# Exploring collaboration in hospital projects’ front-end phase

## Abstract

Hospital projects, like other major projects, start with the front-end phase, which considerably affects projects’ strategic success. There is an expressed need for more knowledge of the front-end to improve and thus strengthen the odds for strategic success. Hospital projects are complex and challenging to run much due to multiple stakeholders and societal impact. Hospital projects’ stakeholder multiplicity makes collaboration a fundamental activity in the front-end. In this paper, we propose a framework for front-end collaboration in hospital projects constituting the following interdependent categories: contexts, structures, means and catalysts. The categories interact to make collaboration happen and make collaboration work, indicating that the different categories should be considered at different times in the planning process. Successful collaboration may positively affect project outcome and leads to innovation and learning, which are important assets for hospital projects in identifying successful future solutions hence strengthening the projects’ odds for long-term success.

*Keywords*: Project front-end, hospital projects, collaboration,

# Introduction

Despite established knowledge of the front-end’s role in achieving project success (Edkins et al., 2013; Flyvbjerg, 2017; Miller & Hobbs, 2005; Samset & Volden, 2016), the front end phase and role of project management in this phase still appear to be insufficiently understood (Tzortzopoulos et al., 2006; Williams et al., 2019), (Edkins et al., 2013).

Also in hospital projects, the importance of the front-end phase is recognised. Insufficient exploration of the opportunity space in terms of focussing on structural issues rather than looking into future concepts integrated with users’ needs, may lead to poor outcomes (Elf et al., 2012; Elf & Malmqvist, 2009). Rapid changes in the health sector due to technological and medical advances challenge the development of hospital concepts suitable to meet future needs and the hospitals’ long-life expectancy (Bayer et al., 2007; Ettelt et al., 2009; Pauget & Wald, 2013; Särkilahti, 2017). De Neufville and Scholtes (2011) illustrate the value of a flexible design in hospital projects.

Being complex organisations, hospitals, comprise a multitude of different activities, professionals and mindsets organised differently (Fréchette et al., 2020; Glouberman & Mintzberg, 2001; Mintzberg & Glouberman, 2001). This point of departure makes hospital *projects* complex at several levels, carrying multiple paradoxes (Aubry et al., 2014). Organisational, structural and managerial complexity due to e.g. multiple and heterogenic stakeholders (Aubry & Lavoie-Tremblay, 2018; Aubry et al., 2014; Pauget & Wald, 2013; Särkilahti, 2017), as well as uncertainties and pace connected to future medical, technological and demographic development (Bayer et al., 2007; Eeckloo et al., 2007; Ernst & Young, 2016; Särkilahti, 2017), and the projects’ socio-political position and inherent decision-making processes (Aubry & Lavoie-Tremblay, 2018; Eeckloo et al., 2007; Särkilahti, 2017), make these projects challenging to run. [LIST OF REFERENCES SPLIT AND MOVED TO REWRITTEN TEXT ABOVE]. Coping with project complexity calls for further understanding of the more informal mechanisms embedded in the complexity (Bygballe & Swärd, 2019; Bygballe et al., 2016; Cicmil & Marshall, 2005).

Collaboration is viewed as a stakeholder management strategy (Aaltonen et al., 2015; Savage et al., 2010). Although regarded as fundamental for front-end managing (Edkins et al., 2013; Williams et al., 2019) and project success (Baccarini, 1999; Tzortzopoulos et al., 2006), managing stakeholders and their dynamics is not well understood for the front-end phase (Aaltonen et al., 2015). Stakeholder management strategies are also important means for project managers to shape and handle stakeholder dynamics and positions, in both the front-end (Aaltonen et al., 2015), and generally (Olander & Landin, 2005; Savage et al., 1991). From a practitioner’s viewpoint, collaboration is a characteristic of projects as complex social settings (Bygballe & Swärd, 2019; Cicmil et al., 2006).

Showing a duality being both a construction project and an organisational change project, hospital projects demand the integration of different skills, knowledge and project perspectives. Managing such integration in the front-end phase, where uncertainty is high and information is scant, places demands on the project participants both on an individual and organisational level. Inter-organisational collaboration is associated with both risk and complexity, and collaborative efforts are associated with high failure rates (Bygballe & Swärd, 2019; Gulati et al., 2012). Efforts should be made to overcome these challenges in early project phases (Saukko et al., 2020).

Although we are aware of many possible challenges in the front-end phase of major projects that would be worth studying, ref. e.g. Flyvbjerg (2017), our study is limited to investigating collaboration in hospital projects’ front-end from a practical viewpoint, taking into account hospital projects’ multiple stakeholder-nature. Several authors recognise collaboration as important and challenging and closely connected to a successful project performance and outcome, however, these efforts mainly concentrate on the project execution phase (Bygballe et al., 2016; Dietrich et al., 2010; Haaskjold et al., 2019; Ika & Donnelly, 2017; Kokkonen & Vaagaasar, 2018; Lavikka et al., 2015; Merschbrock et al., 2018; Pauget & Wald, 2013; Sebastian, 2011). Ika and Donnelly (2017) found that structural, institutional and managerial conditions might enable project success, which can be both initial and emergent. Collaboration was assigned as one of four meta-conditions (multi-stakeholder commitment, collaboration, alignment and adaption), incorporating the former conditions and providing a strong link between context and success factors (Ika & Donnelly, 2017).

So, how can we understand collaboration in hospital projects’ front-end? We set out to answer this research question by studying three Norwegian hospital projects of different size and scope.

Several Norwegian hospital projects have commenced in the last 10-20 years, constituting a unique opportunity for studying the planning of hospital projects of different sizes and scope. Several authors and entities highlight the need for knowledge, innovation and reasonable use of resources in the planning processes (Consulting Engineers' Association (RIF), 2015; Ernst & Young, 2016; Helse- og omsorgsdepartementet (HOD), 2015; Larssen, 2011; Office of the Auditor General in Norway, 2011; Pauget & Wald, 2013).

[PARAGRAPH ADDED TO PRESENT STRUCTURE OF PAPER ACCORDING TO R4]:

The paper starts with presenting the theoretical framing comprising three strains of literature: the front-end and decision-making, hospitals and complexity, and stakeholders and collaboration. The methods and data structure of the study is then presented, followed by our findings from 13 semi-structured interviews and subsequent analysis and discussion on how collaboration can be understood in hospital projects’ front-end. Finally, we present our implications and concluding remarks, suggesting a framework for collaboration, and point to further avenues for research.

# Theoretical background and literature review

The theoretical basis for our study combines three domains mainly viewed through a project management lens: the front-end phase and decision-making, hospitals and complexity, and stakeholder handling and collaboration, presented in the following section.

## The front-end phase and decision-making

A literature study by Williams et al. (2019) states that front-end literature is sparse, and despite the front-end’s critical impact on projects’ strategic success, it is not fully understood. Projects’ front-end shows several characteristics, among these are high uncertainty levels, low levels of information, stakeholder recognition and knowledge of their interests and preferences (Williams et al., 2019).

Front-end decision-making is especially important for projects’ long-term success, as described by several authors and summarised by Williams et al. (2019). Moreover, the decisions are made in complex and sometimes turbulent environments (Williams & Samset, 2010). In public projects, the decisions are made on behalf of the society and should ensure beneficial long-term project outcomes, both financially and developmentally. Appreciation of the front-end’s importance for project outcome has increased in recent years (Williams & Samset, 2010). Samset and Volden (2016) point at several challenges in public projects due to deficiencies in front-end analytical and political processes. Denis et al. (2011) bring to our attention the concept of ‘escalating indecision’, describing perpetual strategic decision-making processes. When multiple actors with divergent views have to make decisions but are unable to arrive at a final agreement despite persistent decision-making efforts, their indecision will compromise project implementation (Denis et al., 2011). Inherent structural and dynamic complexities create uncertainty and unpredictability influencing decision-making and thus project management (Daniel & Daniel, 2018).

To support decision-making and ensure project success, analytical and political deficiencies should be met through proper governance that is balancing proper systems, processes and tools (Samset & Volden, 2016; Turner et al., 2013). Governance of projects is further connected to organisational behaviour and human resource management (Turner et al., 2013), which is in accordance with the need for considering what Williams and Samset (2010) refer to as social geography in these processes.

## Hospitals and complexity [MINOR CHANGES MADE TO PROVIDE MORE RHYTHM TO THE TEXT]

Hospital projects are complex at several levels, much due to hospital organisations inherent diversities (Fréchette et al., 2020; Glouberman & Mintzberg, 2001; Mintzberg & Glouberman, 2001). Healthcare organisations are identified as complex systems, and making changes to these systems is challenging (Aubry et al., 2014). In addition, hospital projects are both construction projects and organisational transformation projects (Fréchette et al., 2020; Gordon & Pollack, 2018).

Complexity in project management is not clearly defined, and complexities are found in many forms such as structural complexities, dynamic complexities, pace, socio-political complexities and uncertainties (Daniel & Daniel, 2018; Geraldi et al., 2011; Müller et al., 2011). To enable improvement of complex systems, such as hospital projects’ front-end, both structural and dynamic complexity should be considered, affecting project managers and decision makers through the creation of unpredictability (Daniel & Daniel, 2018). Managing under uncertainty, as is the case in hospital projects’ front-end, calls for organisational improvisation and the ability to model, experiment and learn in order to improve (Daniel & Daniel, 2018). The most successful planning processes are experienced when commitment to management and planning happens simultaneously through experimentation and mutual learning (Elf et al., 2015).

Skills required to manage complex projects go beyond those connected to project management, and beneficially combine with elements from change management (Bygballe, 2010; Olsson, 2008), especially in the projects’ front-end and for the management of stakeholders (Gordon & Pollack, 2018). [SECTION CURTAILED]

Pauget and Wald (2013) stress different stakeholders’ need for relational competence in complex surroundings. Projects need to be seen as social systems (Cicmil & Marshall, 2005) and people-oriented issues (Gordon & Pollack, 2018; Turner et al., 2013) require attention. The need for understanding human relationships in order to manage collaboration is emphasised by several authors (Bygballe, 2010; Bygballe et al., 2016; Olsson, 2008; Pauget & Wald, 2013; Pemsel et al., 2010). Informal relations may bring different stakeholders closer, and may facilitate communication, which is crucial in these complex environments (Barlow & Köberle-Gaiser, 2009; Bygballe, 2010; Elf et al., 2015; Elf & Malmqvist, 2009; Kokkonen & Vaagaasar, 2018; Pemsel et al., 2010).

