

"I am a consulting engineer. Who has distinctive himself in the past in the field of knowledge and expertise. And expect from the team to be professional in their field as well" – Follower - Only take action in their own task

"If someone does not fit in the team or does not perfume well enough, I will probably hear that from the team" – Follower – Agree with decision making of team

Lead Engineer Building Physics

"That is the way I work. I can easily delegate tasks." – Leader – Identify opportunities and act on them

"I try to determine if things are happening outside my field of expertise and if things tend to go wrong." – Leader- Take action and show initiative

Lead Engineer Acoustic

"My role within the team mainly concerns my professional knowledge of my field." - Follower - Only take action in their own task

"If I look back to the process of the schematic design, you see that schedules are not met. It looks like this is happening because it is very easy to say, 'I will deliver this a week later." – Follower - Agree with decisions making of team

"I like that there is someone to control the process of the project." – Follower - Do not change status quo

Lead Engineer Fire & safety

"My responsibility is to ensure that there is a good fire & safety plan which is well compatible with the entire design." – Follower – Only take action in their own task

"If they take care of building a good building. Than I can take care of our part Fire & safety." - Follower – Do not try identify opportunities

#	Role team member	Leader	Follower
1	Project Manager	X	
2	Design manager	X	
3	Architect	X	X
4	LEAD Engineer Construction		X
5	LEAD Engineer Building Physics	X	
6	LEAD Engineer Acoustic		X
7	Lead Engineer Fire & Safety		X

Table 8. Results leader versus followers.

4.3.2. Leadership styles

The same interviews are used to assign leadership styles to the four team members who are defined as 'leader' in the previous part (see: Theoretical framework - table 1). This is done by first defining the concrete actions of each leadership style. These actions are related to the representative behaviour and are used to code the interview. For every team member, the citations will be given with the corresponding leadership

style and the underlying substantiation with the reason on which base that leadership style is selected. The latter is related to the representative behaviour shown in Appendix 2.

Project Manager

"Keep the team involved. Involve them every time and by not just giving them information through e-mail. But I also think personal contact is really important." – Transformational - ***"Generate commitment of the team (stimulation)" and "Support individual members"***

"If I would build my own team. I'll search for people who can take their own responsibility. Which is really important, because I don't like to steer on tasks." – Empowerment – "***Encourage self-responsibility of team members"***

"You do a project together. I could not do it on my own. I would fail. I need other people to manage the project together with me. And the other team member also has their own responsibilities and tasks. But together you go from A to B." – Empowerment - ***"Encourage initiative of team members"***

The project manager is also asked about his own leadership style. And this is compared with the analysed leadership style throughout the entire interview, visible in table 9. He makes the following statements:

"I am friendly, enthusiast and have a team who comes along with you. I am a social leader." – Transformational – "***Enthuse the team"***

"But I am not a leader. I see myself as a mean to achieve the goal. It is always a team performance. And what I am trying to say is that I don't see myself standing above the team. That is why I think those Organisational Charts are misleading." – Empowerment – ***"Encourage initiative of team members"***

Table 9 shows that this project manager has a great preference for the transformational and empowerment leadership styles.

Design manager

"I try to look for the connection with the team members to see what is motivating someone to do certain things. I find it incredibly interesting what is the intrinsic motivation of someone to work on this project. What do you want to achieve out of this?" – Transformational – "***Generate commitment of the team"***

"I expect from the team members that they make a contribution from their professional expertise, but also take the extra steps to look for opportunities to make it better." – Empowerment – "***"Encourage initiative of team members" and "Encourage self-responsibility of team members"***

Table 9 shows that the design manager has a great preference for the transformational and empowerment leadership styles like the project manager.

Executive architect

"Getting the most out of the team I achieve by understanding what they do and how they think. And also by giving them the space to collaborate by thinking freely." - Transformational – ***"Generate commitment"***

"I expect from my team members to be critical like me." - Transformational – ***"Set example"***

Lead Engineer Building Physics

"I am good in delegating work to others. I do not have a problem with that." – Directive – ***"Structure team members' task"***

"I am really good in keeping the team members sharp about the direction we are going and whether we are taking the right steps." – Directive – "***Supervise the steps of a team"***

Role	Directive	Transactional	Transformational	Empowerment	Own interpretation about own leadership style	Style analysed
Project Manager	5	2	11	13	Transformational/Empowerment	Empowerment/Transformational
Design manager	3	8	14	10	Transformational/Empowerment	Transformational/Empowerment
Lead engineer building physics	7	1	0	3	Directive	Directive
Executive architect	0	1	8	3	Transformational	Transformational

Table 9. Leadership styles analysed for case 1.

4.4. Observations

The following fragments of the observations of Oncological Centre shows the behaviour of the team member during the design team meetings. An observation checklist is used to determine the different behaviours. The meeting is also recorded by an audio recorder. First, all the observations will be explained. Finally, all the observations are summarized.

The fragments will be analysed by looking at three aspects:

1. The frequency and the percentage of the communication labels.
2. The most performed communication label by each team member.
3. The role definition according to the communication labels

The aim of this research was to define and making shared leadership measurable. This is done by developing the communication labels.

The above is shown by observing the project team meetings. The following fragments will show how the communication flow was and how the leadership role was distributed within the team. The observations focused mainly on the communication between the team members, the tone and their behaviour.

The results of the observations are shown in three types of graphs. The main purpose of graph 1A is to identify whether leadership was performed by one team member (e.g. project manager) or by more members of the team. This results in a graph with the communication labels on the horizontal axis plotted against the absolute numbers on the vertical axis, to show how often the communication labels were performed by the different team members. This graph displays the division of the communication labels performed by which role.

Graph 1B is the derivative of graph 1A where the label **Define shared conceptual model** is excluded to represent a clear overview of the other labels as well.

The aim of graph 1C is to show which percentage a person has spent on a particular communication label. This results in a graph with the roles on the vertical axis and the percentages on the horizontal axis. Per role percentage of the performed communication labels are visible. To make these results more explicit the results are made visible in the attached table.

Oncological Centre - OBSERVATION 1 - 21 December 2016

General

This meeting started by the project manager with the subjects which will be discussed in this meeting. Which was followed by input of the design manager and the architect about the design. Every member got a turn to give input about their own discipline. Engineer building physics left a half an hour before the end of the meeting. Engineer construction used a half an hour to discuss his discipline together with the architect.

Observation 1

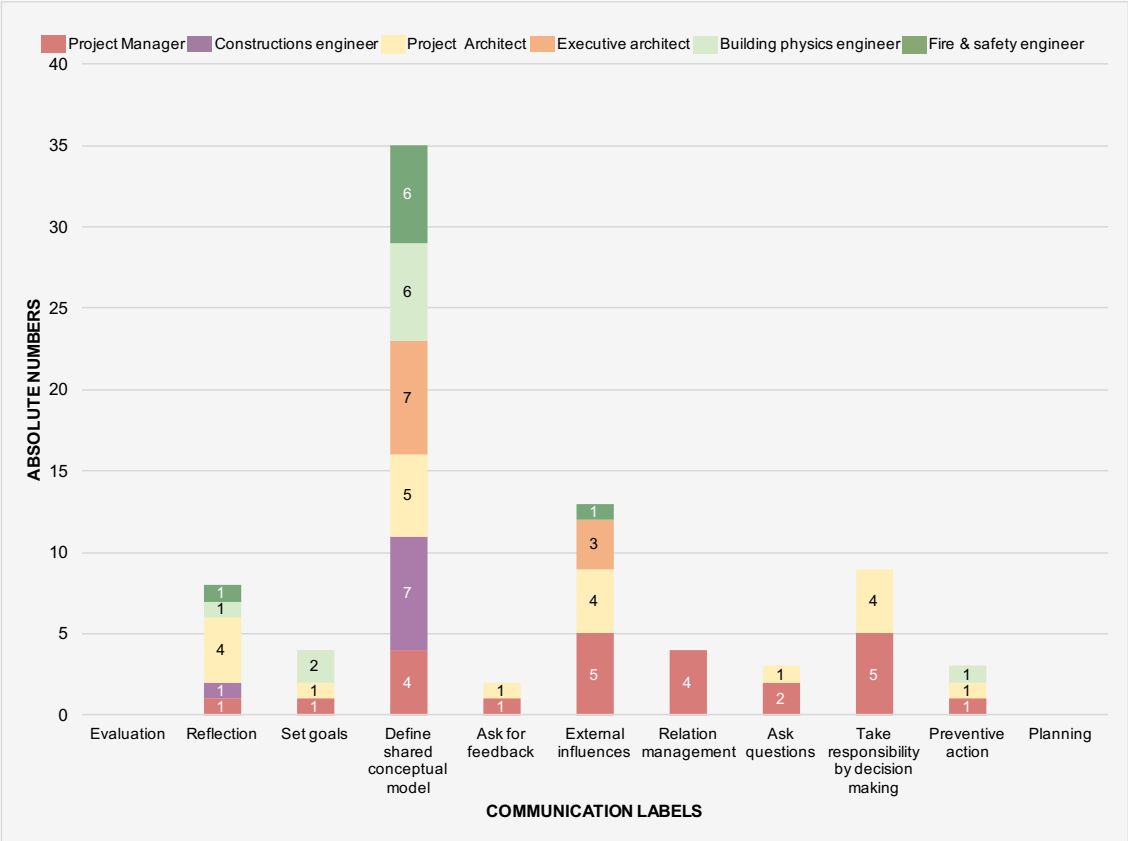
Attendees: Project manager, design manager, executive architect, engineer building physics, engineer constructions and engineer fire & safety

1. Agenda
    - Program of Requirements
    - Installations
    - Fire & Safety
    - Structural design

2. Behaviour

The project manager started the meetings with the topic "Program of Requirements", where he made a process agreement and mentioned that engineer building physics handed in his document too late, which was the reason that he could not read it through on time. This was also the case with the document of the engineer acoustics. The project manager asks the design manager to start with the part about the functional design because the design manager had to leave earlier. Engineer constructions started asking questions to the design manager about the operation rooms. As the placement of these rooms will have an impact on the structural design because of the heavy machines which are placed in the operation rooms. Engineer building physics suggested to make a draft document which can be adjusted later and to use that to show it to the client. Everyone agreed on this and the design manager was relieved that engineer building physics proposed that idea and stopped the discussion with engineer constructions and the project manager confirmed the idea.

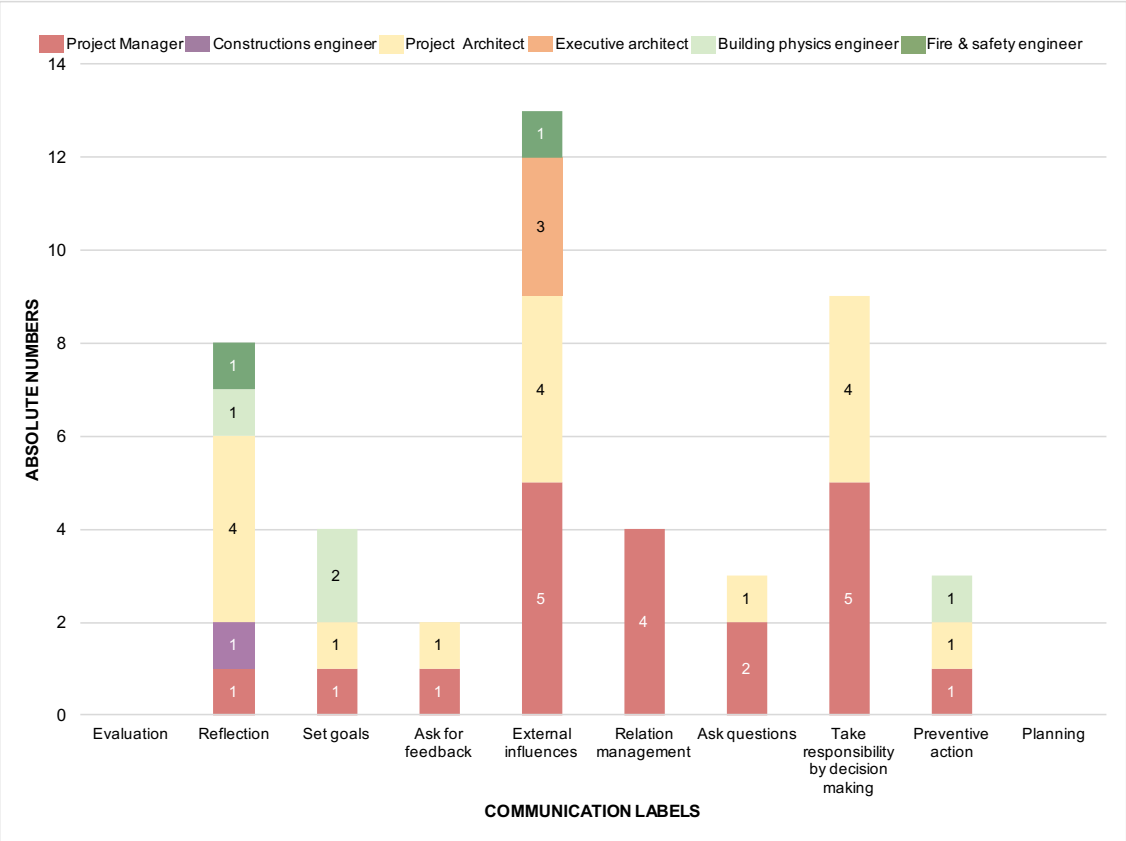
The critical question of engineer constructions opens a new discussion about the Program of Requirements and how the starting points will be designed. And design manager took some decision and suggest how the process will be designed. It continued with the part about installations and fire & safety. Design manager had to leave, so the project manager made a process agreement how the review phase will be executed. Followed by a dialogue between the executive architect and engineer constructions about the structural design and the impacts on the architectural design.



Graph 1 A. Absolute amounts of the communication labels plotted against the communication labels.

Graph 1A

In this fragment the communication label **Define shared conceptual model** was performed by every team member by sharing their expert knowledge. Furthermore, the communication label **Evaluation** and **Planning** were not performed by any team member. The project manager and the design manager has performed all the other labels which results in a dispersion which is visible in the graph. As the communication label **Define shared conceptual model** is very dominant in the graph 1A, it disturbs the analysis of the other labels. Therefore, graph 1B displays the results by excluding the label **Define shared conceptual model**.

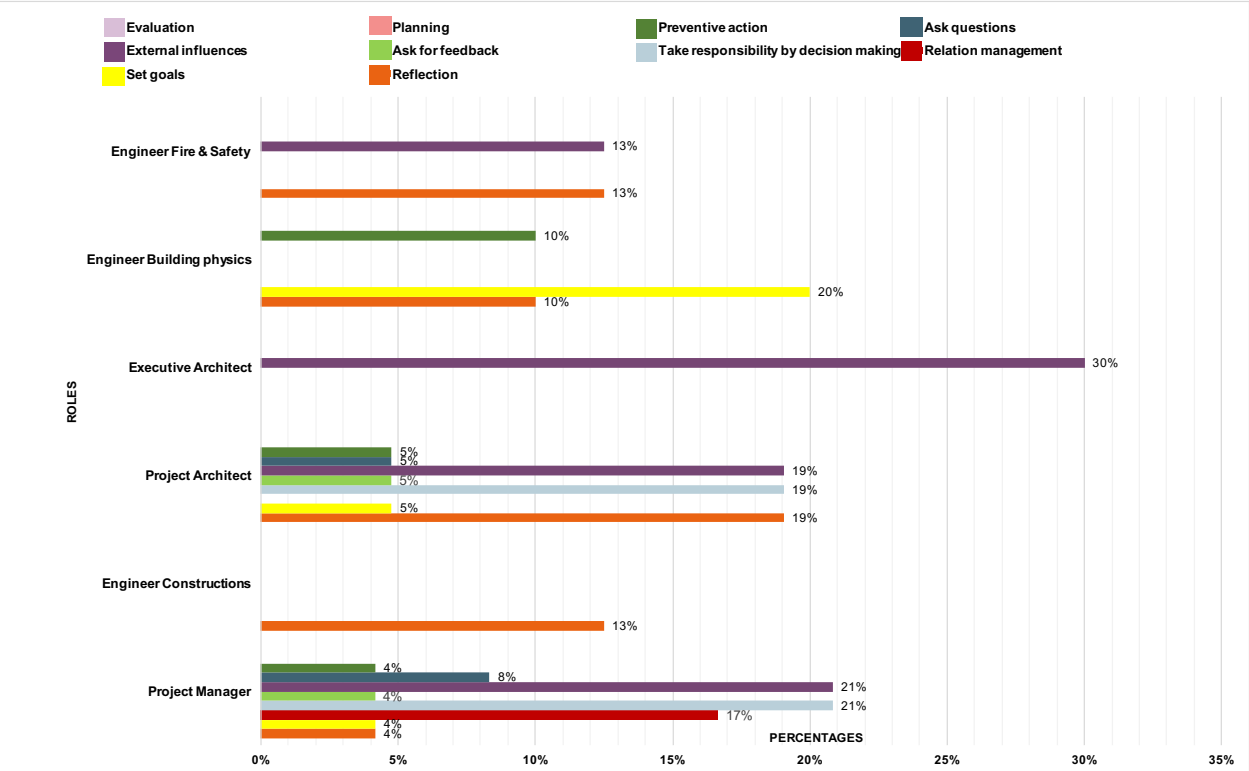


Graph 1 B. Absolute amounts of the communication labels plotted against the communication labels, excluding the label **Define shared conceptual model**.

Graph 1B

This graph shows a clear distribution of the communication labels. **External influences** was performed the most in this fragment. The label **Reflection was** performed by all the team members except for the executive architect. Furthermore, engineer construction has only performed the label **Reflection**. Performing specifically one label was also the case for the executive architect who has solely performed the label **External influences**. On the other hand, **Relation management** was solely performed by the project manager. And **Ask questions** and **Ask for feedback** was performed by both, the project manager and the design manager.

Furthermore, it can be concluded that engineer building physics have also performed same labels as the project manager and design manager, specifically the labels **Set goals** and **Preventive action**. These labels were not performed by engineer construction, executive architect and engineer fire & safety.



	Project Manager	Engineer Constructions	Project Architect	Executive Architect	Engineer Building physics	Engineer Fire & Safety
Evaluation						
Planning						
Preventive action	4%		5%		10%	
Ask questions	8%		5%			
External influences	21%		19%	30%		13%
Ask for feedback	4%		5%			
Take responsibility by decision making	21%		19%			
Relation management	17%					
Set goals	4%		5%		20%	
Reflection	4%	13%	19%		10%	13%

Graph 1 C. Communication labels plotted against the team members in percentages.

Graph 1C

Graph 1C shows, the communication label **Define shared conceptual model** was performed by every team member by sharing their expert knowledge. The team members has performed 60% to 88% of their time to share knowledge from their expertise background as input for the design project. Except for the project manager (17%) and the design manager (24%). Furthermore, it can be concluded, the labels **Planning** and **Evaluation** were not performed by any team member. Excluding **Define shared conceptual model**, shows more dispersion of the labels performed by engineer constructions, executive architect, engineer building physics and engineer fire & safety. It can be observed that engineer building physics has performed **Reflection** (10%) and **Set goal** (20%) and engineer Fire & Safety have mainly performed **Reflection** (13%) and **External influences** (13%). Whereas, engineer construction has solely performed **Reflection** (13%).

Most of the communication labels were performed by the project manager and design manager. The following labels were performed respectively, **Ask for** feedback (4% and 5%), **Ask questions** (8% and 5%) and **Take responsibility by decision making** (21% and 19%). The label **Relation management** is solely performed by the project manager with 17%. Furthermore, graph 1C is showing that the labels **Set goals** (20%) and **Preventive action** (10%) are mainly performed by engineer building physics compared to performing **Set goals** by project manager (4%) and design manager (5%).

The design manager has mainly performed the labels: **Reflection, External influences** and **Take responsibility by decision making** by equally 19%. It is worth mentioning that the design manager and the project manager are the only two team members who has performed the label **Ask questions**, respectively 5% and 8%.

Oncological Centre - OBSERVATION 2 - 2 March 2017

General

This project team meeting was also attended by the senior project manager. This meeting took place after the client was satisfied with the schematic design. This means that the team also reflected on the working process of the entire team. Furthermore, it was remarkable that the senior manager made several times a statement which he implied from his experience and the team listens attentively.

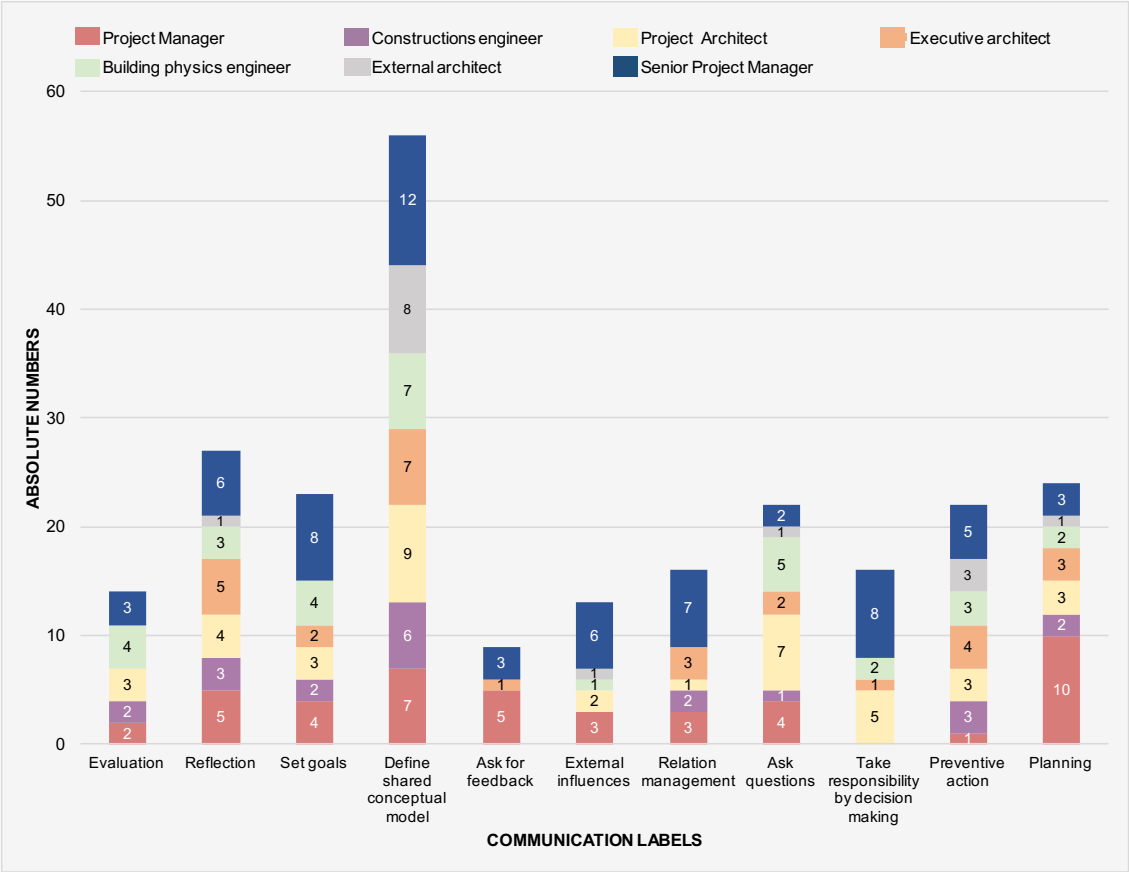
Observation 2

Attendees: Senior project manager, project manager, design manager, executive architect, engineer building physics, engineer constructions and external architect

1. Agenda
    - Permit process
    - Review the schematic design
    - Optimize relationship with client
    - Interpretation of the design phase Preliminary Design
    - Decision making process of the client
    - Organisation of user meetings
    - Organize the usage of BIM

2. Behaviour

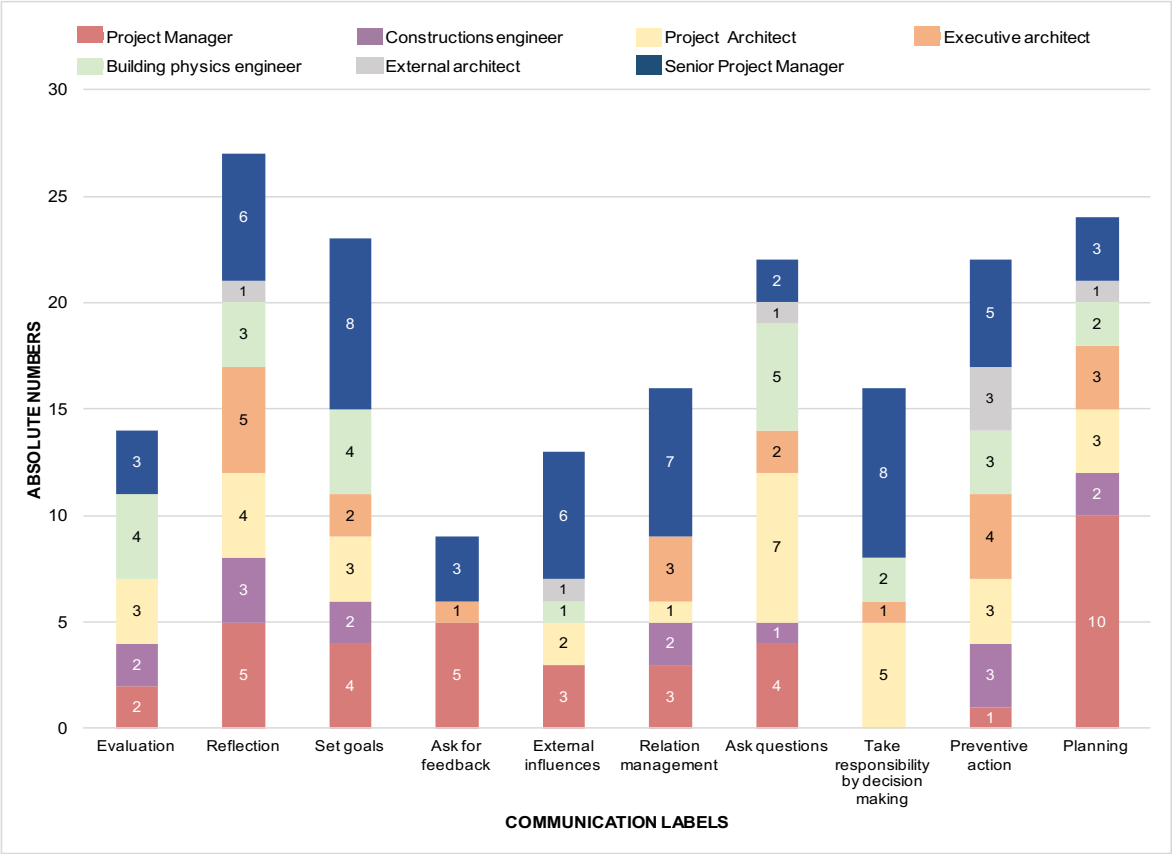
The meeting started with a discussion on how the preliminary design phase is interpreted by the client and what will be the consequences for the design team in terms of deliverables. The engineer constructions was very active in this discussion. The project manager continued with the reflection on the schematic design where the executive architect gave an extensive reflection of how the team collaboration is experienced. The reflection resulted in a dialogue between the senior project manager and the executive architect about optimizing the relationship between the client and the design team. The design manager also gave her reflection which led to a dialogue between the senior project manager and the design manager about the decision-making process of the client. Furthermore, the project manager talked about the planning related to the permit process of the client. Moreover, the organisation of the user meetings was discussed. This was a very long discussion and the engineer building physics got a little irritated and asked, *"Are we just discussing for such a long time the amount of the user meetings?"*. Then a discussion started about the Local Content of Description. And finally, a discussion about the organisation of the BIM implementation where engineer building physics is a bit sceptical about it because of his bad experiences with former projects. It is noteworthy that structural design is discussed very shortly in this meeting, but engineer construction was very active in giving input in the various discussion about the permit process, optimizing relationship with the client and the implementation of BIM. It is remarkable that the senior project manager and the design manager are the most active in the decision-making process.



