FORWARD COMMITMENT PROCUREMENT

The effects of the Forward Commitment Procurement method on perceived risks in projects concerning Public Procurement of Innovation.

Master thesis

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UNIVERSITY OF TWENTE.

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COLOPHON

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> *"There are risks and costs to a program of action. But they are far less than the long-range risks and costs of comfortable inaction."*
>
> *John F. Kennedy*

PREFACE

The world is rapidly changing and simultaneously facing a number of Grand Challenges such as climate change, energy and water supply, public health, ageing societies and changes in world economy (Lund Declaration, 2009). Public sector agencies therefore require new and better products and services that require innovation. Procuring such products or services (i.e. Public Procurement of Innovation) provides opportunities for facing above-mentioned challenges, but is considered risky.

Interpreting the words of John F. Kennedy, public sector agencies should endeavour in these kinds of projects nonetheless. Today's and tomorrow's challenges cannot be faced by sticking to regular, traditional approaches in procurement. However, comfortable inaction seems to remain as parties deem projects concerning Public Procurement of Innovation too risky.

There is a need to manage risks.

One approach specifically developed to manage these risks is Forward Commitment Procurement (FCP). The FCP method and its effects on perceived risks in project concerning Public Procurement of Innovation are the subject of this thesis. This thesis work aims at contributing to the successful management of risks in Public Procurement of Innovation.

Some words of gratitude are appropriate, as the help of several people was of great value during my research period.

I would like to start with thanking my university supervisors Geert Dewulf and Hans Voordijk. Your comments were always constructive and provided just the help I needed to take the next step in my research. I would also like to thank TNO, and particularly Joram Nauta, for providing the opportunity to do this thesis project. Joram, you really made TNO a welcome place to do a thesis project and I thank you for guidance.

Thanks also go out to the people of the case studies and the LCB-Healthcare Network for their input and time. Special thanks to Gaynor Whyles who supported my work from the UK.

This thesis is written in fulfilment of the master programme Civil Engineering & Management. Furthermore, it marks the end of being a student for more than seven years. There are many happy memories to look back on, for which I have friends and family to thank. I specifically want to thank my parents for their support through all the years.

Hendrik van Meerveld
Utrecht, September 2012

MANAGEMENT SUMMARY

In facing considerable financial and efficiency challenges and a move to low carbon operations, public agencies require new and better products and services. Procuring these innovative products and services is also referred to as Public Procurement of Innovation (PPI).

However, both public agencies and market parties perceive risks in projects concerning PPI.

Public agencies consider procuring innovative products and services risky, because the outcomes of such procurement projects are not known upfront. Risk is inherent in buying something innovative (European Commission, 2007) and there is a potential for failure.

Market parties deem these projects risky as well, because PPI requires market parties to invest in product/service development (Hommen & Rolfstam, 2009). Besides, suppliers of potential new products and services often lack the knowledge of what customers might want in the future (Edler & Georghiou, 2007).

Consequently, both public agencies and market parties are reluctant to endeavour in projects concerning PPI due to risk and risk aversion. For the successful procurement of innovative products and services, it is necessary to manage risk.

One approach specifically developed to manage risks is **Forward Commitment Procurement (FCP).** Although its potential for managing risk is considered high, its application is still limited to a small number of projects. Furthermore, all risk management processes consume valuable resources and can themselves constitute a risk to the project that must be effectively managed (Chapman & Ward, 2003). This research was aimed at gaining better understanding of this FCP approach, and to improve its future application. The research question therefore was:

> *What are the effects of (actions of) the Forward Commitment Procurement method on perceived risks in project concerning Public Procurement of Innovation?*

Following Yin (2009), a case study research was designed to provide an answer to this question. The research phases of this case study are discussed below.

The Forward Commitment Procurement method (unit of analysis).

The first research phase concerned a detailed investigation of the unit of analysis: the FCP method. The FCP method covers three consecutive phases: an identification phase, a market engagement phase and a procurement phase. Of these phases, the market engagement phase is of most interest. It is during this phase that clients can take first action in creating the conditions necessary to support the delivery of innovative solutions (Department for Business Innovation & Skills, 2011).

An important step in the analysis of the FCP method was to identify the actions. Actions are goal oriented purposeful human acts to reach goals set. The actions defined are the most elemental aspects of the FCP method. Understanding how these actions affect perceived risks, helped to determine the overall effect of FCP. The following six actions were identified.

- **Communicating;** the transferring of information of from clients to market parties.
- **Sounding;** the transferring of information (feedback) from market parties to clients, which is initiated by clients.

- **Adjusting demand;** matching clients' needs with market parties' capabilities to enable innovative solution to be developed.
- **Aggregating demand with other clients;** increasing market pull (e.g. potential future sales for market parties).
- **Facilitating networking;** stimulating cross-fertilization and cooperation.
- **Aligning the procurement strategy;** developing a procurement strategy that allows innovative solutions to be delivered.

These actions can be taken individually or simultaneously with in single events or activities. To help determine the effects of abovementioned actions on perceived risks in PPI, a theoretical perspective is required.

Theoretical perspective

As the context of this research concerns procurement projects (i.e. transactions), agency theory and Transaction Cost Economics are applied.

Agency theory is directed at the ubiquitous agency relationship, in which one party (the principal) delegates work to another (the agent), who performs that work (Eisenhardt, 1989a). Agency Theory emphasises that clients and market parties have different (conflicting) goals and attitudes towards risks taking.

Agency theory is similar to Transaction Cost Economics (Eisenhardt, 1989a), although the former emphasizes that actors have different goals and risk attitudes.

Transaction Cost Economics (TCE) is also referred to as the economics of contracting. A contract concerns a relationship between principal and agent (Eisenhardt, 1989a). TCE supports two behavioural propositions, (1) bounded rationality and (2) opportunism (Williamson, 1981) which are also assumed in agency theory (Eisenhardt, 1989a). Bounded rationality implies rational decision by buyer and sellers under conditions of incomplete information (Parker & Hartley, 2003).

According to Williamson (1979, 1981), the three critical dimensions for characterizing transactions are: (1) uncertainty, (2), transaction bounded investments, and (3) frequency in which transactions recur.

Focussing on the context of a single procurement project (e.g. one transaction), the aspects uncertainty and transaction bounded investments are of most interest.

- Uncertainty by definition stems from the absence of information (Edler et al., 2006) and determines actors' ability to accurately estimate outcomes. A natural response to uncertainty is information seeking behaviour. However, seeking out information is difficult or expensive.
- Transaction bounded investments are inputs that are specifically used for a single transaction and are therefore not usable to other uses without loss of value (Dorée, 1996). Cowen and Parker state that transaction cost "arise from seeking out buyers and sellers and arranging, policing and enforcing agreements or contracts in a world of imperfect information" (Cowen and Parker (1997) in Parker & Hartley, 2003).

With increasing levels of uncertainty and transaction bounded investments, the less attractive transactions becomes. In other words, the riskier transactions become. As the purpose of applying the FCP method is to manage risks, applying FCP would ideally result in decreased levels of uncertainty and transaction bounded investments for both clients and market parties. However, such an ideal situation is seldom possible. From the outset, there will always be some degree of

information asymmetry. Furthermore, uncertainty and transaction bounded investments related to one another (information seeking behaviour can increase transaction bounded investments). Therefore, clients need to outweigh positive and negative effects.

Consequently, the idea behind FCP is that clients consider theirs and market parties' level of uncertainty and transaction bounded investments. Together with client's goal and risk attitude, the client can act to change a situation (with risks) to a situation most favourable for achieving client's goal.

The next step in this research phase was to formulate proposition to reflect upon what the expected effect of the (actions of) FCP method are. This is indicated in the table below. Effects indicated as a question market are effects that are expected, but could not be clearly defined from a theoretical perspective.

Table: Expected effects of (actions of) the FCP method, based on theory.

	Client's level of uncertainty	Client's transaction bounded investments	Market parties level of uncertainty	Market parties transaction bounded investments
Communication	-	Increases	Decreases	-
Sounding	Decreases	Increases	-	Increases
Adjusting demand	Decreases	-	?	?
Aggregating demand	Decreases	Increases /decreases	Decreases	Decreases
Facilitating network	-	Increases	-	Decreases
Aligning procurement strategy	Decreases	?	?	?
Overall	Decreases	Increases /decreases	Decreases	Increases /decreases

Case studies

Subsequently, three case studies were conducted to analyse the effects (of actions) of the FCP method in practice. Access to case studies was gained through the Low Carbon Building (LCB) Healthcare Network, which is one of three public procurement networks that have been established under the European Lead Market Initiative. Data sources included project documentation, interviews and observations (in one case study). These sources provided the necessary information for analysing the effects of the FCP method in practice.

These effects are indicated in the table on the next page. An asterisk indicates effect that were not predicted. Effects in *italic* indicate when the effect was only found in one case study.

Table: Summation of effects of FCP as found in the case studies.

	Clients' level of uncertainty	Clients' transaction bounded investments	Market parties' level of uncertainty	Market parties' transaction bounded investments
Communication	Decreased*	Increased	Decreased	-
Sounding	Decreased	Increased	-	Increased
Adjusting demand	-	-	*Decreased (expected)*	-
Aggregating demand	Decreased	Increased*	Decreased	Decreased
Facilitating network	Decreased*	Increased	-	?
Aligning procurement strategy	Decreased	*Increased*	*Increased*	*Decreased*
Overall	Decreased	Increased	Decreased/ increased	Decreased/ increased

Conclusions & recommendations

The effects perceived in practice validated the effects that were expected from a theoretical point of view. In some cases however, additional effects were perceived. Overall, it was found that applying the FCP method has the following effects.

- Clients' level of uncertainty was decreased.
- Clients' transaction bounded investment were increased.
- Market parties' level of uncertainty decreased. One case (Erasmus MC) shows and exception were market parties' level of uncertainty by aligning the procurement strategy.
- Market parties' transaction bounded investments were decreased, with the exception of the action of sounding.

This indicates that risks can be managed, although managing risks generally results in additional transaction bounded investments for the client. This general conclusion was acknowledged during case study interviews. Furthermore, it supports the statement of Chapman & Ward (2003) that all risk management processes consume valuable resources. This calls for effective and efficient risk management.

Based on this research, a number of recommendations were made to make the FCP method more effective or effecting.

- **Consider formalizing aggregating of demand.** Aggregating demand is the only action identified that can decrease in clients' transaction bounded investments. This was however, not perceived in the case studies where the aggregation of demand was not formalized.
- **Consider choice of project.** After clients have identified a need, they should asses if the potential benefits of procuring an innovative solution justify the required additional investments of applying the FCP method.
- **Combining activities for higher effectiveness and efficiency.** Although actions were investigated individually, they often occur simultaneously. Actually, the cases demonstrate benefits of taking multiple actions within specific activities. One benefit of combining actions in single events is that more efficient use can be made of required time and effort.

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Chapter 1

INTRODUCTION

The world is rapidly changing and simultaneously facing a number of Grand Challenges such as climate change, energy and water supply, public health, ageing societies and changes in world economy (Lund Declaration, 2009). Public sector agencies are therefore facing considerable financial and efficiency challenges and a move to more sustainable operations. In order to face these challenges, public sector agencies will require new, better products and services. However, these products and services are not always provided by market parties and need to be developed first. In other words, they require innovation. In more recent years, increased attention is being paid to procuring innovative products and services. This form of procurement is referred to as *Public Procurement of Innovation.*

Public Procurement of Innovation (PPI) can be defined as "the buying or procuring of a good that currently is not available, but can be developed in a reasonable amount of time" (Edquist & Hommen, 2000).

There are, however, several barriers to the implementation of public procurement of innovative products and services.

1.1 BARRIERS IN PUBLIC PROCUREMENT OF INNOVATION

Barriers to the implementation of Public Procurement of Innovation lie with both public agencies and market parties deeming such procurement projects too risky. Edler et al. (2006) discuss that public agencies face different risks than market parties. Hence, there are two perspectives on risks in PPI and both perspectives are important to consider.

Public agencies perceive procurement of innovation as risky because the outcomes of such procurement projects are unknown upfront. Risk is inherent in buying something innovative (European Commission, 2007) and there is a potential for failure. Failure may be total, if a supplier is simply unable to deliver; or partial if performance falls below expectations, or delivery is late (European Commission, 2007). Failure can also come from practical difficulties in applying new solutions and integrating them within the organisation (European Commission, 2007). Several aspects constitute or exacerbate this risk.

First, public agencies often find it difficult to determine their needs and define them as outcome-based requirements (e.g. functional requirements instead of prescriptive). Specifying

needs as outcome-based requirements is necessary to allow for innovative solutions, but simultaneously results in a larger degree of uncertainty about what solutions will be developed.

Secondly, public procurers are often not aware, or fully aware, about what product and service innovation the market offers them – or could offer them (Edler & Georghiou, 2007). In setting their needs, they do not know whether the market will be capable of delivering a solution. This uncertainty is caused by information asymmetry and is often named as one of the causes for market failures (European Commission, 2011).

A third problem often mentioned is that public procurement procedures (e.g. tender procedures and contracts, including selection and award criteria) hinder innovation. Procedures often (unintentionally) exclude market parties from contending for the contract (DTI, 2006; Myoken, 2010). This is especially true for Small and Medium sized Enterprises (SME's) that may very well provide suitable solutions for clients' problems, but are excluded due to criteria like annual revenue or a certain number of reference projects. Moreover, inappropriate award criteria (e.g. lowest price) also decrease the chances for innovative solutions. Instead, most economical advantageous tender (MEAT) criteria should be applied (Edler & Georghiou, 2007; European Commission, 2007). However, developing these criteria is often both new and difficult for procuring agencies. Furthermore, which criteria and strategy to apply differs from project to project. This means that before entering the tendering process, requirements and user readiness would have to be checked accordingly (Edler et al., 2006). The fact remains that developing an appropriate procurement strategy is difficult.

These three aspects constitute or exacerbate the risks perceived by public parties. These risks can particularly become barriers if public agencies are risk averse. Winch (2002) discusses that clients within public sector bureaucracies encourage risk aversion. The type and size of the public agency may also play a role in risk aversion. For instance, healthcare parties or other devolved public agencies may be especially risks averse (compared to larger public authorities), as they have little experience with new ways of procurement and therefore face many uncertainties about whether or not their required products and services will be delivered through the procurement process.

Market parties also perceive risks in projects concerning PPI. Their perceived risk can be referred to as market risk and is constituted by two aspects.

First, the products or services required in PPI are innovative or 'new', and require development (Hommen & Rolfstam, 2009). The costs for product/service development represent an investment risk. The magnitude of this risk depends on the degree of innovation (e.g. radical, incremental) that is required (Edler et al., 2006). In any case, development costs have to be compensated by a certain demand (e.g. future sales). Smaller public agencies like hospitals often cannot create such a large demand (European Commission expert group, 2005).

A second aspect is closely related to the information asymmetry described earlier. Suppliers of potential new products and services often lack the knowledge of what customers might want in the future (Edler & Georghiou, 2007). Hence, there is a lack of insight in the requirements of the procuring agency. Ward & Chapman (2003) state that a lack of clear specification is a source of uncertainty.

Investment decisions are made on the basis of attractive business plans (DTI, 2006). This means the chance of losing investments needs to be small and potential sales need to be high. This is especially true in a time of severe economic, social and environmental crisis where entrepreneurs, investors and businesses are more than before exposed to risk taking (European Commission, 2011).

Consequently, both public agencies[1] and market parties are reluctant to endeavour in projects concerning Public Procurement of Innovation due to risk and risk aversion. Hence, the delivery of new and innovative products and services is seriously hindered due to the barriers of risks that are perceived.

It is, however, paramount that the public sector needs innovations to overcome today's and tomorrow's challenges. A study by the Fraunhofer Institute for Systems and Innovations (Edler et al., 2006) showed it is necessary to think about risk management to deal with the uncertainty involved in buying innovative products or services. A report by the European Commission mentions that deciding how to deal with risk, is one of ten elements of good practices (European Commission, 2007).

For the successful procurement of innovative products and services, it therefore seems vital that risks in projects concerning PPI are managed. One approach specifically developed to manage these risks is **Forward Commitment Procurement (FCP).**

1.2 FORWARD COMMITMENT PROCUREMENT

The Forward Commitment Procurement method was conceived by the Environmental Innovations Advisory Group (DTI, 2006). The FCP method is a holistic approach to public procurement in the sense that it describes the procurement process from beginning (i.e. the identification of needs) to end (i.e. procurement of good or service). Following the guide from the UK Department for Business, Innovation & Skills (2011), the FCP method can be divided into three phases:

1. An identification phase in which clients identify their needs (needs that currently cannot be satisfied by the market) and develop a FCP project outline.
2. A market engagement phase in which clients actively engage market parties.
3. A procurement phase that concerns an actual (EU) procurement procedure (e.g. competitive dialogue) to procure the products or services required.

From a procedural point of view, the phases described above are similar to 'standard' procurement practice. Both will start with the identification of needs and end with a (EU) procurement procedure.

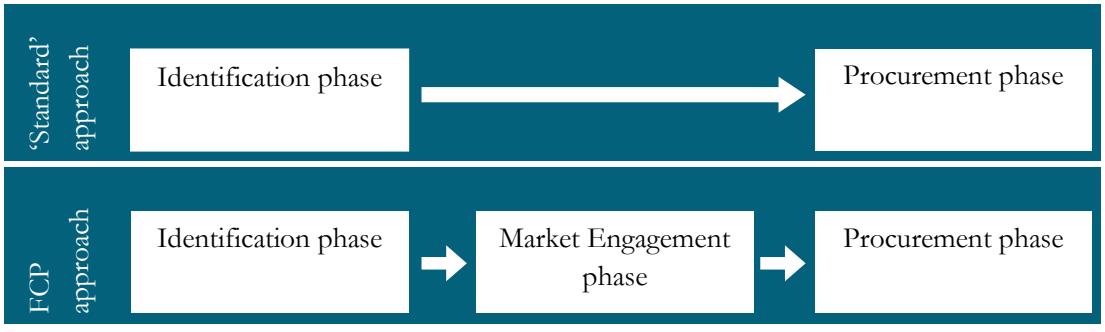


Figure 1.1: Initial comparison of FCP method with 'standard' practice.

However, the main difference between 'standard practice' and the FCP method concerns the market engagement phase. During this phase, which takes place prior to any actual tender

[1] Hence forth, public agencies will (also) be referred to as clients.

procedure, clients can take several actions to manage perceived risks. More specifically, it iincludes the following six actions[2]:

- **Communicating**; to convey information about client's (future) demand and requirements.
- **Sounding**; to gather feedback from the market (e.g. about market capabilities, clients requirements, etc.)
- **Adjusting demand**; to match clients need with market capabilities to better enable innovative solution to be developed.
- **Aggregating demand with other clients;** to increase market pull (e.g. potential future sales).
- **Facilitating networking**; to stimulate cross-fertilization and cooperation.
- **Aligning the procurement strategy**; to have a procurement procedure that allows for innovative solutions to be delivered.

The idea behind FCP is that clients perceive both theirs and market parties' risks, and then acts to change that situation in to a situation in which risks are acceptable. Doing so, they create a situation that is more favourable to procuring required (innovative) products and services.

1.3 PROBLEM STATEMENT & RESEARCH QUESTION

The use of FCP is relatively new and has only been applied on a limited number of projects. Therefore, there is still little insight in what the effects of FCP on perceived risks are.

Having this insight is important however, as these effects do not necessarily concern positive effects. While actions of the FCP method might favourable influence clients' and market parties' perceived risks, those same actions can, for instance, drive clients' costs. All risk management processes consume valuable resources and can themselves constitute a risk to the project that must be effectively managed (Chapman & Ward, 2003). Hence, it seems important to outweigh positive effects with any negative effects (e.g. effective risk management). This is a very difficult task to perform. The high levels of uncertainty during the early stages of the project cycle mean that the greatest requirements for effective risk management occurs when there is the lowest level of reliability data for analysis (Winch, 2002). In dealing with this problem, an essential first step is to understand how the FCP method affects perceived risks.

Therefore, the following research question was formulated (from the perspective of the client).

> *What are the effects (of actions) of the Forward Commitment Procurement method on clients' and market parties' perceived risks in projects concerning Public Procurement of Innovation?*

1.4 RESEARCH GOAL

This research aims at dealing with the problem described above. The goal of this research is therefore as follows.

> *To provide clients with decision support in applying FCP in procurement projects, by indicating the effects of actions taken in FCP on clients' and market parties' perceived risks in projects concerning Public Procurement of Innovation.*

[2] Paragraph 3.3 goes into dept about the actions that are identified.

The ultimate goal is to improve the application of the FCP method to enable public agencies to successfully procure the products and services required in facing their challenges.

1.5 RELEVANCE

In facing the Grand Challenges mentioned in the Lund Declaration, public agencies need to manage the risks perceived in project concerning Public Procurement of Innovation. Managing these risks is a difficult task that involves careful decision making on which action to take. The FCP method is an approach that provides the means for doing so.

This exploratory research is a first, but essential, step in improving the application of the FCP method. By having a clear understanding of actions and the effect they have on perceived risks, decision-making is improved. Besides indicating the effects of FCP, findings of this research also allow making recommendations on improving the future application of FCP.

This thesis discusses Public Procurement of Innovation on an operational level. In other words, the perspective in this research is taken is that of individual public agencies. However, public procurement can also serves as a *strategic*[3] tool that governments can use to stimulate innovation (Edler & Georghiou, 2007). At 16.3% of the combined EU-15 Gross Domestic Product (Georghiou, 2004 in Edler and Georghiou (2007)), public procurement represents a key source of demand for firms in sectors such as construction, health care and transportation (Edler & Georghiou, 2007). Public demand, when oriented towards innovative solutions and products, has the potential to improve delivery of public policy and services, often generating improved innovative dynamics and benefits from the associated spillovers (Edler & Georghiou, 2007).

The Lund declaration mentions that Europe must "develop public innovation procurement related to Grand challenges at all policy levels"(Lund Declaration, 2009). Efforts need to be based on a better understanding of how public procurement actually can and should work – in a very practical sense – to contribute to more innovative activity in industry and to the growth or even creation of markets for innovative products and services (Edler et al., 2006). It has become clear that strong efforts are needed to mobilise procurement at all state levels for innovative markets.

However, it must be considered that the procurement budget of a country is spread out over both central government and devolved bodies. In the UK for instance, the central government controls approximately 25% of the state's procurement budget while devolved bodies at different levels control 75% (Edler et al., 2006). Specifically devolved bodies will generally be smaller and more risk averse which makes the management of risk particularly important. This research provides insight in how public procurement can actually work in practice.

Concluding, this research is relevant on both an operation and strategic level. On an operational level, contributions concern improving decision making by indicating the effects of FCP. Suggestions for improving the application of FCP are also provided. On a strategic level, this research may contribute to the current body of knowledge on how Public Procurement of Innovation can or should work in practice.

[3] Telgen (2006) provides a overview of these different perspectives.

1.6 THESIS OUTLOOK

The remainder of this thesis has the following outline.

- Chapter 2 discusses the methodology applied in this research.
- Chapter 3 discusses the FCP method to provide insight in the central subject of this research.
- Chapter 4 discusses the theoretical background of this research. It provides a theoretical perspective on the FCP method and the actions within this method.
- Chapter 5 discusses the data resulting from case studies. In this chapter, each case is discussed and analysed individually.
- Chapter 7 discusses the cross-case analysis, in which the different case studies are compared.
- Chapter 7 concerns the conclusions of this research and provides practical recommendations that based on the findings of this research.
- Chapter 8 concerns a reflection on this research and discusses the relevance and quality of this research.

Chapter 2

METHODOLOGY

2.1 RESEARCH STRATEGY

According to Verschuren & Doorewaard (2007), there are five main strategies for conducting research: (1) a survey; (2) an experiment; (3) a case study; (4) a well-founded theory approach; and (5) a desk research. Of these strategies, case study research was chosen.

2.1.1 Case study research

According to Yin (2009) a case study is "an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly defined". A case study research allows for an integral investigation of the research subject. Choosing a case study research as a research strategy is therefore suited for this research as the focus lies with a specific method within a complex project context. Moreover, outcomes of case study research tends to be of higher value to practitioners in the field, since the methods used and data provided by case studies are more common and recognizable (Verschuren & Doorewaard, 2007).

There are different case study designs. Yin (2009) discusses a 2x2 matrix in which distinctions are made between (1) single versus multiple case studies and (2) holistic versus embedded case studies.

Performing multiple case studies is beneficial because they provide the possibility of replication. Analytic conclusions, independently arising from multiple case studies, are more powerful than conclusions arising from single case studies (Yin, 2009). According to Verschuren & Doorewaard (2007), a comparative analysis between cases helps in achieving a higher level of abstraction and provide more general conclusions.

Within multiple case studies, there are two main variations: holistic and embedded case studies. Yin (2009) states that the choice between these two depends on the type of phenomenon being investigated, and the research question. The 'phenomenon' in this research is the FCP method (and more specifically the actions within this method) which can be considered as an element within the context of a procurement project. Therefore, this research concerns a multiple embedded case study research.

2.1.2 Case selection

According to Van Aken et al. (2007) and Yin (2009), the selection of cases may be on pragmatic grounds, like the availability of cases or accessibility of information. Yin (2009) furthermore states that cases should be chosen that are likely to illuminate the research question. A last consideration in the selection of cases is that it is preferable to select both successful and unsuccessful cases. However, this implies that success is already been determined while such a conclusion can only be based on detailed examination (van Aken et al., 2007).