The context is very important when designing organisations (Aubry & Lavoie-Tremblay, 2018). It shapes the organisation and should be described through a joint collaborative effort among project stakeholders (Aubry & Lavoie-Tremblay, 2018). The hospital organisation and project operate in pluralistic settings, characterised by diffuse power and divergent interests (Aubry et al., 2014; Denis et al., 2011). In such settings, strategy making is understood to be broadly participative compared to more hierarchical settings (Denis et al., 2011). In a Scandinavian context, there is a pronounced tradition for user involvement as part of a strong democratic culture (Eriksson et al., 2015; Olsson, 2008; Strand & Freeman, 2015). Involvement is a process that lasts throughout the front-end phase, and is a key success factor both in hospital projects (Henriksen et al., 2006; Olsson et al., 2010), and for building design and briefing in general (Elf et al., 2012; Eriksson et al., 2012; Eriksson et al., 2015; Olsson et al., 2010; Tzortzopoulos et al., 2006).

## Stakeholders and collaboration [AS ABOVE]

Complexity, management and interaction of multiple stakeholders are well-known challenges in major projects (Cicmil & Marshall, 2005; Cooke-Davies, 2009; Dietrich et al., 2010; Engwall, 2003; Eskerod et al., 2015b; Flyvbjerg, 2017; Lenfle & Loch, 2017; Merschbrock et al., 2018). Stakeholder multiplicity and potential diversities in goal perception, interests and expectations challenge stakeholder handling (Gordon & Pollack, 2018; Smith & Lewis, 2011; Williams et al., 2019). Public projects’ front-end phase also often involve major political and societal processes, considerably influencing the planning and decision-making processes (Williams & Samset, 2010). A wide variety of people and organisations often having conflicting perspectives on hospital projects, affect or are affected by the project. The external context, i.e. politics, is pronounced (Aubry & Lavoie-Tremblay, 2018), and political processes play an important role in the front-end phases (Aaltonen et al., 2015). Diversities or plurality may create tensions between organisations or individuals, such as multiple and competing goals, challenges to organisational identity following role change, a need for flexibility and an altering of stable routines (Aubry et al., 2014; Smith & Lewis, 2011). [SECTION CURTAILED; highlighted text moved here from a later section]

Careful planning and flexibility regarding the management of stakeholders may lead to a successful front-end phase, but need different approaches and flexibility due to stakeholders’ varying degree of salience (Aaltonen et al., 2015; Williams et al., 2019). Failing to manage the different views and understandings of multiple stakeholders may adversely affect long-term project success (Baccarini, 1999; Gareis et al., 2013; Klakegg, 2010; Silvius & Schipper, 2014; Toor & Ogunlana, 2010).

Although tensions are demanding to manage, and potentially harmful for project performance and outcome, they could be an asset for the projects if harnessed (Smith & Lewis, 2011), and co-existence of order and conflicts are found (van Marrewijk et al., 2016). van Marrewijk et al. (2016, p.1747) also found that ‘*…Complexity, ambiguity and uncertainty…. can drive collaboration in complex organisations*’. Smith and Lewis (2011) suggest paradox theory as an approach to cope with such contradictions, which are becoming more common in today’s complex environments. Managerial implications of paradoxes is to view management as a process where paradoxes continually are rearranged (Cicmil & Marshall, 2005). [SECTION CURTAILED]

Even if project management’s role in handling stakeholders in complex settings is limited (Aaltonen et al., 2015), some efforts are needed. Several strategies for stakeholder handling exist (Savage et al., 1991), collaboration being one of these. Collaboration is not comprehensively defined, but can be seen as a human resource strategy (Bedwell et al., 2012). Bedwell et al. (2012, p.130) define collaboration as ‘…*an evolving process whereby two or more social entities actively and reciprocally engage in joint activities aimed at achieving at least one shared goal*’. Collaboration further makes organisations solve problems or achieve results they could not do alone (Savage et al., 2010), and is a way of coping with uncertainty and ambiguity (Walker et al., 2017). To counter potential conflicts of interests or tensions due to different stakeholder views compromising project performance, efforts to create a shared identity would be helpful (Bedwell et al., 2012).

Preparation for changes in the traditional organising, decisive authority and decision-making structures should be present to enable collaboration (Bygballe, 2010). Changes that break with established routines call for a considerable involvement of employees (Bygballe, 2010; Olsson et al., 2010). When designing the project organisation, it should be acknowledged that the real collaboration happens between stakeholders even if it is arranged at the organisational level (Bygballe & Swärd, 2019; Bygballe et al., 2016; Kokkonen & Vaagaasar, 2018).

Front-end involvement enables the project organisation to record the different stakeholders’ recommendations for the project, which may improve the project and save money (Bygballe, 2010). Management in the front-end phase should be able to focus on more social and relational issues, e.g. building trust, mutual understanding, rather than the project itself (Bygballe et al., 2016; Matinheikki et al., 2016; Merschbrock et al., 2018; Pauget & Wald, 2013), as the importance of the social dynamics seen in such organisational settings are considered as important as structural dimensions (Aubry et al., 2014; Turner et al., 2013; Winch & Cha, 2020).

Coordination mechanisms, such as mutual decision-making, shared goals and co-location, have a positive impact on collaboration, and are needed early in the front-end (Lavikka et al., 2015). Managers should be aware of how to use these mechanisms and of the influential relational factors underlying them (Bygballe et al., 2016).

# Methods

## Research setting and approach [MINOR CHANGES ACCORDING TO R4]

The findings presented in this paper, is part of a larger empirical study aiming to obtain further insight into hospital projects’ front-end for the purpose of improvement. We address the collaboration phenomenon in hospital projects’ front-end phase by leaning on theoretical underpinnings regarding collaboration’s general importance in major projects. Due to the nature of our research question, and limited previous research on front-end collaboration, we have chosen to use a qualitative research design, following an exploratory purpose. This is a suitable approach, according to Mason (2018) and Saunders et al. (2009), when the aim is to generate data from relevant respondents’ experiences and answers to questions. Using interviews for collecting data is suitable for gaining in-depth knowledge of the planning processes (Kvale & Brinkmann, 2015; Mason, 2018; Saunders et al., 2009; Tjora, 2012; Yin, 2014), and further allows for directly focussing on the study‘s topic and provide explanations as well as personal views (Yin, 2014).

Prior to data analysis, we did a literature study to create a reference frame for studying collaboration viewed through a project management lens. We found previous research to be limited although some efforts are made to describe collaboration in hospital projects, however not specifically for the front-end phase. Malterud’s Systematic Text Condensation (STC)-method was used for data analysis. This method is inspired by phenomenological ideas, and offers a pragmatic and iterative approach, and a process of inter-subjectivity, reflexivity and feasibility while maintaining methodological rigour (Malterud, 2011; Malterud, 2012). STC is a descriptive and explorative method for analysing qualitative data focussing on participants’ meanings and experience, which was suitable for this study (Malterud, 2011; Malterud, 2012). The method is further used in a range of qualitative research (Sari et al., 2017), and is considered structured and well-defined (Sagsveen et al., 2018). Several of the qualitative studies using STC belong to health sciences, which fits with this study’s scope. The method implies an inductive approach, however, the link to findings from the literature study provided a lens for our interpretation (Malterud, 2001), and was further used as a preliminary template for the coding procedure. This balanced data openness and the need for some initial structure, partly reflecting topics from the interview guide and literature review (Fereday & Muir-Cochrane, 2006; King, 2004; King et al., 2002).

### The Norwegian context

Norwegian public hospitals’ structure consists of regional and local levels. Four Regional Health Authorities (RHAs) are formal owners of different Local Health Authorities (LHAs) that consist of one or more hospitals with different size and services. The RHAs derive their funding from the Norwegian Ministry of Health and Care services (Ministry). By law, RHAs have the superior responsibility for all investments needed in the hospitals in their area. The LHAs should elaborate on local requirements for health care services through a strategic plan stating the need for investment projects. When investment projects exceed 50 million Euros, there is a governmental demand to employ the national competence-hub for hospital planning and building, the Norwegian Hospital Construction Agency (NHCA), founded in 2014. Norwegian hospitals are planned using guidelines issued by the NHCA in 2017. The planning process builds on a stage-gate model (Figure 1). For projects exceeding 50 million Euros, it is obliged to carry out an external quality assurance (QA).



Figure 1 Front-end planning according to the NHCA guidelines, adapted from NHCA (Sykehusbygg HF, 2017)

Based on reports elaborated in the concept phase and the QA, investment decisions are made at the regional level. Finally, the reports are presented to the Ministry, and serve as the basis for an application for loan and approval according to legislation.

The organisational structure of the planning process varies among Norwegian hospital projects. In a broad outline, project organisations comprise internal stakeholders from both the LHA, serving as senior user coordinators or as members of different stakeholder groups, and the expert organisation, (EO/NHCA) owned by RHAs, as well as architects and engineering consultants. The composition of the different stakeholder groups may vary, but they comprise mainly hospital employees from different disciplines (both medical and technical), patient representatives, representatives from the local municipalities, different spokespersons for hospital employees, and personnel safety representatives. In some projects, internal stakeholders from the LHA titled project managers manage these groups.

## Data collection

Textual analysis of interviews with project participants from three different hospital projects has been the primary data source. This has enabled us to gather experiences from different project environments and to potentially shed light on cross-project differences and similarities. The projects were conveniently sampled (Marshall, 1996; Saunders et al., 2009), based on personal networks and publicly available front-end documents. It was an inclusion criterion that all projects should have completed an external quality assurance that is reached the B3-gate in the stage-gate model, Figure 1.