Graph 2 A. Absolute amounts of the communication labels plotted against the communication labels.

Graph 2A

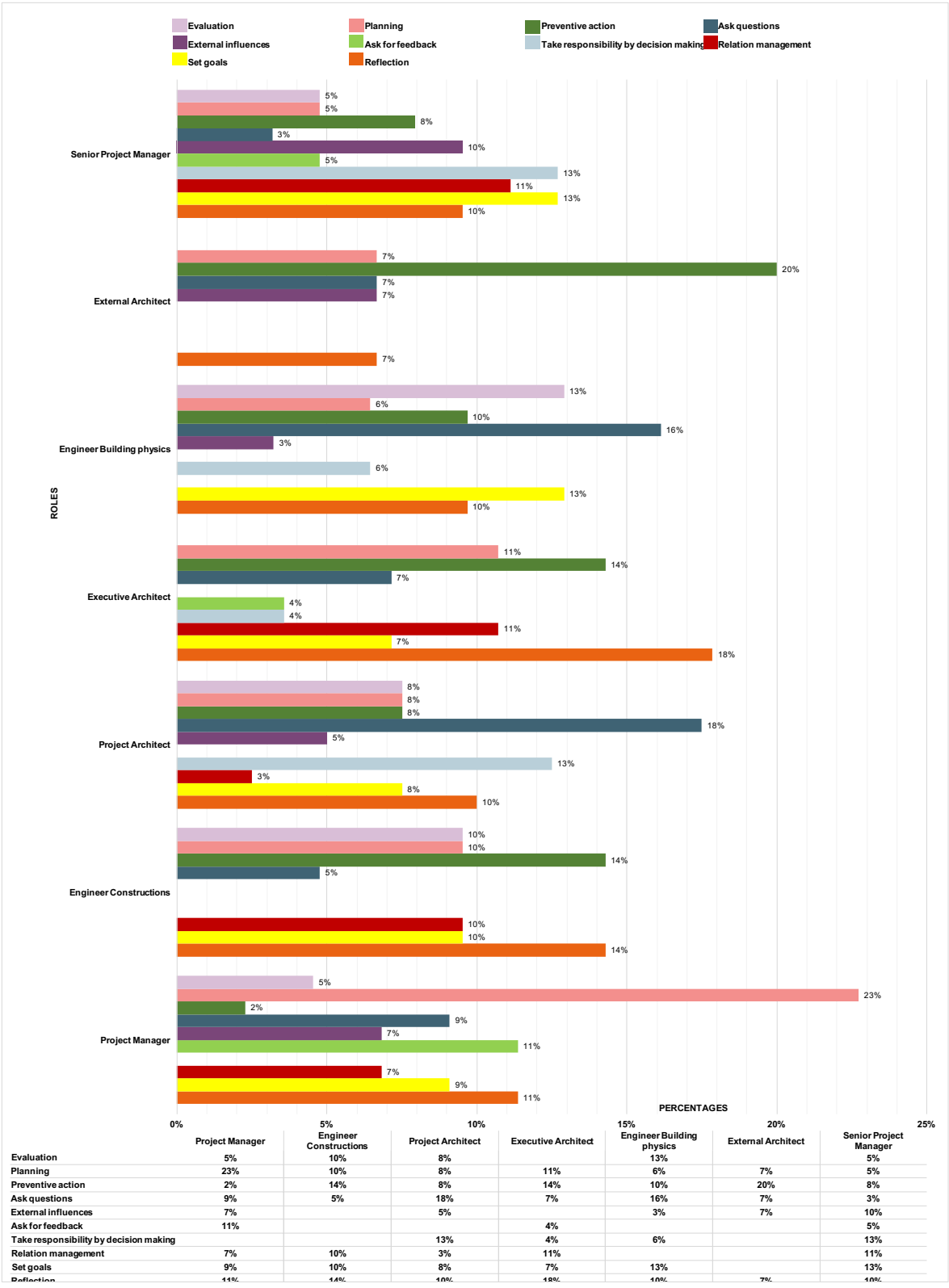
In this fragment, the following communication labels were performed by all team members **Define shared conceptual model, Reflection, Ask questions, Preventive action** and **Planning**. Moreover, **Define shared conceptual model** was also performed the most in absolute numbers. Therefore, graph 2B shows a representation of the same graph by excluding the variable **Define shared conceptual model.**



*Graph 2 B. Absolute amounts of the communication labels plotted against the communication labels, excluding the label **Define shared conceptual model**.*

Graph 2B

This graph shows a dominant appearance of the senior project and project manager and the design manager which is respectively visible in the absolute numbers of the performed labels. Furthermore, the label **Planning** was excessively performed in this fragment and mainly by the project manager. Labels **Ask for feedback** was solely performed by the project manager, senior project manager and the executive architect. It is remarkable that the label **Take responsibility by decision making** was not performed by the project manager at all. The labels **Set goals** and **Take responsibility by decision making** were mainly performed by the senior project manager. Furthermore, engineer constructions was much more active in this meeting and is performing more diverse labels. Almost all the team member, except for the external architect, took an active part in the labels: **Reflection, Set goals, Ask questions** and **Planning.** Moreover, the design manager performed the labels **Take responsibility by decision making** and **Ask questions** the most.



	Project Manager	Engineer Constructions	Project Architect	Executive Architect	Engineer Building physics	External Architect	Senior Project Manager
Evaluation	5%	10%	8%		13%		5%
Planning	23%	10%	8%	11%	6%	7%	5%
Preventive action	2%	14%	8%	14%	10%	20%	8%
Ask questions	9%	5%	18%	7%	16%	7%	3%
External influences	7%		5%		3%	7%	10%
Ask for feedback	11%			4%			5%
Take responsibility by decision making			13%	4%	6%		13%
Relation management	7%	10%	3%	11%			11%
Set goals	9%	10%	8%	7%	13%		13%
Reflection	11%	14%	10%	18%	10%	7%	10%

Graph 2 C. Communication labels plotted against the team members in percentages.

Graph 2C

This graph and the attached table shows wide variety of communication labels performed by the entire team within this fragment. The senior project manager was clearly performing all the labels in a large amount. Nevertheless, the project manager, design manager and engineer building physics also performed almost all the labels. Whereas, the label **Take responsibility by decision making** was not performed by the project

manager at all, was taken over by the design manager (13%) and senior project manager (13%) and for a smaller percentage by engineer building physics (6%) and the executive architect (4%). On the other hand, the project manager performed **Ask for feedback** (11%) compared to the executive architect (4%) and senior project manager (5%). The external architect has mainly focused on the labels **Define shared conceptual model** and **Preventive action**. The latter is supported by the fact, the external architect have knowledge about the local rules and regulations of the project location. It is noteworthy that engineer construction has performed **Relation management** (10%) almost in equal percentages as the executive architect (11%) and the senior project manager (11%), which is more than the project manager (7%).

In this fragment the entire team has mainly performed the labels: **Set goals, Planning** and **Preventive action**.

Oncological Centre - OBSERVATION 3 - 4 April 2017

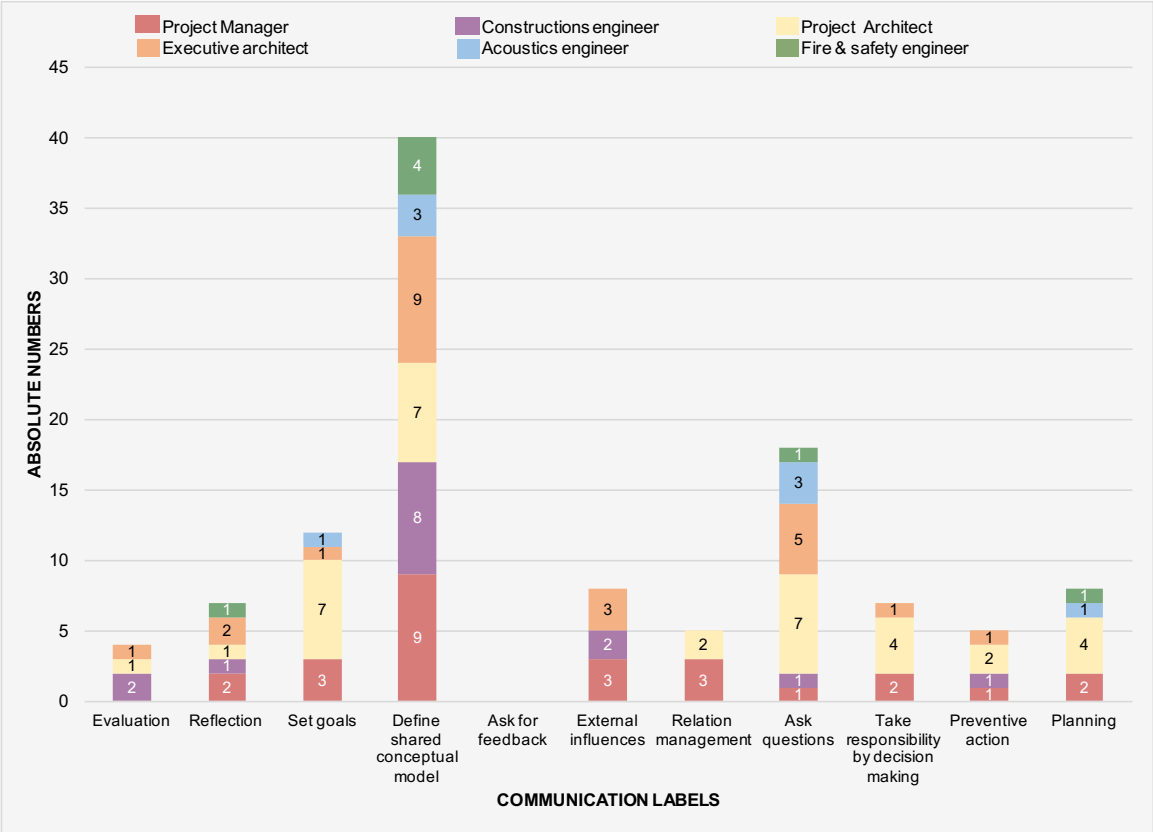
General
Engineer acoustics have joined the project team meeting for the first time. The meeting started with talking about the planning by the project manager and including input from other team members.

Observation 3

Attendees: Project manager, design manager, executive architect, engineer constructions, engineer acoustics and engineer fire & safety

1. Agenda
    - Review the documents
    - Organisation of the Local Content Description
    - Organisation of BIM session
    - Structural design
    - Fire & Safety

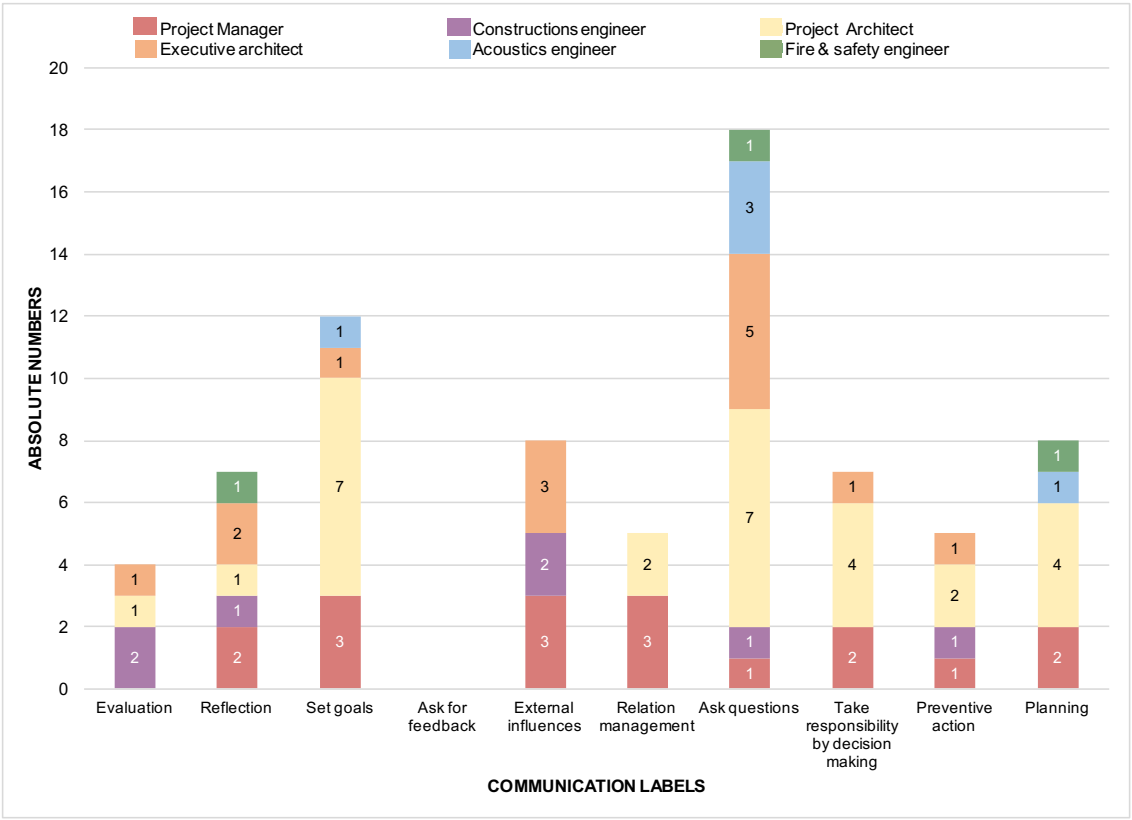
2. Behaviour
The meeting was started by the project manager and the topics which would be discussed in the session and continued with the planning for the next deadline. The design manager continued with the Local Content Description and how that could be organised. This was followed by the discussion how the BIM session could be organised. Engineer constructions gave input by explaining from his experience in construction projects how the BIM competence works within the company which could be used for the BIM session as well. Furthermore, the topic fire & safety was discussed where there was a dialogue between engineer fire & safety and engineer constructions. Because the structural design was being influenced by the decision made by engineer fire & safety. In this meeting the design manager was steering on the process and content by making decisions about the actions to be taken by other team members. Whereas the project manager was setting goals for the actions he should do himself and made sure that everyone got enough chance and time to give their input from their expertise background.



Graph 3 A. Absolute amounts of the communication labels plotted against the communication labels.

Graph 3A

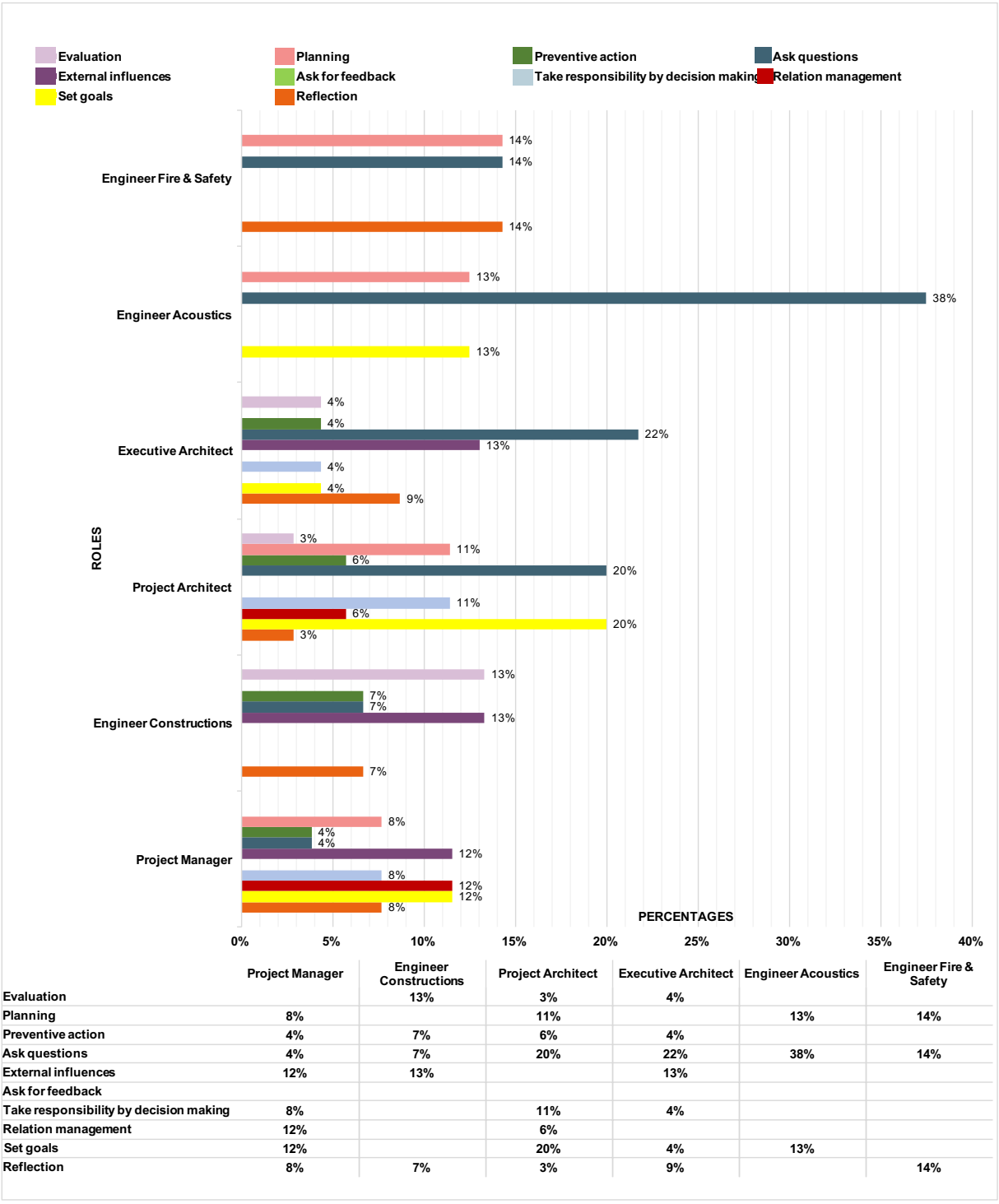
In this fragment, it was noticeable that not one team member has performed **Ask for feedback** and every team member has performed **Define share conceptual model**. This label is excluded in graph 3B to create a much clearer overview of this fragment.



*Graph 3 B. Absolute amounts of the communication labels plotted against the communication labels, excluding the label **Define shared conceptual model**.*

Graph 3B

This graph shows that all team members has performed the label **Ask questions**. By removing **Define shared conceptual model** it was remarkable that the design manager is performing more labels with a higher absolute number. Furthermore, **Relation management** was solely performed by the project manager and design manager. Moreover, it can be seen that **Reflection** was performed by almost all the team member except for engineer acoustics. **Set goals, Take responsibility by decision making** and **Planning** was dominantly performed by the design manager.



	Project Manager	Engineer Constructions	Project Architect	Executive Architect	Engineer Acoustics	Engineer Fire & Safety
Evaluation		13%	3%	4%		
Planning	8%		11%		13%	14%
Preventive action	4%	7%	6%	4%		
Ask questions	4%	7%	20%	22%	38%	14%
External influences	12%	13%		13%		
Ask for feedback						
Take responsibility by decision making	8%		11%	4%		
Relation management	12%		6%			
Set goals	12%		20%	4%	13%	
Reflection	8%	7%	3%	9%		14%

Graph 3 C. Communication labels plotted against the team members in percentages.

Graph 3C

From the attached table of graph 3C it can be concluded that the project manager, design manager and the executive architect were performing most of the labels. Whereas, engineer construction is more active in performing the labels: **Evaluation** (13%), **External influences** (13%) and the following in equal percentage of 7%; **Reflection, Preventive action and Ask questions.** On the other hand, engineer building physics has mainly performed the labels **Ask questions** (38%), **Planning** (13%) and **Set goals** (13%). Moreover, engineer fire & safety has performed the following labels in equal percentages: **Planning** (14%), **Ask questions** (14%) and **Reflection** (14%). It is noteworthy, that **Reflection** is mainly performed by engineer fire & safety

compared to the rest of the team, executive architect (9%), project manager (8%), engineer constructions (7%) and the design manager (3%)

Most performed labels within this fragment were: **Ask questions** and **Set goals.**

Oncological Centre – OBSERVATION 4 - 13 June 2017

General

It is noteworthy within this fragment that the project manager was not present. This resulted in a natural shift of the roles and the design manager takes over in a way which is unanimous accepted by the rest of the team member. The important topic within this meeting was discussing the stakeholder analysis of the hospital users.

Observation 4

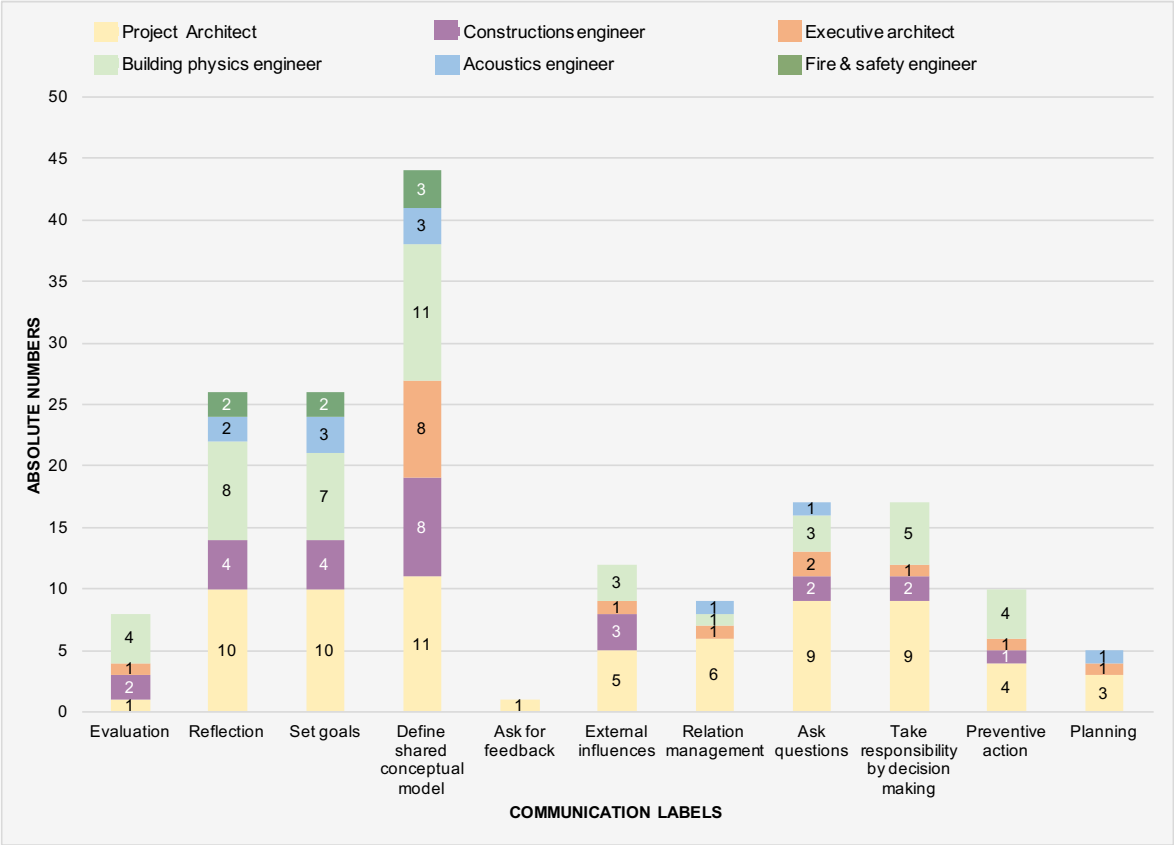
Attendees: design manager, executive architect, engineer constructions, engineer acoustics and engineer fire & safety

1. Agenda
    - Implementation BIM for the project
    - Structural design
    - Installations

2. Behaviour roles

The meeting started with the announcement that the project manager was sick and was not attending the meeting. The design manager took over the role very naturally and starts leading the meeting. By first reflecting on the BIM session which did not result in a clear view how the team is going to use BIM which resulted in a dialogue with engineer building physics. They continued discussing about the organisation of the Local Content of Descriptions. The design manager asked the engineer constructions to elaborate on the structural design part. Engineer constructions started by mentioning that he wants to share something what he has experienced with a supplier of structural elements where the client contacted the supplier behind his back to get different information. The design manager listened very carefully and gave him the space and time to tell his story. Furthermore, engineer constructions talked about the combination of the façade design and the structural design and the conflicts with the installations. Which led to a dialogue between the engineer constructions and engineer building physics. After that discussion, engineer fire & safety talked about his part, which led to a dialogue between the design manager, engineer building physics about the installations and constructions.

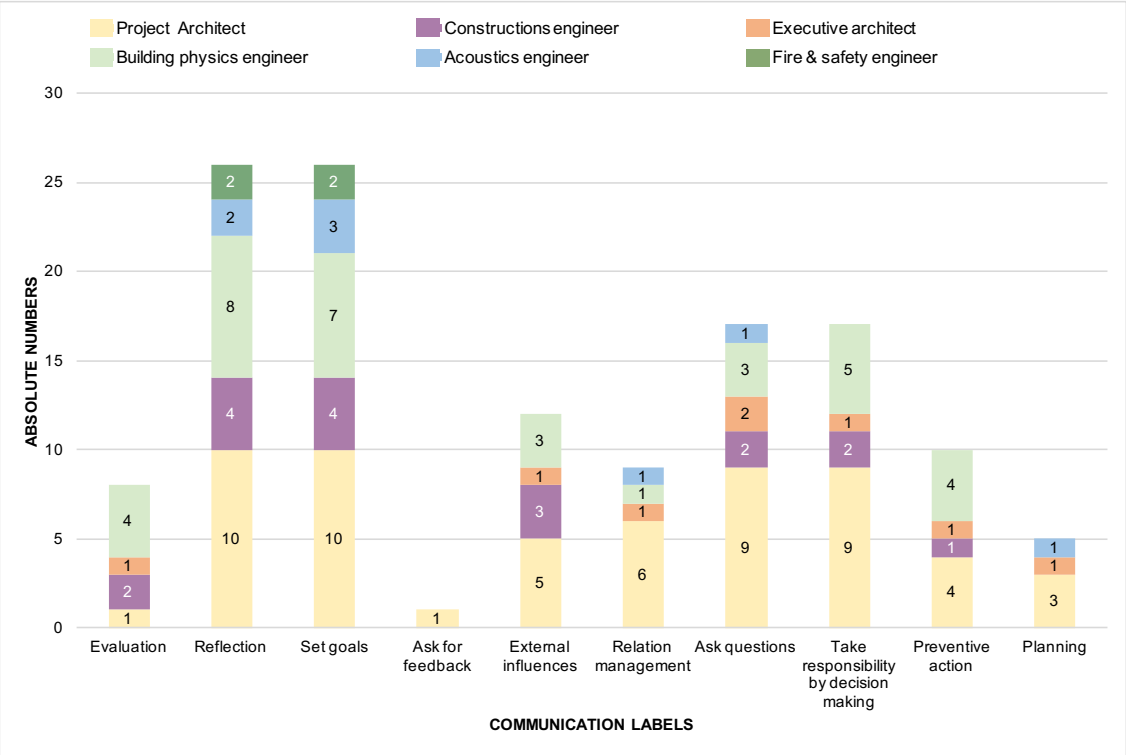
Engineer building physics and the design manager were the most active in the decision-making process.



