Beyond the Boundaries

What we can learn from applying the parallels between improvisation in jazz and organisation to project management

MSc Thesis

Liz Hoogeveen

2023/2024

Management in the Built Environment
Faculty of Architecture and the Built Environment
Delft University of Technology

Graduation organization: Brink

Liz Hoogeveen
5005957
Mentor 1: Dr. J. L. Heintz
Mentor 2: Ir. H. J. M. Vande Putte
Graduation organization: Brink
External supervisor: Onno Kassels

Management in the Built Environment
AR4R010 – Graduation Laboratory
Faculty of Architecture and the Built Environment
Delft University of Technology

Abstract

Over the last decades, the complexity of projects has been increasing. Studies have shown that using existing project management theories in a traditional manner has failed to bring success (Whitty & Maylor, 2009). It is impossible to predict everything and act according to a static plan (Sohi et al., 2019). Improvisation is inevitable (Alhussein et al., 2022; Hamzeh et al., 2019) and therefore necessary to be researched.

A substantial part of previous research has focussed on using a jazz metaphor when describing how improvisation can be implemented within organisations, see Barrett (1998), Hatch (1999) and Weick (1998). A specific type of organisation is the project team, which is temporary and focusses on delivering a project. However, the parallels with improvisation in jazz have not been applied to project management yet. Although existing studies on improvisation in project management show the value (Abuseem et al., 2023; Leybourne, 2011; Malucelli et al., 2021), they remain theoretical and lack the application of improvisation. Hence, the main research question of this research is: *"What can we learn from applying the parallels between improvisation in jazz and organisation to project management?".*

Because of the exploratory nature of the research, qualitative methods are applied. First, a literature study is carried out, which is followed by in-depth interviews and observations of design team meetings. The combination of the methods allows triangulation. This research limits itself to improvisational actions within the design phase of construction projects, which means that the construction phase has been omitted. It is scientifically relevant by focussing on getting a new understanding of improvisation in project management using the parallels. Moreover, it is societally relevant by gaining insights into the dynamics and improvisations within design teams, which can help to improve improvisational actions.

We can learn that the parallels, between improvisation in jazz and organisation, can be applied to project management actions taking place in the so-called safe zone. This is a created setting in which all the disciplines come together to (re)act based on their knowledge and experience. The safe zone can be compared to a jazz jam session, which is characterized by its informality and the going back-and-forth between the musicians. The actions taking place within the safe zone could be described as improvisations on a microscale. Furthermore, another type of improvisation in project management has been defined. These are reactions to exogenous trigger events outside of the safe zone. Trigger events could be unexpected behaviour, an external change in circumstances, a late substantial design change or a substantial change in requirements. In jazz, there are also trigger events present. However, the reactions to the trigger events are still part of the safe zone in jazz, while in project management, this is not the case. Therefore, the parallels have not been applied to reactions to exogenous trigger events.

In general, this research suggests that by applying the parallels, a new way of understanding design teams in project management is revealed. The applied parallels show that design team meetings are not meetings in which the project manager follows a strict agenda and controls a hierarchical structure as described in traditional project management literature. Instead, the design team meetings are comparable to a jazz jam session in which the course is determined by all the disciplines. The openness of the project manager and emphasis on team dynamics are crucial in facilitating improvisations.

Keywords – improvisation, jazz metaphor, project management, design phase

Executive Summary

Problem statement

Over the last decades, the complexity and ambiguity of projects has been increasing. Studies have shown that the application of traditional project management theories has failed to bring success (Whitty & Maylor, 2009). This proves that the traditional "plan-then-execute" approach is not sufficient (Leybourne, 2011). A new mindset is asked for. This mindset should not omit the spontaneous and less predictable aspects of project management (Klein et al., 2015). More creative and innovative approaches are needed in order to cope with the high complexity and ambiguity (Weick, 1998), because it is simply impossible to predict everything correctly and act according to a static plan (Sohi et al., 2019). Improvisation is inevitable (Alhussein et al., 2022; Hamzeh et al., 2019). Therefore, it is necessary to study the notion of improvisation.

Research design

Organizational studies have used improvisation in jazz music to get a deeper understanding of structures and actions in organisations. A project team can be considered a special type of organisation. However, the parallels between improvisation in jazz and organisation have not been applied to project management yet. This is why this thesis dives into the following main question:

"What can we learn from applying the parallels between improvisation in jazz and organisation to project management?"

This thesis limits itself to studying improvisational actions during design team meetings in projects in the built environment. This means that the construction phase is omitted. Improvisational actions in between design team meetings are omitted as well.

Key objectives

This research aims to research what we can learn from applying the parallels between improvisation in jazz and organisation to project management. Subordinate goals are to:

i) Learn more about improvisational actions within a team rather than improvisational actions performed by one actor.
ii) Learn more about the application of improvisation in project management rather than studying improvisation purely theoretically.
iii) Get a deeper understanding of the meaning behind improvisation in project management.

Methodology

Improvisation is a relatively new subject in project management. Therefore, this study is of an exploratory nature. This is why qualitative methods are applied. First, a literature study is carried out to learn about improvisation in jazz and organisation. Then, empirical research is performed in order to define improvisation in project management and to apply the parallels. The empirical research consists of exploratory interviews with six project managers and observations of six design team meetings. The observations are combined with short interviews in the form of a pre-brief and debrief. During the pre-brief, the plan and expectations for the meeting are discussed. During the debrief, the course of the meeting and potential improvisations are discussed. The combination of methods allows triangulation. Figure 1 shows the applied methods during the research.

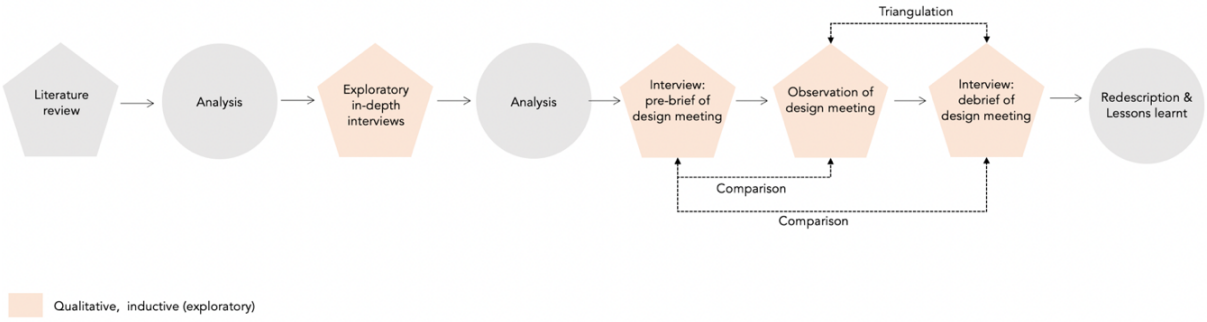

Figure 1: The methods applied during this research (own work, 2024)

Key outcomes

In traditional project management literature, the project manager follows a strict agenda and controls a hierarchical structure. Improvisation is avoided in order to stay in control. By applying the parallels, a more accurate understanding of design team meetings in project management is revealed. It brings a new view on project management which is a response to the increasing complexity in the built environment. The design team meetings are comparable to a jazz jam session in which the course is determined by all the disciplines. The going back-and-forth between the disciplines emphasizes the importance of creating a common understanding. Moreover, initiatives are taken on the spot and are originating from all the disciplines. Stepping outside your own role is sometimes necessary to enhance the product and/or process. This section discusses three key outcomes in more detail: 1) the safe zone as a jazz jam session 2) multiple heads on various levels and 3) facilitation of improvisation: openness and team dynamics.

The safe zone as a jazz jam session

We can learn that the parallels, between improvisation in jazz and organisation, can be applied to project management actions taking place in the so-called safe zone. This is a created setting in which all the disciplines come together to (re)act based on their knowledge and experience. The actions within the safe zone are part of the expected design process. The safe zone can be compared to a jazz jam session, which is characterized by its informality and the going back-and-forth between the musicians. The actions taking place within the safe zone could be described as improvisations on a microscale. They can be defined as actions which merge composing and executing.

Furthermore, another type of improvisation in project management has been found. These are reactions to exogenous trigger events outside of the safe zone. Trigger events could be unexpected behaviour, an external change in circumstances, a late substantial design change or a substantial change in requirements. This type of improvisation can be described as a reaction to the unexpected. In jazz, there are also trigger events present. However, the reactions to the trigger events are still part of the safe zone in jazz, while in project management, this is not the case. Therefore, the parallels have not been applied to reactions to exogenous trigger events.

Multiple heads on various levels

Additionally, improvisations in project management can be based on various heads. The head can be described as the foundation that is improvised on. In jazz, this consists of a basic chord sequence, tempo and melody. In project management, these are the guiding principles and contracts on an organizational level; the program of requirements, the design and the planning on the level of the phases; the agenda on the level of the design team meetings. From this we can learn that the versality of project management results in the presence of multiple heads, which is not the case in jazz. This also causes varying subtypes of improvisation in project management. Figure 2 summarizes the heads and types of improvisations found in this research.

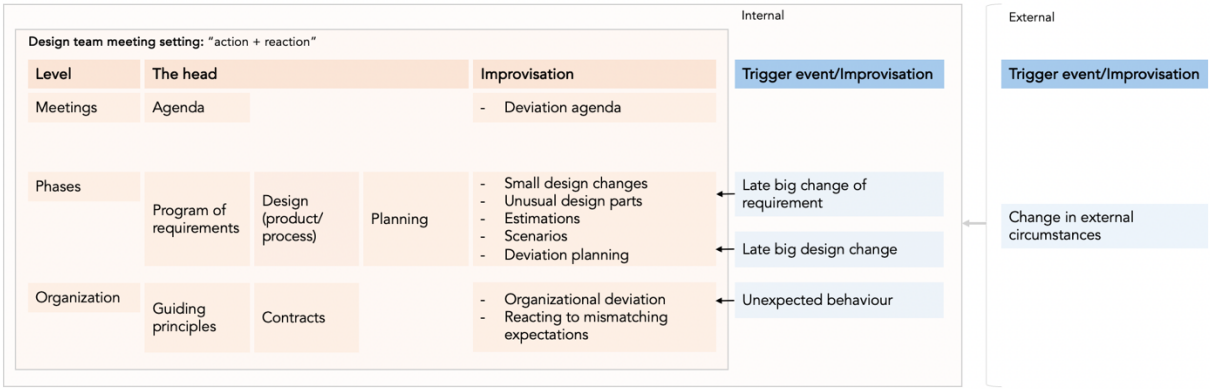

Figure 2: The heads and types of improvisations found in this research (own work, 2024)

Facilitation of improvisation: openness and team dynamics

In traditional literature, project management has been considered a profession in which tasks should be defined upfront. The focus lay on keeping control by staying in between the lines of a predefined plan. Moreover, ambiguity and complexity should be removed from the start to stay in control. However, the applied parallels reveal that space is needed to improvise. Although tasks are indeed defined upfront (for example in the form of guiding principles and contracts), practice shows how they merely form the head upon which is improvised. During the pre-briefs, multiple project managers emphasized the openness with which they would go into a meeting. They indicated they could not predict the atmosphere and reactions of the others as this would differ every single meeting. Instead of preparing for every possible reaction, they would enter the meeting open-minded and see where it would take them. This openness facilitated the improvisations taking place. Another important observation was that the design team meetings are led by the whole design team rather than by only the project manager. Improvisations did not only originate from the project manager but also from the other attendees. This emphasizes the importance of the team dynamics.

Practical implications

The goal of these practical implications is to provide suggestions with which practitioners can improve the course of design team meetings in project management. This helps to provide an answer to the increasing complexity in projects in the built environment.

Facilitation of improvisation as tool for the project manager

Firstly, the facilitation of improvisation can become part of the toolkit of the project manager. Because of the increased complexity in project management, improvisation is inevitable. Therefore, project managers should embrace the facilitation of improvisation. This means it is necessary that project managers accept the fact that not the whole process is controllable. A certain amount of openness should be integrated in design team meetings to ensure that there is room to improvise. Like in jazz, the provision of space is crucial to let the team members feel comfortable in their improvisations.

Focus on team improvisation and the dynamics

Secondly, there should be a stronger focus on team improvisation. The empirical research has shown that the design team meetings are often led by the whole design team rather than only the project manager. Therefore, improvisation as a team should be encouraged. Moreover, the applied parallels between jazz and organisation revealed the importance of the dynamics within a design team. Roles are not defined by strict frameworks but by constantly adjusting and reacting. Actions like taking (over) initiative and bringing in a new idea on the spot are only possible when the dynamics allow this. Sometimes this even requires stepping outside of your own role.

Work on reactions to trigger events

Thirdly, this research has made a distinction between 1) project management actions taking place within the “safe zone” and 2) actions which react to exogenous trigger events outside the “safe zone” (see **Key outcomes**). The choice of the word “safe zone” might indicate that the reactions to trigger events are in an “unsafe zone”. This research suggests that design teams should work on their improvisations within the “unsafe zone”. Successful reactions to trigger events are crucial to keep projects going. However, the empirical research revealed how reactions to trigger events are not shared between practitioners. Therefore, there should be stronger focus on learning how to react to trigger events and this knowledge should be shared between the practitioners.

Reading Guide

1.0 Introduction

This chapter provides the problem statement, a brief summary of the current state of knowledge about improvisation in jazz and organisation and the knowledge gap. Furthermore, the scope of the research is determined.

2.0 Research Design

The second chapter presents the main question and sub-questions of this research. These questions form the foundation for the study.

3.0 Literature Review

The literature review provides an analysis and summary of the current knowledge about (improvisation in) jazz, organisations and project management. The goal is to explain the concepts used in the research questions and to expose the knowledge gap in more detail.

4.0 Research Questions

This chapter presents the research questions and explains how these are determined based on the literature review. It concludes with showing the conceptual framework.

5.0 Methodology

The fifth chapter provides the applied research methods and the reasons behind them. Moreover, it explains the data collection and analysis. It ends with discussing the ethical considerations of the research and the research output.

6.0 Results

This chapter presents the results of the empirical research. First, the results of the interviews are analysed, after which the observations are summarized and examined. It concludes with providing a synthesis which integrates the results from the empirical research. The goal is to answer the research questions.

7.0 Discussion

The discussion aims to put the empirical results into the context of the existing (literature) studies. This helps to determine the added value of this study in comparison to the existing research. Moreover, it provides practical implications for practitioners. It ends with discussing the limitations of the research and suggesting fields for future research.

8.0 Conclusion

The eigth chapter presents the conclusions based on the literature review and the empirical results. The sub-questions of the study are answered, which are eventually integrated to answer the main question.

9.0 Reflection

This report ends by providing a personal reflection in which the researcher looks back on the process as well as the product. The goal is to make explicit which lessons have been learnt.

Table of Contents

Table of Figures

1.0 Introduction

Over the last decades, the complexity and ambiguity of projects has been increasing. Studies have shown that the application of traditional project management theories has failed to bring success (Whitty & Maylor, 2009). This proves that the traditional "plan-then-execute" approach is not sufficient (Leybourne, 2011). A new mindset is asked for. This mindset should not omit the spontaneous and less predictable aspects of project management (Klein et al., 2015). More creative and innovative approaches are needed in order to cope with the high complexity and ambiguity (Weick, 1998), because it is simply impossible to predict everything correctly and act according to a static plan (Sohi et al., 2019). Improvisation is inevitable (Alhussein et al., 2022; Hamzeh et al., 2019). Therefore, it is necessary to study the notion of improvisation.

A significant part of previous research has used a jazz metaphor to redescribe structures and actions within organisations (Hadida et al., 2015). Hatch (1999) describes six important elements of jazz improvisation: soloing, comping, trading fours, listening, responding and groove and feel. Then, she draws a parallel with organizations by comparing these with teamwork, collaboration, sense-making, strategy process and organizational culture and identity. Barrett (1998) has explored the jazz metaphor in redescribing organizational structures as well. He dives into the metaphor in relation to organizational learning and adds provocative competence and embracing errors to the parallels by Hatch (1999). Moreover, Weick (1998) has focussed on the necessary mindset of accepting mistakes. He states that, in the end, mistakes will be followed by success. These existing studies have researched improvisation in organisations. A specific type of organisation is the project team, which can be seen as a temporary organisation and focusses on delivering the project. However, the existing studies have not applied the parallels with improvisation in jazz to project management yet.

Hence, this thesis investigates the application of the parallels between improvisation in jazz and organisation to project management. The parallels by Hatch (1999), Barrett (1998) and Weick (1998) are used as a starting point. This thesis focusses on discovering which actions in project management become salient by using the parallels and how. Existing studies on improvisation in project management show the value of improvisation in project management. Studies by Malucelli et al. (2021), Leybourne (2011) and Abuseem et al. (2023) dive into constructs and factors of individual improvisation in project management. However, these existing studies remain theoretical. None of the existing studies researches the meaning behind improvisation or the application of improvisation in project management. This is the literature gap which this thesis aims to bridge.

This research limits itself to the design phase of construction projects and therefore studies improvisational actions within design teams. As a result, the outcome of this research is specific for project management in the construction sector. By applying the parallels, this thesis aims to get a new understanding of project management, which is scientifically relevant. From a societal point of view, this research helps design teams to gain insights into project team dynamics. Eventually, the outcome of this research can assist in making design teams more aware of their dynamics and in improving their improvisational actions.

This report starts with a brief research design explaining the research questions and goal. An extensive literature review follows, which substantiates the choices and elaborates on the concepts. Next, the applied research methods are discussed. The empirical results and discussion follow. Lastly, a conclusion and reflection are presented.

2.0 Research Design

Organizational studies have used improvisation in jazz music to get a deeper understanding of structures and actions in organisations. A project team can be considered a special type of organisation. However, the parallels between improvisation in jazz and organisation have not been applied to project management yet. This is why this thesis dives into the following main question:

"What can we learn from applying the parallels between improvisation in jazz and organisation to project management?"

In order to investigate this, five sub-questions have been composed. These are the following:

SQ1: What does improvisation mean in jazz and organisation and what are the parallels between improvisation in jazz and organisation?
SQ2: What does improvisation mean in project management?
SQ3: What is "the head" in project management?
SQ4: Which actions in project management become salient when applying the parallels between improvisation in jazz and organisation and how?
SQ5: What does redescribing project management using these parallels tell us about project management actions?

The concepts in these questions are explained in 3.0 Literature Review. The same chapter also dives into the existing knowledge and focusses on exposing the literature gap. The aim of this research is to find out how we can see project management differently by using the parallels, and what we can learn from that.

3.0 Literature Review

In order to substantiate the choices made in chapters 4.0 Research Questions and 5.0 Methodology, a literature review is provided. First, the definition of jazz is established and improvisation in jazz is defined and explained. Subsequently, the definition of an organisation is given and improvisation in organisations come to the fore. Then, the parallels between improvisation in jazz and organisations are researched. These three chapters answer **SQ1:** *"What does improvisation mean in jazz and organisation and what are the parallels between improvisation in jazz and organisation?".* Moreover, the definitions of project management and a design team are established and the most important paradigms in project management are discussed. This gives a tentative answer to **SQ2:** *"What does improvisation mean in project management?".* See Figure 3 for the structure of this literature review.

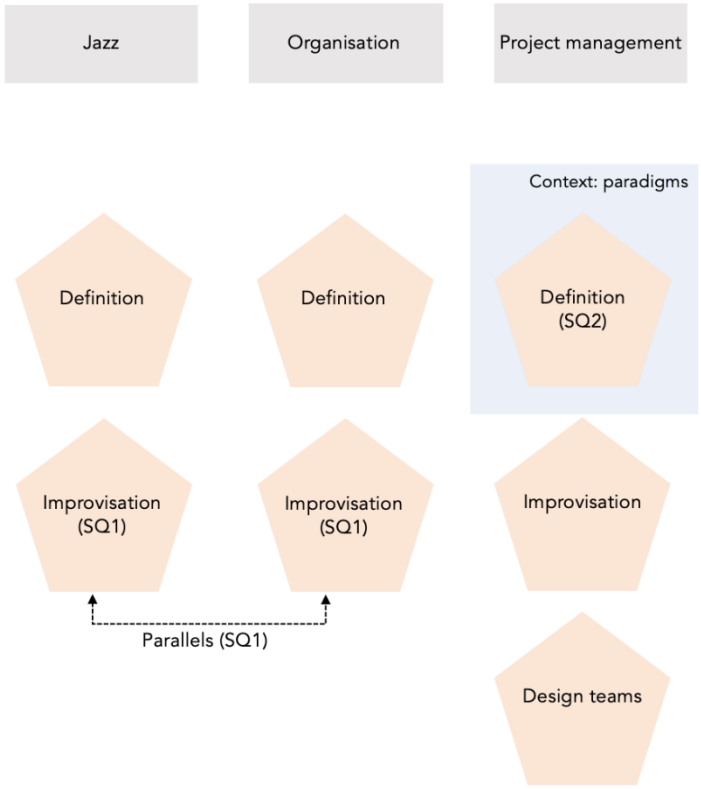

Figure 3: The structure of this literature review (own work, 2023)

3.1 Jazz

3.1.1 Definition of jazz

Since there have been lot of different phases in jazz music, it is impossible to describe it in one definition. Jazz finds its origin during the start of the 20th century and has been developed by African Americans (Schuller, 2023). Its roots lie in blues and gospel. The most famous styles within jazz are early jazz, swing and big band, bebop and modal jazz (School, 2021). Although not always, jazz often can be recognized by its emphasis on improvisation, syncopated rhythms and polyphonic ensembles (Schuller, 2023).

3.1.2 Improvisation in jazz

First, we look into the definition of improvisation that has been provided by jazz literature. In his book called *Improvisation*, Bailey (1992) provides a very simple but effective description of improvisation: "It means getting from A to C when there is no B; it implies a void which has to be filled" (p.136). While filling this void, improvisation is often seen as composing in the moment. Berliner (1994) emphasizes this by stating it is about "composing music in performance" (p. 128). This is illustrated by saxophonist Steve Lacy (Bailey, 1992). He states that the difference between composition and improvisation lies within the different time spans that are available. In composition, you can think as long as you want about the notes that you want to be heard. However, in improvisation, you only can think about this as long as you are performing (Lacy, 1968, as cited in Bailey, 1992). Therefore, improvisation has a high exploratory nature and has also been described as "leaping into the unknown" (Berliner, 1994, p. 606). Furthermore, it is important to understand that improvisation is always based on something. Although it may seem like jazz musicians are choosing notes randomly, this is not the case (Berliner, 1994). Most of the times, improvisations are based upon the head, which will be explained in the next paragraph.

When playing jazz music together, musicians can take on various roles. Often, there is a soloist improvising while other musicians support him or her. The harmonies or rhythms played by the other musicians can inspire the soloist to take the solo into a certain direction. For example, jazz pianist John Hicks is known for basing his improvisation upon the "spirit coming from the whole group" (Berliner, 1994, p. 424). However, it can also be the other way around. The soloist might take the initiative to change the direction suddenly, which then can be followed by the supporting musicians (Berliner, 1994). In order to get a deeper understanding about these roles, we will dive into three concepts next to the head: soloing, comping and trading fours.

The head

As made clear in the definition, it is crucial to realise that improvisation is always based on something. Often, the context of the jazz tune is being set at the beginning. A basic chord sequence, melody and tempo are played to provide a starting point (Hatch, 1999). This is also known as the head of a tune. Most of the times, the head is only played explicitly at the start and at the end of a tune. However, the head will still be recognizable in between. The easiest way to hear this is to keep repeating the head in mind while the improvisations are going on. Parts of the melody and/or rhythm of the improvisation will be related to the head.

There are different sources of inspiration for the head. Murphy (1990) emphasizes how common it is to use a riff to build up the head. He names multiple examples of heads that are constructed from a riff combined with different versions of that same riff. Moreover, the head can be a melody which can come from "spirituals, marches, rags, and popular songs" (Berliner, 1994). In that case, the head is given as a whole and does not have to be constructed from variations. Another less common approach is to take a famous solo and consider that as the head (Berliner, 1994). The famous solo is then seen as the starting point upon which the musicians will improvise.

Soloing

After the head has been played at the beginning of a tune, the musicians get a chance to solo. The solo gives an opportunity to the musicians to improvise on the head and to bring the tune in a different direction (Hatch, 1999). Some soloists also describe this as "changing the weight of a piece from one place to another" (Bailey, 1992, p. 16). The role of soloing changes throughout the tune and the order in which this happens may or may not be established beforehand (Hatch, 1999). While a certain musician is playing a solo, the other musicians will often be supporting the soloist. This is called comping (see **Comping**).

When jazz musicians want to learn how to solo, they often first imitate existing solos. When musicians succeed in doing this, they can move to a new stage: the assimilation stage (Berliner, 1994). This means that you can combine existing bits of solos in such a way that you create your own style. Ultimately, when musicians have enough harmonic knowledge and experience, they can move to the innovation stage. This is described as thinking "of where the music hasn't gone and where it can go" (Berliner, 1994, p. 149). This is seen as the final stage of improvisation in which you can play a solo on the highest level.

Comping

When the soloist is playing a solo, he or she is supported by other musicians. This is known as the concept of comping (Hatch, 1999). Often, there is a part of the ensemble (drums and bass for instance) which provides the rhythm, also called the rhythm section (Berliner, 1994). The rhythm section can emphasize things that are played by the other musicians. For example, some soloists are known for playing a lot of notes and adding complicated rhythms to their solos[1]. Then, the rhythm section only needs to create "a cushion" on which the soloist can improvise (Berliner, 1994, p. 418). However, other soloists tend to leave spaces more open[2]. The rhythm section can use these open spaces to play fills and accentuate certain counts. Playing more or less notes is not the only way in which the rhythm section can emphasize the solo. Another approach is to focus on the dynamics. For instance, the soloist may decide to build their solo by starting softly and then playing gradually louder and more intense. The rhythm section can accentuate this by following the dynamics. However, it is very important that the drummer plays with the soloist, and does not drown out the solo (Berliner, 1994). Moreover, in terms of the rhythm, the rhythm section does not necessarily have to follow the soloist. The rhythm section can also decide to play more in front of the beat, or after the beat (Berliner, 1994). This will change the feel of the whole tune and can encourage the soloist to play differently. It is also known that some musicians have to adjust their style of playing in

[1] See for example Charlie Parker – The Bird: https://www.youtube.com/watch?v=KYQCwoas3rk
[2] See for example Miles Davis – So What: https://www.youtube.com/watch?v=zqNTltOGh5c

front or after the beat so they can align with the other musicians (Berliner, 1994). By adjusting this, they can support the soloist in the best way possible.

Apart from comping rhythmically, there are also musicians who comp harmonically. The bass player, who can provide the rhythm, can also decide to play certain harmonies to the root note (Berliner, 1994). In addition, a pianist may decide to leave out certain notes from a chord so that the chord is not defined. This leaves room for the soloist to decide in which way they want to go. Hatch describes this as "spaces are created and filled by a logic that emerges as part of the interaction of the musicians" (1999, p. 79).

When comping either rhythmically or harmonically, clarinettist Anthony Pay states that there is always a decision between two things. You can listen to the rest and decide to contribute to it or you can destroy it (Berliner, 1994, p. 68). This emphasizes the need to listen to each other and to make decisions quickly.

Trading fours

Trading fours happens when soloists improvise short phrases and change their role every four bars (Berliner, 1994). Often, the next soloist will respond to the solo which has been played before. This can be achieved by embellishing a certain melody or imitating a rhythm. When a new soloist starts to play, the previous soloist switches to comping. Therefore, trading fours results in a rapid succession of soloing and comping.

Trading fours can be seen as a conversation that is going back-and-forth (Berliner, 1994). Jazz pianist Tommy Flanagan explains that he could connect his solo quickly to the solo that had been played before. He states that this results in a conversation that makes sense, which is what you want to achieve (Berliner, 1994). It is important to emphasize the word *trading*, since this illustrates the concept of giving and taking (Brenneis, 2013). This is often not performed within two phrases but continues over multiple iterations. The whole time, musicians are deciding to implement their own ideas or to adjust them to others (Berliner, 1994).

3.2 Organisations

3.2.1 Definition of organisation

An organisation can be defined as follows: "Association of people who interact with each other and use resources of various kinds in order to achieve certain objectives or goals" (Garzón & Lozano, 2022, p. 96). Vargas-Hernandez and Vargas-González (2023) also explain that these people have different roles and usually have agreed upon formal or informal rules. An organisation can be considered as an overarching firm (although this is not always the case) and has ambitions on a high, strategic level.

3.2.2 Improvisation in organisations

Definition

Improvisation in organisations is also known as organizational improvisation (OI). It is defined as the understanding of action as it unfolds while making use of the available social, cognitive, effective and material resources (Cunha et al., 1999). The understanding of action as it unfolds overlaps with the definition by Miner et al. (2001, p. 314): "The deliberate fusion of the design and execution of a novel production". It is also known as "the capacity to engage in unplanned and purposeful action in response to changing circumstances in the context of organizations" (Hadjimichael, 2023). Moreover, Crossan and Sorrenti (2003) state it is "intuition guiding action in a spontaneous way" (p.27).

Parallels between improvisation in organisations and jazz

Hatch (1999) has written an article in which she redescribes organisational structures by using a jazz metaphor. First, she explores the most important elements in jazz music. Subsequently, she links these elements to emerging vocabulary within the field of organisation studies. Her findings can be found in Figure 4.

Jazz	Descriptions	Emerging Vocabulary
Soloing Comping Trading fours	Taking the lead Supporting others' leads Switching between leading and supporting	Teamwork Collaboration
Listening Responding	Opening space for others' ideas Responding to and accommodating others' ideas	Sense-making Strategy process
Groove and feel	Emotional tension and release Resonance of embodied sound Communion among players and audience members	Organizational culture and identity

Figure 4: Parallels between jazz and the emerging vocabulary of organization studies (adopted from Hatch, 1999)

Hatch (1999) concludes that organisations, like jazz ensembles, should leave room for ambiguity to respond to "shifting demands and opportunities" in "globalizing markets" (p. 75). Emotions in organisations should be embraced, as they can enhance learning and change processes. Moreover, members in organisations should pay more attention to leaving spaces open and filling the spaces up, which can be related to the concepts of soloing, comping and trading fours in jazz. She also pays specific attention to the head in jazz music, as described in 3.1.2 Improvisation in jazz.

Studies similar to Hatch (1999)

One of the most cited articles about improvisation in jazz and organizations has been written by Barrett (1998). In order to find out if the parallels found by Hatch (1999) are reoccurring, we dive into his findings.

Barrett (1998) looks into seven characteristics of jazz improvisation. The first one is *provocative competence*, which means that jazz musicians always strive to create something new. Musicians who keep playing the same solos are considered as less capable musicians (Barrett, 1998). Barrett (1998) compares this to organizational learning in the sense that organizations tend to rely on the past. Circumstances may change but organizations are often still holding on to routines. He states that managers should be able to create unusual obstacles "that make it impossible for members to rely on habitual responses" (Barrett, 1998, p. 609). Barrett (1998) sees organisations as lacking provocative competence.