To gain in-depth insight into hospital projects’ front end collaboration, we interviewed 13 people engaged in the projects employed by either NHCA, LHA or RHA (Table 1). To recruit our respondents, we used a sampling strategy based on both convenience and judgement (Marshall, 1996; Saunders et al., 2009), interviewing persons that had approximately the same role in the different projects. Primarily the respondents from the NHCA answered from a specific project point of view. However, this did not exclude the possibility for them to compare or share experiences from other projects as a means for shedding light on the planning processes and collaboration. The interviews were performed from February 2019 until October 2019. We also encouraged the respondents to suggest other respondents based on their experience and knowledge of the field; known as a ‘snowballing’ approach (Tjora, 2012).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Respondent | Organisation | Role | Interview type | No. of interviewers |
| 1 | LHA | Managing director | Notes (pilot) | 1 |
| 2 | LHA | Assistant managing director | Notes (pilot) | 1 |
| 3 | LHA | Senior user coordinator | Recording | 2 |
| 4 | LHA | Senior user coordinator | Recording | 2 |
| 5 | NHCA | Manager/Advisor | Recording | 2 |
| 6 | NHCA | Planner | Recording | 2 |
| 7 | NHCA | Planner | Recording | 1 |
| 8 | RHA | Property manager | Recording | 1 |
| 9 | LHA | Project manager infrastructure/Advisor | Recording, Skype | 3 |
| 10 | LHA | Project director | Recording, Skype | 1 |
| 11 | NHCA | Manager counselling | Recording | 1 |
| 12 | NHCA/RHA | Planner/ Project manager | Recording | 1 |
| 13 | NHCA/RHA | Planner/ Project manager | Recording | 1 |

Table 1 Overview of respondents

Prior to interviewing, a study protocol was made in a manner similar to establishing a case study protocol, as recommended by Yin (2014) and Kallio et al. (2016), to increase the trustworthiness and reliability of the study. Transparency, both regarding the research process and theory, improves the reliability (Olsson & Spjelkavik, 2014). To strengthen the study’s validity, we used multiple data sources to gather information such as publicly available front-end documents to prepare for the interviews and a literature study to create a point of departure for the data analysis.

We used semi-structured interviews with open ended questions with the possibility to change the questions’ order, to provide for the required flexibility and ability to adapt to the situation (Saunders et al., 2009). The objective was not to quantify results but rather to get descriptions of the topic with different nuances/perspectives (Kvale & Brinkmann, 2015). Open questions aim to give the respondents the opportunity to speak freely and delve deeply into parts of the topic when they have thorough insight, meanings or experiences to share (Tjora, 2012). Semi-structured interviews also provide possibilities for permitting digressions in order to explore different angles of the main topic not thought of by the interviewer in advance (Tjora, 2012). The subjective experiences on collaboration are important for gaining deeper insight into its influence on the front-end, which is the main objective of our work.

All respondents received written information regarding the study and its objectives prior to the interview. This enabled them to prepare by gathering documentation and reflect on earlier events and processes before being interviewed, an approach known to increase study validity and reliability (Saunders et al., 2009). All respondents consented by signing a form. Information was treated confidentially according to national requirements and was approved by application to the Norwegian Centre for Research Data.

In accordance with Kallio et al. (2016), we additionally pilot-tested the interview guide on two respondents with considerable experience from hospital projects’ front-end. The pilot interviews were carried out taking notes without audio recording and led to minor adjustments of the interview guide and to expanding the duration of the interview from 60 to 90 minutes.

Interviews were conducted using audio recording, with one researcher serving as the main interviewer in all interviews. All respondents agreed in advance to the presence of two or three researchers during the interview. Several interviewers called for a structured interview schedule, which was managed by jointly discussing the interview guide and the technique in order to strengthen reliability. One researcher carried out the transcription of the interviews by carefully listening to the recordings at slow speed and writing down everything that was said. Afterwards, while listening to the recording at normal speed, the completed transcriptions were read and checked.

## Data analysis

Wanting to gain deeper insight into the phenomenon of collaboration, we based our data analysis on Malterud’s Systematic Text Condensation (STC)-method (Malterud, 2011). However, we did not use a purely inductive approach, applying both theory-driven and data-driven codes. The interview transcripts were coded using the template of theory-driven codes and simultaneously assigning inductive codes that emerged from the text. When new codes emerged, previous coded transcripts were re-analysed in light of the new codes, keeping in mind that it is important that the a priori codes are flexible and open to minor or major modifications, and can even be deleted, as the analytical process progresses (King et al., 2002). All data were coded using NVivo software version 12 (QSR International, 1999-2018).

Analysis of the complete set of codes (n=33) made it clear that some of the codes were more or less interrelated, and hence could be grouped into twelve preliminary categories. Text assigned to each code in each category was read and the content condensed in order to make the most essential features of the phenomenon of collaboration in hospital projects emerge. Our professional point of departure, in our case project management in the front-end of projects, are known to influence these features (Malterud, 2011). Further analysis of the condensed contents of the different categories lead to a final clustering into four main categories describing collaboration in the front-end of hospital projects. The data structure is shown in Figure 2.

STRUCTURES

MEANS

CATALYSTS

CONTEXTS

Theory-driven and

data-driven (n=33)

Organising

Roles

Competence

Management

Involvement

Change capability

Catalytic actions and relations

Complexity

Inner context

Outer context

Perspectives

Project triggering factor(s)

**INITIAL**

**CODING**

**PRELIMINARY CATEGORIES**

**MAIN**

**CATEGORIES**

Figure 2 Data structure [ORDER OF MAIN CATEGORIES CHANGED TO MIRROR ORDER IN TEXT]

# Results and analysis [INTRODUCTION TO CHAPTER REVISED ACCORDING TO R4]

As shown in Figure 2, four main categories, comprising sets of preliminary categories, emerged from our analysis. The contexts define the projects’ opportunity space mounted mainly by political and analytical determinants, objectives and needs. The contexts set premises for collaboration, but are also a way of shaping the project using existing diversities to explore the opportunity space. Structures point at the expressed need for clarity in organisation and roles in order to collaborate, while means describe the necessity of involvement, management and competence. The last category, catalysts, comprises actions and relations needed for collaboration together with the ability and capacity to change. In the following, we elaborate on the four main categories.

## Project contexts affect collaboration

The respondents described the front-end as both demanding and exciting and emphasised that balancing the multidisciplinary stakeholders, politics and directives made collaboration in the front-end a challenge.

‘…it [the front end] is probably the most exciting and challenging part of the projects, at least in my opinion. Where…where in a way many topics are mixed; methods and politics and…and… the LHA, economy, and sort of everything that are supposed to be handled in the front-end. So this is both challenging and exciting to be working with’

(Planner)

The projects’ studied showed that it is common for hospital projects to have a turbulent history or being the cause of political conflicts about localisation or allocation of resources. The respondents stressed the severe impact this had on both the LHA and the project organisation, as well as and the local community, and hold that it should be accounted for in the planning process. Stakeholders showed different priorities due to different perspectives, and the respondents have experienced demanding discussions and tensions between the project organisation and the LHA, between RHA and LHA, inside the LHA and towards the local communities and political level. For example, clinical managers from the LHA felt put up against each other having to make decisions regarding allocation of resources or localisation preferences, making them defensive and reducing their ability to think in conceptual terms.

‘…there was some intense discussions on hospital functions uh… internally among the LHA managers too… of course..haha…You try to keep what belongs to you [your responsibility], in a way, the situation puts us up against each other’

(LHA stakeholder)

The clash of interests have been of such a strength that decision-makers have initiated re-assessments or made fuzzy decisions to please everyone and to stabilise the situation. This is considered both time-consuming and expensive, creating a perpetual decision-process. It may also alter the project’s ability to find suitable conceptual solutions. The respondents elucidated that the wish for stabilising the conditions and avoid reviving old conflicts may lead to an indecisive and unclear project, aiming to please all participants and the local community. This can further have considerable consequences for project progress and the short-term and long-term project outcomes. Some LHA representatives experienced that being loyal to decisions made was challenging given the turbulent project context, but still necessary to navigate through the complexity of the front-end phase.

‘Not following current decisions would have made us all fall flat on our faces long ago’

 (LHA stakeholder)

All respondents highlighted the importance of the project owner’s (the LHA and/or the RHA) strategic responsibility, that is to point out the direction and be future-oriented. The respondents claimed that the LHA does not fully utilise possibilities that lie within the project, leading to dissension in the internal and external contexts. When the projects lack strategic capability the projects seem to experience a time-consuming ‘consolidation phase’ when starting the front-end. This may further become a ‘survival of the fittest’ process potentially compromising the search for suitable concepts and exploitation of the opportunity space.

‘We have started to […] introduce this corporate strategy thing. We more or less try to..to…inform our principal about the need for a corporate strategy that guides us when things happen in the future […] what happens if we do not get all the functions we have said that we will, you know...[…] it has been like no one wants to touch this, it is politically challenging, challenging for the workforce and everything…and then you get these breaks and delays and the hard discussions and decisions if you haven’t made a good strategy up-front’

(Planner)

‘…my most important message has to be to really use time early on to set direction and premises and discuss the opportunity space before the concept phase is started…’

(Planner)

Independent of organisational belonging, the respondents highlighted involved users’ difficulties in meeting the front-end’s expected level of abstractness. The front-end requires skills that differ considerably from the hospital’s core business. Still, involvement of hospital personnel is considered critical to gain the necessary insight into daily operations and future professional development. If decisions result from a process perceived as involving and focussed, they seem to appear stronger. This may also mitigate re-opening difficult (political) discussions, ease project managers’ work, and positively influence project progress. The respondents pointed out that involved users from the hospital came from daily operations and struggled to let go of day-to-day challenges, which made it difficult to fully exploit the possibilities of identifying possible future concepts. As pointed out by one respondent, hospital employees have a tradition for being solution-oriented and practical, making the front-end’s level of abstraction challenging. Early on, they express a need for concretising in terms of calculations and drawings, which may be unfortunate for keeping the opportunity space open for as long as possible.