Graph 4 A. Absolute amounts of the communication labels plotted against the communication labels.

Graph 4A

This graph shows a high number in performing the label **Define shared conceptual model** and was performed by all the team members. Furthermore, a small amount of the labels **Ask for feedback** and **Planning**. The label **Define shared conceptual model** is excluded in graph 4B to show a clear overview of the results.



*Graph 4 B. Absolute amounts of the communication labels plotted against the communication labels, excluding the label **Define shared conceptual model***

Graph 4B

This graph shows a high amount of the labels **Reflection** and **Set goals**, both were performed the most by design manager and engineer building physics. Furthermore, it can be concluded that the labels **Ask questions** and **Take responsibility by decision making** were also performed mostly by the design manager. Graph 4B indicates that all the labels were performed by the design manager. Engineer building physics have also performed all the labels, except for **Planning** and **Ask for feedback**. Whereas the project manager is the one team members who performed the label **Ask for** feedback within this meeting. Moreover, it can be concluded that engineer constructions has performed almost all labels in this meeting, except for **Ask for feedback**, **Relation management** and **Planning.**

Most performed communication labels within this fragment were: **Reflection**, **Set goals**, **Take responsibility by decision making** and **Ask questions.**

	Project Architect	Engineer Constructions	Executive Architect	Engineer Building physics	Engineer Acoustics	Engineer Fire & Safety
Evaluation	1%	8%	6%	9%		
Planning	4%		6%		9%	
Preventive action	6%	4%	6%	9%		
Ask questions	13%	8%	13%	7%	9%	
External influences	7%	12%	6%	7%		
Ask for feedback	1%					
Take responsibility by decision making	13%	8%	6%	11%		
Relation management	9%		6%	2%	9%	
Set goals	14%	15%		15%	27%	29%
Reflection	14%	15%		17%	18%	29%

Graph 4 C. Communication labels plotted against the team members in percentages.

Graph 4C

The attached table of graph 4C shows a wide variation of the distribution of labels. The team members have performed all the labels in different sets. The design manager has performed all the labels in almost equal order, except for a smaller percentage of the labels **Evaluation** (1%) and **Ask for feedback** (1%). On the other hand, engineer constructions (8%) and engineer building physics (9%) has performed a high percentage of the label **Evaluation**. This can also be said about the label **Planning** which was performed by the design manager (4%) and by executive architect (6%) and engineer acoustics (9%). This results in the following, the labels which were performed less by the design manager, as that person automatically took the lead, were performed in a higher percentage by other team members.

Furthermore, this fragment shows much more equal performed labels. **Ask questions** was performed by all the team members, except engineer fire & safety in the range 7% to 13%. **Take responsibility by decision making** was performed the most by design manager (13%) and engineer building physics (11%). Nevertheless, engineer constructions (8%) and the executive architect (6%) has performed this label in a smaller percentage. **Relation management** is equally performed by the design manager (9%) and engineer acoustics (9%). It is noteworthy that the labels **Set goals** and **Reflection** were performed by all the team members, except for the executive architect in a range of 14% to 29%.

4.5. Summary observations

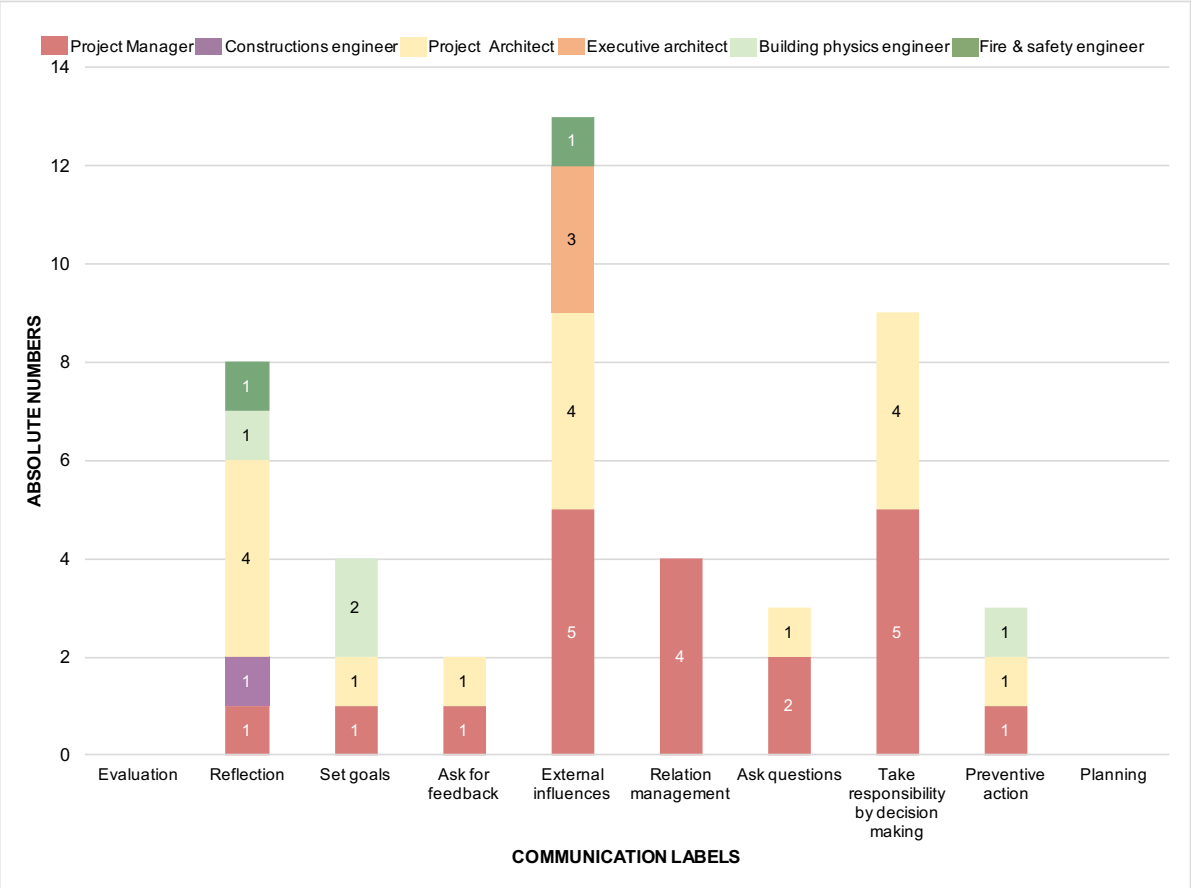
The four observations are compiled together below. In these graphs the label **Define shared conceptual model** is excluded as these labels was performed by every team member in every fragment. The following can be concluded by comparing these fragments.

The project manager was performing almost all the labels when he joined the meeting, except for fragment four, as this meeting was not attended by the project manager. Furthermore, there is a remarkable difference to be seen between the fragment 2 where the senior project manager has joined the meeting and the other fragments. As in fragment 2 a high amount of performed labels could be seen and more diversity in the performed labels by the team members. Is not just the fact, that the senior project manager was performing all the labels, but also other team members were performing more labels in fragment 2. Moreover, the project manager were performing the labels **Reflection**, **Set goals** and **Planning** relative more in fragment 2 compared to other fragments.

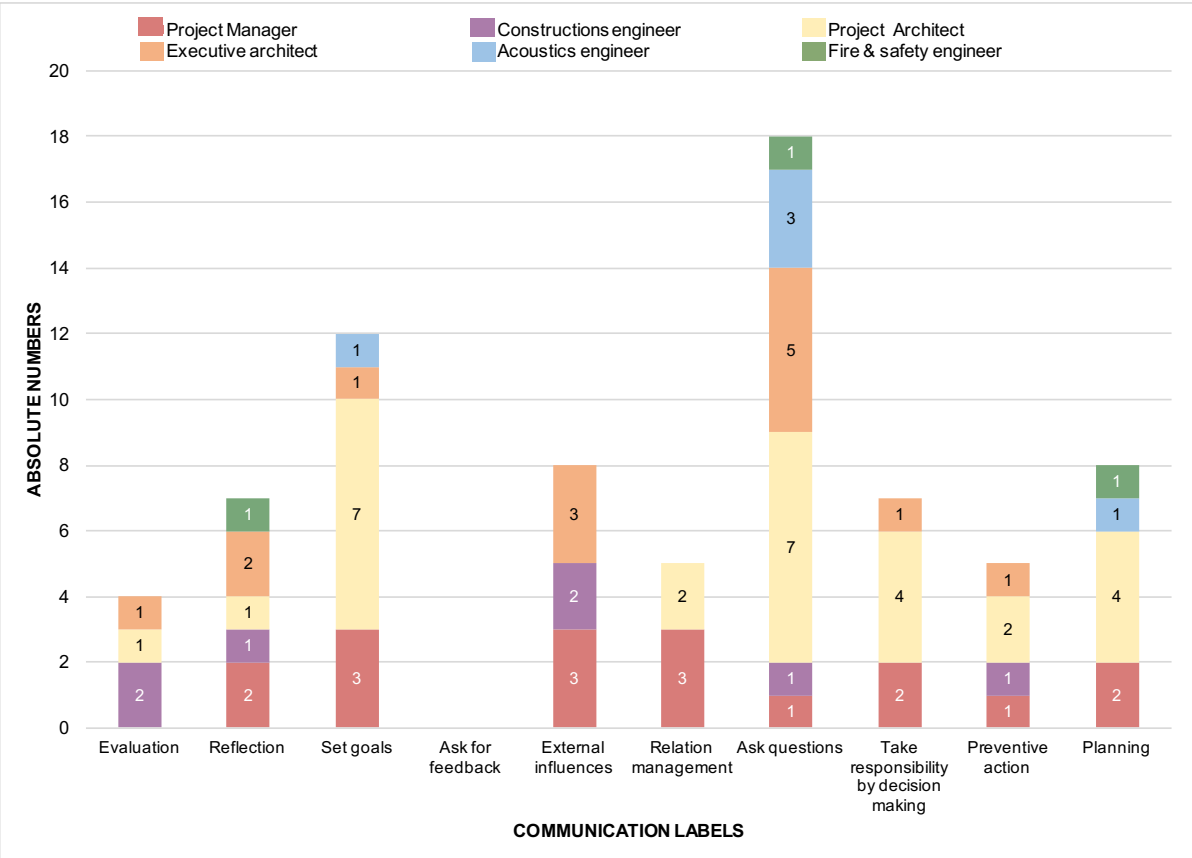
The design manager was performing a high number of communication labels in all the fragments and especially in fragment 4 where the design manager unsurprisingly steered the meeting. It can be noted, that the project manager performed the labels **Reflection, Set goals, Ask questions** and **Take responsibility by decision making** in extensively high amount in fragment 4.

Finally, it could be seen that engineer constructions has performed a high amount and diverse labels in fragment 2, where the senior project manager joined the meeting, and fragment 4 where the project manager is not present.

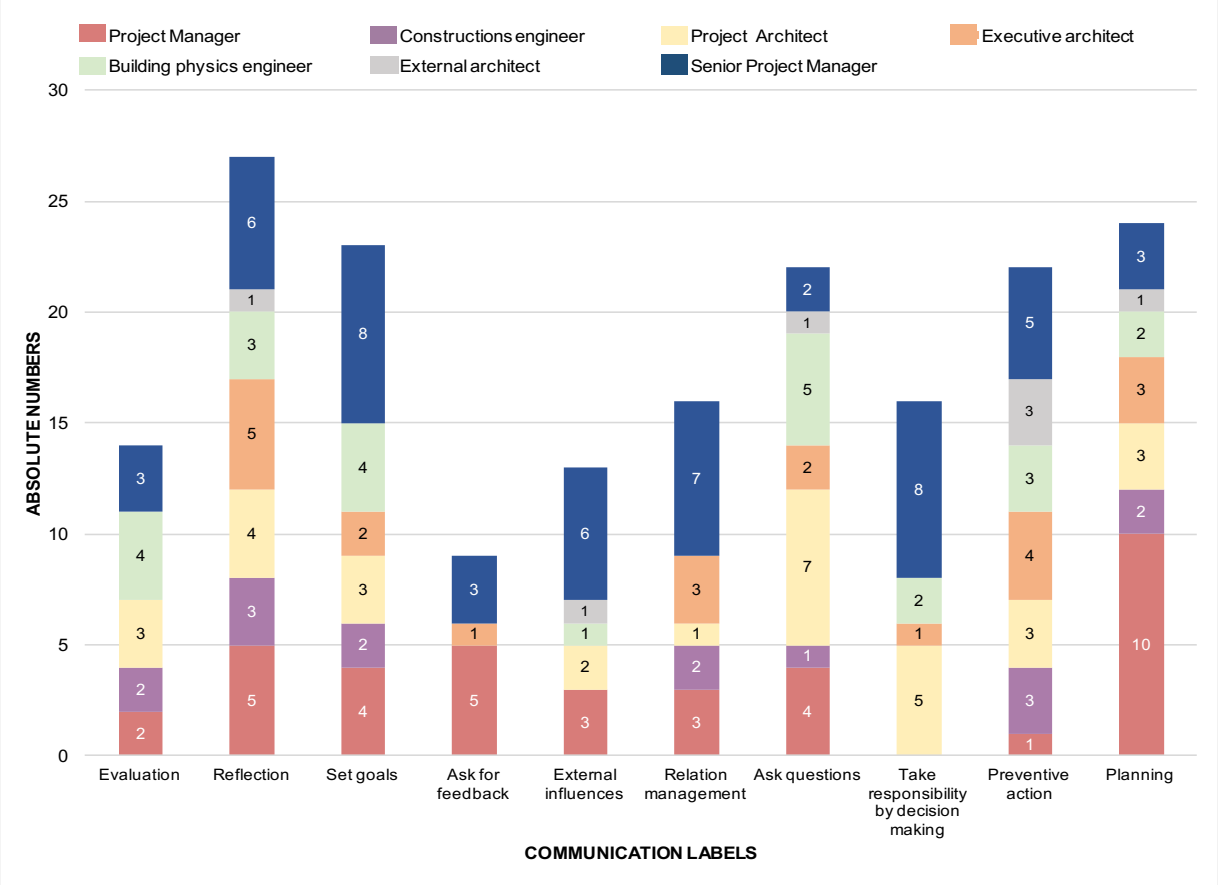
Fragment 1



Fragment 3



Fragment 2



Fragment 4

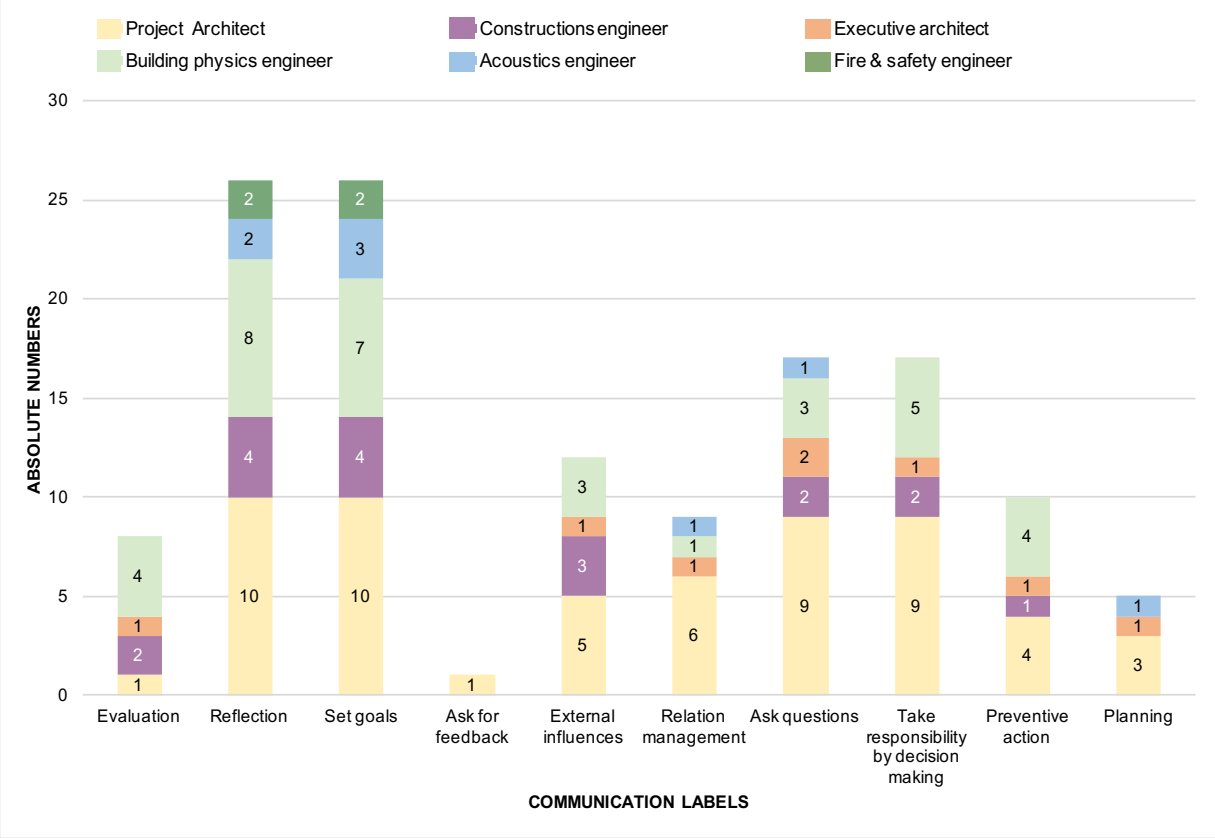


Table 10. Summary of the observations for case 1.

ROLE		LEADERS					FOLLOWERS			TOTAL SUM
		Senior Project manager	**Project manager**	**Design manager**	**Executive architect**	**Engineer building physics**	**Engineer Construction**	**Engineer Acoustics**	**Engineer Fire & Safety**	
LEADERSHIP STYLE		Directive/ Transformational	Empowerment/ Transformational	Transformational/ Empowerment	Transformational	Directive				
COMMUNICATION LABELS	**Evaluation**	A: 3 C: 12% R: 5%	A: 2 C: 8% R: 2%	A: 5 C: 20% R: 3%	A: 1 C: 4% R: 2%	A: 8 C: 32% R: 9%	A: 6 C: 24% R: 9%	A: 0 C: 0% R: 0%	A: 0 C: 0% R: 0%	**A = 25** **C =100%**
	Reflection	A: 6 C: 9% R: 10%	A: 8 C: 12% R: 9%	A: 19 C: 28% R: 12%	A: 7 C: 10% R: 11%%	A: 12 C: 18% R: 14%	A: 9 C: 13% R: 13%	A: 2 C: 3% R: 11%	A: 4 C: 6% R: 18%	**A = 67** **C = 100%**
	Set goals	A: 8 C: 12% R: 13%	A: 8 C: 12% R: 9%	A: 21 C: 32% R: 13%	A: 3 C: 5% R: 5%	A: 13 C: 20% R: 15%	A: 6 C: 9% R: 9%	A: 4 C: 6% R: 21%	A: 2 C: 3% R: 9%	**A = 65** **C = 100%**
	Define shared conceptual model	A: 12 C: 8% R: 19%	A: 20 C: 13% R: 21%	A: 32 C: 20% R: 19%	A: 23 C: 14% R: 38%	A: 24 C: 15% R: 28%	A: 29 C: 18% R: 41%	A: 6 C: 4% R: 32%	A: 13 C: 8% R: 59%	**A = 159** **C = 100%**
	Ask for feedback	A: 3 C: 25% R: 5%	A: 6 C: 50% R: 6%	A: 2 C: 17% R: 1%	A: 1 C: 8% R: 2%	A: 0 C: 0% R: 0%	A: 0 C: 0% R: 0%	A: 0 C: 0% R: 0%	A: 0 C: 0% R: 0%	**A = 12** **C = 100%**
	External influences	A: 6 C: 14% R: 10%	A: 11 C: 25% R: 12%	A: 11 C: 25% R: 7%	A: 6 C: 14% R: 10%	A: 4 C: 9% R: 5%	A: 5 C: 11% R: 7%	A: 0 C: 0% R: 0%	A: 1 C: 2% R: 5%	**A = 44** **C = 100%**
	Relation management	A: 7 C: 21% R: 11%	A: 10 C: 30% R: 11%	A: 9 C: 27% R: 5%	A: 3 C: 9% R: 5%	A: 1 C: 3% R: 1%	A: 2 C: 6% R: 3%	A: 1 C: 3% R: 5%	A: 0 C: 0% R: 0%	**A = 33** **C = 100%**
	Ask questions	A: 2 C: 4% R: 3%	A: 7 C: 12% R: 7%	A: 24 C: 42% R: 15%	A: 7 C: 12% R: 11%	A: 8 C: 14% R: 9%	A: 4 C: 7% R: 6%	A: 4 C: 7% R: 21%	A: 1 C: 2% R: 5%	**A = 57** **C = 100%**
	Take responsibility by decision making	A: 8 C: 17% R: 13%	A: 7 C: 15% R: 7%	A: 22 C: 46% R: 13%	A: 2 C: 4% R: 3%	A: 7 C: 15% R: 8%	A: 2 C: 4% R: 3%	A: 0 C: 0% R: 0%	A: 0 C: 0% R: 0%	**A = 48** **C = 100%**
	Preventive action	A: 5 C: 14% R: 8%	A: 3 C: 8% R: 3%	A: 10 C: 28% R: 6%	A: 5 C: 14% R: 8%	A: 8 C: 22% R: 9%	A: 5 C: 14% R: 7%	A: 0 C: 0% R: 0%	A: 0 C: 0% R: 0%	**A = 36** **C = 100%**
	Planning	A: 3 C: 9% R: 5%	A: 12 C: 34% R: 13%	A: 10 C: 29% R: 6%	A: 3 C: 9% R: 5%	A: 2 C: 6% R: 2%	A: 2 C: 6% R: 3%	A: 2 C: 6% R: 11%	A: 1 C: 3% R: 5%	**A = 35** **C =100%**
	Total	**A = 63** **R = 100%**	**A = 94** **R = 100%**	**A = 165** **R = 100%**	**A = 61** **R = 100%**	**A = 87** **R = 100%**	**A = 70** **R = 100%**	**A = 19** **R = 100%**	**A = 22** **R = 100%**	

A: Absolute number of the communication labels performed in all the fragments
C: Percentage of the communication label performed in all the fragments
R: Percentage of the communication label performed per role

Table 10 summarizes all the observations from the case Oncological Centre. It shows the percentage of the performed communication labels by the team members.

This table will be further elaborated on using the observations described before and quotations from the analysed observations.

Communication labels
By looking at the quantitative data of the observations, it can be concluded that the design manager is the most active member. Furthermore, it has been observed that **Relation management** and Ask for feedback is almost solely performed by the project manager and the design manager.

The most observed communication label within this case was **Define shared conceptual model**, which is due to the fact that the project meetings were attended by different professionals to share their knowledge about their expertise. Other most performed communication labels were **Reflection, Set goals, Ask questions** and **Take responsibility by decision making**. These labels were performed the most by both the design manager and engineer building physics or mostly solely by the design manager. This is remarkable as they both also were analysed as "leader" within the interviews the beginning of the case study.

Reflection was mostly performed by the design manager and engineer building physics. This label could be stained positive and negative. Positive reflection was performed by indicating the actions which lead to a positive result, whereas negative reflection is associated with indicating the actions which lead to insufficient outcome. This difference is also recognizable in the way the design manager and engineer building physics has performed this label.

"We had an extensive reflection on the collaboration process of the schematic with our intern team. Which is experienced in a satisfied way by the entire team." - Design manager

"That was also the case with the document of fundamentals which we had to finish very fast, before Christmas, to make sure that the client receives it in time. If we have something like this again, it would be better to organize a meeting and give them some background information before handing the final document. Because you can see that the client is struggling if they get an entire document which they have to approve." - Engineer building physics

Set goals was mostly performed by the design manager and engineer building physics. This means clearly appoint that there needs to be a task assigned in order to achieve a certain result.

"We (the team) have to make this clearly insightful for us and the client." - Design manager

"Are we seriously discussing for a half hour how much users meetings we need? We should just start with the meetings and along the way it will come become clear how much meetings we need more and whether it will may result in a possible delay." - Engineer building physics

Ask questions and **Take responsibility by decision making** was significantly performed the most by the design manager. **Ask questions** is not solely associated with asking about information which can be used for your own discipline as well. But these questions are likewise asked out of interest and curiosity to understand the expertise of another team member as well. And by understanding the expertise of another team member, the collaboration process smoothens as well as all the team members are working towards one project result.

Take responsibility by decision making is taking the responsibility that a decision is made which results in a focus of making things actually happen. The observations show a that the design manager take a big part in performing this label.

"It is smart to meet periodically with the design team at the office of the client with the technical service and the organization planning guy. And to monthly discuss these kinds of subjects which will result in a representative attitude from our side where we can comment in a sufficient way." – **Design manager**

Leadership styles

The team members who were analysed as "follower", on the basis of the interviews, have not performed any significant different communication labels then the team members who were analysed as "leader". Although, the data shows that the team members analysed as "leader" were more active during the project team meetings. Furthermore, engineer construction, who is defined as "follower", has performed the label Take responsibility by decision making as well. This indicates that this decision making is not related to the position, role or expertise.

Furthermore, it can be concluded that leadership styles are observed during the observations. However, they are not connected to the tasks. As in this case the design manager was analysed with the leadership style *Empowerment*. The design manager and the executive architect were analysed with the leadership style *transformational* on the basis of the interviews. Although, there are not observed the same communication labels for the design manager and the executive architect. Moreover, it has been observed that the design manager and engineer building physics both performed the communication labels which frequent occurred within the project team meetings. While they both are analysed with different leadership styles. As the engineer building physics was analysed with *directive* leadership style on basis of the interview and the project manager with the style *Empowerment*.

It is remarkable that the project manager and design manager were analysed with different leadership styles, respectively *empowerment* and *transformational*, but results in performing the label *Relation management* the most during the observations. Whilst, they both answered the question, "How would you describe your own leadership style?" in a different manner during the interviews.

"Friendly, enthusiastic and take the team with you within the process. A social leader. But I am not a leader. I see myself as a mean to achieve a goal. It is always a team performance." – Project manager

Case 2 Head office Auctions 5

5.1 Context

This case is the development of the head office building for a company who auctions flowers. At the entrance of terrain there is now an outdated building and an office building which is built in 2004.

5.1.1 Project description

This outdated building will be sloped and the office building Zuidzicht will be expanded. The total area should provide 250 flex working spaces, a restaurant, a new main entrance, a meeting centre and a few facility rooms for storage, archive and repro. The expansion of the office building should be integrated with the current office building resulting in one building.

5.1.2 Organization

Stakeholders

For this development, the engineering company has formed a joint venture with an Architect bureau. Engineering company will be responsible for the project management and engineering. Engineering consists of the following disciplines; construction, electrical engineering and mechanical engineering. Furthermore, the Architect bureau is responsible for the architectural design of the building, the interior design and the building cost estimation.

The Architect bureau has also worked in the past with engineering company on other projects for the same client. One architect from the Architect bureau will attend the project team meetings and on their office there is also one BIM modeller who is working on this project. The following list consists of the roles involved in case 2:

- Project manager
- Architect
- BIM modeller
- Engineers (construction, mechanical installations, electrical installations)
- Advisor building physics
- Cost management
- Advisor sustainability
- Advisor municipal permits

The current project manager was the third project manager for this project. The last two project managers left the project because of conflicts. Engineer mechanical and engineer electrical work very closely together in this project and in several other projects as well. Engineer construction has never worked before with the architect and the other team members. The architect and the project manager have never worked before with any member of this team.