The second characteristic is *embracing errors*. In jazz improvisation, errors are often repeated or developed in such a way that it is not seen as an error anymore. Barrett (1998) says that organizations tend to see errors as something unacceptable, which is also the reason why they are often not shared within organizations. However, errors should be shared so that other members in the organization can learn from them (Barrett, 1998).

The third feature consists of *minimal structures*. Jazz improvisation is loosely structured around the head of a tune (see 3.1.2 Improvisation in jazz). This loose structure allows musicians to make decisions while they play. The looseness of the structure also is named in the article by Hatch (1999). Comping musicians leave room for the soloist to decide in which way they want the improvisation to go. Barrett (1998) believes organizations could also use minimal structures, which could be updated while the processes are ongoing. He compares this updating process with chord changes in a jazz tune, which in his opinion could help to create awareness.

As fourth characteristic, he describes *distributed task.* Barrett (1998) describes the giving and taking in jazz improvisation and the ongoing dialogue, as also discussed in 3.1.2 Improvisation in jazz. He states that members within organizations should put a stronger focus on emotional connections and concepts such as teambuilding.

The fifth feature is called reliance on *retrospective sense-making*. He brings to the fore how jazz improvisation does not rely on a predefined plan, but is "widely open to transformation" (Barrett, 1998, p. 615). Therefore, jazz improvisers have to create something with whatever they have available, which is also called bricolage (Barrett, 1998). In his opinion, organizations are not aware of the importance of bricolage. Often, tasks are broadly defined and require members to be creative and apply the concept of bricolage. Organizations should be made aware of this, so they can improve their application of bricolage.

The sixth characteristic is *membership in communities of practice* (Barrett, 1998). As a jazz musician, you can learn a lot from playing with colleagues and behaving like them. The more you are part of the community, the better jazz musician you will get. As made clear in 3.1.2 Improvisation in jazz, musicians adjust their way of playing to the style of the other musicians. This can be learned through changing groups. In organizations, a stronger emphasis on building a community and a common language is recommended by Barrett (1998).

The last feature is called *alternating between soloing and supporting* (also called comping). This is known as trading fours (see 3.1.2 Improvisation in jazz), as also named by Hatch (1999). Organizations might not support certain members in taking an initiative (in other words: performing a solo). Often, soloing is rewarded more frequently than supporting in organizations. Therefore, Barrett (1998) advices organizations to become more aware of members who are supporting and trading fours.

If we compare the characteristics and implications with Hatch (1999), a lot of similarities can be found. The use of minimal structures (with the head in jazz improvisation), distributed task, communities of practice and alternating between soloing and supporting can be found back in Figure 4. Barrett (1998) extends this by naming provocative competence and embracing errors. The papers of Barrett (1998) and Hatch (1999) are therefore strengthening and expanding the other's findings, rather than opposing them.

Another article about jazz improvisation and organisations which has been cited many times has been written by Weick (1998). He stresses that improvisation is always based on something, which also came to the fore in the articles by Barrett (1998) and Hatch (1999). Like Barrett (1998), he believes we should embrace errors and consider improvisation as a sense-making process rather than a decision-making process. In organizational meetings, he recognizes the give and take process which in jazz improvisation is called trading fours. In short, the article by Weick (1998) shows a lot of similarities with the works of Barrett (1998) and Hatch (1999), but puts a stronger focus on the different degrees of improvisation.

In Figure 5, an overview of the findings by Hatch, Barrett and Weick can be found, which shows the parallels between improvisation in jazz and organisations. This thesis focusses on applying these parallels to project management. Since there are a lot of parallels between jazz and organisations, this thesis focusses on the actions which become salient by applying the parallels. Therefore, one of the sub-questions centres upon finding out which actions become salient in project management (see 4.0 Research Questions).

Hatch	Barrett	Weick
Improvisation is based on the head	Improvisation is based on a loose structure	Improvisation is always based on something
Soloing Comping Trading fours	Part of give and take Part of give and take Alternating between soloing and supporting	Part of give and take Part of give and take Part of give and take
Listening (sense-making) Responding	Retrospective sense-making	Retrospective sense-making
Groove and feel (including communion)	Membership in communities	
	Provocative competence	
	Embracing errors	Embracing errors

Figure 5: An overview of the findings by Hatch, Barrett and Weick (own work, 2023)

Reaction on Hatch

After Hatch presented the jazz metaphor, not only positive but also negative responses arose. The first category of negative feedback consists of people considering the jazz metaphor as something for the elite and as a source for egotism. Although jazz has been developed by African Americans as a reaction to their oppression, it is nowadays often seen as something for the elite. This might result in the metaphor not being accessible to people unfamiliar with jazz and improvisation. In her reaction to criticism, Hatch (1998) acknowledges that jazz musicians might focus mostly on themselves and show forms of egotism. For example, jazz musicians might have the habit of showing up late for performances or being rude in another way. These forms of exclusion and egotism should obviously not be transferred to organisations when applying the jazz metaphor (Hatch & Weick, 1998).

The second category consists of people considering the jazz metaphor as a symbol for sexism. The most famous jazz musicians, except for the vocalists, are often males and audiences are frequently dominated by males. This domination and exclusion of females should again not be transferred to organisations (Hatch & Weick, 1998).

Hatch's response is that the metaphor should not be avoided, "but that it is imperative for those who use metaphors as management tools to become conscious of their power to exclude" (Hatch & Weick, 1998, p. 603). In other words, the criticism should not prevent ourselves from applying the jazz metaphor but should make us aware of the consequences it brings. Labels, such as elitism and sexism, will not be transferred if we apply the metaphor in a responsible way. Since a lot of things have been affected by elitism, egotism and sexism, it is impossible to throw out everything that has been affected by it. Weick adds it is not jazz itself that they praise, but the improvisation that takes place within jazz music (Hatch & Weick, 1998). Therefore, one does not have to like jazz in order to learn lessons from improvisation and apply implications in organisations. This is also the case when applying the metaphor to project management, as this research does.

Other organizational studies on improvisation

The aforementioned studies by Hatch (1999), Barrett (1998) and Weick (1998) used jazz as a metaphor to get an understanding of improvisation in organizations. However, a lot of studies have also researched improvisation in organizations without the use of this metaphor. Ciuchta et al. (2021) provide a review on 186 existing studies. In Figure 6, their proposed framework of an organizational improvisation episode (OIE) can be found. They state that improvisation can take place in different degrees, but that "at least some part of the design of action occurs during execution" (Ciuchta et al., 2021, p. 291). They also mention novelty as an important aspect of improvisation. Again, they acknowledge that novelty can come in many degrees. They conclude that the existing literature has not yet defined a threshold for calling an action improvisation.

Later, they state that the "improvisational episode" consists of many different aspects (Ciuchta et al., 2021, p. 303). For example, one aspect could be the first action that deviates from predetermined designs or plans. Another aspect could be an embellishment of already performed actions. For future research, they advise to determine the research unit (Ciuchta et al., 2021). They also state there are two types of improvisation: completion improvisation and redesign improvisation. In the first one, a predefined plan or design is finished by improvising; in the latter, a predefined plan or design is rejected and changed (Ciuchta et al., 2021). The conclude that completion improvisation is far more frequent than redesign improvisation.

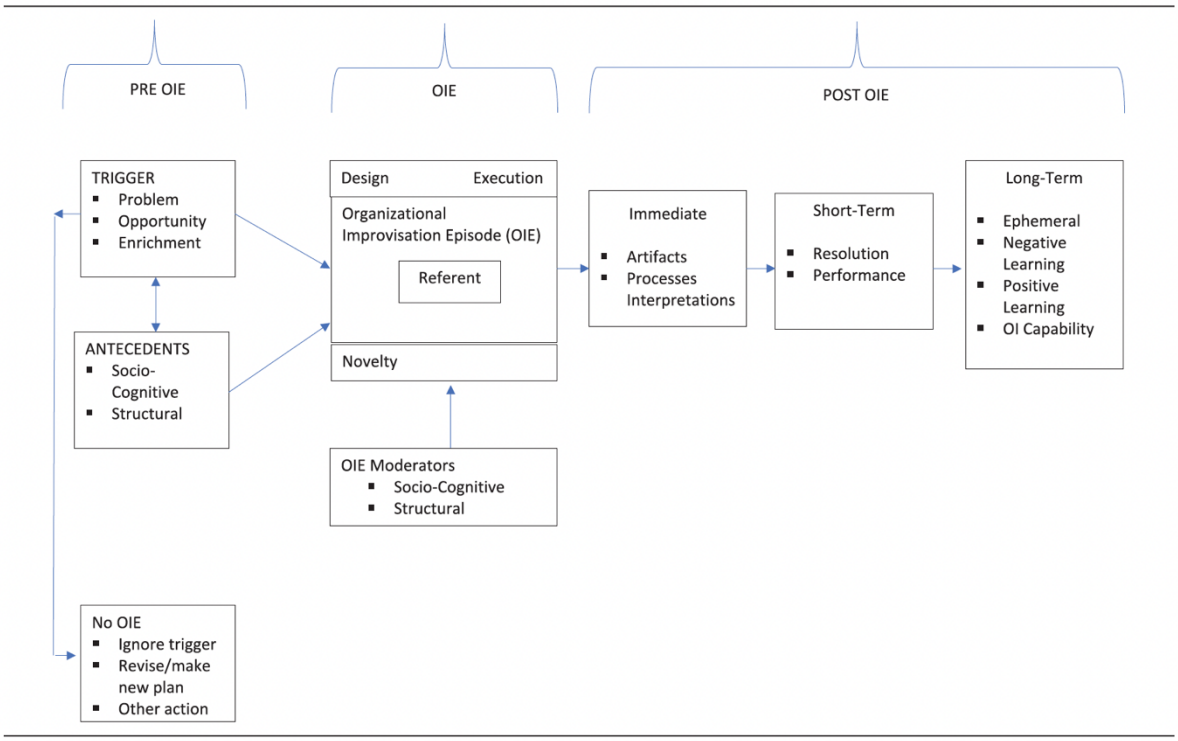

Figure 6: Framework for Organizational Improvisation Episode (adopted from Ciuchta et al., 2021)

In order to get a deeper understanding of organizational improvisation, we dive into studies which used empirical research such as observations and interviews. Although there are not a lot of studies observing organizational improvisation, some can be found (Flach, 2014). During five months, Pina E. Cunha and Vieira Da Cunha (2003) studied a product development organization using archival data, interviews and observations. Their unit of analyses was "the improvisation, defined as an action that was conceived in real-time (as it unfolded)" (Pina E. Cunha & Vieira Da Cunha, 2003, p. 172). Other studies which have used this unit of analysis have been done by Scaglione et al. (2019) and Flach (2014). With this indicator, Pina E. Cunha and Vieira Da Cunha (2003) found 83 improvisations. They conclude that emerging problems were dealt with using actions rather than planning. In relation to this thesis, an interesting remark is made about the old norms and standards within the companies working together. They state that these old norms and standards were treated as a departure point and not as a reference to which new norms and standards should adhere. They compare this to jazz improvisation. Although they do not go into detail about this, we could argue that the old norms and standards can be seen as the head (see 3.1.2 Improvisation in jazz). This head could be compared to a famous solo, on which other musicians improvise.

Pina E. Cunha and Vieira Da Cunha also did a non-empirical study in 2010 on organizational improvisation. They state that structuration theory by Giddens (1984) is the most frequently used framework to investigate improvisation in organizations. Structuration theory proclaims that the structure of an organization influences and is influenced by the organizational agents. The structure of an organization consists of its rules, resources and expectations, while the organizational agents create routines and execute actions. Crossan and Sorrenti (2003) also state that improvisational actions can take place within the boundaries of the organization's structure. Actions are therefore influenced by the overarching structure of the organization. Giddens (1984) says that change can take place in the interplay between the organizational structure and agents. He also states that a tolerance for mistakes and a loose structure within the organization might advance the emergence of improvisation, but these two do not have to be considered conditions (Giddens, 1984). Another theory which they bring to the fore is the theory by Goffman (2002). As McGinn and Keros (2002) explain in their study on improvisations in negotiations, Goffman states that every social interaction is in fact a performance. In this performance, he states that people have a so-called frontstage and backstage. In order to avoid embarrassment, people will only perform actions on the frontstage which they think will be accepted by others. In empirical studies, improvisations have to take place on the frontstages in order to be visible to others. This is implicitly seen as a given in existing empirical studies on improvisation in organisations (Vieira da Cunha & Pina e Cunha, 2010). Furthermore, Klemsdal and Clegg (2022) explain how Goffman's theory reasons from two levels of social order: the context and the micro-level interactions. On the level of the micro-level interactions, improvisational actions can be found.

An earlier study by Cunha et al. (1999) stated that improvisation could be measured on the basis of two parts. The first part has already been mentioned above and consists of the fusion of the design and execution of an action. The second part consists of the deviation from the planned action, as brought to the fore by Johnson and Rice (1984). In order to study improvisation, they advise studying the integration of the two parts. Moreover, they state that a demand for speed and action and/or an unexpected occurrence can be indicators for improvisation.

Another empirical study by Miner et al. (2001) looked into two organisations developing new products. Their main method consisted of observations, of which they performed approximately 50. They focussed on product development meetings during the concept and prototype stages. At first, they tried to identify improvisational actions at the scale of the project stages. However, they did not feel like they could do this satisfactorily, which is why they decided to focus "on identifying improvisational actions within specific projects" (Miner et al., 2001, p. 308). They concluded that in order to call an action improvisation, design and execution should not only converge in time but also substantively. The design and execution of an action are fused is such a way that they are inseparable. At the same time, an improvisation always has a deliberate purpose. Moreover, improvisations were linked to a specific issue and time and creating knowledge was never a characteristic of an improvisation. The improviser does not know the consequences of his or her improvisational action. They also name a couple of referents, which they describe as infusing "meaning into improvisational action and providing a constraint within which the novel activity unfolds" (p. 316). Unexpected problems and unanticipated opportunities are named as referents. Although these were not explicitly described as set predecessors of improvisations, they could be seen as indicators for a future improvisational action.

Figure 7 shows a model which integrates the aforementioned aspects of organizational improvisation in existing empirical research. The overall structure of the model is based on the structuration theory by Giddens (1984). The structure of an organization influences the (improvisational) actions by the agents and vice versa. An organizational improvisational action is seen as deviating from a planned action (Johnson & Rice, 1984) and the convergence of the design and execution of an action (Cunha et al., 1999; Miner et al., 2001). In order to be noticed during empirical research, the improvisational action is taking place on the frontstage (Goffman, 2002). Indicators and characteristics of an organizational improvisational action are also added to the model (Cunha et al., 1999; Miner et al., 2001). This model could be seen as a base for future empirical research.

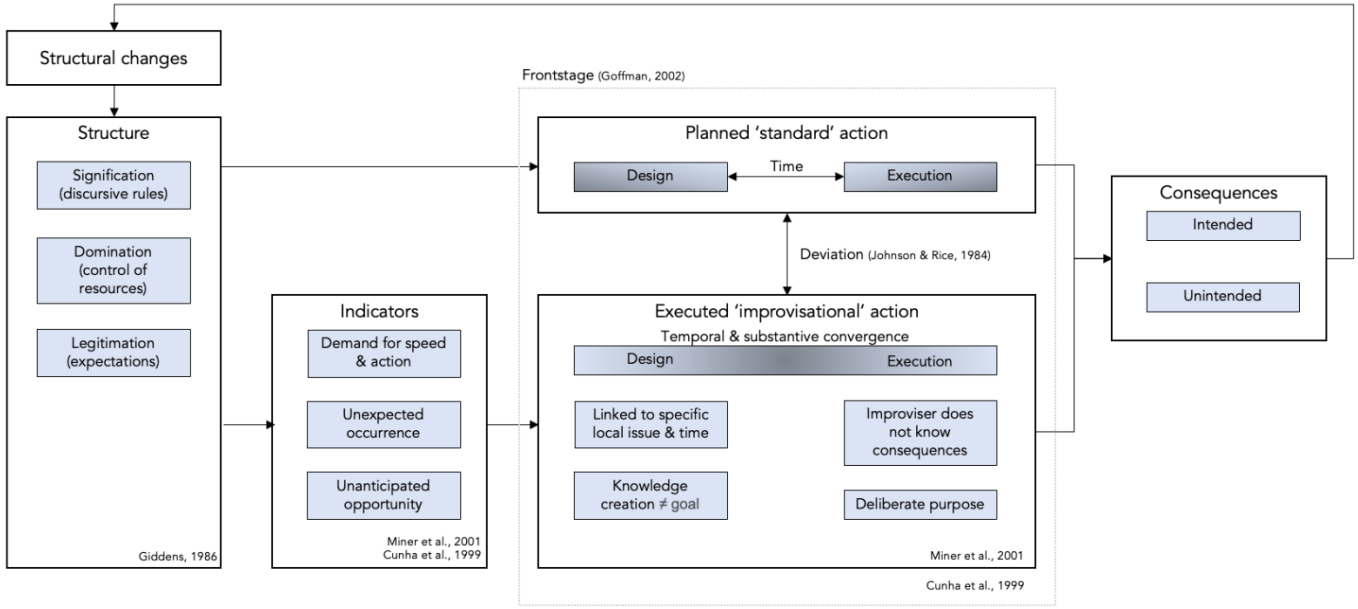

Figure 7: Model on studying organizational improvisation in existing empirical research (own work, 2023)

3.3 Project management

3.3.1 Definition of project management

A project is a temporary endeavour which has a single, definable goal and explicit end-terms and deliverables (Luijten, 2022). This means that a project always has a beginning and an end. By Turner and Müller (2003), a project is seen as a temporary organization. Moreover, a project has an established budget and can make use of a set of resources. Another characteristic which is often recognized is the fact that a project is unique (Morris, 2002). As a result of this uniqueness, Morris (2002) believes that the most important feature of a project is the fact that it goes through a life cycle. He states that every project will go through the phases of "Concept through Definition, Development, Build, and Hand-over – or words to such effect" (Morris, 2002, p. 4). The project life cycle is shown in Figure 8.

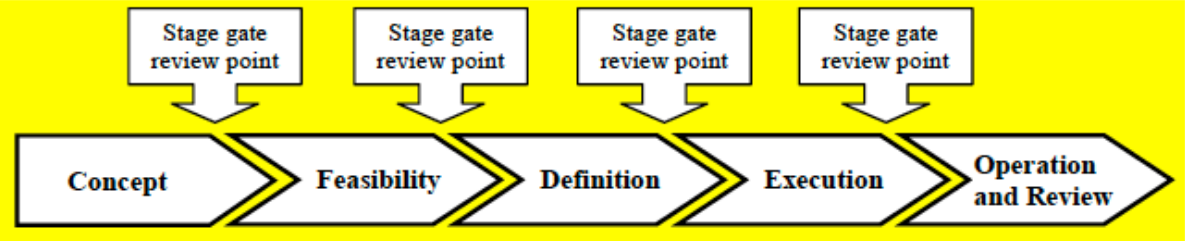

Figure 8: The life cycle of a project (adopted from Morris, 2004)

Project management is "the application of knowledge, skills, tools, and techniques to project activities in order to meet or exceed stakeholder needs and expectations from a project" (Luijten, 2022, p. 14). Decisions have to be made in terms of scope, time, cost and quality.[1] Morris (2002) adds that these activities are performed in order to go through the life cycle successfully. Not only scope, time, cost and quality, but also risk and value need to be managed through the project's life cycle (Morris, 2002).

When comparing these definitions with the definition of an organisation, it is important to notice that a project is bound to go through the life cycle, while an organisation is not (Morris, 2002). Although a project team could also be described as an "association of people who interact with each other" who try to "achieve certain objectives or goals" (Garzón & Lozano, 2022), a project team is an organisation of a specific nature. Whereas an organisation is focussed on the long-term (Too & Weaver, 2014), a project team is temporary and focussed on a shorter term.

In order to get a deeper understanding of project management, the two main paradigms in project management are discussed next: the predict-and-control approach and the prepare-and-commit approach.

Predict-and-control approach

From a traditional point of view, project management is seen as an activity related to process and control (Leybourne, 2011). Plans are created in advance and are carried out subsequently. This is also known as the "plan-then-execute" approach (Leybourne, 2011), the mechanistic approach (Sohi et al., 2019), the hard paradigm (Pollack, 2007) or the predict-and-control approach (Osipova & Eriksson, 2013). Time, budget and goals are set up during the beginning

[1] In project management, these four elements play a crucial role. However, it is not the goal of this research to investigate the parallels between these four elements in project management and jazz. The parallels mentioned in 3.2.2 Improvisation in organisations are chosen to base this research on.

of a project and leave little room for flexibility or adjustment. The goal is to remove ambiguity and complexity from the start (Osipova & Eriksson, 2013). A strong emphasis lies on the front-end and activities are narrowly and hierarchically defined (Koppenjan et al., 2011).

A guide which helps to define these activities is the Project Management Body of Knowledge (PMBOK) guide (Sohi et al., 2019). The PMBOK guide defines five phases: initiating, planning, execution, monitoring and controlling, and closing (Guide, 2001). In every phase, the guide provides activities to be carried out. The PMBOK guide also brings the use of a Work Breakdown Structure (WBS) to the fore. This is a decomposition of activities that need to be done, in a hierarchical order (Norman et al., 2008). A tool that is often used in combination with a WBS is the Critical Path Method (CPM). When using this method, the activities are broken down with their interdependencies (Winch, 2009). The earliest and latest starting-and finish day of the activities are determined and used to define the shortest length of the project. This can help to define definitive decision moments and different scenarios for the schedule of the project (Winch, 2009). Although tools like the WBS and CPM have been used for a long time, they are now "starting to be seen as appropriate only in the simplest problem contexts" (Pollack, 2007, p. 269). This is why a new paradigm, called the prepare-and-commit approach, has gotten increasing attention lately.

Prepare-and-commit approach

Over the last couple of decades, research about project management is shifting towards a new view. This new view is 'softer' and puts a greater focus on behavioural aspects and horizontal relationships (Leybourne, 2011). It is also called the organic approach (Sohi et al., 2019), the soft paradigm (Pollack, 2007) or the prepare-and-commit approach (Osipova & Eriksson, 2013). Ambiguity and complexity are not removed during the frond-end but managed throughout the whole project. The activities are less narrowly defined and less hierarchical (Koppenjan et al., 2011).

The latest version of the PMBOK does integrate adaptability and flexibility in project management to a certain extent. However, it still puts a strong emphasis on predicting and executing and does not respond to the dynamics and complexities which have come with the last couple of decades (Sohi et al., 2019). In Figure 9, the most important differences between the hard paradigm (predict-and-control approach) and the soft paradigm (prepare-and-commit approach) in project management are illustrated.

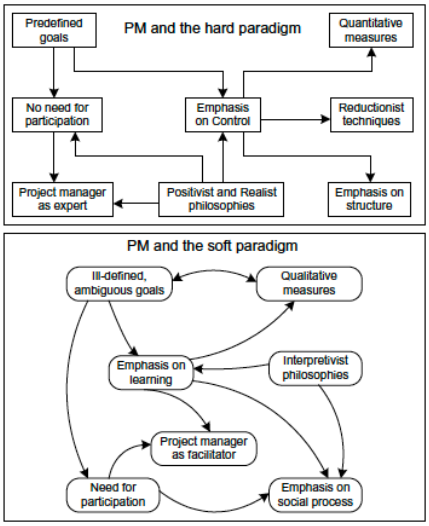

Figure 9: The hard paradigm versus the soft paradigm (adopted from Pollack, 2007)

3.3.2 Improvisation in project management

Subsequently, the definition of improvisation in project management has to be discussed. In project management, improvisation is seen as the merging of composing and executing (Leybourne, 2011). It is often described as a response to the unexpected. Alhussein et al. (2022) state that improvisation is "the act of dealing with the unexpected without having the luxury of preparation" (p. 1). Although plans may work out for some time, at one point or another, unforeseen problems will arise and will call for improvisations (Raelin, 2016). These definitions provide a broad description of improvisation in project management, but do not address what it exactly means. How does the merging of composing and executing look like in project management? This is not known yet and will therefore be part of 4.0 Research Questions.

Seen from the predict-and-control approach, improvisation is something which should be avoided. The goal is to remove ambiguity and complexity from the start (Osipova & Eriksson, 2013) which means that there is little to no room for improvisation. The tools which are provided by the PMBOK guide focus on decomposing the activities and carrying them out based on a predefined plan. However, the question is if the predefined plan is ever executed as predicted. If this is not the case, there will still be room for improvisation. Moreover, the prepare-and-commit approach focusses on managing ambiguity and complexity during the whole timespan of a project. When doing this, improvisation can be integrated (Leybourne, 2011). Rather than defining all the activities upfront, a project team can embrace the uncertainty and accept the fact that improvisation sometimes is needed. Therefore, the application of improvisation would be more likely to take place in a prepare-and-commit approach, but it could also take place when the predict-and-control approach falls short. It is important to notice that the two camps now have been described in the most extreme way. In practice however, the approaches can be combined, or a strategy can lie between the two. Pollack (2007) states that the predict-and-control approach should not necessarily be replaced by the prepare-and-commit approach. Instead, tools should be adjusted and the prepare-and-commit approach can be seen as an addition. Improvisation can take place when there is at least some room for the prepare-and-commit approach.

Existing studies on improvisation in project management

Malucelli et al. (2021) have written an article in which they try to achieve an understanding of literature on improvisation in project management so far. In their review of 36 articles, 39% consisted of case studies and 33% were exploratory. Their results can be found in Figure 10.

Variable	Description	No.	%
Research method	Modelling	0	0
	Theoretical-conceptual	3	8
	Literature review	3	8
	Simulation	1	3
	Case study	14	39
	Research	0	0
	Exploratory	12	33
	Survey	6	17

Figure 10: Research methods of existing literature on improvisation in project management (adapted from Malucelli et al., 2021)

They conclude there are four constructs of improvisation in project management: intuition, creativity, innovation and adaptability. These are the four elements needed to perform an improvisational action. They also conclude that the study of improvisation in project management is still exploratory and that the existing studies do not deliver a theory.

One of the most cited authors, who also comes to the fore in the article by Malucelli et al. (2021), is Leybourne. His work mainly focusses on the constructs of improvisation and he concludes that creativity, intuition and bricolage are the most important inputs of improvisation. Adaptation, compression and innovation are the most frequent outputs according to Leybourne (2011). He emphasizes that "a mature level" of improvisation can lead to efficient solutions to problems but that it is also hard to achieve (p. 10). Moreover, support from a cultural, managerial and an organizational perspective is crucial. Without this support, effective improvisation can lead to losses of advantages. His article focusses on individual improvisational actions and does not address when improvisation occurs and why it could be beneficial in project management.

A very recent study by Abuseem et al. (2023) studied the factors which had an influence on project manager improvisation. In Figure 11, an overview of their findings can be seen.

Factor	**Study**	**Method**	**Effect on improvisation**
Expertise	(Vera & Crossan, 2005) (Leybourne & Sadler-Smith, 2006)	Likert Scale Likert Scale	There is a positive relation There is significant effect
Training	(Vera & Crossan, 2005)	Survey	Training helps in increasing the quality of improvisation
Age	(Leybourne & Sadler-Smith, 2006) (Gniaka et al., 2019)	Likert Scale Questionnaire	There is no significant effect There is little effect
Gender	(Nisula & Kianto, 2015) (Gniaka et al., 2019)	Survey Questionnaire	There is no significant effect There is no significant effect

Figure 11: Factors and their effect on project manager improvisation (adopted from Abuseem et al., 2023)

Although their article concludes with proposing three hypotheses about the effect of experience, age and training on project manager improvisation, they do not confirm or deny the hypotheses. Therefore, their article provides an interesting overview of existing literature on improvisation in project management but fails to deliver a new theory.

Another article by Klein et al. (2015) provides a conceptual model in which degrees of improvisation are linked to different schools in project management. They conclude guides like the PMBOK "may want to embrace the plurality of project-management knowledge" (Klein et al., 2015, p. 276). No singular school of project management can be followed. Instead, combinations of tools and an acceptance of improvisation is advised by Klein et al. (2015).

Lastly, Wikström and Rehn (2002) have explored the similarities between project management and jazz. They conclude there are five connections to be found: (1) plans are enabling, not constricting, (2) aberrations are normal, (3) work with what happens, (4) order is emergent, not pre-defined and (5) disorder is not chaotic (Wikström & Rehn, 2002). Although they propose interesting parallels, they do not deliver a theory. Furthermore, the meaning of parallels like the head and soloing in project management is not discussed.

3.3.3 The design team

As made clear in 1.0 Introduction, this thesis limits itself to studying a design team. A design team is "the group of individuals drawn from contributory professional practices who will work together to provide the concept, scheme and detailed design information" (Gray & Hughes, 2007, p. 166). The need for a design becomes clear when a client formulates the desire for a new or renovated building. A design starts when the brief, which includes the ambitions and requirements of the client (van Meel & Størdal, 2017), is delivered to the architect. It is then the job of the designers to create a concept design and scheme design which comply with these ambitions and requirements. The project manager carries the overall responsibility of delivering the project, which includes safeguarding the scope, time, costs and quality. In Figure 12, the relationships between the tasks carried out by the different team members are illustrated. When relating this to the project life cycle mentioned in 3.3.1 Definition of project management, the design phase will take place during the Concept through Definition and Development phase.

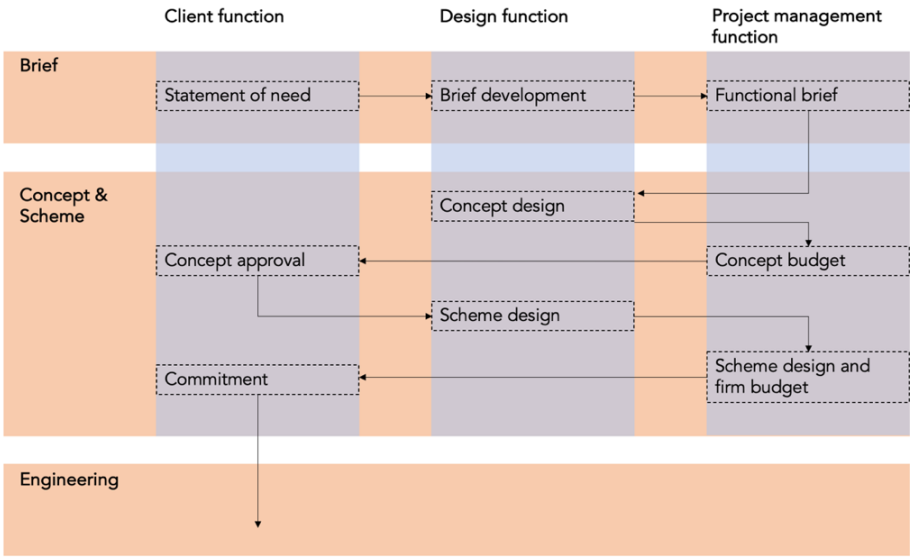

Figure 12: The relationships between the tasks carried out by the client, designers and project manager in the design team (adopted from Gray & Hughes, 2007)

Gray and Hughes (2007) state that the influence of the team members of the design team differs over the time span of the design phase. During the brief, the focus lies on the requirements of the client and the developing of the brief. Therefore, the client dominates. During the concept-and scheme design, the designers will make most of the decisions and will therefore have the highest influence. After this, the design team goes into the engineering phase in which the project manager has the highest influence. In this phase, the project manager has to co-ordinate all the production needs. In Figure 13, the changing of dominance is illustrated in relation to the different phases. The team member on top represents the dominating influence. When studying the design team, it would be interesting to see to what extent the statements by Gray and Hughes (2007) are true and how this effects improvisation.