‘…the moment lines are drawn on paper, a lot appear to be locked. And then people start to think about the lines instead of function’

(Planner)

Another example is the LHA’s financial situation, which considerably affects the ability to exploit the opportunity space sufficiently. In one case, for parts of the LHA, the project became an explanation or scapegoat for the bad financial situation. Others looked at the project as part of the solution for solving the financial situation. Such different views make collaboration challenging on several levels. Thus, the projects are capable of introducing an ambivalence or paradox into the LHA and have the power to split the organisation. Paradoxes are also experienced because of different maturity levels, especially between the EO and the users. The projects need to keep a certain timeline to reach the National budget, and the LHA representatives have felt time pressure. They describe that the need for making the National budget force them to make judgements quickly missing the possibility for reflecting on potential consequences. The EO, on the other hand, has gradually gained more experience and competence in executing the planning process, while hospital employees need time to grasp the bigger picture and process different solutions. This may become a dilemma in the planning process, balancing the time needed for maturity and hereby the creation of ownership, with the need for keeping the timeline.

 ‘… it feels like decisions are made to fit the process so that you can continue the project without really looking at consequences. At least this is how it appears to me…’

(LHA stakeholder)

To some extent, the EO shares this view by the development of concepts not being optimal.

 ‘Well, in a way you don’t get… there is no room for the ‘brainstorming’-phase? Where you really get to take the challenge in finding new solutions…uh… having some time and space to be flexible…’

(Planner)

Furthermore, the respondents mentioned the parent organisation’s culture, a component of the inner context, as a strong influential force on the project planning and collaboration. Some respondents highlighted that poor organisational culture, shown as mismanagement or unclear decision lines, are generally unfortunate for collaboration. Using existing organisational assets to run the project is unfortunate without taking precautions and preparing the planning process in some sort of way. The respondents pointed to establishment of a project strategy, structure and clarity as tools for handling difficult contextual factors by creating a mutual understanding of the premises and project goal.

## Structures and means

Our respondents guided us into finding both formal and more informal categories describing collaboration such as structure and means. Shortcomings in these categories might compromise collaboration or make it more difficult.

### Expressed need for structures

The projects studied are organised differently. There are differences in the involvement of the EO, financial responsibilities, project ownership and the establishment of a project board. The respondents offered no unified explanation for this, but indicated that it is about to be standardised throughout the country. The respondents further emphasised that a structure for stakeholder involvement and collaboration should be available early in the planning process.

Independent of organisational belonging, all respondents mentioned clarity in organisation and roles as an important feature for project collaboration and progress.

‘I believe that different views on roles and responsibilities between the parent organisation and the project organisation and their interaction […] the fact that we lack a structure for governing the project..[…] generate trouble’

(Planner)

Due to the challenging history and inherent complexity of some projects, this is especially important in order to build trust and create predictability, factors deemed crucial for collaboration by the respondents. Predictability in the planning processes, both regarding organisation, roles, successive outputs, authority and responsibilities, help navigate project complexity and is viewed beneficial for project progress. Roles and organisational structure should be clarified before starting the actual front-end planning. The respondents highlighted that the combination of time-pressure and lack of structural clarity sometimes forced the project organisation to spend valuable time clarifying this instead of doing the actual front-end planning. Clarity is considered to strengthen predictability, while lack of clarity influences the working relationships negatively by creating suspiciousness and doubts; adversely affecting trust building. Potentially, lack of clarity also created arenas for reverse decisions. Lack of structure seemed to make the projects more vulnerable to changes.

All respondents strongly emphasised that organisational roles should be clear regarding content and authority, since this is believed to clarify mutual expectations, and is important for creating predictability. Fuzzy roles is said to adversely affect the relationship between collaborating parties, and may cause conflicts and suspiciousness, negatively affecting project progress. The respondents further explain that fuzzy roles challenge information flow and negatively influence trust among the stakeholders. The fuzziness is also said to affect the ‘lines of command’, making a complex organisation even more complex. Moreover, role clarity is perceived as key to inhibiting potential conflicts of interest and for aligning project goals and perspectives among the different stakeholders. Hospital employees serving as project managers expressed that their role was not to be a project manager in classical terms, but rather a facilitator or interpreter.

 ‘My job is to be a conductor. To balance carrots and sticks… and hope that people do their job’

(Project director)

When the actual content of the role is unclear, the LHA risks recruiting the wrong competence to the project. The LHAs’ project managers experienced unclear expectations regarding the project manager-role as frustrating.

‘Suddenly we were supposed to write minutes, which was clearly stated that we should not do. So our role in the meetings was sort of very unclear…’

(LHA stakeholder)

Some respondents from the LHA experienced the fuzziness as a challenge for their legitimacy when collaborating with the EO and in the stakeholder groups, which they were expected to manage. The project managers had to defend their attendance, and were assigned tasks outside their mandate. They furthermore emphasised their local knowledge of the LHA and its history as an important asset for the project, which could serve as a ‘buffer’ for the EO and other stakeholders in coping with the context. In one project, the fuzziness in roles made the project managers feel that they did not get the chance to contribute to the project with this knowledge. The EO’s role in the different projects varied from mere consulting to full-time project managing. Expectations regarding the EO’s contributions vary, but the majority of LHA respondents hold that the EO should possess systemic knowledge in the ability to share experiences from other projects. Both the EO and the project managers acknowledged that this has potential for improvement. The EO is a young organisation, currently trying to find its role in the project organisations by demonstrating its competence and hence gaining sufficient trust. In some cases, the EO experienced that the LHAs expressed a need for some sort of control of the process and premises. Finding a proper balance between consulting and challenging is described as demanding, further influencing the relationship between the EO and the LHA, and may negatively influence collaboration.

Unclear authority is also believed to potentially affect the opportunity space by making stakeholders conservative and less creative. This is unfortunate, as creativity is seen as an important asset in the front-end phase when searching for suitable concepts. Several respondents stress that lack of sufficient authority prevents stakeholders from moving outside their ‘comfort zone’, being afraid of becoming hostages for the choices made when the project is finished, due to the complexity and differences experienced in these projects . Unclear latitude might also lead to inability to act or, on the other hand, a need for showing efficiency by taking too wide-ranging actions, both aspects influencing collaboration negatively.

### Means of collaboration

The respondents highlighted means necessary or beneficial to collaboration. Among these are involvement, management and competence considered most important. Mutual understanding, ownership and empowerment are sub-dimensions of involvement.

#### Mutual understanding through user involvement

The respondents maintain that the multiple stakeholders´ different perspectives are not always easy to unite, challenging the achievement of mutual understanding. Mutual understanding of the project direction and goal is important to project progress and collaboration. The respondents fear that the diversity challenges the ability to align goals due to different project perspectives, task priority and differences in organisational maturity. The respondents highlighted user involvement in the planning process as necessary means for establishing mutual understanding of the project and for strengthening collaboration, which can damage the project if omitted or neglected. The projects studied show broad user involvement in the processes, which is seen as necessary for creating mutual understanding of the front-end’s purpose, ensuring continuity (important when the project reaches the operating phase), and creating necessary stakeholders’ ownership of the project. The respondents pointed to the need for realistic processes holding that when involving a large number of users, there will be a large amount of expectations. To avoid disappointment and loss of motivation and to secure project progress, clarification and reconciliation of the expectations within the realistic possibilities of the project is viewed as necessary. Trust was also considered as important for collaboration, and the respondents closely connected involvement to trust building.

‘We wanted extensive user involvement […] and we genuinely meant it […] but when it includes 200 people […] it generates expectations… There will be trouble and people get disappointed… We create expectations that cannot be fulfilled’

(Advisor)

Even if user involvement was considered necessary, it was also looked upon as a challenge. One of the respondents referred to it as an independent discipline. The challenge pertained to the level of involvement, when to start, who and how many should be involved, and which topics should be handled. The respondents put forth that user involvement should be a structured and predictable process in order to avoid reverse decisions and waste of time and money.

Information and communication, clarity and predictability are also elements required for ensuring proper involvement when handling the more remote stakeholders.

#### Importance of management

The majority of respondents held that the societal and organisational impact of the projects set standards for the LHA management in being clear about their ambitions and intentions with the project and the project’s place in the parent organisation. The management should allocate sufficient time, resources and competence to the projects, and the projects should not be treated as any ordinary issue on the busy managerial agenda.

‘When the LHA management is supposed to run these processes, it gets mixed with other issues. You don’t get a ‘clean project focus’[…] it becomes a part of an ordinary meeting agenda together with ordinary budget discussions for example[…] I believe that it would be beneficial to handle the project exclusively, ordinary management meetings are not a good venue for these discussions’

(LHA stakeholder)

This was experienced as a challenge, which in turn may negatively affect the planning process and compromise the projects’ outcome. The respondents also highlighted the management’s role in communicating the project in the parent organisation to avoid suspiciousness and erroneous assumptions. Clarity is said to facilitate project progress and establishes advantageous conditions for collaborating stakeholders to find suitable conceptual solutions. Anchoring the project within the parent organisation is considered especially important due to a frequently demanding context, both to prevent project opponents from initiating exhausting processes for reverse decisions and to support the project managers’ (from the health authority) role towards the EO and the different stakeholder groups. According to the respondents, lack of management support adversely affected the project managers’ motivation and project progress, created room for doubt and provided a breeding ground for reverse decisions.

#### Competence

The respondents highlighted a lack of formal project management and planning competence in the hospital organisations and difficulties in understanding the purpose of the front-end due to its abstract nature. Lack of competence or insufficient knowledge of the planning process or project management created a fear of making the wrong decisions. The respondents also pointed at user representatives being afraid of becoming hostages in the planning processes, being involved without real empowerment or the possibility to fully understand the processes they are part of. Diversity of perspectives due to the multiplicity of stakeholders, pose a challenge to the collaboration, but is also perceived as a valuable asset in finding solutions different stakeholders could not have come up with by themselves. Competence sharing and multidisciplinary collaboration are appreciated, and considered necessary means to meet project goals.

Several respondents emphasised the importance of gaining organisational maturity in these processes as necessary but time-consuming, and that due to diversity in knowledge and experience among the collaborating stakeholders, it may become a potential area of conflict.