Organizational Chart

Figure 6 shows the organization of the stakeholders of the case 2. This team consisted of the client, engineering company, Architect bureau and a cost management bureau. Which is hired by the Architect bureau as a sub-contractor.

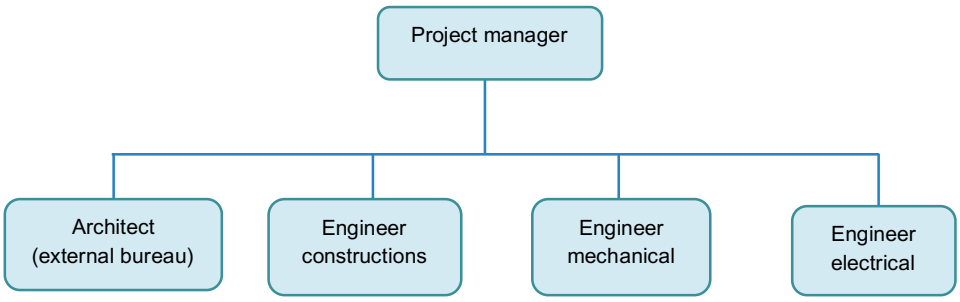


Figure 6. Organizational Chart design team case 2.

5.1.3 Meeting structure

The following table shows which meetings take place and how frequently they are held for this case.

Meeting	Frequency
Project team	Once every 3 or 4 weeks
Engineering teams	Once every week
Design team External architect bureau	Once every week

Table 11. Meeting structure case 2.

The project team meetings were planned every two weeks with the project manager, architect and all the engineers. But in practice the meetings were held every 3 or 4 weeks, as it was not necessary to meet every two weeks.

5.2 Researcher's vision

It is remarkable in this case that the current project manager was the third project manager for this project. It was interesting to find out the reason behind that change. Furthermore, this was a small team which can functions differently than a bigger team.

The kick-off meeting could not be attended as the graduation research started later. The first meeting which was attended was the project team meeting in January 2017.

5.3 Interview with team members

The interviews were held to get an insight how the team members experience the collaboration between the team members, the atmosphere within the team, background information about the team member themselves.

5.3.1 Leader or follower

Project manager

"I give my team their freedom. But freedom comes together with a lot of responsibility and I expect from my team that they identify opportunities to take their responsibility." – **Leader – Identify opportunities and act on them**

"I steer on ownership in the sense that I expect that deliverables should be there. And if they are not there, I will address to the concerning team members." **Leader – Take action**

"I am very clear about what we are going to do. And also show the planning beforehand on time when we have to deliver the products." **Leader – Show initiative**

Design manager

"Name X is the real project manager, I see him as my direct client and the engineer's mechanical, electrical and construction do support him." – Follower – Do not challenge status quo

"I think this engineering company is representing large part of the team. And in the beginning, I really thought I have a big battlefront in front of me and that I will have to defend myself." – Follower – Passively adapt to their work conditions

"As an architect, I often underestimate my role." – Follower – Fail to identify opportunities

Engineer mechanical

"I am strict in the fact that, if you have a project then there should be clear responsibilities. And that can also mean that you look beyond your own discipline and expertise and you can have an opinion about that." – Leader - Identify opportunities and act on them

"You can also say something if something is not going the right way which is something I also do always." – **Leader – Improve current circumstances**

"But I am not going to pull all the opportunities to take actions towards me. I'm not paid for it either. That is why I would not take such an initiative." – **Follower – Show little initiative**

Engineer electrical

"I am responsible for the discipline electrical, but I also look in other gardens." – **Leader – Identify opportunities and act on them**

"I would to the work of other team members and im not afraid to ask question." – **Leader – Show initiative**

Engineer construction

"I see my role as a supporting role towards the architect. I make it possible that the architect can design the building the way he imagines it in his mind" – **Follower – Do not challenge status quo**

"The architect could also take over the role of the architect." – **Follower – Passive adapt to their work conditions**

#	Role team member	Leader	Follower
1	Project Manager	X	
2	Design manager		X
3	Engineer mechanical	X	
4	Engineer electrical	X	
5	Engineer construction		X

Table 12. Result leader versus follower

5.3.2 *Leadership styles*

Project manager

"I mainly put the responsibilities by the team members themselves. If you give the people their freedom and space then, I think, there will arise more enthusiasm and pleasure in their work." - Empowerment

"Al the people here have done higher education. You do not have to explain them what to do. You only have to tell them, 'We are going to do this project with each other and how are we going to this? You guys can tell me… " – Empowerment

"Sometimes I am stubborn. My truth is the truth. Maybe I should also think about other arguments which can be relevant. I do not the latter that often. I do not take other people's opinion into account." – Directive

Engineer mechanical

"That is because of my modesty in my nature and in my nature I am not a leader at all. As I becoming older, I get more experience, self-confidence and I know very well what I want and do not want. I have a very clear picture how to deal with teams and how to motivate people. And that is being seen and is the reason why I am asked to become a team leader." - Transformational

"My incentives are not focused on being a manager but focused on a very nice way of working together." - Transactional

"I am more of a people person. It is all about the people, because I know for sure that if I can make sure that you enjoy your work, I do not need to talk with you about whether or not you are running enough order related hours or about the budget of projects. Because I know it's all good." - Transformational

Engineer electrical

"I know I have very dominant style. And because I know, I tried to calm down." - Directive

"I am kind of politically oriented. I formulate my answers very well. It's also in me, I am set up for it. And in my role I can clearly say where it is about in our interest and the client." - Directive

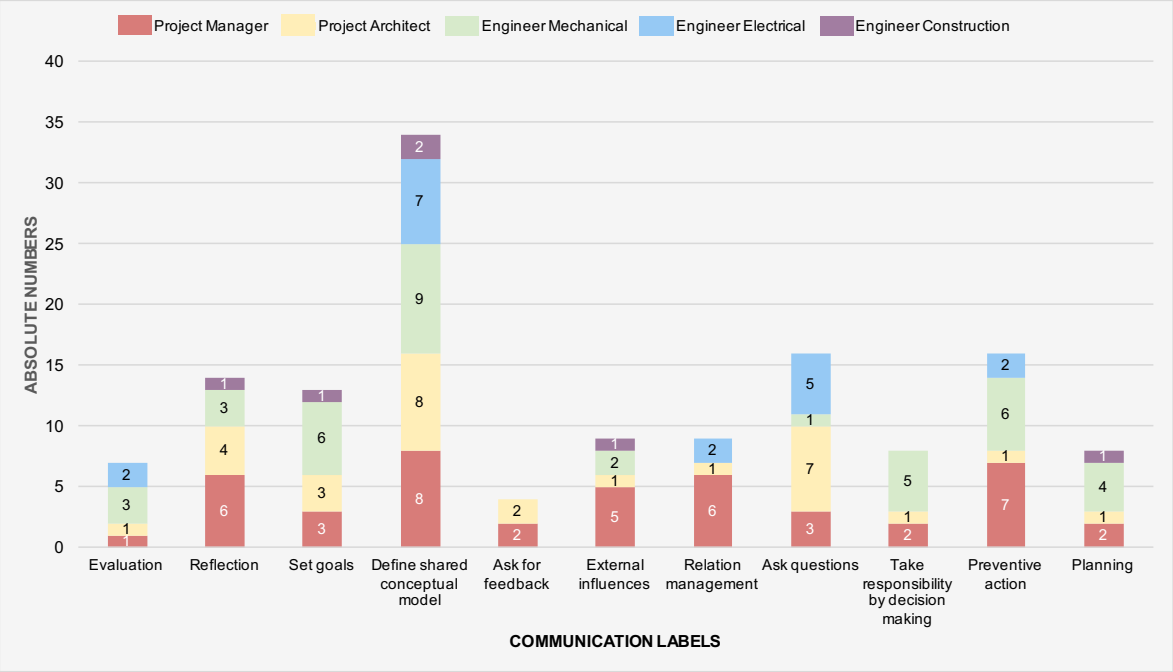
"Sometimes it is not rewarded to interfere with other disciplines. But likely that is not the case in this team. I also interfere with other disciplines because I feel involved. I think other team members should also do that" - Transactional

5.4 Observations

Head office Auctions – OBSERVATION 1 - 11 January 2017

General

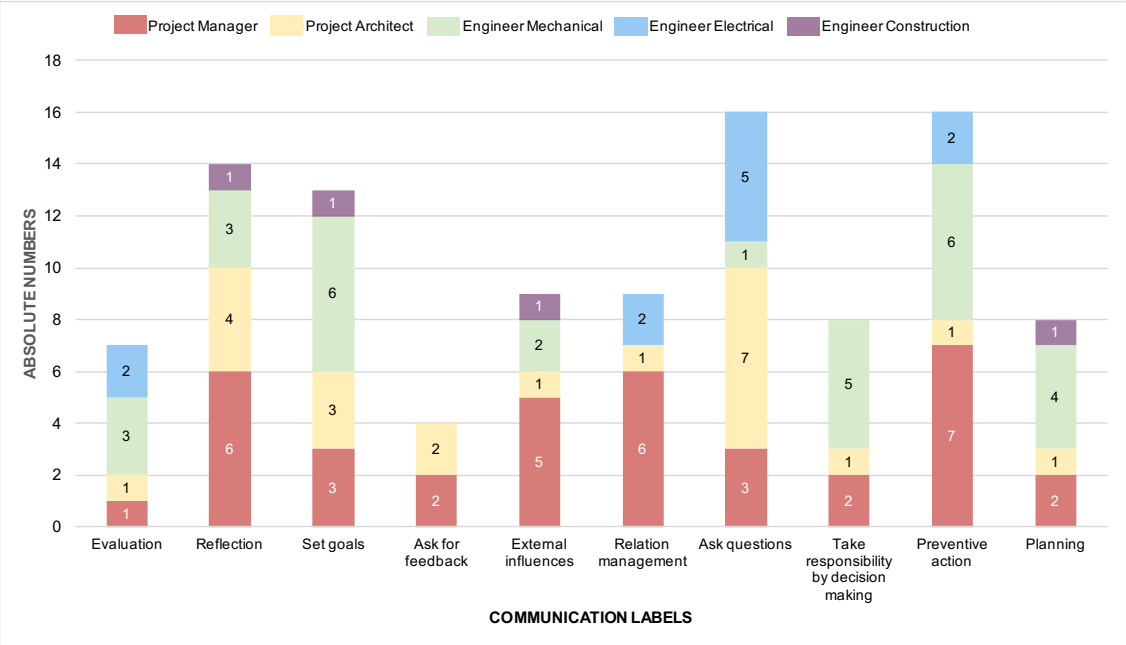
This meeting started with the agenda points by the project manager with one of the important subject was to discuss the results of the permit done by the design manager. Furthermore, all the disciplines were discussed and the BREEAM concept for this project.



Graph 5 A. Absolute amounts of the communication labels plotted against the communication labels.

Graph 5A

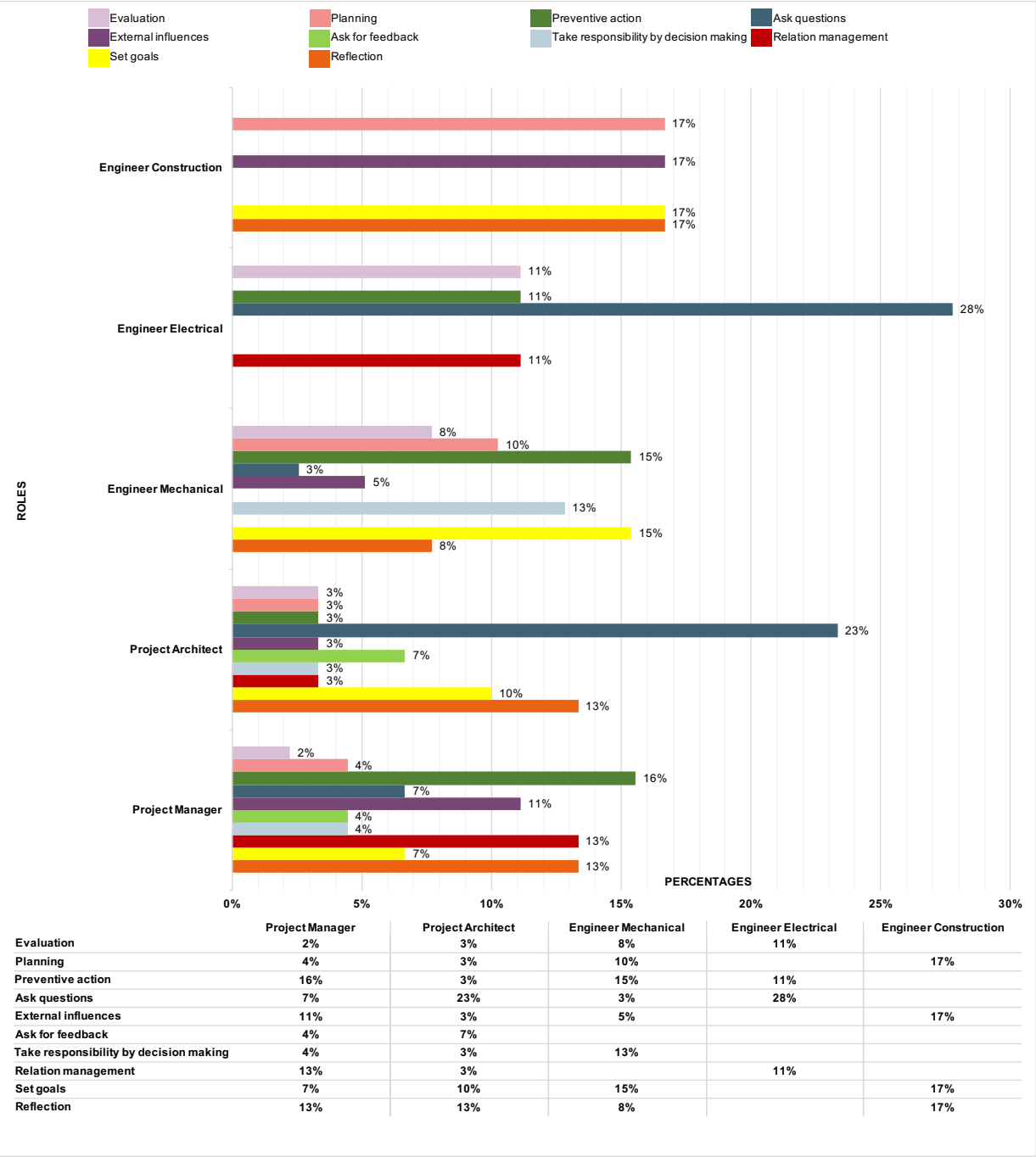
It is clear in graph 5A, that the label **Define shared conceptual model** was performed the most in this fragment and is the only label which was performed by every team member. This label is excluded in graph 5B to see the spread of the other labels.



*Graph 5 B. Absolute amounts of the communication labels plotted against the communication labels, excluding the label **Define shared conceptual model**.*

Graph 5B

Graph 5B shows that labels **Ask questions** and **Preventive action** were performed the most. Followed by **Reflection** and **Set goals.** On the other hand, **Ask for feedback** was exclusively performed by the project manager and design manager. Furthermore, it can be concluded that the project manager and design manager has performed all the communication labels. The latter also counts for engineer mechanical, except for the label **Ask for feedback**. It is remarkable that engineer mechanical and the design manager were mainly performing the label **Ask questions**.



	Project Manager	Project Architect	Engineer Mechanical	Engineer Electrical	Engineer Construction
Evaluation	2%	3%	8%	11%	
Planning	4%	3%	10%		17%
Preventive action	16%	3%	15%	11%	
Ask questions	7%	23%	3%	28%	
External influences	11%	3%	5%		17%
Ask for feedback	4%	7%			
Take responsibility by decision making	4%	3%	13%		
Relation management	13%	3%		11%	
Set goals	7%	10%	15%		17%
Reflection	13%	13%	8%		17%

Graph 5 C. Communication labels plotted against the team members in percentages.

Graph 5C

Graph 5C shows clearly that the project manager and design manager has performed all the labels. It is remarkable that **Reflection** is the one label which they have performed equally with 13%. Furthermore, engineer mechanical has also performed almost all the labels except for **Ask for feedback** and **Relation management**. For a few labels it can be concluded that it was performed in a lower percentage by some team members, but performed in a higher percentage by other team members. **Evaluation** was performed less by the project manager (2%) and design manager (3%), but performed more by engineer mechanical (8%) and engineer electrical (11%). This also counts for **Planning**, project manager (4%) and design manager (3%) compared to engineer mechanical (10%) and engineer constructions (17%). **Ask questions** was performed less by engineer mechanical (3%) and project manager (7%) compared to design manager (23%)

and engineer electrical (28%). **External influences** was performed less by design manager (3%) and engineer mechanical (5%), but performed more by project manager (11%) and engineer constructions (17%). It is remarkable that **Take responsibility by decision making** was mainly performed by engineer mechanical (13%) and less by the project manager (4%) and design manager (3%). Moreover, it is noteworthy that engineer constructions has performed his labels in equal percentage; **Planning** (17%), **External influences** (17%), **Set goals** (17%) and **Reflection** (17%).

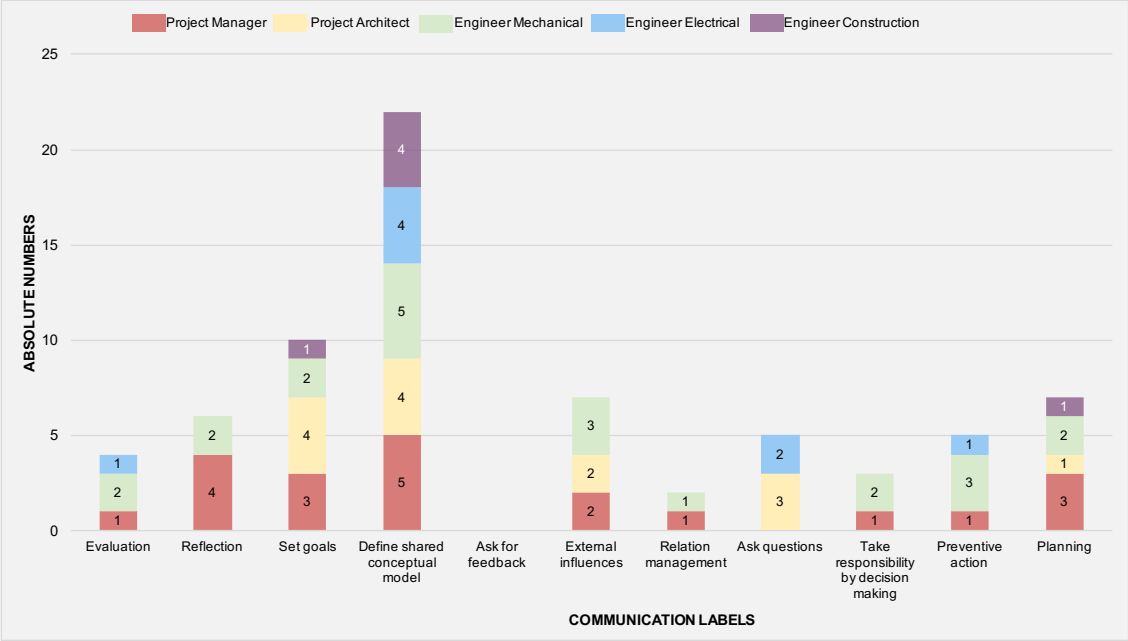
The meetings ended with some confusion about BREEAM whether it is applicable for this project or not the project manager satisfies the team that he will take care of it. The project manager did a final questioning where everyone can ask a question or share a last note.

Most performed communication labels within this fragment were**: Ask questions, Preventive action** and **Reflection.**

Head office Auctions – OBSERVATION 2 – 22 March 2017.

General

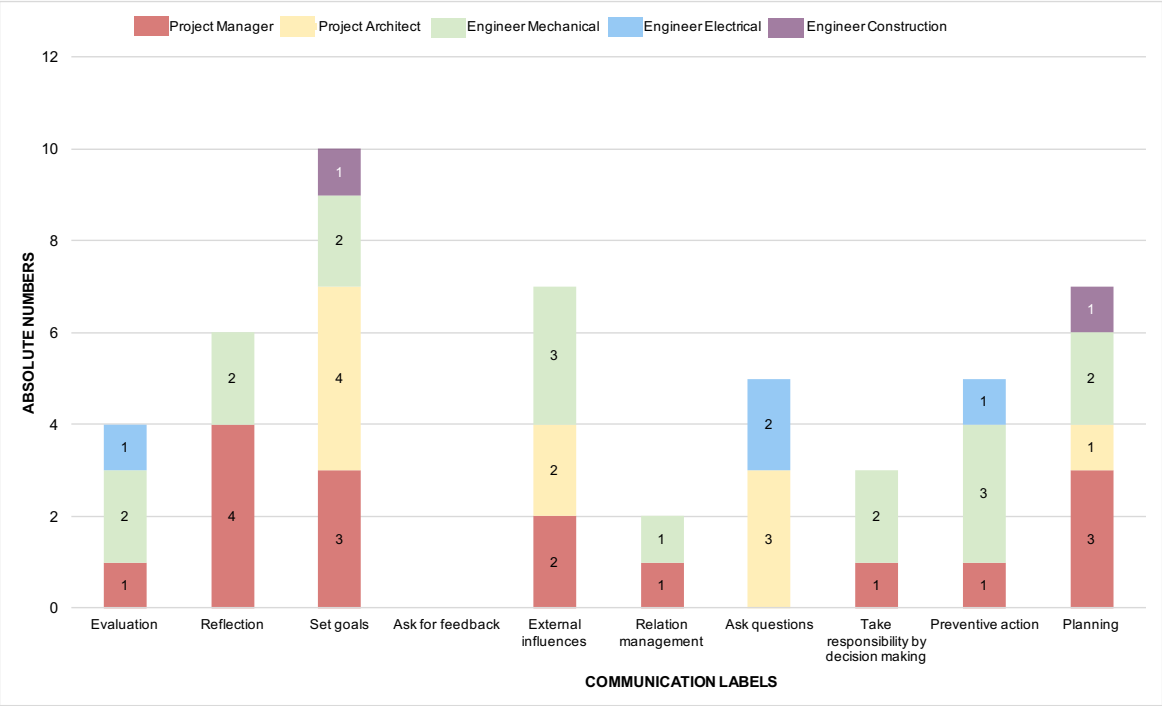
This meeting started with the agenda points by the project manager and the announcement that BREEAM will be definitely part of this project as the client has made a final decision. Furthermore, all the disciplines were discussed and more time was spent on discussing the construction as a challenge occurred. This meeting took place after handing in the deliverables for the Final Design.



Graph 6 A. Absolute amounts of the communication labels plotted against the communication labels.

Graph 6A

This graph shows a high performance of the label **Define shared conceptual model.** Followed by the label **Ask questions, Reflection** and **Set goals**. Label **Ask for feedback was performed by no one. Define shared concept model** will be excluded in the graph 6B.



*Graph 6 B. Absolute amounts of the communication labels plotted against the communication labels, excluding the label **Define shared conceptual model**.*

Graph 6B

The graph shows that the labels: **Ask questions, Reflection, Set goals** and **Planning** were performed by all team members. Furthermore, the project manager has performed all the labels, except for **Evaluation**. It is noteworthy, that the project manager also performed the labels in a relative high number. Engineer mechanical have also performed all the labels, except for **Ask for feedback**.

	Project Manager	Project Architect	Engineer Mechanical	Engineer Electrical	Engineer Construction
Evaluation	5%		9%	13%	
Planning	14%	7%	9%		17%
Preventive action	5%		14%	13%	
Ask questions		21%		25%	
External influences	10%	14%	14%		
Ask for feedback					
Take responsibility by decision making	5%		9%		
Relation management	5%		5%		
Set goals	14%	29%	9%		17%
Reflection	19%		9%		

Graph 6 C. Communication labels plotted against the team members in percentages.

Graph 6C

Graph 6C makes it visible that the project manager and engineer mechanical were performing most of the labels and the label **Ask for feedback** was performed by nobody. On the other hand, the design manager was performing a lesser amount of labels, but the percentage of the label **Set goals** (29%) performed by the design manager is the highest, followed by engineer construction (17%), project manager (14%) and engineer mechanical (9%). It is remarkable that the following labels are solely performed by project manager and engineer mechanical, respectively **Take responsibility by decision making** (project manager 5%,

engineer mechanical 9%), **Relation management** (project manager 5%, engineer mechanical 5%) and **Reflection** (project manager 19%, engineer mechanical 9%). Moreover, it can be concluded that engineer constructions was mainly performing the labels **Planning** (17%) and **Set goals** (17%). Whereas, engineer electrical have mainly performed **Ask questions** (25%), **Evaluation** (13%) and **Preventive action** (13%).

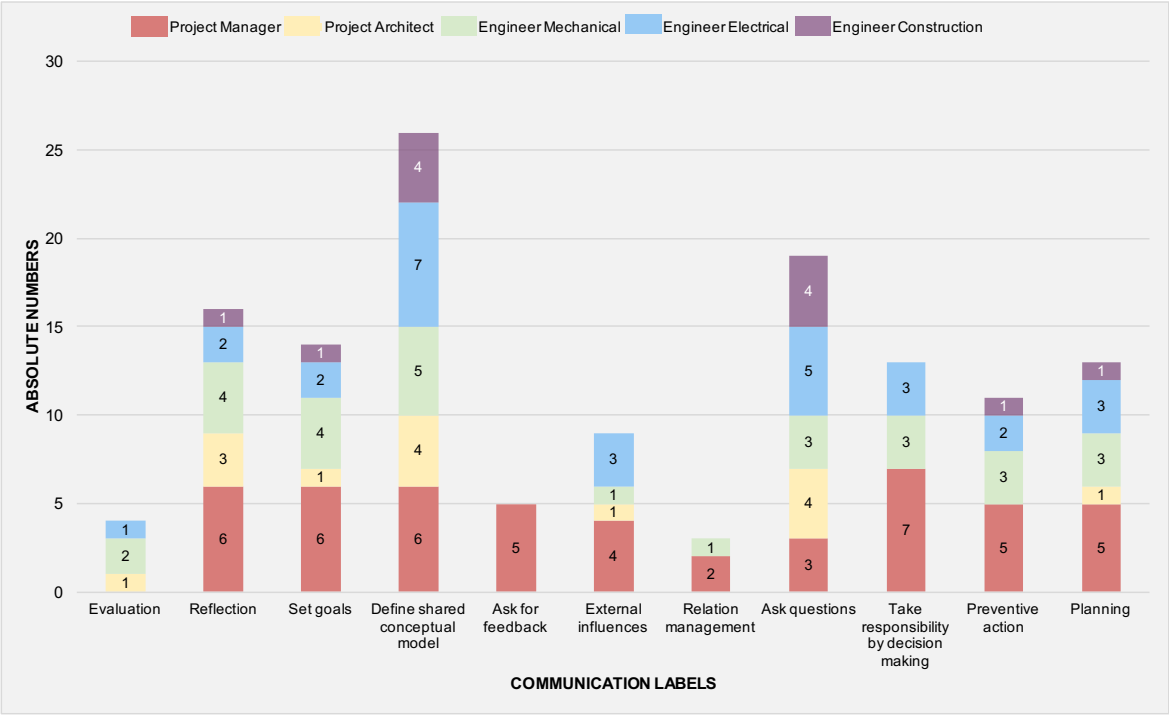
The project manager did a final questioning where everyone can ask a question or share a last note.

Most performed communication labels within this fragment were: **Set goals, External influences** and **Planning.**

Head office Auctions – OBSERVATION 3 – 10 May 2017.