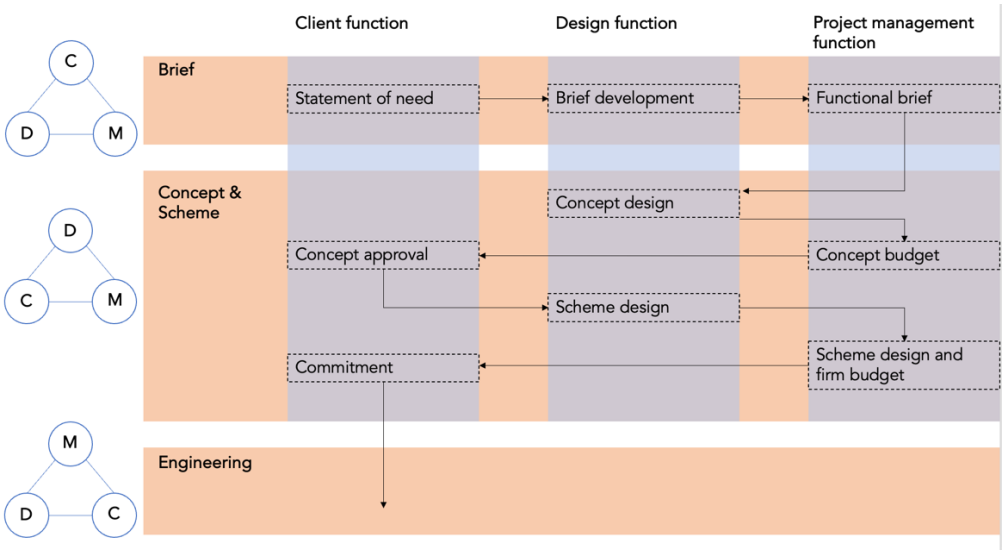

Figure 13: The changing of dominance in relation to the different phases, in which C = client, D = designers and M = project manager (adopted from Gray & Hughes, 2007)

Observations of design team meetings

Lastly, we look into existing studies which made use of observations of design team meetings. McDonnell and Lloyd (2022) have collected a number of studies which made use of the same observations of two architectural design meetings, in which the architect and client were present. It immediately becomes clear that every researcher interprets the observations in his or her own way. Some researchers, like Luck (2022), focus on the interaction that takes place during the discussion. She highlights a couple of extracts and analyses how talk-in-interaction helps to design together. Other researchers, like Glock (2022), put a focus on paralinguistics like gestures. He also uses extracts to analyse. Another method is used by Lloyd (2022), who first read all the raw data and then chose keywords to focus on. His research focusses on ethical aspects of the design processes, which resulted in indicators like “right” and “good”. Then, ten themes were defined from which five are chosen to dive into.

Since the exact function of improvisation in project management is not known yet, we cannot predict whether observing talks will be sufficient, or whether other signals are crucial as well. Depending on the possibilities offered by the internship firm, this research aims to collect talks as well as other signals, so the added value of other signals can be investigated. Keywords in the form of indicators will be chosen to focus on (see 5.0 Methodology).

3.4 Conclusion

First of all, the literature review aimed to answer **SQ1**: *"What does improvisation mean in jazz and organisation and what are the parallels between improvisation in jazz and organisation?".* To conclude, improvisation in jazz means "composing music in performance" (Barrett, 1998, p. 128). In organisation, improvisation is seen as "the deliberate fusion of the design and execution of a novel production" (Miner et al., 2001, p. 314). Important characteristics are that the action is a deviation from an existing plan (Johnson & Rice, 1984) and has an unknown outcome (Miner et al., 2001). In total, nine parallels between improvisation in jazz and organisation have been found: the head, soloing, comping, trading fours, listening, responding, groove and feel, provocative competence and embracing errors (Barrett, 1998; Hatch, 1999; Weick, 1998). Since the head plays a crucial role, it is investigated in a separate sub question (see 4.0 Research Questions).

Moreover, the literature review aimed to give a tentative answer to **SQ2**: *"What does improvisation mean in project management?".* Because of the exploratory nature of this research, we do not pin the definition of improvisation in project management yet. Instead, the members of design teams are asked about their understanding of improvisation (see 5.0 Methodology). For now, "the act of dealing with the unexpected without having the luxury of preparation" (Alhussein et al., 2022, p. 1) is chosen as a starting point.

3.5 The literature gap

To conclude, a substantive part of literature has used parallels with improvisation in jazz to get a new understanding of improvisation in organisations. A specific type of organisation is the project team, which is temporary and focusses on getting a project through the project's life cycle. Existing literature on improvisation in project management has focussed on theoretical constructs that influence individual improvisation. However, the parallels between improvisation in jazz and organisation have not been applied to project management yet.

Therefore, this thesis aims to research what we can learn from applying the parallels between improvisation in jazz and organisation to project management. Subordinate goals are to:

i) Learn more about improvisational actions within a team rather than improvisational actions performed by one actor.
ii) Learn more about the application of improvisation in project management rather than studying improvisation purely theoretically.
iii) Get a deeper understanding of the meaning behind improvisation in project management.

This research focusses on discovering which actions in project management become salient by using the parallels. The rest of the research then goes deeper into these actions and parallels. For an overview of the existing knowledge, see Figure 14. The question marks in this Figure are researched in this thesis.

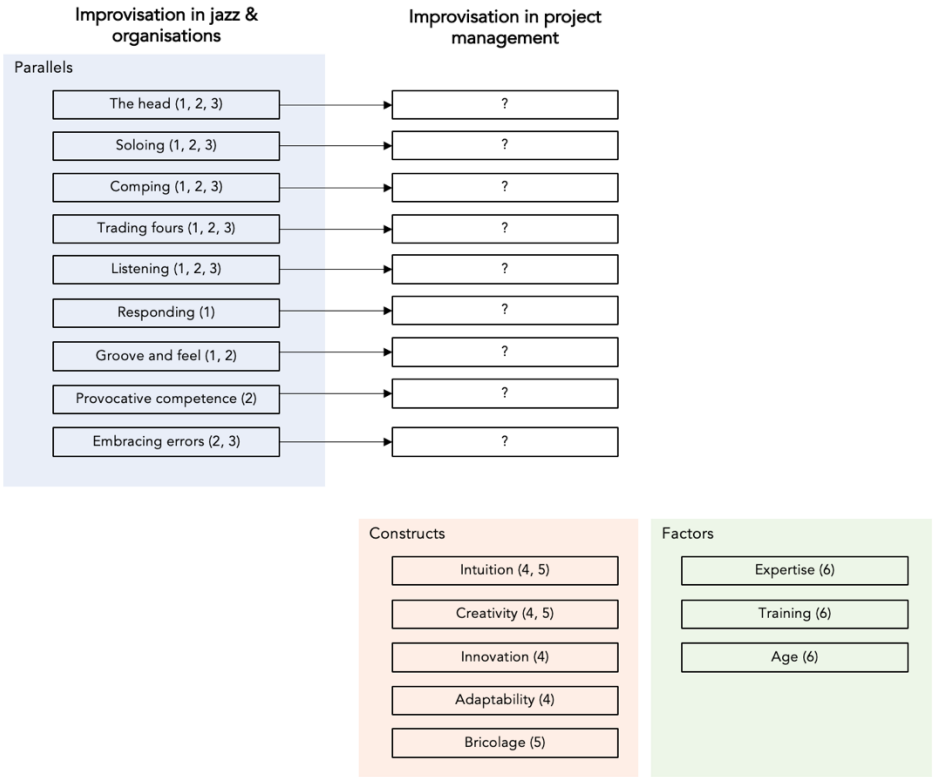

Figure 14: Overview of findings on improvisation in jazz, organisations and project management (own work, 2023)
1) Hatch (1999) 2) Barrett (1998) 3) Weick (1998) 4) Malucelli et al. (2021) 5) Leybourne (2011) 6) Abuseem et al. (2023)

4.0 Research Questions

As made clear in 1.0 Introduction, it is necessary to study the notion of improvisation. As explained in 2.0 Research Design, the following main question is investigated:

"What can we learn from applying the parallels between improvisation in jazz and organisation to project management?"

In order to formulate the sub-questions, we first needed to answer SQ1. From chapter 3.0 Literature Review, we can conclude that the first important concept is the head. When applying this concept to project management, the question becomes what the "head" looks like in project management (SQ3). What are we improvising on in project management?

Next, we can go back to the parallels by Hatch (1999), Barrett (1998) and Weick (1998) and see what questions they ask themselves. When showing the parallels, Hatch (1999) asks a couple of questions out loud: "Are solos interesting? Are those providing the comping contributing to the soloist's ideas or are they interfering with the soloist's ability to express him or herself? Do players know when to take a solo? Do they know when and how to end one?" (Hatch, 1999, p. 81). These are all interesting questions, especially when applying them to other fields. Although she draws parallels between jazz music and organisations, she does not apply these parallels to project management. Responding to the questions by Hatch, this research focusses on looking into the actions which become salient using the parallels. Therefore, SQ4 researches which actions become salient. The parallels by Barrett (1998) and Weick (1998) are also taken into account. Lastly, SQ5 provides a redescription and show what it tells us about project management actions. In short, the main question is answered based on the following five sub-questions (of which SQ1 and SQ2 have been (tentatively) answered in 3.0 Literature Review):

SQ1: What does improvisation mean in jazz and organisation and what are the parallels between improvisation in jazz and organisation?
SQ2: What does improvisation mean in project management?
SQ3: What is "the head" in project management?
SQ4: Which actions in project management become salient when applying the parallels between improvisation in jazz and organisation and how?
SQ5: What does redescribing project management using these parallels tell us about project management actions?

In order to narrow down the scope of the research, this thesis limits itself to project management in the construction sector. It focusses specifically on the design phase of buildings; the construction phase is omitted. Furthermore, this thesis dives into the dynamics within the whole team rather than the actions performed by only the project manager. Therefore, all relevant actors within the design team are subject of this investigation. This is also why the design phase of buildings is chosen to focus on: in this phase, the emphasis lies on a team rather than on one project manager. It is contrary to the approach of for example Abuseem et al. (2023) and Klein et al. (2015). The final conceptual framework can be found in Figure 15. Since SQ1 has already been answered, it is left out of the conceptual framework. The following chapter, called 5.0 Methodology, explains how the answers to the sub-questions are collected.

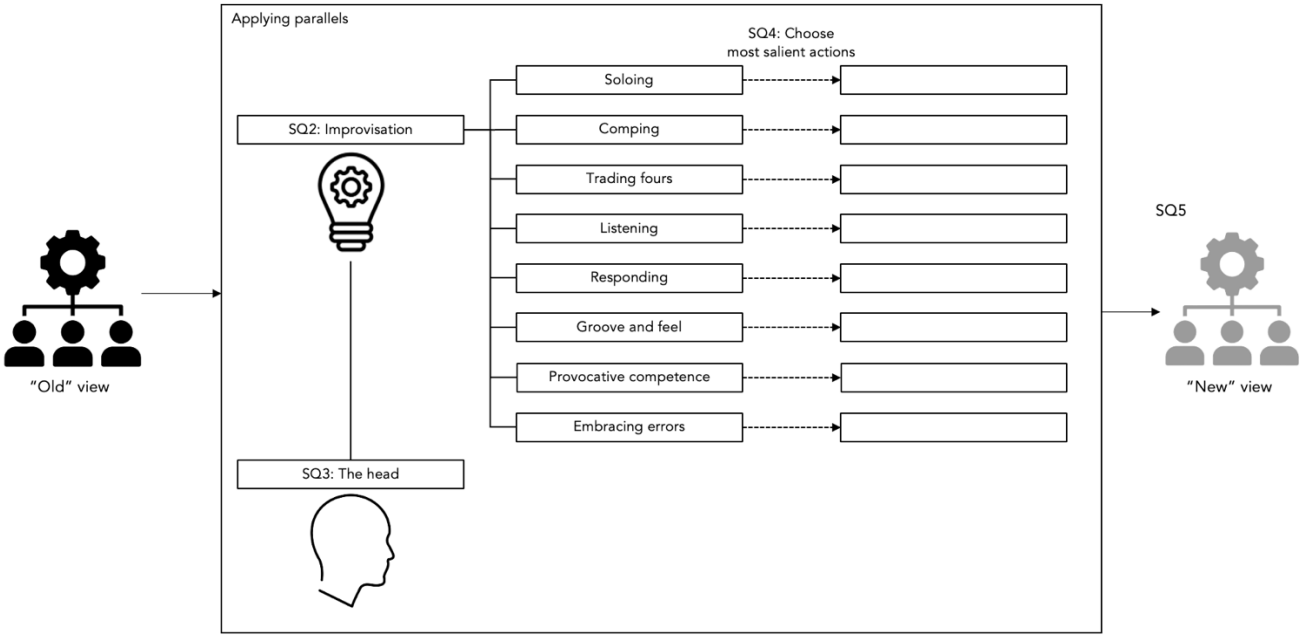

Figure 15: The conceptual framework of this research (own work, 2023)

5.0 Methodology

Now the research questions are made clear, we can dive into the research methods. In this chapter, the type of study with its applied methods, the data plan and ethical considerations are discussed.

5.1 Type of study, methods, data collection and analysis

Since improvisation in project management is a relatively new subject in existing literature, most of the existing research focusses on using qualitative methods. According to Malucelli et al. (2021), 78% of the studies up until 2019 have made use of qualitative methods. They state that improvisation within project management is still studied in an exploratory way. This means that the constructs "are not well operationalized yet" (Malucelli et al., 2021, p. 378) and that quantitative methods cannot be applied. Although prior qualitative research has been able to provide case descriptions, it has not generated a theory yet. Therefore, this research focusses on generating a new theory. This consists of a definition and application of improvisation in project management by making use of the jazz metaphor. Although previous research by Wikström and Rehn (2002) has dived into this metaphor, their article remains abstract and the meaning of parallels like the head and soloing in project management is not discussed. Due to the lack of tangible research on improvisation in project management, this thesis can be seen as an explorative type of study. Because of the lack of operationalization of constructs, this research focusses on qualitative data and an inductive logic of inquiry. This consists of generating a theory based on collected data, which is also called a "data-driven" approach (Shaw et al., 2018). It is combined with a deductive logic of inquiry, since the parallels are also used as a starting point.

In Figure 16, the sequence of the research methods is illustrated. First of all, secondary research in the form of a literature review has been carried out (see 3.0 Literature Review). The purpose of the literature review is to answer SQ1 and provide a tentative answer to SQ2. A synthesis matrix has been used in order to compare the findings between the different studies. In terms of the search plan, three main concepts are used: "improvisation", "project management" and "jazz". These concepts are searched by using different synonyms ("OR") and by combining them ("AND"). The results of the search are prioritized in two ways: number of citations and the year in which the article is published. The literature study focussed on articles with a high number of citations and articles which are published less than five years ago.

Secondly, primary research is performed. This consists of two parts. The first part consists of exploratory semi-structured in-depth interviews with team members of the design teams. The goal is to find out what improvisation means to the team members in a design team and what we are improvising on (SQ2 & 3). An interview protocol has been developed before performing the interviews (see Appendix A: Exploratory interview protocol [NL]). The semi-structured nature of the interviews allows the participants to partly steer the conversation and to leave room for new insights. The interviews are analysed in ATLAS.ti using open-coding as well as closed-coding. After the exploratory interviews, the meaning of improvisation and the research unit are established. The research unit is expected to be similar to the one in existing empirical organizational studies (see 3.2.2 Improvisation in organisations). The second part of the primary research consists of participant observations during design meetings. As Crossan and Sorrenti (2003) mentioned, observations help to get a better understanding of the meaning behind improvisation and the application of improvisation. The aim is to discover which actions become salient using the parallels and

how (SQ4). We will be studying the micro-level interactions as defined by Goffman (2002). Furthermore, the actions have to take place on the frontstage to be observable (Goffman, 2002). The indicators during the observations are expected to be similar to the ones in existing empirical organizational studies (see 3.2.2 Improvisation in organisations). As proposed by Miner et al. (2001), the observations focus on improvisational actions within the specific projects rather than the actions at the scale of the project phases. The observations are combined with interviews in the form of a pre-brief and debrief (see Appendix B: Pre-brief and debrief interview protocol [NL]). The pre-brief and debrief can be considered the backstage by Goffman (2002). The pre-brief allows us to discover the plan for a design meeting and will be a point of comparison afterwards. The debrief allows the application of the principle of "triangulation" (Amaratunga et al., 2002). This consists of using multiple methods of gathering data which can help to strengthen findings. The observations, pre-briefs and debriefs are analysed using both open-coding and closed-coding. For the closed-coding, the nine parallels found in 3.2.2 Improvisation in organisations are used. The parallels that make the improvisational actions most salient are chosen to focus on. Additionally, the threshold for identifying potential improvisations is low. By doing this, the researcher intentionally captures too many actions in order to investigate how the empirical research can contribute to the existing studies. The researcher expects that approximately five exploratory interviews and five to seven observations (in combination with a pre-brief and debrief) will be sufficient to provide the necessary data. In order to keep the phenomenon researchable, this thesis focusses on improvisations during design meetings. Improvisations between design meetings are therefore left outside the scope of this research.

Finally, a theory is generated based on the results of the in-depth interviews and observations. By answering sub-questions 1 up until 4, we can answer sub-question 5 by looking into the insights that the metaphor brought to the fore.

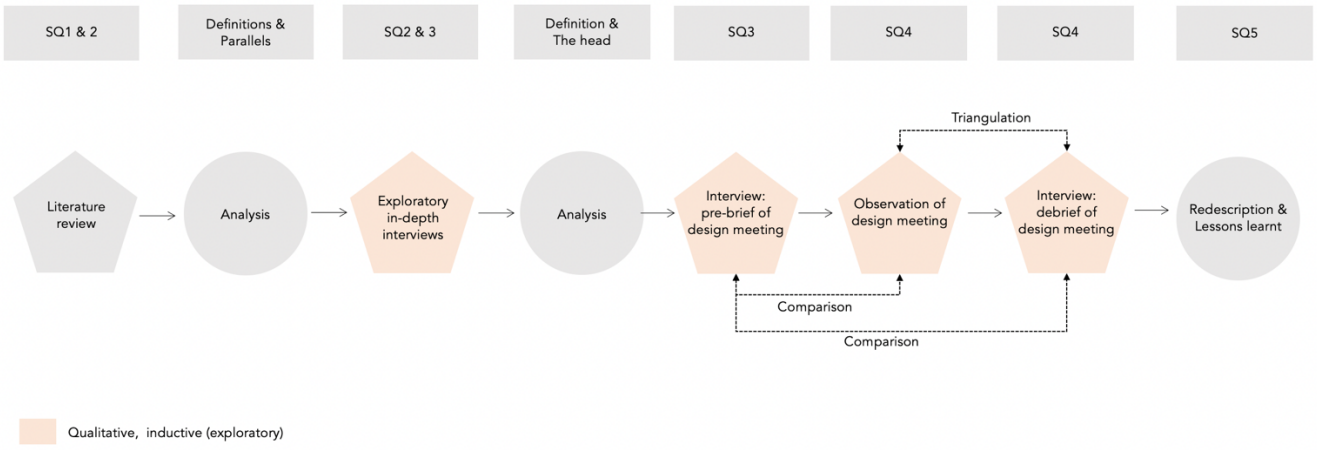

Figure 16: The sequence of research methods in this research (own work, 2023)

5.2 Data plan and ethical considerations

First of all, the collected data for this research will be as limited as possible. This means only data, which is necessary to answer the research questions, will be collected. The data and quotes will be anonymised. However, it is important to notice that specific characteristics of a person might be recognized by another member of the same firm. Although the author of this thesis aims to avoid this, it might be inevitable. Therefore, the investigated firm will not get access to the collected data. This provides a safe environment for all respondents. The firm does get full access to the results. All participants in the research have to sign consent forms and are always able to withdraw from the research without giving a reason. The data of these informed consent forms will be stored separately from the data of the interviews and observations. This data will be destroyed six months after graduation. In case of publishment, this period might be extended. Code names will be used to ensure animosity of the respondents. Moreover, the audio and video recordings of the in-depth interviews and observations will be destroyed when the transcriptions are finalized. For the in-depth interviews and observations, it will be necessary to know the role of the respondent within the design team and the company to which they belong. The concerned projects will be collected but stored separately. In the case that confidential subjects are discussed during the meetings, these will be left out in the transcriptions. The data will be stored in the project storage drive following the rules of FAIR: Findable, Accessible, Interoperable and Responsible. ATLAS.ti will be used as a tool to process the qualitative data. This software program is available for free for researchers, which creates an even playing field.

According to Shenton (2004), qualitative data can be seen as trustworthy when it meets four criteria: being credible, transferable, dependable and confirmable. A number of possible provisions provided by Shenton (2004) have been implemented in this research. An overview can be found in Figure 17.

Criteria	Possible provision by Shenton (2004)	Implementation in this research
Credibility	Appropriate, well recognised research methods	In-depth interviews and observations help to perform an explorative study with an inductive logic of inquiry
	Development of early familiarity with culture of participating organisations	The research will be combined with a 5-month internship which offers the possibility for "prolonged engagement"
	Triangulation	Multiple research methods (in-depth interviews and observations) are used to compensate for the other's limitations
	Honesty in informants	Participants can always withdraw without giving a reason and the researcher will have an independent status
	Frequent debriefing sessions	Sessions with both the internship organization and the mentors will widen the vision of the researcher
	Member checks	The participants are always allowed to check the results of the interviews and observations
Transferability	Provision of background data	The context of the research will be described as thorough as possible, including characteristics of the organization and environment
Dependability	In-depth methodological description	The research methods, operation of the research methods and evaluation will be described in detail
Confirmability	Triangulation to reduce investigator bias	See 'Triangulation' in 'Credibility'

Figure 17: The implementations in this research to ensure trustworthiness (own work, adapted from Shenton, 2004)

5.3 Output

This research has two main goals. The first one is related to the societal relevance. As made clear in chapter 1.0 Introduction, the complexity and ambiguity of projects has been increasing and this asks inevitably for improvisation. The outcome of this thesis can provide insights into the dynamics of a design team. It helps design teams to understand how improvisation occurs and how they could improve their dynamics in order to improvise better. Crossan and Sorrenti (2003) also state that "a better understanding of improvisation will enable us to enhance the quality of action" (p.29). This research aims to legitimise improvisation in project management.

The second one is based on a scientific point of view. Existing literature on improvisation in project management focusses on finding constructs and factors for individual improvisation. Moreover, it does not provide insights about the application of improvisation and lacks a definition of improvisation in project management. By generating a new theory on these subjects, the purpose is to bridge an empirical gap. According to Miles (2017), an empirical gap is the result of "a lack of rigorous research in the prior literature" (p. 6). This lack of research lies within the study of improvisation in project management.

In terms of deliverables, this research seeks to deliver a thorough literature review and data set of the in-depth interviews and observations. The literature review has been summarized based on a synthesis matrix. The in-depth interviews and observations are transcribed and the data is analysed making use of software.

Furthermore, the audiences for this thesis are related to the two main goals. The first main audience consists of design teams which seek to improve the dynamics within their teams to be able to improvise. The second main audience consists of researchers who want to learn more about improvisation within project management. By applying an existing metaphor, new fields of research could be exposed. This could also lead to ideas for future research. This research is disseminated by storing it in the repository of the *Delft University of Technology.* It is accessible to all organisations and researchers who are interested in the outcomes. The specific outputs per sub-question are made clear in Figure 18.

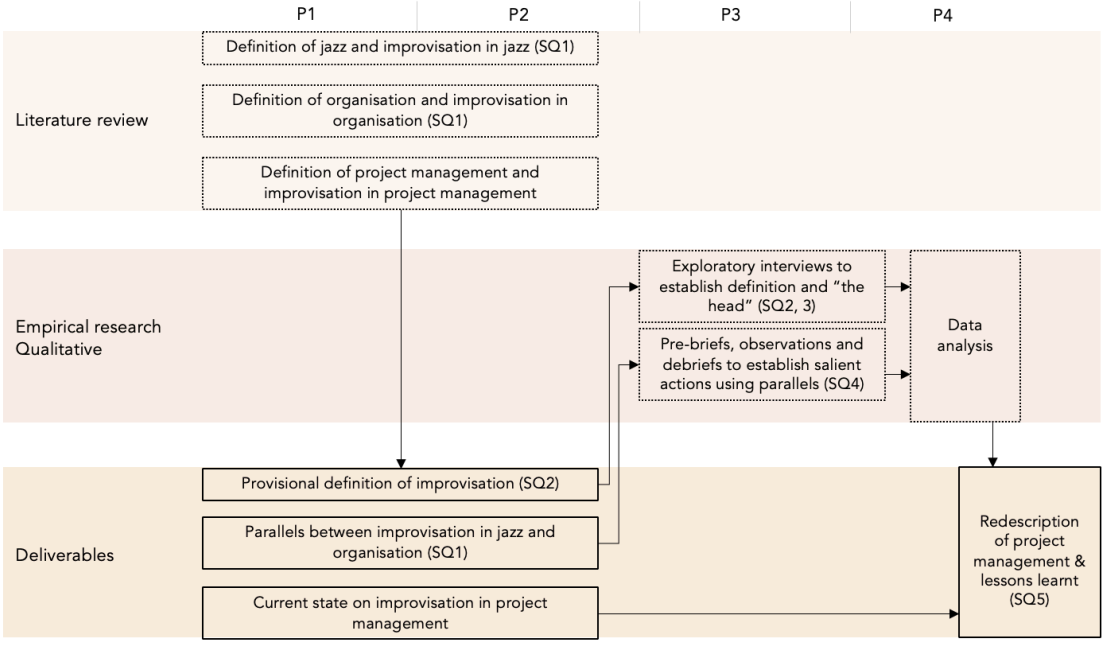

Figure 18: The research output per sub question in this research (own work, 2024)

6.0 Results

This section addresses the empirical results of this study. First, the results of the interviews are discussed, after which the analysis of the observations follow. Lastly, a synthesis is presented to integrate the results of the interviews and observations.

6.1 Interviews

The first part of the empirical research consisted of performing six exploratory interviews. Because of the exploratory nature of the interviews, the research is based on an interpretative approach. This means that rather than applying a predefined framework, the emphasis lay on capturing the different perspectives of the interviewees. The interviewees were project managers with experience ranging from 5 to 20 years. All the interviews took place physically at the office of the graduation company. They took about 45 up to 60 minutes, which resulted in transcripts totalling 50 pages.

The transcripts were analysed in ATLAS.ti using open-coding as well as closed-coding. The open codes were determined by reading all the transcripts and marking the most interesting parts. Then, the marked parts were compared between the different transcripts and themes were determined. This can be seen as an inductive approach, as the data provided the information to choose the themes. Furthermore, the closed codes resulted from the literature review. These consist of different definitions of improvisation, the head, and some of the parallels. This is a deductive approach, as the literature review determined these codes beforehand. In total, 5 main themes have been set up with 20 codes. Figure 19 shows an overview of all the codes that have been used.

	Open coding (inductive)	**Closed coding (deductive)**
Categories of definition		Deal with the unexpected without preparation
		Deviation from existing plan
		Merging of composing and executing/On the spot
		Unknown outcome
The head		The head (explicit)
		The head (implicit)
Parallels		Soloing
		Comping
		Provocative competence
Phase	Phase SO	
	Phase VO	
	Phase DO	
Other	Example	
	Experience	
	Intuition	
	Problem statement	
	Roles	
	Space	
	Style	
	Types	

Figure 19: Overview of open and closed codes of the exploratory interviews (own work, 2024)

After coding all the interviews, a force-directed graph has been made to show the relationships between the different codes. This is illustrated by Figure 20, in which the open codes are indicated with a blue colour and the closed codes are indicated with a red colour. It is important to realise that the distance between the different codes do not represent anything. The connections between the codes show how often multiple codes have been mentioned in the same text fragment (a thicker connection represents a stronger co-occurrence). If a certain code has been mentioned multiple times, the circle indicating the code is larger. For the codes which has been discussed the most, the names of the codes are added to Figure 20. As the main goal of the interviews was to answer **SQ2** and **SQ3**, the codes related to the definition and the head occurred the most, as expected. Apart from these codes, a lot of references to the problem statement have been made, and examples and roles within a design team have been discussed multiple times.