## Catalysts

Respondents elucidated the considerable change the projects exerted on parent organisations, challenging them and their employees’ capacity and ability for change, which is strongly connected to the fear of losing responsibilities and position. Such fear is said to promote defensiveness and conservatism, which are poor qualities for front-end collaboration and performance. As some respondents expressed, changes are perceived as painful and have to be carefully handled in order to avoid project delays.

The interviews further revealed a heterogenic group of catalytic actions and relations connected to both the individual and organisational level that influence collaboration in the front-end. These are labelled catalysts. All findings are presented in Table 2.

|  |  |
| --- | --- |
| CONTEXT | Complexity |
| Inner context |
| Outer context |
| Perspectives |
| Project triggering factor(s) |
| STRUCTURES | Organising |
| Roles |
| MEANS | Competence |
| Management |
| Involvement | * Ownership
* Mutual understanding
* Empowerment
 |
| CATALYSTS | Change capacity/ability |
| Catalytic actions | * Coordination
* Documentation
* Doing things in the right order
* Keeping the pace/

being subject to keeping pace |
| Catalytic relations | * Trust
* Motives
* Relations
* Reliability
* Disagreement
* Communication
* Personal chemistry
* Clarity in conduct and process
* Openness among stakeholders
* Individual or organisational maturation
 |

Table 2 Main categories and preliminary categories affecting collaboration in the front-end phase of hospital projects

# Discussion and implications [RESTRUCTURED AND PARTLY REWRITTEN]

This study set out to echo the call for more understanding of complex projects’ front-end phase (Williams et al., 2019), by studying collaboration in this part of the project life cycle. Informal mechanisms, such as collaboration, should be understood in order to cope with complexity (Bygballe & Swärd, 2019; Bygballe et al., 2016; Cicmil & Marshall, 2005). Hospital projects’ complexity partly results from the many stakeholders involved, and collaboration is also viewed as a stakeholder management strategy where dynamics connected to stakeholder management are insufficiently understood in the front-end phase (Aaltonen et al., 2015).

The concept of collaboration has not reached a unified, multidisciplinary understanding, although conceptualising collaboration as a process retains the dynamics associated with collaboration found in definitions across disciplines (Bedwell et al., 2012). Our analysis identified four main categories (see Figure 2) describing collaboration in hospital projects’ front-end. The categories do not constitute separate entities, but are interdependent and interact making collaboration happen and making collaboration work. The nuance between making collaboration happen and making collaboration work indicates that the different categories should be considered at different times during the front-end phase to facilitate collaboration. Thus, we adopt the view of collaboration as an evolving process (Bedwell et al., 2012; Gray, 1985; Mintzberg et al., 1996). To initiate collaboration, that is to make it happen, structures and means seem to play an important role, while for making collaboration work, catalytic actions and relations (see Table 2) come more into play. Throughout the front-end phase, the projects’ external and internal contexts should be taken into account due to their considerable impact on collaboration.

The following sections discuss the four categories and their interactions in order to describe collaboration in hospital projects’ front-end.

## Contexts

The projects’ external (socio-political position and more remote stakeholders) and internal (inter-/intra-organisational) contexts affect both the initiation and maintenance of collaboration, and encompass the other categories describing collaboration in the front-end. According to Bedwell et al. (2012), collaboration may look different as the context changes. Thus, the context should be thoroughly analysed and considered throughout the front-end phase. In line with literature (Aaltonen et al., 2015; Aubry & Lavoie-Tremblay, 2018; Cicmil et al., 2006; Engwall, 2003; Williams et al., 2019), we find that context is important whereby the planning processes must take hospitals’ political implications and impact on the surroundings into account. Conflicts of interest among the many involved stakeholders due to different project perspectives or priorities can have severe impact on the planning processes, forcing decision-makers to start new assessments, reverse decisions or other drastic actions, making the project indecisive and unclear and further compromise its implementation (Denis et al., 2011). This is time-consuming and expensive and may alter the focus of the project, risking a failure in identifying suitable long-term solutions, thus compromising the front-end’s intention (Williams et al., 2019).

Project complexity requires flexibility and dynamic capabilities in the front-end to be able to meet the projects’ changing environments in order to avoid compromising the exploration of the opportunity space and the identification of new sustainable solutions. The complex nature of hospital projects may lead to resistance in finding new solutions (Bygballe, 2010). For the projects to manage this, the different stakeholders need to share their different perspectives, experiences and competences, thus utilising the projects’ multidisciplinary nature. Acknowledging the different perspectives, helps establish the broad focus needed to fulfil the front-end’s goal. The decision-makers should balance the interests of different stakeholders in order to maintain the project purpose (Aaltonen et al., 2015), and means such as management, involvement and competence support multidisciplinary action. Project management skills needed in the front-end (Edkins et al., 2013), differ from those needed in an execution point of view, or at least the skills need to be accentuated differently than in the execution phase. Coping with social dynamics and people orientation should be emphasised (Aubry et al., 2014; Bygballe et al., 2016; Cicmil & Marshall, 2005; Cicmil et al., 2006; Matinheikki et al., 2016; Merschbrock et al., 2018; Pauget & Wald, 2013; Turner et al., 2013), and might be a source of conflict if not handled (Aubry & Lavoie-Tremblay, 2018; Olsson, 2008; Pemsel et al., 2010). Thus, from a project manager’s point of view, the clue is to balance the different views while at the same time avoiding delays of necessary decisions and stalling the project. It is argued that postponement of decisions and thinking that agreements will come downstream is risky (Bygballe, 2010).

Further, suitable governance should accommodate political and analytical deficiencies (Samset & Volden, 2016; Turner et al., 2013). However, it is also argued that these ambiguities cannot be met with conventional ‘ordering’ (Cicmil & Marshall, 2005; Hartmann, 2012). The strategic ambiguity or vagueness experienced around front-end decisions, are often a result of the complexity and divergent perspectives. This may be a necessity in accommodating multiple stakeholders’ views and keeping stakeholders in the planning process to enable further discussions and process maturity. Being able to handle tensions and exploit the inherent ambiguities for the benefit of the project, may strengthen the projects’ change capability and thus nurture collaboration (Denis et al., 2011; Smith & Lewis, 2011). Inherent tensions might actually drive collaboration in projects (Smith & Lewis, 2011; van Marrewijk et al., 2016). To cope with tensions, a more open management strategy viewing tensions as continually rearranging issues in the project might be beneficial (Cicmil & Marshall, 2005).

## Making collaboration happen and making collaboration work

All respondents emphasise the need for clarity in structures and roles early in the planning process. This implies a necessity for structuring to make collaboration happen, which is in line with findings from (Gray, 1985). Structures help to position the project towards the parent organisation, and further provide a clarity through creating a degree of predictability for interdependent stakeholders with different professional background and project perspectives (Gray, 1985).

Without sufficient clarity in structure, time will be wasted and project progress and quality may suffer (Bygballe, 2010; Pemsel et al., 2010). Clarity further contributes to enhancing mutual understanding, which corresponds to findings by Bygballe et al. (2016) and Dietrich et al. (2010). Lack of clarity, on the other hand, reduces levels of trust, described as a crucial factor for collaboration by the respondents. We have found trust to be an important relational catalyst for collaboration (see Table 2), to maintain collaboration or making it work. This is an illustration of the processual nature of collaboration, where structures and clarity initiate collaboration and contribute to the generation of trust, which further helps collaboration work in the planning process. The role of trust corresponds to findings from several authors (Bygballe & Swärd, 2019; Dietrich et al., 2010; Haaskjold et al., 2019; Nevstad et al., 2018; van Eyk & Baum, 2002).

The need for structure may also be perceived as a reflection of the stakeholders’ competence, harnessing project complexity with familiar tools, which in this case mostly relate to those found in classical project management in an execution point of view. This is manifested by hospital employees expressed need for concretising early on in terms of calculations and drawings, thus challenging the front-end’s level of abstraction, which may be unfortunate for keeping the opportunity space open for as long as possible. The front-end presents a terminology and requires a mindset and set of skills considerably different from the hospital core business, unfamiliar to several of the stakeholders. The respondents point to the lack of needed competence for front-end intentions and activities, and consider it challenging to relate to the front-end’s need for abstractness in seeking future solutions. In addition, the hospital employees may find themselves taking on two roles, as knowledge providing experts pointing out the hospital’s future professional direction, but also as appointed organisational representatives participating in the planning processes and further contributing to justification of decisions made (Olsson et al., 2010). This is perceived as a challenge. As representatives, the LHAs’ project managers fear to become hostages for the decisions made, lacking sufficient empowerment or understanding of the planning process, which also is elucidated by Henriksen et al. (2006) and Olsson et al. (2010). Thus, the respondents highlighted the need for the parent organisation’s management to be clear about its ambitions and intentions with the project to achieve a successful planning process (Elf et al., 2015; Winch & Cha, 2020).

We also discovered another dimension of the hospital employees’ role as project managers. There is need for a supportive and interpretive orientation acting as facilitators and bridging gaps between the LHA and the project organisation. This is similar to the relational competence described by Pauget and Wald (2013), and the alternative view of project managers’ skills described by Cicmil et al. (2006).

Early user involvement is seen as essential for a successful project outcome by specifying demands, creating ownership and continuity and building project culture, in line with literature (Bygballe, 2010; Henriksen et al., 2006; Olsson et al., 2010; Pemsel et al., 2010; Tzortzopoulos et al., 2006; Zou et al., 2014). However, some challenges should be addressed. There are differences in maturity level between the EO and the hospital employees when it comes to the planning process. This pose a dilemma when balancing the time needed for maturity and creation of ownership, with the need for keeping the timeline in order to reach deadlines such as the National budget (Barlow & Köberle-Gaiser, 2009; Pemsel et al., 2010). Further, it is pointed out that involvement in planning generates expectations, which also is supported in literature (Dietrich et al., 2010; Eriksson et al., 2012; Eriksson et al., 2015; Eskerod et al., 2015a; Eskerod et al., 2015b; Henriksen et al., 2006). The risk of false expectations should be taken into account when involving a large amount of stakeholders with different perspectives (Daniel & Daniel, 2018), and one should reflect upon what constitutes the optimal level of planning (Serrador & Turner, 2015). Mutual understanding of the projects´ goals and limitations may balance this, avoiding disappointment and lack of motivation among stakeholders caused by unrealistic expectations.