General

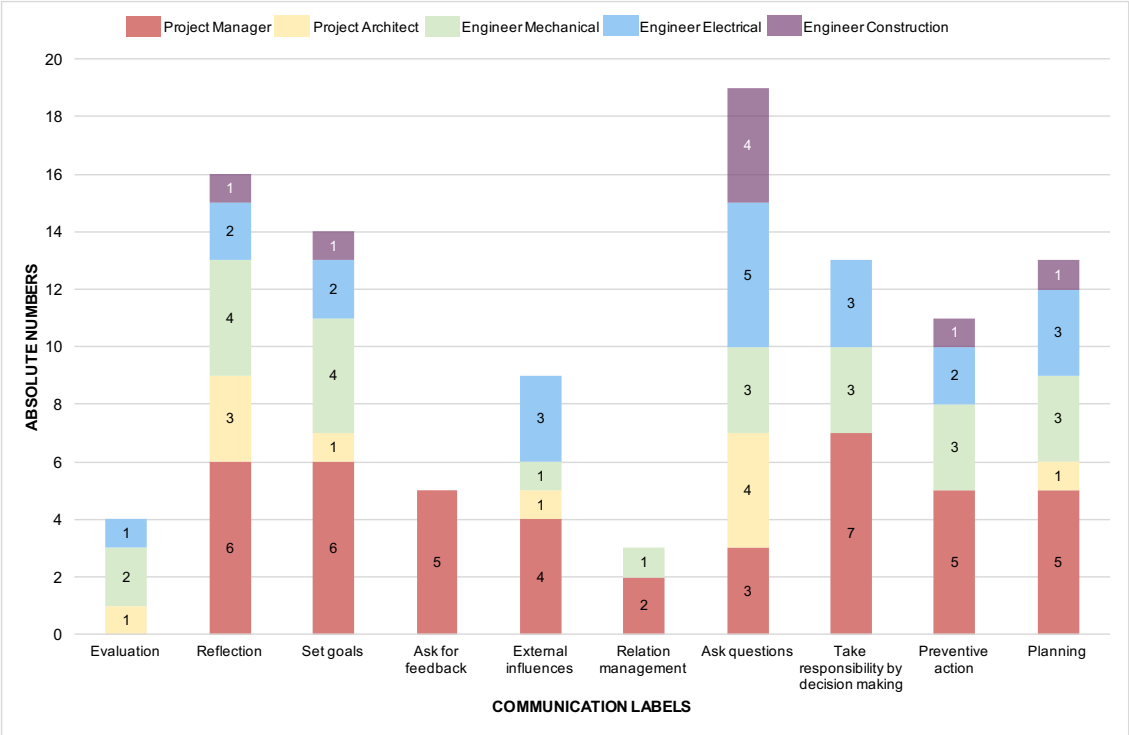
This meeting started with the agenda points by the project manager. The team members had some question marks about the interior layout as this team had the assignment to design the building shell. And it was not clear whether a few items were a part of building shell or the interior layout and until which detail level the deliverables should be provided. The planning was also an important subject as the project manager was planning the date for the deadline of the Technical Design.



Graph 7 A. Absolute amounts of the communication labels plotted against the communication labels.

Graph 7A

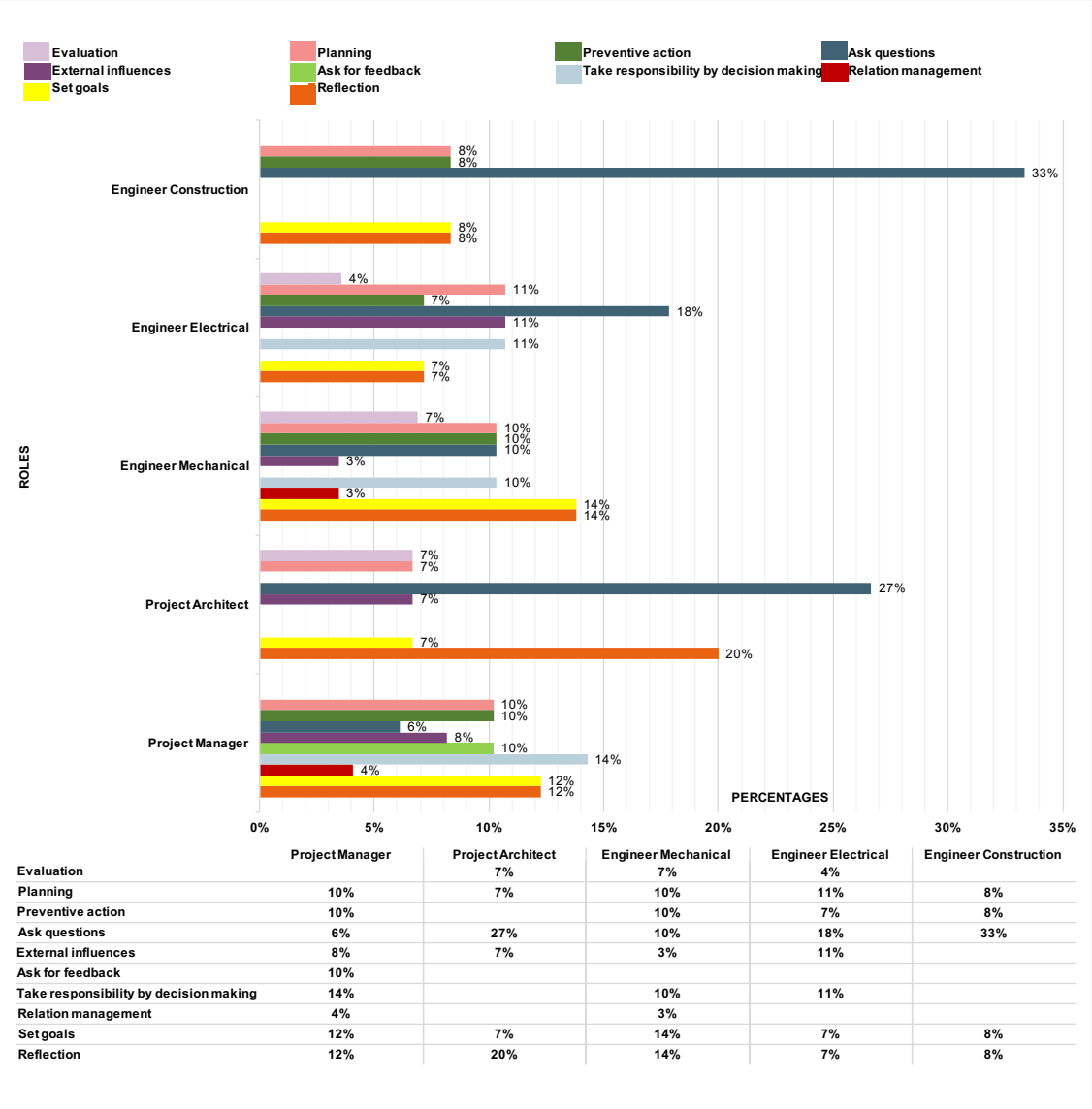
The graph shows a high performance of the label **Define shared conceptual model** by all the team members. Followed by **Ask questions, Reflection** and **Set goals. Relation management, Evaluation** and **Ask for feedback** were performed in a smaller amount. Furthermore, the project manager is performing all the labels, except for **Evaluation**.



Graph 7 B. Absolute amounts of the communication labels plotted against the communication labels, excluding the label ***Define shared conceptual model****.*

Graph 7B

The label **Define shared conceptual model** is excluded in graph 7B. This results in a remarkable high performance of the label **Ask questions, Reflection, Set goals** and **Planning**. All the previous mentioned labels were performed by all the team members. Mainly by the project manager, except for **Asking question**, which is mainly performed by engineer electrical.



	Project Manager	Project Architect	Engineer Mechanical	Engineer Electrical	Engineer Construction
Evaluation		7%	7%	4%	
Planning	10%	7%	10%	11%	8%
Preventive action	10%		10%	7%	8%
Ask questions	6%	27%	10%	18%	33%
External influences	8%	7%	3%	11%	
Ask for feedback	10%				
Take responsibility by decision making	14%		10%	11%	
Relation management	4%		3%		
Set goals	12%	7%	14%	7%	8%
Reflection	12%	20%	14%	7%	8%

Graph 7 C. Communication labels plotted against the team members in percentages.

Graph 7C

The attached table in graph 7C shows a high performance of all the labels divided over the team members, mainly performed by the project manager, engineer mechanical and engineer electrical. It is remarkable that the labels **Set goals** and **Reflection** were performed equally by all the team members, except for the design manager who has performed Reflection (20%) extensively more than the other team members. **Set goals** was performed by the project manager (12%), design manager (7%), engineer mechanical (14%), engineer electrical (7%) and engineer constructions (8%). **Reflection** was performed by the project manager (12%), design manager (20%), engineer mechanical (14%), engineer electrical (7%) and engineer constructions (8%). The label **Take responsibility by decision making** was mainly performed by the project manager (14%), followed by engineer electrical (11%) and engineer mechanical (10%). It can be noted, that **Ask for feedback** was only performed by the project manager (10%). Furthermore, **Relation management** was solely performed by project manager (4%) and engineer electrical (3%). Lastly, engineer construction has performed **Ask questions** the most with a percentage of 33%.

The project manager did a final questioning where everyone can ask a question or share a last note. And shared with the team that he will contact the project manager who manages the interior layout for this

project as there was as a confusion about the responsibility of the deliverables and also talk to the client to give feedback about the detail level of the deliverables.

Most performed communication labels within this fragment were: **Ask questions, Reflection** and **Set goals.**

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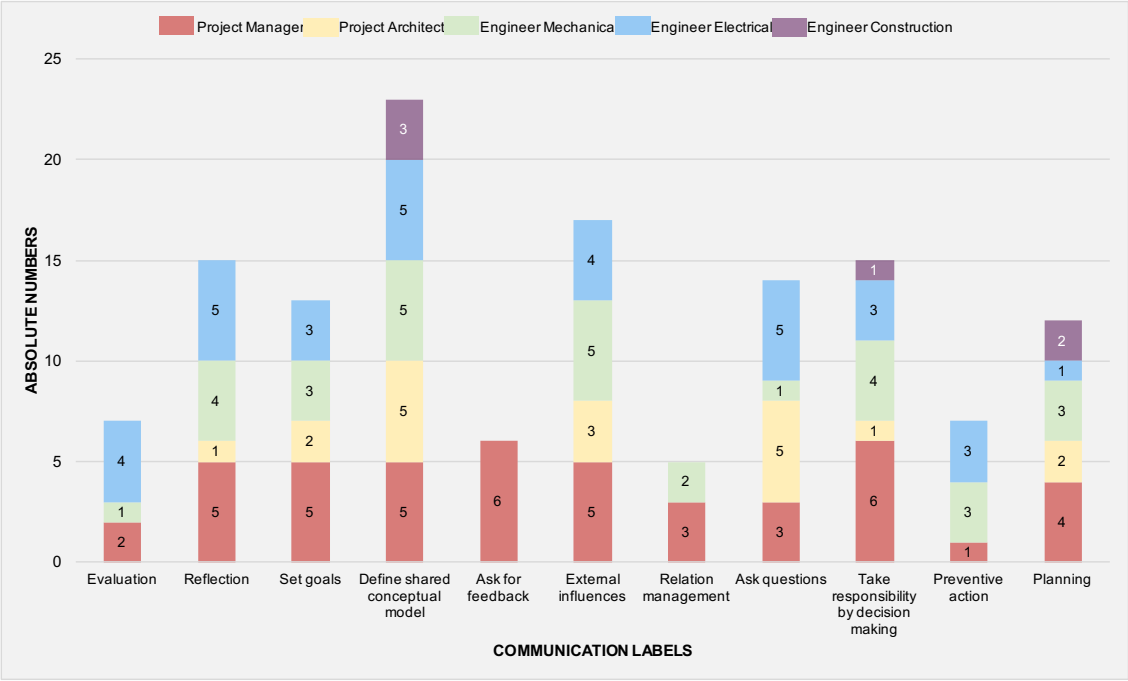
General

Between the previous meeting and this meeting, project managed had emailed the outcomes of the detail level of the deliverables and also the outcome of his conversation with the project manager who is responsible for the interior layout. He also mentioned that the he will send his first concept of the planning for the Technical Design and asked to team members to give their input about the planning whether it is realistic.

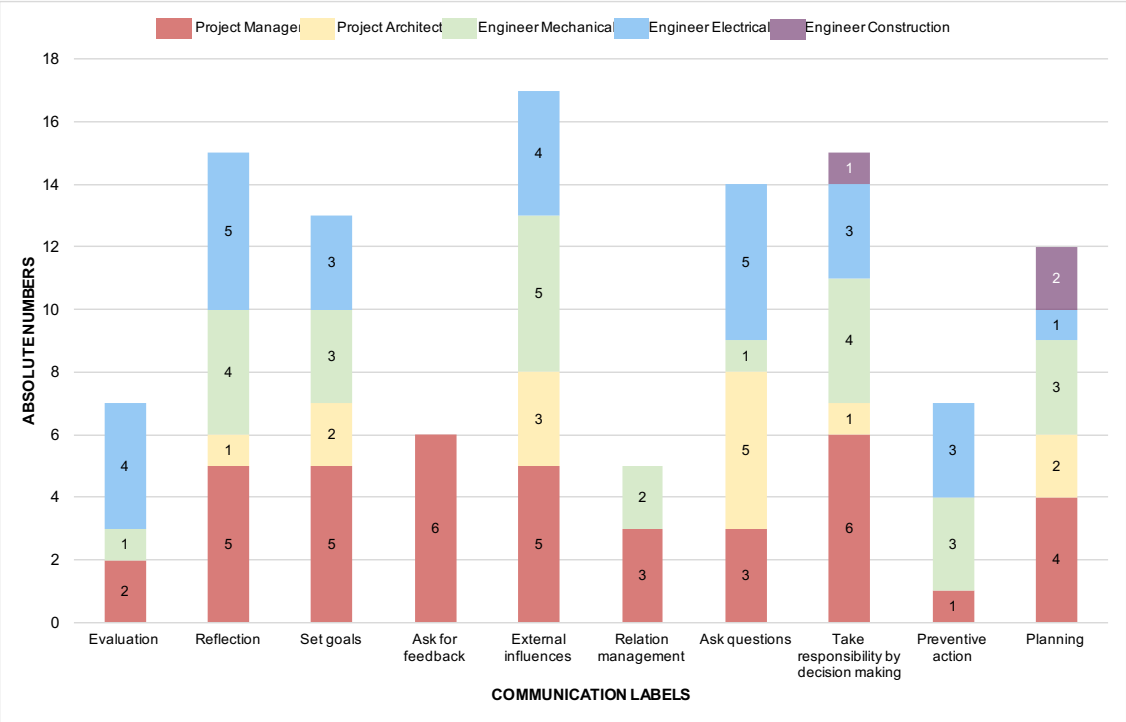
This meeting started with the agenda points by the project manager. In this meeting, there was much of discussion again about the responsibility of the deliverables concerning the fact whether it is part of the building shell or the interior layout.



Graph 8 A. Absolute amounts of the communication labels plotted against the communication labels

Graph 8A

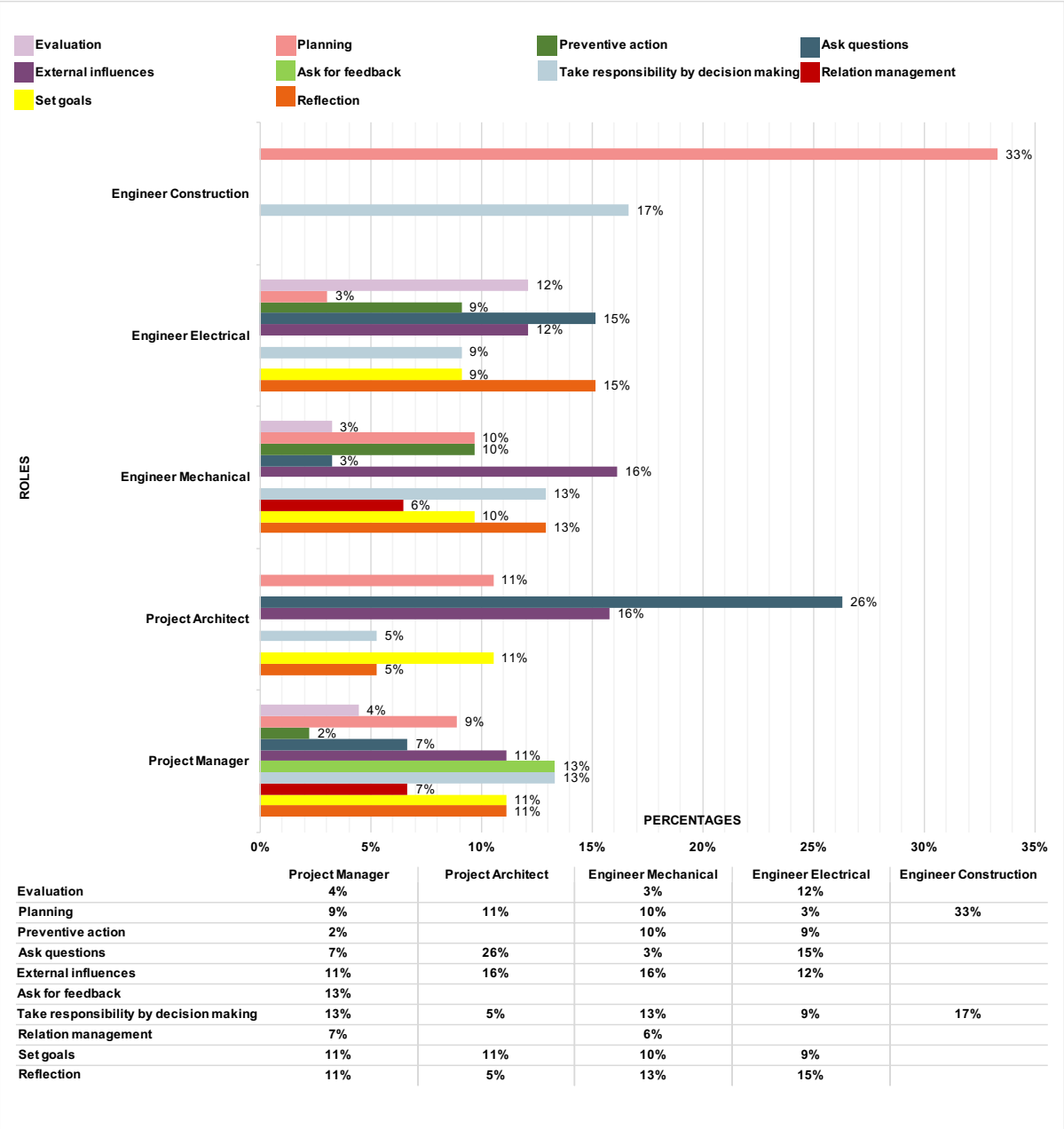
This graph shows, labels **Define shared conceptual model, Take responsibility by decision making** and **Planning** were performed by all team members. Furthermore, the project manager and engineer mechanical has performed all the labels, except for **Ask for feedback** which was solely performed by the project manager. Engineer electrical have also performed all the labels, except for **Ask for feedback** and **Relation management**.



*Graph 8 B. Absolute amounts of the communication labels plotted against the communication labels, excluding the label **Define shared conceptual model**.*

Graph 8B

Graph 8B shows a high performance of the labels **External influences, Take responsibility by decision making, Reflection, Set goals** and **Ask questions**. Whereas **Take responsibility by decision making** and **Planning** were performed by all the team members. Furthermore, **Evaluation** and **Preventive action** were only performed by project manager, engineer mechanical and engineer electrical. Moreover, the design manager has mainly performed the label **Ask questions.**



	Project Manager	Project Architect	Engineer Mechanical	Engineer Electrical	Engineer Construction
Evaluation	4%		3%	12%	
Planning	9%	11%	10%	3%	33%
Preventive action	2%		10%	9%	
Ask questions	7%	26%	3%	15%	
External influences	11%	16%	16%	12%	
Ask for feedback	13%				
Take responsibility by decision making	13%	5%	13%	9%	17%
Relation management	7%		6%		
Set goals	11%	11%	10%	9%	
Reflection	11%	5%	13%	15%	

Graph 8 C. Communication labels plotted against the team members in percentages.

Graph 8C

The attached label in graph 8C shows an active performance of the communication labels by the team members; project manager, engineer mechanical and engineer electrical and design manager. Engineer constructions has only performed the labels **Define shared conceptual model** (50%), **Planning** (33%) and **Take responsibility by decision making** (17%). Although, the last mentioned label was performed the most in percentages by engineer constructions (17%), compared to the project manager (13%), engineer mechanical (13%), engineer electrical (9%) and design manager (5%). Furthermore, it can be concluded that the design manager has mainly performed **Ask questions** (26%). The label **Set goals** was performed by the following team members in almost equal percentages; project manager (11%), design manager (11%), engineer mechanical (10%) and engineer electrical (9%). The label **Reflection** was performed by the team members with a diversity in the performed percentage; project manager (11%), design manager (5%), engineer mechanical (13%) and engineer electrical (15%).

The project manager has mainly performed **Ask for feedback** and **Take responsibility by decision making**. Design manager has mainly performed.

5.5 Summary observations

The four observations are compiled together below. In these graphs the label **Define shared conceptual model** is excluded as these labels was performed by every team member in every fragment. The following can be concluded by comparing these fragments.

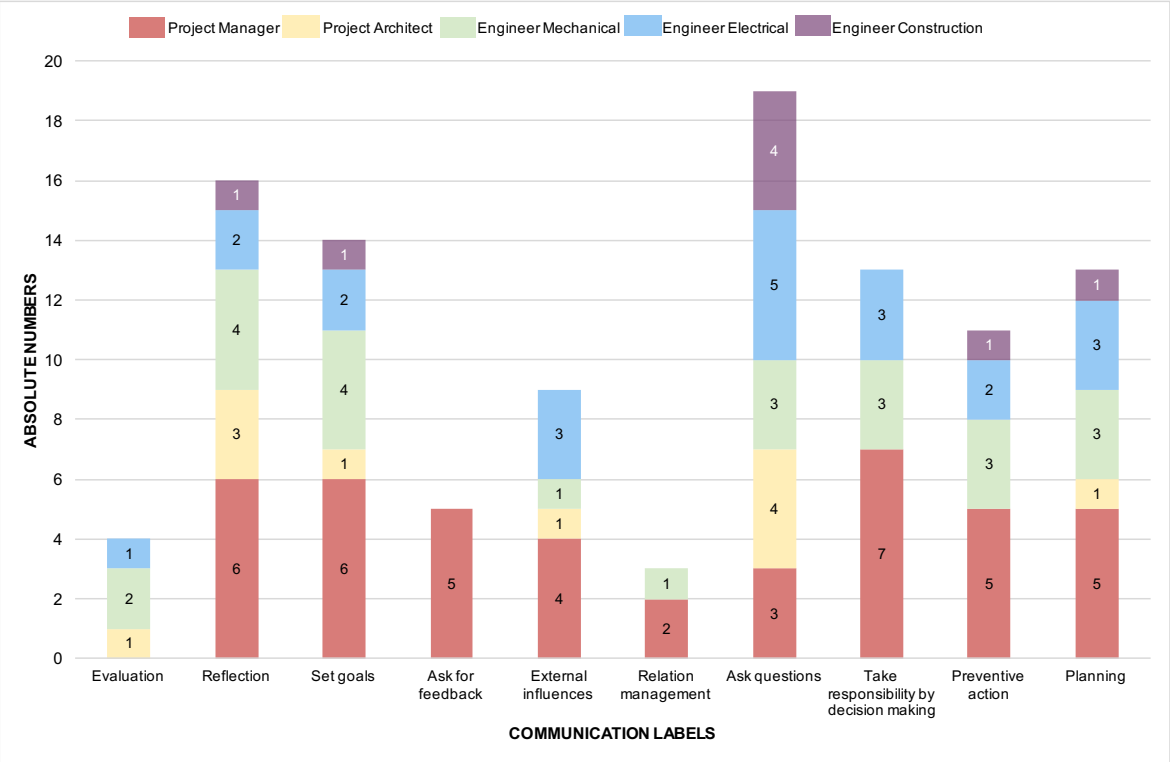
The project manages was extensively performing all the communication labels in almost all the fragments, except for **Evaluation** in fragment 1 and **Ask for feedback** and **Ask questions** in fragment 2. Furthermore, it can be said that **Reflection** and **Set goals** was performed in a high amount in all the fragments by the project manager. It is remarkable that project manager was the only person who performed the label **Ask for feedback**, except for fragment 3, where the design manager also performed this label.

It is interesting to see that the engineer mechanical and project manager have both performed Relation management in all fragments, whereas engineer electrical also performed this label in fragment 3.

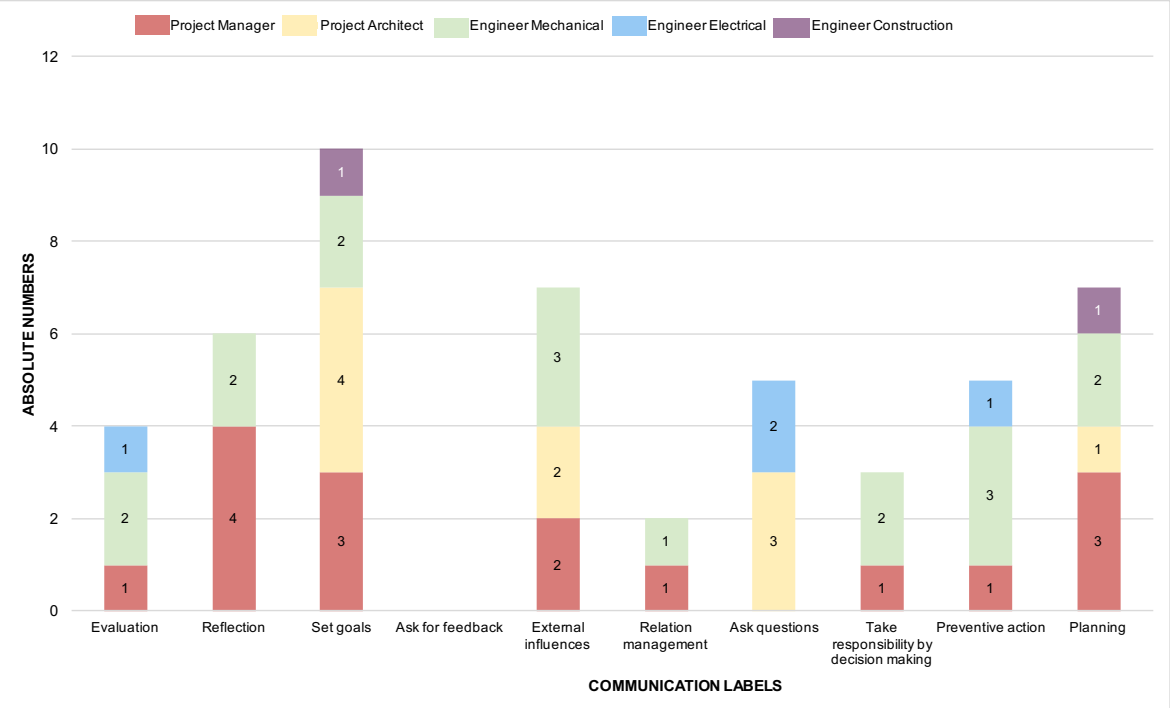
In all fragments, it is visible, that the labels **Reflection** and **Set goals** are dominant.