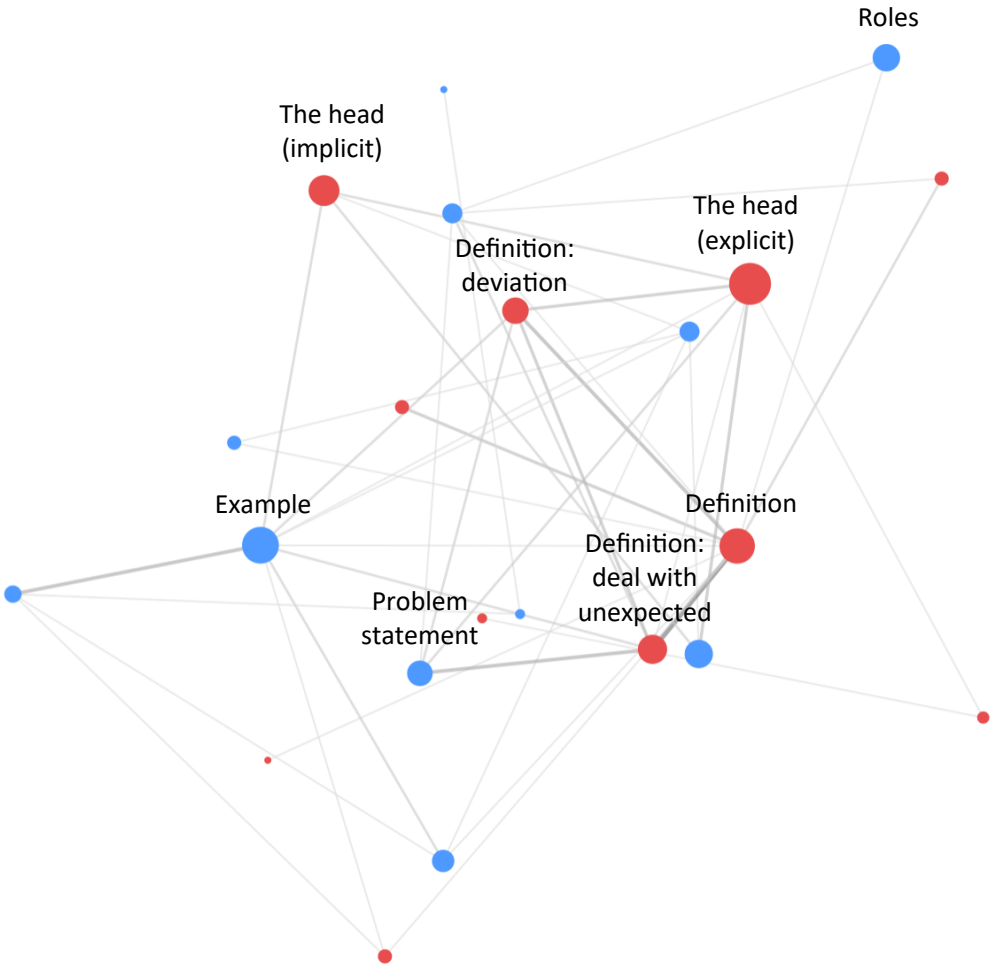

Figure 20: Force-directed graph of codes in interviews (own work, 2024)

6.1.1 The categories of the definition

The first main purpose of the exploratory interviews is to answer **SQ2:** *What does improvisation mean in project management?* In order to answer this question, all the interviewees have been asked about their view on the meaning behind improvisation in project management. Apart from asking this directly, the researcher also has written down definitions which have been mentioned implicitly. This means that every interviewee can have provided multiple definitions. In Figure 21, an overview of the definitions provided can be found. This shows the development of the definition while the interview was going on. As explained in 5.0 Methodology, the researcher intentionally captures too many actions. Although not all actions will be called improvisations eventually, they help to define the threshold for an improvisation. The goal is to widen the view compared to the existing studies on improvisation in project management. Therefore, more data and the widest range of the phenomena have been captured. In 6.3 Synthesis, the empirical results will be compared to the definition provided in 3.4 Conclusion to construct a final definition.

When categorising the definitions of improvisation, four main categories can be found. The first category goes into the fact that you must react to something unexpected. As illustrated by Figure 20, this definition has been mentioned multiple times. Interviewees 2 and 3 have provided this definition implicitly. When asked explicitly, interviewee 1 states: “All the time you have to act upon situations which arise” (2024). This matches the definition provided by Alhussein et al. (2022).

The second category assumes there as a deviation from an existing plan, as also mentioned by Johnson and Rice (1984) in organizational studies (see 3.2.2 Improvisation in organisations). Interviewee 6 states: “There is something that you do by default, in a certain way, and when improvising you consciously deviate from that standard way to try something” (2024). Multiple interviewees indicated that it does not always have to be a deviation from an existing plan, but that it can also consist of a deviation from a standard solution. Interviewee 1 and 6 have mentioned this definition implicitly, while interviewee 3 considers this the definition when asked explicitly.

The third category consists of having an unknown outcome. This was mentioned by Miner et al. (2001) in an organizational research as well. “You embark on a path where you are not sure whether it will turn out well, but that is what you will discover”, interviewee 2 mentions when asked explicitly about the definition (2024). Moreover, interviewee 6 states that you are always improvising during a design team meeting as you do not know the outcome of every discussion point.

The last category assumes you are doing something “on the spot” (interviewee 5, 2024). This is comparable to the definition by Leybourne (2011), who defines improvisation as the merging of composing and executing. For both interviewee 5 and 6, this was the definition provided when asked explicitly.

Interestingly, interviewee 2 stated that it is the role of the project manager to create a setting in which everyone is able to think from a different perspective. According to interviewee 2, the different disciplines should be able to think outside of their roles. This is comparable to the statement by Barrett (1998), who says that people should not only hold on to their routines. This is part of the parallel *provocative competence* (see 3.2.2 Improvisation in organisations).

The varying categories of the definition of improvisation show there is not an agreed meaning or threshold defined in project management yet. While a certain action can be called an improvisation by one practitioner, this does not mean that it is seen as an improvisation by all practitioners. Paragraph 6.1.2 The head goes deeper into the different types of improvisations and 6.3 Synthesis defines various thresholds.

	Definition 1	**Definition 2**	**Definition 3**	**Definition 4**
Interviewee 1	"All the time you have to act upon situations which arise"	"Improvising to me is sensing what is and is not possible in order to move on"	"Deviating from a standard solution"	"Acting upon a situation which we did not expect or foresee" (when explicitly asked)
Interviewee 2	"We have an unexpected problem. How you move forward in a situation"	"The magic happens when people let go off their role. And think outside of their role"	"You embark on a path where you are not sure whether it will turn out well, but that is what you will discover" (when explicitly asked)	
Interviewee 3	"I came with a goal and if it goes differently, you have to change plans quickly"	"One hour before, new information has been shared. Then you have to improvise on the contents: what is the best thing to do now?"	"Deviating from the thing I had in mind in my reaction" (when explicitly asked)	"Dealing with deviating information to go into the right direction based on that"
Interviewee 4	"When something needs to happen, and you are working towards a solution without getting too many requirements beforehand" (when explicitly asked)	"Going from A to B without a strict framework. That is from a creative point of view"		
Interviewee 5	"If you have to come up with something on the spot without preparation" (when explicitly asked)			
Interviewee 6	"If you are going to discuss a point, you do not know the outcome. Then you are improvising constantly"	"There is something that you do by default, in a certain way, and when improvising you consciously deviate from that standard way to try something"	"If you do something you had not planned to do" (when explicitly asked)	

Figure 21: All the definitions provided during the exploratory interviews (own work, 2024)

6.1.2 The head

The second main goal of the exploratory interviews is to answer **SQ3:** *What is "the head" in project management?* As most of the project managers did not know what the meaning of "the head" was, this question was asked in a different way. The following question was asked: "What explicit and implicit components are always present during design team meetings?".

During the interviews, it became clear this was a difficult question to answer. The answers given to this question varied to a high degree and the implicit components were hard to put into words. Because of the high variety in answers and the high complexity in project management, the head might be present on different levels. The following levels have been discussed: *organization, phases* and *meetings.* Figure 22 illustrates the heads on the different levels.

First of all, the *organizational* level consists of two heads: the guiding principles and the contracts. The guiding principles determine the relationships within the organization of the project broadly (interviewee 2, 2024). For example, a guiding principle might be to make use of a Design-Bid-Build principle, in which the contractor will only be involved after the design phase. The choice for this guiding principle will form the foundation for negotiations and meetings. Moreover, the contracts form the head for all the relationships and collaborations taking place on the organizational level. Interviewees 1 and 5 name the importance of contracts and how they can influence the atmosphere during the design process. Interviewee 5 states the following: "In projects where you organize less, you do more things implicitly" (2024). Moreover, interviewees 1 and 2 mention the importance of managing expectations on the organizational level. They state that expectations are always present but do not have to be talked about out loud (2024).

Secondly, we can look at the level of *phases*. Interviewees 2 and 6 name the different phases (see Morris (2002) in 3.3.1 Definition of project management) as part of the design process which always come back. Interviewee 6 says: "Only at the very end of the phase you must improvise, because that is the moment in which you decide to move to the next phase or not. You work towards the end of a phase" (2024). Depending on which phase the project is currently going through, there are different heads. During the initiative phase, the program of requirements can be considered a head which unfolds itself during the process. When the program of requirements is developed, they are generally known explicitly to the involved parties and form the foundation for discussions (interviewee 2, 2024). During the design phase, the design itself could be seen as a head which unfolds over time. Another head on the level of *phases* is the planning. According to interviewee 1, 3 and 5, the planning is something they come back to often. Interviewee 5 explains that if the presented drawings are of good quality, the planning forms the implicit head. If the drawings are not up to date, the planning will be discussed explicitly and there will be a stricter fixation of agreements (2024).

Thirdly, there is a level of *design team meetings.* During these meetings, often the agenda forms the head. Interviewees 1, 3 and 5 name "geld, risico's, organisatie, tijd, informatie en kwaliteit" (GROTIK, translated as: money, risks, organisation, time, information and quality) as re-occurring themes in the agenda. Interviewee 4 also indicates they prefer to use the same structure in the agenda for every meeting. They say this helps for "familiarity and to find appointments back" (2024).

Level	The head		
Meetings	Agenda		
Phases	Program of requirements	Design (product/ process)	Planning
Organization	Guiding principles	Contracts	

Figure 22: The head on different levels in project management (own work, 2024)

As the head occurs on different levels, the improvisations can also occur on different levels. Figure 23 shows the different types of improvisation based on the head.

It is important to realise that these types of improvisations have been defined based on an analysis of all the improvisations named in the interviews and observed during the meetings. The types are introduced here to provide an overview and understand the categorisation in 6.2 Observations.

Level	The head			Improvisation
Meetings	Agenda			- Deviation agenda
Phases	Program of requirements	Design (product/ process)	Planning	- Small design changes - Unusual design parts - Estimations - Scenarios - Deviation planning
Organization	Guiding principles	Contracts		- Organizational deviation - Reacting to mismatching expectations

Figure 23: The different types of improvisation based on the head (own work, 2024)

6.1.3 Problem statement, roles, elements and style

Because of the exploratory nature of the interviews, a couple of subjects apart from **SQ2** and **SQ3** came to the surface. These were: a confirmation of the problem statement as provided in the 1.0 Introduction, different roles, the importance of experience, intuition and providing space and the influence of the project manager's style.

Problem statement

Almost all interviewees explained how it is impossible to predict everything correctly, as also stated by Sohi et al. (2019). Interviewee 5 said: "You can think about everything beforehand, but nothing goes according to plan entirely. Especially in project management" (2024). They state that often these deviations from plans are the source for improvisations. Interviewees 1 and 6 also emphasize the uniqueness of projects. There are many factors which can influence a project, which makes every project new. This matches the ideas of Morris (2002) (see 3.3.1 Definition of project management). Moreover, the fact that complexity plays an important role in project management, as explained by Weick (1998) and Alhussein et al. (2022), is confirmed by the project managers. Interviewee 2 states: "The more complex a certain project, the more relevant it becomes to search for solutions by making use of improvisation" (2024).

Roles

The interviewees have mentioned a lot of different disciplines which can be part of a design team meeting. Broadly, they name the architect, installation advisors, manufacturer, client and the contractor. Not all disciplines are present in all design team meetings. In general, interviewees 1, 2 and 3 state that architects are more open for improvisations compared to the other disciplines. Interviewee 2 says that architects often have a broader lens to look through, which provides more opportunities and areas to improvise on (2024).

Elements: experience, intuition, space

The importance of having experience in project management has been emphasized by interviewees 1, 2 and 5, as also brought to the fore in the literature by Abuseem et al. (2023). Interviewee 5 states that a lot of improvisations are not based on thin air, but on earlier experiences (2024). They provided an example in which someone asked: "What is this project going to cost?". Based on an earlier, comparable design, they could provide an estimation on the spot. Although interviewee 5 considers this an improvisation, they emphasize that it is different from improvising without having previous experiences. Moreover, interviewees 1 and 5 talked about the role that intuition plays in improvisations. This is also named by Crossan and Sorrenti (2003), Malucelli et al. (2021) and Leybourne (2011). "Improvisation to me is sensing what is and is not possible at certain moments in order to continue", interviewee 1 says (2024). Interviewee 5 explains that the word 'improvisation' is almost never used in project management, and that project managers are more inclined to use words like 'intuition'. Lastly, interviewees 1, 2, 4, 5 and 6 have (implicitly) talked about providing space, which has been mentioned before by Hatch (1999). Interviewee 1 states that there is always room to "move left or right" (2024). When asked explicitly about the definition of improvisation, interviewee 4 also states that something unexpected can happen, after which you have to search for a solution while not having a lot of conditions beforehand. The lack of having a lot of conditions could be seen as leaving space open for improvisations.

Style

Another question which has been asked of all interviewees is: “How would you describe your personal style?”. Interviewee 1 says that they are strongly focused on relationships, and less on structures. When asked about this, they state that this type of style provides more room for improvisations compared to a more structured style. Interviewee 2 explains they are focused on the overview of a project and on seeing things that are going on implicitly. Interviewee 3 focusses on being open in providing information to both the client and the design team. Interviewee 4 says they prefer to have an agenda which has the same structure during all design team meetings. This could be seen as part of the explicit head (see 6.1.2 The head). Interviewee 5 describes their style as being more flexible and emphasizes that they only organise things if they are necessary. Lastly, interviewee 6 states their style is focussed on providing a structure and facilitating everything that is needed for the other disciplines. When asked about the influence of the project manager’s style on improvisation, they state: “I have a style which is focussed on creating a structure. If something goes differently than expected, you must improvise. Others have a more flexible style. Then you are varying to a higher degree in what you are discussing, so more flexible. But I do not know if that is called improvising. Then, you are not deviating from something, because you did not have a plan yet” (2024). It is interesting to see how interviewee 1 considers a more flexible style as being more open to improvisations, while interviewee 6 states that a more flexible style does not necessarily facilitate more improvisations. This depends on which definition of improvisation is chosen. In the style which is focussed on relationships, an improvisation is defined as the merging of composing and executing. An improvisation in the structure focussed style could be defined as a deviation from an existing plan (see 6.1.1 The categories of the definition).

6.2 Observations

In order to bring more depth to the research, six observations of design team meetings took place. The main goal of the observations is to answer the following sub-questions:
SQ3: *What is "the head" in project management?*
SQ4: *Which actions in project management become salient when applying the parallels between improvisation in jazz and organisation and how?*

Every observation has been combined with a pre-brief to get an understanding of the project and the plan for the meeting. A debrief has been used to ask about unexpected occurrences and improvisations. For every observation, the potential improvisations are summarized in a table and categorised in terms of the level, the head and the type as discussed in 6.1.2 The head. Moreover, the potential improvisations are linked to the parallels which were named in 3.2.2 Improvisation in organisations.

6.2.1 Observation #1: Pilot observation

Pre-brief

This project concerns student housing. Usually, the client themselves take on the role of project manager, but due to lack of capacity this role is taken over by an external party. At this moment in time, the project has just started the definitive design phase. The design team meets every two weeks and up to this point, the project is going smoothly. The project manager explained that the different personalities of the design team members fit well together. As an example, they name the personality of the architect, who is "fighting" for their design but at the same time willing to move along with the other disciplines. The project manager expects that more tension might arise when they will work towards the end of the phase. The project is currently facing a delay of about two weeks.

Beforehand, the project manager has prepared an agenda which included two main topics: action points and an update from every discipline. In total, 8 people (including the researcher) were present. Figure 24 shows the situation and the roles of the attendees.

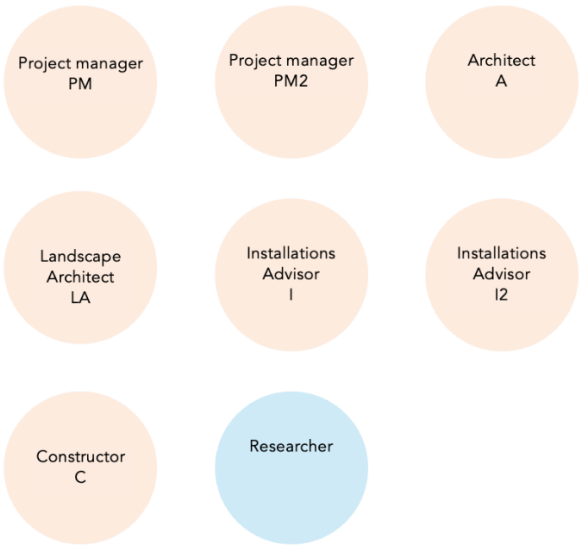

Figure 24: The situation and attendees during observation #1 (own work, 2024)

The design team meeting
The design team meeting took about one hour and was held online. As this was the pilot observation, the researcher did not have ability to record the meeting yet. In 6.2.5 Observation #5, a recorded meeting of this project will be discussed. During this pilot observation, the researcher focussed on getting a first feeling of the course of design team meetings and on recognizing improvisations taking place. The researcher has used written notes and the minutes to remember the discussion points.

The meeting started by the researcher introducing themselves and the thesis project. Also, the landscape architect and installations advisor introduced themselves, as they were new to the project. Then, different action points were discussed. In the light of improvisations, it was interesting to see how most decisions were postponed, which resulted in the avoidance of improvisations. For example, a certain part of the design has windows opening to the inside, which could result in a bottleneck for fire safety. This action point was concluded by I2 deciding to dive into this after the meeting. This is an example how one action point resulted in another.

Next, the design was discussed from the perspective the different disciplines. One improvisation took place when the attendees talked about the maintenance of greenery on the façade. Because of a change in the design, the maintenance of the greenery might be difficult to achieve from inside the building. After discussing this for a while, I2 proposed to do the maintenance of the greenery from another point of the building. The other attendees agreed with this proposal and it is incorporated in the minutes as a 'decision'. I2 did not have this idea before the meeting and thought about this solution because of the problems that were discussed. I2 came up with this solution on the spot, which is why it could be seen as an improvisation.

Debrief
As this was a pilot observation, no debrief has taken place. See 6.2.5 Observation #5 for an extensive analysis of a meeting of the same project.

6.2.2 Observation #2

Pre-brief

This design team meeting was about a project including two parts of a building, of which the casco was already in the definitive phase. The fit out however, was still in the preliminary design phase. This meeting concerned the fit out of the project. Interestingly, a couple of members of the design team were also assigned to other parts of the same building, which will be discussed in 6.2.3 Observation #3. The design team had to deal with a lot of obstacles as the client had not always been clear about their expectations and had requested changes over time. A week before this meeting, the client and the design team agreed upon changes in the program of requirements. However, a couple of days later, someone else on the client's side made clear that no deviation from the program of requirements were allowed. The project manager expected that the architect would need more clarity during the meeting in order to keep moving forward.

The project manager explained that their style focused on following the list with all the actions. They wanted to provide space for all the disciplines and to motivate them instead of imposing actions. They wanted to enter the meeting open-minded, as they could not predict how the other attendees would react. The main goal of the meeting was to provide clarity. This meant that apart from the agenda and list with actions, they had no plan before going into the meeting.

In total, six people (including the researcher) were present in the meeting. Figure 25 shows the situation and all the roles of the attendees. Apart from a small introduction, the researcher only observed the meeting and did not participate.

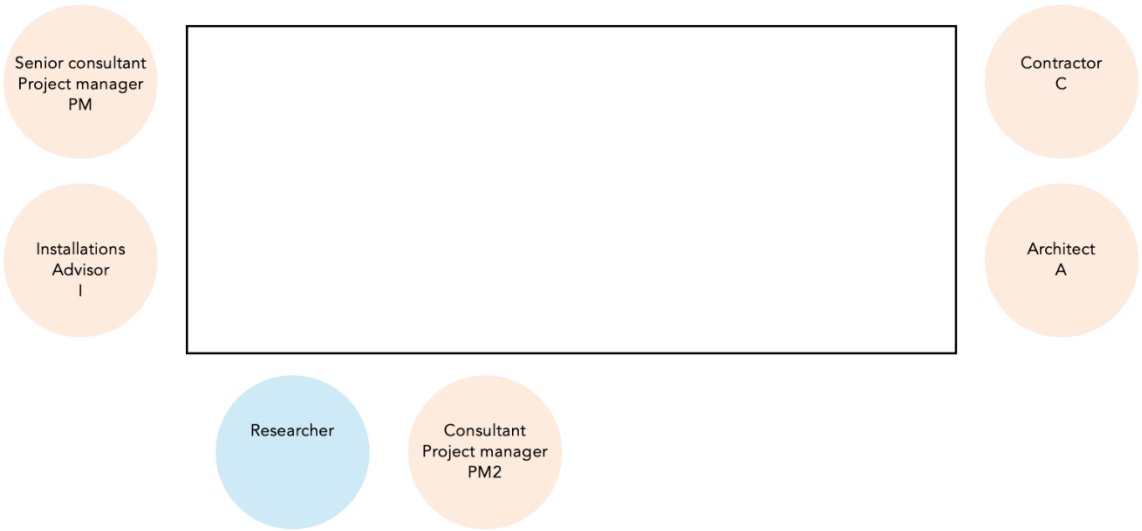

Figure 25: The situation and attendees during observation #2 (own work, 2024)

The design team meeting

The meeting took almost two hours and two main topics were discussed: the list with actions and the design. It was held at the office of the architect. The first topic took about 1,5 hours and also caused some tension between the attendees.

Improvisation 1

The first improvisation concerned the design itself. During the discussion about the list with actions, PM asked about the positions of doors in a certain part of the design. A had indicated earlier that they would like to change the positions and types of doors. PM wanted to know more about this and asked what the consequences would be. A provided a couple of options by naming different positions and types of doors. Eventually, the decision was not made on the spot, but left open for another party to decide.

Later, the doors were discussed again. A told that they had already tried to contact the other party but did not get any answer. First, PM proposed to go after the other party, but A indicated that it is necessary to get an answer in a short time frame. Therefore, A decided to call the other party after the meeting.

Improvisation 2

The strongest tension between the attendees occurred when discussing the product list. PM had asked the other disciplines a couple of weeks ago to provide a product list, in order to make the expectations of all the parties explicit (this was also mentioned in
6.1.2 The head). At that time, the disciplines agreed upon doing this. However, during the meeting, the list had not been made yet and not all disciplines saw the added value of providing such a list. PM and C kept emphasizing the importance, while I kept repeating that it would only be a short list without creating a lot of added value. In the end, they agreed upon creating the product list.

Improvisation 3

Another improvisation took place when one of the actions on the list was not clear. It was a very technical point which had not been written down clearly enough. The attendees had to improvise what the meaning behind the action was. One by one, they proposed different meanings. In the end, they agreed upon a certain meaning behind the action and decided to mark it as completed.

Improvisation 4

The last improvisation occurred when A asked about the layout of certain toilets. A asked I whether some parts could be left out of the design. Every question could be seen as an improvisation on a small scale, as the other attendee must improvise their answer to a certain extent. At first, I answered that the parts could be left out. This was done on the spot and could be seen as an improvisation. However, A asked if I could check it. Then, I looked up different versions of plans and concluded again that the parts could be left out.

Debrief

After the design team meeting, the project manager was asked about their experience of the meeting. They thought the meeting went "pretty okay". The meeting had largely gone according to the plan as discussed in the pre-brief. However, they also named a couple of improvisations which took place. *Improvisation 2* was named by the project manager. They considered this an improvisation as they did not expect this reaction from the other disciplines. They also indicated that they did still not trust that all parties would make this list, which is why they will call this week again to prevent surprises at the end of the week. *Improvisation 3* was also brought to the fore by the project manager. According to them, having an action point which is not clear happens from time to time. They had to improvise the meaning behind the action point on the spot. Furthermore, the project manager named another improvisation (*Improvisation 5*), which had not been noticed by the researcher during the design team meeting. The project manager had sent a certain document before the meeting, but during the meeting certain parties were not aware of this document. The project manager therefore had to improvise, as his expectations of the other parties deviated from reality. Instead of discussing the document, the project manager had to explain the contents and purpose of it. In Figure 26, an overview of all the improvisations can be found.

	Level	**The head**	**Type**	**Parallel**
Improvisation 1 (Researcher)	Organization	Contracts	Organizational deviation	Soloing
Improvisation 2 (Researcher & PM)	Organization	Contracts	Reacting to mismatching expectations	*Inapplicable*
Improvisation 3 (Researcher & PM)	Organization	Contracts	Organizational deviation	Embracing errors
Improvisation 4 (Researcher)	Phases	Design	Estimation	Soloing by installations advisor, comping by architect
Improvisation 5 (PM)	Organization	Contracts	Reacting to mismatching expectations	*Inapplicable*

Figure 26: Overview of improvisations in observation #2 (own work, 2024)

In the first improvisation, the architect takes the initiative to provide options for the doors and to call another party after the meeting. Although the project manager proposes to go after the other party, the architect decides this would take too much time and therefore takes over the lead from the project manager. When looking at the parallels named by Hatch (1999) (see 3.2.2 Improvisation in organisations), this could be compared to soloing.

The third improvisation is an example of embracing errors, as explained by Barrett (1998) (see 3.2.2 Improvisation in organisations). The project manager 2 had written down a technical action point but during the meeting the meaning behind this action point was not clear anymore. This could be seen as a small error. Instead of blaming, the attendees try to figure out what the meaning could be. The error is solved on the spot as also occurs in jazz.

In the fourth improvisation, the installation advisor takes the lead in deciding whether certain parts of the design can be left out. The installation advisor makes this decision on the spot, which could be seen as an improvisation. However, the architect does not accept the decision right away, and asks the installation advisor to check the decision based on drawings. The installation advisor does this, which results in the same decision. The architect could be compared to a comping musician (see Hatch (1999)), who is supporting the installation advisor's lead. Although the architect asks the installation advisor to check their decision, the architect also allows the installation advisor to take the lead and make the decision.

6.2.3 Observation #3

Pre-brief

This design team meeting was part of the same project as 6.2.2 Observation #2, but focussed on two different parts. Another project manager had been assigned to this design team meeting and two other manufacturers were present. In total, three of the attendees of the second observation were also present during this design team meeting. Overall, the process of these parts of the project went more smoothly compared to the parts which were discussed during the second observation. A week before this meeting, the permit application had been sent out, which seemed to create a lighter atmosphere.

The project manager did not have a very strict agenda and wanted to put the course of the meeting in the hands of the other disciplines. The main goal of the meeting was to discuss action points which needed correspondence between the different disciplines.

In total, 8 people (including the researcher) were present in the meeting. In Figure 27, an overview of the situation and all the disciplines is shown, in which all the attendees marked in green were the same as during the second observation.

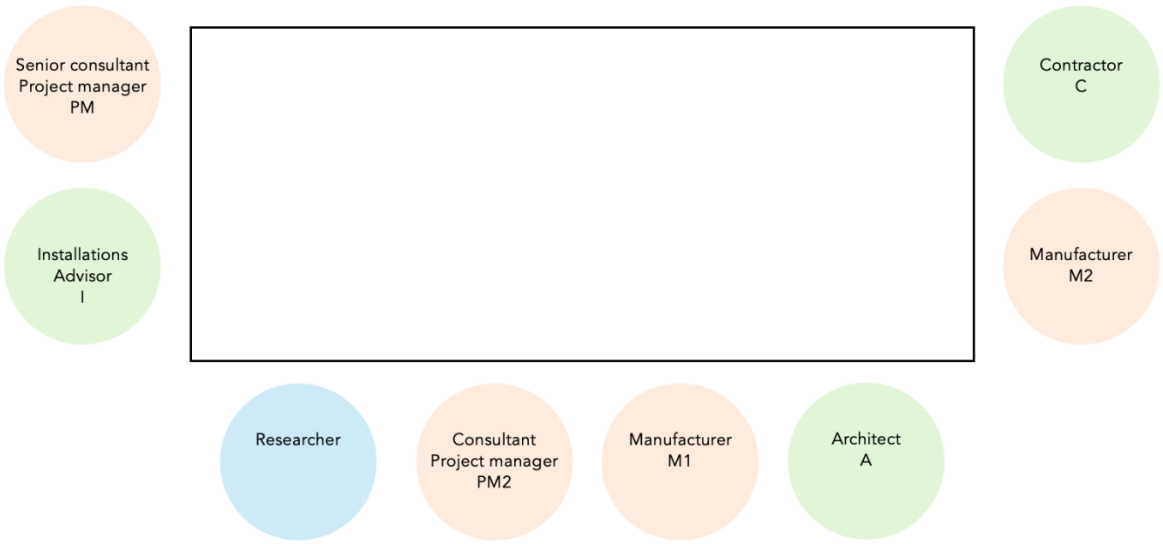

Figure 27: The situation and attendees during observation #3 (own work, 2024)

The design team meeting
The meeting took about an hour, in which three topics were discussed: a list with actions, a list with reactions from the contractor and a list with open issues. It was held at the same place as the second observation.

Improvisation 1
The first improvisation took place when M2 asked about the fire safety of a certain part of the roof. After a short discussion, I decided it would be easier to draw the situation and explain which options were possible. As a reaction to this, M2 also drew a couple of lines in a different colour to provide another option. According to I, this option of M2 was not possible in the light of fire safety issues. M1, A and C also asked a couple of questions about the technicalities. In the end, the decision was left open for another time.

Improvisation 2
In between discussing the action points, PM decided it would be good to determine what they would discuss during another meeting with another party. The establishing of these discussion points was not part of the agenda and the points were discussed on the spot.

Improvisation 3
At a certain point during the meeting, A wanted to discuss an issue they encountered when designing. They showed how three parts of the design must connect to each other and how this is difficult to achieve. M1, A, M2 and C discussed different options for this connection. In the end, A decided to look at it in more detail after the meeting.

Debrief
When asked about the course of the design team meeting, the project manager stated that not a lot of improvisations had taken place. It was a relative short meeting in which the main goal was to achieve correspondence between the disciplines. No significant deviations had been made before the meeting. The project manager also explained they were focussed more on diverging and converging rather than improvising. Figure 28 shows the improvisations observed by the researcher.

	Level	The head	Type	Parallel
Improvisation 1 (Researcher)	Phases	Design	Scenarios	Trading fours
Improvisation 2 (Researcher)	Meetings	Agenda	Deviation agenda	Soloing
Improvisation 3 (Researcher)	Phases	Design	Scenarios	Trading fours

Figure 28: Overview of improvisations in observation #3 (own work, 2024)

The first improvisation is initiated by the installations advisor. They take the lead in drawing a certain part concerning the fire safety. Then, manufacturer 2 takes over the lead by also drawing a proposition. The installations advisor allows manufacturer 1, the architect and the contractor to do some propositions as well. The installations advisor provides space to the others to improvise, or in other words: they switch from soloing to comping. This can be compared to the concept of trading fours as explained by Hatch (1999) (see 3.2.2 Improvisation in organisations).

In the second improvisation, the project manager takes the lead in making a deviation to the agenda (soloing). This is accepted by the other attendees without questions.

The third improvisation consists of the architect, manufacturers and contractor looking into a specific connection of the design. They come up with different solutions on the spot. At one point, the architect is in the lead, while at another point, they provide space for the manufacturers for example. Like the first improvisation, this could be compared to trading fours.