The following criteria were used to select the cases:

1. **Case should be a project concerning Public Procurement of Innovation**. In other words, the goal of the project needed to be to procure a product or service that requires innovation. With this criterion, it was ensured that the cases reflect the situation described in the introduction of this thesis.
2. **Application of the FCP methodology**. As this research focuses on the application and improvement of FCP in procurement projects, cases had to concern the application of the FCP method.
3. **Availability of data**. To gain useful insights, access to project specific documentation was required, as well as the possibility to perform interviews.

While the above three criteria were preconditions, a fourth criterion was only partially decisive in including or excluding cases.

- **Completion of FCP project.** The main benefit of studying finished projects is that the entire process can be investigated and outcomes of projects can be reviewed. However, this research focuses on perceived risks, and the management of those risks. As described in paragraph 1.2., specific parts of the FCP process (e.g. market engagement phase) are particularly important. Hence, it was not necessary that projects were completed (e.g., when the product/service has been procured). Moreover, there are also benefits gained by investigating on-going projects. On-going projects allowed for real-time investigation (and observations) that can provide more detailed insights compared to reflecting on projects from hindsight.

No criteria were applied in relation to the success or failure of the cases. For one, it is hard to determine success and failure without detailed examination (van Aken et al., 2007). Moreover, both successful and unsuccessful cases can provide interesting information.

Access to case studies was gained through the Low Carbon Building (LCB) Healthcare Network[4] which is one of three public procurement networks that been established under the European Lead Market Initiative[5]. Although there were five potential cases within this network, only three met the criteria formulated. The cases are shown in Table 2.1, and are discussed in detail in Chapter 5.

[4] For more information: http://lowcarbon-healthcare.eu/

[5] The Lead Market Initiative is the European policy for six important sectors that are supported by actions to lower barriers to bring new products or services onto the market.

Table 2.1: Case selection indicating cases, description of the projects and current status (progress in the FCP process)

Case	Project description	Status
Rotherham NHS Trust (UK)	Ultra-efficient lighting for future wards	Contract awarded
Erasmus MC (the Netherlands)	Cleaning of hospital beds	Procurement procedure underway
Nottingham NHS Trust (UK)	Integrated ultra-low carbon energy supply and management for city campus site.	Market engagement underway

2.2 RESEARCH DESIGN

According to Yin (2009) any research design concerning case studies has five components.

1. A study's question;
2. Its propositions, if any;
3. Its unit(s) of analysis;
4. The logic linking the data to the propositions;
5. The criteria for interpreting the findings.

The study's question has been addressed in paragraph 1.3.

Yin (2009) states that propositions direct the attention to something that should be examined within the scope of study. The research question has already (partially) indicated the direction. The study should focus on effects on perceived risks in projects concerning PPI. Propositions can also be seen as the basis from which hypothesis can be derived (Hak & Dul, 2009). In other words, propositions state what the researcher expects to find in practice, based on literature or theory.

According to Yin (2009), defining the unit of analysis helps to determine the scope of the data collection and to distinguish data about the subject of the case study from the context of the case. The unit of analysis was defined in the problem statement, namely the FCP method. In this research, the FCP method is the larger unit of analysis. As already briefly mentioned, the FCP method concerns a number of actions, which are more specific units of analysis. Taking both into account prevents one of the pitfalls discussed by Yin, namely that researchers often focus on specific units of analysis and fail to return to the larger unit of analysis (Yin, 2009).

The last two components of a research design concern the data analysis steps in case study research and concern a range of techniques (Yin, 2009). The case study data and analysis should reflect the initial study propositions. Within this research, one important technique applied is 'pattern matching' in which researchers compare propositions (i.e. expected patterns) based on literature and theory to what they find in practice (i.e. perceived patterns).

The abovementioned elements and techniques will be discussed in more detail in the remainder of this thesis.

2.3 RESEARCH MODEL

Figure 2.1 provides an overview of the research. This research model shows the different phases of the case study research. Also indicated are the chapters that will discuss each research phase.

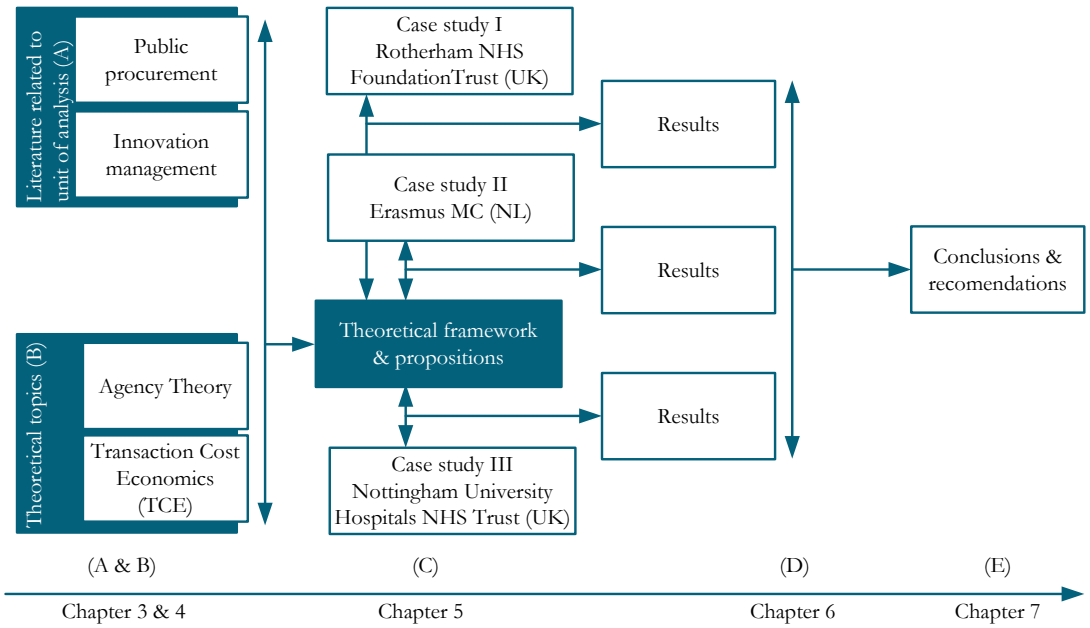


Figure 2.1: Research model (based on Verschuren & Doorewaard, 2007).

Below, each research phase is discussed to elaborate on the goals and central research questions of each phase. Answering the research questions of each phase will lead to the ability to answer the main research question.

Analysis of the unit(s) of analysis (A)

Investigating the units of analysis of this research helps to distinct the subject from context (Yin, 2009). Moreover, it helps in understanding the relationship between the units of analysis and context. The central question in this research phase was as follows.

A. How can (the actions) of the FCP method be described in the context of a procurement project?

- What are the characteristics of the FCP method?
- What are the characteristics of the actions that can be taken in the FCP method?

This research phase resulted in a better understanding of the unit of analysis, which was important for the second research phase. The discussion of the FCP method is discussed in Chapter 3.

Development of theoretical perspective and propositions (B)

This research phase had two goals. A first goal was to develop a theoretical framework to allow for a uniform way of analysing the cases. A second goal was to formulate propositions. These propositions were formulated by reviewing the actions of FCP (first research phase) from a theoretical perspective. By comparing these theoretical propositions to practice, the analytical technique of pattern matching (see Hak & Dul, 2009; Yin, 2009) is applied. The central question in this research phase was as follows.

B. How can the effects (of actions) of the FCP method on perceived risks be described from a theoretical perspective?

- How can risks and uncertainties be described in the context of procurement projects?
- How can the FCP method be described from a theoretical perspective?

- What are the expected effects of each action of FCP on risks?
- What are the expected effects of the FCP method on risks?

Chapter 4 discusses this research phase.

Case studies (C)

The goal during this research phase was to collect data from practice (i.e. case studies). First, each case was studied individually. Miles & Huberman (1994) state that it is important to understand the dynamics of each case individually before proceeding to cross-case explanations.

As this case study research concerns embedded case studies, it was first important to consider the context and background of the procurement project. This was followed by a detailed investigation of the FCP method and subsequent analysis of the actions of the FCP method. The theoretical framework that resulted from the previous phase helped in analysing and describing the cases. Furthermore, pattern matching as an analytical technique was applied to compare theory to practice.

The central question and sub questions in this research phase were as follows.

C. What are the effects (of actions) of the FCP method on perceived risks in practice?

- What is the background of the project?
- What is the client's goal concerning the procurement project?
- What were the perceived risks and uncertainties in this procurement project?
- What actions (of the FCP method) were taken?
- What were the effects of the actions taken?
- What are the similarities and differences between the literature and the case?

Chapter 5 discusses the case studies and will furthermore discuss the case study approach.

Cross-case analysis (D)

The data resulting from the individual case studies allowed conducting a cross-case analysis. This made it possible to come to more general conclusions on the effects of FCP. In essence, the central question of the previous phase also applies to this phase. However, the following questions were important in the cross-case analysis.

- What are the commonalities and differences between the cases?
- What are the similarities and differences between theory and practice?

The cross case analysis, and the analytical techniques used, are discussed in Chapter 6.

Concluding (E)

By answering the previous research questions, it was possible to answer the main research question. This means this research has indicated the effects of applying the FCP method on perceived risks in projects concerning PPI. However, the ultimate goal is to improve the application of the FCP method. Therefore, the following question also needs to be addressed.

- Based on this research, how can the application of the FCP method be improved?

Chapter 7 discusses the conclusions and recommendations resulting from this case study research

2.4 BOUNDARIES AND PERSPECTIVE

Setting boundaries is useful for keeping a research project manageable. It is furthermore important to consider these boundaries in the remainder of this thesis. Also important to consider is the perspective taken in this research.

This research will specifically focus on the FCP method, and the actions identified within this method. Furthermore, there is focus on one of the phases of the FCP method, namely the market engagement phase. According to the Department for Business, Innovations & Skills (2011), this phase concerns first actions in creating the conditions necessary to support the delivery of innovative solutions.

Under the EU legislative framework for public procurement, there are possibilities for interaction between public authorities and market parties. Among these possibilities are so-called foresight techniques like 'market surveys' and 'technical dialogues'. The former refers to finding out what kind of possibilities the market can offer, while the latter is aimed at arriving at the decision on which specific requirements to use (European Commission expert group, 2005). The use of early encounters (just as FCP) with market parties therefore is not new and even becomes more common. For instance, the executive arm of the Dutch Ministry of Infrastructure and the Environment (Rijkswaterstaat) executes a 'market consultation' exercise by default before starting a competitive dialogue procedure. This exercise is particularly aimed at determining whether or not the market is interested in the project and if the project, as it is being proposed, can be realized (Rijksoverheid, 2009).

Abovementioned activities show resemblances to actions identified within the FCP method (see next chapter). However, the focus on the FCP method can be justified. The cases that concern the application of the FCP method strongly reflect the initial problems identified in the introducing chapter of this thesis. In these cases, it is emphasized that innovative solutions are required. Furthermore, it is indicate that public agencies take specific actions to manage risks. Different to consultation, 'engagement' emphasizes that actions are taken (based on the encounters with the market) that engage the market towards delivery of the required products and services. The focus on FCP is therefore justified as selecting FCP projects is more likely to illuminate the research question.

Also important to mention is the perspective in this research. As was mentioned in the introduction, there are two main perspectives involved in this topic of PPI: a client's perspective and a market party's perspective. Both these perspectives are important to consider in this research. However, the problem statement and the research goal indicate the primary focus: the clients' perspective. Focussing on this perspective indicates an additional boundary. This focus on client's perspective is justified for the following reasons.

One reason is that one could argue that the client's perspective is more important in the success of a project concerning PPI. After all, it is the client that requires innovative products or services and will be the initiator of a procurement project. A pragmatic reason for this focus was that the researcher had better access to the information on the client's perspective.

The perspective of market parties however, did play an important role. As is already stated, the idea of FCP is that clients consider both theirs and market parties' perceived risks.

In Chapter 7, the consequences of choosing these boundaries and this perspective are discussed.

Chapter 3

FORWARD COMMITMENT PROCUREMENT

Following the research model, the first phase of this research is aimed at taking a closer look at the FCP method and the actions within this method. After a short discussion of the history of FCP, the FCP method is discussed in general. The actions identified within this method are discussed next.

Doing so, this chapter provides a detailed description of the units of analysis (see Yin, 2009). Besides, it provides insights in the context in which these actions take place. In the following chapter, this information is used to discuss the FCP method from a theoretical perspective.

3.1 HISTORY OF FORWARD COMMITMENT PROCUREMENT

The concept of the FCP method has been conceived by the Environmental Innovations Advisory Group (EIAG) that was established in 2003 (DTI, 2006). The EIAG investigated how innovative products and services could be brought to the market successfully. One of the findings was that innovative products are often unsuccessful in breaking into the marketplace (DTI, 2006). Consequently, the EIAG developed the concept of Forward Commitment Procurement.

According to the EIAG, the FCP approach can be described as follows: "In essence, the approach involves providing advance information of future needs, searching out and engaging with potential suppliers and, critically, incentivising them through a Forward Commitment - the promise of current and future business to promote investment in innovative new product development"[6] (DTI, 2006). Later publications also specifically mention that the FCP method aimed at managing clients' risks in buying something innovative (see Department of Business, Innovation & Skills, 2011).

The concept of FCP was taken up in demonstration projects including the HM Prison service (UK). Currently, the FCP method is being applied in pilot projects within the Low Carbon Buildings (LCB) Healthcare Network. Three cases within this network are subject to this case study research.

[6] In essence, the approach proposed by the EIAG is that, by using the FCP approach, the risks for market parties (e.g. market risk) can be managed. It is this market risk that has a main focus in the report of the EIAG.

3.2 PHASES IN FORWARD COMMITMENT PROCUREMENT

The Department for Business, Innovation & Skills (2011) published a guide that describes the various steps taken in the FCP method. In this guide, FCP is presented as a process consisting out of three main phases in which specific steps are taken (see figure below).

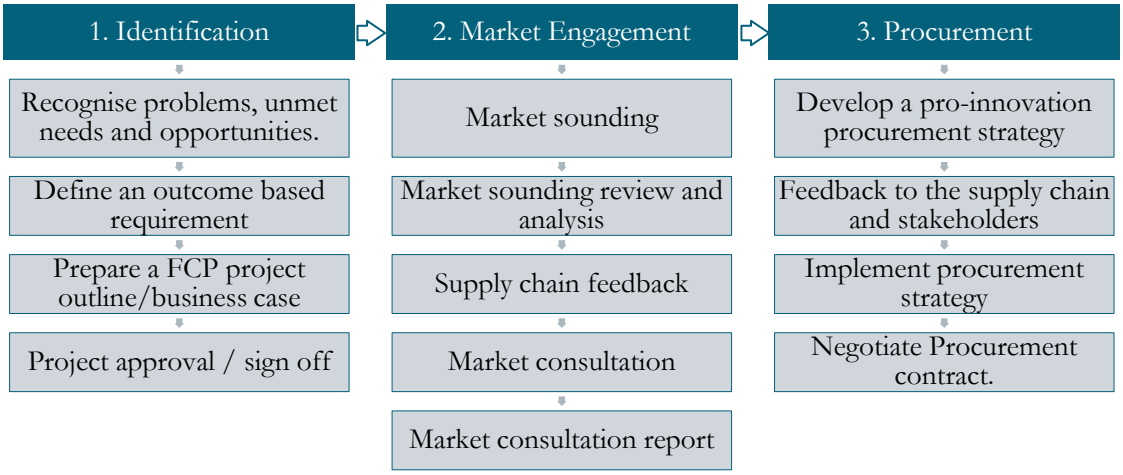


Figure 3.1: Steps of the Forward Commitment Procurement process according to the Department for Business, Innovation & Skills (2011).

The first phase concerns the identification of possibilities for a FCP project (e.g. "knowing what you want"). It therefore concerns clients evaluating their current and future needs. If the market cannot meet those needs, market parties need to develop products or services in order to meet those 'unmet' needs. The next step of importance is that clients formulate their needs as outcome-based requirements (instead of prescriptive requirements). This is an important aspect since this should provide market parties freedom to address clients' needs in various ways.

The outcome of this first phase is a FCP project outline. Compared to 'standard' procurement practice that also concerns identifying needs, this phase is conducted much earlier to allow time for the market engagement phase.

The formulated requirement can be regarded as the input for the second phase. This phase is the "Market Engagement" (e.g. "letting the supply chain know") phase. According to the Department for Business, Innovations & Skills (2011), this phase concerns first actions in creating the conditions necessary to support the delivery of innovative solutions[7]. The market engagement phase can be divided into two stages: the market sounding stage and the market consultation stage.

The market sounding stage aims at getting feedback of potential suppliers. The market consultation stage brings together interested parties in order to share ideas and facilitate the forming of partnerships between suppliers.

The third phase concerns the actual procurement which consist out of the tender procedure and awarding of contract (e.g. "buying the product or service"). An important aspect here is that the procurement strategy is based on the information gained through the market engagement phase. With this information, clients are more able to develop a procurement strategy that enables the actual procurement of better and innovative products and services.

[7] This justifies the focus on the market engagement phase as discussed in paragraph 2.4.

Thus, the FCP method is a process that covers three consecutive phases. Furthermore, there are dependencies between these phases. Each phase will depend, at least partially, on the previous one.

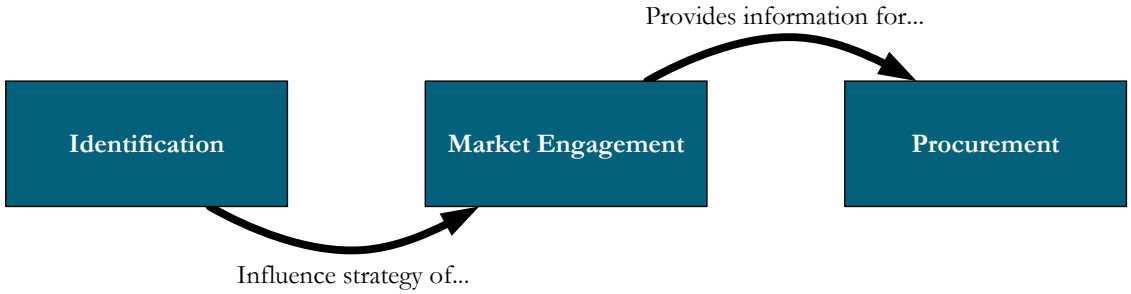


Figure 3.2: Dependencies between FCP phases.

Figure 3.1 on the previous page provides a good procedural overview. However, the steps that it describes can be considered as activities. Activity describes a state of being active, while actions can be defined as goal oriented purposeful human actions to reach goals set. Where actions are individual acts, activities can contain multiple actions. Therefore, it is important to define actions within FCP, as they are the most elemental aspects of the FCP method. Understanding how these actions affect perceived risks helps in determining the overall effect of FCP.

3.3 ACTIONS OF FCP

To identify actions of FCP, a desk review was conducted. Reviewed were guides on FCP (see Department of Business, Innovation & Skills, 2011) and available case studies. Most often, these documents described activities and goals of FCP. Actions were identified by constantly asking two questions:

- What action is central in the activity described?
- What action is directly related to achieving the goal described?

The next sections will discuss the actions identified. To provide a better overview, these actions are discussed per phase. The goal of each action and related literature is discussed.

The context of these actions is also discussed, as well as interdependencies between actions.

3.3.1 Action(s) during the identification phase

Within the identification phase, only one action was identified. This action is the choice or of project and the defining of requirements. The choice of project will initially determine the potential of innovation. It determines in how many ways market parties can address clients' requirements. Several characteristics of the project play an important role.

- Time available for the delivery of new products and services. If there is insufficient time for development, one cannot expect that the market will deliver new products or services.
- The type of project influences on the number and sort of market parties that will be able to provide, or contribute to, solutions.
- The size of the project plays a role in two ways. First, the size can limit the number of market parties that can handle such a project. On the other hand, a large project will be interesting for market parties, as it constitutes a large demand.

These project characteristics like size and type can greatly influence the potential for innovative solutions.

How the requirement is formulated, is also an important factor. For innovation, it is indispensable that demand is based on specifying functionalities, rather than prescribing a specific design (Edler & Georghiou, 2007). Functional specifications provide private parties 'freedom' to come up with different alternatives and ideas, while prescriptive specifications can form a tremendous hindrance for introduction innovative ideas.

Beside this direct relation with the chance of innovative solutions, the choice of project will also play an important role in other actions of FCP. The project chosen will influence the potential interest of market parties and the procurement strategy. Especially market parties' interest will keep playing a role during the market engagement phase. The involvement of market parties is necessary for the development of the required products or services. A last comment is that the initial demand may be altered later on (see next section).

In this research, this initial project choice is not regarded as an action of FCP. The main argument for this is that project choice is not really a choice. Rather, it is the result of a genuine need of the client. The choice therefore should actually be: which procurement method or strategy is most appropriate? This question is not of relevance in this research, as the research focuses on the management of risk after project choice. However, the choice is taken into account in the case studies (as independent variables) as it indeed plays an important role in each project.

3.3.2 Action(s) during the market engagement phase

Within the market engagement phase, five actions were identified. Although these actions below are presented individually, in fact multiple actions can be taken within a single activity or event. For instance, organizing a market consultation workshop may help in communicating a message, getting feedback on client's requirements and facilitate networking.

Communication

Communication is the act of conveying information. In this research, communication is seen as the unilateral transferring of information from client to market parties. In his book, Winch call this information disclosure (Winch, 2002).

Von Hippel (1986) discusses that accurate understanding of user needs is essential for the development of commercially successful products. Providing information is therefore important for market parties to understand clients' problem and/or requirements. Edler & Georgiou (2007) furthermore state that it is important that suppliers are given signals regarding future public demands early. Providing these signals early is not only important to raise market parties' interest, but also to align clients' needs and market capabilities.

Communication not only concerns the transferring of information, but also to whom the information is transferred.

Sounding

Sounding is, although initiated by clients, the means for market parties to share information with clients. Market sounding provides possibilities for potential suppliers to react on the requirements of clients. Winch (2002) calls this form of information transfer feedback. It serves as a means to check if market parties are able to deliver clients' required products or services, if the requirements of clients are formulated properly, if there is an interest of market parties in the upcoming procurement project, etc.

Getting feedback from market parties is the other important part of aligning clients' needs and market capabilities. If alignment is necessary (public demand and market capabilities do not match), the project or requirement may need to be refined (see adjusting demand below). Sounding may also reveal other information about required actions.

Adjusting demand

Although the initial demand is determined during the first phase of FCP, clients can alter the project during the market engagement phase (a formal EU procurement procedure had not yet started). Adjusting demand may include changes to the scope of project or adjustments to requirements and specifications.

Based on other steps in the process, adjustments may be required. For instance, if sounding reveals that clients' requirements are unrealistic, these may be altered to be better aligned to market capabilities. If the gap between needs and capabilities is too great, innovation may not be feasible (Edler et al., 2006).

Just as with the initial phase, adjusting the project will influence the potential for innovative solutions.

What seems clear is that this action will only occur after feedback (result of sounding) has indicated a necessity to do so.

Aggregating demand

Demand (e.g. future market or sales) is a way to increase market parties' interest, as demand is an important incentive for market parties. The greater the future market, the more interested market parties will be. In certain circumstances, the demand of a single public party will not generate enough demand, which means that market parties will not be inclined to invest in developing the products or services required. If other public parties also state a similar interest, demand can be aggregated and market pull can be increased. Hence, it enlarges the interest of market parties to invest in product/service development.

Aggregation of demand will require the procuring public party seeking out other public parties to aggregate demand.

Related to this is literature on horizontal cooperation in purchasing. Horizontal cooperative purchasing can be defined as "the operational, tactical, and/or strategic cooperation between two or more organizations in one or more steps of the purchasing process by pooling or sharing their purchasing volume, information, and/or resources in order to create symbiosis" (Schotanus, 2007). In his dissertation, Schotanus (2007) discusses the advantages and disadvantages of horizontal cooperation. Advantages flow from factors like economy of scale, a reduced number of transactions between suppliers and other organizations in a purchasing group, and stronger negotiation positions. Disadvantages flow from factors such as an increased complexity of the purchasing process and loss of flexibility and control (Schotanus, 2007).

An important consideration is that not all products or services are suitable for horizontal cooperation. Schotanus (2005) discusses that among agencies of the United Nations, choosing the right products and services is an important factor for successful cooperative purchasing. According to the same study, products are suitable for cooperative purchasing if:

- The needs, requirement or specifications of public are similar;
- Total gains should outweigh (coordination) costs;

- Standardised or not customized items;
- Items which are required on an ongoing basis;
- Stable market;
- Geographical availability of items;
- No preference of local supplier items;
- Programme activity synergy in various agencies.

Thus, by pooling the purchasing volume, clients can create larger economies of scale and improve their negotiation positions. However, this may prove difficult if the product of service required by a client does not match with other clients. In such a case, the client is left with either going on as a single purchasing organization (not increasing changes of market parties' involvement by aggregating demand) or changing its requirement to match more with those of other clients. However, Laing & Cotton (1997) discuss that horizontal cooperation might hinder innovation. In order for (horizontal) cooperation, compromises may have to be made. These compromises can stifle innovation.