## Potential outcomes from collaboration

Collaboration may lead to learning, innovation and value-creation, and may strengthen the odds for project success (Bygballe, 2010; Dietrich et al., 2010; Elf et al., 2012; Kanter, 1994; Matinheikki et al., 2016). Learning is beneficial for both the long-lasting hospital project, to future projects and the parent organisation, as well as for the efficient use of societal resources. The respondents actually requested experiences and lessons learned from other projects to lean on, in order to make them more capable of executing front-end planning. Enabling innovation is beneficial for hospital projects in order to cope with the rapidly changing medical and technological environment surrounding these projects (Barlow & Köberle-Gaiser, 2009; Bygballe, 2010), thus reaching for long-term successful and sustainable solutions.

## Linking to other findings

In a value-creating perspective, Matinheikki et al. (2016) point to focussing on both structural, relational and cognitive factors in the front-end. The categories from our study partly correspond to these dimensions, and also partly resemble Ika and Donnelly’s (2017) conditions for project success (structural, institutional and managerial). We suggest that structural issues are important for collaboration to happen and relational issues (means, catalysts, see Figure 2) are important both to make collaboration happen (means) and to make it work (catalysts). The cognitive dimension (Matinheikki et al., 2016) pertains to building and sharing a vision among stakeholders, which corresponds to the contexts category in our framework when it comes to embracing the different perspectives and contexts to create a common goal through the achievement of mutual understanding. Being able to manage project context and complexity by acknowledging the diversity of project stakeholders strengthens the focus of the project and makes it possible to better exploit the opportunity space and avoid early lock-in, important actions for achieving long-term project success (Aaltonen et al., 2015; Flyvbjerg, 2014; Gareis et al., 2013; Klakegg, 2010; Silvius & Schipper, 2014; Toor & Ogunlana, 2010).

## Implications

Given hospital projects’ complexity, we assume that collaboration is key to strengthening front-end performance thus paving the way for strategic successful projects. This study advances our understanding of the front-end of complex projects by exploring collaboration, viewing it as a process, emphasising its inherent dynamic and evolving characteristics. The study further adds to the general understanding of collaboration pointing at the need for differentiating efforts along a (project) planning timeline. More insight contributes to enabling improvement of the front-end phase thus strengthening the sector’s project performance and further sector development and project value for money. Obtaining more knowledge will also potentially enable cross-project learning, which is a desired development for the sector.

Our analysis and findings on categories and their interactions are summarised in Figure 3, proposing a conceptualisation and providing a framework for collaboration in the front-end of hospital projects. The framework illustrates how categories relate and interact to make collaboration happen and make collaboration work, and points at the potential outcomes from functioning collaboration.



Figure 3 Framework for collaboration in hospital projects’ front-end phase [FIGURE PARTLY REVISED ACCORDING TO R4; OUTCOMES CHANGED TO POTENTIAL OUTCOMES AND ILLUSTRATED DIFFERENTLY]

The distinction between making collaboration happen and making collaboration work that is what should be thought of when initiating the projects’ front-end and what should be thought of and acted on after the initiation to further fuel collaboration in the front-end, illustrate collaboration’s processual nature. We believe that it is possible to engineer and prepare collaboration to a certain extent to help the project get off to a good start, and to maintain the pace further on. The managerial implications relate to the proposed framework serving as a practical guide for project managers to prepare and retain collaboration throughout the front-end phase. Tensions or paradoxes are inevitable due to hospital projects’ inherent complexity. The front-end is further characterised by uncertainty and lack of information. Combined, these issues constitute a relatively challenging point of departure for hospital projects. More knowledge of the planning process and potential pitfalls mitigate the challenges by enabling harnessing what may be harnessed. Further, there is potential for strengthening project performance by learning to accept and exploit differences among stakeholders and organisations. The project managers should be able to balance such differences, and the framework may help by clarifying different issues that should be included for preparing and continuing front-end collaboration.

# Conclusion

In our study, we set out to answer the question of how collaboration can be understood in hospital projects’ front-end. In order to answer this question, we interviewed 13 persons involved in hospital front-end planning in Norway.

We found that four categories interact to make collaboration happen and make collaboration work. This points at a nuance in initiating and continuing collaboration throughout the front-end where aspects affecting collaboration should be emphasised differently. The suggested categories address both structural and relational aspects. Structures and means are needed to make collaboration happen, and catalysts are necessary for making collaboration work throughout the planning process. Contexts set premises for collaboration, but are also a way of shaping the project using existing diversities to explore the opportunity space, which is an essential part of the front-end phase. Collaboration is also a vessel for bringing the project forward, release potentials, and create values larger than the project itself.

Our findings suggest that collaboration has a processual nature, and may be engineered to a certain extent, thus calling on the need for project managers to have proper knowledge and skills to cope with this issue. Our findings may support project managers by elucidating the different aspects that should be thought of when initiating and continuing collaboration.

# Limitations and further research

We chose to study collaboration in hospital projects’ front-end from a practical project manager’s point of view. Viewing this through other theoretical lenses such as organisational theory or management theory, might be fruitful and provide deeper insight into the collaboration phenomenon.

There are several ongoing projects in Norway that we have not looked into. Doing so would have provided more variation and would have been beneficial for validating the results in a Norwegian context. The small sample of respondents and our focus on one type of project and one stage of the project lifecycle in a Norwegian context may limit the generalisability of our findings. The respondents are also people working in the projects, thus we might have gotten a wider perspective on collaboration if we included patients and relatives as interviewees. The interviews were conducted in the Norwegian language and quoting and references made to the respondents’ answers are translated, introducing a potential source of error. All projects had finished the front-end phase and moved on to subsequent phases. This represents long periods of time, thus it may be challenging for the respondents to remember all details when interviewed in retrospect. Observation studies or longitudinal approaches would have improved the study’s reliability. A further triangulation of methods and data collection would strengthen the validity, and may serve as an approach for expanding our preliminary findings.

Testing our preliminary results on other projects could be an avenue for further research. Comparisons with other sectors’ front-end or collaboration in other project phases would be valuable, thus reviewing our findings in light of established knowledge and in a wider context. Looking for answers to why or why not collaboration in hospital projects differs from collaboration in complex, major projects in other sectors would be interesting. Looking at hospital projects internationally to gather experiences and enable learning from other practices would also be interesting. Conducting interviews with a wider category of respondents would also be valuable to elucidate more perspectives on collaboration.

# Acknowledgements

This research is partly funded by the Research Council of Norway through the Public sector PhD-scheme, grant no. 272377.

# References

Aaltonen, K., Kujala, J., Havela, L., & Savage, G. (2015). Stakeholder Dynamics During the Project Front-End: The Case of Nuclear Waste Repository Projects. *Project Management Journal, 46*(6), 15-41. doi:<https://doi.org/10.1002/pmj.21549>

Aubry, M., & Lavoie-Tremblay, M. (2018). Rethinking organizational design for managing multiple projects. *International Journal of Project Management, 36*, 12-26. doi:<https://doi.org/10.1016/j.ijproman.2017.05.012>

Aubry, M., Richer, M.-C., & Lavoie-Tremblay, M. (2014). Governance performance in complex environment: The case of a major transformation in a university hospital. *International Journal of Project Management, 32*(8), 1333-1345. doi:<https://doi.org/10.1016/j.ijproman.2013.07.008>

Baccarini, D. (1999). The Logical Framework Method for Defining Project Success. *Project Management Journal, 30*(4), 25-32. doi:[https://doi.org/10.1177%2F875697289903000405](https://doi.org/10.1177/875697289903000405)

Barlow, J., & Köberle-Gaiser, M. (2009). Delivering Innovation in Hospital Construction: Contracts and Collaboration in the UK's Private Finance Initiative Hospitals Program. *California Management Review, 51*(2).

Bayer, S., Köberle-Gaiser, M., & Barlow, J. (2007). *Planning for Adaptability in Healthcare Infrastructure* Paper presented at the The 2007 International Conference of the System Dynamics Society, Boston, Massachusetts, USA.

Bedwell, W. L., Wildman, J. L., DiazGranados, D., Salazar, M., Kramer, W. S., & Salas, E. (2012). Collaboration at work: An integrative multilevel conceptualization. *Human Resource Management Review, 22*(2), 128-145. doi:<https://doi.org/10.1016/j.hrmr.2011.11.007>

Bygballe, L. E. (2010). *Samarbeid og læring i byggenæringen. En casestudie av Nye St. Olavs Hospital i Trondheim (Collaboration and learning in the construction industry. A case-study of the new St.Olavs Hospital in Trondheim)* (No. 2/2010). Retrieved from <https://biopen.bi.no/bi-xmlui/bitstream/handle/11250/94198/2010-02-Bygballe.pdf?sequence=1&isAllowed=y>

Bygballe, L. E., & Swärd, A. (2019). Collaborative Project Delivery Models and the Role of Routines in Institutionalizing Partnering. *Project Management Journal, 50*(2), 161-176. doi:10.1177/8756972818820213

Bygballe, L. E., Swärd, A. R., & Vaagaasar, A. L. (2016). Coordinating in construction projects and the emergence of synchronized readiness. *International Journal of Project Management, 34*(8), 1479-1492. doi:<https://doi.org/10.1016/j.ijproman.2016.08.006>

Cicmil, S., & Marshall, D. (2005). Insights into collaboration at the project level: complexity, social interaction and procurement mechanisms. *Building Research & Information, 33*(6), 523-535. doi:10.1080/09613210500288886

Cicmil, S., Williams, T., Thomas, J., & Hodgson, D. (2006). Rethinking Project Management: Researching the actuality of projects. *International Journal of Project Management, 24*(8), 675-686. doi:<https://doi.org/10.1016/j.ijproman.2006.08.006>

Consulting Engineers' Association (RIF). (2015). *Norges tilstand 2015. State of the nation*. Retrieved from <http://www.rif.no/media/5486/rif_stateofthenation_2015_lavopploeselig.pdf>

Cooke-Davies, T. (2009). Front-end Alignment of Projects-Doing the Right Project. In T. M. Williams, K. Samset, & K. Sunnevåg (Eds.), *Making Essential Choices with Scant Information: Front-end Decision Making in Major Projects* (pp. 106-124).