6.2.4 Observation #4

Pre-brief

This project consisted of an interior and installations renovation of an office building. Currently, the project members are working on the technical drawing plan in the design phase. The design team has meetings every two weeks to align their ideas. Interestingly, the client of this project is not the same as the end-user. The project manager has explained that this has made the design process harder sometimes. Although the project did not have to deal with major issues yet, it is a bit behind schedule, which might have consequences for the schedule of the contractor and the ordering of materials.

The project concerned a building abroad. Therefore, not only an architect and interior designer but also two local advisors were involved in the project. This meeting was the first encounter between the architect, interior designer and local advisors. The main goal of the meeting was to answer questions from both sides. This is why the project manager asked the attendees to prepare questions beforehand. As there were no major issues that needed to be solved, the project manager focussed on getting the answers to the questions from both sides.

In total, seven people (including the researcher) were present in the meeting. Figure 29 illustrates the situation and the roles of the attendees. Apart from a small introduction, the researcher only observed the meeting and did not participate.

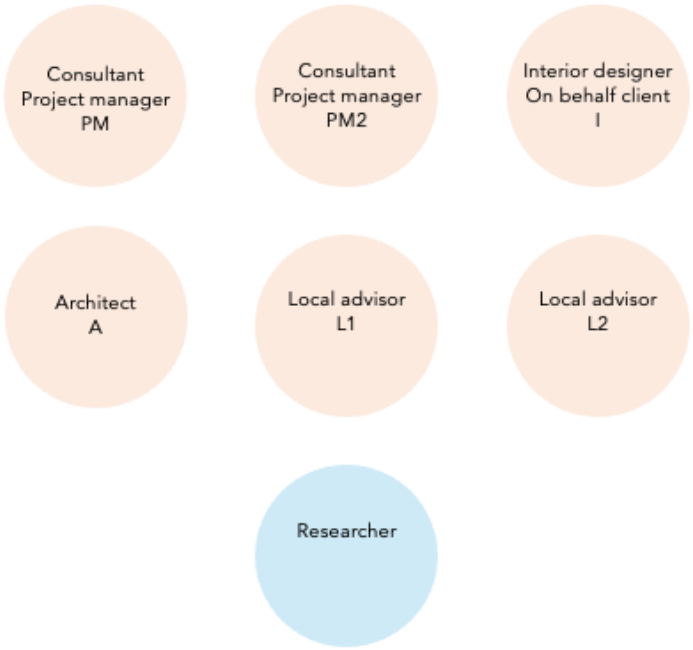

Figure 29: The situation and attendees during observation #4 (own work, 2024)

The design team meeting
The meeting took about one hour and apart from answering each other's questions, there was no strict agenda. It was held online.

Improvisation 1
As part of the meeting, I presents the interior design. In the presentation, I shows a certain type of toilets. L2 explains that this type of toilets is possible, but not usual in their region. First, A proposes to create a false wall which would help to solve some of the issues. Then, L1 also indicates that it would be hard to do the maintenance locally with this type of toilets. Earlier during the meeting, PM had stated that it would be important to have products with a high quality and to maintain them locally. I concludes this point by deciding to change the type of toilets. This could be seen as an improvisation because I did not know how L1 and L2 would react to their proposal beforehand. I decided on the spot to change the design, based on the knowledge of L1 and L2.

Improvisation 2
After the first improvisation, the attendees talk a bit longer about the toilets. L2 asks if they have to take a certain amount of flushing water into account regarding sustainability. PM thinks this should not be a problem, but they will check this with the sustainability advisor. Earlier during the meeting, L2 has told they will visit the building in its current status. This is why L1 proposes to L2 to check the current situation of the toilets. L2 agrees to do this. Before this meeting, L2 might have had ideas about what to look for in the building, but checking the status of the toilets was not part of this. This idea was proposed by L1 on the spot and could therefore also be seen as an improvisation.

Improvisation 3
As the PM did not have an extensive agenda, the course of the meeting was put in the hands of the other attendees. Towards the end of the meeting, PM asks the others if they want to discuss more. "You are the bosses, you tell me what to do", PM says. This shows the flexibility of the PM's style, in which the end of the meeting is improvised by asking for the other's needs rather than finishing set action points.

Improvisation 4
L1 explains there is a lead time for the materials. They indicate they would prefer to have time between the selection of the contractor and the start of the refurbishment to import the materials. PM reacts to this by proposing to start importing the materials now already, because the schedule is delayed. This is a deviation from the original planning which is why it could be described as an improvisation.

Debrief

The project manager has indicated that the meeting "went okay in terms of organisation". However, they also indicate that multiple unexpected things happened during the meeting, which were either improvisations or led to improvisations. They explain that although the project itself is relatively small, it is sometimes hard to coordinate as the consortium consists of about twelve different persons. The project manager feels as if they are the only one with an overview, while some of the other disciplines do not show effort to know more about the progress. A week ago, one of the disciplines asked: "When will the execution phase start?". The project manager answered with "June", upon which this discipline asked: "Of this year?". This shows the ignorance which exists between the involved parties. The project manager thinks this ignorance is also the consequence of having many parties involved who are all not working on the project full-time.

What makes the project special, is that there are also local advisors involved. These local advisors function as architects who convert the design into a design which can be built locally. Sometimes, the interests of the local advisors can create tension with the interest of the architect. Moreover, the cultural differences and the higher security level of the project sometimes create tension between the different team members.

When asked about improvisations which took place, the project manager confirms *Improvisation 1.* However, they state that the improvisation did not so much take place in terms of the change of the design, but rather in the fact that the interior architect showed a certain type of toilet in the first place. The choice for this type was improvised according to the project manager. The type had not been tailored to the local requirements.

Furthermore, the project manager confirms *Improvisation 3.* They explain they almost never prepare an agenda during this phase of the project. At the start of the project, they prepared agendas with discussion points. During the project, they have gotten so involved in the project that they know what is happening, which is why they do not need an agenda. They also explain that the minutes of the previous meeting provide action points for the next meeting. The project manager considers this an improvisation and states it is more efficient for this project. They do think that a more complex project of a larger size might require a stricter agenda.

Apart from the improvisations which were already observed by the researcher, the project manager has also named two other improvisations.

Improvisation 5

Firstly, the project manager explains that the architect does not carry the responsibility of elaborating the drawings at this point anymore. The main task of the architect at this moment is to supervise and to check the drawings of the local advisors. However, during the meeting, the architect proposed to work on the drawing themselves. According to the project manager, this was an improvisation. After the meeting, the project manager has called with the architect to ask why they did this and to tell the architect that they should not do this. As possible reason, the project manager says that the architect now almost has no tasks left. The architect might find it hard to let go of the project.

Improvisation 6
Moreover, the interior architect had sent the presentation with the interior design to the project manager just before the meeting. Therefore, the fact that the interior architect was going to present did not come as a surprise to the project manager. However, the interior architect also said during the presentation that they "would still elaborate on things". The project manager did not expect this, as they expected the interior designer to deliver specifications instead of leaving things open to elaborate on. This is why the project manager had to improvise in their reaction to the presentation of the interior architect. In Figure 30, an overview of all the improvisation which took place during the fourth observation are summarized.

	Level	**The head**	**Type**	**Parallel**
Improvisation 1 (Researcher & PM)	Phases	Design	Small deviation design	Trading fours
Improvisation 2 (Researcher)	Organization	Contracts	Organizational deviation	*Inapplicable*
Improvisation 3 (Researcher & PM)	Meetings	Agenda	Deviation agenda	Comping
Improvisation 4 (Researcher)	Phases	Planning	Deviation planning	Soloing
Improvisation 5 (PM)	Organization	Contracts	Reacting to mismatching expectations	Soloing
Improvisation 6 (PM)	Organization	Contracts	Reacting to mismatching expectations	*Inapplicable*

Figure 30: Overview of improvisations in observation #4 (own work, 2024)

In the first improvisation, the interior designer started by showing a certain type of toilet. As the interior designer takes the lead in showing this, it could be seen as soloing. The local advisors react to this and take over the lead. The role of the interior designer changes from soloing to comping, as they provide space to the local advisors to share their knowledge and expertise. After this, the interior designer takes over the lead again by making the decision to change the design. This going back and forth between soloing and comping could be seen as trading fours.

The third improvisation, in which the project manager continuously improvises the agenda, could be seen as an act of comping. The project manager puts emphasis on providing space for all the disciplines to share their concerns and questions, instead of leading the meeting with a strict agenda.

The fourth improvisation could be seen as an act of soloing by the project manager, as they take the initiative to deviate from the planning.

The fifth improvisation has been performed by the architect. They took the initiative to elaborate on the drawings themselves. This can be seen as soloing. Interestingly, after the meeting, the project manager has made clear that they want to recall this improvisation. This could be seen as an action in which the project manager emphatically does not comp the soloing of the architect.

6.2.5 Observation #5

Pre-brief

This observation concerned the same project as 6.2.1 Observation #1: Pilot observation, but this time, a videorecording has been made. In between the previous observation and this observation, one other design team meeting took place. The time span in between was about a month. Therefore, the researcher asked if anything unexpected had happened during the last month. The project manager explained there were two things which could impact the project. First of all, the municipality had certain requirements which the project should comply with. Secondly, the user had just discovered that in current design, the whole ground floor was accessible to everyone. The user had indicated a couple of days before this meeting that they still have to make a decision whether this is acceptable for them. Both the municipality and the user could influence the design even though the definitive design drawings had to be finished in a couple of weeks.

When asked about their style, the project manager said they were focused on involving all the disciplines. Rather than "chasing" after everyone to finish their tasks, the project manager wanted the others to take the initiative by themselves. They say they want to rely on trust. In between the two-weekly design team meetings, separate meetings with for example the architect have been arranged to discuss certain design-related aspects. Up until this point, the project manager feels like their approach works well.

A point for attention was the changing within the party of the installations advisor. The person representing this party had stopped with the project and now had been replaced by someone else. Moreover, the cost expert had let the project manager know that they would like to have the definitive drawings a week earlier than expected, due to a busy schedule. The project manager thinks this could cause some tension towards the end of the definitive design phase.

Next, the project manager was asked about their plan for the meeting. The project manager emphasized that the goal of the meeting was to monitor the progress, and not to discuss solutions. Therefore, the design team meeting focussed on the process, while the in-between meetings between specific disciplines focussed on the product.

The same attendees as in 6.2.1 Observation #1: Pilot observation were present, except for the fact that two disciplines were missing. The landscape architect had asked permission to work on other things during the meeting, and the second installations advisor was having a couple of days off. Figure 31 shows the situation and attendees during this observation. The constructor had forgotten that the meeting would take place physically, which is why they joined online.

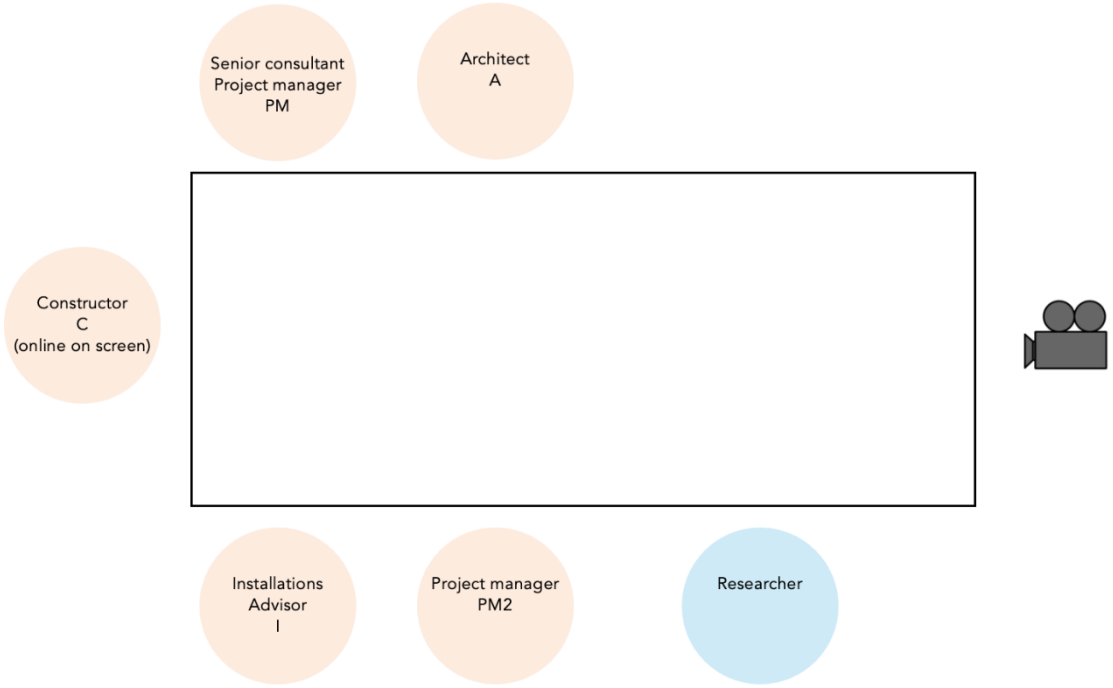

Figure 31: The situation and attendees during observation #5 (own work, 2024)

The design team meeting

The meeting took about 1,5 hours. There was a clear structure within the agenda, containing the following points:

- Opening
- Approval minutes of the previous meeting
- Action points
- Organisation
- Design
    - Architecture
    - Construction
    - Installations
    - Building physics
    - Greenery
- Government and utilities
- Planning
- Finance
- Environment
- Questions

It was held at the office of the project manager.

Improvisation 1 (Organisation)

PM: "Another point was… We discussed the ramp. We have worked on our plan in such a way that we keep one level. On, what exactly, level 150+ NAP?"
[looks to A]

A: "Yes"

PM: "We will still do that. We have discussed with the user that especially at the entrance, there is a ramp of 4,7%. And at the bicycle parking there is another ramp. We try to keep it very short on the outside. They were enthusiastic about it, so that is fine."

A: "Yes. That is something we have to discuss with the municipality. The ramp on the outside."

PM: "Okay, would it be a good idea to already put that on an e-mail? Could you write an e-mail about that?"

A: [nods]

The proposal of the project manager to email the municipality could be seen as an improvisation because it was brought up on the spot. It is a reaction to the architect who emphasized that not only the user, but also the municipality should approve the ramp.

Improvisation 2 (Organisation)

PM: "The acoustics in the main hall is also a point of attention. But anyway, that is something for when you are going to elaborate... Something with that… That there are enough sound-absorbing facilities in there"
[looks to A]

A: "We will have to discuss that with the installations advisor, I think. Let's see what is necessary for that, but I think we will figure it out. Maybe it means that there will be some spray plants against the ceiling, or a lowered ceiling with something in it."

PM: "Okay"

The architect names a couple of solutions which could help to reduce the noise disturbance in the main hall. These solutions are thought of based on their experience and expertise and were not written down beforehand. However, the definitive choice in noise disturbance measurements is postponed.

Improvisation 3 (Design: Architecture)

A: "Still a point of attention for us is… Next week we have a meeting with ecology. Maybe we will discuss it later. With the urban ecologist of the city. To see what we can, or should, integrate in our façade for that."

PM: "Yes, you can discuss it now."

A: "Yes, in fact I have already explained it." [laughs] "Next week Wednesday, we have a meeting with a couple of others with the urban ecologist. We would like to hear which kind of birds are and where. We would like to integrate that safely in the design."

Although the topic of ecology was already part of the agenda, it was originally meant to be discussed at a later point. However, the project manager decides that the architect can continue their story and already discuss this topic.

Improvisation 4 (Design: Architecture)

PM: "Then we can maybe already anticipate… In fact it was somewhere else on the agenda but now we are discussing it anyway: the façade maintenance installation. That is somewhat of a discussion point with the municipality. We have had a good conversation where we concluded with: we will put everything in an overview including maybe some additional options. But two days after the meeting we got an e-mail with: you cannot put anything in the garden. Then I thought: yes, that is weird, because right now we are investigating how we could do that in a good way. Otherwise it will be heavier from a constructive perspective, and it will be harder to comply to the NPG and BENG, and it will cost more."

A: "Yes and also from an esthetic point of view. If the greenery is left out, I think that will be very complicated. The lot passport required to create a texture. Now we use the greenery to create a depth effect in the façade. If that is not possible, we really must do something about it. Then we also have to deal with welfare committee."

PM: "Maybe we, or you, could already think about a solution in case it is not possible, what we could to do compensate? Maybe you would have an idea about that?"

A: "Yes. Not yet."

PM2: "Creating fake plants, of plastic" [laughs]

A: "I think you would have to do something to create a certain depth effect in the façade in any case. Maybe attaching extra shelfs onto the bamboo or something like that to create a texture. That is more complicated and costly. I am just thinking out loud. But I have to do something with it."

The architect finds it very important that the façade has a certain depth effect. In the current design, this is achieved by greenery on the façade. However, the façade maintenance installation which is needed for the greenery comes with a couple of complications. The project manager sketches a scenario in which the greenery on the façade is not approved by all the parties because of this maintenance installation. The project manager wants the architect to be prepared for this situation and proposes to already think about alternatives. The architect names a couple of solutions on the spot but also indicates they will need time to think about this. The solutions offered by the architect could be seen as an improvisation, while the proposition of the project manager to be prepared for the scenario could be seen as an avoidance of improvisation.

Improvisation 5 (Design: Construction)

C: "How much space is needed for the air shafts in the core top right at the elevator?"

I: "Yes. I think I have already passed along those dimensions. Am I saying that right? Or the collapse channels, those I have passed along. From the top of my head, it is around 160 diameter."

C: "Yes, the tube?"

I: "Yes, exactly."

C: "That is fine. That should suffice."

PM: "And does that work? Because if it would be too big it would not fit."

C: "Yes, that should work."

PM: "And could you check it?" [looks to I]. "Because you said: 'I thought around 160'"

I: "Yes, I will check it indeed."

PM: "Could you check it tomorrow and confirm it via email?"

I: "Yes"
PM: "Then we are certain that it is right."

This could be seen as an improvisation by the installations advisor who does not know the exact numbers of a certain diameter. Instead of checking the diameter, they improvise an estimation on the spot. However, the project manager wants to make sure this is the right number so they ask if the installations advisor can check it later.

Improvisation 6 (Design: Construction)

PM: "Moreover, for the construction, do you have questions or things to tell?" [looks to C]
C: "Yes that window cleaning installation. Is there any idea what that thing weighs?"
PM: "No, but that is only for the investigation. Not for our elaboration now."
C: "It is mainly about how far that thing would hang towards the outside. I understood this was already decided, that it would be this option"
PM: "No no. Certainly not. Maybe I take a step back to explain it. We are working on the options. The municipality is very keen that we do something on the roof because they don't want anything in the garden. We find that strange because it is quite limited when we place something in the garden. Doing anything on the roof is always excluded by the user unless there are special circumstances. So I wouldn't include it as definitive in the plan yet."

In this improvisation, the project manager expected the constructor to know that the window cleaning installation was only integrated as an option. However, the constructor thought the installation was already definitively chosen. Then, the project manager has to improvise in their reaction as they have to explain the situation instead of discussing the option.

Improvisation 7 (Design: Installations)

PM: "And the channels are integrated in the construction, in the floors?"
I: "Yes. We have calculated that the ventilator is pretty small. So the channels are bigger. With a special detail…"
PM: "Okay. That is also known to you?" [looks to C]
C: "No, I did not know that. The channels?"
I: "Yes the channels for fresh air in the wide slab floors"
PM: "How big is that channel?"
I: "2.50 and 80. There is a special detail at the façade"
C: "Local small thing"
I: "Yes, at the side of the window frame."
C: "Could you send the detail of that?"
I: "Yes, you have a detail of that, I think?" [looks to A]
A: "Yes, I will send it. Sketch detail."

This was also an improvisation as the constructor was not aware of the fact that certain ducts would go through the wide slab floor. The project manager and installations advisor had to improvise in their reaction to this.

Debrief

In general, the project manager thought that the design team meeting went well. They focused on the process, and not on the product, as planned. They indicated not a lot of improvisations took place. The improvisations which did occur were on a small scale. Although not a lot was unexpected, it was unexpected for the project manager that a couple of action points were not finished yet. However, the project manager does not think this will have a substantial effect on the progress of the project. *Improvisation 6* and *Improvisation 7* were also named by the project manager. They regard their reaction to the unexpected occurrences as an improvisation. *Improvisation 2 and 4* are not necessarily seen as an improvisation by the project manager, but more as part of the design process. Moreover, the project manager thinks *Improvisation 3* could be described as an interpretation rather than an improvisation. Another unexpected occurrence was the fact that one party was absent. They had asked permission the evening before the meeting, but it was still unexpected because of the late notice. In Figure 32, an overview of all the improvisation can be found.

	Level	**The head**	**Type**	**Parallel**
Improvisation 1 (Researcher)	Organization	Contracts	Organizational deviation	*Inapplicable*
Improvisation 2 (Researcher)	Phases	Design	Scenarios	Soloing
Improvisation 3 (Researcher)	Meetings	Agenda	Deviation agenda	Comping
Improvisation 4 (Researcher)	Phases	Design	Scenarios	Soloing
Improvisation 5 (Researcher)	Phases	Design	Estimation	Soloing by installations advisor, comping by constructor
Improvisation 6 (Researcher & PM)	Organization	Contracts	Reacting to mismatching expectations	*Inapplicable*
Improvisation 7 (Researcher & PM)	Organization	Contracts	Reacting to mismatching expectations	*Inapplicable*

Figure 32: Overview of improvisations in observation #5 (own work, 2024)

In the second and fourth improvisation, the architect takes the lead in improvising scenarios. These could be seen as actions of soloing. In the third improvisation, the project manager decides to shift certain points of the agenda. This could be seen as supporting the other attendees: comping. Lastly, the installations advisor improvises during the fifth improvisation in providing the diameter of a certain part of the design. At first, this is supported by the constructor, who is then comping the improvisation of the installations advisor. However, the project manager wants the installations advisor to check the dimensions at a later moment. This could be regarded an act of not comping.

6.2.6 Observation #6

Pre-brief

This project regarded a laboratory for research. The project is now in the preliminary design phase, which they plan to finish in about three or four weeks. Parts of the laboratory have specific requirements due to safety, which makes the design process a bit more challenging. The sketch design had already been finished in 2021 but due to circumstances the project had been put on hold for a while.

Up until this point, the project manager does not think there have been many particularities. However, they do point out a couple of aspects of the design which might become challenging. The first one is the choice of installations for a thermal energy storage system. This choice has not been made yet and might result in tensions between the different parties. Moreover, the architect had created a lay-out a couple of weeks ago with which the client was satisfied. Later, the constructor had done a proposition for the columns over this lay-out, which resulted in two columns in the middle of the largest room. The client made it clear that this they would not accept this. Therefore, the lay-out has been changed by the architect and the construction has been set up without columns in the middle of the room. Lastly, the architect and constructor have proposed to use wood as material for parts of the design. However, the client shows a lot of resistance against the use of natural materials. This might result in tensions in the future.

The project manager indicates that they will not play a prominent role during the meeting, as the architect is the one who leads the meeting. The role of the project manager is to monitor the costs. They say their style is to “force” people to make choices. This can sometimes be confrontational, but they emphasize that they want to maintain good relationships.

For this specific meeting, the project manager expects that the focus will be on discussing the progress and coordinating the action points. They expect that the focus will not lie on making decisions, because most of those involved on the client’s side are not present. They consider this meeting as a meeting between the architect and advisors themselves. They explain that sometimes the design team meetings proceed very smoothly, while other times the whole meeting will be about one specific problem. However, because of the high frequency of design team meetings, they are flexible in the shifting of topics and problems. Because of the different atmospheres during various meetings, they cannot predict how this meeting will go. In Figure 33, the situation and attendees during the sixth observation are shown.

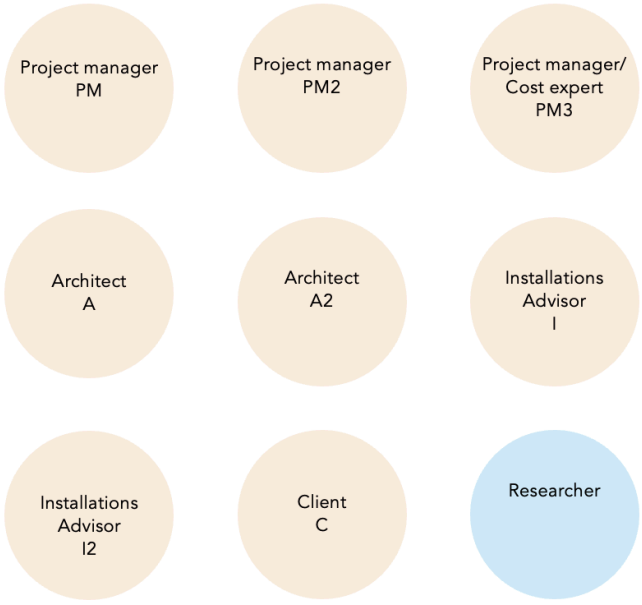

Figure 33: The situation and attendees during observation #6 (own work, 2024)

The design team meeting

The meeting took 1,5 hours and was held online. There were five points on the agenda:

1. Financial check
2. Plans
3. Installations
4. Fire safety
5. 3D model

Improvisation 1 (Financial check)

A2: "And when.. Because next week is in fact the last week in which we can refine the design with the user. After that, there comes a period in which we elaborate on it. Could you already say something about the budget next week? So next week Thursday? Because otherwise we have to elaborate on something now. And we will do that based on the assumptions we think are realistic financially speaking. But if something has to be shifted, then it is good to know next week."

I: "That is way too short"

C: "I want to propose that everyone stays within their budget. And from an installations point of view, I can follow the advisor. It will be too early for that now."

A2: "Okay"

The architect expected that the installations advisor would already be able to provide an estimation of the costs in one week. However, the installations advisor indicates "that is way too short". Then, the architect has to improvise in their reaction to the mismatching expectations. In this case, they adjust their expectation to match with the installations advisor's expectation.

Improvisation 2 (Financial check)

I: "In the overall budget of installations are also the cooling-and climate cells included. From an installations point of view, you could on certain aspects… I can say temperature class. Now, that is class 2, that is pretty strict, especially with a transparent roof. Maybe there are opportunities there."

In this improvisation, the installations advisor draws some scenarios with which costs can be saved. This is done based on their experience and knowledge.

Improvisation 3 (Plans)

A: [shows plans]
C: "Do you also take into account the extraction for the kitchen? The building on the opposite side has a diameter of 500 I think, the tube. That would be at least the same hear. Then there will also be an opening from the kitchen, through the offices I think? Or not?"
A: "Can go through the façade" [draws on plan]
PM: [laughs]
C: "Yes, you do not want that through the front façade. So it should end on the roof somewhere. They always wish for a beautiful cove standing up straight. Because the extraction block is on the roof most of the times."
PM: "Yes, it goes through the lab, so I think it will be fine."
A: "Yes it is projected underneath the lab so it will be fine. If we want something going up we can also provide the fire separation with something. A shaft for example."

Here, the client reacts to the plans by asking if the architect took the extraction for the kitchen into account. On the spot, the architect goes through the plans and concludes it will be possible to create a shaft going up.

Improvisation 4 (Plans)

I: "I cannot estimate precisely how much sand is blowing through the air during the summer. If we really have to work with a ventilation grille."
C: "You can assume it will be very dusty."
I: "Yes, okay. I was thinking the same. We will just put it in without natural ventilation and solve the heat inside."
C: "Yes they go across the land with food and that dust blows enormously. And the wind always comes from southwest, so always against the building. You cannot get away from it."
I: "Okay."

First, the installations advisor indicates that they cannot estimate how much sand will blow through the air. When the client makes clear that it will be very dusty, the installations advisor decides to not make use of natural ventilation. The installations advisor makes this decision on the spot based on the knowledge of the client.

Improvisation 5 (Installations)

PM: "I was not there last week, but those air handling units you have drawn on the roof, they are about 3 or 3,5 metres high. Are it such high units?"
I: "Yes, two on top of each other."
PM: "And because you have such a length, could you not put them next to each other? That cutout on the roof is not cheap of course."
I: "And what is your goal? Because it will not create a smaller cutout."
PM: "Well, is it not possible to put them underneath the roof?"
A2: "But you ask in fact if the air handling units do not fit in the technical area?"
PM: "No, at the second floor. But now you have drawn a cutout in the roof where the air handling units rise 1,5 metres above the roof slope. So then it are units standing outside. If you just make them 1,5 metres high and put them next to each other, they could stand on the second floor I think, underneath the roof."

Although the architect, who is leading the meeting, does not bring up the air handling units, the project manager feels the need to discuss them. The project manager does a couple of propositions with which they aim to lower the costs. They improvise in bringing this up, and the other attendees have to improvise in their reaction to this.

Debrief

After the meeting, the project manager was asked how they felt about the meeting. They indicated it was a very "usual" design team meeting in which nothing unexpected occurred. However, after the meeting, there had been some issues concerning the budget. A cost expert had made a cost estimate in which it became clear that the project would become too expensive. Due to different versions of estimates and some optimistic estimations, the current design exceeds the budget of the client. The client reacted aggressively when hearing about this. They blame the other disciplines of consciously exceeding the budget. The project manager indicates that their reaction to client could be described as an improvisation because the client's reaction was unexpected.

The project manager explains that to them, the design team meetings are a setting for action and reaction. They describe this as their "safe zone", in which the actions and reactions do not feel like improvisations. Seen from this perspective, all the aforementioned improvisations are part of the "safe zone" (see Figure 34). The project manager describes an improvisation as "being confronted with something unexpected and having to react to that on the spot" (2024). Therefore, they only consider an action an improvisation when it takes place outside of the "safe zone". As examples they name a client who reacts unexpectedly or wants to change the requirements of the design.

	Level	The head	Type	Parallel
Improvisation 1 (Researcher)	Organization	Contracts	Reacting to mismatching expectations	*Inapplicable*
Improvisation 2 (Researcher)	Phases	Design	Scenarios	Soloing
Improvisation 3 (Researcher)	Phases	Design	Estimation	Soloing
Improvisation 4 (Researcher)	Phases	Design	Small deviation design	Comping
Improvisation 5 (Researcher)	Phases	Design	Scenarios	Provocative competence

Figure 34: Overview of improvisations in observation #6 (own work, 2024)

In the second improvisation, the installations advisor takes the initiative to discuss scenarios for saving costs. As they take this initiative on their own, it could be seen as soloing. In the third improvisation, the architect goes through their drawings and concludes on the spot that a shaft for ventilation can be included. They make this decision on their own which is why it is related to the parallel of soloing. In the fourth improvisation, the installations advisor trusts the experience of the client and comps based on that. In the fifth improvisation, the project manager steps outside of their role by challenging the position of the air handling units. This could be seen as an act of provocative competence.