Finally, the label **Ask questions** was relatively performed in a high amount by all the team members

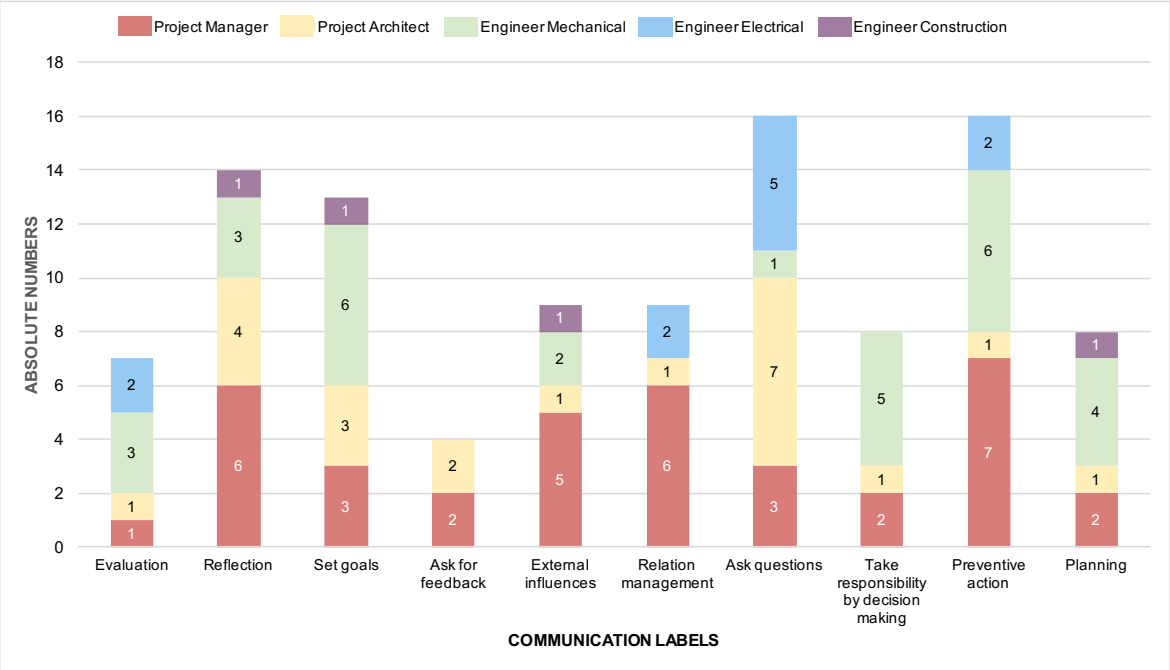
Fragment 1



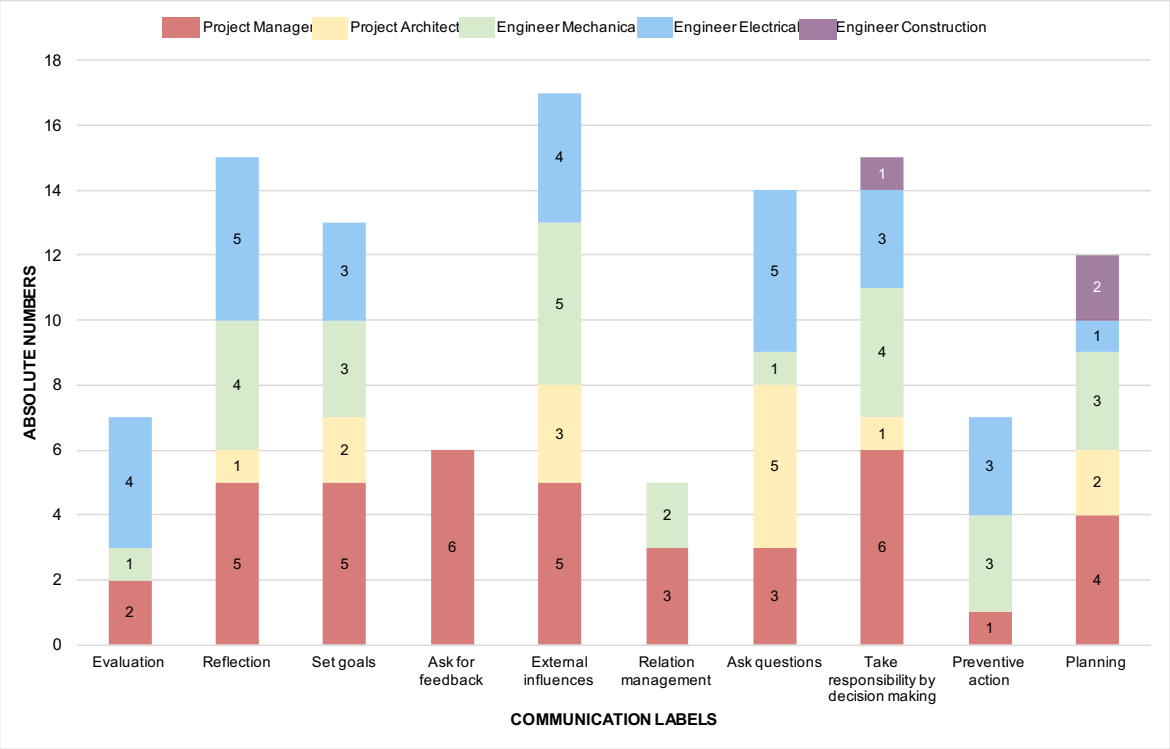
Fragment 2



Fragment 3



Fragment 4



5.5.1 Case 2

Observations of case 2 indicates that the project manager is very open to input from his team and asks a lot of feedback of the team whether he is taking the right direction. This also resulted in the answer of the interview with the engineer mechanical, where he indicates that the project manager contacted him to discuss about the project process and how the project is going. This indicates the project manager reflects on the process outside the design team meetings as well.

Engineer mechanical – *"The progression of this project was a bit different. And sometimes the project manager approaches me and we have discussions about the process and I give my feedback on it. And we also brainstorm about it to share each other's view to check whether we have the same perspective on things and whether the project is going in the right direction."*

It can be concluded that the project manager is verifying his performance by the team members, as he is the third project manager on this project. Verifying his performance is visible in the observations as well as in the project manager performing in a high extent the communication labels **Ask for feedback**, **Ask questions** and **Reflection**.

Project manager – *"I it is good if we set the deadline for the final design after the summer, and what do you think about that idea?"* – **Ask for feedback**

ROLE		LEADERS			FOLLOWERS		
		Project manager	Engineer mechanical	Engineer electrical	Engineer construction	Project architect	TOTAL
LEADERSHIP STYLE		Directive/ Empowerment	Transformational	Directive			
COMMUNICATION LABELS	Evaluation	A: 4 C: 14% R: 3%	A: 8 C: 29% R: 8%	A: 8 C: 29% R: 13%	A: 6 C: 21% R: 26%	A: 2 C: 7% R: 4%	**A = 28** **C = 100%**
	Reflection	A: 21 C: 41% R: 15%	A: 13 C: 25% R: 13%	A: 7 C: 14% R: 11%	A: 2 C: 4% R: 9%	A: 8 C: 16% R: 14%	**A = 51** **C = 100%**
	Set goals	A: 17 C: 34% R: 13%	A: 15 C: 30% R: 15%	A: 5 C: 10% R: 8%	A: 3 C: 6% R: 13%	A: 10 C: 20% R: 18%	**A = 50** **C = 100%**
	Define shared conceptual model	A: 24 C: 23% R: 18%	A: 24 C: 23% R: 25%	A: 23 C: 22% R: 36%	A: 13 C: 12% R: 57%	A: 21 C: 20% R: 37%	**A = 105** **C = 100%**
	Ask for feedback	A: 13 C: 87% R: 10%	A: 0 C: 0% R:0%	A: 0 C: 0% R: 0%	A: 0 C: 0% R: 0%	A: 2 C: 13% R: 4%	**A = 15** **C = 100%**
	External influences	A: 16 C: 38% R: 12%	A: 11 C: 26% R: 11%	A: 7 C: 17% R: 11%	A: 1 C: 2% R: 4%	A: 7 C: 17% R: 12%	**A = 42** **C = 100%**
	Relation management	A: 12 C: 63% R: 9%	A: 4 C: 21% R: 4%	A: 2 C: 11% R: 3%	A: 0 C: 0% R: 0%	A: 1 C: 5% R: 2%	**A = 19** **C = 100%**
	Ask questions	A: 9 C: 41% R: 12%	A: 5 C: 9% R: 5%	A: 17 C: 31% R: 27%	A: 4 C: 7% R: 17%	A: 19 C: 35% R: 33%	**A = 54** **C = 100%**
	Take responsibility by decision making	A: 16 C: 41% R: 12%	A: 14 C: 36% R: 14%	A: 6 C: 15% R: 9%	A: 1 C: 3% R: 4%	A: 2 C: 5% R: 4%	**A = 39** **C = 100%**
	Preventive action	A: 14 C: 36% R: 10%	A: 15 C: 38% R: 15%	A: 8 C: 21% R: 13%	A: 1 C: 3% R: 4%	A: 1 C: 3% R: 2%	**A = 39** **C = 100%**
	Planning	A: 14 C: 35% R: 10%	A: 12 C: 30% R: 12%	A: 4 C: 10% R: 6%	A: 5 C: 13% R: 22%	A: 5 C: 13% R: 9%	**A = 40** **C = 100%**
	Total	**A = 136** **R = 100%**	**A = 97** **R = 100%**	**A = 64** **R = 100%**	**A =23** **R = 100%**	**A = 57** **R = 100%**	

A: Absolute number of the communication labels performed in all the fragments
C: Percentage of the communication label performed in all the fragments
R: Percentage of the communication label performed per role

Table 13. Summary of the observations for case 2

Communication labels

The quantitative data of the observations shows that the project manager is the most active team member. Furthermore, it can be concluded that **Ask for feedback** was almost only performed by the project manager. Moreover, it can be said that **Relation management** and **Reflection** was significantly performed the most by the project manager as well.

The most observed communication labels, after **Define shared conceptual model**, are **Ask questions**, **Reflection**, **Set goals** and **External influences**. These labels were performed the most by the project manager and engineer mechanical.

Ask questions was mostly performed by the engineer construction and engineer electrical. In the following situation engineer construction ascertained a problem with the stability wall.

"I have ascertained the following problem with the stability wall. And can I ask you (the team) to look at this problem together with me?" – Engineer construction

In the interview, after the observation, engineer construction made the following statement regarding the problem with the stability wall and the reaction of the team.

"I had that problem lately with the stability wall and I had some ideas about it to solve it. But I asked the team to look at it as well. And they did not say why I share this with them so late. And I thought they would have said that. But they were very open and they immediately tried to think with me and puzzle how to solve it." – Engineer construction

Furthermore, the engineer electrical said in the interview that he likes to look in the "garden' of other team members. Which leads to asking questions as well.

"I ask questions to show I feel involved in the project. And sometimes asking questions is not appreciated by the team. But I do not feel it that way in this team." – Engineer electrical

This is aligned with the results of the team-scan about the part 'psychological safety' which is focused on feeling secure within the team to ask questions and share opinions. The entire team felt secured to share their thoughts and ask questions, but not the entire team felt completely supported by taking risks. However, the project manager and engineer construction do not completely agree that the team is fully able to share difficult problem and situations with the team.

Reflection was mostly performed by project manager and engineer mechanical. This is remarkable, as the engineer mechanical indicated within the team-scan that the team did not reflect and evaluate at all. Moreover, engineer electrical and engineer construction have also performed this label in a lesser extent.

"Are there any comments about the report we made last time? Are there any things in particular which we have to revise again?" - Project manager

"I have noticed that we ran out of time. And that we finally handed in the deliverables at 11.30 in the evening. Whilst we were thinking that we could possibly hand in earlier." - Project manager

The observations and citations shows that reflection is certainly have been performed several times.

Set goals was mostly performed by project manager and engineer mechanical comparing to a lesser extent by the other team members. Comparing this to the team-scan almost the entire team indicated that the goals were clear for everyone except by one team member. Furthermore, it can be concluded that engineer construction also performed this label several times.

The associated citations from the observations are:

"We are not finished at all with the cost estimation. Now it is the time to do a cost estimation for the final design." - Engineer mechanical

"Now, we have to choose a direction." – Engineer mechanical

External influences was mostly performed by project manager and engineer mechanical. A reason why this label is used many times is also due to the fact that the project was in a phase where permits were needed for the project. The following citation is regarding this label.

"I had contact with the review committee. And he declared that we do not need a well fare judgement from the committee. Thus, that is good and saves us time again." – Design manager

Leadership styles

The team members who were analysed as "follower", on the basis of the interviews, have not performed any significant quantity of certain communication labels more than the team members who were analysed as "leader". However, it is remarkable that engineer construction is significantly more active than the design manager. Whilst, they both were analysed as "follower".

Project manager, engineer mechanical and engineer electrical were all analysed as "leader". But with three different styles. The project manager was analysed with leadership style *Empowerment* and *Directive*. Engineer mechanical was analysed with leadership style *Transformational* and engineer electrical with leadership style *Directive*. It is noteworthy, that project manager has significantly performed more of the label Relation management and Ask for feedback. This is could not be related to the fact that he was analysed as a "leader", because engineer mechanical and engineer electrical did not performed Ask for feedback at all and performed Relation management in a small quantity. But these communication labels could be related to the leadership style *Empowerment*. As this leadership style support the label Ask for feedback, because this shows the fact that the project manager encourages the team to give input by indicating taking responsibility.

SYNTHESIS 6

This research aims to explore the concept of shared leadership in integrated design teams in the construction industry. It addresses the question whether leadership styles and tasks are solely performed by the project manager of a design team, or whether leadership styles and tasks are also performed by other team member of the design team. To answer this question, the two cases are compared to see in what areas the two cases suggest the same points, where they differ, and where the two cases conflict.

In the following paragraph (6.1) the "leaders" and "followers" within the two cases are identified, following the theory of Wang et al. (2016). In paragraph 6.2, the "leaders" of both cases are further analysed on their leadership style, identified through the interviews, to see whether formal roles (i.e. project manager, executive architect) can be connected to particular leadership styles. Paragraph 6.3 identifies the different leadership behaviours by analysing and labelling the data retrieved through the observations of team meetings. Paragraph 6.4 shows which leadership styles and the corresponding behaviours are connected to communication labels. Finally, paragraph 6.5 shows the tasks of a project manager translated into behaviours.

6.1. Leader versus follower

A design team consists of different team members which were identified by their formal function, for example project manager, architect, construction engineer, among others.

For case 1, the project manager, senior project manager, design manager, executive architect and engineer building physics were classified as "leader" and engineer construction, engineer acoustics and engineer fire & safety were classified as "follower". In for case 2, the project manager, engineer mechanical and engineer electrical were classified as "leader" and project architect and engineer construction were classified as "follower". This shows a discrepancy in the division of "leader" and "follower" according to their formal function as the project architect for case 1 was classified as "leader" and the project architect for case 2 was classified as "follower".

6.2. Leadership styles versus roles

The interviews were analysed to identify the leadership style of each team member who were labelled as "leader". Table 14 shows that a formal role is not connected to a particular leadership style as project manager from case 1 shows style *Empowerment* and *Transformational* and project manager from case 2 uses style *Empowerment* and *Directive*. Furthermore, the executive architect from case 1 only applies style *Transformational* and executive architect from case 2 was analysed as a *Follower*. Finally, a person can have more than one style, as seen in table 14 for the senior project manager, both project managers and the design manager show more than one style.

Formal role	Senior project manager	Project manager	Design manager	Executive architect	Engineer building physics	Engineer mechanical	Engineer electrical
Case 1	Transformational/ Directive	Empowerment/ Transformational	Transformational/ Empowerment	Transformational	Directive	*Not applicable*	*Not applicable*
Case 2	*Not applicable*	Empowerment/ Directive	*Not applicable*	*Assigned as follower*	*Not applicable*	Transformational	Directive

Table 14. Leadership styles per roles of leaders.

The observations indicated that boundaries between the different styles are quite vague as the team members tends to change their behaviour according to the situation at hand. However, these styles are showing the dominance of certain behaviours, but not a particular style related to roles within a team. The quote below shows a behaviour which corresponds with leadership style *Empowerment* by encouraging the self-confidence of a team members by asking a question to better understand the client.

Senior project manager – *"Do you think that you got more feeling of the client's need during this starting period? Not only business wise but also emotional wise? That you better understand him and you can better follow him now? And that you are standing beside him now instead of still searching?"*

The following quote shows a behaviour which corresponds with leadership style *Directive* by supervising the steps of a team by assigning a task.

Senior project manager – *"We should note that point that we have think about the way we want to proceed this phase."*

This leads to the conclusion that there is no relationship to be recognized between a leadership style or a set of leadership styles and the roles of the team members.

6.3. Analysis communication labels

During the observations, communication labels were developed to label the communication flow and the behaviour of the team members of the two cases. This is shown in table 15. The table shows three types of data. The *absolute number* of the communication label performed in all the fragments are shown with an 'A' within the table. Followed by the percentage of the *communication label* performed in all fragments by the team members are shown with a 'C' and the percentage of the communication label performed per *roles* shown with an 'R'. The total sum of the absolute number and the total percentage of 100% *per communication label* performed are shown in the last column. The total sum of the absolute number and the total percentage of 100% for the communication labels performed *per role* are shown in the last row.

Table 15. Summary of results from case 1.

ROLE		LEADERS					FOLLOWERS			TOTAL SUM
		Senior Project manager	**Project manager**	**Design manager**	**Executive architect**	**Engineer building physics**	**Engineer Construction**	**Engineer Acoustics**	**Engineer Fire & Safety**	
LEADERSHIP STYLE		Directive/ Transformational	Empowerment/ Transformational	Transformational/ Empowerment	Transformational	Directive				
COMMUNICATION LABELS	**Evaluation**	A: 3 C: 12% R: 5%	A: 2 C: 8% R: 2%	A: 5 C: 20% R: 3%	A: 1 C: 4% R: 2%	A: 8 C: 32% R: 9%	A: 6 C: 24% R: 9%	A: 0 C: 0% R: 0%	A: 0 C: 0% R: 0%	**A = 25** **C =100%**
	Reflection	A: 6 C: 9% R: 10%	A: 8 C: 12% R: 9%	A: 19 C: 28% R: 12%	A: 7 C: 10% R: 11%%	A: 12 C: 18% R: 14%	A: 9 C: 13% R: 13%	A: 2 C: 3% R: 11%	A: 4 C: 6% R: 18%	**A = 67** **C = 100%**
	Set goals	A: 8 C: 12% R: 13%	A: 8 C: 12% R: 9%	A: 21 C: 32% R: 13%	A: 3 C: 5% R: 5%	A: 13 C: 20% R: 15%	A: 6 C: 9% R: 9%	A: 4 C: 6% R: 21%	A: 2 C: 3% R: 9%	**A = 65** **C = 100%**
	Define shared conceptual model	A: 12 C: 8% R: 19%	A: 20 C: 13% R: 21%	A: 32 C: 20% R: 19%	A: 23 C: 14% R: 38%	A: 24 C: 15% R: 28%	A: 29 C: 18% R: 41%	A: 6 C: 4% R: 32%	A: 13 C: 8% R: 59%	**A = 159** **C = 100%**
	Ask for feedback	A: 3 C: 25% R: 5%	A: 6 C: 50% R: 6%	A: 2 C: 17% R: 1%	A: 1 C: 8% R: 2%	A: 0 C: 0% R: 0%	A: 0 C: 0% R: 0%	A: 0 C: 0% R: 0%	A: 0 C: 0% R: 0%	**A = 12** **C = 100%**
	External influences	A: 6 C: 14% R: 10%	A: 11 C: 25% R: 12%	A: 11 C: 25% R: 7%	A: 6 C: 14% R: 10%	A: 4 C: 9% R: 5%	A: 5 C: 11% R: 7%	A: 0 C: 0% R: 0%	A: 1 C: 2% R: 5%	**A = 44** **C = 100%**
	Relation management	A: 7 C: 21% R: 11%	A: 10 C: 30% R: 11%	A: 9 C: 27% R: 5%	A: 3 C: 9% R: 5%	A: 1 C: 3% R: 1%	A: 2 C: 6% R: 3%	A: 1 C: 3% R: 5%	A: 0 C: 0% R: 0%	**A = 33** **C = 100%**
	Ask questions	A: 2 C: 4% R: 3%	A: 7 C: 12% R: 7%	A: 24 C: 42% R: 15%	A: 7 C: 12% R: 11%	A: 8 C: 14% R: 9%	A: 4 C: 7% R: 6%	A: 4 C: 7% R: 21%	A: 1 C: 2% R: 5%	**A = 57** **C = 100%**
	Take responsibility by decision making	A: 8 C: 17% R: 13%	A: 7 C: 15% R: 7%	A: 22 C: 46% R: 13%	A: 2 C: 4% R: 3%	A: 7 C: 15% R: 8%	A: 2 C: 4% R: 3%	A: 0 C: 0% R: 0%	A: 0 C: 0% R: 0%	**A = 48** **C = 100%**
	Preventive action	A: 5 C: 14% R: 8%	A: 3 C: 8% R: 3%	A: 10 C: 28% R: 6%	A: 5 C: 14% R: 8%	A: 8 C: 22% R: 9%	A: 5 C: 14% R: 7%	A: 0 C: 0% R: 0%	A: 0 C: 0% R: 0%	**A = 36** **C = 100%**
	Planning	A: 3 C: 9% R: 5%	A: 12 C: 34% R: 13%	A: 10 C: 29% R: 6%	A: 3 C: 9% R: 5%	A: 2 C: 6% R: 2%	A: 2 C: 6% R: 3%	A: 2 C: 6% R: 11%	A: 1 C: 3% R: 5%	**A = 35** **C =100%**
	Total	**A = 63** **R = 100%**	**A = 94** **R = 100%**	**A = 165** **R = 100%**	**A = 61** **R = 100%**	**A = 87** **R = 100%**	**A = 70** **R = 100%**	**A = 19** **R = 100%**	**A = 22** **R = 100%**	

A: Absolute number of the communication labels performed in all the fragments
C: Percentage of the communication label performed in all the fragments
R: Percentage of the communication label performed per role

ROLE		LEADERS			FOLLOWERS			
		Project manager	Engineer mechanical	Engineer electrical	Engineer construction	Project architect		TOTAL
LEADERSHIP STYLE		Directive/ Empowerment	Transformational	Directive				
COMMUNICATION LABELS	Evaluation	A: 4 C: 14% R: 3%	A: 8 C: 29% R: 8%	A: 8 C: 29% R: 13%	A: 6 C: 21% R: 26%	A: 2 C: 7% R: 4%		**A = 28** **C = 100%**
	Reflection	A: 21 C: 41% R: 15%	A: 13 C: 25% R: 13%	A: 7 C: 14% R: 11%	A: 2 C: 4% R: 9%	A: 8 C: 16% R: 14%		**A = 51** **C = 100%**
	Set goals	A: 17 C: 34% R: 13%	A: 15 C: 30% R: 15%	A: 5 C: 10% R: 8%	A: 3 C: 6% R: 13%	A: 10 C: 20% R: 18%		**A = 50** **C = 100%**
	Define shared conceptual model	A: 24 C: 23% R: 18%	A: 24 C: 23% R: 25%	A: 23 C: 22% R: 36%	A: 13 C: 12% R: 57%	A: 21 C: 20% R: 37%		**A = 105** **C = 100%**
	Ask for feedback	A: 13 C: 87% R: 10%	A: 0 C: 0% R:0%	A: 0 C: 0% R: 0%	A: 0 C: 0% R: 0%	A: 2 C: 13% R: 4%		**A = 15** **C = 100%**
	External influences	A: 16 C: 38% R: 12%	A: 11 C: 26% R: 11%	A: 7 C: 17% R: 11%	A: 1 C: 2% R: 4%	A: 7 C: 17% R: 12%		**A = 42** **C = 100%**
	Relation management	A: 12 C: 63% R: 9%	A: 4 C: 21% R: 4%	A: 2 C: 11% R: 3%	A: 0 C: 0% R: 0%	A: 1 C: 5% R: 2%		**A = 19** **C = 100%**
	Ask questions	A: 9 C: 41% R: 12%	A: 5 C: 9% R: 5%	A: 17 C: 31% R: 27%	A: 4 C: 7% R: 17%	A: 19 C: 35% R: 33%		**A = 54** **C = 100%**
	Take responsibility by decision making	A: 16 C: 41% R: 12%	A: 14 C: 36% R: 14%	A: 6 C: 15% R: 9%	A: 1 C: 3% R: 4%	A: 2 C: 5% R: 4%		**A = 39** **C = 100%**
	Preventive action	A: 14 C: 36% R: 10%	A: 15 C: 38% R: 15%	A: 8 C: 21% R: 13%	A: 1 C: 3% R: 4%	A: 1 C: 3% R: 2%		**A = 39** **C = 100%**
	Planning	A: 14 C: 35% R: 10%	A: 12 C: 30% R: 12%	A: 4 C: 10% R: 6%	A: 5 C: 13% R: 22%	A: 5 C: 13% R: 9%		**A = 40** **C = 100%**
	Total	**A = 136**	**A = 97**	**A = 64**	**A =23**	**A = 57**		
		R = 100%	**R = 100%**	**R = 100%**	**R = 100%**	**R = 100%**		

A: Absolute number of the communication labels performed in all the fragments
C: Percentage of the communication label performed in all the fragments
R: Percentage of the communication label performed per role

Table 16. Summary of results from case 2.

The data of table 15 is used as a base to identify the most performed communication labels by the roles of the team. This is mainly done by looking at factor *C* and *R* and the related quotes from the observations. In this way, insight is gained in the way self-managing teams fulfil the roles in the context of shared leadership, taking into account the leadership styles. The observations are used to give an insight of the way shared leadership is executed in practice and therefore the focus will be on leaders and the communication labels they performed in the fragments. In the following the communication labels will be elaborated by using the table 15 to show which communication labels were performed the most and by which team members who are categorized as leader.

The communication label **Evaluation** is interpreted as sharing knowledge about previous executed projects. This label is mainly performed by engineer building physics (C:32%, R:9%). In the quote below the engineer referring to a previous experience with BIM which caused for complications with the contractor in the execution phase.

Engineer building physics – *"I am a little sceptical about the implementation of BIM, because I have used it 3 years ago for another project. And the main problem which occurs every time in the phase of the execution, is to explain the contractor the things which we do not draw in the BIM model."* – **Evaluation**

The communication label Reflection is in this research interpreted as how the team experienced the results and outcomes of the project and the collaboration process. This label is mainly performed by the design manager (C:28%, R:12%) and engineer building physics (C:18%, R:14%). The design manager is reflecting on the collaboration process with the client and engineer building physics is reflecting on how the deadline for the schematic design is experienced an proposing a way to do it better in the future.

Design manager - *"I still think the decision-making process is a lot more complicated and vague than we thought. And the meetings with the client indicated that thinking on the level of the main vision of the organization is limited there"* – **Reflection**

Engineer Building physics - *"That also happened with the document of starting point which we handed in without looking at it very carefully due to time shortage". It could have worked better if we first organize a meeting where we give an explanation about the document and then ask the client to read it carefully. Because you can see that they are struggling with that as well."* – **Reflection**

The communication label Set goals is in this research explained as clearly appointing the corresponding tasks to achieve a certain goal. This label is mainly performed by the design manager (C:32%, R:13%), senior project manager (C:12%, R:13%) and engineer building physics (C:20%, R:15%).

Senior project manager is pointing out the tasks for the team members of the discipline installations, to guide them in a certain way, taking into account the different interpretation of the design phases. The second quote is referring to a session which is needed to explain the team members the way BIM can be implemented in this project.