Daniel, P. A., & Daniel, C. (2018). Complexity, uncertainty and mental models: From a paradigm of regulation to a paradigm of emergence in project management. *International Journal of Project Management, 36*(1), 184-197. doi:<https://doi.org/10.1016/j.ijproman.2017.07.004>

De Neufville, R., & Scholtes, S. (2011). *Flexibility in engineering design*: MIT Press.

Denis, J.-L., Dompierre, G., Langley, A., & Rouleau, L. (2011). Escalating Indecision: Between Reification and Strategic Ambiguity. *Organization Science, 22*(1), 225-244. doi:10.1287/orsc.1090.0501

Dietrich, P., Eskerod, P., Dalcher, D., & Sandhawalia, B. (2010). The dynamics of collaboration in multipartner projects. *Project Management Journal, 41*(4), 59-78. doi:10.1002/pmj.20194

Edkins, A., Geraldi, J., Morris, P., & Smith, A. (2013). Exploring the front-end of project management. *Engineering Project Organization Journal, 3*(2), 71-85. doi:10.1080/21573727.2013.775942

Eeckloo, K., Delesie, L., & Vleugels, A. (2007). Where is the pilot? The changing shapes of governance in the European hospital sector. *The Journal of The Royal Society for the Promotion of Health, 127*(2), 78-86. doi:[https://doi.org/10.1177%2F1466424007075457](https://doi.org/10.1177/1466424007075457)

Elf, M., Engström, M. S., & Wijk, H. (2012). An assessment of briefs used for designing healthcare environments: a survey in Sweden. *Construction Management and Economics, 30*(10), 835-844. doi:<https://doi.org/10.1080/01446193.2012.702917>

Elf, M., Fröst, P., Lindahl, G., & Wijk, H. (2015). Shared decision making in designing new healthcare environments—time to begin improving quality. *BMC Health Services Research, 15*(1), 114. doi:<http://dx.doi.org/10.1186/s12913-015-0782-7>

Elf, M., & Malmqvist, I. (2009). An audit of the content and quality in briefs for Swedish healthcare spaces. *Journal of Facilities Management 7*(3), 198-211. doi:<https://doi.org/10.1108/14725960910971478>

Engwall, M. (2003). No project is an island: linking projects to history and context. *Research Policy, 32*(5), 789-808. doi:[https://doi.org/10.1016/S0048-7333(02)00088-4](https://doi.org/10.1016/S0048-7333%2802%2900088-4)

Eriksson, J., Fröst, P., & Ryd, N. (2012). *Mapping a Framework For Co-design in Healthcare Projects: an empirical study.* Paper presented at the INTERNATIONAL CONFERENCE ARCH.

Eriksson, J., Glad, W., & Johansson, M. (2015). User involvement in Swedish residential building projects: a stakeholder perspective. *Journal of Housing the Built Environment, 30*(2), 313-329. doi:<https://doi.org/10.1007/s10901-014-9412-7>

Ernst & Young. (2016). *Eierskap og forvaltning av sykehusbygg. Oppsummering av analyser og dokumentasjon vedrørende sykehusbygg* (*Ownership and Property Management of Hospital Buildings. A Summary of Analyses and Documentation Concerning Hospital Buildings*) (2016:25). Retrieved from <https://www.regjeringen.no/contentassets/6db6ac4fbfde49e6bc5f8bd615c6fa1e/no/sved/vedlegg5.pdf>

Eskerod, P., Huemann, M., & Ringhofer, C. (2015a). Stakeholder Inclusiveness: Enriching Project Management with General Stakeholder Theory1. *Project Management Journal, 46*(6), 42-53. doi:10.1002/pmj.21546

Eskerod, P., Huemann, M., & Savage, G. (2015b). Project Stakeholder Management—Past and Present. *Project Management Journal, 46*(6), 6-14. doi:10.1002/pmj.21555

Ettelt, S., McKee, M., Nolte, E., Mays, N., & Thomson, S. (2009). Planning health care capacity: whose responsibility? In B. Rechel, S. Wright, N. Edwards, B. Dowdeswell, & M. Mckee (Eds.), *Investing in hospitals of the future* (pp. 47-66). Copenhagen, Denmark: World Health Organization.

Fereday, J., & Muir-Cochrane, E. (2006). Demonstrating Rigor Using Thematic Analysis: A Hybrid Approach of Inductive and Deductive Coding and Theme Development. *International Journal of Qualitative Methods, 5*(1), 80-92. doi:[https://doi.org/10.1177%2F160940690600500107](https://doi.org/10.1177/160940690600500107)

Flyvbjerg, B. (2014). What You Should Know About Megaprojects and Why: An Overview. *Project Management Journal, 45*(2), 6-19. doi:[https://doi.org/10.1002%2Fpmj.21409](https://doi.org/10.1002/pmj.21409)

Flyvbjerg, B. (2017). Introduction: The Iron Law of Megaproject Management. In B. Flyvbjerg (Ed.), *The Oxford Handbook of Megaproject Management* (pp. 1-18). Oxford: Oxford University Press.

Fréchette, J., Lavoie-Tremblay, M., Aubry, M., Kilpatrick, K., & Bitzas, V. (2020). Major hospital transformations: An integrative review and implications for nursing. *Journal of Nursing Education and Practice, 10*(7), 46-52. doi:10.5430/jnep.v10n7p46

Gareis, R., Huemann, M., & Martinuzzi, A. (2013). Project Management and Sustainable Development Principles. Retrieved from pmi.org website: <https://www.pmi.org/-/media/pmi/documents/public/pdf/research/research-summaries/gareis_-pm-and-sustainable-development.pdf>

Geraldi, J., Maylor, H., & Williams, T. (2011). Now, let's make it really complex (complicated): A systematic review of the complexities of projects. *International Journal of Operations & Production Management, 31*(9), 966-990. doi:10.1108/01443571111165848

Glouberman, S., & Mintzberg, H. (2001). Managing the Care of Health and the Cure of Disease. Part I: Differentiation. *Healthcare Management Review, 26*, 56-69.

Gordon, A., & Pollack, J. (2018). Managing healthcare integration: Adapting project management to the needs of organizational change. *Project Management Journal, 49*(5), 5-21. doi:[https://doi.org/10.1177%2F8756972818785321](https://doi.org/10.1177/8756972818785321)

Gray, B. (1985). Conditions facilitating interorganizational collaboration. *Human relations, 38*(10), 911-936.

Gulati, R., Wohlgezogen, F., & Zhelyazkov, P. J. T. A. o. M. A. (2012). The two facets of collaboration: Cooperation and coordination in strategic alliances. *6*(1), 531-583.

Haaskjold, H., Andersen, B., Lædre, O., & Aarseth, W. (2019). Factors affecting transaction costs and collaboration in projects. *International Journal of Managing Projects in Business, Ahead of print*. doi:<https://doi.org/10.1108/IJMPB-09-2018-0197>

Hartmann, T. (2012). Wicked problems and clumsy solutions: Planning as expectation management. *Planning Theory, 11*(3), 242-256. doi:10.1177/1473095212440427

Helse- og omsorgsdepartementet (HOD). (2015). *Meld. St. 11 Nasjonal helse- og sykehusplan (2016-2019) (National plan for health and hospitals (2016-2019))*. Retrieved from <https://www.regjeringen.no/contentassets/7b6ad7e0ef1a403d97958bcb34478609/no/pdfs/stm201520160011000dddpdfs.pdf>

Henriksen, B., Olsson, N. O. E., & Seim, A. (2006). *Adjustments, effectiveness and efficiency in Norwegian hospital construction projects.* Paper presented at the CIB W70 Trondheim International Symposium. Changing User Demands on Buildings, Trondheim, Norway.

Ika, L. A., & Donnelly, J. (2017). Success conditions for international development capacity building projects. *International Journal of Project Management, 35*, 44-63. doi:<https://doi.org/10.1016/j.ijproman.2016.10.005>

Kallio, H., Pietilä, A.-M., Johnson, M., & Kangasniemi, M. (2016). Systematic methodological review: developing a framework for a qualitative semi-structured interview guide. *The Journal of Advanced Nursing, 72*(12), 2954-2965. doi:<https://doi.org/10.1111/jan.13031>

Kanter, R. M. (1994). Collaborative advantage. *Harvard Business Review*(July-August), 96-108.

King, N. (2004). Using Templates in the Thematic Analysis of Text. In C. Cassell & G. Symon (Eds.), Essential Guide to Qualitative Methods in Organizational Research (pp. 256-270). London: SAGE Publications Ltd. Retrieved from <http://sk.sagepub.com/books/download/essential-guide-to-qualitative-methods-in-organizational-research/n21.pdf>.

King, N., Carroll, C., Newton, P., & Dornan, T. (2002). You can’t Cure it so you have to Endure it: The Experience of Adaptation to Diabetic Renal Disease. *Qualitative Health Research, 12*(3), 329-346. doi:<https://doi.org/10.1177/104973202129119928>

Klakegg, O. J. (2010). *Governance of Major Public Projects. In pursuit of Relevance and Sustainability.* (Doctoral theses), NTNU, Trondheim. (2010:15)

Kokkonen, A., & Vaagaasar, A. L. (2018). Managing collaborative space in multi-partner projects. *Construction Management and Economics, 36*(2), 83-95. doi:<https://doi.org/10.1080/01446193.2017.1347268>

Kvale, S., & Brinkmann, S. (2015). *Det kvalitative forskningsintervju (Qualitative research interviewing)* (3 ed.). Oslo, Norway: Gyldendal Akademisk.

Larssen, A. K. (2011). *Bygg og eiendoms betydning for effektiv sykehusdrift (Buildings' impact on Hospital Effectiveness).* (Doctoral Thesis), NTNU, Trondheim.