What has become clear is that the feasibility of this action is strongly related to the project chosen (and the action of adjusting demand).

Facilitating market networking

This action aims at stimulating cooperation and cross-fertilization between market parties. Although companies can innovate individually, Edquist & Hommen (1999) state that firms almost never innovate in isolation. Innovation is therefore the result of inter-organizational cooperation. Such cooperation can be forced (Bossink, 2007) as both physical and human resources, such as subsystems, components, technologies, skills, information and knowledge can be dispersed among various organizations (Rutten, Dorée, & Halman, 2009).

Bossink (2007) provides an overview of inter-organizational innovation processes that, depending on the authors at hand, concern different stages. However, there seems to be consensus that in such inter-organizational cooperation processes, first steps concern discovering and exploring opportunities for cooperative innovation. The act of facilitating networking can contribute to these first steps.

This is similar to what Winch (1998), describes as system integrators. System integrators play a particular important role in setting up a network of various organization and coordinating the network (Winch, 1998).

Whether or not clients can succeed in stimulating cross-fertilization partly depends on the diversity of market parties that show an interest in the project. If only similar market parties show an interest, there will be little potential and use for facilitating a network. The type of project at hand is also of importance as this may determine what kind of market parties may be interested.

3.3.3 Action(s) during the procurement phase

Between the market engagement phase and the procurement phase, a last action was identified. This action is **aligning the procurement strategy**.

A procurement strategy involves many different, but related aspects that enable or stimulate innovation. Several choices have to be made about the project delivery method (e.g. contract), procurement procedure (e.g. competitive dialogue, negotiated procedure), selection criteria and award criteria. Furthermore, there are also different ways for assessing bids of market parties.

According to Hoezen et al. (2008), procurement procedures like the competitive dialogue can stimulate innovation through the addition of the dialogue between clients and contenders. Award criteria can provide additional incentives for innovative solutions. Stressed out by multiple authors (Edler & Georghiou, 2007; European Commission, 2007), it is important that the awarding of the contract is not based on lowest price, but (also) on qualitative criteria (i.e. the Most Economic Advantageous Tender). However, performing elaborate tender procedures requires time and financial resources. The awarding process may be a costly process if selection is done based on more than just the initial procurement price.

The most important aspect about aligning the procurement strategy is that the strategy is line with the rest of the FCP methodology. The strategy should aim a creating the best conditions for delivering the required products or services.

Aligning the procurement strategy is an action that is preceded by other actions. The market engagement phase precedes the procurement phase and aligning the procurement strategy can only be done based on information which first needs to be gained (e.g. sounding).

Project characteristics (resulting from project choice) also influences the choices made in the procurement strategy (Luu, Ng, & Chen, 2003). Decision makers partially base their decisions about the procurement procedures on project characteristics like available budget and time.

A last aspect that needs to be addressed is whether this action should be included in this case study research. This action is part of the procurement phase, which is outside the initial boundaries of this research. However, the action is included because this action can definitely influence perceived risks prior to the actual procurement of new products or services.

3.4 SUMMARY

The FCP method is a procurement approach that has been conceived by the Environmental Innovation Advisory Group (EIAG) as a "powerful tool to help innovative products break into the marketplace" (DTI, 2006).

Further development and application has led to a practical guide by the UK Department of Business Innovations & Skills (2011). In this guide, the FCP method is described as a method covering three phases (identification, market engagement, procurement).

Multiple actions (i.e. communication, sounding, changing demand, aggregating demand, network facilitation, and aligning the procurement strategy) were identified within the FCP method that have an effect on the likelihood that the FCP process will result in the procurement of a solution that satisfies clients' needs. These actions have been discussed individually and are summarized in Table 3.1.

Table 3.1: Summary of actions per phase and their relation to innovation.

	Action	Effect related to innovation
Market engagement phase	Communicating	Provides information for potential suppliers.
	Sounding	Provides feedback from market parties (e.g. about market capabilities, available technologies, etc.).
	Adjusting demand	Alignment of demand can close the gap between clients' requirements and market parties' capabilities.
	Aggregating demand	Increases market pull, hence increases markets' interest and willingness to invest.
	Facilitating networking	Parties often innovate in cooperation; network facilitation enables/stimulates innovation.
Procurement phase	Aligning Procurement strategy.	Can allow innovative solutions and further incentives.

Also discussed was the context in which these actions take place. Furthermore discussed were the (temporal) dependencies between different actions. For instance, adjusting the scope of the project during the process (e.g. adjusting demand) is likely only done if feedback from the market indicates that this is necessary. Indeed many actions may be (partly) dependent on information gained over the course of the process.

Another consideration is that these actions can be taken simultaneously within singe activities or events.

A last important consideration is the choice of project. Although it can be argued that this is not really a choice (but the result of a genuine need), it seems clear that the project at hand will play a significant role. It may certainly affect the actions like the aggregation of demand, facilitating networking and the aligning of the procurement strategy.

By discussing the FCP method, and the actions in this method, insight is gained in the characteristics of FCP. It therefore provided answers to the central question of the first research phase as discussed in paragraph 2.3.

However, this chapter has not shown how these actions may affect perceived risks in project concerning PPI. In order for this to become clear, a theoretical perspective is required.

> *"He who loves practice without theory is like the sailor who boards ship without a rudder and compass and never knows where he may cast."*
>
> *Leonardo da Vinci*

Chapter 4

THEORETICAL PERSPECTIVE

In the previous chapter, insight was gained in the actions of FCP (i.e. the units of analysis) and the context in which these actions can occur. In this chapter, focus will be on how to analyse and describe the effects of these actions. Essentially, this chapter has two goals.

The first goal is to provide a theoretical perspective and to develop a theoretical framework. This framework can be used to describe and analyse the FCP method and its actions in a uniform way. The theoretical framework serves as an analytical tool.

The second goal is to formulate propositions. According to Yin (2009), propositions directs the attention to something that should be examined within the scope of study. The propositions were formulated by reviewing the actions of FCP from a theoretical perspective.

This chapter starts by shortly addressing the terms of risk and uncertainty as these terms play a central role in this research. Following, these terms are discussed in the specific context of this research, namely a procurement project. The theoretical perspective in this research and theoretical framework will be discussed next. After this, the formulated propositions will be clarified.

4.1 RISK & UNCERTAINTY

Risk and uncertainty are terms that are freely used in every day speech, and hold different meaning to different people. Understanding the difference is important as it helps in understanding how these concepts play a role in this research.

Van der Heijden (2011) distincts three types of uncertainty: risk, structural uncertainty and uncertain uncertainty. Risk can be quantified using data. Structural uncertainties can be determined through cause and effect diagrams, but the probability cannot be determined. With uncertain uncertainties, Van der Heijden refers to the unknown, things that cannot be imagined.

In his book, Knight (2002) makes quite a radical distinction between risks and uncertainties. According to Knight, risks are quantities susceptible to measurements (measurable uncertainty) whereas this is not the case with uncertainties (immeasurable uncertainty). According to Langloise & Cosgel (1993), a widely adopted interpretation of Knight's distinction refers to situations where one can assign probabilities to outcomes (i.e. risk) and by uncertainty situations in which one cannot. Langloise & Cosgel (1993) furthermore discuss that assigning probabilities can be done either objectively or subjectively. Winch (2002) discusses that people assign probabilities

subjectively when there is little reliable data available, like during the early stages of the project life cycle. Lastly, Langloise & Cosgel (1993) state that probabilities can always be expressed subjectively and that by definition, all probabilistic situations are matters of risk.

In light of the above, uncertainty is best regarded as an attribute of a risk. Decisions makers can assign probabilities objectively or subjectively. In either case, uncertainty decreases decision makers' ability to estimate outcomes *accurately*. This aligns with the definition of risk by the US Project Management Institute quoted by Ward & Chapman (2003): "an uncertain event or condition that, if it occurs, has a positive or negative effect on a project objective".

This definition brings forth another aspect of risk, namely that it concerns both positive and negative effects. It concerns both threats *and* opportunities. In any given decision situation, both threats and opportunities are usually involved, and both should be managed (Chapman & Ward, 2003). Chapman & Ward (2003) furthermore explain that opportunities and threats can sometimes be treated separately, but they are seldom independent, just as two sides of the same coin can be examined at one at a time, but they are not independent when it comes to tossing the coin. Courses of action are often available which reduce or neutralise potential threats, and simultaneously offer opportunities for positive improvements in performance.

This paragraph provided a clear definition of risk and uncertainty. However, these terms are not discussed in the context of a procurement project. Furthermore, it has not yet been explained how risks and uncertainties influences the behaviour of actors (e.g. clients and market parties). As the context of this research concerns procurement projects (i.e. transactions), agency theory and Transaction Cost Economics are applied.

4.2 AGENCY THEORY & TRANSACTION COST ECONOMICS (TCE)

Agency theory is directed at the ubiquitous agency relationship, in which one party (the principal) delegates work to another (the agent), who performs that work (Eisenhardt, 1989a). In this research, principals are public agencies or clients that want to procure innovative products or services and agents are market parties that need to develop those products to content for contract awarding. The theory describes this relationship using the metaphor of a contract. According to Eisenhardt (1989a), the key idea of agency theory is that principal-agent relationships should reflect efficient organization of information and risk-bearing costs. Agency theory is concerned with resolving two problems.

1. Principals and agents have different (conflicting) goals. In this research, the goal of the principal is to procure better products or services while the agent will essentially have the goal of profit making.
2. Principals and agents have different attitudes towards risk taking. As there is more uncertainty, more risks need to be borne. If the outcome is uncertain, and the agent/principle is risk-adverse, they generally want to shift risk to the other party. Take the following example. Since it is impossible for the principal to specify the work that has to be done (the principal does not know the solution, or how to develop it) an out-come based contract will likely be formed (Eisenhardt, 1989a). Such an outcome-based contract motivates behaviour by aligning the agent's preferences with those of the principal, but at the price of transferring risk to the agent (Eisenhardt, 1989a).

Agency theory is similar to the transaction cost perspective (Eisenhardt, 1989a), although the former emphasizes that actors have different goals and risk attitudes. This will be discussed later on.

Transaction Cost Economics (TCE) is also referred to as the economics of contracting. A contract concerns a relationship between principal and agent (Eisenhardt, 1989a), or in this case client and supplying market party.

Cowen and Parker state that transaction cost "arise from seeking out buyers and sellers and arranging, policing and enforcing agreements or contracts in a world of imperfect information" (Cowen and Parker (1997) in Parker & Hartley, 2003). According to Parker & Hartley (2003), transaction costs and the internal capabilities of making a product determine whether a party will 'make or buy'.

In this research, it is clear that clients do not possess the internal capabilities required for developing the products/services they need. However, the goal will still be to minimize transaction costs while striving after achieving the goal of procuring required products or services. In addition, market parties consider transaction costs in evaluating if the transaction costs outweigh the potential revenues from the transaction (e.g. is this a good business case?)

TCE supports two behavioural propositions, (1) bounded rationality and (2) opportunism (Williamson, 1981) which are also assumed in agency theory (Eisenhardt, 1989a). Bounded rationality implies rational decision making by buyers and sellers but under conditions of incomplete information (Parker & Hartley, 2003). Information asymmetry describes a situation where principal and agent do not possess the same information (Tysseland, 2008), which can cause problems due to opportunism. Opportunism refers to the seeking of self-interest with guile (Williamson, 1979).

The result of bounded rationality and opportunism is the risk that one of the parties in a transaction or series of related transactions will exploit its information advantageously (Parker & Hartley, 2003). If agents are acting in their own interest at the expense of the principal, this is called adverse selection (Tysseland, 2008).

According to Williamson (1979, 1981), the three critical dimensions for characterizing transactions are: (1) uncertainty, (2), transaction bounded investments, and (3) frequency in which transactions recur.

The assumption is that transaction costs increase with higher degrees of uncertainty and transaction bounded investments. According to Dorée (1996), the influence of the frequency is twofold. On the one hand, with more transactions taking place, the total amount of transaction cost will rise. On the other hand, the transaction cost per transaction may decrease due to scaling up and corresponding learning effects.

Because this research concerns the context of a single transaction (i.e. an individual procurement project), the degree of uncertainty and transaction bounded investments are of most interest.

4.2.1 Degree of uncertainty

Uncertainty, by definition, stems from the absence of information (Edler et al., 2006). Referring to the definition of uncertainty mentioned in paragraph 4.1, uncertainty determines the ability of actors to estimate outcomes accurately.

Uncertainty of clients involves the question on whether or not the party that will be contracted will actually be the most suitable party. Uncertainty also plays a role from the perspective of market parties. For one, it is often uncertain what the future demands of clients will be (Edler et al., 2006). Other uncertainties for instance, include whether their developed products or services will meet clients' requirements.

A natural response to uncertainty is information seeking behaviour. However, seeking out information can be difficult and expensive (Eisenhardt, 1989a).

That fact that acquiring information can be expensive points to the second characteristic of a transaction: transaction bounded investments.

4.2.2 Transaction bounded investments

Transaction bounded investments are inputs that are specifically used for a single transaction and are therefore not usable to other uses without loss of value (Dorée, 1996). As mentioned earlier, transaction costs arise from seeking out buyers and sellers and arranging, policing and enforcing agreements or contracts in a world of imperfect information (Cowen and Parker (1997) in Parker & Hartley, 2003). Such activities are often costly (Coase, 1960).

As this research is concerned with the procurement of goods or services that require development, it is likely that the market parties transaction bounded investments will be higher compared to cases where development is not required (see Hommen & Rolfstam, 2009). Especially if the demand is idiosyncratic, the transaction bounded investments will be high as future sales are limited (Aschhoff & Sofka, 2009). Within TCE, this relates to 'asset specificity'. With a high degree of asset specificity, opportunistic behaviour may become a particular problem (Parker & Hartley, 2003).

Already indicated is that transaction costs arise from different activities. For this research, it is useful to specify these activities. Following several authors, Dorée (1996) discusses the ex-ante period of a transaction (i.e. contact, contract and control) en the ex post period of any transaction. Table 4.1 shows this as a series of different interwoven activities. Also indicated in this table is that the activities (and resulting transaction costs) differ between clients and market parties. Added to this table in *italic* are the phases or actions of FCP.

Table 4.1: Differentiated activities over times that incur transaction costs (based on Dorée, 1996).

	Client	Supplying market party
FCP: Identification	Defining needs. Formulating needs as outcome-based requirements. Prepare FCP project.	-
Contact *FCP: Market engagement*	Choice of market approach method. Seeking potential suppliers. Attract bids/offers. *(FCP actions during market engagement)*	Express market capabilities. Making themselves accessible/reachable. Active seeking for projects/work.
Contract *FCP: Procurement*	-	Making bids. *(including product/service development)*
	Evaluate bids/bidders. Selecting bid/bidder.	-
	Negotiating & contracting.	
Control	Coordinate, control and steering. Renegotiate. Transfer and discharge.	Produce/build. Renegotiate. Deliver and transfer.
Post transaction	Guaranties and certainties.	Guarantee.

There are two approaches to influencing transaction bounded investments.

One course of action entails making the inputs of the transaction less bounded to a single transaction. Related to this, for instance, is horizontal cooperation that was discussed earlier (see section 3.3.2). However, horizontal cooperation entails coordination costs that are considered transaction bounded investments.

Another approach concerns influencing the efforts required for activities that incur transaction costs (see table above). For instance, clients can reimburse market parties' development costs, transferring transaction bounded investments from market party to client.

Thus, transaction bounded investments can be influenced externally (the extent to which investments are bounded) and internally (influencing the investments required for the specific transaction).

4.3 THEORETICAL PERSPECTIVE ON FCP

The terms uncertainty and transaction bounded investments have been discussed as the major aspects that influence the course of transactions. With increasing levels of uncertainty and transaction bounded investments, transactions become less attractive. In other words, they become more risky.

As the purpose of applying the FCP method is to manage risks, applying FCP would ideally result in decreased levels of uncertainty and transaction bounded investments for both clients and market parties. However, such an ideal situation is seldom possible. From the outset, there will always be some degree of information asymmetry. Furthermore, uncertainty and transaction bounded investments are closely related to one another (information seeking behaviour can increase transaction bounded investments).

Therefore, clients need to outweigh positive and negative effects. Consequently, the idea behind FCP is as follows.

> *In applying FCP, clients consider theirs and market parties' level of uncertainty and transaction bounded investments. Together with clients' goal and risk attitude, clients can act to change the situation (with risks) into a situation most favourable to achieving client's goal.*

Clients have the possibility to affect risks, by deciding to take certain actions (see Chapter 3). The next section will discuss the theoretical framework in which decision making plays a central role.

4.3.1 Theoretical Framework

The theoretical framework developed is an analytical tool that helps the researcher asses the actions of the FCP method. As mentioned, the concept of decision-making plays a central role in this matter.

Baron (2000) states that decisions are about actions- what to do or what not to do. The best decision is the one that best helps us to achieve our goals (Baron, 2000). Beach (2009) sees decisions as the beginning when you decide about the desirability of the future offered by an extrapolated forecast. An extrapolated forecast is an educated guess about how the future might unfold if you do not make an effort to change it. If you decide that this forecast is undesirable, you formulate a plan and generate an action forecast. An action forecast is an educated guess about how the future might unfold if you make an effort to change it. If you decide the action forecast offers a desirable future, you implement the plan that generated it. Then, as implementation progresses, you make repeated decisions about whether it is bringing you closer to a desirable future. Using Beach's approach to decision making as a general layout and supplementing this with agency theory and TCE, the following theoretical framework was developed.

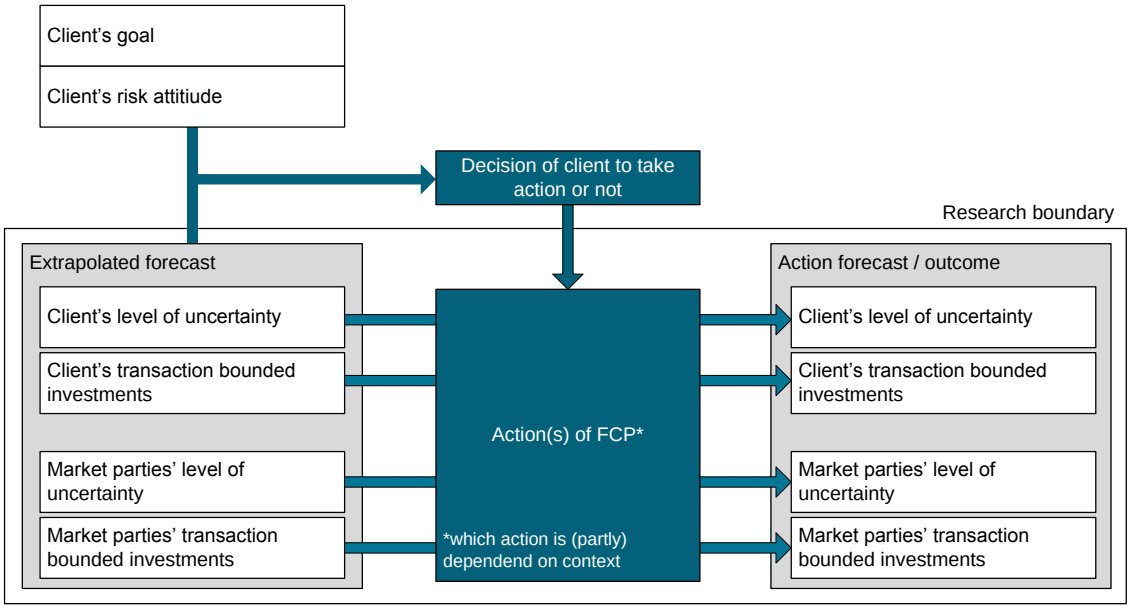


Figure 4.1: Theoretical framework for case analysis.

Explanation of theoretical framework

Clients perceive a current situation with risks for both clients and market parties. These risks are explained in terms of level of uncertainty and transaction bounded investments (see paragraph

4.2). The current situation, and the resulting future of that situation, can be considered as the extrapolated future. Based on their goal and risk attitude, clients decide about how desirable this future[8] is. Clients have the opportunity to change this future by deciding to take action (e.g. one or more actions of the FCP method).

As mentioned earlier, these decisions are based on perceived risks, expected outcome of taking action(s) and the client's goal and risk attitude. The action is taken when the action forecast is more favourable to achieving client's goal than the extrapolated forecast.

This research focuses on the effects of actions on perceived risks (see research boundary in Figure 4.1). Following the theoretical framework, effects are described as the relative differences between the extrapolated forecast and the action forecast/outcome. This research set out to indicate these effects.

Before entering the field to investigate the effects of FCP in practice, effects were first determined based on theory.

4.4 PROPOSITIONS

The propositions formulated in this paragraph allow for a comparison between theory and practice. The propositions are 'expected patterns' and reflect what the research expects to find in practice, basing on literature and theory. For each of the actions identified in chapter 3, two propositions are formulated.

- The first proposition refers to Chapter 3, and describes if, and when the actions is likely to occur. This accounts for contextual aspects and is supplementary to the theoretical framework that excludes such aspects (this is also indicated in Figure 4.1).
- The second proposition is based on theory, stating what effect is expected, if the action is taken.

As discussed in the previous paragraph, these effects are effects are described in terms of level of uncertainty and transaction bounded investments. Determining these effects was done using the following criteria.

The effect of an action on the level of uncertainty is based on (also see section 4.2.1):

- if information is provided, as uncertainty is directly related to the lack of information (Edler, 2006).
- how the ability to accurately predict an outcome is influenced.

For example, when an action leads to the provision of information, or the actor will be better able to predict an outcome, the level of uncertainty is decreased.

The effect of an action on transaction bounded investments is based on (also see section 4.2.2):

- how the action changes the extent to which the investments are bounded to a single transaction.
- how the action affects the efforts required for the activities mentioned in Table 4.1 on page 39.

Just as in the rest of this thesis, a distinction is made between clients and market parties.

[8] Following paragraph 1.1, this situation is not very desirable, as both clients and market parties consider projects concerning PPI (too) risky.

Communication

Communication is the unilateral transferring of information from clients to market parties. This action is therefore likely taken in situations where market parties' uncertainty is perceived. The degree of communication required is furthermore likely dependant on the level of uncertainty.

By providing information, this action decreases market parties' level of uncertainty. As communication is considered unilateral (e.g. without feedback) in this research, clients' level of uncertainty is not influenced.

Communication will require resources, which will incur transaction bounded investments that are borne by the client. Therefore, the following propositions are formulated.

- Communicating occurs when clients perceive market parties' uncertainty. The extent depends on the degree of uncertainty.
- Communication decreases market parties' level of uncertainty and increases clients' transaction bounded investments.

Sounding

Sounding is the counterpart of communication, i.e. it is the unilateral transferring of information from market parties to clients. However, sounding is an action initiated by clients. Because information seeking behaviour is positively related to the level of uncertainty, this action is likely to taken when clients perceive uncertainties. As sounding also concerns a unilateral conveying of information, market parties' level of uncertainty is not influenced.

Taking this action increases the transaction bounded investments of both clients and market parties. Clients will have costs in initiating sounding activities and assessing gained feedback. Market parties will incur cost by providing that feedback.

The following propositions are therefore formulated.

- Sounding occurs when clients perceive uncertainty.
- Sounding decreases clients' uncertainties and increases both clients' and market parties' transaction bounded investments.

It should be noted that market parties will only experience increased transaction bounded investments if they provide feedback. For this proposition, it is assumed that they will provide feedback.

Adjusting demand

Adjusting demand involves altering the scope or size of the project, or adjusting clients' requirements. Clients will have chosen a project in the initial phase of the project. Reasons for adjusting demand will therefore need to be presented by the abovementioned action (i.e. sounding).

Determining what the effect is of adjusting demand is difficult. For instance, broadening the scope may allow for more innovative solutions. Hence, it decreases the level of uncertainty about the degree of improvement that can be delivered by market parties. On the other hand, broadening the scope can also increase the level of uncertainty, as it becomes less clear what solution will be delivered. However, as this action will be based on information gained through sounding, it is expected that adjusting demand will at least decrease the level of uncertainty of the client (e.g., clients should be more certain the outcome matching the goals set).

- Changing of demand (e.g. scope, size) will only occur when feedback from the market (i.e. the result of sounding) indicates the necessity of this.
- Adjusting demand decreases clients' level of uncertainty. (other effects could not be formulated).

Aggregating demand

This action concerns increasing market pull by cooperating with other procuring agencies. It has been discussed that aggregation is not always possible or suitable given a situation or project (see section 3.3.2).

Aggregating demand decreases the level of uncertainty for both clients and market parties. Increasing demand increases market pull, which is beneficial to the bargaining power of clients. In other words, it is more likely that the outcome will by as desired, as aggregation creates a higher incentive for market parties to fulfil the requirement of clients. For market parties, the level of uncertainty is decreased because future sales become more likely.

The aggregation of demand is as an accumulation of multiple transactions. By definition, aggregating demand decreases market parties' transaction bounded investments. Certain investments (e.g. development costs) can be spread out over multiple transactions. The effect of aggregating demand on clients' transaction bounded investments is twofold as there are benefits (e.g. sharing of costs with other purchasing agencies) and losses (e.g. coordination costs). Therefore, the following hypothesis is formulated.