6.3 Synthesis

To conclude, all the examples of improvisations named during the interviews have been summarized in one table (see Appendix G: Analysis of improvisations). Moreover, all the potential improvisations observed during the design team meetings have been added to this table. Each improvisation has been categorised in terms of the definition, the level, the head, the type and if possible, a parallel has been applied. As explained in 5.0 Methodology, the researcher intentionally captured too many actions. Although not all actions will be called improvisations eventually, they help to define the threshold for an improvisation. The goal is to widen the view compared to the existing studies on improvisation in project management.

When doing this, it became clear that there is a broader distinction to be made between the different improvisations than only the different types. Whereas some improvisations are occurring often, others are scarcer. The project manager of observation 6 explains that in general, design team meetings have a setting in which actions and reactions are always occurring (2024). They could be seen as improvisations on a microscale. The project manager describes design team meetings as the "safe zone" in which everyone comes with their experience and knowledge to become part of this "action and reaction game" (2024). The "safe zone" creates a setting which allows the attendees to improvise on a microscale[2]. Moreover, improvisations within the "safe zone" are expected actions. The idea of the "safe zone" is confirmed by interviewee 2 (2024). Interviewee 5 describes them as improvisations "on a manageable scale" (2024) and the project manager from observation 5 as "improvisation on a small scale".

Apart from improvisations taking place within the design team meeting setting, there are exogenous trigger events (originating from outside the setting) which cause another type of improvisations. These are improvisations which take place on a larger scale and carry a higher level of unexpectedness. According to the project manager of observation 6, they take place outside of the "safe zone" (2024). They make the attendees during a design team meeting feel uncomfortable and sometimes overwhelmed. The exogenous trigger events cannot be predicted and therefore the improvisations and behaviour which follow as a response are unpredictable. Creating this distinction between 1) improvisations taking place within the design team meeting setting and 2) improvisations reacting to exogenous trigger events, brings new insights to the categories of the definition of improvisation and the head of project management.

[2] Note that it is not the goal of this research to investigate whether improvisations lead to a faster or more effective design process. When applying the parallels (see **The applied parallels between improvisation in jazz and organisation**) however, it becomes clear that the improvisations on a microscale might improve the design process to a certain extent. See 7.4 Future research for suggestions for future research about this.

The categories of the definition of improvisation in project management

The literature review concluded by taking "the act of dealing with the unexpected without having the luxury of preparation" (Alhussein et al., 2022, p. 1) as a starting point for the definition of improvisation (see 3.4 Conclusion). However, the empirical research showed that this definition does not capture all the improvisations that are taking place within project management. It specifically defines the second type: improvisations which are reactions to exogenous trigger events. The various exogenous trigger events and reactions within the second type will be discussed in **The head**. The first type, improvisations which are taking place within the design team meeting setting, can be defined by another category of the definition. In order to investigate which category is most strongly linked to the first type, all improvisations have been examined. They have been analysed whether they would take place within the design team meeting setting or as a reaction to an exogenous trigger event. This has been done in combination with analysing each improvisation in terms of the four categories provided in 6.1.1 The categories of the definition. The results can be found in Figure 35. Each improvisation could be linked to multiple definitions. This means that the total is not the sum of the columns. The total shows how many improvisations took place within the setting or as a reaction to an exogenous trigger event. The columns indicate how many of those relate to a certain definition. This means that in total, 9 improvisations took place as a reaction to an exogenous trigger event. Of those, 6 could be linked to 'react to unexpected without preparation' and 6 could be linked to 'deviation from an existing plan'. Apart from that, 32 improvisations took place within the setting. Of those, 26 are relatable to the 'merging of composing and executing' while 15 are a 'deviation from an existing plan'. This illustrates that the improvisations taking place within the design team meeting setting can be best categorised as 'the merging of composing and executing'.

	React to unexpected without preparation	**Deviation from existing plan**	**Unknown outcome**	**Merging of composing and executing**	**Total**
Reaction to exogenous trigger event	**6**	**6**	5	3	9
Within setting	7	15	6	**26**	32

Figure 35: The number of improvisations within and outside of setting related to the categories of the definition (own work, 2024)

Finally, the empirical research has shown that the first type of improvisation, which is taking place within the design team meeting setting, can be described as the 'merging of composing and executing'. The second type of improvisation, namely reactions to exogenous trigger events, is most strongly linked to the category 'react to the unexpected without preparation'. This illustrates that the different types of improvisation relate to different categories of the definition of improvisation. This also explains the different categories of the definition provided in 6.1.1 The categories of the definition. Some of the practitioners see actions within the design team meeting setting as improvisations, while others do not. This influences the definition they provide and the threshold they define. The overall definition of improvisation captures both categories. The two categories have in common that there is no time between the thinking about the action and the performing of the action. In the first category, the word 'merging' emphasizes this, while the second category indicates this with the words 'without preparation'. Therefore, improvisation in project management can be described as the simultaneous occurrence of the creation and performance of an action.

The perspective from which the improvisation has been put forward (project manager or researcher) is also included in the analysis. This tells us more about how project managers think differently about improvisation. For example, one of the project managers (observation 4) calls a deviation from the agenda an improvisation, while another project manager (observation 5) does not. The (re)actions within the setting are not seen as improvisations by one project manager (observation 6), but interviewee 1 says they "are improvising during the whole day" (2024). This shows how the threshold for calling an action improvisation differs between practitioners. As explained in 5.0 Methodology, the threshold for calling an action improvisation is low for the researcher, in order to stay open-minded. This means that improvisations taking place within the setting are also included. Therefore, the researcher has captured more types of improvisation than some of the individual practitioners shared.

Lastly, improvisations which were only observed from the project manager's perspective are often not observed by the researcher due to a lack of previous knowledge about the project or situation. There were three improvisations identified by the project manager but not by the researcher (observation 2 & observation 4). For example, one of the project managers (observation 2) had sent a document before the meeting and had to improvise in their reaction when the attendees had not read it yet. To the researcher, this was not clear as this document had not been discussed during the pre-brief. It is important to note that the improvisations only observed by the project managers have been included in the research if they fit one of categories of the definition found by the researcher. Improvisations which do not fit one of the categories have been left out.

The head in project management
As discussed in 6.1.2 The head, improvisation can take place on different levels, depending on the head. Figure 36 illustrates this.

Level	The head	Improvisation	Example
Meetings	Agenda	Deviation from the agenda	A point on the agenda is discussed earlier during the meeting (observation 5)
Phases	Program of requirements	*No example found*	
	Design	Small changes	Natural ventilation is not used anymore in a specific area (observation 6)
		Unusual design parts	Using unique lighting fixtures (interviewee 5)
		Estimations	Installations advisor estimates how much space is needed for air shafts (observation 5)
		Scenarios	Installations advisor proposes solutions to cut in the budget (observation 6)
	Planning	Deviation planning	Project manager proposes to import materials before the selection of contractor instead of afterwards (observation 4)
Organization	Guiding principles	*No example found*	
	Contracts	Organizational deviation	Another party is called on the spot (interviewee 6)
		Reacting to mismatching expectations	Project manager had sent documents before the meeting but attendees had not read it (observation 2)

Figure 36: The different types of improvisation based on the heads (own work, 2024)

The types of improvisation and examples provided above are present during design team meetings often. These could be described as improvisations taking place within the design team meeting setting. As discussed in the categories of the definition section, there are also improvisations which are reactions to exogenous trigger events. They can occur on different levels, depending on the head. In Figure 37, this is shown.

Level	The head	Improvisation/ Trigger event	Example	Reaction
Phases	Program of requirements	Late big change of requirement	Client wants extra room (interviewee 1)	It became clear that another room was not necessary, so the design was changed functionally
	Design or design process	Late big design change	Architect has changed design of façade completely in 1 week time (interviewee 3)	A difficult discussion followed. Eventually, a compromise in the design was reached
Organization	Contracts	Unexpected behaviour	Attendee becomes personal and angry at another attendee (interviewee 3)	The two attendees sat together to sort things out apart from the rest of the team. They made it clear that the behaviour was not normal
External		Change in circumstances	Economic crisis (interviewee 5)	*Not discussed*

Figure 37: The different types of improvisation based on the heads, outside of the design team meeting setting (own work, 2024)

When we dive into the improvisations which are reactions to exogenous trigger events, there are a couple of things that stand out. Firstly, a design change is only considered as taking place outside of the setting when it is late in time. This is emphasized by interviewee 6. They state that a demand for speed and action is necessary to call an action an improvisation. Cunha et al. (1999) have also mentioned this demand (see 3.2.2 Improvisation in organisations). Interviewee 6 states that this demand only occurs at the end of a phase, which makes the design change 'late'. Additionally, it is important to notice that a late big change of requirement and a late big design change can be seen as an improvisation in terms of both the product and the process. For example, the extra room must be improvised in the plans, while the process of designing this new room is also improvised. The decision to change the design or requirement can be an improvisation from one discipline's perspective, while it also forms the trigger event to which the rest of the team must react. It becomes a trigger event when there is a demand for speed, when it is of a considerate size and when it carries a high level of unexpectedness. Secondly, interviewee 3 names the example of an attendee becoming personal and angry unexpectedly. This can be seen as an "unexpected occurrence", which has been mentioned by Cunha et al. (1999) as an indicator for an improvisational action.

Furthermore, Figure 37 shows the reactions that occurred after the exogenous trigger events. In the first reaction, the emphasis lies on finding out the 'why' behind the trigger event. When the question behind the question was asked, it helped to provide a response to the trigger event. The second reaction focusses on finding a solution together with the team by reaching a compromise. In the third reaction, the involved attendees decide to sort things out apart from the team. These reactions consist of more than just the parallels between improvisation in jazz and organisation. Figure 38 summarizes the different levels with its heads and types of improvisations within and outside of the setting.

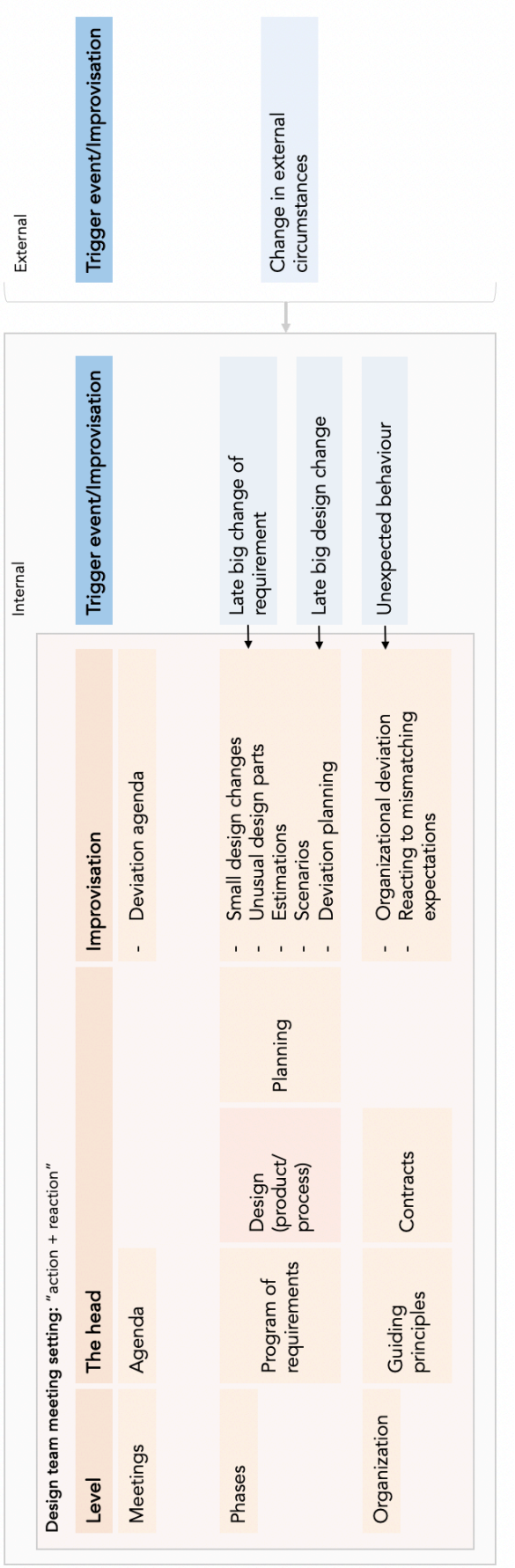

Figure 38: The heads on the different levels including improvisations within the setting and outside of the setting (own work, 2024)

The applied parallels between improvisation in jazz and organisation
When possible, an improvisation has been linked to one of the nine parallels as discussed in 3.2.2 Improvisation in organisations. Four parallels would make the actions the most salient: comping, trading fours, soloing and provocative competence. In general, the applied parallels would only make the actions in project management salient on a microscale. Therefore, the parallels have only been applied to improvisations taking place within the design team meeting setting. In Figure 39, an overview can be found.

Level	The head	Improvisation	Example parallel	Parallel	Lessons
Meetings	Agenda	Deviation from the agenda	No agenda, project manager: "You are the bosses, you tell me what to do" (observation 4)	Comping	Course of meeting is determined together like in a jazz jam session
Phases	Design	Small changes	Installations advisor, manufacturers, architect and contractor draw changes in the design for fire safety (observation 3)	Trading fours	Going back-and-forth important to create a common understanding, contributes to accelerated (design) process
		Estimations	Architect decides it will be possible to create ventilation shaft up to roof (observation 6)	Soloing	Taking initiative decided on the spot, originating from all disciplines
		Scenarios	Project manager does alternative propositions for placement air handling units (observation 6)	Provo-cative compe-tence	Stepping outside your own role necessary to enhance product/ process
Organization	Contracts	Organizational deviation	First, the project manager proposes to go after other party but then the architect decides to call (observation 2)	Soloing	*See soloing*

Figure 39: Parallels applied to improvisations on the different levels (own work, 2024)

First of all, the parallel *comping* was applied to actions on all levels. In this particular example, it becomes clear how the project manager is supporting the other disciplines by giving the course of the meeting out of hands. Rather than imposing action upon the other disciplines, they provide space to discuss what is needed to move forward. From this we can learn that the project manager does not have to follow a strict agenda and distribute tasks as would happen with a predict-and-control approach (see 3.3 Project management). Instead, by providing space and comping the other attendees, the course of the meeting is determined together like in a jazz jam session.

The parallel *trading fours* was applied to actions on the level of phases. Often, various disciplines would discuss a specific part of the design and build on top of each other's propositions. In this example, it becomes more explicit because the disciplines are drawing on top of each other's drawings. From this we can learn that the going back-and-forth between the different roles is very important. It helps to understand each other's viewpoints and to create a common understanding amongst the team members, which is also the case when improvising in jazz. Additionally, the going back-and-forth can be described as an accelerated design process, in which the disciplines undergo multiple cycles of generating. This is often part of a trial-and-error process. By applying the parallel *trading fours,* it becomes clear how the rapid (re)actions of the disciplines contribute to solving problems in the product or process within a relatively short time frame.

Moreover, the parallel *soloing* was observed the most (9 times) and could be applied to actions on all levels. The example on the phases level shows how the architect takes the lead in improvising a decision. The example on the organizational shows how the architect takes over the lead from the project manager in going after another party. From this we can learn that the taking of initiatives is not determined beforehand. The disciplines decide on the spot whether it is important and acceptable to take the initiative to improvise. It also emphasizes the fact that the soloist expects that the other attendees will comp their improvisation. This relates to the word "safe" in "safe zone", which will be discussed in more detail in 7.1 Findings into context. If the attendees feel comfortable, they can all decide to take a *solo*. This would result in the merging of the knowledge and experience of all the disciplines, which could eventually result in a more productive process. Furthermore, by applying the parallel *soloing*, it becomes clear that all the attendees may expect to get their turn, to solo. This is also the case in jazz. It emphasizes the give and take process which is necessary to create a strong "safe zone". In general, it is important to create a setting in which the disciplines feel comfortable with taking the initiative to improvise, or in other words: to solo. In a jazz jam session this comfort is a given from the start most of the times.

Lastly, the parallel *provocative competence* was observed only three times but was discussed during one of the interviews as well (see 6.1.1 The categories of the definition). This makes the evidence thin and suggests a possibility rather than a firm finding. In this example, the project manager steps outside of their role by challenging the current placement of the air handling units. They also start doing alternative propositions for the placement. Eventually, this resulted in the attendees agreeing upon checking multiple scenarios for the air handling units. This might improve the design as a whole. From this we can learn that it is important to go beyond the boundaries and challenge each other like musicians do during jazz jam sessions. It is important to realise that the parallel *provocative competence* can be applied in combination with *soloing, comping* or *trading fours.* In this case, the project manager is also *soloing* by taking the initiative to step outside of their role, which is *comped* by the other attendees. Additionally, the example of *trading fours* is an example of *provocative competence,* as the disciplines who are not experts on fire safety step outside their role and challenge the fire safety expert to come up with a better solution. Therefore, *provocative competence* is a parallel which often does not come on its own.

Project management and the jazz metaphor

Finally, the last sub-question is investigated by integrating the insights which were revealed by sub-questions 1 up to 4. The last sub-question reads as follows:

SQ5: *What does redescribing project management using these parallels tell us about project management actions?*

In general, this research suggests that by applying the parallels, we find a new way of understanding design teams in project management. The applied parallels show that design team meetings are not meetings in which the project manager follows a strict agenda and controls a hierarchical structure as described in traditional project management literature. Instead, the design team meetings are comparable to a jazz jam session in which the course is determined by all the disciplines (*comping*). The going back-and-forth between the disciplines emphasizes the importance of creating a common understanding (*trading fours*). Moreover, initiatives are taken on the spot and are originating from all the disciplines (*soloing*). Stepping outside your own role is sometimes necessary to enhance the product and/or process (*provocative competence*). By applying the parallels, a more accurate understanding of design team meetings in project management is revealed. It brings a new view on project management which is a response to the increasing complexity in the built environment. The following section will provide a more elaborate explanation of the lessons learnt from redescribing project management.

The "safe zone" as a jazz jam session

First, as showed by Figure 38, there are two types of improvisation to distinguish: 1) improvisations taking place within the design team meeting setting and 2) improvisations reacting to exogenous trigger events from outside this setting. The first type consists of (re)actions taking place within this setting, which has been described as the "safe zone" by the project manager of observation 6 and interviewee 2 (2024). Interviewee 5 described them as improvisations "on a manageable scale" (2024) and the project manager from observation 5 as "improvisation on a small scale". All the disciplines are (re)acting within this "safe zone" based on their knowledge and experience. Perhaps, this "safe zone" could be compared to a jam session rather than a performance. A jam session can be described as an informal performance during which musicians play together without preparation. It is less strict compared to a performance and can be characterized by the going back-and-forth between the musicians. This can be compared to the (re)actions taking place within the "safe zone" of project management. Hence, the (re)actions within the design team meeting setting are like free play in jazz. The parallels between improvisation in jazz and organisation can be applied to project management actions taking place within this "safe zone". The parallels soloing, comping, trading fours and provocative competence show how project management actions make up a constant game of taking (over) initiative and providing space for each other. These project management actions can be described as improvisations on a microscale.

Moreover, the second type of improvisation consists of a reaction to exogenous trigger events. Exogenous trigger events can be a late big design change, big change of requirement, unexpected behaviour or a change in circumstances. These exogenous trigger events distinguish themselves from the trigger events within the design team meeting setting because they are taking place on a larger scale with more time pressure. Additionally, they carry a high level of unexpectedness. To make it extreme, they are more like panic reactions compared to the actions within the "safe zone". In jazz, there are also trigger events present.

For instance, there could be a stranger with a totally different style sitting in (unexpected behaviour), or the music which will be recorded is only shared during the morning of the recording session (change in circumstances). However, the reactions to these trigger events are still part of the "safe zone" in jazz. In the first example, the musicians will respond by adjusting their *groove and feel* (see 3.1.2 Improvisation in jazz). The second example can be seen as an act of *provocative competence,* as the musicians are challenged to come up with and respond to something new (see 3.1.2 Improvisation in jazz). In jazz, it is also important to notice that reactions to trigger events, if successful, often become famous stories[3]. In project management, the reactions to exogenous trigger events consist of more than just the parallels between improvisation in jazz and organisation, as shown in Figure 37. Therefore, although trigger events are present in jazz as well as project management, the reactions are part of the "safe zone" in jazz, while they are not in project management. This means that the parallels cannot be applied to the second type of improvisation in project management. Additionally, the reactions to trigger events in project management are often not shared as famous stories. In project management, the emphasis lies more strongly on the image of a whole building and process rather than one response to a certain trigger event.

Multiple heads on various levels

Secondly, there are multiple heads on various levels present in project management. These are the guiding principles and contracts on an organizational level; the program of requirements, design and planning on the level of the phases; the agenda on the level of the meetings. These different heads and levels result in multiple subtypes of improvisation. This illustrates the complexity and versatility of project management.

Facilitation of improvisation: openness and team dynamics

Finally, in traditional literature, project management has been considered a profession in which tasks should be defined upfront (see 3.3.2 Improvisation in project management). The focus lay on keeping control by staying in between the lines of a predefined plan. Moreover, ambiguity and complexity should be removed from the start to stay in control. In broad terms, this could perhaps best be compared to classical music, in which every note has been rehearsed and where there are no unexpected occurrences.

However, the applied parallels reveal that space is needed to improvise. Although tasks are indeed defined upfront (for example in the form of guiding principles and contracts), practice shows how they merely form the head upon which is improvised. Rather than focussing on following a static plan, control is achieved by reacting and thinking beyond your own role. During the pre-briefs, multiple project managers emphasized the openness with which they would go into a meeting. They indicated they could not predict the atmosphere and reactions of the others as this would differ every single meeting. Instead of preparing for every possible reaction, they would enter the meeting open-minded and see where it would take them. This openness facilitated the improvisations taking place. Another important observation was that the design team meetings are led by the whole design team rather than by only the project manager. Improvisations did not only originate from the project manager but also from the other attendees. This emphasizes the importance of the team dynamics.

[3] An example is the recording of the album *Kind of Blue,* during which Miles Davis challenged the musicians to record the album with almost no rehearsal. Only sketches of scales and melodies were shared as a foundation to improvise on (Kahn, 2018). The album has been named one of the best jazz albums ever recorded.

7.0 Discussion

This section presents a discussion on the study. First, it puts the findings into context by comparing them to existing (literature) studies. Then, the limitations of the research are discussed and finally recommendations for future research are done.

7.1 Findings into context

Organisations

First of all, we can go back to the organisational studies on improvisation. If we recall the framework for an organizational improvisation episode (OIE) by Ciuchta et al. (2021), we can find various triggers before an OIE (see Figure 40, which was also shown in 3.2.2 Improvisation in organisations). These are: a problem, an opportunity or an enrichment. These can be compared to the exogenous trigger events, causing improvisations taking place within project management. Unexpected behaviour, a change in circumstances, a late big design change and a big change of requirement were named during this research as exogenous trigger events in project management. It is worth noting that these trigger events could all be described as problems. Perhaps, some of them could also be seen as opportunities, because they could help to improve the overall design or process.

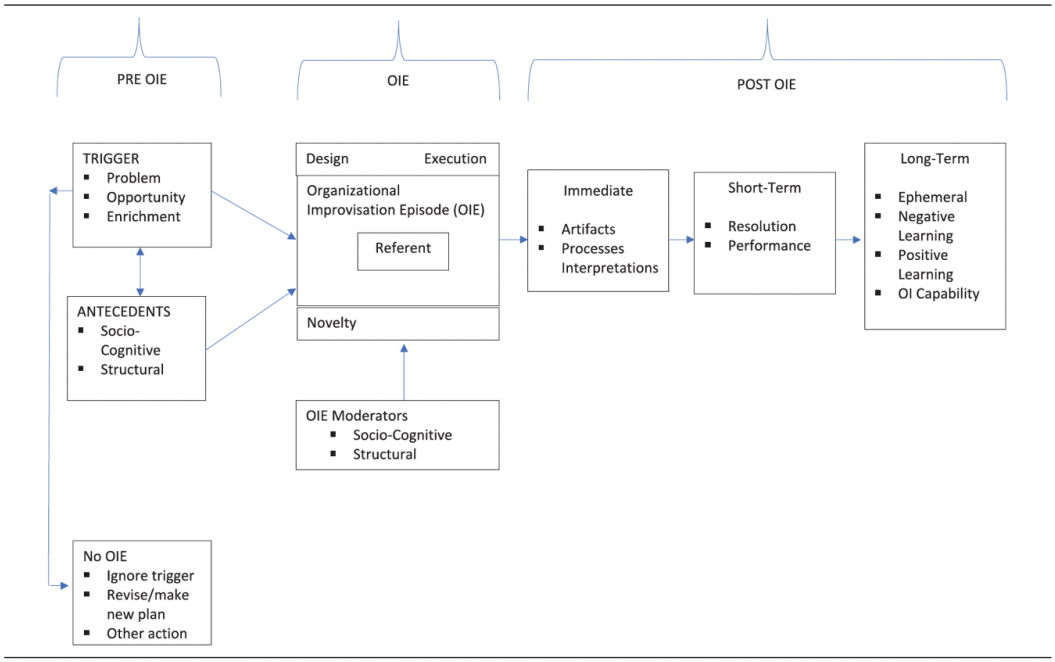

Figure 40: Framework for Organizational Improvisation Episode (adopted from Ciuchta et al., 2021)

Moreover, Pina E. Cunha and Vieira Da Cunha (2003) found 83 improvisations in their empirical research (see 3.2.2 Improvisation in organisations). Their conclusion was that emerging problems were dealt with using actions rather than planning. This is another example of an organizational study which looks into trigger events, namely emerging problems. To conclude, the trigger events in organizational studies show strong resemblance to the exogenous trigger events found in this study. The reactions to exogenous trigger events in organisations as well as project management differ from those in jazz. Whereas in jazz the reactions are still part of the “safe zone”, this is not the case in organisations and project management. Perhaps, the “safe zone” in organisations and project management can be expanded to facilitate improved reactions to exogenous trigger events.

Project management

As described in 6.3 Synthesis, the (re)actions taking place within the design team meeting setting are seen as taking place in a "safe zone". This "safe zone" can be compared to a jam session rather than a performance. In a jam session, musicians often play together for the first time and therefore have to get adjusted to each other's style. In project management, this also happens, but over a longer timescale. The group development over time in project management has often been described based on the model by Tuckman and Jensen (1977), see Figure 41. First, the members of the group get familiar with each other and the task which needs to be performed (*forming*). Next, team members want to "fight" for the same role and conflicts arise (*storming*). In the next phase (*norming*), the "roles and norms are established" (Bonebright, 2010). This is the first phase in which cohesion is developed. Lastly, the group comes to *performing*, where tasks are carried out efficiently. In a revised version of this model, *adjourning* has been added to indicate the end of the group life cycle model.

Figure 41: The model of group development by Tuckman and Jensen (1977) (adopted from Bonebright, 2010)

The same group development can be recognized in only one jam session in jazz. First, the basic rules of the jam session are established (*forming*). After that, the musicians may want to go into different musical directions or might want to take on the same role (*storming*). If it is a successful jam session, it might come to the phases *norming* and *performing*. During the *norming* phase, musicians might listen and respond, while the *performing* phase might go even a step further and add a certain groove and feel to the whole (see 3.2.2 Improvisation in organisations). This shows that the jazz metaphor can be extended to the group development process.

Moreover, a lot of actions observed during the design team meetings were reactions to mismatching expectations. They did not become salient because of the application of the parallels but were still considered improvisations by the project managers. An example was observed during the second observation, in which the project manager expected that the other attendees had read a certain document before the meeting. However, during the meeting, it became clear that this was not the case. Therefore, the project manager had to improvise in their reaction to this. The key in these kinds of situations might be not wanting to fix the situation, but to respond. This is comparable to jazz, in which musicians do not condemn the other but try to react on the spot. Mismatching expectations are not necessarily seen as something negative but rather as something to which should be responded.

Lastly, project management originated from a systems thinking approach (see Baccarini (1996)), which focussed breaking project management tasks down in systems. These systems consisted of elements and links (Baccarini, 1996). Over the last couple of decades, a shift towards a more socially oriented approach has been visible (Floricel et al., 2014). Project management has to be executed by people and therefore concepts like teambuilding and personality types were starting to play a more prominent role. Now, this research focussed on a more dynamic approach. In this approach, systems as well as social aspects are present, but are seen as dynamic aspects in which reactions play a crucial role.

The definition of improvisation in project management

As stated in 3.3.2 Improvisation in project management, existing literature has not provided a clear definition of improvisation in project management yet. This research defines improvisation as follows: the simultaneous occurrence of the creation and performance of an action. This study also provides two types of improvisation, each relating to a different category of the definition. The first type of improvisation consists of micro improvisations taking place within the design team meeting setting. This type is most strongly linked to the category 'the merging of composing and executing'. The second type of improvisation consists of reactions to exogenous trigger events, which is 'reacting to the unexpected without preparation'. When looking at existing literature on improvisation in project management, the emphasis lies on the second type. The improvisations taking place within the design team meeting setting, the so-called "safe zone", are not highlighted in existing literature and therefore not linked to a category of the definition. This research opens up a discussion about different scales of improvisation in project management and the consequences of those scales for the categories of the definition of improvisation.

The "safe zone"

The "safe zone" in project management has been described as a setting in which all the disciplines come together with their knowledge and experience to act and react. The word "safe" suggests that a certain amount of psychological safety is present in this zone in order to facilitate the (re)actions. A study by Edmondson (1999) stated that psychological safety is a feeling shared by all the members of the team, where there is a low risk to express ideas and to disagree with other team members. When there is no psychological safety, team members might be afraid to be viewed negatively (Milliken et al., 2003). Team members might also be afraid to deviate from the group's general view on a certain topic. An existing study has shown that often there is a strong bias to fit into the group's view (Stasser & Titus, 1987). This results in team members withholding opinions or information. Moreover, Bendoly (2014) has looked into the relationship between having a shared understanding of system dynamics and psychological safety. He concludes that the more similar the understanding of the system dynamics is, the higher the psychological safety will be. A better understanding of the system dynamics consists of knowing interdependencies between the activities of a project and being familiar with the overall structure. He states that this better and shared understanding would positively affect the team's performance. This also means that psychological safety would increase the team's performance.

Furthermore, Marder et al. (2021) confirm this statement. They state that psychological safety helps to increase the team's performance, group learning, interpersonal communication and creativity. Improvisation can be part of group learning and interpersonal communication and is related to creativity (see 3.3.2 Improvisation in project management). Therefore, the connection between improvisation and psychological safety could be interesting to investigate in future research. If a higher level of psychological safety contributes to the facilitation of improvisation, another interesting line of research could be whether improvisations contribute to the satisfaction achieved in projects.

One of the most-cited articles about psychological safety in organisations has been written by Kahn (1990). He states that in every situation, members of the organisation would reflect on three conditions: *psychological safety, meaningfulness* and *availability*. For every condition, he names factors which would have an influence. He brings interpersonal relationships, group and intergroup dynamics, management style and process, and organizational norms to the fore as factors influencing the *psychological safety*. In terms of the interpersonal relationships, Kahn (1990) says that a climate, in which everyone feels free to share ideas, increases the psychological safety. As an example, he names an architectural firm in which everyone feels comfortable to share ideas without being afraid that the criticism would be destructive. The openness which has been emphasized in 6.3 Synthesis is also named by Kahn (1990) as being important when improving interpersonal relationships.