Senior project manager: *"But engineer building physics you should make sure that you guide your people, taking into account that the design phase VO is interpreted differently for this client. And that they expect a higher detail level of the products."* – **Set goals**

Senior project manager: *"We should organise a session to discuss how we get the bill of quantities out of the drawings. My goal is to achieve a smart and efficient way to get this data."* – **Set goals**

The design manager is indicating that the team should prepare the Local Content Description (Dutch: Lokale Inhouds Beschrjiving) before going to the client.

Design manager: "We should prepare the Local Content Description with our intern team, before presenting it to the client." – **Set goals**

Design manager: *"I think it is good to think how we are going to organize the phase how we are going to execute the Local Content Description, how are all the team members going to give their input in form of product and how can we make one integrate format which is also controlled with the quality check. "* – **Set goals**

Engineer building physics is indicating that installations are going to play a bigger role in this design phase and steps are needed to organize it with the corresponding technical team members.

Engineer building physics: *"I think it is important, as the user meetings will start soon, to have a good estimation how to include the technical people of our team if we will talk about installations. Because the installation will have a bigger part in the design in this phase."* – **Set goals**

The communication label Ask for feedback is in this research explained as asking whether the right decision and/or steps are taken. This label is mainly performed by the project manager (C:50%, R:6%) and senior project manager (C:25%, R:5%). In the example below the project manager is asking the design manager to give an opinion about the decision how the meetings with users are planned. The second quote is referring to the start-up. The senior project manager is proposing a step which should be done and is checking with the team whether they agree with that task to be done.

Project manager – *"For the user's meetings I assumed that we could use this plan (observation: pointing at the screen). Design manager, can you maybe explain how this will be working in practice?"* – **Ask for feedback**

Project manager – *"This is maybe a start-up. Some points can be ticked off if we all agree on that..?"* (observation: the project manager looks at the team members to get a reaction) – **Ask for feedback**

Senior project manager – *"Can we not discuss this straight with the client? These are the bottlenecks which we are seeing and how can we solve this and make sure that we reach consensus?"*- **Ask for feedback**

External influences is explained in this research as taking into account external processes which influences the project. This label is mainly performed by the project manager (C:25%, R:12%) and the design manager (C:25%, R:7%).

Project manager – *"The VIPA dossier is a foreign document to request subsidy for the project. Which means that we first need to make an inventory."* – **External influences**

Design manager – *"The client has the wish to finally have a Local Content Description for all their rooms and departments. Which will result in a good organisation of it from our side"* – **External influences**

Relation management is explaine in this research as making sure that the atmosphere of the team is good without any misunderstandings. This label is mainly performed by the project manager (C:30%, R:11%) and senior project manager (C:21%, R:11%).

Senior project manager – *"We need to try slowly to get the technical people on our side, because we can do it the rough way but that will not help us to convince them."* – **Relation management**

There was a discussion about the interpretation of the preliminary design. A lot of team members gave their view on this and the observation shows that project manager realized that engineer building physics was trying every time to say something, but did not get the chance.

Project manager – *"Engineer building physics, did you also had a question?"* – **Relation management**

By Ask questions is meant that questions are asked to better understand the content. Also, known as inquire questions (Dutch: inhaakvraag). This label was performed more extensively by the design manager (C:42%, R:15%). The quote below shows a dialogue between the design manager and engineer constructions.

Design manager – *"Can we think of something else engineer constructions? Do you think we can avoid the columns in the room and move them to the façade?"* – **Ask questions**

Engineer constructions: - *"Can I first finish my story? And then we can discuss that point."*

Design manager – *"Do we have an idea when we are going to receive the review. The latest version?"* – **Ask questions**

Take responsibility by decision making is explained as focusing on making things happen. Decide that something needs to happen set out in actions. This label is extensively performed by the design manager (C:46%, R:13%) and senior project manager (C:17%, R:13%).

Design manager – *"We should make one typical as an example to show the client a clear overview what which information we are going to show in the Local Content Description."* - **Take responsibility by decision making**

Design manager – "Let us agree that we will have our deliverables before Friday" - **Take responsibility by decision making**

Design manager – "We will need the drawings for the review. I will go after it myself." - **Take responsibility by decision making**

Preventive action is explained by taking actions to prevent the occurrence of certain activities in the future. This label is mainly performed by the design manager (C:28%, R:6%). and engineer building physics (C:22%, R:9%).

Design manager – "I want to prevent that we will send the documents to the client which are not up to date. Where things are not correct or synchronised within the models." - **Preventive action**

Engineer building physics – "I think we should work if possible with A3 books and include the different spaces." - **Preventive action**

Planning is explained by giving input for the schedule of the project. This label is mainly performed by the project manager (C:34%, R:13%).

Project manager – "We are now at the starting point of the preliminary design, in the total progress. The final design is together with the permit application." – **Planning**

Project manager – "The lead time is longer, which has due to the decision-making process from the client." - **Planning**

Summary comparison communication labels case 1 and 2

The agenda of design team meetings of case 1 are mainly steered by the project manager, senior project manager and the design manager. For case 2 the meetings are presided mainly by the project manager.

Table 15 and 16 shows the percentage and the absolute amount of the performed communication labels for case 1 and 2. To define the dominant communication labels, the following is considered, *percentage of the communication label performed per role (R)* is between 10%-30% and the *percentage of the communication label performed in all the fragments* (C) is between 10%-45%. The considered percentage are based on two factors: a minimum percentage of 10% by the team member and whether there are outliers to be recognized.

From this it can be concluded that the following labels were performed the most: **Reflection**, **Set goals**, **Ask questions** and **Take responsibility by decision making**.

Furthermore, it can be concluded that the senior project manager, design manager from case 1 and the project manager from case 2 has performed similar communication labels.

6.4. Leadership styles behaviours and communication labels

In the conceptual model, it is suggested that there possibly could be a relationship between the leadership behaviour and communication labels. To analyse this relationship the following figures 7 and 8 are developed. In figure 7 and 8, the leadership styles with the corresponding behaviours and roles are presented for case 1 and 2, for the team members who are categorized as "leaders", explained in detail in chapter 4 and 5. Furthermore, the communication labels which were performed the most by these roles are presented. The aim of these figures is to visualize and analyse whether there is a one-on-one relationship between the behaviours and the communication labels.

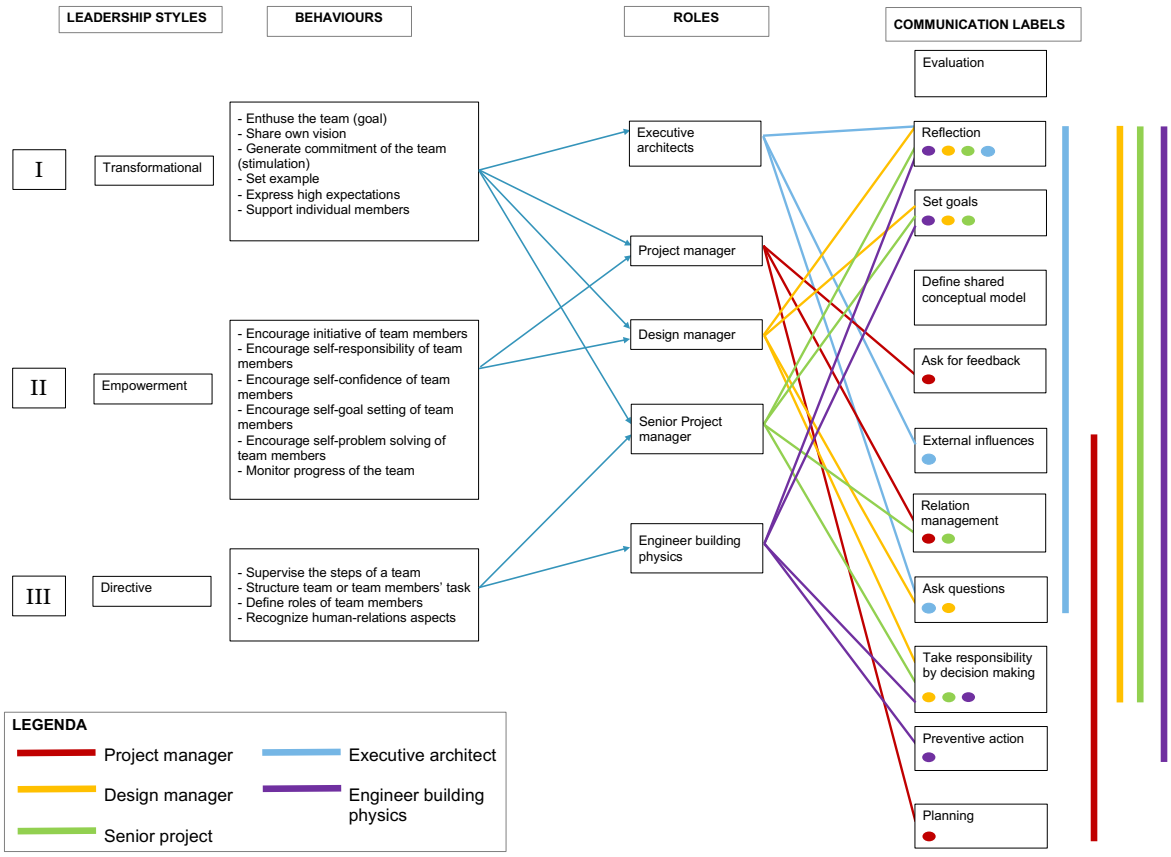


Figure 7. Case 1: Leadership behaviours linked to communication labels.

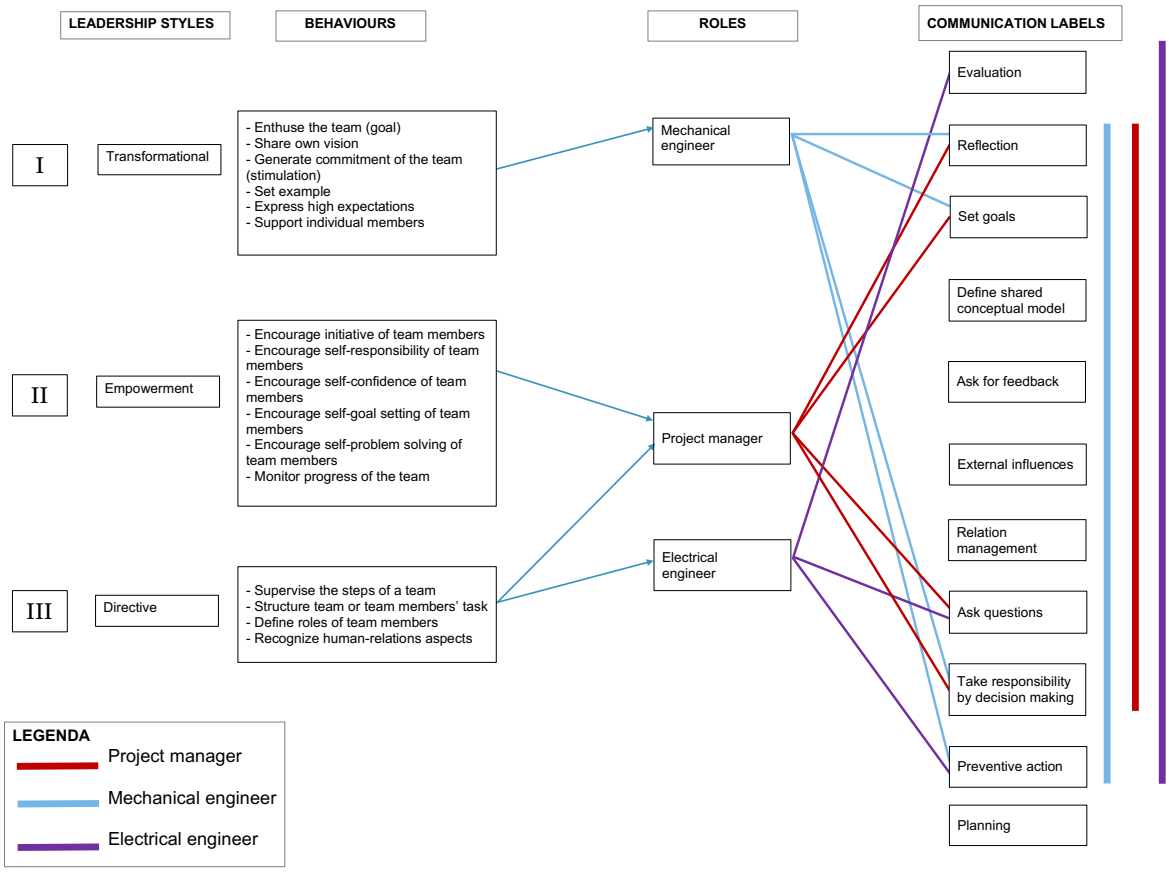


Figure 8. Case 1: Leadership behaviours linked to communication labels.

First, most of the roles are analysed with a set of two leadership styles. Second, the project manager and the design manager from case 1 are analysed with the leadership styles *Transformational* and *Empowerment*. However, they both performed different communication labels in a larger extent. As the project manager from case 1, has mainly performed the labels *Ask for feedback, Relation management* and *Planning*.

Project manager – *"How are we going to deal with the reviewing part?" (observation: look at the team for their input)* – Ask for feedback

And the design manager has mainly performed *Reflection, Set goals, Ask questions* and *Take responsibility by decision making*.

Design manager – *"Maybe we can invite the BIM-modeller next Tuesday. Subsequent we can take time to go through the way how we want to organize the Local Content Description. It would be nice if you could be there too!" (observation: saying to engineer building physics)* – Take responsibility by decision making

The communication labels do not match each other. Furthermore, engineer building physics was analysed with leadership style *Directive* and is performing the labels *Reflection* and *Set goals*, which are also performed by the design manager.

Engineer building physics – *"I would suggest to work on the base of so many technical as possible. And dependent on the kind of space this can be discussed with the technical staff."* – Set goals

The senior project manager was analysed with the leadership style *Transformational* and *Directive*. The corresponding behaviours of *Transformational* are "*enthuse the team (goal)*", "*share own vision*", "*generate commitment of the team (stimulation)*", "*set example*", "*express high expectations*" and "*support individual*

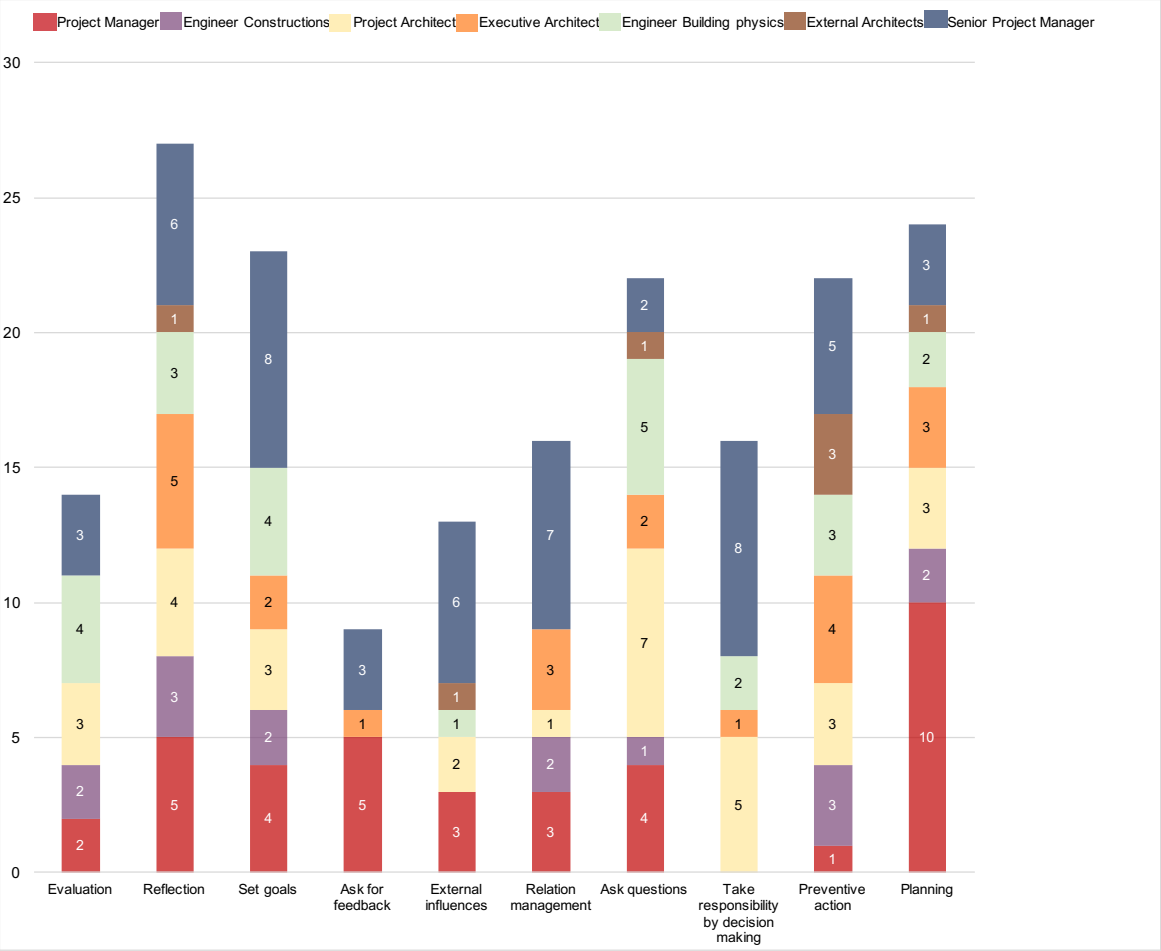
members". These behaviours are in line with the tasks related to shared leadership, described in the theoretical framework. However, the corresponding behaviours of leadership style *Directive* are "*supervising the steps of a team"*, *"structure team or team members' task"*, *"define roles of team members"* and *"recognize human-relations aspects"*. These behaviours are related to the traditional leadership whereby top-down management is applied. This lead to the conclusion that a person can perform the behaviours according to the situation at hand.

It can be concluded that there is not a one-on-one relationship to be recognized between leadership behaviour and communication labels.

6.5. Project manager's task and communication labels

The observations of the two cases were the most significant research method to retrieve data for this research. For every case, four observations are conducted. For the observations of case 2, all the fragments consisted out of the same five team members. However, case 1 shows a different data set because not all roles were present during the four design team meetings. The senior project manager was attending the second meeting, whereas the project manager was absent in the last meeting. This has led to another dynamic within the design team meeting.

As this fragment showed a variant graph compared to the other three fragments (see graph 9). The results of the interview with the senior project manager and the fragment of the second design team meeting will be compared with the other fragments where he was not present and the fragment where there was not any project manager attending the meeting.



Graph 9. The communication labels are shown in absolute numbers.

6.5.1. Dynamic fragment 2

The first impressions of fragment 2 (graph 9) are the following:

- All the team members were active which is visible in the variation and amount of communication labels they are performing.
- The senior project manager has extensively performed the communication labels **Set goals**, **Relation management** and **Take responsibility by decision making**.
- The project manager was extensively performing the label **Planning.**
- The dominant communication labels in this fragment were: **Reflection**, **Planning**, **Set goals** and **Take responsibility by decision making**

6.5.2. Interview with senior project manager

The questions below will give an insight about the role of the senior project manager, the behaviour of the performed role. It is remarkable to point out the approach of the senior project manager and which strategic is applied to steer the team in a certain way.

Interview

An extra interview with the senior project manager has been conducted to get a better insight of his leadership behaviour and how that contributed to the dynamics within the second design team meeting (fragment 2). Furthermore, there has been tried to get an answer on the underlying question, "*What does the senior project manager does differently than others, which caused a dynamic graph?"*. Five questions, are selected out of the extended interview, and the corresponding answer are given below.

Question: Can you describe your role within this project?

Answer: My formal role is master project responsible (Dutch: projectdirecteur). I am responsible for the financial quality and the overall project aspects. And this can be fulfilled in different ways. That is what I sometimes do, I try to go the roots of the tree which I try to do from a sideway and not using an hierarchical approach. I'll do this by asking inquiring questions, e.g. "how is the project going?" and "how are you doing?". And try to get to know the bottlenecks. The response you get out of these questions and the atmosphere are the most important. I try to facilitate and optimize that by setting the team in motion and that will help the team

Question: What do you mean by approaching the team from a sideway?

Answer: The project has an executive project manager who leads the project. I would not try to take up his position, because then I would undermine his position. If I think that the executive project manager needs to be steered by, I always take him separately. And I never do it in front of the team.

Question: Can you give your first impression and your view on these fragments?

Answer: I think I have specialists in my team for a reason. They know how things work and you only need to steer them sometimes in the right direction. And check from time to time whether they are on the right track. It is not the exchange of knowledge between the disciplines, but the challenge of what I just told you. By asking questions like, "What do you think?", "And how does that work?", "And did you also thought about that…?", "You are explaining it in that way, but that is a very fast decision. Can you explain me why you are saying this?". I tried to mainly ask the Why, What, Where, When and How questions in between the dialogues. And actually, the project manager should take over this role together with the design manager and ask this kind of questions. Because this is the core and the design manager needs to connect all the disciplines together and try got the technical design on a certain level.

The project manager is not a design manager who must attend all the meetings. But the project manager is needed to get the feeling how the team members within the design team are doing. The project manager should observe the team members to check whether it is going well with the wellbeing of the team members

and how they are feeling. The project manager should not be part of the design process, because that is why there is the design manager for. This results in the question whether the project manager and design manager understand their role?

If I attend a meeting like this, I always have to trigger the engineers and make them active to be part of the discussion and stand up for their own discipline. Actually, I would like if they would do it by themselves. Because then they will become a self-managed team.

Question: Do you intentionally use a certain strategy in fragment?
Answer: I'm aware of the fact what somebody or the team member is going through which is dependent on the situation. I try to judge the situation, by not ranking the people. But I would look at the ratios between the team members. In general, I have an idea of the background of the team members, whether he/she had a stressful period or a more relaxed period. I'll take that into account and at the situation at hand I asses how to deal with that kind of information. And there is a strategy behind that which I learned in the time I had sales conversations. Because in these conversations you learn to pay attention to selling signals. And how the person is behaving. And these skills I use very consciously to implement my coaching role (points at fragment 2).

Question: What do you do differently in your behaviour and communication towards the team members in fragment 2 compared to other fragments?
Answer: I have a huge interest in how other people think, what their motives are and that they all feel heard. And that is by showing interest. That is something different than fulfilling a task. The team member all know how the technical process works. It is important to think about the functionality and the integral collaboration. And that needs to get attention. That is where my attention goes. Which is much more people oriented then task oriented. But many project managers are focused a lot on the task oriented side. And that is where the difference lies.

Findings interview
The main conclusion which can be drawn from the interview, is that it is important as a project manager to avoid hierarchy and focus on people rather than tasks. Furthermore, in the extended interview the senior project manager has spoken about the changing world of the complexity of the multidisciplinary projects. Traditionally, the project manager was used to have checklists for planning and deliverables. These checklists were one of the measures to steer the project. Today, the use of BIM requires a different approach. As BIM is much more complex and that requires another decision mechanism. In the past, changes could be made within the design until the drawings went to the contractor. Using BIM, that is not possible anymore, because certain design decisions should be made at the latest in the final design. And after that phase no changes are possible in the technical design phase. because BIM cannot implement the changes automatically in an integral way, which means that the effect of a change should be controlled manually. In other words, a design has two phases: conceptualization and development. First, general decisions are made about the concept, then the details are worked out. Senior project manager is referring to the development phase which cannot be adjusted anymore, when the execution plan (uitvoerings-gereed ontwerp) is sent to the contractor. This requires a different decision-making process by the project manager.

An important insight from the interview is that the senior project manager shows he's aware of what the team members are going through, by paying genuine interest to how other people think, what their motives are and that they all feel heard. Furthermore, the project manager should observe the team members to check the wellbeing of the team members and how they are feeling. The project manager should not be part of the design process, because that is the role of the design manager. The main strategy is applying a people oriented strategy instead of task oriented strategy. This is significant in the dialogue which is shown below.

6.5.3. Dialogue between senior project manager – Executive architect

The following dialogue took place within fragment 2, between the senior project manager and the executive architect is representing the people oriented approach and showing genuine interest and get to know the motives of a team member.

Senior project manager – *"Are you satisfied with the client?"*

Executive architect – *"Euhm..I am. But the client is not very decisive on some points. But I have told myself that it is something in their culture. And we need to find our way in it and how to deal with that. We cannot always force the client. We could steer them in that and control it slightly. Because it is also connected to hierarchy and their decision-making process. So yes, I am satisfied until now, but if we will have a better picture how the decision-making process works we will also know who to ask for what."*

Senior project manager – *"Do you think that you got more feeling of the client's need during this starting period? Not only business wise but also emotional wise? That you better understand him and you can better follow him now? And that you are standing beside him now instead of still searching?"*

Executive architect – "*I think that is the case. It is already being said that the client is satisfied with us. I think we found our way in that. And I think we will also indicate towards the client our structure much more controlled. Because we will shorten our planning now, which will mean that we will propose our ideas how we want the planning to be."*

Senior project manager – *"I am talking to you, but it is applicable for the entire team, did you have a gained good feeling during the phase of the schematic design of how the client manoeuvres. I mean instinctively, because that will help you in the follow-up steps with user meetings. Do you have a good instinctive feeling about it or do you think the time was too short to really sense the client, because the user meeting goes along with a lot of emotions?"*

Executive architect – "*That is right. But I think that they trust us on that aspect. They leave us to our thing and give us the complete freedom."*

Design manager – *"It is good to attend the different meetings of the client with different team members, because that will help us to analyse how it works at the client, their different views on the topics and their decision-making process. Because we need to adapt on their requirement and that our approach should be effective."*

Senior project manager – *"That you trust someone…I think that is a good one and a very important definition. Because it includes a lot if you don't understand each other's emotional language. Because than you will get a mismatch hole in your trust."*

Project manager – *"I think it is all good with the trust. That is also something the client explicitly mentioned in our last phone call. The client literally said, "This is the one project I do not have to worry about a lot". That is really positive and it indicates that there is trust."*

Executive architect – *"But it is important to hold on that trust."*

Senior project manager – *"That is why I hold on to this point for long time. Because you generate credits by increasing the trust in this phase. And you need to cherish your credits and use it when needed. Because in the next phase we will be working with a bigger team at the client-side and we will make use of the credits."*

Design manager – *"And I think it is good if we are doing a good job and if it will become difficult with the technical part, the credits of trust can help us."*

CONCLUSION & DISCUSSION 7

The goal of this thesis, is provide an insight of shared leadership by executing observations of two cases to answer the main research question, '*What are the main tasks that need to be addressed in project teams with shared leadership?'*

This chapter presents the discussion and conclusion of this research. First, the main findings are presented. Second, the key-findings will be discussed in the form of a theoretical debate. Third, limitations of this research will be elaborated. Fourth, the practical implications and recommendations for further research. Finally, this chapter ends with a conclusion.

7.1. Main findings

The most important findings within this research are that shared leadership can be measured by making observations and applying communication labels as developed during the research. It can be concluded that there is not a relationship to be recognized between the formal role of a person and the shown behaviour. Furthermore, it can be said that shared leadership is dynamic as it is not linked to specific leadership styles. That may be so, because certain circumstances, (e.g. the topic to be discussed or the formation of the team) could lead to different kind of behaviour by the team members.

Furthermore, a new definition of shared leadership appeared from this study. Bergman et al. (2012) defines shared leadership as follows, when two or more members engage in the leadership role of the project team to influence the direct fellow members to maximize team effectiveness. However, from this research it can be concluded that a definition for shared leadership should also emphasize the dynamic nature of these processes: Shared leadership consists of multiple dynamic leadership behaviours to maximize team effectiveness.