- Aggregating demand occurs when project characteristics (see Schotanus, 2007) allow for aggregation and it is likely that market parties face uncertainty about future sales.
- Aggregating demand decreases clients' and market parties' level of uncertainty and market parties' transaction bounded investments. Clients' transaction bounded investments can both increase and decrease.

Facilitating networking

This activity is aimed a facilitating a network to stimulate cooperation and cross-fertilization. The necessity of this action depends on the assumption that market parties need to cooperate to develop the products or services required by clients. According to Edquist & Hommen (1999), they often do. Bossink (2007) mentions that first steps in cooperation concerns the discovery and exploration of opportunities for cooperative innovation. The action of facilitating networking aims at contributing to these first steps. In other words, facilitating networking decreases the required effort of market parties in seeking out partners. Hence, it decreases market parties' transaction bounded investments, at the cost of increasing clients' transaction bounded investments.

- Facilitating networking by the client occurs if the project or requirements will likely require cooperation between different market parties.
- Facilitating networking decreases market parties' bounded investments while increasing clients' bounded investments.

Aligning the procurement strategy

Aligning the procurement strategy concerns many different aspects that have different effects on innovation. Choices in selection and award criteria and in the procurement procedure can have different effects. What these choices will be depends on each individual situation. If can be

assumed however, that the procurement strategy will be (partly) based on the information gained through the market engagement phase (e.g. via sounding). This mainly because developing the procurement strategy is preceded by other actions.

The general idea of aligning a procurement strategy is to ensure the delivery of required goods and services. Therefore, it is expected that the procurement strategy will decrease clients' level of uncertainty. However, it is unclear what the other effects will be, because it is unclear how decreasing clients' level of uncertainty will influence the strategy. For instance, selection criteria can influence the number of market parties that enter the procurement procedure and seriously determine the efforts required for negotiation (see Table 4.1 on page 39). The following propositions are therefore formulated.

- The procurement strategy will be based on information gained through the market engagement phase.
- Aligning the procurement strategy will decrease clients' level of uncertainty. (other effect could not be determined)

Overall proposition on the effects the FCP method

Toward formulating a proposition on the overall effect of applying the FCP method in general, the effects of individual actions are summed up below. If effects are considered possible, but the effect is difficult to determine, a question market is noted.

Table 4.2: Summation of effects from theoretical perspective (i.e. expected patterns).

	Clients' level of uncertainty	Clients' transaction bounded investments	Market parties' level of uncertainty	Market parties' transaction bounded investments
Communication	-	Increases	Decreases	-
Sounding	Decreases	Increases	-	Increases
Adjusting demand	Decreases	-	?	?
Aggregating demand	Decreases	Increases/decreases	Decreases	Decreases
Facilitating network	-	Increases	-	Decreases
Aligning procurement strategy	Decreases	?	?	?
Overall	Decreases	Increases/decreases	Decreases	Increases/ decreases

Clients' and market parties' level of uncertainty are uniformly influenced by actions of FCP. Clients' level of uncertainty is positively influenced (e.g. a decrease is expected) by four actions. In addition, the overall effect on market parties' level of uncertainty is also easily determined (it decreases as well), although should be noted that it is influenced by less actions than clients' level of uncertainty.

How applying the FCP method influenced clients' and market parties' transaction bounded investments is more difficult to determine.

Clients' transaction bounded investments generally are expected to increase although aggregating demand might also prove to decrease transaction bounded investments. Given the aspect that aggregating demand will also incur additional costs (e.g. coordination cost) and that this

action cannot always be taken (contrary to other actions), it is assumed that clients' transaction bounded investments will increase.

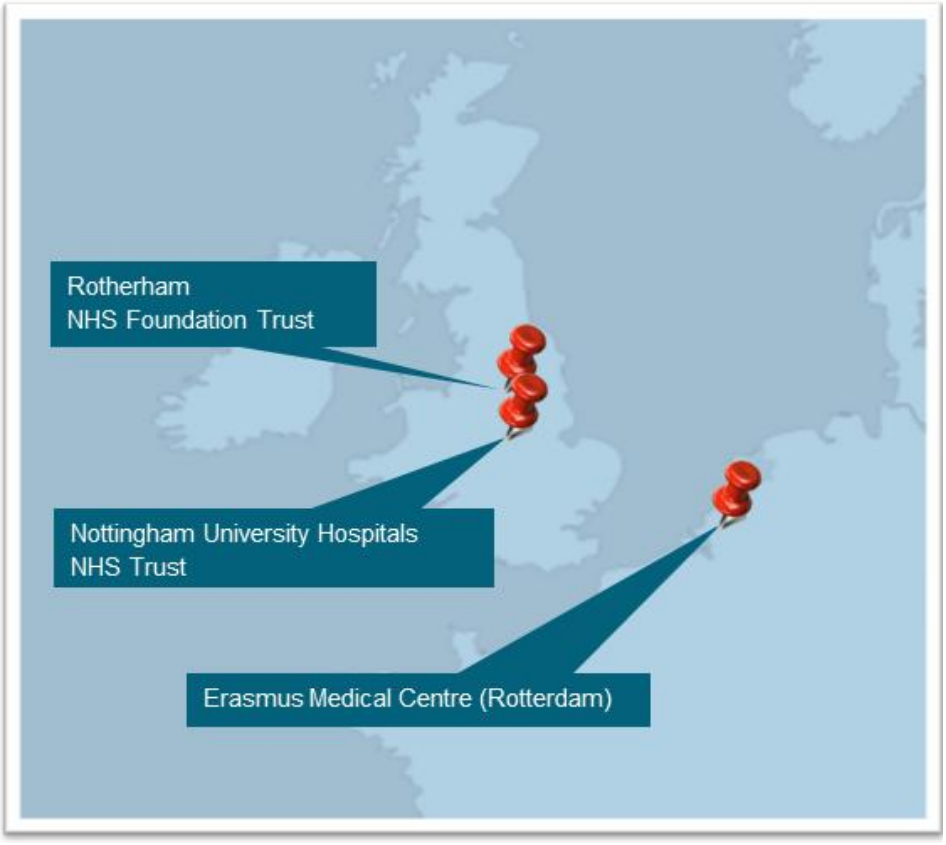
Focussing on market parties' transaction bounded investments; there are also 'conflicting' effects. The question is whether the increased cost involved with sounding are greater or smaller that than the costs savings by aggregating demand and facilitating networking. One consideration is that aggregating demand can seriously decrease transaction bounded investments (e.g. development costs), but will not always occur. Another consideration is that a cost for providing feedback in sounding activities only applies to those parties that provide feedback.

Overall, the following proposition is formulated on the expected effects of applying the FCP method.

> *Applying the FCP method decreases clients' level of uncertainty and decreases market parties' level of uncertainty & transaction bounded investments, while increasing clients' transaction bounded investments.*

As mentioned in paragraph 4.34.3 , an ideal situation entail that applying FCP leads to an overall decrease in levels of uncertainty and transaction bounded investments. However, this is an unrealistic situation and this supported by the propositions formulated. Furthermore, this overall proposition reflects the problem stated in paragraph 1.31.3 , namely that managing risks and uncertainties also incurs cost and these positive and negative effects of FCP need to be considered.

The next chapter discusses the effect of applying FCP in practice. These perceived effects in practice will be compared to the expected effects discussed in this chapter.


Rotherham
NHS Foundation Trust
Nottingham University Hospitals
NHS Trust
Erasmus Medical Centre (Rotterdam)

Chapter 5

CASE STUDIES

This chapter discusses the conducted case studies in which the effects of the FCP method in practice are analysed. Following Miles & Huberman (1994), this chapter discusses the selected case studies individually. In Chapter 6, these cases will be analysed in comparison to one another (i.e. a cross-case analysis).

The first paragraph of this chapter discusses the case study approach. Also discussed in this paragraph are methods for data collection, data sources and analytical techniques. After this, the remaining paragraphs will discuss the three cases studies.

5.1 CASE STUDY APPROACH

This paragraph discusses the case study approach. Doing so improves the controllability of the research (Van Aken et al., 2007).

5.1.1 Approach in data collection

The approach in data collection was based on the paper of Makkonen, Aarikka-Stenroos, & Olkkonen (2012) who discuss a **narrative approach**. A narrative is an entity constructed around a plot in which key sub-narrative elements – activities, events, actors, motives and scene (context) – are linked causally to each other (Makkonen et al., 2012). In narrative research, causality means that a narrative provides an account of how one event is related to another under a specific set of circumstances.

A narrative approach in this research is suitable for several reasons. Just as case study research, a narrative may be of higher value to practitioners. A narrative is a medium that is easy to construct, understand, convey and remember. Narratives provide rich information on time, place, actors and context that may be crucial in interpreting events. According to Makkonen et al. (2012), narrations can help in understanding events ('what happened', 'how it happened'), actors ('who was involved'), context ('where it happened', 'when it happened', 'in which setting it happened'), proposals for explanation ('why it happened'). Moreover, researchers' data (reports, interviews, etc.) often have narrative qualities. Last, narrative data can be collected retrospectively, in real time and with respect to an anticipated future.

Narratives imitate the real world and reflect and emphasizes perceived aspects thereof. Narrators produce narratives from their perspective, and thereby reflect specific subjective

orientations (Makkonen et al., 2012). According to Makkonen et al. (2012), there are four types of narratives.

- **Informant narratives**; subjective perception of the process and information of the process and information that is considered relevant.
- **Group narratives**; overlapping and conflicting perceptions of the actors, activities and events.
- **Researchers' narratives**; perception of process and evaluation of what is relevant to serve as a basis for theorizing.
- **Theoretical narratives**; this narrative involves the employment of theory.

Informant and group narratives represent data sources. The sources used in this research will be discussed in the next section. Researchers develop the researchers' and theoretical narratives. These narratives are discussed further in section 5.1.35.1.3 .

5.1.2 Data sources

According to Yin (2009), one principle of data collection in case study research is to use multiple sources of evidence. Main sources in this case study research are project documentation and interviews. In one of the cases (Erasmus MC), these sources were supplemented with direct/participant observations. Due to time and geographical constraints, this was not possible in the other two cases. Table 5.1 below provides an overview of the different data sources and provides examples per type.

Table 5.1: Data sources and descriptions.

Data source		Description & examples
Project documentation	Internal	Project outlines, risk assessments, management summaries, meeting notes, procurement strategy.
	External	Communiqués with supply chain, market sounding prospectus, meeting day invitations and reports, briefings, etc.
Interviews		Interviews were held with project team members and with external consultants that took part in these projects. While project team members could be characterized as respondents in interviews, external consultants could be characterized as informants (see Verschuren & Doorewaard, 2007).
Observations		Researcher was allowed to join and participate in project team, allowing for direct observations.

Important to consider is that different sources may reflect different perceptions. For instance, an interview will generally concern one's personal perception of the process while a management summary provided by the entire project team will demonstrate a general perception of the process.

In the appendix, and overview is provided of the different documents used in the case studies. A list of people that were interviewed is also included.

5.1.3 Steps in case study

For conducting the case studies, a strategy was developed that involved the following steps.

1. The first step in each case study investigation was to develop an initial narrative. This narrative was based on project documentation and analysis of this documentation. As a general layout, the narrative would discuss the three phases of the FCP method. The rest of the structure of the narrative was created by identifying story elements and pooling them around specific

periods and/or events. These events helped to identify actions and decision moments preceding these actions.

2. Next, several interviews were conducted with members of the project team. The initial narrative functioned as a guide to structure the interviews. The interviews helped in confirming the initial narrative. The main goal of the interview however, was to ask in-depth questions about the project, project goal and perceived risks and uncertainties. Furthermore, the researcher would ask specific question about taken actions, their rationale and the results of those actions.

   A problem identified in such a line of questioning is that respondents might be inclined to 'reinvent the truth' and come up with new arguments in retrospect. During interviews, the researcher addressed this problem by first formulating more open questions before asking more in-depth questions. The problem was also be addressed by triangulation later on.

   Two different kinds of interviews were held, depending on the person being interviewed. Informal, more frequent interviews were held with external project members (i.e. consultant that supported the project team) and formal semi-structured interviews were held with internal project team members.

3. The third step was to develop a final narrative, which is included in this thesis. In this research, the narrative provides information on what happened (e.g. events, actions, outcomes), when and in what setting it happened (e.g. context), and why it happened (rationale). Doing so, the narrative provides the information required for employing the theoretical framework and evaluate the effects of individual actions. Because the narrative also provides information on the context in which these actions took place, it also provides the means for determining the effects of the FCP method in general.

   While the first three steps were mainly aimed at describing the cases and collecting required data, the fourth step included the employment of theory. It is in this fourth step that the (actions of the) FCP method were analysed. This was done by using the theoretical framework (also see 5.1.4) as mentioned on page 40 and the criteria for determining the effects on the level of uncertainty and transaction bounded investments on page 41. Besides the narrative (result of step 3), all case data was reviewed to allow for triangulation in the analysis of actions. The next section describes how this framework was employed in the case studies.

5.1.4 The theoretical framework in case studies

Below, is explained how the various elements of the theoretical framework are uses in the case studies.

The framework mentions client's goal and risk attitude. The goal of project is the outcome-based specification as mention in project documentation. The risk attitude is included as a contextual factor and is assumed constant in the case studies. The narrative that has been developed helps indicating significant events and actions and therefore indicated decision moments. The theoretical framework was then used to asses that decision moment and the decision that has been made. As discussed, the actions that taken have an effect on clients' and market parties' level of uncertainty and transaction bounded investments.

Once again, it is important to consider that the effects discussed here are relative differences between client's perception of a future situation when doing nothing (extrapolated forecast), and the situation when taking action (the action forecast). Of course, the actual outcome is of most interest. However, because not all cases were completed during the research period, some to the effects are described as they are currently expected to be.

5.2 ROTHERHAM NHS FOUNDATION TRUST [UK]

5.2.1 Background and overview

Rotherham NHS Foundation Trust[9,10] provides a wide range of health services to the people of Rotherham and further afield. The main base of operations is Rotherham Hospital.

One of the NHS wide goals is to achieve the government's target of reducing carbon emissions by 80% by 2050. Another development is the patient choice agenda, in which patients can decide where they want to be treated.

One of the goals of the Chief Executive and Board was to become "The Hospital of Choice". Pursuit of this goal included a major refurbishment programme: the Future Wards Programme (later mentioned as the site utility development programme). This multiyear programme, initially starting in 2009 for a period of 8 years, involves the refurbishment of 26 wards. The refurbishment programme would have two phases (both roughly taking 3 to 4 years).

This programme provided an opportunity for a new approach in procurement.

Figure 5.1: Rotherham Hospital.

A procurement project, using the FCP method, started for the procurement of **"ultra-efficient lighting for future wards"**. This project started around May 2008 and was initiated trough the Department for Business, Innovation & Skills (BIS) as a demonstration project with pump priming funding from the Department of Health (DH). Later on in November 2010, this project also became part of the LCB-Healthcare Network.

On the next page, a timeline is provided that shows key events and activities of the project, as well as the different phases of the project.

[9] In the remainder of this paragraph the Rotherham NHS Foundation Trust is mentioned as "the Trust".

[10] The National Health Service (NHS) is the world's largest publicly funded health service. Although funded centrally from national taxation, NHS services in England, Northern Ireland, Scotland and Wales are managed separately. Foundation trusts are a new type of NHS hospitals run by local managers, staff and members of the public. They are tailored to the needs of the local population.(NHS, 2011)

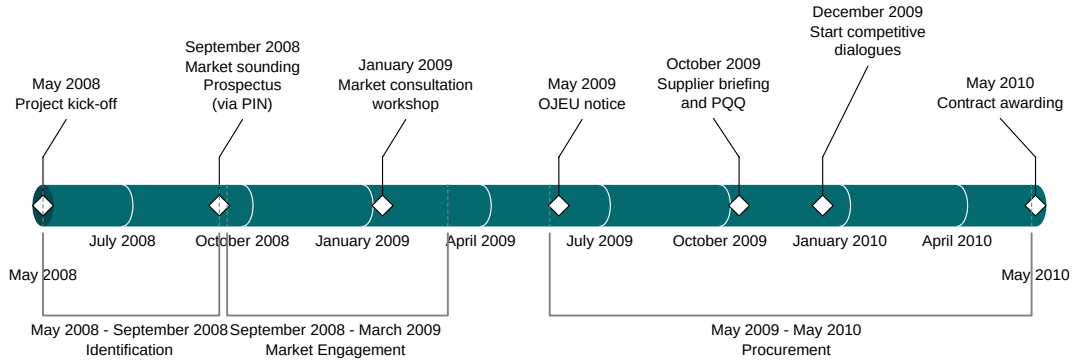


Figure 5.2: Timeline of the FCP process at Rotherham NHS Foundation Trust.

A preparatory phase started in May 2008 that ended with the identification and formulation of an outcome based requirement. A market engagement phase started in September 2008 with the publication of a market sounding prospectus called 'Market sounding regarding the supply of innovative and ultra-efficient lighting systems for The Rotherham NHS Foundation Trust "Future Ward" refurbishment programme'. The Trust requested market parties to respond to this document via a response form. Later, a second stage of the market engagement phase started in the form of a market consultation workshop. With the evaluation of this workshop, the market engagement phase concluded. An EU procurement procedure started in May 2009 resulting an in awarding of a contract halfway into 2010.

The goal of the project in terms of outcome was formulated as follows.

> *'The Trust wish to achieve a step change in the patient experience; creating a patient centred environment, including the incorporation of highly efficient, smart lighting systems that can deliver economical carbon reductions while at the same time contributing to a pleasant and healthy environment for both patients and staff'*

In the next three sections, a narrative is provided of the FCP process. Although the market engagement phase is of most interest, each phase will be discussed. In discussing the identification phase, attention is paid to the goal of the project and the perceived risks and uncertainties. In the section about the market engagement phase, it is described what was done in response to these perceived risks. Last, the procurement phase will be discussed to elaborate on how the procurement strategy was developed.

Section 5.2.5, will discuss the analysis of perceived actions.

5.2.2 Identification phase

Besides identifying and formulating the requirement (see goal above), the identification phase also included the identification of risks. The risks identified could be categorized into two categories.

The first category included risks related to the performance of the outcome. I.e. risks concerning whether the desired step changes in patient experience and lighting efficiency would be achieved. Several aspects played a role in this matter.

- There was uncertainty about whether or not the market could deliver a solution. In the Trust's believe, the market would not provide innovative solutions if they would not be properly informed about the needs of the Trust.

- There was uncertainty about market capabilities and what technologies were (or would become) available for delivering a desirable solution. As the refurbishment programme would stretch for several years (7-8 years was indicated at the start), it was likely that further improvement would be needed in future phases of the refurbishment programme. Hence, the solution provided needed to be future proof.
- The Trust was uncertain about whether or not there were any barriers to the delivery of a solution.
- Related to the previous point, the Trust was uncertain about how to develop the procurement strategy. This included how to evaluate different solutions, what standards would need to be set and how to procure the lighting solution in relation to the refurbishment programme.

The second category of risk related to viability of the outcome. I.e. whether the outcome from the project would fit into the organization of the Trust.

- An important aspect mentioned in interviews and project documentation was that the solution provided had to be cost effective and affordable. The Trust believed that innovative solutions could require additional upfront investments due to development costs.
- Another aspect related to the timeframe in which a solution would be available. In part, this also relates to an earlier mentioned issue regarding technologies that would become available over the course of the refurbishment programme.
- A last aspect was the integration with the rest of the refurbishment programme, as this lighting project would only be a part of the whole refurbishment programme. However, this was seen as a minor issue.

The project team also considered risks faced by market parties. Market parties would face a market risk due to uncertainty about the future market. Besides, they would not know what to develop because they had limited insights in the Trust's requirements.

Table 5.2: Risks & uncertainties after project choice.

Client	Market party (perceived by client)
Outcome & performance - Market parties' involvement/level of informant. - Uncertainty about market capabilities (needed cross-fertilization). - Uncertainty about available technologies. - Uncertain about procurement strategy. Outcome & viability - Uncertainty about initial investment cost. - Uncertainty about availability in timeframe. - Uncertainty about fit in refurbishment programme.	Market risk - Uncertainty about the requirements or expectations. - Uncertainty about credibility of Rotherham NHS as a buyer. - Uncertainty about future demand

5.2.3 Market engagement phase

Based on the situation described above, the project team took several actions during the market engagement phase.

One action concerned the Trust contacting other Trusts to have them participate in the remainder of the project. This aggregation of demand was deemed very important for a number of reasons. By showing that there was a future market, market parties would have a higher incentive to participate. Furthermore, the Trust would demonstrate itself as a credible buyer. Several other Trusts (that would undergo similar refurbishment programmes) expressed their interest. Their

plans and projected budgets would later be indicated in the market sounding prospectus. Aggregation was not formalized into a cooperative purchasing project. Rather, future sales were simply signposted.

Another action of the Trust was to publish a market sounding prospectus in September 2008. This document was made available via a Prior Information Notice (PIN) in the Official Journal of the European Union (OJEU). The project team drew on the expertise of the Electronics, Sensors and Photonics Knowledge Transfer Network[11] and other supply chain intermediaries, to communicate the existence of the market sounding prospectus. These rather extensive communication efforts were done to make sure that all parts of the supply chain were aware of the opportunity.

According to project documentation and interviews, one of the goals of this market sounding prospectus was to communicate the requirement to the supply chain and to provide advanced information of the requirements of the Trust. The prospectus gave detailed information about the context and drivers of the project and what the Trust was hoping to achieve in this procurement project. In addition, the document provided information about market opportunities, indicating the estimated budget for the refurbishment programme, as well as other opportunities within the wider NHS (e.g. signposting aggregation of demand). Providing this information would increase the chances of market parties getting involved. In turn, it was more likely that market parties would come up with solutions would meet the Trust's needs.

A response form was provided alongside the market sounding prospectus. The Trust requested market parties to express their interest and answer a number of questions via this response form. These questions were aimed at providing the Trust with information about what market parties could deliver and in what timeframe, what available technologies were or would become available that could contribute to the requirement of the Trust, and if there were any barriers foreseen by market parties in commercializing these technologies.

Perceived actions during the first stage of the market engagement phase are communicating, sounding, and aggregating demand.

The result of this first stage in the market engagement phase was a large number of responses; 40 of which were considered of good quality (they provided useful feedback). From the responses and the number of responses, the Trust concluded that there was a real interest from the market, that there were a number of technologies (becoming) available for achieving the Trust's goal, and that there were a number of different ways in which the goal of the Trust could be addressed.

Consultation workshop

A second stage in the market engagement phase started, in which the Trust organized a market consultation workshop in the beginning of 2009. One of the major goals of this workshop was to discuss any aspects that were important for developing the procurement strategy.

Market parties that had expressed their interest were invited to the market consultation workshop, which was organised in cooperation with the UK Displays & Lighting Knowledge Transfer Network. The entire supply chain was attending, representing a broad range of different

[11] A Knowledge Transfer Network is a single over-arching national network in a specific field of technology or business application which brings together people from businesses, universities, research, finance and technology organizations to stimulate innovation through knowledge transfer.

companies (lighting suppliers, designers, etc.). Besides market parties, other hospitals, DH, BIS, and refurbishment contractors also attended. Having these organizations present would further contribute to the credibility of the Trust as a serious buyer.

During the workshop, a large number of topics would be discussed (both technical and more general topics).

- Available technologies and choice of lighting technology.
- Design.
- Standards/norms (from perspective of patients, staff, visitors).
- How to measure lighting efficiency.
- Future proofing.
- Optimum procurement and contract approach (e.g. evaluation of solutions, contract scope)

Discussing these topics would provide the Trust with much more insights and information, with a particular emphasis on the how to develop an appropriate procurement strategy.

From the start of the project, it was assumed that market parties would need to cooperate to develop a solution that would meet the requirements of the Trust. Therefore, cross-fertilization was stimulated during the market consultation workshop. Although it did not get specific attention, the day definitely allowed for cross-fertilization. In addition, a directory of attending companies was distributed among participants.

Perceived actions during the second stage of the market engagement phase are communicating, sounding, and facilitating networking.

Around 75 people attended the day. The Trust came to similar conclusions as after reviewing the responses from the first stage of the market engagement phase. The consultation workshop confirmed the interest of the market and that technology that would be available. Information was also gained about required upfront capital investments. These were not unreasonable. However, the most important information that was gained was about how to develop a suitable procurement strategy.

5.2.4 Procurement phase

The procurement phase started with a publishing a notice in the OJEU in May 2009. However, the actual tender procedure started in October 2009. The procurement strategy was not determined prior to the procurement phase, and was (partially) based on information gained through the market engagement phase. The Trust made several choices regarding the procurement strategy, and these choices are discussed below.

One choice concerned how the solution would contracted in relation to the refurbishment programme. The refurbishment programme concerned two phases (see introduction). During the market engagement phase, it became clear that new technologies would become available over the years. To ensure that the solution was future proof, only the first phase would be put out as a contract. Awarding this contract would however, included an intention to award the second phase of the refurbishment to the same supplier. By reserving the right to put the second phase out as to a new tender, the Trust was more that market parties would consider 'future proofing' in developing their solutions.

Because the outcome of the procurement project could not be objectively determined, the Trust chose the competitive dialogue as a procurement procedure. During the market engagement phase, it was indicated that correct installation of new lighting technologies was important. Therefore, the

Trust indicated that it was their intention to procure a complete lighting solution (e.g. design through to end of life package including maintenance and future proofing).