Additionally, for the *meaningfulness*, Kahn (1990) states that the task characteristics, role characteristics and work interaction play a crucial role. The factor role characteristics refers back to the idea by Goffman (2002) (see 3.2.2 Improvisation in organisations). In organisations, members are implicitly assigned to certain roles on the frontstage. In general, members will feel more satisfied with their role when they feel like they are important and special within the organization.

Hence, this study can open new lines of research about the relationship between psychological safety and improvisation in project management. How can a team create a "safe zone" in which team members feel comfortable to improvise? And could the "safe zone" even be expanded to the reactions to exogenous trigger events? Perhaps, the jazz metaphor can help to get a new conceptualization of psychological safety.

Project management and team dynamics

As explained in 6.3 Synthesis, it was remarkable how the applied parallels revealed that the team dynamics observed during design team meeting differed from traditional literature on project management in the construction sector. In 3.3.3 The design team, Figure 42 was shown to illustrate the changing of dominance of the different disciplines during the design phase. Gray and Hughes (2007) stated that first the client (brief), then the designer (concept & scheme) and lastly the project manager (engineering) would be dominant.

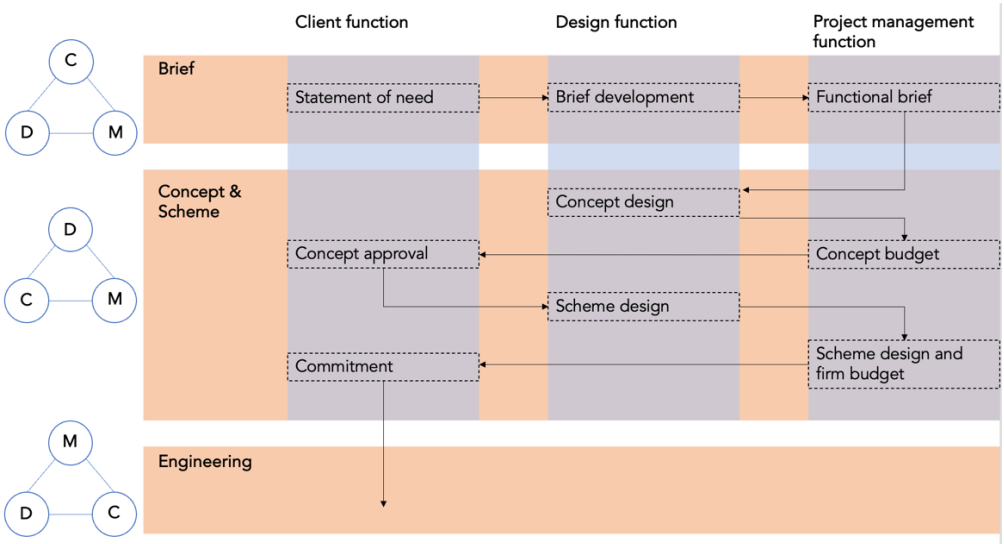

Figure 42: The changing of dominance in relation to the different phases, in which C = client, D = designers and M = project manager (adopted from Gray & Hughes, 2007)

However, during the observed design team meetings, it became apparent that the relationships between the team members are more dynamic. The meetings were often led by the whole team rather than only one of the disciplines, as Figure 42 would suggest. As a result, the improvisations originate from all the attendees. This also means that if practitioners desire to improve their improvisations, they should work on their team dynamics.

Moreover, Osipova and Eriksson (2013) explain that the traditional outlook on project management focusses on the project manager staying in control (see 3.3 Project management). They name a couple of tools that are often used by project managers to keep control: hierarchical structures, centralised decision-making and the separation of tasks and responsibilities. This suggests rather static relationships in which the project manager is imposing actions and controlling the team dynamics. However, this research showed that, in order to facilitate improvisations, there should be stronger emphasis on openness and fluidness in the team dynamics. This results in structures being less hierarchical, decision-making processes led by the team and a flexibility in the tasks and responsibilities.

Flexibility

The openness which has been described in 6.3 Synthesis is also related to the amount of flexibility that is accepted or strived for. Lenfle and Loch (2010) argue that the roots of project management lie within the application of flexibility and novelty rather than control. They state that the emphasis of project management on control is the result of multiple historical events. In the 1960s, the focus shifted from performance to control, and this is still the main focal point nowadays (Lenfle & Loch, 2010). They conclude their paper by stating that project management "should overcome its self-imposed constraints and go back to its roots from the 1940s of 'making the impossible happen'" (Lenfle & Loch, 2010, p. 51). According to them, the focus of project management should shift towards flexibility again as this would bring more success in project management. They propose two practical implications to achieve this: 1) project managers do not only execute the orders given by senior management but also become part of the strategy making process and 2) in complex projects the higher risk and unpredictability must be accepted at the beginning of the project. They specifically name improvisation as one of the tools with which knowledge can be gained about the project's challenges.

Moreover, Sohi et al. (2019) have studied if flexibility during the early phases of project management contributes to the performance of the project. In their problem statement, they explain that the complexity in project management has been increased, which asks for a certain degree of flexibility to respond to the project dynamics. This is comparable to the problem statement defined in 1.0 Introduction. They define flexibility as "the readiness to adapt to the project conditions, which is characterized by a certain degree of dynamism" (Sohi et al., 2019, p. 666). The conclusion is that an open, proactive attitude and wide approach in project management enhance the flexibility. This comes back to the openness of the project manager as described in 6.3 Synthesis. Future research could investigate whether improvisations help to understand flexibility in project management.

7.2 Practical implications

This paragraph presents the practical implications which follow from the literature review and empirical research. The goal is to provide suggestions with which practitioners can improve the course of design team meetings in project management in the built environment. This helps to provide an answer to the increasing complexity in projects in the built environment.

Facilitation of improvisation as tool for the projectmanager

Firstly, the facilitation of improvisation can become part of the toolkit of the project manager. Both the literature review and the empirical research have shown that the complexity in project management has been increased. This means that the traditional predict-and-control approach is not sufficient to bring projects to an successful end. Because of the increased complexity, improvisation is inevitable. Therefore, project managers should embrace the facilitation of improvisation. This means that project managers should accept the fact that not the whole process is controllable. A certain amount of openness should be integrated in design team meetings to ensure that there is room to improvise. Elements such as the agenda and the planning merely form the head (what is improvised on), like a chord progression can form the head in jazz. Improvisations on this head should not be considered as something negative. Like in jazz, the provision of space is crucial to let the team members feel comfortable in their improvisations.

Focus on team improvisation and the dynamics

Secondly, there should be a stronger focus on team improvisation. The empirical research has shown that the design team meetings are often led by the whole design team rather than only the project manager. Improvisations do not only originate from the project manager but also from the other disciplines. Therefore, improvisation as a team should be encouraged. Moreover, the applied parallels between jazz and organisation revealed the importance of the dynamics within a design team. Roles are not defined by strict frameworks but by constantly adjusting and reacting. Actions like taking (over) initiative and bringing in a new idea on the spot are only possible when the dynamics allow this. Sometimes this even requires stepping outside of your own role, which has been described as *provocative competence* in literature about jazz and organisations.

Work on reactions to exogenous trigger events

Thirdly, this research has made a distinction between 1) project management actions taking place within the “safe zone” and 2) actions which react to exogenous trigger events outside the “safe zone”. The “safe zone” can be described as an action and reaction game in which everyone improvises on a microscale. The improvisations within this zone are expected. The exogenous trigger events could be a late, considerate design change, change of requirement, unexpected behaviour or an external change in circumstances. These are unexpected events which have a large effect on the project and process. The choice of the word “safe zone” might indicate that the reactions to exogenous trigger events are in an “unsafe zone”. This research suggests that design teams should work on their improvisations within the “unsafe zone”. Successful reactions to trigger events are crucial to keep projects going. However, the empirical research revealed how reacting to trigger events is a struggle for most practitioners. Therefore, there should be stronger focus on learning how to react to trigger events and this knowledge should be shared between the practitioners.

7.3 Research limitations

To begin, we can look into *external validity:* do the sample results represent the entire target population? It is important to realise that the number of interviews and observations performed during this research do not allow generalisation. Because of the exploratory nature of the research, the emphasis lay on getting an understanding of improvisations in project management rather than providing a defined solution for the problem stated in 1.0 Introduction. The delivered definitions, heads and salient actions should be seen as propositions rather than definitive answers. Hopefully, this study can be a stepping stone to more extensive research about improvisation in project management and to new thought processes. Furthermore, the empirical part of this study has been performed entirely at one internship company. Although some of the attendees during the design team meetings were employees from other companies, there was always at least one person present from the internship company present. This might entail a bias in the results. Additionally, some of the attendees during the design team meetings might have worked together before, while others have not. This could result in a bias because of intact groups. Lastly, the results are linked to project management in the built environment specifically. Applicability to other fields should be researched in future research. Secondly, the *internal validity* (do the research instruments measure what they intent to measure?) is examined. The interviewees might have felt the pressure to answer in a socially desirable way. The societal values and values of the company might put improvisations in a certain light which could have influenced the results. Moreover, the Hawthorne effect might have affected the participants during the observations. This means that the attendees of the design team meetings (re)act uncharacteristically because they know that they are studied. This is an important research limitation to be aware of, which could unfortunately not be avoided during the performance of this research.

7.4 Future research

First of all, future research could follow multiple design team meetings of the same project, in order to investigate how improvisations might develop through time. The researcher experienced how the atmosphere during first encounters between attendees differed from design teams who were familiar with each other. This relates to the group development process as explained in 7.1 Findings into context. The development of improvisations during the group development process might bring interesting insights into the frequency and nature of improvisations. Moreover, the projects observed in this study were all in the preliminary or definitive design phase. Future research could compare improvisations between the sketch, preliminary and definitive design phase. As discussed in 6.3 Synthesis, time pressure plays an important role while improvising in project management. A hypothesis could be that the number of improvisations increases towards the end of every phase. It might be interesting to investigate if this is true and whether there are significant differences between the different subphases in the design phase. Additionally, future research could perform a pre-brief and debrief from multiple perspectives, by involving the architect and engineers for example. The researcher found the pre-brief and debrief with the project manager very insightful and helpful to place actions into context. By interviewing more disciplines, the emphasis shifts from the project manager to the whole design team. It could be interesting to see if expectations are different between multiple disciplines beforehand and how this affects the idea of the head. Also, the categories of the definition of improvisation could be investigated from various angles which might reveal new results. Lastly, future research could examine whether improvisations contribute to the level of satisfaction achieved in a project.

8.0 Conclusion

Over the last decades, the complexity of projects has been increasing. Studies have shown that using existing project management theories in a traditional manner has failed to bring success. Improvisation is inevitable and therefore necessary to be researched. A substantial part of previous research has focussed on using a jazz metaphor when describing how improvisation can be implemented within organisations. A specific type of organisation is the project team, which is temporary and focusses on delivering a project. However, the parallels with improvisation in jazz have not been applied to project management yet. Hence, the main research question of this research is: *"What can we learn from applying the parallels between improvisation in jazz and organisation to project management?".* This research limits itself to the design phase of project management in the built environment. The focus lay on studying design team meetings. This chapter presents the most important conclusions.

SQ1: What does improvisation mean in jazz and organisation and what are the parallels between improvisation in jazz and organisation?

To conclude, improvisation in jazz means "composing music in performance" (Barrett, 1998, p. 128). In organisation, improvisation is seen as "the deliberate fusion of the design and execution of a novel production" (Miner et al., 2001, p. 314). In total, nine parallels between improvisation in jazz and organisation have been found: the head, soloing, comping, trading fours, listening, responding, groove and feel, provocative competence and embracing errors (Barrett, 1998; Hatch, 1999; Weick, 1998). "The head" in jazz is what is improvised on. It consists of a basic chord sequence, melody and tempo.

SQ2: What does improvisation mean in project management?

This research describes improvisation in project management as follows: the simultaneous occurrence of the creation and performance of an action. This study also relates different types of improvisation to different categories of the definition. Two types of improvisation are distinguished: 1) actions taking place within the setting of the design team meeting and 2) reactions to exogenous trigger events outside this setting. The design team meeting setting has been described as a safe zone and actions taking place within this zone can be seen as improvisations on a microscale. This type of improvisation relates to the category 'the merging of composing and executing'. Secondly, reactions to exogenous trigger events are taking place on a larger scale and carry a higher level of unexpectedness. They relate most strongly to the category 'a reaction to the unexpected without preparation'.

SQ3: What is "the head" in project management?

In project management, there are multiple levels with various "heads" to define. "The head" is what is improvised on. On an organizational level, guiding principles and contracts make up the head. On the level of the different phases, the program of requirements, the design itself and the planning form "the head". Lastly, on the level of the meetings, the agenda is seen as "the head". This is different from jazz, where there is only one head to improvise on: a certain tune. The type of improvisation is dependent on "the head". It also depends on whether it is taking place within the design team meeting setting or as a reaction to an exogenous trigger event.

SQ4: Which actions in project management become salient when applying the parallels between improvisation in jazz and organisation and how?

The parallels can be applied to the actions taking place within the setting of the design team meeting. Of the nine parallels found in SQ1, applying four parallels would result in salient actions. This is apart from "the head" which has already been discussed in SQ3. The parallel *soloing* is applied to the estimation of the size of a certain tube, which shows how initiatives are taken on the spot and originate from all the disciplines. *Comping* is applied to an action in which the course of the meeting is determined together like in a jazz jam session. *Trading fours* is applied to the drawing of scenarios on top of each other's propositions. This illustrates the importance of going back-and-forth between the disciplines to create a common understanding and to accelerate the design process. Lastly, the parallel *provocative competence* is applied to an action in which the project manager steps outside of their role to enhance the product and/or process.

SQ5: What does redescribing project management using these parallels tell us about project management actions?

In general, this research suggests that by applying the parallels, we find a new way of understanding design teams in project management. The applied parallels show that design team meetings are not meetings in which the project manager follows a strict agenda and controls a hierarchical structure as described in traditional project management literature. Instead, the design team meetings are comparable to a jazz jam session in which the course is determined by all the disciplines. Although tasks are defined upfront (for example in the form of guiding principles and contracts), practice shows how they merely form the head upon which is improvised. Rather than focussing on following a static plan, control is achieved by reacting and thinking beyond your own role.

Moreover, during the pre-briefs, multiple project managers emphasized the openness with which they would go into a meeting. They indicated they could not predict the atmosphere and reactions of the others as this would differ every single meeting. Instead of preparing for every possible reaction, they would enter the meeting open-minded and see where it would take them. Another important observation was that the design team meetings are led by the whole design team rather than by only the project manager. Deviations from the head (the agenda) did not only originate from the project manager but also from the other attendees.

Finally, a lot of the actions within project management are taking place in a safe zone. This is a created setting in which all the disciplines come together to (re)act based on their knowledge and experience. These actions can be considered improvisations on a microscale. The parallels soloing, comping, trading fours and provocative competence show how these project management actions are focussed on taking (over) initiative and providing space. Moreover, there exists a second type of improvisation in project management. This consists of a reaction to exogenous trigger events outside of the safe zone. Trigger events could be unexpected behaviour, an external change in circumstances, a late substantial design change or a substantial change in requirements. The parallels have not been applied to this second type of improvisation.

MQ: What can we learn from applying the parallels between improvisation in jazz and organisation to project management?

From the predict-and-control approach, improvisation has been considered as something which should be avoided in project management (Osipova & Eriksson, 2013). The focus lay on defining tasks upfront and keeping control by staying in between the lines of a predefined plan. However, by applying the parallels, a more accurate understanding of design team meetings in project management is revealed. It brings a new view on project management which is a response to the increasing complexity in the built environment. We can learn three main things: 1) the safe zone in project management can be compared to a jazz jam session in which improvisations on a microscale are prevalent 2) there are different heads on various levels present in project management and 3) the openness and team dynamics are crucial in facilitating improvisations.

Firstly, we can learn that the parallels, between improvisation in jazz and organisation, can be applied to project management actions taking place in the so-called safe zone. This is a created setting in which all the disciplines come together to (re)act based on their knowledge and experience. The actions within the safe zone are part of the expected design process. The parallels soloing, comping, trading fours and provocative competence show how project management actions make up a constant game of taking (over) initiative and providing space for each other. The safe zone can be compared to a jazz jam session, which is characterized by its informality and the going back-and-forth between the musicians. The actions taking place within the safe zone could be described as improvisations on a microscale. They are most strongly linked to the following category of the definition: 'the merging of composing and executing'.

Furthermore, another type of improvisation in project management has been defined. These are reactions to exogenous trigger events outside of the safe zone. Trigger events could be unexpected behaviour, an external change in circumstances, a late substantial design change or a substantial change in requirements. The reaction to exogenous trigger events is linked to the following category of the definition: 'a reaction to the unexpected without preparation'. The empirical research has shown that knowledge about and experience with reacting to the trigger events has not been shared between the practitioners yet. In jazz, there are also trigger events present. However, the reactions to the trigger events are still part of the "safe zone" in jazz, while in project management, this is not the case. In project management, the reactions consist of more than just the parallels between improvisation in jazz and organisation. Therefore, the parallels have not been applied to reactions to exogenous trigger events.

Secondly, improvisations in project management can be based on various heads. The heads play a crucial role as they are the foundation upon which the improvisations take place. The heads are the guiding principles and contracts on an organizational level; the program of requirements, the design and the planning on the level of the phases; the agenda on the level of the design team meetings. Although tasks are defined upfront (for example in the form of guiding principles and contracts), practice shows how they merely form the head upon which is improvised. From this we can learn that the versality of project management results in the presence of multiple heads, which is not the case in jazz. This also causes varying subtypes of improvisation in project management.

Thirdly, the openness of the project manager and the team dynamics play an important role in facilitating improvisations. During the pre-briefs of the observations, multiple project managers emphasized the openness with which they would enter a meeting. The project managers indicated they could not predict the reactions of the others as this would differ every single meeting. Instead of preparing for every possible reaction, they would enter the meeting open-minded. This helps to facilitate improvisations. Moreover, it is remarkable how the design team meetings are led by the whole design team, rather than just by the project manager. The project manager does not impose actions on the other disciplines and does not focus on controlling a hierarchical structure. Instead, the decision-making processes are led by the team and there is a certain amount of flexibility in the tasks and responsibilities. Although the head, in the form of the agenda, has been prepared, deviations are prevalent. They can originate from all the disciplines.

Therefore, if practitioners would like to provide an answer to the increasing complexity in projects in the built environment, they can follow three practical implications. Firstly, practitioners should work on their reactions to exogenous trigger events. Moreover, the design teams should focus on team improvisation and their dynamics. Finally, project managers should facilitate improvisation by providing openness. By providing room for each other and for creativity, design teams become able to facilitate improvisation and deal with the increasing complexity in the built environment.

9.0 Reflection

In the seventh grade, my history teacher started the year by drawing a square on the chalkboard. “Everything inside this”, he said, “is the knowledge you have obtained up until this moment”. Then, he drew another, larger square around it. “At the end of the year, this will be the knowledge you obtain”, he explained. Next, he points to the sides of the small square and compares that to “everything you know you don’t know”. But then he also points out that the sides of the larger square have become bigger. “The more you know, the more you realise, you do not know”. This is exactly how I feel about my thesis project. I have learnt many things, not only in terms of contents but also in terms of process and organising. At the same time, I feel like I have even more questions than when I started.

The notion of improvisation is relatively new in project management and therefore, the whole study felt exploratory. In hindsight, I think that defining improvisation in project management and defining a threshold for calling an action an improvisation has been quite challenging. The varying perspectives on this subject helped me to explore but made it harder to converge to one point again. A debrief towards the end of the empirical research in which a project manager distinguished improvisations within a safe zone from improvisations reacting to exogenous trigger events, was an eye-opener for me. It allowed me to look at the data again and provide a possible explanation for the different definitions and thresholds.

Moreover, the interviewees expressed a strong need for defining multiple subtypes of improvisation. First, I categorised the improvisations based on the subtypes provided by the interviewees. Later, I had a stronger image about the different heads in project management and used those to categorise the improvisations. I feel like this helped to create more depth and to create a red thread throughout the study. Additionally, performing the pre-briefs and debriefs in combination with the observations worked well. This allowed me to put actions into context and to triangulate my own observations.

On a more critical note, I experienced that most of the interviewees found it hard to talk about implicit components in project management. A couple of them would ask for examples first, before answering the question themselves. By offering examples, I think the conversation was steered in a certain direction, which is not desirable in an exploratory research. It might have been a better approach to only ask which elements are always present in project management, without making the distinction between implicit and explicit elements. A follow-up question could be whether or not the attendees talk about the elements.

Furthermore, one of the goals of this research was to study improvisational actions within a team. Although the observations included some improvisational actions performed by multiple actors, most of the actions were still performed by only one of the attendees. Therefore, this study did focus on improvisational actions within a team, but not many group improvisations have been identified.

Lastly, it is important to realise that the values associated with certain words might have resulted in a bias in the results. Words like ‘deviation’ and ‘intuition’ can evoke negative or positive emotions and this also influences the way practitioners regard improvisations. I have tried to keep the translations of the words as close as possible to the original meaning, so that the values associated with the words are mostly the same. I have only used those words in the results if they have been brought up by the interviewee or participant literally.

Additionally, in the 6.3 Synthesis section, I had to choose which examples were the best representations of improvisations on the different levels and the parallels. For the different levels, I have chosen the examples in which the recognition of the head is not too hard. For the parallels, I have compared the actions with the concepts in jazz and chose the ones that were the most corresponding. For example, for trading fours, it becomes clear how multiple attendees build on top of each other's ideas by drawing together. To me, this was a stronger similarity than a discussion between two parties which goes back-and-forth only a couple of times.

References

Abuseem, A. J., Ojiako, U., & Dweiri, F. T. (2023). An Exploration of the Notion of Improvisation within Project and Project Management.

Alhussein, H., Shehab, L., & Hamzeh, F. (2022). Improvisation in construction planning: An agent-based simulation approach. *Buildings*, *12*(10), 1608.

Amaratunga, D., Baldry, D., Sarshar, M., & Newton, R. (2002). Quantitative and qualitative research in the built environment: application of "mixed" research approach. *Work study*, *51*(1), 17-31.

Baccarini, D. (1996). The concept of project complexity—a review. *International Journal of Project Management*, *14*(4), 201-204.

Bailey, D. (1992). Improvisation: its nature and practice in music. Ashborune, England: Moorland Pub.

Barrett, F. J. (1998). Coda—creativity and improvisation in jazz and organizations: Implications for organizational learning. *Organization science*, *9*(5), 605-622.

Bendoly, E. (2014). System dynamics understanding in projects: Information sharing, psychological safety, and performance effects. *Production and operations management*, *23*(8), 1352-1369.

Berliner, P. F. (1994). Thinking in jazz: the infinite art of improvisation. The University of Chicago Press. Verenigde Staten: Chicago.

Bonebright, D. A. (2010). 40 years of storming: a historical review of Tuckman's model of small group development. *Human Resource Development International*, *13*(1), 111-120.

Brenneis, D. (2013). Trading fours: Creativity, analogy, and exchange. *American Ethnologist*, *40*(4), 619-623.

Ciuchta, M. P., O'Toole, J., & Miner, A. S. (2021). The organizational improvisation landscape: Taking stock and looking forward. *Journal of Management*, *47*(1), 288-316.

Crossan, M. M., & Sorrenti, M. (2003). Making sense of improvisation. In *Organizational improvisation* (pp. 37-58). Routledge.

Cunha, M. P., Cunha, J. V., & Kamoche, K. (1999). Organizational improvisation: What, when, how, and why. *International Journal of Management Reviews*, *1*(3), 299-341.

Edmondson, A. (1999). Psychological safety and learning behavior in work teams. *Administrative science quarterly*, *44*(2), 350-383.

Flach, L. (2014). Use or abuse of improvisation in organizations? *Creativity and Innovation Management*, *23*(4), 374-385.

Floricel, S., Bonneau, C., Aubry, M., & Sergi, V. (2014). Extending project management research: Insights from social theories. *International Journal of Project Management*, *32*(7), 1091-1107.

Garzón, N. R., & Lozano, M. R. (2022). Organizational Sustainability: An Index From Macroeconomic Variables. In *Handbook of Research on Organizational Sustainability in Turbulent Economies* (pp. 94-110). IGI Global.

Giddens, A. (1984). The constitution of society. *Outline of the theory of structuration. Cambridge: Polity*.

Glock, F. (2022). Aspects of language use in design conversation. In *About Designing* (pp. 285-301). CRC Press.

Goffman, E. (2002). The presentation of self in everyday life. 1959. *Garden City, NY*, *259*.

Gray, C., & Hughes, W. (2007). *Building design management*. Routledge.

Guide, A. (2001). Project management body of knowledge (pmbok® guide). Project Management Institute,

Hadida, A. L., Tarvainen, W., & Rose, J. (2015). Organizational improvisation: A consolidating review and framework. *International Journal of Management Reviews*, *17*(4), 437-459.

Hadjimichael, D. (2023). IMPROVISATION IN ORGANIZATION. *The Routledge Companion to Improvisation in Organizations*, 454.

Hamzeh, F. R., Faek, F., & AlHussein, H. (2019). Understanding improvisation in construction through antecedents, behaviours and consequences. *Construction management and economics*, *37*(2), 61-71.

Hatch, M. J. (1999). Exploring the empty spaces of organizing: How improvisational jazz helps redescribe organizational structure. *Organization studies*, *20*(1), 75-100.

Hatch, M. J., & Weick, K. E. (1998). Critics' Corner—Critical Resistance to the Jazz Metaphor. *Organization science*, *9*(5), 600-604.

Johnson, B. M., & Rice, R. E. (1984). Reinvention in the innovation process: The case of word processing. *The new media*, 157-183.

Kahn, A. (2018). *Kind of Blue: Miles Davis and the Making of a Masterpiece*. Granta Books.

Kahn, W. A. (1990). Psychological conditions of personal engagement and disengagement at work. *Academy of management journal*, *33*(4), 692-724.

Klein, L., Biesenthal, C., & Dehlin, E. (2015). Improvisation in project management: A praxeology. *International Journal of Project Management*, *33*(2), 267-277.

Klemsdal, L., & Clegg, S. (2022). Defining the work situation in organization theory: bringing Goffman back in. *Culture and Organization*, *28*(6), 471-484.

Koppenjan, J., Veeneman, W., Van der Voort, H., Ten Heuvelhof, E., & Leijten, M. (2011). Competing management approaches in large engineering projects: The Dutch RandstadRail project. *International Journal of Project Management*, *29*(6), 740-750.

Lenfle, S., & Loch, C. (2010). Lost roots: How project management came to emphasize control over flexibility and novelty. *California management review*, *53*(1), 32-55.

Leybourne, S. A. (2011). Improvisation and project management: what, when, and how. Paper presented at PMI Global Congress 2011 - North America, Dallas, TX. Newton Square, PA: Project Management Institute.

Lloyd, P. (2022). Ethical imagination and design. In *About Designing* (pp. 85-99). CRC Press.

Luck, R. (2022). 'Does this compromise your design?'Socially producing a design concept in talk-in-interaction. In *About Designing* (pp. 233-249). CRC Press.

Luijten, M. (2022). Lecture 1 Introduction – CME4001 Project Management. Retrieved at 7th of November 2023, from: https://brightspace.tudelft.nl/d2l/le/content/595133/viewContent/3369223/View.

Malucelli, G., Barbosa, M. T., & Carvalho, M. M. d. (2021). Facing the challenge of improvisation in project management: A critical review. *International Journal of Managing Projects in Business*, *14*(2), 369-389.

Marder, B., Ferguson, P., Marchant, C., Brennan, M., Hedler, C., Rossi, M., Black, S., & Doig, R. (2021). 'Going agile': Exploring the use of project management tools in fostering psychological safety in group work within management discipline courses. *The International Journal of Management Education*, *19*(3), 100519.

McDonnell, J., & Lloyd, P. (2022). *About designing: Analysing design meetings*. CRC Press.

McGinn, K. L., & Keros, A. T. (2002). Improvisation and the logic of exchange in socially embedded transactions. *Administrative science quarterly*, *47*(3), 442-473.

Miles, D. A. (2017). A taxonomy of research gaps: Identifying and defining the seven research gaps. Doctoral student workshop: finding research gaps-research methods and strategies, Dallas, Texas,

Milliken, F. J., Morrison, E. W., & Hewlin, P. F. (2003). An exploratory study of employee silence: Issues that employees don't communicate upward and why. *Journal of management studies*, *40*(6), 1453-1476.

Miner, A. S., Bassof, P., & Moorman, C. (2001). Organizational improvisation and learning: A field study. *Administrative science quarterly*, *46*(2), 304-337.

Morris, P. W. (2002). Science, objective knowledge and the theory of project management. Proceedings of the Institution of Civil Engineers-Civil Engineering,

Murphy, J. P. (1990). Jazz improvisation: The joy of influence. *The black perspective in music*, 7-19.

Norman, E. S., Brotherton, S. A., & Fried, R. T. (2008). *Work breakdown structures: the foundation for project management excellence*. John Wiley & Sons.

Osipova, E., & Eriksson, P. E. (2013). Balancing control and flexibility in joint risk management: Lessons learned from two construction projects. *International Journal of Project Management*, *31*(3), 391-399.

Pina E. Cunha, M., & Vieira Da Cunha, J. (2003). Organizational improvisation and change: two syntheses and a filled gap. *Journal of Organizational Change Management*, *16*(2), 169-185.

Pollack, J. (2007). The changing paradigms of project management. *International Journal of Project Management*, *25*(3), 266-274.

Raelin, J. A. (2016). Imagine there are no leaders: Reframing leadership as collaborative agency. *Leadership*, *12*(2), 131-158.

Scaglione, V. L. T., Meyer Jr, V., & Mamédio, D. F. (2019). Improvisation in higher education management: Coping with complexity and organizational dynamics. *Global Journal of Flexible Systems Management*, *20*(4), 291-302.

School, G. T. M. (2021). *The Eras & History of Jazz Music. Retrieved at 9th of November 2023, from: https://www.greatertorontomusic.ca/post/the-eras-history-of-jazz-music*.

Schuller, G. (2023). Jazz music. Encyclopaedia Britannica. United States: Chicago. .

Shaw, R. L., Hiles, D. R., West, K., Holland, C., & Gwyther, H. (2018). From mixing methods to the logic (s) of inquiry: Taking a fresh look at developing mixed design studies. *Health Psychology and Behavioral Medicine*, *6*(1), 226-244.