7.2. Key-findings

In order to answer the main research question, the main findings are structured around the sub questions and the insights of the different components that were identified in the empirical study. Moreover, an analysis of the connections with the theoretical grounding is provided for each of these sections.

According to Bergman et al. (2012) shared leadership consists of four types of leadership tasks: initiating structure, consideration, envisioning and spanning. These tasks can be related to the leadership styles of Pearce & Sims (2002), in particular the leadership styles: *Directive, Transactional, Transformational* and *Empowerment,* as described within the theoretical framework (e.g. section 2.1.2). The following three leadership styles, *Directive, Transactional* and *Empowerment* were recognized within the cases. Furthermore, the synthesis results in the following key findings which are elaborated with a theoretical discussion in paragraph 7.3

7.3. Discussion

7.3.1. Relationship leadership styles, behaviours and communication labels

Leadership styles are connected to leadership behaviours (Pearce & Sims Jr., 2002). These behaviours are derived from theory and are the specific tasks which are related to the leadership styles. By conducting the observations for the two cases different behaviours and communication labels are identified. The communication labels performed by the team members analysed as "leaders" are placed next to the behaviours of the leadership styles, to identify a relationship. The observations and the analysis of the interview have shown that a team member cannot be identified with just one leadership style. A team member performs a set of leadership styles. Furthermore, the leadership style can be changed according to the situation at hand.

A leadership style is in particular seen as behaviour that is shown by one person who leads the team (Yukl, 2010). These behaviours are linked to different leadership styles. Bergman, Rentsch, Small, Davenport, & Bergman (2012) and Pearce & Sims Jr. (2002) have categorized the leadership styles with the corresponding behaviours. First, observations in this research have shown that certain behaviours which are linked in theory to a certain leadership style *A*, are also performed by persons who were identified with leadership style *B*. Second, a person is not performing only one leadership style, since the situation at hand determines the behaviour of a person.

Yukl (2010) have classified the leadership styles into three broad categories: task-oriented, person-oriented and change-oriented. However, the interviews have shown that people simply have knowledge of the categories: person-oriented and task-oriented. It is worth mentioning that classification and categorization of leadership behaviours and styles can shed new light on this matter.

From the observations it may be concluded that team members applied leadership behaviours that were associated with more than one leadership style, and thus expressed dynamic leadership styles. This is shown by the collected data, from which it can be concluded that the team members identified with the same leadership style or a set of leadership styles are not performing the same communication labels, presented in table 17. There is no clear relationship to be recognized between leadership styles, their linked behaviours and communication labels.

Role	Leadership style	Communication label
Case 1		
Executive architect	Transformational	Reflection External influences Ask questions
Project manager	Transformational Empowerment	Ask for feedback Relation management Planning
Design manager	Transformational Empowerment	Reflection Set goals Ask questions Take responsibility by decision making
Senior project manager	Transformational Directive	Reflection Set goals Relation management Take responsibility by decision making
Engineer building physics	Directive	Reflection Set goals Preventive action Take responsibility by decision making
Case 2		
Mechanical engineer	Transformational	Reflection Set goals Preventive action Take responsibility by decision making
Project manager	Empowerment Directive	Reflection Set goals Ask questions Take responsibility by decision making
Electrical engineer	Directive	Evaluation Ask questions Preventive action

Table 17. Overview Leadership Styles and Communication Labels per role for Cases 1 & 2

7.3.2. Communication labels and shared leadership

From the observations, it can be concluded that there are dominant types of communication which were performed in a higher amount by team members.

Shared leadership is not static and leadership roles can be assumed by different team members either at the same time or at various points during the team's life cycle (D'Innocenzo et al., 2016). This also appeared from the observations, for instance in the situation that the design manager took up the leadership role in case 2 when the project manager was not attending the meeting. Importantly, here certain other team members also changed their behaviour. The communication label, **Define shared conceptual mode**l was performed by every team member between 15% to 59% of their individual communication flow over the four fragments. In descending order, the following labels can be identified: **Reflection, Set goals, Ask questions** and **Take responsibility by decision making**. It is remarkable that **Take responsibility by decision making** was performed less than the label **Ask questions** in both cases. At the same time, the dominant performance of the mentioned labels reflects in the interpersonal side, which is visible in the answers of the questionnaire. The dominant communication labels will be discussed below by regarding the corresponding theory, described in the theoretical framework, and the view of different authors on the communication labels.

Reflection

Ferris et al. (2008) have explained evaluation and reflection as a mechanism when people experienced something in the past regarding the social, emotional, cognitive, political and relationship context. The emotional and cognitive aspect of reflecting was visible in the observations. This is observed by listening to the tone when a team member is communicating, because a certain emotional attachment comes along when the team members starts reflecting on a situation and/or experience in the past. And by focusing on

the tone how someone is communication about it, it can be said whether it was a positive or negative experience.

The team members of both cases agreed upon the fact that the team did not reflect enough. However, the observations indicate that the label **Reflection** was performed in the highest percentage in both cases, after **Define shared conceptual model**. But the team mainly reflects on other subjects and they do not reserve separate time within the meeting to reflect in a comprehensive way.

Set goals

De Meuse (2009) mentioned that a team should always begin with a team level goal. After the goal is defined, the roles and responsibilities will become clearer. This is visible within the observations as well, where team members are sometimes struggling with clearly defined tasks.

The questionnaire included a question about 'goal setting'. More specifically, whether the goals were clear at the start of the project, if the team spent enough time to understand the goals, if the goals were realistic enough and whether the goals were adjusted during the project. For both cases, the goals were not completely clear. Additionally, few team members thought that the goals were not clear at all. Lastly, the team members from case 1 agreed on the goals being realistic, contrary to case 2 where the team members were not sure whether the goals were realistic enough to be executed.

It can be concluded that not all team members agreed upon the fact that the goals were clear within the project and this was visible within the observations as this led to a high percentage of performance of the label **Set goals**. The results of the observations confirm the argument of De Meuse (200) that clear goals are needed to define clear roles and responsibilities.

Ask questions

Brewer & Holmes (2016) have argued that listening to each other is a good way to emphasize the effectiveness of the tasks to be executed and improves communication by avoiding miscommunication. One of the attributes which indicates that the listening is going well within the group is by proposing questions. Ask questions to clarify something which is not clear (Brewer & Holmes, 2016).

The questionnaire included a question about feeling secure within the team to share their opinion and ask questions. This question was answered positively by all team members in both cases. This is related to a high percentage of the label **Ask question** performed by all the team members in both cases. However, it was performed the most by the design manager in case 1.

There is a positive correlation to be recognized between unclear goals and asking questions. If the goals are not clear it leads to difficulties in defining the corresponding responsibilities and tasks. Which in turn makes it uncertain how to assign the right tasks to the right persons within the team. That is the reason why the team members tend to ask questions within the design team meeting. Because these are the moments every two weeks that the lead engineers are together. The coordination of tasks is one of the agenda point during the meetings as there is time reserved on the agenda to discuss the different disciplines. The responsibilities and the corresponding tasks are important for the team member to organize their own tasks and the collaboration with the other disciplines.

Take responsibility by decision making

Take responsibility by decision making is described by Castellan (2013) as process data, apply individual expertise, communicate relevant information and by taking the responsibility to make a decision and defining relevant concrete tasks. The observations have shown that this is mainly done by the design manager and senior project manager in case 1 and by the project manager and engineer mechanical in case 2. The observations have represented that the project manager in case 1 does not have necessarily should be the person to take the responsibility within decision making. This is a clear example of shared leadership, as the

theory of shared leadership supports decision making by other team members dependent on the situation at hand (Bergman et al., 2012).

The performance of the label **Take responsibility by decision making** is linked to the questionnaire, where it has been specifically asked whether the team is satisfied with the decisions made by the project manager. In both cases, the answers indicate that most of the team members do not agree to the decision making by the project manager. This is visible in the observations, where other team members step forward and perform this label dominantly.

By comparing the observations of both cases, it becomes clear that there are specific tasks to be recognized. In this research the tasks during the design team meetings are defined as the communication labels. The communication labels **Reflection**, **Set goals**, **Ask questions** and **Take responsibility by decision making** were dominant during the observations. These communication labels were developed during the observations by analysing the behaviour and communication flow of the team members from two cases. As there are not several existing studies about the content of shared leadership and the related tasks, this research introduces these communication labels as one of the tasks which were performed in teams with shared leadership, which can be added to the definition of shared leadership within the broad scientific framework. However, D'Innocenzo et al. (2016) indicate, that acknowledging multiple leadership will result in responsibilities which creates a mechanism by which leadership responsibilities can be distributed among team members to facilitate task completion. These communication labels or tasks can form an addition to these responsibilities. It is recommended to conduct further research to explore the detailed definition of these specific communication labels. And how these labels were performed in different team settings.

7.3.3. Leaders versus followers

Wang et al. (2016) sets out the personality as the main factor which defines a person in a leader or follower. Which is not about being shy, modest or being a calm person. But having a proactive or passive personality. Wang et al. (2016) describes a leader as a person with a proactive personality which refers to the behavioural tendency to take action to influence their environment. Leaders seek to improve the current circumstances and identify opportunities and act on them, show initiative, take action and stay persistent until meaningful changes occur. On the other hand, followers are described as people with a passive personality who do not challenge the status quo, do not try to identify opportunities and show a little initiative. Followers only take action within their own task and are satisfied with the decisions which are made by other people within the team.

If the theory of Wang et al. (2016) is factual, it would apply that *Leaders* and *Followers* will not perform the same communication labels. As their behaviours are contradictory. However, the observations within this research have shown that there are communication labels recognized which were performed by both the *Leaders* and *Followers*: **Reflection** and **Set goals**. Nevertheless, there is a difference to be mentioned that the label **Take responsibility by decision making** is mainly performed by the *Leaders* and **Ask questions** is mainly performed by the *Followers*.

It can be concluded that there are communication labels which correspond with being a *Leader* or *Follower*, but there are also communication labels observed which could be performed by both. Further research is needed as of how this should be interpreted.

Leader	**Follower**
Reflection Set goals Take responsibility by decision making	Reflection Set goals Ask questions

Table 18. Dominant communication labels performed by leaders and followers

7.4. Limitations

Any research process has impairments from different point of views, be in terms of its approach, its methodology or simply a matter of time. This thesis has also gone through some limitations.

A scientific research is an iterative process, this was very helpful to review the decisions made in every step, adjust the focus of the research and continuously reduce the scope of the research process. In this sense, grounded theory (sensitizing concepts) was particularly a helpful framework to keep a clear focus on the scope and the research question. As the iterative process gives new insight every time the cycle is gone through. And it is enticing to research and dive into subjects which are related and interesting, but are not directly within the scope of the research.

Then, time was a relevant concern. The limitation of the cases is related to the amount of observations which are be conducted for this research. Furthermore, the observations have shown that including and excluding team members have led to a different dynamic. The change of the different formation of the team members could have explored more if more observations were done.

7.5. Implications and future research

There are several possibilities to extend the body of knowledge presented in this research, in terms of the topics that were explored.

An interesting insight of this research is the new development of the communication labels. These different types of communication could be explored in more depth by relating it to the corresponding behaviours. And specifically outline these labels in concrete definitions. The topic represents a contemporary discussion where the focus is on the people-oriented side of shared leadership. In further research, it could be interesting to explore the people-oriented behaviour of leaders in teams where shared leadership is implemented.

7.6. Conclusion

The aim of this research was to give an answer on the research question, '*What are the main roles and/or tasks that need to be addressed in project teams with Shared Leadership?*'.

This research has resulted in a new approach of expressing tasks within shared leadership. This is done by developing a set of communication labels which are developed during the observations, whereby these labels were defined as tasks. Furthermore, these communication labels could be addressed as the main tasks of shared leadership whereby some of the communication labels are more frequently present than others.

Shared leadership is a context where a different team member steps upfront to take the lead according to the situation at hand. To increase team effectiveness, it is believed that this is achieved by avoiding hierarchy and having a stronger focus on people than on tasks. Focus on people means that a project manager needs to be aware of what the team members are going through, by paying genuine interest to how other people think, what their motives are and that they all feel heard. This also answers the underlying question of this research. In the past, the role of the project manager was to control progress and to steer the project using checklists for the deliverables. And the checklists were one of the guidelines to steer the project. Today, the use of the BIM tool/technologies requires a different approach. Building information modelling (BIM) and BIM have changed this practice. The use of this technology require that first general decisions are made about the concept, and then the details are worked out. The use of BIM is thought to change communication within the design team, e.g. because of the improved possibilities to demonstrate and understand the design; and to identify clashes in the design. Since BIM is changing the communication in the design team, and as shown in this research, the role of the project manager is now shifting towards ensuring good communication and supporting team collaboration. Particularly in the second meeting of the first case, the engagement of the whole design team was striking. This seems to be related to the way the senior project manager was acting: by asking questions he gained insight into the wellbeing of the team members and how

they are feeling. This was thought to be important because wellbeing is a factor that increases the commitment of the team. This in turn will increase the chance that the individual team members will taking responsibility for their own tasks.

As I said before, people-oriented behaviour has certain benefits for projects. As projects in the built environment are done by people with a high professional level and expertise who are used to take responsibility in their own discipline. Their focus goes to the product, as one of their main goals is to deliver a good product in terms of technical deliverables. Therefore, it requires one or more persons within the team who focus on the soft skills to have a good synergy within the team and create a pleasant collaboration between team members. Since collaboration is about delivering products by applying a coherent process, then the process is the moment where the project manager take precedence. To manage a fluent process, the project manager needs to understand *Why* the team members are taking certain steps. To get that information it is important to ask questions about the *What, Why, Who, When* and *How*. By asking these kinds of questions there is interest shown in the person how is doing it and it becomes clear how the different relations are between the team members and their deliverables.

It is important to give compliments, which is also part of the people-oriented approach. From the interviews, it appears that team members did not often receive compliments. Yet compliments increase the wellbeing of a person within the team and it is therefore worthwhile to keep this in mind, becoming a project manager myself in near future.

RECOMMENDATIONS 8

This research has concluded with a positive outlook on increasing team collaboration by implementing shared leadership. As such, there are some recommendations for practice.

First, there are dominant communication labels recognized during the design team meetings, Reflection, Set goals, Ask questions and Take responsibility by decision making. The conclusions of these research have shown that the performance of the labels: Ask questions and Set goals has a relationship with the clarity of the project goals, tasks and roles of the team members. When these labels are observed during the design team meetings, it is recommended to check with the team members whether the project goals are well-defined together with the corresponding tasks. This comes along with applying soft skills to gain this kind of information within the team. No certain order of the communication labels can be implemented as people tend to go back and forth because it a design process is an iterative process

Second, it is recommended to practice and train the soft skills of the team members. This will start by hiring project managers. During the hiring process, there should be a more focus on the soft skills of the candidates. These soft skills can be identified by asking specific questions and analysing the answers and the behaviour. As concluded before, these soft skills will play a big role when the candidate is asked to perform a project manager's role. The focus should be on the persons behaviour with other people.

Third, the project managers should be trained differently, currently the project managers are trained with the focus on the task-oriented side of project management. It is recommended to train the people-oriented side of the project management as well. This could be executed by designing the training in a way where role play was performed. Certain situations which occur within a design team meeting can be acted out with for example a team of five people. Where everyone gets a short script. By applying role play the team members are trained to show empathy for their role and other team members. Furthermore, the fictive situations can be used to look at the design team meetings objectively, where the team members are confronted with the situation at hand. Furthermore, the project managers should be trained how to the What, Why, When, Where and How-questions. As this research, have shown that these questions play a big part of the soft side of project management. As these questions are needed to gain better insight of the team members. As interest is shown in the person and it becomes clear how the different relations are between the team members and their deliverables.

Fourth, as the communication label Reflection and Set goals were performed the most during the observations, it needs more focus during the project process. Projects have an obligatory check every month where among others the planning and budget are checked. It is recommended to include a different category reflection. Where a reflection is executed on the soft side of the project team. When this become obligatory, the team members will get conscious and the importance of the people-oriented side of project management

REFLECTION 9

9.1 Graduation process

Before the summer of my graduation year, I was thinking about how things were done at Croon Electrical engineering where I worked prior my Masters. I was curious about the success of projects within the company and how it is related to the way the project is managed. I realized that the success of a project is not solely related to strong content and a good strategy, but also to the way it is managed. And whether the personality of a manager determines the leadership style he adopts. To further explore these topics, I thought that it might be interesting to do a graduation research about this subject. At first, I thought about process management, and how that can be improved within companies. When I explained my interest to my first mentor, he was on board with the idea. Upon further investigation and reading, I realized that I'm more interested in the soft skills of the project manager and the team. I wanted to research the relationship between the soft skills and the way a project is executed.

I started reading different articles about the relationship between managerial soft skills and the way a project is executed. Discussing my ideas with my chosen mentors, gave me the first step in the right direction by setting a clear focus on project management instead of line management.

Before the summer of 2016, I had already found a graduation internship at an engineering company. The internship gave me the opportunity to do a test-case for my observations at a project within the company. I used this test-case to execute a few observations of the project team meetings. Since I had planned to use participant observation as one of the research methods, the test case gave me the chance to familiarize myself with the do's and don'ts of field observation.

Focusing on my thesis subjects via literature studies, made it possible to formulate a main research question that would be central to this research. I started from a wide spectrum of subjects and narrowed it down to certain variables which formed my research question. After formulating the research question, the next step was to think about the research methods. The research methods were linked to the main variables of the research.

Since I had a clear idea about my research interest, compiling a research proposal was fairly simple. After my research proposal, I started with observations and interviews with two cases at the engineering company. I found that the observations took more time than expected, mainly due to cancelled design team meetings. Once all the research methods were executed, I started with analysing my data, structuring and looking for connections. This was the part where my challenge started. First, I struggled a lot with defining 'team collaboration' in a logical way. Second, I had executed four types of research methods and I found it difficult to structure the data in a logical order so that it can answer the research questions. By creating an overview of the research in the form of a mind-map and discussing my issues with my mentors I was back on track. Afterwards, I realized that the struggle made me being critical about my own research. It felt like a puzzle where the pieces fell back into place in the end. At this point, all the variables and connections were clear and I understood the relations between the different parts. Subsequently, I continued writing my thesis and worked towards the end product.

A few weeks before the P4 presentation, my laptop crashed and I lost all my audio files. Luckily, I had written out all the interviews and finished all the data processing of the observations. But I could not do the double check and I had to use my written notes for continuing the data analysis and write out the cases.

9.2 Important decisions influencing the graduation research:

- Project management instead of line management
- Introduce the concept "shared leadership" within the research
- Focus on the roles and responsibilities of the team members
- Clearly write down the tasks of a project manager and team members
- Define team collaboration clearly and logically with the right sub-definitions

9.3 Lessons learned from overall graduation process

Tight schedule: During my graduation, I have learned to work within a very tight schedule. As I planned to complete my Masters in 1.5 years instead of 2 years, I had to do a lot of my compulsory courses next to my graduation. It was quite tough, but I have managed it very well because I enjoyed my graduation subject a lot. This made it possible for me to work a little harder and deliver good products. To manage a tight schedule, I made my own deadlines to make sure that I can finish on time.

Clear definitions: One of the important things I have learned during the graduation project is to have a clear definition of the terms I have used during the research. This started with clearly defining the main variables of my research. Furthermore, it is important to constantly find a link with the literature. Thus, everything I wrote down was scientifically supported by literature and written down clear and concise. One of the reasons to do it this way was to increase reliability of the graduation research.

Mind-maps: I have used a lot of mind-maps while brainstorming. Mind mapping was a good way to structure my thoughts onto paper, and it helped me to find the right connections between the different topics, ideas and scientific literature.

Consult-summaries: To document the process, I made summaries after every consult with my mentors. I used this in the end to reflect on the entire graduation process. One of the essential things which are noted in the summaries, are the important decisions which influenced the graduation research.

9.4 Lessons learned from executing research methods:

Observations:

- The observation form should be tested.
- While observing the mind needs rest after every 10 minutes to process the information.
- The planning of projects changed because project team meetings got cancelled or shifted. This led to a prolonged observation period. Due to this I was not able to execute the initially planned 6 observations, although I have reached my minimum requirement of 4 observations.

Interviews:

- Semi-structured interviews give an insight into the personality and thoughts of people. My experience was that people trust me easily and are willing to share a lot of confidential information which is not easily shared with other team members or within the company itself.
- Conducting the interviews cost a lot of time. However, I was able to plan all the interviews with both of the project teams within 3-4 weeks.

Questionnaire (team-scan)

- The team members experienced the questionnaire (team-scan) as very long and time consuming. As I read the questions again for myself, I realized that the questions were indeed a little similar sometimes.

9.5 Relationship between project and wider social context

Project management taught at university versus project management in practice

When I was doing my graduation research at the engineering company, I realized that there is a discrepancy in the way project management is taught at the university when compared to how project management is practiced at the company. For example, in the course Design and Construction Management at the university, we have learned that project management is executed top-down. That means there is one project manager who takes the responsibility for the entire project, does all the decision making and is more leading than facilitating. However, I have seen it differently in practice. Where I observed that the project manager is more facilitating and supports the experts within the project team to decide according to the situation at hand and their expertise background.

Furthermore, the interviews with the project manager showed that project managers, in the case I observed, do not see their self as a leader and do not wish to manage by instructing the team on what to do. As the project team consist of professionals with a high educational background, the team members are able to make their own decision and decide which tasks are needed to deliver their products. This was another contrast I observed between the university education and practice.

Moreover, I observed another discrepancy of setting goals when starting a project. At the course Design and Construction Management, setting the goals is proposed as the first step of doing a project. However, this is a step which is often forgotten in practice. In the kick-off meetings at the beginning of a construction project, the focus goes to the deliverables of the clients. These are the products in terms of drawings which should be delivered at the end of the first phase. The deliverables are interpreted as the goal of the project. However, I think it is also important to define the team goals along with all the team members and what they want to achieve at the beginning of a project, since this could help the team to pursue the same goal which is defined together at the start.

Through this research, I became aware of the importance of soft skills while executing complex projects. Even within the company, there is an increased awareness of the importance of soft skills as a project management tool. It is interesting to see how this influences the project process and the team collaboration in a positive way. It is noteworthy to discuss whether the soft skills within project management could get attention within the education program about project management. I believe that, if students begin with paying attention to exercising soft skills, building trust within the team and defining team goals, they will approach a project very differently in practice.

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APPENDICES

Appendix 1

Theoretical background

Difference between line management and project management

Today, the role of the project manager has evolved and the project manager is getting involved earlier in the project, before it has even become a 'project'. A project manager works with the client's representative to form a first idea of the project and determine whether it is feasible. The next step, is to put together a team who can work on turning that idea into reality. Leaders of different disciplines (construction, fire safety, installations etc.) will be assigned. The availability will be taken into consideration and their expertise in each functional area. Sometimes the project manager cannot wait for them to become available, then the project should be accomplished with the people who are available (Bosman, 2010).

Furthermore, the project manager is responsible for the planning which is designed by making use of the LEAN-method together with the project team. This planning consists of the tasks and deliverables of the different team members over a period of time. Moreover, the overall process of a project is managed by the project manager in terms of budget of the project, risks, organization of resources, time, information sharing and distribution and quality-control. Some of the responsibilities which are typically for a project manager are the following (Bosman, 2010; Trivellas & Reklitis, 2014) shown in table 19.

Line management	*Project management*
- Define the long-term goals together with other line managers - Recruiting and hiring new employees - Providing training and support to new employees - Providing coaching of employees and ensuring understanding of functional goals - Monitoring the performance of the team versus targets - Ensuring quality standards for all processes. - Evaluate team and individual performance - Providing reports on productivity and occupancy rate to higher management	- Short term goals - Build a project team - Define scope - Cost management - Time management → planning - Risk management - Resource management - Information management - Quality management - Monitoring goal achievement - Role of a chairman - Provide psychological safety - Decision making

Table 19. Difference between line-management and project management.

One of the main difference between line management and project management is the duration. As project management is focused on short-term goals depending on the duration of the projects in months or years. Whereas line management defines long-term goals taking into account the strategy of the company. Furthermore, line management emphasizes the development of the employees. Whilst, project management focuses on the well-being of the team members to be adequate to accomplish the deliverables for the concerning period of the project schedule.

Appendix 2

Codes for shared leadership styles

Leadership style	Representative behaviour	Actions/code
Directive	- - Give direction, instructions in a friendly way. - Controlling and rigid approach for obtaining deliverables. - Distribution of tasks and responsibilities	- Supervise the steps of a team - Structure team or team members' task - Define roles of team members - Recognize human-relations aspects
Transactional	- High input gets rewarded/complimented. - Good performance, will repeat itself by complementing performance - Remove unwanted behaviour by reinforcing desired behaviour.	- Clarify effort-reward system - Implement equal reward system - Reinforce desired behaviour
Transformational	- - Charismatic and exemplary behaviour. - A clear vision and communicate this in a motivating way to the team to enthusiasm them to work together toward a common goal - High expectations set for performance. - Support and encouragement. - Focus on mutual understanding	- Enthuse the team (goal) - Share own vision - Generate commitment of the team (stimulation) - Set example - Express high expectations - Support individual members
Empowerment	- - Encourage team to autonomously come up with solutions - Encourage collaboration within team. - Encouraging self-development of individuals - Set independent goals and achieve them. - Let the team develop its own potential.	- Encourage initiative of team members - Encourage self-responsibility of team members - Encourage self-confidence of team members - Encourage self-goal setting of team members - Encourage self-problem solving of team members - Monitor progress of the team
Boundary spanning	- Providing the team with reality checks. - Focus on client's demand that may affect the team - Serve to continuously remind the team that its product or decision must meet with external approval.	- Take external influence into consideration - Focus on client's demand - Remind team of external approval of client

Appendix 3

Interview protocol

Questions

Achtergrond informatie

1. Wat is u functie en welke verantwoordelijkheden horen daarbij?
2. Hoeveel ervaring heeft u in uw functie?
3. Hoe lang werkt u voor dit bedrijf?
4. Heeft u eerder samengewerkt met één of meerdere teamleden?
5. Heeft u ervaring met soortgelijke projecten?
6. Wat voor soort projecten heeft u gedaan?

Team/project related:

1. Kunt u uw functie beschrijven in dit project?
2. Wat is uw rol in dit project team en wat houdt dat in?
3. In hoeverre ziet u de essentie van een zelfsturend team?
4. Hoe ziet u de rol van de andere teamleden? Wat is hun rol binnen een multidisciplinair team?
5. Hoe is dit team bij elkaar gekomen? Waar heeft u rekening mee gehouden bij het kiezen van de teamleden?
4. Hoe denkt u dat de teamleden in hun kracht worden gezet/gemotiveerd door elkaar? En wat uw bijdrage hierbij?
5. Hoe laat u zien u iets waardeert dat het team heeft gedaan? En bent u de enige die dat doet of zijn er meerdere teamleden die elkaar complimenteren?
6. Denkt u dat uw rol in een bepaalde projectfase (SO, VO, DO en TO) een grotere rol speelt in tegenstelling tot andere projectfasen?
7. Hoe gaat het team om met spanning en wat uw rol daarin?
8. Hoe beschrijft u uw eigen leiderschapsstijl?

Appendix 4 Observation checklist

Project								
Date (session)								
Location								
Attendees			Timestamp (10 min.)					
Name	Function/ role	M/F	1a (0:00 - 0:10)	1b (0:10 - 0:20)	2a (0:20 - 0:30)	2b (0:30 - 0:40)	3a (0:40 - 0:50)	3b (0:50 - 1:00)
1.....								
2.....								
3.....								
4.....								
5.....								
6.....								
7.....								

Figure 9. Observation checklist (own illustration)