As the technology would be new, it was preferable that the solution would be tested first. During the market engagement phase, market parties indicated that providing a prototype would not be a real problem and the development of a demonstration unit would therefore become part of the competitive dialogue.

The Trust applied selection criteria to limit the number of market parties that could enter the competitive dialogue. Although this is similar to regular practice, the criteria that were applied in this project specifically addressed the aspect of innovation. Of the parties that submitted for contending for the contract, only a limited number would qualify for starting the first dialogue rounds.

The outcome base requirements were simplified based on the market engagement phase and would concern three core elements:

- A step change in patient experience.
- A demonstrable step change in energy efficiency with progressive improvements in energy efficiency and operation performance over the life of the project.
- A fully installed, maintained and future-proofed service.

This simplification of requirements was done to clearly communicate the desired outcome. Hence, it concerned a refinement of the requirement and did not change anything about the scope of the project. Besides these core elements, it was still stressed out that the presented solution should be transferable to other trusts within the NHS.

The way these criteria would be evaluated however, was strongly based on the market engagement phase (particularly the consultation workshop). For measuring lighting efficiency, a specific calculation method was chosen that was best suited for this project (his method was proposed during the consultation workshop). Furthermore, different criteria for evaluating the patient experience were discussed. The Trust developed baselines that it would use to compare the different solutions and finally award the contract.

Figure 5.3: Picture of modular 'UEL-pods' as presented during the competitive dialogue.

The procurement phase resulted in the awarding of a contract to a newly formed consortium. This consortium concerned multiple parties (from across Europe) that had shown an interest earlier on

in the process, and had joined forces to develop an integrated solution. The result was an integrated, modular solution, with integrated bio-dynamic lighting, trunking, and storage for use by patients and staff (a "UEL-pod"). This outcome actually exceeded the expectations of the Trust as the costs of this system were similar to a traditional built, but demonstrated significant improvements in patients experience and energy efficiency.

Aftermath

Although the contract was awarded, testing still would need to take place. It did not become an element of the competitive dialogue and testing of the solution would become a precondition for signing a so-called Memorandum of Understanding (MOU). Signing a MOU, instead of an standard contract, also had to do with the fact that the refurbishment programme was put on hold due to the economic crisis. At the moment of writing this thesis, it is expected that the refurbishment programme will start next year.

However, the solution that was provided is can very well be placed in other hospitals within the NHS first. The Trust is contributing to the promotion and commercialization of this solution, as it has indicated throughout the process.

5.2.5 Analysis of actions

Below, the actions identified of FCP are discussed individually.

Communicating

This action occurred several times over the course of the process. Activities concerning communicating are the publication of the market sounding prospectus and the wide spread communication of this documents in the initial stage of the market engagement phase. Interviews indicated that communication with the supply chain was not regular practice, and therefore constituted an increase in client' transaction bounded investments.

By providing market parties with information, this action resulted in a decrease of market parties' level uncertainty. However, interviews indicated that client's level of uncertainty were also decreased by communicating. The Trust assumed that by having provided information (without feedback) and having this information widely spread, the chances for a successful outcome would be higher.

- Communicating decreased client's and market parties' level of uncertainty and increased client's transaction bounded investments.

This is different from the expected effect as formulated in Chapter 4. The difference between the expected and perceived effect lies with different assumptions about the necessity of feedback. From a theoretical perspective, it was stated that feedback was required for increasing client's level of uncertainty. In the case study, the client found it likely that market parties would understand client's requirements.

Sounding

This action primarily occurred at two events. The first sounding activity involved filling out response forms that were attached to the market sounding prospectus. The second activity was the market consultation workshop. Both the response form and the market consultation workshop were aimed at getting information on available technologies, market capabilities, the interest of market parties, and potential barriers for the delivery of a solution. The consultation workshop

aimed at getting more information on how to develop an appropriate procurement strategy. In any case, the provided information (i.e. feedback) that was highly useful for the client.

This action required efforts of both client (initiating and organizing the activities) and market parties (providing feedback).

- Sounding decreased client's level of uncertainty and increased both client's and market parties transaction bounded investments.

Adjusting demand

This action was not perceived in this case study, although the outcome based specifications were refined over the course of the project. However, this refinement of specifications did not constitute significant alterations in terms of scope or size, and were simply made clearer.

Aggregating demand

This action was taken in the initial stages of the project. Trusts that had indicated their interest, would be specifically explicitly mentioned in the market sounding prospectus. In the procurement procedure, the Trust furthermore indicated that it would make an effort to help market parties with commercializing the provided solution. It was furthermore made clear that there were a number of other Trusts that could become future buyers when they would undergo similar refurbishments programmes as the Trust.

By having multiple potential buyers, market parties would be more certain about future buyers and that their development costs would not be used specifically for just one project. Therefore, this action decreased both market parties' level of uncertainty and transaction bounded investments. Furthermore, by demonstrating a future market, the Trust was ensured that market parties would be interested in delivering a solution. Project documentation mentions that by demonstrating a future market, the negotiation position of the Trust was strengthened. This action therefore also decreased client's level of uncertainty.

The aggregation of demand was not formalized into an cooperative purchasing project i.e. aggregating demand was only done in the sense that other Trusts' showed their upcoming plans and interest and demonstrate that there was a wider future market. Aggregating demand therefore only required limited efforts (e.g. coordination costs). However, there were also no opportunities for sharing transaction costs with other Trusts.

- Aggregating demand decreased client's and market parties' level of uncertainty, decreased market parties' transaction bounded investments, and (marginally) increased clients' transaction bounded investments.

The aftermath of the project brings forth an interesting point. One aspect of market risk is uncertainty of future sales. This risk actually became fact in this project as the refurbishment programme at the Trust was put on hold.

Facilitating network

From the start of the project, the Trust assumed that market parties would need to cooperate (e.g. form consortia) for developing a desired solution. Facilitating networking was done via distributing a directory of companies to interested parties. The market consultation workshop also helped in stimulating cross-fertilization. The efforts required to do this were marginal, as activities only concluded the provision of a directory of companies and letting people meet during the

consultation workshop. These activities decreased the level of uncertainty of the client as it was indicated that stimulating networking would lead to a better outcomes. Effects on market parties' level of uncertainty or transaction bounded investments were not perceived, or were unable to find in this case.

- Facilitating networking decreased client's uncertainties while marginally increasing client's transaction bounded investments.

Aligning procurement strategy

The procurement strategy largely based on information gained through the market engagement phase, particularly the market consultation workshop.

The main points were the formulation of award criteria and evaluation methods that were best suited to the needs of the Trust. Besides this, future proofing the solution was also an important element that was addressed by awarding the contract for different phases (reserving the right to separately tendering for later phases). Selection criteria were used to filter out companies that did not demonstrate the potential of delivering innovative solutions.

All in all, aligning the procurement strategy decreased the level of uncertainty for the client as the strategy was 'tailor' made to the project. Because the activities (selecting, assessing and awarding) of the procurement procedure were essentially not influenced essentially, the alignment of the strategy did not result in higher transaction bounded investments. Besides this, there is no reason to believe the action had an effect on market parties' perceived risks.

- Aligning the procurement strategy decreased client's uncertainties.

5.2.6 Overall analysis of FCP and conclusions of case study

In the previous section, the effects of actions in the case have been discussed. These effects are summed up below. Indicated by an 'asterisk' are effects that were not (as) expected in the propositions formulated in paragraph 4.4. Indicated with a question mark are effects that are deemed likely, but were not clearly indicated by the case study.

Table 5.3: Summation of effects of FCP as found in case of Rotherham NHS Foundation Trust.

	Client's level of uncertainty	Client's transaction bounded investments	Market parties Level of uncertainty	Market parties transaction bounded investments
Communicating	Decreased*	Increased	Decreased	-
Sounding	Decreased	Increased	-	Increased
Adjusting demand	N/A	N/A	N/A	N/A
Aggregating demand	Decreased	Increased (marginally)	Decreased	Decreased
Facilitating networking	Decreased*	Increased (marginally)	-	?
Aligning procurement strategy	Decreased	-	-	-
Overall	Decreased	Increased	Decreased	Decreased /increased

Some overall effects become clear instantly like client's level of uncertainty and transaction bounded investments, and market parties level of uncertainty. However, determining the effect of FCP on market parties' transaction bounded investments is more difficult.

In coming to an overall effect of the FCP method, it is important to consider the context in which these actions have taken place. For one, although the actions have been reviewed individually, they often occurred in a limited number of events or activities. For instance, the consultation workshop facilitated communication, sounding and facilitating networking.

This relates back to the issue of determining if market parties' transaction bounded investments have increased or decreased in this case. For one, it can be stated the aggregation of demand may seriously decreased the transaction bounded investments. Furthermore, costs for providing feedback only applies to market parties that provided feedback (e.g. filling out response forms and attending the consultation workshop). It is therefore much more likely that the transaction bounded investments of market parties have decreased.

The overall effect of the FCP method as perceived in this case study is formulated as follows.

- Applying the FCP method decreased client's and market parties' level of uncertainty; decreased market parties' transaction bounded investments and increased client's transaction bounded investments.

This is in line with what was expected from a theoretical point of view. Applying the FCP method results has a positive influence with the exception of client's increased transaction bounded investments. As mentioned before, an ideal situation would mean that the effects would only include decreases.

As a last part of the case study interviews, the market engagement phase was reviewed. Questions were asked about whether or not the market engagement phase contributed to managing risk and if the time, effort and cost for doing so were justified.

Interviews indicate that without the market engagement phase, the outcome of the project would not have been the same as it has turned out now. Also mentioned was that without market parties' feedback, the Trust would not have had the confidence to proceed with the project and start and tender procedure.

It was also acknowledged that the FCP approach requires additional investments compared to standard practice. Interviews further indicated that these efforts were justified by the results of the project (e.g. projected benefits of the UEL-pod when it would be installed). Also indicated was that parts of the investments in this project are learning costs (it is a pilot project). A last consideration is that this project was partly funded by government (see introduction of this paragraph).

5.3 ERASMUS MEDICAL CENTRE [NL]

5.3.1 Background and overview

The Erasmus Medical Centre (Erasmus MC) in Rotterdam is the largest of eight academic medical centres in the Netherlands and is currently involved in major renovation and rebuilding projects. In total 185.000 m² of new hospital will be realized over the next years, until 2017.

Figure 5.4: Impression of Erasmus MC when major construction projects are concluded.

Erasmus MC has a strategic ambition to be a green and low carbon hospital and to decrease the hospital's energy consumption. As one of the partners of a multi-year action plan for all academic hospitals in the Netherlands, a 20% energy reduction is sought after by 2020. Related to this strategic ambition, Erasmus MC formed a partnership with TNO[12].

The combination of energy and carbon emission reduction targets goals and the rebuilding project led Erasmus MC to consider new approaches in procurement. At that time, TNO was a partner of the LCB-Healthcare Network and this project would be suited as a pilot project within this network. After an initial assessment, the project chosen concerned procuring a solution for **"cleaning 70.000 hospital beds and mattresses per year"**.

Figure 5.5 on the next page provides a timeline that shows key events in the project, as well as the different phases of the project.

The timeline starts with the project outline (e.g. proposal for procurement project following the FCP method. A preparatory period followed until the market engagement phase started in September 2011. This phase was divided into two stages. First, a market sounding prospectus was published. Erasmus MC requested market parties to respond to this document via an attached response form. After analysing these written responses, a second stage of the market engagement phase started when a market meeting day was organized. After this event, the market engagement phase was concluded in the beginning of 2012.

[12] TNO is an independent research organisation in the Netherlands.

Partially based on the information gained through the market engagement phase, a procurement strategy was developed. A procurement procedure (competitive dialogue) started in the end of March 2012. At the moment of writing, the competitive dialogue is underway.

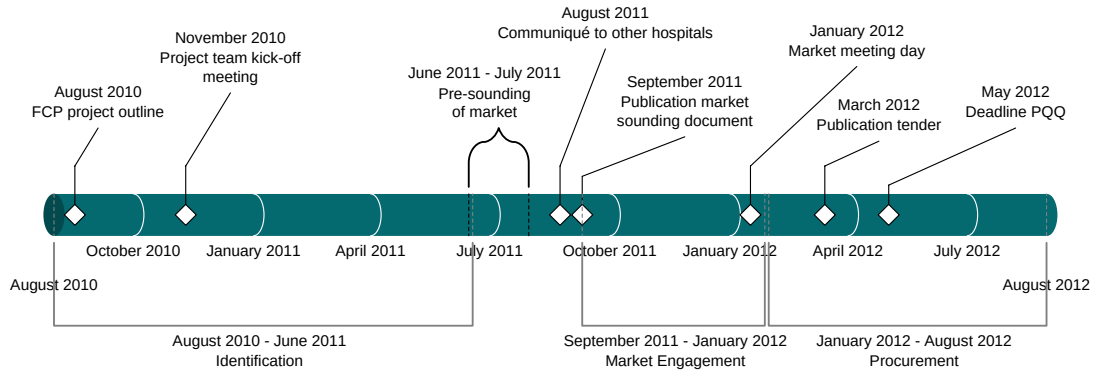


Figure 5.5: Timeline of the procurement project at Erasmus MC.

As indicated in project documentation, the goal of the project was as follows:

> *"To procure an innovative solution for cleaning 70.000 beds and mattresses that, in comparison to the current facility, delivers significant improvements in the use of water, electricity, cleaning agents, carbon emissions, and labour hours. Besides, the solution should have a total cost of ownership that was as low as possible."*

In the next three sections, a narrative is provided of the FCP process. Although the market engagement phase is of most interest, each phase will be discussed. In discussing the identification phase, attention is paid to the goal of the project and the perceived risks and uncertainties. In the section about the market engagement phase, it is described what was done in response to these perceived risks. Last, the procurement phase will be discussed to elaborate on how the procurement strategy was developed.

Section 5.3.5 will discuss the analysis of perceived actions.

5.3.2 Identification phase

A project team consisting of people from different disciplines had a kick-off meeting at the end of 2010. During the period after this meeting, attention was paid to the internal organization (e.g. project team) and issues at stake. This also included discussions about perceived risks and uncertainties in the project. There were several risks and uncertainties identified. These can be categorized into two categories.

The first category concerned risks related to the performance of the outcome. I.e. risks concerning whether the desired savings in carbon emissions and total cost of ownership would be achieved. Related to this were the following aspects.

- There was uncertainty about the capabilities and interest of market parties. The number of parties in the specific business of bed washing facilities was limited and even shrinking. Interest outside the 'regular' market was therefore important. It was furthermore uncertain if this project would get any attention at all.

- There was uncertainty if technologies that could contribute to achieving the goal of Erasmus MC were available.
- It was uncertain if the process and the (EU) procurement procedure would be conductive to delivering an outcome that achieved client's goal. Related to this was that it was unknown what market parties would require from Erasmus MC to be able to present their solutions.

The second category of risk concerns risks related to the viability of the outcome. I.e. whether the outcome from the project would fit into the context of Erasmus MC. Since the idea of this procurement project was to let the market come up with innovative solutions, it was important to provide as much freedom as possible. However, this also caused uncertainty on four aspects.

- The first aspect concerned the quality of cleaning, which is an important aspect in the prevention of infections. Beds are part of the direct environment of patients and therefore play a significant role in the spread of infections. However, there were no specifications, rules, standards or definitions available on what constituted a clean bed (that were outcome based). Normally, specifications were provided on the conditions/process of the cleaning process (e.g. describing the use of cleaning agents, temperature, etc.) that ensured thorough cleaning (e.g. overkill). However, this would prescribe a specific solution and therefore limit potential new solutions.
- A second problem identified was a risk about what effects the outcome would have on the organization of Erasmus MC. For instance, the outcome could have serious effects on logistics and on people currently working in the bed washing facility.
- A third aspect concerned uncertainty about the timeframe in which a solution could be delivered.
- A last aspect was uncertainty about the required upfront capital investments.

At that point in time, the project team also thought that the market faced uncertainties. From the perspective of the client, market parties needed to know a number of things to make the project an interesting business case. First, it needed to be clear what Erasmus MC required. Second, it needed to become clear that Erasmus MC was a credible buyer (e.g. procurement of the solution is 'guaranteed') or that there was a future market for the developed product or service.

Table 5.4: Perceived risks and uncertainties after project choice.

Client	Market party (perceived by client)
Outcome & performance - Uncertainty about the capabilities and interest of market parties. - Uncertainty about available technologies. - Uncertainty about potential barriers for market parties in process. Outcome & viability - Uncertainty about quality of cleaning. - Uncertainty about effect on organization. - Uncertainty about timeframe in which solutions could be presented. - Uncertainty about capital investments.	Market Risk - Uncertainty about future demand - Uncertainty about actual procurement of solution by Erasmus MC. - Uncertainty about the requirements or expectations.

5.3.3 Market engagement phase

Based on this situation, the project team took a number of actions during the period indicated as the market engagement phase.

A first action concerned a two-month period in which market parties from multiple sectors were contacted by telephone. Market parties were informed about an upcoming procurement and inquiries were made on how (other) market parties could be contacted.

Secondly, Erasmus MC contacted other hospitals within the Netherlands about this upcoming procurement project and asked about their interest in the potential outcome. Several other hospitals were interested. Erasmus MC asked if the names of interested hospitals could be explicitly mentioned later on in the process. This aggregation of demand with other hospitals was done to create a larger future market for potential suppliers. This aggregation was not seen as an absolutely necessity (the project would continue in any case) but would contribute to the interest of market parties and therefore higher chances for success. The aggregation would not be formalised into a cooperative purchasing project. The interest of other hospitals would be simply be mentioned in the remainder of the process.

The next action concerned the publication of a market sounding prospectus[13] that was made available via Prior Information Notice (PIN) in the Official Journal of the European Union (OJEU). The publication of this document was furthermore widely communicated to various market sectors via personal contacts, phone inquiries (mentioned above), press releases, trade journals, etc. This was done to ensure that market parties would be aware of the project. The market sounding prospectus had multiple goals. One goal was to provide information about the requirements and the context of Erasmus MC. Besides that market parties would be interested in this information, Erasmus MC found it important that market parties would use this information to develop solutions that would fit into the context of Erasmus MC.

Perceived actions during the first stage of the market engagement phase are communicating, sounding, and aggregating demand.

Attached to the market sounding prospectus was a response form that contained several questions. This response form was aimed at finding out market interest, market capabilities, available technologies and whether the rest of the process/procedure created barriers for innovative solutions.

The market sounding prospectus was accessed by more than 50 parties. Of these parties, 10 responded with filling out the attached response form. From the responses, the project team concluded that there was indeed an interest in the project and that this interest was demonstrated by a variety of companies from different sectors. Another conclusion was that market parties were somewhat hesitant about this project (e.g. how will it continue?). The responses of the market parties also indicated that they did not foresee any obstacles in the remainder of the project, although the project team was not sure this was really the case.

Overall, the project team did gain confidence that there was interest and that there was potential for a successful outcome. Therefore, the project continued into a second stage of the market engagement phase.

The market meeting day

Market parties were invited to attend a market meeting day. Other organizations were also invited, like the hospitals that expressed their interest in the outcome. Prior to this day, another document

[13] Dutch: marketconsultatiedocument

was published and was distributed to market parties. Communicating this event was done to create more awareness of the event and to make sure that market parties would participate.

The day covered a number of elements. First, a presentation was given about Erasmus MC and the challenge they set to clarify their intentions. Next part was a presentation about 'clean hospital beds' from the perspective of infection prevention. These presentations were aimed at clearly communicating the intentions of Erasmus MC and that Erasmus MC was serious about its search for an innovative solution. This was particularly important since many interested parties were not familiar with the healthcare sector. A guided tour around the hospital and the current bed washing facility was to provide market parties with more insight about the context of the Erasmus MC.

In the afternoon of the market meeting day, there was time available for discussion and questions. The project team had formulated two statements to start the discussion round and these statements reflected two uncertainties faced by the project team. One statement concerned the question 'what is a clean bed?' and the second statement concerned a question about the carbon footprint as a measurement of sustainability. These discussion rounds helped in finding out how familiar/capable market parties were with the cleaning of hospital beds (from an infection prevention perspective) and with the concept of carbon footprint calculations in procurement procedures.

Figure 5.6: Discussion session during the market meeting day at Erasmus MC.

From the feedback gained during the first stage of the market engagement phase, Erasmus MC concluded that a range of different market parties was interested in the project. This partly contributed to the idea that cross-fertilization would be beneficial to a successful outcome of the project. To facilitate networking, a list of market parties was distributed among the participants. Furthermore, a discussion round was specifically focussed on finding partners by discussing strong and weak points of each market party.

The day would close with a round of questions.

Perceived actions during the second stage of the market engagement phase are communicating, sounding, and facilitating networking.

Around 60 people, representing a broad range of organizations, attended the market meeting day. Results were interesting. According to people at Erasmus MC, the market meeting day further confirmed that there are indeed solutions that can deliver improvements compared to the current situation.

However, uncertainty remained on the aspect of cleaning, as it was not yet certain that the solutions provided by market parties would provide a sufficient degree of cleaning. Furthermore, the discussion round also let to the belief that many parties were not familiar with carbon footprint

calculations. This also became apparent from the questions asked during the market meeting day. During a round of questions, market parties also expressed other concerns that mainly had to do with their investment cost in developing a solution for Erasmus MC. Furthermore, it was wondered to what extent Erasmus MC really was open to 'new' solutions, and not just a mechanical solution (e.g. a new bed washing facility). Another point being addressed was if the procurement procedure would exclude (particularly) smaller companies. Therefore, in contrast to the written responses, market parties did see risks in this project.

With the evaluation of this market meeting day, the market engagement phase was concluded.

5.3.4 Procurement phase

The procurement strategy was developed after the market engagement phase, and was based on information gained through this phase. There were four main decisions made related to the procurement procedure and the risk and uncertainties perceived.

The competitive dialogue was chosen as a procurement procedure upfront. The main reason was that this procedure allows for discussing the project before awarding. Choosing this procedure was already done in the initial stages of the project, but now also had another benefit. This benefit was that it was not necessary for market parties to develop an entire solution upfront, but that their solution could be developed during the dialogue rounds. This meant that investment cost would rise through the dialogue rounds; but that market parties' chances of getting the contract awarded will also increase (as parties are excluded during dialogue phases).

Prior to the invitation to the dialogue, market parties are selected using selection criteria. Normally, these selection criteria are aimed at limiting the number of parties that enter the dialogue to limit transaction costs. However, since many parties seemed to be unfamiliar with these kinds of (EU) procedures, the project team decided to keep these criteria to a minimum to eliminate any barrier for market parties to participate. In fact, it meant that nearly any party that would successfully subscribe to the dialogue would be invited to the first round.

The main award criteria from the initial start were (1) the total cost of ownership and the (2) carbon footprint. A third award criterion was added however, namely the fit of the outcome to the strategy of Erasmus MC. This criterion covered a number of aspects but most importantly, it included the quality of cleaning and the impact on the organization of Erasmus MC. By making this an award criterion, it could be discussed in the dialogue phase and would also provide an incentive for market parties to consider these aspects. It therefore provided more certainty that the outcome would be suited for Erasmus MC.

During the market engagement phase, it became clear that market parties had little experience with calculation concerning carbon footprints and life cycle costing. Requiring these calculations would therefore form potential barriers for parties that could develop desired solutions. It was therefore decided that Erasmus MC would aid market parties in this matter and developed models to determine the carbon footprint and lifecycle cost. A benchmark developed by TNO was shared and made public to eligible partners

At time of writing, the competitive dialogue is underway. Ten parties submitted for entering the competitive dialogue. Eight of these parties were invited to enter the first dialogue round.

5.3.5 Analysis of actions

Below, the actions of the FCP method as perceived in this case are discussed individually.

Communicating

This action was perceived multiple times and is most clearly recognized in publishing the market sounding document and the market meeting day. Communication efforts were relative extensive as these concerned the publication of multiple documents, effort in personal contact, etc. This would not been done normal practice. The main goal was to provide market parties with necessary information to come up with a suitable solution. By definition, this provision of information decreased market parties' level uncertainty.

However, interviews indicate that client's level of uncertainty also decreased. This was particularly so regarding the risk of the fit of the outcome within the organisation. By providing information about the hospital (e.g. guided tour), the client was more certain that solutions provided would be desirable. As a result, the following effects were perceived in this case.

- Communicating decreased client's and market parties' level of uncertainty, and increased client's transaction bounded investments.

Sounding

The action of sounding was also taken multiple times. Different activities throughout the process can be characterized as sounding, such as the response form and market meeting day. The effects of these different activities were similar though.

The client gained information through sounding, hence the action decreased client's level of uncertainty. Besides gaining confidence that a desired outcome would be presented, insight was also gained in possible problems faced by market parties. Interviews indicated that without this information, the project would not have proceeded into a tender procedure. These sounding activities were not standard practice and therefore involve increased client's transaction bounded investment. Market parties will also have experienced increased transaction bounded investments as they provided feedback (which required time and effort).

- Sounding decreased client's level of uncertainty and increased client's and market parties' transaction bounded investments.

There are however, some differences between the different activities in terms of results or information gained. For instance, based on the responses to the market sounding prospectus, the market it seemed that market parties did not perceive any problems in the upcoming procurement procedure. During the market meeting day however, several questions were asked and it seemed that there were several concerns.