Shenton, A. K. (2004). Strategies for ensuring trustworthiness in qualitative research projects. *Education for information*, *22*(2), 63-75.

Sohi, A. J., Bosch-Rekveldt, M., & Hertogh, M. (2019). Practitioners' perspectives on flexible project management. *IEEE Transactions on Engineering Management*, *68*(4), 911-925.

Stasser, G., & Titus, W. (1987). Effects of information load and percentage of shared information on the dissemination of unshared information during group discussion. *Journal of personality and social psychology*, *53*(1), 81.

Too, E. G., & Weaver, P. (2014). The management of project management: A conceptual framework for project governance. *International Journal of Project Management*, *32*(8), 1382-1394.

Turner, J. R., & Müller, R. (2003). On the nature of the project as a temporary organization. *International Journal of Project Management*, *21*(1), 1-8.

van Meel, J., & Størdal, K. B. (2017). *Briefing for Buildings: a practical guide for clients and their design teams*. Icop.

Vargas-Hernandez, J. G., & Vargas-González, O. C. (2023). Organizational Socio-Ecosystem Innovation. In *Measuring the Effectiveness of Organizational Development Strategies During Unprecedented Times* (pp. 86-103). IGI Global.

Vieira da Cunha, J., & Pina e Cunha, M. (2010). Organizational improvisation: change or stability? *Management Research: Journal of the Iberoamerican Academy of Management*, *8*(2), 81-100.

Weick, K. E. (1998). Introductory essay—Improvisation as a mindset for organizational analysis. *Organization science*, *9*(5), 543-555.

Whitty, S. J., & Maylor, H. (2009). And then came complex project management (revised). *International Journal of Project Management*, *27*(3), 304-310.

Wikström, K., & Rehn, A. (2002). Playing the live jazz of project management. *Project Jazz LLC paper*.

Winch, G. M. (2009). *Managing construction projects*. John Wiley & Sons.

Appendix A: Exploratory interview protocol [NL]

Introductie protocol

Allereerst, ontzettend bedankt alvast voor het delen van je inzichten. Ik ben Liz Hoogeveen en ik studeer *Management in the Built* Environment aan de TU Delft. In mijn thesis onderzoek ik improvisatie in projectmanagement van bouwprojecten. Voordat we met het interview beginnen, zou ik graag je toestemming willen vragen voor het maken van een audio-opname tijdens het interview. Deze opname zal worden verwijderd na het afronden van mijn thesis. De gegevens zullen gecodeerd worden bewaard en anoniem worden verwerkt.

Als je hiervoor toestemming geeft, zou ik graag de opname starten en de vraag herhalen.

[Opname starten]

Geef je toestemming voor het maken van een audio-opname?

[Toestemming geven]

Fijn, bedankt voor je bijdrage aan mijn thesis. De volledige uitleg staat in het informed consent formulier, dat je kunt ondertekenen als je toestemming geeft.

[Ondertekenen Informed Consent]

Het interview zal ongeveer 45 tot 60 minuten duren. We zullen het hebben over de betekenis van improvisatie in projectmanagement en hetgeen waarop geïmproviseerd wordt. Voordat we beginnen, heb je nog vragen?

Introductie interview

Zoals al even kort toegelicht onderzoek ik improvisatie in projectmanagement. De complexiteit van projecten binnen de bouwwereld is de afgelopen decennia enorm gegroeid en daarom ben ik geïnteresseerd in hoe mensen hiermee omgaan. In dit onderzoek richt ik mij specifiek op de ontwerpfase van bouwprojecten.

(1) Achtergrond

Om te beginnen, zou je iets over je werk kunnen vertellen? Hoe ziet een dagelijkse werkdag eruit?

Wat is jouw motivatie om dit beroep uit te oefenen?

Hoeveel jaar ervaring heb je in dit beroep?

(2) Ontwerpvergadering
Zou je kunnen vertellen hoe een typische ontwerpvergadering verloopt?

Wat is jouw rol binnen zo'n vergadering?

Heb je een bepaalde stijl bij het uitoefenen van jouw rol?

Ga je een ontwerpvergadering in met een plan? Zo ja, hoe ziet zo'n plan eruit?

(3) The "head"
Zijn er impliciete of expliciete onderdelen die altijd aanwezig zijn tijdens het ontwerpproces? (contracten, programma van eisen?)

Welke rol speelt zo'n onderdeel dat altijd aanwezig is?

Komt het expliciet aan bod of wordt aangenomen dat iedereen deze kennis al heeft? Hoe merk je dat?

In hoeverre verschillen deze onderdelen tussen verschillende ontwerpprocessen?

(3) Improvisatie
Komen er improvisaties voor tijdens een ontwerpvergadering? Zo ja, wat betekent improvisatie voor jou?

Kan je een specifiek voorbeeld noemen van een improvisatie?
- Over welk onderdeel ging de improvisatie? (geld, tijd, kwaliteit, scope?)
- In welke fase van het ontwerpproces vond de improvisatie plaats (front-end, detaillering?)
- Waarom zie je dit als een improvisatie?
- Waarop werd geïmproviseerd?

(4) Afsluiting
Zijn er nog onderdelen niet aan bod gekomen tijdens dit interview, die je graag zou willen bespreken?

Zijn er nog andere mensen die je zou aanraden om te betrekken bij dit onderzoek?

Nogmaals ontzettend bedankt voor je bijdrage. Ik zal de transcriptie opsturen zodat je de mogelijkheid hebt om aanpassingen door te geven. Mocht je achteraf nog vragen of suggesties hebben, dan kun je altijd contact opnemen.

Appendix B: Pre-brief and debrief interview protocol [NL]

Introductie protocol

Allereerst, ontzettend bedankt alvast voor het delen van je inzichten. Ik ben Liz Hoogeveen en ik studeer *Management in the Built* Environment aan de TU Delft. In mijn thesis onderzoek ik improvisatie in projectmanagement van bouwprojecten. Voordat we met het interview beginnen, zou ik graag je toestemming willen vragen voor het maken van een audio-opname tijdens het interview. Deze opname zal worden verwijderd na het afronden van mijn thesis. De gegevens zullen gecodeerd worden bewaard en anoniem worden verwerkt.

Als je hiervoor toestemming geeft, zou ik graag de opname starten en de vraag herhalen.

[Opname starten]

Geef je toestemming voor het maken van een audio-opname?

[Toestemming geven]

Fijn, bedankt voor je bijdrage aan mijn thesis. De volledige uitleg staat in het informed consent formulier, dat je kunt ondertekenen als je toestemming geeft.

[Ondertekenen Informed Consent]

Het interview zal uit twee delen bestaan: een pre-brief voor de ontwerpvergadering en een debrief na de ontwerpvergadering. Beide delen zullen ongeveer 15 tot 20 minuten duren. We zullen het hebben over het plan voor de ontwerpvergadering en een terugblik op hoe het is gegaan. Voordat we beginnen, heb je nog vragen?

Introductie interview

Zoals al even kort toegelicht onderzoek ik improvisatie in projectmanagement. De complexiteit van projecten binnen de bouwwereld is de afgelopen decennia enorm gegroeid en daarom ben ik geïnteresseerd in hoe mensen hiermee omgaan. In dit onderzoek richt ik mij specifiek op de ontwerpfase van bouwprojecten.

(1) Achtergrond

Om te beginnen, zou je iets over je werk kunnen vertellen? Hoe ziet een dagelijkse werkdag eruit?

Wat is jouw motivatie om dit beroep uit te oefenen?

Hoeveel jaar ervaring heb je in dit beroep?

Zou je kort kunnen uitleggen over welk project de ontwerpvergadering gaat? In welke fase bevinden jullie je op dit moment? Wat is het doel van het project?

Wat zijn voor jou bijzonderheden tot nu toe in het proces?

(2) Pre-brief
Wat is jouw rol binnen de ontwerpvergadering?

Heb je een bepaalde stijl bij het uitoefenen van jouw rol?

Wat zijn de rollen van de anderen in de ontwerpvergadering?

Ga je de ontwerpvergadering in met een plan? Zo ja, hoe ziet het plan eruit?
- Zou je aan de hand van de agenda kunnen uitleggen wat de stappen zijn die jullie willen maken?
- Hoe verwacht je dat de anderen gaan reageren op dit plan?

[*Observatie ontwerpvergadering*]

---

(3) Debrief
Hoe vond je dat de ontwerpvergadering verliep?

In hoeverre is het verlopen volgens het plan dat we tijdens de pre-brief besproken hebben?

Heeft er improvisatie plaatsgevonden? Waarom wel of niet?

Zo ja, kan je een specifiek voorbeeld noemen van een improvisatie?
- Over welk onderdeel ging de improvisatie? (geld, tijd, kwaliteit, scope?)
- Waarom zie je dit als een improvisatie?
- Waarop werd geïmproviseerd?
- Hoe reageerde(n) jij/anderen op deze improvisatie?

(4) Afsluiting
Zijn er nog onderdelen niet aan bod gekomen tijdens dit interview, die je graag zou willen bespreken?

Zijn er nog andere mensen die je zou aanraden om te betrekken bij dit onderzoek?

Nogmaals ontzettend bedankt voor je bijdrage. Ik zal de transcriptie opsturen zodat je de mogelijkheid hebt om aanpassingen door te geven. Mocht je achteraf nog vragen of suggesties hebben, dan kun je altijd contact opnemen.

Appendix C: Informed Consent Form Interview

You are being invited to participate in a research study titled *Beyond the Boundaries*. This study is being done by Liz Hoogeveen from the TU Delft, who is currently graduating in Management in the Built Environment. This research is combined with an internship at Brink.

The purpose of this research study is to learn more about improvisation in design team meetings. Your participation consists of a semi-structured interview which will take you approximately 45 to 60 minutes to complete. We will be asking you to share your thoughts on the meaning behind improvisation and what we are improvising on. This includes examples of times when you, or other people you work with, have improvised.

As with any activity the risk of a breach is always possible. We might discuss topics that could lead to reputation damage or the exposure of confidential information. To the best of our ability your answers in this study will remain confidential. We will minimize any risks by destroying all personal data except for your role within the design team. Your answers will be anonymised. Confidential or sensitive information will be left out of the transcript and the audio recording of the interview will be destroyed as soon as the transcript is finalized. You are free to check the results and request changes if necessary.

Your participation in this study is entirely voluntary and you can withdraw at any time. You are free to omit any questions.

Thank you for participating.
Liz Hoogeveen

If you have any remarks or questions, please contact me:

PLEASE TICK THE APPROPRIATE BOXES	Yes	No
A: GENERAL AGREEMENT – RESEARCH GOALS, PARTICPANT TASKS AND VOLUNTARY PARTICIPATION		
1. I have read and understood the study information dated [*DD/MM/YYYY*], or it has been read to me. I have been able to ask questions about the study and my questions have been answered to my satisfaction.	☐	☐
2. I consent voluntarily to be a participant in this study and understand that I can refuse to answer questions and I can withdraw from the study at any time, without having to give a reason.	☐	☐
3. I understand that taking part in the study involves:	☐	☐
- *An audio-recorded interview. Written notes might be taken.* - *The audio recording will be destroyed as soon as the transcript is finalized.*		
4. I understand that the study will end after the interview	☐	☐
B: POTENTIAL RISKS OF PARTICIPATING (INCLUDING DATA PROTECTION)		
5. I understand that taking part in the study also involves collecting specific personally identifiable information (PII) and associated personally identifiable research data (PIRD) with the potential risk of my identity being revealed	☐	☐
• *PII: In the Informed Consent Form, the names and email addresses will be collected for administrative purposes. The Informed Consent forms will be stored separately from the other data and securely. They will only be accessible to the study team. The collected data will be anonymized and the names will be codified.* • *Re-identification: Colleagues might identify participants because of specific characteristics. Participants who are experts on a specific area might be identified. These risks will be mitigated by storing the collected data separately and not making it accessible to the companies. If certain information reveals someone is one of a handful of experts, this will be left out. Extracts of the transcripts might be used in the Results section of the thesis. The data will be anonymized and names will be codified.*		
6. I understand that the following steps will be taken to minimise the threat of a data breach, and protect my identity in the event of such a breach	☐	☐
- *Data will be anonymised* - *Data will be stored securely, accessible only to the study team*		
7. I understand that personal information collected about me that can identify me, such as my name, will not be shared beyond the study team.	☐	☐
8. I understand that the (identifiable) personal data I provide will be destroyed within 6 months after the research has ended	☐	☐
C: RESEARCH PUBLICATION, DISSEMINATION AND APPLICATION		
9. I agree that my responses, views or other input can be quoted anonymously in research outputs	☐	☐

Signatures

_____	_____	_____
Name of participant [printed]	Signature	Date

I, as legal representative, have witnessed the accurate reading of the consent form with the potential participant and the individual has had the opportunity to ask questions. I confirm that the individual has given consent freely.

_____	_____	_____
Name of witness [printed]	Signature	Date

I, as researcher, have accurately read out the information sheet to the potential participant and, to the best of my ability, ensured that the participant understands to what they are freely consenting.

_____	_____	_____
Researcher name [printed]	Signature	Date

Study contact details for further information:

Liz Hoogeveen
+316 11802891
l.hoogeveen@student.tudelft.nl

Appendix D: Informed Consent Form Observation

You are being invited to participate in a research study titled *Beyond the Boundaries*. This study is being done by Liz Hoogeveen from the TU Delft, who is currently graduating in Management in the Built Environment. This research is combined with an internship at Brink.

The purpose of this research study is to learn more about improvisation in design team meetings. Your participation consists of an observation of a design meeting which will take as long as the design meeting. We will be asking you to take part in the design meeting as normal. The observation will be combined with two short interviews with the project manager, who is asked about his/her thoughts on the plan for the design team meeting (pre-brief) and on improvisation that have taken place (debrief).

As with any activity the risk of a breach is always possible. The project discussed during the design team meeting might become public. In case of disputes among the participants, this might lead to reputation damage or the exposure of confidential information. To the best of our ability, the observations in this study will remain confidential. We will minimize any risks by destroying all personal data except for your role within the design team. A risk might be that members of the same design team meeting can be re-identified. The goal of the research is to identify and describe improvisation, and not to evaluate the performance of every individual. The results will be presented in a neutral way. The observations will be anonymised. Confidential or sensitive information will be left out of the transcript and the audio and video recording of the observation will be destroyed as soon as the transcript is finalized. You are free to check the results and request changes if necessary.

Your participation in this study is entirely voluntary and you can withdraw at any time.

Thank you for participating.
Liz Hoogeveen

If you have any remarks or questions, please contact me:
l.hoogeveen@student.tudelft.nl

PLEASE TICK THE APPROPRIATE BOXES	Yes	No
A: GENERAL AGREEMENT – RESEARCH GOALS, PARTICPANT TASKS AND VOLUNTARY PARTICIPATION		
1. I have read and understood the study information dated [*DD/MM/YYYY*], or it has been read to me. I have been able to ask questions about the study and my questions have been answered to my satisfaction.	☐	☐
2. I consent voluntarily to be a participant in this study and understand that I can refuse to answer questions and I can withdraw from the study at any time, without having to give a reason.	☐	☐
3. I understand that taking part in the study involves:	☐	☐
- *An audio-and video recorded observation.* - *The audio-and video recordings will be destroyed as soon as the transcripts are finalized.*		
4. I understand that the study will end after the observation	☐	☐
B: POTENTIAL RISKS OF PARTICIPATING (INCLUDING DATA PROTECTION)		
5. I understand that taking part in the study also involves collecting specific personally identifiable information (PII) and associated personally identifiable research data (PIRD) with the potential risk of my identity being revealed	☐	☐
• *PII: In the Informed Consent Form, the names and email addresses will be collected for administrative purposes. The Informed Consent forms will be stored separately from the other data and securely. They will only be accessible to the study team. The collected data will be anonymized and the names will be codified.* • *PIRD: Video recordings of the observations might result in respondents being identified. The video recordings are only available to the study team and the transcriptions will be stored separately and securely.* • *Re-identification: Colleagues might identify participants because of specific characteristics. Participants who are experts on a specific area might be identified. These risks will be mitigated by storing the collected data separately and not making it accessible to the companies. If certain information reveals someone is one of a handful of experts, this will be left out. Extracts of the transcripts might be used in the Results section of the thesis. The data will be anonymized and names will be codified. A risk might be that members of the same design team meeting can be re-identified. The goal of the research is to identify and describe improvisation, and not to evaluate the performance of every individual. The results will be presented in a neutral way.*		
6. I understand that the following steps will be taken to minimise the threat of a data breach, and protect my identity in the event of such a breach	☐	☐
- *Data will be anonymised* - *Data will be stored securely, accessible only to the study team*		
7. I understand that personal information collected about me that can identify me, such as my name, will not be shared beyond the study team.	☐	☐
8. I understand that the (identifiable) personal data I provide will be destroyed within 6 months after the research has ended	☐	☐
C: RESEARCH PUBLICATION, DISSEMINATION AND APPLICATION		
9. I agree that my responses, views or other input can be quoted anonymously in research outputs	☐	☐

Signatures

_____	_____	_____
Name of participant [printed]	Signature	Date

I, as legal representative, have witnessed the accurate reading of the consent form with the potential participant and the individual has had the opportunity to ask questions. I confirm that the individual has given consent freely.

_____	_____	_____
Name of witness [printed]	Signature	Date

I, as researcher, have accurately read out the information sheet to the potential participant and, to the best of my ability, ensured that the participant understands to what they are freely consenting.

_____	_____	_____
Researcher name [printed]	Signature	Date

Study contact details for further information:

Liz Hoogeveen
+316 11802891
l.hoogeveen@student.tudelft.nl

Appendix E: Informed Consent Form Observation Organizations

You are being invited to participate in a research study titled *Beyond the Boundaries*. This study is being done by Liz Hoogeveen from the TU Delft, who is currently graduating in Management in the Built Environment. This research is combined with an internship at Brink.

The purpose of this research study is to learn more about improvisation in design team meetings. Employees of your organization are invited to participate in the research. The participation consists of an observation of a design meeting which will take as long as the design meeting. We will be asking the participants to take part in the design meeting as normal. The observation will be combined with two short interviews with the project manager, who is asked about his/her thoughts on the plan for the design team meeting (pre-brief) and on improvisation that have taken place (debrief).

As with any activity the risk of a breach is always possible. The project discussed during the design team meeting might become public. In case of disputes among the participants, this might lead to reputation damage or the exposure of confidential information. To the best of our ability, the observations in this study will remain confidential. We will minimize any risks by destroying all personal data except for your role within the design team. A risk might be that members of the same design team meeting can be re-identified. The goal of the research is to identify and describe improvisation, and not to evaluate the performance of every individual. The results will be presented in a neutral way. The observations will be anonymised. Confidential or sensitive information will be left out of the transcript and the audio and video recording of the observation will be destroyed as soon as the transcript is finalized. You are free to check the results and request changes if necessary.

The participation in this study is entirely voluntary and the participants can withdraw at any time.

Thank you for participating.
Liz Hoogeveen

If you have any remarks or questions, please contact me:
l.hoogeveen@student.tudelft.nl

PLEASE TICK THE APPROPRIATE BOXES	Yes	No
A: GENERAL AGREEMENT – RESEARCH GOALS, PARTICPANT TASKS AND VOLUNTARY PARTICIPATION		
1. I have read and understood the study information dated [*DD/MM/YYYY*], or it has been read to me. I have been able to ask questions about the study and my questions have been answered to my satisfaction.	☐	☐
2. I consent voluntarily to be a participant in this study and understand that I can refuse to answer questions and I can withdraw from the study at any time, without having to give a reason.	☐	☐
3. I understand that taking part in the study involves:	☐	☐
- *An audio-and video recorded observation.* - *The audio-and video recordings will be destroyed as soon as the transcripts are finalized.*		
4. I understand that the study will end after the observation	☐	☐
B: POTENTIAL RISKS OF PARTICIPATING (INCLUDING DATA PROTECTION)		
5. I understand that taking part in the study also involves collecting specific personally identifiable information (PII) and associated personally identifiable research data (PIRD) with the potential risk of my identity being revealed	☐	☐
• *PII: In the Informed Consent Form, the names and email addresses will be collected for administrative purposes. The Informed Consent forms will be stored separately from the other data and securely. They will only be accessible to the study team. The collected data will be anonymized and the names will be codified.* • *PIRD: Video recordings of the observations might result in respondents being identified. The video recordings are only available to the study team and the transcriptions will be stored separately and securely.* • *Re-identification: Colleagues might identify participants because of specific characteristics. Participants who are experts on a specific area might be identified. These risks will be mitigated by storing the collected data separately and not making it accessible to the companies. If certain information reveals someone is one of a handful of experts, this will be left out. Extracts of the transcripts might be used in the Results section of the thesis. The data will be anonymized and names will be codified. A risk might be that members of the same design team meeting can be re-identified. The goal of the research is to identify and describe improvisation, and not to evaluate the performance of every individual. The results will be presented in a neutral way.*		
6. I understand that the following steps will be taken to minimise the threat of a data breach, and protect my identity in the event of such a breach	☐	☐
- *Data will be anonymised* - *Data will be stored securely, accessible only to the study team*		
7. I understand that personal information collected about me that can identify me, such as my name, will not be shared beyond the study team.	☐	☐
8. I understand that the (identifiable) personal data I provide will be destroyed within 6 months after the research has ended	☐	☐
C: RESEARCH PUBLICATION, DISSEMINATION AND APPLICATION		
9. I agree that my responses, views or other input can be quoted anonymously in research outputs	☐	☐

Signatures

_____	_____	_____
Name of participant [printed]	Signature	Date

I, as legal representative, have witnessed the accurate reading of the consent form with the potential participant and the individual has had the opportunity to ask questions. I confirm that the individual has given consent freely.

_____	_____	_____
Name of witness [printed]	Signature	Date

I, as researcher, have accurately read out the information sheet to the potential participant and, to the best of my ability, ensured that the participant understands to what they are freely consenting.

_____	_____	_____
Researcher name [printed]	Signature	Date

Study contact details for further information:

Liz Hoogeveen
+316 11802891
l.hoogeveen@student.tudelft.nl

Appendix F: Informed Consent Form pre-brief and debrief

You are being invited to participate in a research study titled *Beyond the Boundaries*. This study is being done by Liz Hoogeveen from the TU Delft, who is currently graduating in Management in the Built Environment. This research is combined with an internship at Brink.

The purpose of this research study is to learn more about improvisation in design team meetings. Your participation consists of a semi-structured interview which will take you approximately 2x 15-20 minutes to complete. We will be asking you to share your thoughts on your plan for the design team meeting (pre-brief) and on improvisations that have taken place (debrief). In between, an observation of the design team meeting will take place. During the observation, we will be asking the participants to take part in the design meeting as normal.

As with any activity the risk of a breach is always possible. We might discuss topics that could lead to reputation damage or the exposure of confidential information. To the best of our ability your answers in this study will remain confidential. We will minimize any risks by destroying all personal data except for your role within the design team. Your answers will be anonymised. Confidential or sensitive information will be left out of the transcript and the audio recording of the interview will be destroyed as soon as the transcript is finalized. You are free to check the results and request changes if necessary.

Your participation in this study is entirely voluntary and you can withdraw at any time. You are free to omit any questions.

Thank you for participating.
Liz Hoogeveen

If you have any remarks or questions, please contact me:
l.hoogeveen@student.tudelft.nl

PLEASE TICK THE APPROPRIATE BOXES	Yes	No
A: GENERAL AGREEMENT – RESEARCH GOALS, PARTICPANT TASKS AND VOLUNTARY PARTICIPATION		
1. I have read and understood the study information dated [*DD/MM/YYYY*], or it has been read to me. I have been able to ask questions about the study and my questions have been answered to my satisfaction.	☐	☐
2. I consent voluntarily to be a participant in this study and understand that I can refuse to answer questions and I can withdraw from the study at any time, without having to give a reason.	☐	☐
3. I understand that taking part in the study involves:	☐	☐
- *An audio-recorded interview. Written notes might be taken.* - *The audio recording will be destroyed as soon as the transcript is finalized.*		
4. I understand that the study will end after the interview	☐	☐
B: POTENTIAL RISKS OF PARTICIPATING (INCLUDING DATA PROTECTION)		
5. I understand that taking part in the study also involves collecting specific personally identifiable information (PII) and associated personally identifiable research data (PIRD) with the potential risk of my identity being revealed	☐	☐
• *PII: In the Informed Consent Form, the names and email addresses will be collected for administrative purposes. The Informed Consent forms will be stored separately from the other data and securely. They will only be accessible to the study team. The collected data will be anonymized and the names will be codified.* • *Re-identification: Colleagues might identify participants because of specific characteristics. Participants who are experts on a specific area might be identified. These risks will be mitigated by storing the collected data separately and not making it accessible to the companies. If certain information reveals someone is one of a handful of experts, this will be left out. Extracts of the transcripts might be used in the Results section of the thesis. The data will be anonymized and names will be codified.*		
6. I understand that the following steps will be taken to minimise the threat of a data breach, and protect my identity in the event of such a breach	☐	☐
- *Data will be anonymised* - *Data will be stored securely, accessible only to the study team*		
7. I understand that personal information collected about me that can identify me, such as my name, will not be shared beyond the study team.	☐	☐
8. I understand that the (identifiable) personal data I provide will be destroyed within 6 months after the research has ended	☐	☐
C: RESEARCH PUBLICATION, DISSEMINATION AND APPLICATION		
9. I agree that my responses, views or other input can be quoted anonymously in research outputs	☐	☐

Signatures

_____	_____	_____
Name of participant [printed]	Signature	Date

I, as legal representative, have witnessed the accurate reading of the consent form with the potential participant and the individual has had the opportunity to ask questions. I confirm that the individual has given consent freely.

_____	_____	_____
Name of witness [printed]	Signature	Date

I, as researcher, have accurately read out the information sheet to the potential participant and, to the best of my ability, ensured that the participant understands to what they are freely consenting.

_____	_____	_____
Researcher name [printed]	Signature	Date

Study contact details for further information:

Liz Hoogeveen

+316 11802891

l.hoogeveen@student.tudelft.nl

Appendix G: Analysis of improvisations

	Improvisation	React to unexpected	Deviation from existing plan	Unknown outcome	"On the spot"	Perspective	Within setting?		Type	The head	Parallel
int 1	Unusual placement extraction air					PM			Small deviation design	Design	
int 1	Client wants extra room					PM			Change client	Program of requirements	
int 2	Energy supply will not be organised as expected; other piece of land has become available this morning and can bring opportunities					PM			Change circumstances		
int 3	One attendee shows unexpected behaviour by keeping to blame another attendee					PM			Unexpected behaviour	Contracts	
int 3	Architect has changed the design of the facade completely in 1 week time					PM			Big change in design during late phase	Design	
int 3	Attendee becomes personal					PM			Unexpected behaviour	Contracts	
int 4	Architect creates design which deviates from expectations client					PM			Big change in design during late phase	Design	
int 4	Project abroad: all the involved parties are "taken off the street"					PM			Change circumstances		
int 4	Existing parts of the ceiling are used for the plinth					PM			Small deviation design	Design	
int 5	Client wants to make a change					PM			Change client	Program of requirements	
int 5	Using unique lighting fixtures					PM			Small deviation design	Design	
int 5	Wooden structure is too hard to calculate, so it's taken to another party					PM			Organizational deviation	Contracts	
int 5	Leasing an elevator					PM					
int 5	Estimating the costs based on earlier designs					PM			Estimation		
int 6	Making open facade closed one day before deadline					PM			Big change in design during late phase	Design	
int 6	Deviation from the agenda					PM			Deviation agenda	The agenda	
obs 2	Architect needs information from other party. PM proposes to go after the other party. Architect needs answer in short time frame and decides to call the other party after the meeting					Researcher			Organizational deviation	Contracts	Soloing
obs 2	Previously, the attendees agreed to create a product list. During the meeting, it was not finished and the value of the list was questioned					PM & Researcher			Reacting to mismatching expectations	Contracts	
obs 2	Point on action list was not clear. Attendees try to come up with meaning behind the action					PM & Researcher					Embracing errors
obs 2	Architect asks installations advisor if some parts can be left out. Without checking, the installations advisor says: "Yes"					Researcher			Estimation	Design	Soloing
obs 2	Project manager had sent document before meeting but attendees hadn't read it					PM			Reacting to mismatching expectations	Contracts	
obs 3	Installations advisor, manufacturers, architect and contractor draw scenarios for fire safety					Researcher			Small deviation design	Design	Trading fours
obs 3	Project manager decides to make a list of points to discuss during another meeting					Researcher			Deviation agenda	Agenda	Soloing
obs 3	Architect, manufacturers and contractor discuss options for connection of design					Researcher			Scenarios	Design	Trading fours
obs 4	Interior designer shows type of toilets, local experts react, interior designer changes type					PM & Researcher			Small deviation design	Design	Trading fours
obs 4	Local expert will visit the building and local expert 2 proposes to also look at the toilets when visiting					Researcher			Organizational deviation	Contracts	
obs 4	No agenda, "You are the bosses, you tell me what to do"					PM & Researcher			Deviation agenda	Agenda	Comping
obs 4	Architect takes responsibility which isn't theirs					PM			Reacting to mismatching expectations	Contracts	Soloing
obs 4	Interior designers says they will "elaborate on things" while PM expected to only focus on specifications					PM			Reacting to mismatching expectations	Contracts	
obs 5	PM decides on the spot it would be good to write an email to the municipality about a certain ramp					Researcher			Organizational deviation	Contracts	
obs 5	Architect proposes some solutions to fix the acoustics in the main hall					Researcher			Scenarios	Design	Soloing
obs 5	Deviation from the agenda					Researcher			Deviation agenda	Agenda	Comping
obs 5	Architect proposes some solutions to create a depth effect in the facade					Researcher			Scenarios	Design	Soloing
obs 5	Constructor asks how much space is needed for air shafts and installations advisor answers "on the top of my head"					Researcher			Estimation		Soloing
obs 5	PM thought it was known that the window cleaning installation hadn't been chosen yet but the constructor thought the choice had been made					PM & Researcher			Reacting to mismatching expectations	Contracts	
obs 5	Attendees thought that constructor knew about certain channels in the floors, but they did not yet					PM & Researcher			Reacting to mismatching expectations	Contracts	
obs 6	Architect wants to get certainty about budget next week but this is not possible for the installations advisor					Researcher			Reacting to mismatching expectations	Contracts	
obs 6	Installations advisor proposes solutions to cut in the budget					Researcher			Scenarios	Design	Soloing
obs 6	Architect decides it will be possible to create a ventilation shaft up to the roof					Researcher			Estimation		Soloing
obs 6	Client explains a lot of sand wil blow and the installations advisor decides to not make use of natural ventilation					Researcher			Small deviation design	Design	Comping
obs 6	PM asks about placement of air handling units and does a couple of alternative propositions					Researcher			Scenarios	Design	Provocative competence