Lavikka, R. H., Smeds, R., & Jaatinen, M. (2015). Coordinating collaboration in contractually different complex construction projects. *Supply Chain Management: An International Journal, 20*(2), 205-217. doi:<https://doi.org/10.1108/SCM-10-2014-0331>

Lenfle, S., & Loch, C. (2017). Has megaproject management lost its way? Lessons from history. In B. Flyvbjerg (Ed.), *The Oxford handbook of megaproject management*. Madison Avenue, New York, NY 10016, United States of America: The Oxford University Press.

Malterud, K. (2001). Qualitative research: standards, challenges, and guidelines. *The Lancet, 358*(9280), 483-488.

Malterud, K. (2011). *Kvalitative metoder i medisinsk forskning. En innføring (Qualitative methods in medical research. An introduction* (3rd ed.). Oslo: Universitetsforlaget.

Malterud, K. (2012). Systematic text condensation: a strategy for qualitative analysis. *Scandinavian journal of public health, 40*(8), 795-805.

Marshall, M. N. (1996). Sampling for qualitative research. *Family practice, 13*(6), 522-525. doi:<https://doi.org/10.1093/fampra/13.6.522>

Mason, J. (2018). *Qualitative researching* (3 ed.). London, UK: Sage Publications.

Matinheikki, J., Artto, K., Peltokorpi, A., & Rajala, R. (2016). Managing inter-organizational networks for value creation in the front-end of projects. *International Journal of Project Management, 34*, 1226-1241. doi:<https://doi.org/10.1016/j.ijproman.2016.06.003>

Merschbrock, C., Hosseini, R. M., Martek, I., Arashpour, M., & Mignone, G. (2018). Collaborative Role of Sociotechnical Components in BIM-Based Construction Networks in Two Hospitals. *Journal of Management in Engineering, 34*(4).

Miller, R., & Hobbs, B. (2005). Governance Regimes for Large Complex Projects. *Project Management Journal, 36*(3), 42-50. doi:<https://doi.org/10.1177/875697280503600305>

Mintzberg, H., & Glouberman, S. (2001). Managing the Care og Health and the Cure of Disease-Part II: Integration. *Healthcare Management Review, 26*(1), 70-84.

Mintzberg, H., Jorgensen, J., Dougherty, D., & Westley, F. (1996). Some surprising things about collaboration—Knowing how people connect makes it work better. *Organizational Dynamics, 25*(1), 60-71. doi:[https://doi.org/10.1016/S0090-2616(96)90041-8](https://doi.org/10.1016/S0090-2616%2896%2990041-8)

Müller, R., Geraldi, J., & Turner, J. R. (2011). Relationships between leadership and success in different types of project complexities. *IEEE Transactions on Engineering Management, 59*(1), 77-90.

Nevstad, K., Børve, S., Karlsen, A. T., & Aarseth, W. (2018). Understanding how to succeed with project partnering. *International Journal of Managing Projects in Business, 11*(4), 1044-1065. doi:<https://doi.org/10.1108/IJMPB-07-2017-0085>

Office of the Auditor General in Norway. (2011). *Riksrevisjonens undersøkelse av eiendomsforvaltningen i helseforetakene* (*The Office of the Auditor General's investigation of property management in Norwegian Health Authorities*). Retrieved from

Olander, S., & Landin, A. (2005). Evaluation of stakeholder influence in the implementation of construction projects. *International Journal of Project Management, 23*(4), 321-328.

Olsson, N. O. E. (2008). Conflicts related to effectiveness and efficiency in Norwegian rail and hospital projects. *Project Perspectives, 29*(1), 81-85.

Olsson, N. O. E., Blakstad, S. H., & Hansen, G. K. (2010). *Who is the user?* Paper presented at the CIB W070 International Conference in Facilities Management.

Olsson, N. O. E., & Spjelkavik, I. (2014). Assumption surfacing and monitoring as a tool in project risk management. *International Journal of Project Organisation and Management, 6*(1/2), 179-196. doi:<https://doi.org/10.1504/ijpom.2014.059740>

Pauget, B., & Wald, A. (2013). Relational competence in complex temporary organizations: The case of a French hospital construction project network. *International Journal of Project Management, 31*(2), 200-211. doi:<https://doi.org/10.1016/j.ijproman.2012.07.001>

Pemsel, S., Widén, K., & Hansson, B. (2010). Managing the needs of end-users in the design and delivery of contruction projects. *Facilities, 28*(1/2), 17-30. doi:<https://doi.org/10.1108/02632771011011378>

QSR International. (1999-2018). NVivo (Version 12.0.0.71).

Sagsveen, E., Rise, M. B., Grønning, K., & Bratås, O. (2018). Individual user involvement at Healthy Life Centres: a qualitative study exploring the perspective of health professionals. *International Journal of Qualitative Studies on Health and Well-being, 13*(1), 1492291. doi:10.1080/17482631.2018.1492291

Samset, K., & Volden, G. H. (2016). Front-end definition of projects: Ten paradoxes and some reflections regarding project management and project governance. *International Journal of Project Management, 34*, 294-313. doi:<https://doi.org/10.1016/j.ijproman.2015.01.014>

Sari, S., Muller, A. E., & Roessler, K. K. (2017). Exercising alcohol patients don’t lack motivation but struggle with structures, emotions and social context - a qualitative dropout study. *BMC Family Practice, 18*(1), 45. doi:10.1186/s12875-017-0606-4

Saukko, L., Aaltonen, K., & Haapasalo, H. (2020). Inter-organizational collaboration challenges and preconditions in industrial engineering projects. *International Journal of Managing Projects in Business, ahead-of-print*. doi:10.1108/IJMPB-10-2019-0250

Saunders, M., Lewis, P., & Thornhill, A. (2009). *Research methods for business students*. In.

Savage, G. T., Bunn, M. D., Gray, B., Xiao, Q., Wang, S., Wilson, E. J., & Williams, E. S. (2010). Stakeholder Collaboration: Implications for Stakeholder Theory and Practice. *J Bus Ethics, 96*, 21-26. doi:<https://doi.org/10.1007/s10551-011-0939-1>

Savage, G. T., Nix, T. W., Whitehead, C. J., & Blair, J. D. (1991). Strategies for assessing and managing organizational stakeholders. *Academy of Management Perspectives, 5*, 61-75. doi:<https://journals.aom.org/doi/abs/10.5465/ame.1991.4274682>

Sebastian, R. (2011). Changing roles of the clients, architects and contractors through BIM. *Engineering, Construction and Architectural Management, 18*(2). doi:<https://doi.org/10.1108/09699981111111148>

Serrador, P., & Turner, J. R. (2015). What is Enough Planning? Results from a global quantitative study. *IEEE Transactions on Engineering Management, 62*(4), 462-474. doi:10.1109/TEM.2015.2448059

Silvius, G., A.J., & Schipper, R., P.J. (2014). Sustainability in project management: A literature review and impact analysis. *Social Business, 4*(1), 63-96. doi:<https://doi.org/10.1362/204440814x13948909253866>

Smith, W. K., & Lewis, M. W. (2011). Toward a theory of paradox: A dynamic equilibrium model of organizing. *Academy of management Review, 36*(2), 381-403.

Strand, R., & Freeman, R. E. (2015). Scandinavian Cooperative Advantage: The Theory and Practice of Stakeholder Engagement in Scandinavia. *Journal of Business Ethics, 127*(1), 65-85. doi:10.1007/s10551-013-1792-1

Sykehusbygg HF. (2017). Veileder for tidligfasen i sykehusbyggprosjekter. In *Guidelines for the Front-End phase in Hospital Projects*.

Särkilahti, A. (2017). *Change management during hospital construction projects- a multiple case study.* (Master's Thesis), Aalto University School of Science, Finland.

Tjora, A. (2012). *Kvalitative forskningsmetoder i praksis (Qualitative research methods in practice)*. Oslo: Gyldendal Akademisk.

Toor, S.-u.-R., & Ogunlana, S. O. (2010). Beyond the ‘iron triangle’: Stakeholder perception of key performance indicators (KPIs) for large-scale public sector development projects. *International Journal of Project Management, 28*(3), 228-236. doi:10.1016/j.ijproman.2009.05.005

Turner, J. R., Anbari, F., & Bredillet, C. (2013). Perspectives on research in project management: the nine schools. *Global Business Perspectives, 1*(1), 3-28. doi:10.1007/s40196-012-0001-4

Tzortzopoulos, P., Cooper, R., Chan, P., & Kagioglou, M. J. D. S. (2006). Clients' activities at the design front-end. *27*(6), 657-683. doi:<https://doi.org/10.1016/j.destud.2006.04.002>

van Eyk, H., & Baum, F. (2002). Learning about interagency collaboration: trialling collaborative projects between hospital and community health services. *Health and Social Care in the Community, 10*(4), 262-269. doi:<https://doi.org/10.1046/j.1365-2524.2002.00369.x>

van Marrewijk, A., Ybema, S., Smits, K., Clegg, S., & Pitsis, T. (2016). Clash of the titans: Temporal organizing and collaborative dynamics in the Panama Canal megaproject. *J Organization Studies, 37*(12), 1745-1769.

Walker, D. H., Davis, P. R., & Stevenson, A. (2017). Coping with uncertainty and ambiguity through team collaboration in infrastructure projects. *J International Journal of Project Management, 35*(2), 180-190.

Williams, T., & Samset, K. (2010). Issues in Front-End Decision Making on Projects. *Project Management Journal, 41*(2), 38-49. doi:[https://doi.org/10.1002%2Fpmj.20160](https://doi.org/10.1002/pmj.20160)

Williams, T., Vo, H., Samset, K., & Edkins, A. (2019). The front-end of projects: a systematic literture review and structuring. *Production Planning & Control, 30*(14), 1137-1169. doi:<https://doi.org/10.1080/09537287.2019.1594429>

Winch, G. M., & Cha, J. (2020). Owner challenges on major projects: The case of UK government. *International Journal of Project Management, 38*(3), 177-187.

Yin, R. K. (2014). *Case Study Research: Design and Methods* (5 ed.). Los Angeles, CA: SAGE Publications.

Zou, J., Zillante, G., Zhen-Yu-Zhao, & Xia, B. (2014). Does project culture matter? A comparative study of two major hospital projects. *Facilities, 32*(13/14), 801-824. doi:<https://doi.org/10.1108/f-02-2013-0014>