Moreover, the different activities (e.g. filling out a response from vs. attending a meeting day) will have required a different amount of effort.

Adjusting demand

This action was not perceived in this project. Following the findings in Chapter 3, adjusting demand is an action that only occurs when responses from the market indicates the necessity of changing the demand. If not perceived in this case study, it should therefore not have been indicated.

However, there were a number of discussions (some were initialized by market parties) about the appropriate scope of the project throughout the process. Specifically, the question was raised to include or exclude the beds and mattresses in the project, or just keep the focus on cleaning these beds (which has been the scope throughout the process). Including them could provide more room for innovation and other benefits. Due to budget constraints, the fact the new beds would not go to tender until 2017, and for managerial reasons, the scope remained the same throughout the project.

Aggregating demand

This action was taken from the start of the project and was later on communicated via the market sounding prospectus. Aggregating demand was done, to provide the market certainty that the solution they would develop could be introduced in other hospitals in the Netherlands (that there was a larger market). The effect was therefore twofold: to provide more certainty about a future market (e.g. sales), and to show that investments are not solely made for one specific business opportunity.

Based on interviews, aggregating demand also decreased client's level of uncertainty. In the opinion of the project team, a larger future market would increase the interest of market parties and this would increase the chances for a successful outcome.

In this case, aggregation of demand was not formalized as there were no formal arrangements made between the different hospitals. Aggregation was only done in the sense that potential future buyers made their interest in this procurement project explicit (signposting a future market). Aggregating demand was therefore also relatively easy to facilitate, and costs for doing so were marginal. By not formalizing the aggregation, there were no benefits of aggregation (e.g. sharing tender costs) regarding transaction bounded investments. The following effect is therefore formulated.

- Aggregating demand decreased market parties and clients' level of uncertainty, decreased market parties' transaction bounded investments, and (marginally) increases clients' transaction bounded investments.

Facilitating network

The facilitation of network was done during the market meeting day. Besides opportunities during the day, further contact information about companies was distributed afterwards. Based on the interviews, facilitating this network was not a strictly required, but could very well contribute to a better outcome. It therefore decreased uncertainty of delivery of suitable outcome. The proposition stated in Chapter 4 stated that actions concerning facilitating a network would decrease the market parties' transaction bounded investments. Case investigation did not uncover this, although project team members felt (based on interviews) that parties did manage to 'find each other'. It is unclear to what extent market parties were really helped in finding partners.

- Facilitating a network decreased client's level of uncertainty.

Aligning procurement procedure

The Erasmus MC team aligned their procurement strategy based on the information gained through the market engagement phase. In general, the alignment was aimed at eliminating potential barriers for market parties. The market engagement phase provided information that market parties were not familiar with EU procurement procedures or the award criteria that would

be applied. As a result, selection criteria would be minimal and would allow most market parties that wanted to participate. Furthermore, Erasmus MC indicated that they would aid market parties in the calculations required for developing bids.

According to Erasmus MC, aligning the procurement strategy ensured is aimed at achieve the best possible outcome. Hence, it decreased client's level of uncertainty. By doing so, Erasmus MC would start the first round of dialogues with more market parties than what is regularly expected. Not only did this increase client's transaction bounded investments, it also increased client's level of uncertainty. It would be less clear for market parties to gauge their potential of getting the contract awarded. However, market parties transaction bounded investments were decreased. For one, they were not required to develop proposals for the first round of the dialogue. Secondly they will subsequently be aided by Erasmus MC in developing bids. Therefore, the following effect is formulated.

- Aligning the procurement strategy decreased client's level of uncertainty, increased market parties' level of uncertainty, decreased market parties' transaction bounded investments and increased client's transaction bounded investments.

5.3.6 Overall effect of FCP and conclusions of case study

In the previous section, the effects of actions in the case have been discussed. These effects are summed up in
Table 5.5 on the next page. Indicated by an 'asterisk' are effects that were not (as) expected in the propositions formulated in paragraph 4.4. Indicated with a question mark are effects that are deemed likely, but were not clearly identified in the case study.
Some overall effects become immediately clear. Just about all actions of FCP increase client's level of uncertainty while client's transaction bounded investments are increased. However, there is a mix of effects regarding client's level of uncertainty and transaction bounded investments.

These different effects that were perceived form market parties' perspective should not be reviewed in isolation. For instance, aligning the procurement strategy increased market parties' level of uncertainty (almost any market parties could enter the competitive dialogue). However, this increase was (partly) compensated by not requiring market parties to have a solution developed in the first stages of the procurement procedure.

Table 5.5: Summation of effects of FCP as found in case of Erasmus MC.

	Client's level of uncertainty	Client's transaction bounded investments	Market parties' level of uncertainty	Market parties' transaction bounded investments
Communicating	Decreased*	Increased	Decreased	-
Sounding	Decreased	Increased	-	Increased
Adjusting demand	N/A	N/A	N/A	N/A
Aggregating demand	Decreased	Increased	Decreased	Decreased
Facilitating networking	Decreased*	Increased	-	?
Aligning procurement strategy	Decreased	Increased*	Increased*	Decreased*
Overall	Decreased	Increased	Decreased /increased	Decreased /increased

However, it is difficult to weigh the effects on market parties' level of uncertainty and transaction bounded investments. Therefore, the following overall effect is formulated.

> *Applying the FCP method decreased client's level of uncertainty and increased client's transaction bounded investments. Market parties' level of uncertainty and transaction bounded investments both decreased and increased.*

At least for the part of the client, this overall effect supports the effect that was expected. A next important consideration is whether or not client's increased transaction bounded investments outweighed the benefits of the final outcome. However, this is not possible to determine yet as the procurement procedure is still underway.

What has been indicated in the interviews was that without the market engagement phase (i.e. the actions that have been taken), the project would not have continued. It was indicated that without this phase, the risks of continuing with the project would be considered too high. Through the market engagement phase, the project team feels confident that the outcome will be delivered.

Also confirmed is that transaction bounded investments (e.g. transaction costs) in this specific project are very high. Reasons for accepting this high investment are that the project is subsidized by the European Union through the Lead Market Initiative and that there are learning effects involved. Furthermore, interviews indicated that the project has gotten much positive publicity.

5.4 NOTTINGHAM UNIVERSTITY HOSPITALS NHS TRUST [UK]

5.4.1 Background and overview

Nottingham University Hospitals NHS Trust[14] is one of UK's largest acute Trusts[15]. Similar to the NHS in general, the Trust faces a range of challenges including increasing energy costs, the pricing of carbon, the need for flexibility in building use in the face of changing healthcare provisions, and the goal of a substantial reduction in carbon emissions. The Trust also has self-imposed targets on carbon emission reductions, aiming at a 34% of the 1990 baseline by 2020.

The Trust operates from three different sites. For the last 35 years, the primary source of heat and power for the city campus site has been a coal-fired boiler, which is now nearing the end of its useful life. The Trust also faces the difficulty of managing different sites which comprise a large number of buildings (some of which are of heritage status). Moreover, the city campus site will undergo redevelopment and it is likely that functions and activities will shift between sites and/or buildings.

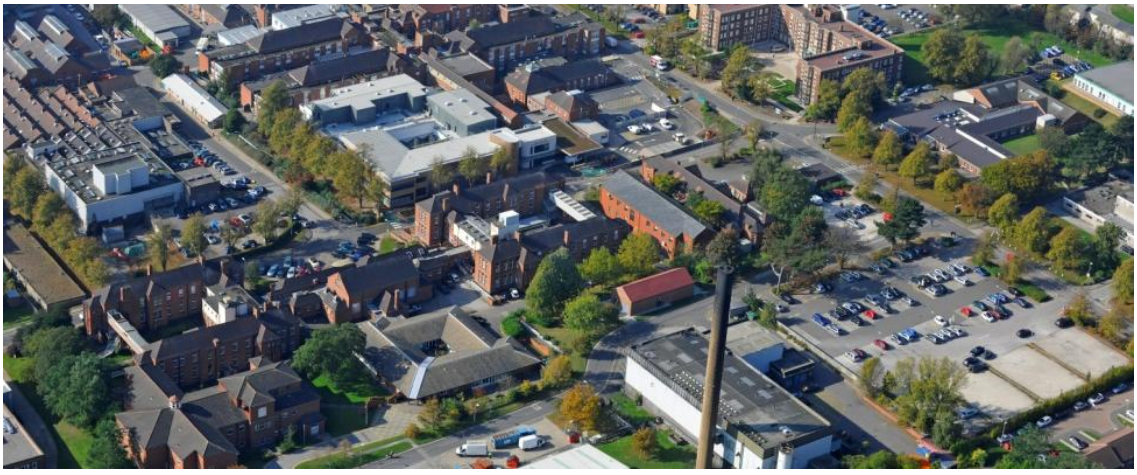


Figure 5.7: Overview of the city campus site of Nottingham University Hospitals NHS Trust.

In cooperation with the Department of Business, Innovation & Skills and the Department of Health, the Trust set out on a FCP project concerning an "**integrated ultra-low carbon energy supply and management solution for the city campus site"**. This project also became a pilot project within the LCB-Healthcare Network.

The goal of the project as mentioned in project documentation is as follows.

> *The trusts needs to procure an innovative and integrated ultra-low carbon energy supply and management solution for the City site that is able to adapt to meet the Trust's power, heat and cooling needs now and in the future.*

[14] From this point forward the client is referred to as "the Trust"

[15] Within the NHS, hospitals are managed by acute trusts. Acute trusts make sure that hospitals provide high-quality healthcare and that they spend their money efficiently. They also decide how a hospital will develop, so that services improve. (NHS, 2011)

Figure 5.5 provides a timeline that shows key events in the project, as well as the different phases of the project.

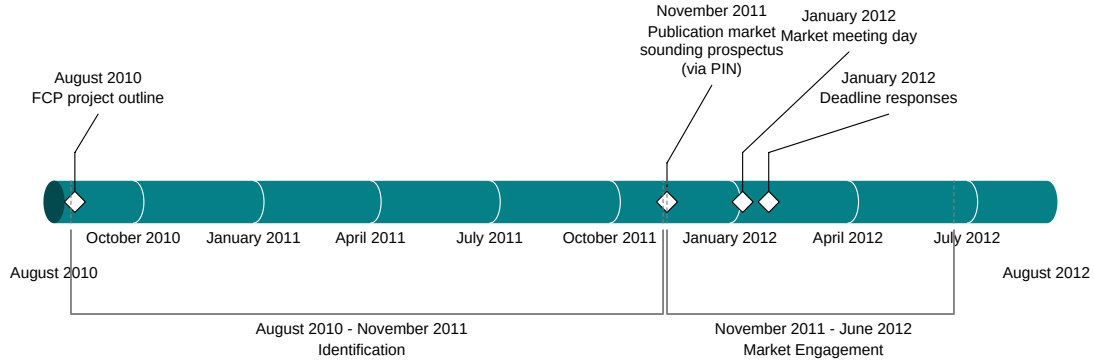


Figure 5.8: Timeline of the procurement project at Nottingham University Hospitals NHS Trust.

The project started in the third quarter of 2010. A long period of preparation followed in which it was decided to proceed with the market engagement phase. This phase started with the publication of a market sounding prospectus in November 2011. This was followed up by a site visit day in January 2012. Later that month, a deadline followed for submitting response forms that were attached to the market sounding prospectus. The Trust is currently assessing the responses.

In the subsequent sections, the identification and market engagement phase are discussed. Also discussed are the proposed next steps of the Trust towards an official tender procedure and conclusion of this FCP project. Paragraph 5.4.5 discusses the analysis of perceived actions.

5.4.2 Identification phase

The project initially started out as a simple replacement for the current boiler house. However, this approach would not deliver the desired improvements sought after by the Trust. The Trust had hired a consultant to provide solutions but the suggested solutions would only provide a onetime improvement of 20% in carbon reduction. A much higher improvement rate was hoped for.

Another important aspect to mention is the scope of the project. The project was initially defined rather broad. The Trust deliberately did this to ensure that all possible solutions could be presented before the scope of the project would be narrowed. If the Trust would specify a specific scope, it would limit the number of solutions presented and this might have jeopardized the potential level of improvement.

During this identification phase, the Trust identified a number of risks and uncertainties. These risks could be categorized into two categories.

The first category concerned risks related to the performance of the outcome. I.e. risks concerning whether the desired savings in carbon emissions and total cost of ownership would be achieved. Related to this were the following aspects.

- There was uncertainty about market capabilities of delivering a solution.
- There was uncertainty about what technologies were available.
- It was uncertain if market parties were interested in this project. Furthermore, another aspect mentioned was that it was uncertain if all relevant market parties would catch on to this project.
- Last, it was uncertain if there were any barriers in the delivery of potential solutions.

The second category of risk related to viability of the outcome. I.e. whether the outcome from the project would fit into the context of the Trust.

- One of the most important risks concerns reliability. The energy solution provided would need to be reliable as the Trust operates in a 24/7 environment.
- Flexibility was also indicated as a concern. The solution that was provided should be adaptable to future needs. This point is related to the expected redevelopment plans of the Trust.
- Another aspect concerns that the solution needs to be affordable in the sense of required upfront capital investments.
- A last aspect is that the transition to the new energy solution needs to be seamless, but this risk would be similar in traditional projects.

Market parties' perspective on this matter was also considered. One aspect was that market parties would require much information to develop proposals. A second aspect concerned that the Trust would need to present itself as a credible buyer and that the Trust was committed to this project.

These risks and uncertainties are summarized in the table below.

Table 5.6: Perceived risks and uncertainties in initial stages of the project.

Client	Market party (perceived by client)
Outcome & goal (delivery of performance) - Uncertainty about market capabilities. - Market parties' interest or involvement. - Uncertainty about available technologies. - Uncertain about barriers in proces. Outcome & fit - Uncertainty about reliability - Uncertainty about flexibility. - Uncertainty about initial investment cost. - Transition to new solution.	Market Risk - Uncertainty about the requirements or expectations. - Uncertainty about credibility of Rotherham NHS as a buyer.

5.4.3 Market engagement phase

A market engagement phase started in which the abovementioned risks were addressed by taking a number of actions. The first actions were concerned with publishing a market sounding prospectus.

This document was made available via a Prior Information Notice (PIN) in the Official Journal of the European Union (OJEU). The publication of this document was furthermore widely communicated to the market via trade journals, knowledge transfer networks, industry groups, personal networks, etc. Besides focussing on regular parties, also other parts of the supply chain were informed about this project. Doing so, the Trust ensured itself that the project would receive enough attention and that all potential suppliers of desired solutions would be aware of the project.

The goal of the market sounding prospectus was to provide information about the project. It was important to elaborate on the current situation and problem of the Trust, as well as stating the Trust's goal. For one, market parties would require this information in product/service development. And second, the Trust wanted to make sure that market parties understood what the Trust was asking for.

Attached to the market sounding prospectus was a response form, containing a number of questions. These question were aimed at providing the client with information about perceived risks and uncertainties.

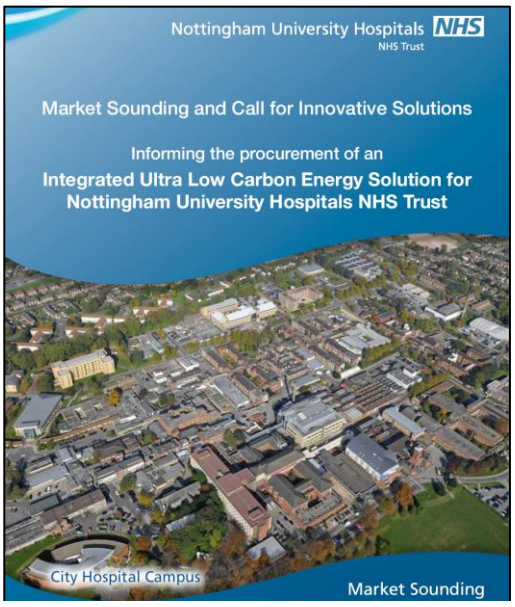


Figure 5.9: Market sounding prospectus

Site visit day

A site visit day was organized in January 2012, and took place between the publication of the market sounding prospectus and the deadline for submitting the response forms that were attached to the prospectus. Given the situation of the project, it was important that market parties could visit the site to have a proper understanding of the project at hand. The day started with a number of presentations in which the current situation and goal of the project would once again be explained. A guided tour followed.

Hence, the site visit day was a supplement to the market sounding prospectus and provided extra information. However, the day also included other aspects.

One of the other goals of the site visit day was to stimulate cooperation between market parties. This was done by distributing a directory of interested market parties. Furthermore, the day allowed for networking. For instance, companies were mixed up during the guided tours across the city campus site.

Perceived actions during the market engagement phase are communicating, sounding, and facilitating networking.

Results

At the end of January 2012, the deadline followed for submitting the response forms. The Trust received 64 responses, which were much more than expected. Evaluating these responses required much effort, also much more than expected. From these responses, the Trust concluded a number of things.

- There was a large interest from the market in delivering a solution.
- There were different directions in which the goal of the Trust could be achieved and technical solutions were available.
- The market is interested in how the project will continue.
- It is desirable that the project is defined more clearly and if it can be specified what the boundaries are of the project.

Current situation of project and outlook

At the moment of writing, the market engagement phase is still underway. A more detailed project proposal has been prepared, informed by the market sounding submissions, and will be reviewed by the relevant governance boards over the next few months. Expected is that a formal procurement procedure will start at the end of 2012. During the case study, questions were asked about the steps that are likely to be taken in the future

- One step concerns the development of a procurement strategy, which has not yet been discussed in the process (e.g. via a consultation workshop). It is expected that there will be another market engagement activity. This will then more specifically focus on the procurement route and strategy.
- A second aspect is that the Trust feels it needs to decide on the direction it should take in the remainder of the process. Specifically, this concerns the scope and definition of the project. Initially, the scope of the project was deliberately broadly defined. Responses from the market revealed that there were multiple approaches in meeting the needs of the Trust. The Trust now feels it is necessary to choose the most appropriated, and likely most successful, route and then continue with the process. Specifying this direction will be important to communicate to the market as they need to determine if this project will be worthy pursuing any further.

Expected actions are adjusting demand and aligning the procurement strategy.

5.4.4 Procurement phase

As mentioned, the procurement phase of this project has not started yet at the moment of writing. However, it is expected that the procurement strategy will be based on information acquired during the market engagement phase.

5.4.5 Analysis of actions

Although this project is currently still underway, the effects of several actions can be analysed.

Communicating

This action was perceived multiple times and is most clearly visibly by the publication of the market sounding prospectus and the site visit day. In interviews, it was stated that it was important that market parties were aware of the situation at the campus site and would furthermore be aware of what the Trust was looking for (not a standard solution). By doing so, market parties were provided with the information they needed to develop proposals. This decreased market parties' level of uncertainty. By providing information, the Trust also finds it more likely that the outcome will be as desired. This means that this action also decreased client's level of uncertainty.

As communication with market parties is not regular practice, costs for taking this action are considered additional transaction bounded investments. The following effect can therefore be formulated.

- Communicating decreased client's and market parties' level of uncertainty and increased client's transaction bounded investments.

Sounding

This action was also perceived in this case, and particularly identified in the response form that was attached to the market sounding prospectus. The site visit day also contained sounding activities as the client had the opportunity to get feedback from market parties. By getting feedback, the client was better able to assess the situation and therefore the action decreased client's level of uncertainty. Initiating these activities and assessing the feedback resulted in increased transaction bounded investments. Interviews indicated that the Trust continuously underestimated the time and effort required for assessing this feedback. The provision of feedback by market parties will have resulted in transaction bounded investments on part of market parties as well. Therefore, the effect of sounding is formulated as follows.

- Sounding decreased client's level of uncertainty and increased client's and market parties' transaction bounded investments.

Adjusting Demand

As mentioned in the previous section, this action has not been perceived. However, it is expected that this action will occur towards the procurement phase. The fact that this action has not been perceived is due to that the project is still underway. In other words, the Trust will more specifically define and restrict the direction in which they are searching for a solution.

The scope of the project was initially defined very broad and this was also explicitly mentioned in the market sounding prospectus. The Trust deliberately defined the project broadly to allow, and not exclude, potential ideas upfront. The market engagement phase (e.g. sounding) then revealed possible directions and potential for improvements. Market parties also indicated that it was preferred that the Trust would chose a direction.

Regarding the expected effects of the action, it can be stated that only market parties' level of uncertainty is influenced. By defining the requirement more clearly, market parties will be better able to determine if this project is worth pursuing. Client's level of uncertainty will not influenced as they already acquired information on which direction is best suited. Adjusting demand does not change this. There are no indications of effects on transaction bounded investments as it is unclear how this action might affect other activities.

- Adjusting demand is <u>expected</u> to decrease market party's level of uncertainty.

Aggregating demand

Strictly speaking, this action is not perceived in this case. The market sounding prospectus does mention options for a wider market. However, this elaboration on opportunities does not really show that there are specific other public agencies interested in procuring the solution provided for Nottingham University Hospitals. Interviews confirmed that not much effort was put into aggregating demand.

There are reasons for this action not being perceived. One reasons was that the project was still broadly defined which does not clarify on what sort of product or solution is really desired. This relates to the literature discussed in section 3.3.2. There it was stated that aggregation is possible when requirements are similar between different clients. However, what actually is required is still not clearly defined and this limits the possibilities for aggregating. Another reason is that the size of this project is quite large and may therefore already provide enough interest from market parties. In other words, it was not necessary to aggregate. The large number of parties that have shown interested supports this argument.

Facilitating networking

This action was taken, particularly during the site visit day by providing a directory of attending market parties. The site visit day allowed for networking and the guided tour was arranged in such a way that different kinds of market parties would be grouped together.

By stating they felt it was more certain that parties would work together meaning that the outcome would be more likely to be as desired. This means a decrease in client's level of uncertainty. Costs for doing so are considered marginally as the day itself was already planned. There are no indications of how beneficial this facilitation was to market parties. Effects on market parties transaction bounded investments are therefore unknown.

- Facilitating networking decreased client's level of uncertainty and (marginally) increased client's transaction bounded investments.

Aligning procurement strategy

The procurement strategy is still in development at the time of writing this thesis. What can be said is that it is expected that consultation with market parties will follow. This therefore would indicate the procurement strategy will, to some extent, be based on information gained through the market engagement phase. However, it is not possible to analyse the effects of this action.

5.4.6 Overall effects of FCP and conclusions of case study

In the previous section, the effects of actions in the case have been discussed. These effects are summed up below. Indicated by an 'asterisk' are effects that were not (as) expected in the propositions formulated in chapter 4.

Table 5.7: Summation of effects of FCP as found in case of Nottingham University Hospitals NHS Trust.

	Client's level of uncertainty	Client's transaction bounded investments	Market parties level of uncertainty	Market parties transaction bounded investments
Communicating	Decreased*	Increased	Decreased	-
Sounding	Decreased	Increased	-	Increased
Adjusting demand	-*	-	Decreases (expected)	-
Aggregating demand	N/A	N/A	N/A	N/A
Facilitating networking	Decreased	Increased	-	?
Aligning procurement strategy	N/A	N/A	N/A	N/A
Overall	Decreased	Increased	Decreased	Increased

Aggregating the effects of the individual actions is easy to do as there are no conflicting effects. The following overall effect of applying the FCP method can therefore be formulated.

> *Applying the FCP method decreased client's and market parties level of uncertainty and increased client's and market parties transaction bounded investments.*

However, in discussing the effect of FCP in general, it is important to consider the different activities together. One of the negative aspects in this case is the increase in market parties' transaction bounded investment. However, these investments only apply to parties actually participating in the sounding activity. Furthermore, there was compensation for these investments. For instance, market parties were told that information would be provided at the site visit day and were therefore incentivised to attend this day. This day allowed for sounding and the client's attained more information about market parties' interest and abilities. So market parties transaction bounded investments for sounding were 'compensated' by the provision of information which is a decrease in market parties' level of uncertainty.

Overall, one clear effect is still that the management of risk required investments. In interviews, it was acknowledged that the activities of the market engagement phase indeed required much extra effort. It was made particularly clear that the project team had consequently underestimated the time required for evaluating all the responses from the market. However, these costs are considered justified. Without these market engagement activities, the Trust would not know if the market was interested or capable of delivering a solution. In other words, it would have been difficult to proceed with the project if it would still be uncertainty that a solution would be provided. Therefore, the FCP method was successful in overcoming some of the barriers in Public Procurement of Innovation.

Following the research model, the next step in the research concerned the cross-case analysis. This analysis will be the subject of the next chapter.

Chapter 6

CROSS-CASE ANALYSIS

Conducting a cross-case analysis is relevant when a case study research consists out of multiple case studies (Yin, 2009). A cross-case analysis is useful for generating more general results (Miles & Huberman, 1994), meaning that the results of the research are externally more valid. Furthermore, Gerring (2004) discusses that the aim of studying a single unit in case study to generalize across a larger set of (similar) units. This emphasizes that it is important in case study research to aim at providing conclusions that are generally more applicable.

The first paragraph of this chapter discusses the approach taken in the cross-case analysis and also discusses the structure of the remaining chapter.

6.1 APPROACH IN CROSS-CASE ANALYSIS

Tactics for cross-case analysis are mostly concerned with forcing the investigators to go beyond initial impressions, especially through the use of structured and diverse lenses on the data (Eisenhardt, 1989b). Result of these forced comparisons can be new categories and concepts which the investigators did not anticipate (Eisenhardt, 1989b). Two main tactics were applied in this analysis.

The first tactic is to select variables, and then to look for within-group similarities and differences. According to Eisenhardt (1989b), variables can be suggested by the research problem or by existing literature, or the researcher can simply choose some variables.

This research concerns an embedded case study research. In selecting variables, it is therefore important to select variables that cover the unit of analysis (i.e. actions of FCP) and select variables that focus on the context of the unit of analysis. These variables are shown in Table 6.1.

By focusing on these specific variables however, researchers may miss important insights.

Therefore, a second tactic was applied which involved selecting pairs of cases and list the similarities and differences between each pair.

The two tactics applied in this cross-case analysis supplement each other. Where the first tactic is aimed at comparing cases per variable, the second tactic compares cases across variables. This is

also discussed by Miles & Huberman (1994) who state the importance of combining variable and case oriented strategies.

Table 6.1: Chosen variables for cross-case analysis.

Variable type	Variables	Paragraph
Case oriented (describes context)	- Organization - Drivers of projects - Projects & project goals - Perceived risks & uncertainties - Project overview	6.2
Within case oriented	- Effect of communicating - Effect of sounding - Effect of adjusting demand - Effect of aggregating demand - Effect of facilitating networking - Effect of aligning procurement strategy - Effect of FCP-method in general	6.3

The variables mentioned in Table 6.1 also form the outline of the remaining chapter. This outline is very similar to the outline of the individual case studies (see paragraphs 5.2, 5.3 and 5.4) with the exception of the narrative case descriptions which are excluded from this chapter. This outline was determined upfront because using a uniform outline in the individual cases studies would ease the process of comparing the cases (Verschuren & Doorewaard, 2007).

6.2 CASE ORIENTED VARIABLES (CONTEXT)

In this paragraph, case oriented variables are discussed. There are two reasons for discussing these variables. The first reason is that it can show how representative the cases are to other cases. This helps to determining how applicable the findings are beyond this specific case study research. The second reason is that these variables describe the context in which actions have taken place.

Because these case oriented variables describe the context of the unit of analysis, they are considered independent variables.

6.2.1 Organizations

The three public agencies in the case studies are similar to one another as they are all (devolved) public healthcare agencies. Although some of these healthcare agencies concern large hospitals (i.e. Erasmus MC and Nottingham University Hospitals (NUH)), they are relatively small compared to other public agencies like provinces of governmental departments.

The three cases however, represent a larger number of public agencies. The two UK cases for instance, can be regarded as representative for many other public agencies within the NHS. Similar to Erasmus MC, there are also other (large) academic hospitals within the Netherlands.

A similarity between the three agencies is that none of them was familiar with new or alternative ways of procurement. Resulting, the FCP projects were therefore all characterized as pilot projects. To some extent related is the aspect of risk aversion. In two of the case studies, it was made clear that the client in general is risk averse.

6.2.2 Drivers of projects

In the introducing sections of the cases studies, the drivers of the projects were mentioned. Reviewing these three cases, it becomes clear that the drivers are similar. Drivers of the projects mainly concerned a move to more sustainable operations and financial and efficiency challenges. This is not unexpected as the case selection criteria resulted in the selecting three cases from the LCB-Healthcare Network. In one of the publication of this network, it is stated that the public healthcare sector faces rapid change, considerable financial and efficiency challenges, and a move to low carbon operations (LCB-Healthcare, 2011). This also indicates that the drivers in the case studies are similar to the wider public healthcare sector. In fact, they are even similar to the Grand Challenges as discussed in Chapter 1 of this thesis.

Facing these challenges made clients consider alternative approaches to procurement. Hence, they are the drivers for the projects and project goals (see next section).

Also similar between the cases is that the opportunities for starting these projects were presented by renovation, rebuilding or refurbishment programmes. In the case of Nottingham and Erasmus MC, the project initially started as a simple replacement project for a product nearing the end of its life cycle.

6.2.3 Projects and project goals

The table below mentions the projects in each case. Relevant aspects for comparing these projects are size, scope and how idiosyncratic they are.

Table 6.2: Project descriptions of each case study.

	Project description
Rotherham NHS Foundation Trust	Ultra-efficient lighting for future wards.
Erasmus Medical Centre	Product or service for the cleaning of 70.000 beds and mattresses per year.
Nottingham University Hospitals NHS Trust	Integrated ultra-low carbon energy supply and management solution for the City campus site.

The projects of the three cases are quite different in nature, especially regarding the aspect of scope. Although the scopes of the projects were clearly defined in both Rotherham and Erasmus MC cases, the scope of the Nottingham case was initially defined very broad.

Furthermore, there seems to be a difference in how idiosyncratic the desired solutions will be. For both Erasmus MC and Rotherham, the solution that was, or will be provided, will in all likelihood be transferable to other hospitals. In the case of Nottingham, this is not yet clear. There, the scope of the project will be defined more clearly in upcoming months. However, it is likely that the solution provided at Nottingham will be more tailor-made to the situation there.

This difference between projects has also played a role in the actions of FCP later on in the process. This will be discussed in paragraph 6.3.

The three goals as they have been identified in the case studies are listed in Table 6.3. All these goals are extracts of the market sounding prospectus of the case at hand.

All goals indicated are outcome bases specifications that by themselves do not specify a particular solution. Furthermore, the goals in each project are aimed at achieving significant improvement

like carbon emission reduction, higher efficiencies, etc. Therefore, these goals are a response to the drivers mentioned section 6.2.2.

Moreover, the three projects can all be characterized as projects concerning Public Procurement of Innovation. In all three cases, the client is in search for a product or product that is not yet provided by market parties. This is perhaps best demonstrated by the Nottingham case. Initially, the Trust hired consultants to propose solutions for the energy provision at the campus site. Their proposed solutions however, would not deliver the required improvements and this is why a solution was sought after through a FCP project.

Table 6.3: Project goals for each case study.

	Goal of procurement project
Rotherham NHS Foundation Trust	The Trust wish to achieve a step change in the patient experience; creating a patient centred environment, including the incorporation of highly efficient, smart lighting systems that can deliver economical carbon reductions while at the same time contributing to a pleasant and healthy environment for both patients and staff.
Erasmus Medical Centre	To procure an innovative solution for the cleaning of 70.000 beds and mattresses that in comparison to the current facility delivers significant improvements in the use of water, electricity, cleaning agents, carbon emissions, and labour hours. Besides, the solution should have a total cost of ownership that is as low as possible.
Nottingham University Hospitals NHS Trust	The Trust needs to procure an innovative an integrated ultra-low carbon energy supply and management solution for the City site that is able to adapt to meet the Trust's power, heat and cooling needs now and in the future.

In part, the projects and project goals also increased risks and uncertainties. The project goals indicated a search for new or innovative products and services. So compared to 'regular' practice, these projects entail additional risks and uncertainties.

6.2.4 Perceived risks and uncertainties

In each case, the risk and uncertainties perceived by clients were indicated. In each case, it was possible to categorize these risks into two categories.

- The first category concerned risks related to the performance of the outcome. I.e. what will the performance of the delivered product or service be?
- The second category concerned risks related to the viability of the outcome. I.e. will the outcome of the project fit into the organization of the hospital?

This is similar to what is stated in a report of the European Commission (also see paragraph 1.1). Failure may be total, if a supplier is simply unable to deliver; or partial if performance falls below expectations, or delivery is late (European Commission, 2007). Failure can also come from practical difficulties in applying a new solution and integrating it within the organisation (European Commission, 2007).

In each case, the client also indicated risks and uncertainties that would face market parties. Table 6.4 provides an overview of frequently perceived risks or uncertainties.

Table 6.4: Frequently perceived risks and uncertainties.

Client		Market parties
Outcome & performance	**Outcome & viability**	**Market Risk**
- Uncertainty about market interest - Uncertainty about market capabilities - Uncertainty about available technologies or possible approaches. - Uncertainty about the suitability of the procurement strategy.	- Required upfront capital investments. - Timeframe in which solutions would be available.	- Uncertainty about requirements. - Uncertainties about future demand. - Uncertainty about credibility of procuring agency.

Comparing the risks perceived in the case studies to the risks mentioned in paragraph 1.1, there are many resemblances. Particularly recognized in the cases is the statement of Edler & Georghiou (2007): "purchasers, private and public, are often not aware, or fully aware, about what product and service innovation the market offers to them — or could offer to them. Suppliers of potential new products and services often lack the knowledge on what customers might want in the future".

It therefore seems that the perceived risks in these projects reflect the problems as discussed in the first chapter of this thesis.

6.2.5 Project overviews

Timelines with significant events were provided in the individual case studies. In all cases, the project team followed the basic outline of the FCP method as mentioned in Chapter 3. However, the overviews also show differences.

For one, the identification phases differ in length. This is explained by the fact that the three cases were prepared in different ways and in different organizational settings. At Erasmus MC, a number of demonstrations and trials were held on other projects. At Nottingham, the move from traditional procurement methods required a preparation time before there was agreement about the new approach.

Another difference is the sequence of events, particularly when looking at the days that were organised during the market engagement phase. Following the guide of the Department of Business, Innovations & Skills (2011) it is suggested that a written sounding exercise precedes any form of further market engagement. The Rotherham and Erasmus MC case followed this basic outline, but this was not the case at Nottingham. There, a site visit day was organised as a 'supplement' of the written sounding exercise and prior to the deadline for submitting the responses. However, it is indicated at Nottingham that further consultation with the market may follow.

Table 6.5 provides an overview of the different phases and stages of each project. Also indicated are the actions that were perceived during these stages.

Table 6.5: Overview of perceived actions per phase, per case study.

	Rotherham NHS Foundation Trust	Erasmus MC	Nottingham University Hospitals NHS Trust
Actions during Market Engagement	*First stage* Communicating Sounding Aggregating demand	*First stage* Communicating Sounding Aggregating demand	Communicating Sounding Facilitating networking
Actions during Market Engagement	*Second stage* Communicating Sounding Facilitating networking	*Second stage* Communicating Sounding Facilitating networking	
Action after Market Engagement	Aligning procurement strategy	Aligning procurement strategy	N/A

Concluded from this is that, overall, the three cases show many similarities. Not only was the general outline of each project the same, similar actions were taken during each stage of the process. There are however, some differences perceived and these will be discussed in the next paragraph.

6.3 EFFECTS OF (ACTIONS) OF FCP

In this paragraph, within case variables are discussed. The variables chosen are the actions of the FCP method and the FCP method in general (see subsequent sections).

These variables are both dependent and independent. They are dependent in the sense that the occurrence of an action depends on the context of the project. They are independent in the sense that actions determine the effect on perceived risks. Consequently, clients' and market parties' level of uncertainty and transaction bounded investments are considered depended variables.

Table 6.6 provides an initial overview of which actions were perceived in each case study. In some cases, the actions were not perceived but are expected (these projects are still underway).

Table 6.6: Overview of perceived and not perceived actions per case study.

	Rotherham NHS Foundation Trust	Erasmus MC	Nottingham University Hospitals NHS Trust
Communication	Perceived	Perceived	Perceived
Sounding	Perceived	Perceived	Perceived
Adjusting demand	Not perceived	Not perceived	*Expected*
Aggregating demand	Perceived	Perceived	Not perceived
Facilitating network	Perceived	Perceived	Perceived
Aligning procurement strategy	Perceived	Perceived	*Expected*

In the next sections, each action will be discussed individual. Differences between the occurrences and/or effects will be discussed. After this, the FCP method in general is discussed in which the results of the individual actions are aggregated.

6.3.1 Communicating

The action of communicating was perceived in all cases. Based on the discussion in Chapter 3, it was expected that this action would be taken if market parties would face uncertainties. In each case study, this was indeed the case. The activities concerning communication were similar in each case. The effects of this action in each case are summarized in Table 6.7. Indicated with an asterisk are effects were not expected from a theoretical point of view.

Table 6.7: Perceived effects of the action communication.

	Client's level of uncertainty	Client's transaction bounded investments	Market parties level of uncertainty	Market parties transaction bounded investments
Rotherham	Decreased*	Increased	Decreased	-
Erasmus MC	Decreased*	Increased	Decreased	-
Nottingham	Decreased*	Increased	Decreased	-

As can be seen, the effects are the same in each case. It is therefore easy to generalize the effects of communicating.

- Communication decreased client's and market parties' level of uncertainty, while increasing clients' transaction bounded investments.

However, the effects differ from what was expected from a theoretical point of view. Expected was that communication would only decrease market parties' level of uncertainty and increase client's transaction bounded investments. However, the case studies indicated that clients' level of uncertainty was also decreased. The difference between the expected and perceived patterns lies with the assumptions made by the clients in each case: by providing information, it is more likely that the market parties will understand the situation and develop suitable solutions. From a theoretical perspective, it was assumed that feedback would be required to decrease client's level of uncertainty.

Although the expected en perceived effects differ, they are not conflicting.

6.3.2 Sounding

Sounding activities were perceived in all cases and this was as expected. In each case, the client was facing a range of uncertainties. Getting feedback from market parties was therefore important. The effects are summarized below.

Table 6.8: Perceived effects of the action sounding.

	Client's level of uncertainty	Client's transaction bounded investments	Market parties level of uncertainty	Market parties transaction bounded investments
Rotherham	Decreased	Increased	-	Increased
Erasmus MC	Decreased	Increased	-	Increased
Nottingham	Decreased	Increased	-	Increased

The effects in the cases are similar and furthermore, the same as expected from a theoretical perspective.

- Sounding decreased clients' level of uncertainty while increasing clients' and market parties' transaction bounded investments.

Important to note is that sounding was done multiple times, using different means. For example, in each case sounding was done via a response form and via a market meeting/consultation day. Although the effects of these different methods remained the same (see Table 6.8), the extent of feedback gained and the extent of required investments likely differ.

Another note is that in each case, information from the market was also gathered by counting the number of responses or to count the number of times the market sounding prospectus was accessed by market parties. Although only the potential interest of the market can be gauged from this, it is useful information that does not require any effort.

6.3.3 Adjusting demand

This action was not perceived in any of the cases during the research period. However, in one of the ongoing cases (Nottingham), it is expected that this action will occur in the future.

It is interesting to reflect upon the initial expectation of the occurrence of this action. It was assumed that this action would only follow after feedback of market parties indicated its necessity. In the case of Nottingham, this seems to be supported although the project team already imagined adjusting demand from the start of the project. The reason for starting out with a broadly defined project was to prevent excluding possible directions up front. In the case of Rotherham, this action was never deemed necessary. In the case of Erasmus, it was broad up during the process. However, there were internal reasons for not adjusting demand (see section 5.3.5).

The case studies have shown that the initial project choice can influence the need for adjusting demand (e.g. Nottingham), and that the need can be indicated by market parties (e.g. Nottingham, Erasmus MC). However, reasons for adjusting demand can be presented externally by market parties, but also internally (e.g. Erasmus MC).

Table 6.9: Perceived effects of the action adjusting demand.

	Client's level of uncertainty	Client's transaction bounded investments	Market parties level of uncertainty	Market parties transaction bounded investments
Rotherham	N/A	N/A	N/A	N/A
Erasmus MC	N/A	N/A	N/A	N/A
Nottingham	-*	-	Decreases (expected)	-

As mentioned, only one case will likely demonstrate this action. It expected effects have been clarified in section 5.4.5. Although this allows for a stating a general effect, the value of this finding is very limited.

- Adjusting demand decreased market parties' level of uncertainty (expected effect in Nottingham case).

6.3.4 Aggregating demand

Aggregating demand was perceived in two of the three cases. In both Rotherham and Erasmus MC cases, aggregation of demand was made specific by having other public agencies make their interest explicitly mentioned during the process. Especially the Rotherham case demonstrates this by even mentioning other Trusts' refurbishment plans including estimated budgets. It can be argued that this level of detail about other Trusts is supportive of the credibility of demand and the prospect of future sales.

The case at Nottingham does mention potential routes to a wider market, but did not explicitly mention potential future buyers. Given the size of the project, the project itself would create enough demand and hence interest of the market. This last point is supported by the large amount of interested parties in the project.

The type and scope of the project therefore seem important factors that determine if this action needs to be taken and if it can be taken. Another conclusion is that aggregating demand is related to the action of adjusting demand as both are depended on the initial chosen project. In the Nottingham case, the project was broadly defined which makes it difficult to find other potential buyer (what are we going to buy). In the case of Erasmus with a clearly defined project upfront, it was relative easy to find other buyers.

However, it should be noted that in both the cases demonstrating aggregating demand, the aggregation was not formalized in to a cooperative purchasing project.

Table 6.10 provides an overview of the perceived effects of aggregating demand.

Table 6.10: Perceived effects of the action aggregating demand.

	Client's level of uncertainty	Client's transaction bounded investments	Market parties level of uncertainty	Market parties transaction bounded investments
Rotherham	Decreased	Increased	Decreased	Decreased
Erasmus MC	Decreased	Increased	Decreased	Decreased
Nottingham	N/A	N/A	N/A	N/A

Market parties' level of uncertainty decreased, as well as market parties' transaction bounded investments. By demonstrating that there are multiple buyers, the likelihood of future sales is higher and costs can be reimbursed on multiple projects.

Because a larger demand creates a more market pull, clients were more confident that market parties would develop desirable solutions. In other words, aggregating demand decreased clients' level of uncertainty.

Not formalizing aggregation of demand (cooperative purchasing), has had two consequences. On one hand, it was not possible the share costs with other purchasing agencies (decreasing clients' transaction bounded investments). On the other hand, not formalizing meant that aggregating was easily established, meaning that coordination costs were minimal.

- Aggregating demand decreased clients' and market parties' level of uncertainty, decreased market parties' transaction bounded investments, and (marginally) increased clients' transaction bounded investments.

6.3.5 Facilitating networking

Facilitating networking was done in all three cases. In all cases, directories were distributed among participating market parties about all other companies that were participating in market engagement activities. Moreover, networking received attention during all market meeting of consultation days.

The perceived effects of facilitating networking are indicated in Table 6.11.

Table 6.11: Perceived effects of the action facilitating networking.

	Client's level of uncertainty	Client's transaction bounded investments	Market parties level of uncertainty	Market parties transaction bounded investments
Rotherham	Decreased*	Increased (marginally)	-	?
Erasmus MC	Decreased*	Increased (marginally)	-	?
Nottingham	Decreased*	Increased (marginally)	-	?

In each case study, it was indicated that facilitating network contributed to cooperation and cross-fertilization. Hence, it would provide better conditions for the delivery of a desired outcome. This moves to the argument that facilitating networking increased clients' level of uncertainty.

From a theoretical point of view, it was expected that market parties' transaction bounded investments would decrease. The case of Rotherham for instance resulted in a solution that was developed by a newly formed consortium. It was however, not possible to determine to what extent the facilitation of networking by the client contributed to this. In other cases, this was also not possible to determine. Therefore, it was not possible to determine the effect of this action on market parties, although there are indications that there is an effect. This reveals a limitation of this research and this limitation is further discussed in paragraph 7.2.1.

6.3.6 Aligning the procurement strategy

For evaluating this action, it was only possible to compare the cases of Erasmus MC and Rotherham. In both cases, the procurement strategy was based upon information gained through the market engagement phase. The perceived effects are summarized in Table 6.12. Effects indicated with an asterisk are effects that were not expected from a theoretical point of view.

Table 6.12: Perceived effects of the action aligning the procurement strategy.

	Client's level of uncertainty	Client's transaction bounded investments	Market parties level of uncertainty	Market parties transaction bounded investments
Rotherham	Decreased	-	-	-
Erasmus MC	Decreased	Increased*	Increased*	Decreased*
Nottingham	N/A	N/A	N/A	N/A

In both cases, client's level of uncertainty was decreased, as was expected from a theoretical point of view. This decrease was achieved, because the procurement strategy was aligned to maximize

the chances for the right solution being presented. Besides this effect, the two cases differ from one another.

The main difference between the Rotherham and Erasmus MC was that the alignment of the procurement procedure at Erasmus MC would mean that almost any market party would be allowed to enter the competitive dialogue and would furthermore be aided in developing bids. Although this ensured that there were no (procedural) barriers for market parties to participate in the tender, it did result in the effects mentioned in the table above.

Coming to a uniform conclusion on the effects of this action is not possible, because the two cases show diverse effects. In part, this can be explained by reanalysing the action. In Chapter 3, it was stated that this action concerns a number of choices (e.g. procurement procedure, selection criteria, award criteria, etc.) that can have different effects. It seems that these choices also have quite different effects on the level of uncertainty and transaction bounded investments, and that this limits the ability to come to an overall effect of 'aligning the procurement strategy'.

However, one effect that was expected from a theoretical point of view, was also perceived in the case studies. This is the effect of aligning the procurement strategy on clients' level of uncertainty.

- Aligning the procurement strategy decreased clients' level of uncertainty.

6.3.7 Overall effect of FCP

In this section, the goal is to find the overall effects of the FCP method on clients' and market parties' level of uncertainty and transaction bounded investments.

Table 6.13 indicates the perceived effects of the FCP method in practice. Similar to before, effects that were not expected from a theoretical point of view are indicated with an 'asterisk'. Indicated in italic are effects that were only perceived in a single case. Last a question mark is indicated where an effect is likely, but could not be determined with certainty.

Table 6.13: Summation of effects of FCP as found in the case studies.

	Client's level of uncertainty	Client's transaction bounded investments	Market parties level of uncertainty	Market parties transaction bounded investments
Communication	Decreased*	Increased	Decreased	-
Sounding	Decreased	Increased	-	Increased
Adjusting demand	-*	-	*Decreased (expected)*	-
Aggregating demand	Decreased	Increased	Decreased	Decreased
Facilitating network	Decreased*	Increased	-	?
Aligning procurement strategy	Decreased	*Increased*	*Increased*	*Decreased*
Overall	Decreased	Increased	Decreased/ increased	Decreased/ increased

Besides determining in what way the level of uncertainty and transaction bounded investments are influenced (e.g. increased or decreased), it is also important to not by which actions these aspects are influenced.

- Clients' level of uncertainty was decreased. Furthermore, clients' level of uncertainty was decreased by five actions.
- Clients' transaction bounded investment was increased. Four (five in one case) of six actions caused this decrease in transaction bounded investments.
- Market parties' level of uncertainty was decreased. One case (Erasmus MC) shows and exception were market parties' level of uncertainty by aligning the procurement strategy. The actions communicating and aggregating demand are the main contributors to this decrease.
- Market parties' transaction bounded investments were decreased, with the exception of the action of sounding. However, not all market parties will have incurred these costs.

It should be noted that the adverse effects for market parties were usually compensated in case studies. In the cases where market parties faced increased levels of uncertainty or transaction bounded investments, this would generally be directly related to a decrease in transaction bounded investments or level of uncertainty respectively. For instance, market parties' transaction bounded investments were increased by attending a consultation workshop (and to provide feedback), but simultaneously gained information which decreased their level of uncertainty. What therefore becomes clear is that the concepts of uncertainty and transaction bounded investments are linked.

Another important aspect is that it is very difficult to weigh the different effects. When the effects are uniform (e.g. all actions result in a decrease of the level of uncertainty), the overall effect is easily determined. When the effects are conflicting, the overall effect is very difficult to determine.

Taking into account the above-mentioned exceptions, the perceived overall effect of FCP is as follows.

> *Applying the FCP method decreased clients' and market parties' level of uncertainty, decreased market parties' transaction bounded investments and increased clients' transaction bounded investments.*

This overall effect reflects the overall effect that was expected from a theoretical point of view.

6.4 SUMMARY

The approach in the cross-case analysis was discussed in paragraph 6.1. There, a distinction was made between variables that oriented on the cases in general and variables that focused on the actions of FCP. This paragraph reflects on these variables.

The case oriented variables were (1) organisations, (2) drivers of the project, (3) project & project goals, (4) perceived risks and uncertainties and (5) overview of the process.

Discussing these variables (particular the first four) helped to determine if the findings of the case study research are applicable beyond the immediate case study (e.g. is the research externally valid?). It was found that the three case studies were similar to one another. More importantly, the case studies resembled the problems stated in the first chapter of this research.

However, the case oriented variables also described the context in which the FCP method is applied. These variables, which are independent variables, partly determined the need and applicability of actions of FCP (the within case variables). Two variables played a particular role.

- The variable of perceived risk and uncertainty determined the need for actions. In all cases, each action or activity was aimed at dealing with certain risks or uncertainties.
- The variable of project and project goal mainly determined the applicability of certain actions. In some case for example, the project scope determined the applicability of actions like aggregating demand and adjusting demand.

After the case oriented variables were discussed, attention was paid to the within case oriented variables (i.e. the actions of FCP).

Regarding the effects of actions, the three case studies generally showed that the effects of actions were similar (see sections 6.3.1 to 6.3.5). One exception is the action of aligning the procurement strategy (see section 6.3.6) that showed diverse effects.

Last, the overall effects of applying the FCP method were discussed. The focus here was to determine how, and by which actions, clients' and market parties' level of uncertainty and transaction bounded investments were influenced. It was found that client's level of uncertainty and transaction bounded investments were influenced by almost all actions. The overall effect of applying the FCP method was discussed in the paragraph 6.3.7.

One of the overall findings that the overall effects of the FCP method in practice reflect the overall effect that was expected from a theoretical point of view.

Chapter 7

CONCLUSIONS

In Chapter 2, the research was divided into several research phases that represented the main steps taken in this research. These research steps will form the main structure of this chapter.

In the first paragraph, the different research steps are summarized by summarizing the central research questions and answers of each research phase.

In the second paragraph, these research phases and the resulting findings are critically discussed.

The last paragraph provides a number of practical recommendations on the future application of the FCP method.

7.1 SUMMARY OF CONCLUSIONS

In this paragraph, the findings of the research are summarized by addressing the central research questions of each research phase (see paragraph 2.3). Last, the main research question is answered.

How can (the actions) of the FCP method be described in the context of a procurement project?

In Chapter 3, the FCP method was discussed, which is the main unit of analysis in this research. The FCP method can be divided in to three consecutive phases: an identification phase, a market engagement phase and a procurement phase. Of these phases, the market engagement phase was of most interest. It is during this phase that clients can take first action in creating the conditions necessary to support the delivery of innovative solutions(Department for Business Innovation & Skills, 2011).

An important step in the analysis of the FCP method was to identify the actions within the FCP method. Actions are actions goal oriented purposeful human acts to reach goals set. The actions defined are the most elemental aspects of the FCP method. Understanding how these actions affect perceived risks, helped determine the overall effect of FCP. The following six actions were identified.

- **Communicating;** the transferring of information of from clients to market parties.
- **Sounding;** the transferring of information (feedback) from market parties to clients, which is initiated by clients.
- **Adjusting demand;** matching clients' needs with market parties' capabilities to enable innovative solution to be developed.

- **Aggregating demand with other clients;** increasing market pull (e.g. potential future sales for market parties).
- **Facilitating networking;** stimulating cross-fertilization and cooperation.
- **Aligning the procurement strategy;** developing a procurement strategy that allows innovative solutions to be delivered.

How can the effects of (the actions) of the FCP method be described from a theoretical perspective?

In Chapter 4, the theoretical perspective was discussed. As the context of this research concerns procurement projects (i.e. transactions), agency theory and Transaction Cost Economics are applied.

Agency theory is directed at the ubiquitous agency relationship, in which one party (the principal) delegates work to another (the agent), who performs that work (Eisenhardt, 1989a). Agency Theory emphasises that clients and market parties have different (conflicting) goals and have different attitudes towards risks taking.

Agency theory is similar to Transaction Cost Economics (Eisenhardt, 1989a), although the former emphasizes that actors have different goals and risk attitudes.

Transaction Cost Economics (TCE) is also referred to as the economics of contracting. A contract concerns a relationship between principal and agent (Eisenhardt, 1989a). TCE supports two behavioural propositions, (1) bounded rationality and (2) opportunism (Williamson, 1981) which are also assumed in agency theory (Eisenhardt, 1989a). Bounded rationality implies rational decision by buyer and sellers under conditions of incomplete information (Parker & Hartley, 2003).

According to Williamson (1979, 1981), the three critical dimensions for characterizing transactions are: (1) uncertainty, (2), transaction bounded investments, and (3) frequency in which transactions recur.

Focussing on the context of a single procurement project (e.g. transaction), the aspects uncertainty and transaction bounded investments are of most interest.

- Uncertainty by definition stems from the absence of information (Edler et al., 2006) and determines actors' ability to accurately estimate outcomes. A natural response to uncertainty is information seeking behaviour. However, seeking out information is difficult or expensive.
- Transaction bounded investments are inputs that are specifically used for a single transaction and are therefore not usable to other uses without loss of value (Dorée, 1996). Cowen and Parker state that transaction cost "arise from seeking out buyers and sellers and arranging, policing and enforcing agreements or contracts in a world of imperfect information" (Cowen and Parker (1997) in Parker & Hartley (2003)).

With increasing levels of uncertainty and transaction bounded investments, transactions become less attractive. In other words, they become more risky.

As the purpose of applying the FCP method is to manage risks, applying FCP would ideally result in decreased levels of uncertainty and transaction bounded investments for both clients and market parties. However, such an ideal situation is seldom possible as risk management activities incur transaction bounded investments. Clients need to outweigh these positive and negative effects.

The next step of this research phase was to formulate proposition to reflect upon what the expected effect of the (actions of) FCP method are. This is indicated in Table 7.1.

Table 7.1: Expected effect of actions of the FCP method from theoretical perspective.

	Client's level of uncertainty	Client's transaction bounded investments	Market parties Level of uncertainty	Market parties transaction bounded investments
Communication	-	Increases	Decreases	-
Sounding	Decreases	Increases	-	Increases
Adjusting demand	Decreases	-	?	?
Aggregating demand	Decreases	Increases/decreases	Decreases	Decreases
Facilitating network	-	Increases	-	Decreases
Aligning procurement strategy	Decreases	?	?	?
Overall	Decreases	Increases/decreases	Decreases	Increases /decreases

What are the effects (of actions) of the FCP method on perceived risks in practice?

In Chapter 5 and Chapter 6, the three conducted case studies were discussed. Table 7.2 shows the perceived effects of actions. Effects indicated with an asterisk are supplementary to what was expected from theory. Effects indicated in *italic* were only perceived in one case. Last, a question mark indicates effects that were likely, but were not possible to determine in the case studies.

Table 7.2: Summation of effects of FCP as found in the three cases.

	Client's level of uncertainty	Client's transaction bounded investments	Market parties level of uncertainty	Market parties transaction bounded investments
Communication	Decreased*	Increased	Decreased	-
Sounding	Decreased	Increased	-	Increased
Adjusting demand	-	-	*Decreased (expected)*	-
Aggregating demand	Decreased	Increased*	Decreased	Decreased
Facilitating network	Decreased*	Increased	-	?
Aligning procurement strategy	Decreased	*Increased*	*Increased*	*Decreased*
Overall	Decreased	Increased	Decreased/increased	Decreased/increased

The last step included coming to an answer to the main research question.

What are the effects of the action of the Forward Commitment Procurement method on perceived risks in project concerning public procurement of innovation?

Towards the conclusion of this research, it is important to reflect upon the differences and similarities between the expected effects of FCP (based on theory) and the perceived effects (based on practice). These two perspectives are indicated in Table 7.1 and Table 7.2 respectively. Table 7.2 also indicates the differences between theory and practice.

The main conclusion from seeing this table is that the perceived effects are the same as the expected effects. Therefore, the case studies validate the effects predicted using theory. However, it should be noted that the case studies also show a number of additional effects.

By summing up these effects from theory and practice, it is possible to determine the overall effect of applying the FCP method. With two exceptions, the following overall effect of the Forward Commitment Procurement method is formulated.

> *Applying the FCP method decreases clients' and market parties' level of uncertainty, decreases market parties' level of uncertainty and increases client's transaction bounded investment.*

An exception to this general answer is the action of sounding that increases market parties' transaction bounded investments. A second exception was only perceived in one case (Erasmus MC), where aligning the procurement strategy increased market parties' level of uncertainty.

7.2 DISCUSSION OF RESEARCH AND RESULTS

In this paragraph, the different research phases and results are critically reviewed and discussed.

7.2.1 Discussion of the analysis of the FCP method

The first research phase concerned the analysis of the FCP method. One of the most essential steps taken in this phase was to identify the actions of the FCP method. The identified actions played an essential role throughout the remainder of the research.

Of the six actions identified, two caused difficulties in the remainder of the research. These actions are 'adjusting demand' and 'aligning the procurement strategy'. Although they can definitely be considered actions, it was discussed that there are several choices possible within these actions (also see sections 3.3.2 and 3.3.3). Adjusting demand can include choices in scope, requirements, etc. Aligning the procurement strategy also includes many choices like the type of procedure, selection criteria, etc. This is quite different from other actions like communication and sounding.

One consequence of having all these possible choices within an action is that it was difficult to predict the effects of those actions from a theoretical perspective (see paragraph 4.4). This problem also became visible during the case studies. In the two cases where the alignment of the procurement strategy could be studied, diverse effects were found. This diversity of effects is a direct consequence of the different choices made in developing the procurement strategy. Consequently, it was difficult to determine an overall effect of the above-mentioned actions.

For future research, it is recommended that these two actions, particular aligning the procurement strategy, are specified further. This helps to identify which aspects of the action have what effect.

7.2.2 Discussion of the theoretical approach

A key step in the development of the theoretical perspective and theoretical framework was to translate the concept of risk into the concepts of 'uncertainty' and 'transaction bounded investments'. This was an important and useful step, as these two terms provide better insight in the effects of applying the FCP method. Most importantly, by having this perspective, it was possible to uniformly analyse the actions of FCP and determine its overall effect.

What also became clear was that there is a correlation between these two terms. For most actions, clients' level of uncertainty is related to clients' transaction bounded investments (e.g. when uncertainty decreases, transaction bounded investments increases).

These two terms were operationalized as much as possible. This has led to describing the effects of actions of the FCP method in a relativistic and qualitative way (e.g. a decrease or increase). Also see the discussion about the theoretical framework in section 4.3.1.

However, two aspects made it difficult or even impossible to operationalize these concepts further and to measure them quantitatively.

First, the concept of 'uncertainty' is very difficult to measure quantitatively. It is difficult to put a price on (un)certainty). For the concept of transaction bounded investments, this is much easier to do as the concept is more easily expressed in monetary values.

Moreover, both terms are difficult to quantify as the research focuses on **perceived** risks. This makes it difficult to measure the effects of actions objectively. Furthermore, the perspective of the client is taken in this research, which means that is especially hard to quantitatively determine the effects on market parties' level of uncertainty and transaction bounded investments.

Logically, there are benefits in trying to quantify the effects of applying FCP. For one, it can help to compare the effect of actions to one another. This means that it would become possible to determine which actions are most important. Furthermore, it would also become possible to determine the overall effect of applying FCP better, especially in cases where aspect like the level of uncertainty is both increased and decreased.

Last, if it were possible to quantify effects, it would also become possible to quantitatively determine the effectiveness or efficiency of such procurement projects.

7.2.3 Discussion of the case studies

During conducting the case studies, two limitations were found that are related to the boundaries of this research and the perspective taken in this research.

As mentioned before, the perspective taken in this research is the perspective of the public agency (see paragraph 2.4). In the previous section (7.2.2), it was mentioned that taking a clients' perspective limited the possibilities to quantitatively determine the effects of FCP on market parties' level of uncertainty and transaction bounded investments.

In some cases however, it was even difficult to determine any effect of FCP on parties' level of uncertainty and transaction bounded investments qualitatively. Although criteria were developed for evaluating the effects of actions on market parties' level of uncertainty and transaction bounded investments, it has become clear that some effect were difficult to determine. For example, it was difficult to determine if market parties really benefitted from the facilitation of a network by the client.

In future research, the perspective of market parties could be investigated. This can, for instance, be done by interviewing a cross-section of market parties that are involved over the course of a project. This may reveal how market parties actually perceive the effects of actions taken by clients in project concerning PPI. Furthermore, such research might also uncover which actions are considered most important (according to market parties). In turn, this can help clients in deciding how to manage the risks perceived by market parties more effectively or efficiently.

Another limitation concerns considering the procuring public agency as a single entity, i.e. the decision maker is the public agency. However, reality is that public agencies are comprised of many individual share- and stakeholders. Decision makers are individuals or groups and usually have to deal with other stakeholders. The risks perceived in projects concerning PPI logically also differs depending on the individual at hand (in this research, this issue is addressed by interviewing multiple people and using different data sources). Moore & Antill (2001) for instance, discuss the importance of integrated project teams that bring together all relevant stakeholders in UK defence procurement. A good practice report from the European Commission moreover discusses that any new form of procurement (e.g. procurement aimed at innovation) needs to be well embedded within the organisation (European Commission, 2007).

An interesting contribution to this research is therefore to investigate how risks are perceived by the individual stakeholders in the public agency, and how the effects of FCP influence the decision making process of decision makers within the organization.

7.2.4 Overall discussion

This research has led to indicating the effects of the FCP method on perceived risks in projects concerning PPI. The effects have been indicated in terms of uncertainty and transaction bounded investments. Doing so, it this research has achieved its goals as described in paragraph 1.4.

There is one aspect that did not get specific attention in this research, but is important for procuring agencies to consider.

Although this research showed what the effects of actions of FCP are, it did not show how to apply FCP (i.e. how can actions be taken?). There are in fact, many different methods available for taking these actions. This has been included in this thesis in the sense that it is mentioned that different methods for actions were applied. The narrative descriptions of the case studies provide information on different methods and these were also mentioned during the analysis of individual actions. A good example is the action sounding. This action was taken in each case, and was done via multiple means in each case. Sounding was done via a written response form (a questionnaire) but also during market meeting/consultations days. Although the effects were similar, it is fair to assume that the extent of the effect will differ.

Furthermore, it can also be argued that not all methods are as useful for in each situation. The practical guide from the Department for Business, Innovations and Skills (2011) for instance, states that although the written market sounding can provide a wealth of valuable information, it is often not comprehensive.

Another interesting suggestion for future research therefore is to investigate when and how specific methods are appropriate to apply in early market engagement. Such information would be very welcome to practitioners. Relating to the previous suggestion for further research, the use of different methods can be measured both qualitatively and quantitatively.

Results of research

The effects of applying the FCP method have been discussed in paragraph 7.1. There, it is shown that applying FCP can indeed positively affect perceived risks in projects concerning Public Procurement of Innovation. Three general effects of applying the FCP method lead to a situation with less or lower risks. During the case study interviews, public agencies acknowledged this. The public agencies stated that without the market engagement phase, the risks involved with procuring something innovative would likely been too great to proceed towards a tender procedure. In this sense, applying the FCP method seems a precondition for successfully procuring an innovative solution.

However, this case study research also found that almost any action of the FCP method results in increased transaction bounded investments on part of the client. This, of course, is a negative consequence of applying the FCP method. The public agencies also acknowledged that applying the FCP method requires additional investments.

Consequently, the FCP method reflects a typical management process. According to Chapman & Ward (2003), all risk management processes consume valuable resources and can themselves constitute a risk to the project that must be effectively managed.

Because the goal of this research was ultimate to improve the future application of the FCP method, a number of practical recommendations have been proposed.

7.3 PRACTICAL RECOMMENDATIONS

The recommendations in this paragraph are aimed at improving the effectives or efficiency of applying FCP. The recommendations are based on the findings of this research.

Consider formal arrangements in aggregating demand (e.g. cooperative purchasing).
Nearly all actions that were perceived in the case studies resulted in an increase in clients' transaction bounded investments. By itself, this is not strange as taking any action usually incurs cost. From a theoretical perspective however, one action was identified that also has the potential of decreasing clients' transaction bounded investments. This action is aggregating demand. It was discussed in paragraph 3.3.2 that one potential benefit of horizontal cooperative purchasing is that cost can be shared among procuring agencies.

However, this approach has a number of consequences. First, horizontal cooperative purchasing also requires additional investments (e.g., coordination cost). Such costs were not really experienced in any of the case studies as aggregating demand only included 'signposting' a future demand.

Furthermore, horizontal cooperative purchasing is not always a possibility given the project at hand. Some researcher even suggests that cooperative purchasing can hinder innovation (see Laing & Cotton , 1997).

Still, the potential gains of formalizing aggregation of demand can be significant. It is important to consider possibilities for this in the initial phases of the project, when the project is chosen and defined.

Consider project choice.
In paragraph 3.3.1, it was discussed that the project choice is not really a choice, but the result of genuine need. A very important question at this moment is whether the FCP method should be applied. This decision can have serious consequences for the possible effectiveness and efficiency of the FCP method. Based on the findings of this research, clients should consider the following aspects after they have identified a need that requires innovations to be satisfied.

- Given this identified need, what are the (expected) risks in the procurement project? Clients should also determine if these risks are acceptable or not.
- Given the project and the (expected) risks, what are the opportunities for managing these risks? For instance, in some project there will be limited opportunities for actions like aggregating demand. Furthermore, clients should try to estimate the additional investments required for management risk (i.e. taking required actions).

- Given the above, is it likely that the project will result in an outcome that justifies the additional investments in applying the FCP method?

Although making such an assessment is very difficult during the early stages of a project life cycle, it is a very important aspect to consider.

This research particularly focussed on the second bullet. In this case study research, it was not possible to determine the efficiency of the FCP method, mainly because the outcomes of the case studies have not yet been build in real life (projects are still on-going). Further research on this matter is therefore strongly recommended.

Combining activities for higher effectiveness and efficiency.

Although actions were investigated individually, they often occurred simultaneously. Actually, the cases demonstrate benefits of taking multiple actions within specific activities.

One benefit of combining actions in single events is that more efficient use can be made of required time and effort.

By combining multiple actions in single events, the effectiveness of actions can also be improved. One aspect is that combining activities can compensate possible negative effects. For instance, market parties will feel reluctant to provide information (it requires time and effort). However, such cost may be compensated if their costs are compensated by the provision of information (combining communication and sounding). Another benefit is illustrated by the market meeting days or consultation workshops. Here, cross-sections of market parties wer present as these days provide useful information for market parties. And because these market parties were all present, clients would likely have gotten better feedback from market parties would have been more successful in stimulating cross-fertilization.

Chapter 8

REFLECTION

In the last part of this thesis, it is appropriate to reflect on the research. Therefore, this chapter discusses the relevance and quality of the research.

8.1 RELEVANCE OF RESEARCH

In paragraphs 1.4 and 1.5 the research goal and relevance of research were already mentioned. It is useful to reflect on these paragraphs to discuss the (practical) contributions of this research.

As stated by the research goal, this research set out to indicate the effect of (actions of) the FCP method on perceived risks in projects concerning Public Procurement of Innovation. It has achieved this goal by indicating the effects of each action, and the FCP method in general in terms of level of uncertainty and transaction bounded investments.

Although some limitations have been discussed in paragraph 7.2, this research does indicate important trade-offs that clients have to make applying the FCP method to manage perceived risks in projects concerning PPI. Having these insights is a first, but essential step in improving decision making.

This research has furthermore led to formulating several practical recommendations about the further application of FCP. These recommendations are based on the findings of the case study research and are aimed to improve the effectiveness and efficiency of applying FCP.

In paragraphs 1.5, it was also mentioned that the current body of knowledge on how Public Procurement of Innovation can work in practice is limited. Edler et al. (2006) state that efforts need to be based on better understanding how public procurement actually can and should work – in a very practical sense – to contribute to more innovative activity in industry and to the growth or even creation of markets for innovative products and services.

This research has shown that applying a method like the FCP method can indeed contribute to successful Public Procurement of Innovation. The studies, including the case study descriptions, furthermore give an practical insight in how PPI can work in practice.

8.2 QUALITY OF RESEARCH

The most important quality criteria for assessing the quality of research are controllability, validity and reliability (van Aken et al., 2007) Of these criteria, controllability is mentioned by Van Aken et al. (2007) as a precondition for the validity and reliability of the research. This criterion is therefore discussed first.

8.2.1 Controllability

To make a research controllable, researchers have to discuss how they came to their conclusions.

The controllability of this research has been discussed several times in this thesis. First, Chapter 2 discussed the methodology applied and elaborated on the research phases and steps. Furthermore, paragraph 5.1 discussed the case study protocol used in the data collection, the sort of questions that were asked, the conditions in which the data was collected, and the criteria for assessing the data. Last, used data sources have been discussed and these sources are mentioned in the appendix.

8.2.2 Validity

Yin (2009) and Van Aken et al. (2007) mention three criteria that are commonly used for judging the validity of research. These are (1) construct validity, (2) internal validity, and (3) external validity.

Construct validity concerns whether or not the research measures that what it intended to measure. In this research, the concept to measure was 'effects of (actions of the) FCP method on perceived risks'. Yin (2009), states that it is important to establish a chain of evidence. This means that external observers (or readers) are able to follow the derivation of any evidence from initial research question to ultimate case study conclusions (also see previous section on controllability). One critical step in this chain was to apply Transaction Cost Economics and translate the term risk, into uncertainty and transaction bounded investments. This theoretical perspective was applied because Transaction Cost Economics is suited for describing both the problem context (a procurement project with clients and market parties perceiving risks) and actors' behaviour in such a context.

Internal validity concerns whether the conclusions made about causal relationships in the research are correct. The issue of internal validity has been addressed by the use of analytical techniques. The most important technique applied is that of 'pattern matching'. In Chapter 4, propositions were formulated on the likelihood of actions occurring in practice (explaining the relationship between action and context) and the expected effect of actions when they would occur. The perceived effects have been matched with expected patterns. Differences have been discussed by addressing rival explanation, which is another way of addressing the matter of internal validity.

The last criterion concerning validity concerns the external validity. External validity deals with the problem of knowing whether a study's findings are applicable beyond the immediate case study (Yin, 2009). The external validity was increased by conducting multiple case studies. To further improve the external validity, it has been checked if the cases studies reflect the initial problems as discussed in the first chapter. This was particularly done during the cross-case analysis, which is discussed in Chapter 7. Indeed, the cases resembled the initial problem statement and therefore strengthens the argument for stating that this research externally valid.

Still, more case studies would be a welcome addition to the current body of knowledge. Conclusions may especially be strengthened by selecting cases with a range of different contextual variables like organization type, experience, level of risk aversion, project types, etc.

8.2.3 Reliability

The results of a study are reliable when they are independent of the particular characteristics of that study and can therefore be replicated in other studies (Yin 1994; Swanborn 1996 in Van Aken et al. (2007)). The use of a case study protocol and case study database are the foremost tactics that improved the reliability of the research (Yin, 2009). This has already been mentioned in discussing the controllability of this research.

Yin (2009) states that the goal of reliability is to minimize the errors and biases in a study. The four sources of bias are: the researcher, instruments, respondents, and the situation (van Aken et al., 2007).

The researcher as a source of bias often refers to a possible tendency of researchers to confirm their preconceived notions (Flyvbjerg, 2006). Flyvbjerg (2006) discusses that due to the close proximity to reality, which case studies entail, researcher are actually more inclined to disconfirm preconceived notions that to confirm them.

The second source of bias is the instrument. The results of a research are more reliable if they come forth independently of the instruments used. In this research, multiple instruments were used (documentation, interviews, observations) which is also referred to as triangulation.

Results of the research are also more reliable if they come forth independently from the respondents (the third source of bias) used in the research. The issue of bias of respondents during interviews was already partially discussed in the cases study approach (section 5.1.3) including measures of limiting this bias. Within each case, this form of bias was furthermore addressed by interviewing multiple respondents. Moreover, the fact that multiple case studies were included also decreases possible bias from respondents.

The last source of bias is the situation in which the research is taken. One issue in this research is that some of the case studies are still on-going projects while one project was already finished. Although there were good reasons for making this choice (see case selection on page 20), having these differences between cases is a potential source of bias. For instance, respondents would need to discuss the project as it was going on, or from retrospect. This form of bias was dealt by the using multiple data sources (for instance, the project documentation was similar in all cases). Another aspect in relation to the situation are the case study interviews. Due to geographical constraints, some interviews were done face-to-face and some by telephone. Other conditions were kept constant as much as possible. For instance, all interviews were conducted privately to ensure the respondents were not influenced by external factors like other colleagues.

8.2.4 Conclusion

Above, the three main criteria (i.e. controllability, validity and reliability) for assessing the quality of the research have been discussed. These criteria have been addressed through the entire thesis project. It is the researcher's opinion that this research has met the quality criteria for conducting research.

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APPENDIX: DATA SOURCES

In this appendix, the most important data sources used in the case investigations are listed. Although many are publically available via the internet, some are confidential.

DOCUMENTATION

General documentation on the entire project

- Case overviews and updates (see: LCB-Healthcare website[16])
- General presentations on cases (presented at LCB-Healthcare meetings or other events)

Documents per case

Case specific documentation included several different documents. The table below provides an overview of the different document types in each case.

	Rotherham	Erasmus MC	Nottingham
Project outline (schedule, planned activities)	Yes	Yes (internal)	Yes
Risk assessment/register	Yes	No	Yes
Communication plan	Yes	N/A	N/A
Market sounding prospectus	Yes	Yes	Yes
Feedback report after market sounding	Yes (confidential)	N/A (internally discussed)	Yes (confidential)
Presentations done during market meeting days.	Yes	Yes	Yes
Market meeting day report	Yes; same document as feedback report (confidential)	Yes	N/A
Procurement Strategy	Yes	N/A	N/A
Tender documents (call for tenders, briefings)	Yes	Yes	N/A

[16] http://lowcarbon-healthcare.eu/

INTERVIEWS

As mention interviews were done both formally and informally. Formal, semi-strutucture interviews were held with internal project members. Informal interviews were held with involved external consultants. All persons interviewed are listed below.

Rotherham NHS Foundation Trust

Internal project member(s)
- Steph Holmes — Head of Procurement

External project member
- Gaynor Whyles — [Jera Consulting]

Erasmus Medical Centre

Internal project member(s)
- Jeroen Veenendaal — Manager Strategic Procurement
- Jan van Velzen — Unit head of estates & technical services division
- Frank Raeymakers — Manager healthcare services

External project member
- Joram Nauta — [TNO]

Nottingham University Hospitals NHS Trust

Intenal project member(s)
- Andrew Camina — Assistant Head of Estates Operations
- Alberto Jaume — Environmental Services & Sustainable Development Manager

External project member
- Gaynor Whyles — [Jera Consulting]

OBSERVATIONS

Besides documentation and interviews, the researcher was also able to participate in one of the cases, namely that of Erasmus MC.

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