



EMPIRICAL RESEARCH

# The public procurement of information systems: dialectics in requirements specification

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## Abstract

When acquiring information systems, public entities face a dilemma. On the one hand, they want to procure the system that best suits their needs, which often requires lengthy dialogues with vendors. At the same time, they are restricted by government regulations that mandate limited dialogue in the interests of transparency and equal opportunities for all vendors. To examine how public entities deal with this, we followed three procurement projects in Norway. We show that this dilemma manifests itself as a dialectic between the thesis of getting the system requirements right and the antithesis of strictly adhering to regulations. Public entities search for a resolution of this dialectic through two syntheses: selecting an appropriate tendering procedure, and learning how to specify requirements through networks of peer public entities. Our findings reveal that the syntheses are possible because the dialectic is actually complimentary, both the thesis and the antithesis are needed to create the joint outcome that satisfies both. The resolution of the dialectic unfolds differently over time. Our study contributes to the relatively neglected stream of IS research on dialectics that explicitly searches for a synthesis while revealing the complementarity of the dialectic. We show how time plays a nuanced role in the resolution of the dialectic situation.

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## Introduction

The public procurement of Information Systems (IS) can be a highly complex process. One of the biggest challenges faced by procurement entities relates to requirements specification. The procuring entities, which include public organizations such as municipalities and government agencies or their constituent units, have to adhere to strict regulations enacted by policy-making bodies such as the European Union (EU). These regulations require a transparent process, with equal opportunities for all vendors.

As a consequence, procuring entities face the difficult task of specifying precise requirements. They find this challenging, because rigid regulations do not allow revisions to be made to requirements that are often incomplete (Ovaska *et al*, 2005). Public procurement includes the formulation of business requirements, the development of requirements specifications, and the purchase (which may include tendering and contract signing), receipt and inspection of products (Moe, 2014). Developing accurate requirements specifications is difficult when: (a) a system is complex or

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unique, and (b) when the procuring entity does not have adequate knowledge of the system. There is no clear definition of the term “uniqueness of systems” in the IS literature. However, systems can be more or less unique when seen in the context where it is used and the tasks it is meant to support. “The uniqueness comes from every task domain being embedded in a larger context, and it is not possible to anticipate every user’s concerns and goals in every context” (Germonprez *et al*, 2007, p. 354). Systems “will be used to address problems and goals unique to each user” (p. 354). We do not define uniqueness in an absolute sense but as a continuum between being the only one (i.e. totally unique) and being relatively common. The uniqueness of a system depends on whether there are few installations or whether new versions have unique features.

Complex Information Systems are described as those “large organizational systems that integrate and streamline business processes across various functional departments/areas” (Hsieh & Wang, 2007, p. 216). A prime example is ERP systems. Acquiring such systems is a complex project in itself, with increasing organizational complexity or an increasing number of interdependent organizational units (Baccarini, 1996). Procuring entities often lack internal competencies in evaluating alternative systems, which further complicates the process of identifying requirements. There is often a knowledge asymmetry between a procuring entity and vendors on different issues, including information system requirements (Sawyer, 2001).

Our study is aimed at gaining a better understanding of how a public entity navigates through the maze of regulations and procedures in its quest to procure a system that best meets its requirements. Our research question is:

“How does a public procuring entity procure the Information System best suited to its requirements and simultaneously follow the regulations?”

To answer this question, we studied three cases that differed in terms of the type of system procured and the procurement procedure applied. The cases are from three different entities in two Norwegian municipalities but all were subject to EU regulations. When we cast an interpretive gaze at our research question, it can be reframed as a dialectic between the following thesis and antithesis:

**Thesis** *Obtaining the system that best meets a public entity’s complex information requirements, irrespective of any constraints.*

**Antithesis** *Abiding by the principles of EU regulations on public procurement (i.e. openness and transparency, and equal opportunities for all vendors)*

Obtaining the system that best meets complex requirements usually requires some degree of dialogue between the procuring entity and the vendors throughout the process. The antithesis essentially limits this. The thesis, on the other hand, tends to encourage such dialogue.

This reframing of our research question enabled us to address an area of the IS research on dialectics that has received relatively little attention in the literature. The steadily growing body of IS research that has employed the dialectics lens (e.g. Nordheim & Nilsen, 2008; Nordheim & Päiväranta, 2006; Sabherwal & Newman, 2003) primarily focus on understanding and explaining the conflicts that underlie processes such as systems development, organizational change and system implementation. While these studies have revealed how conflicts are eventually resolved (or not resolved), few studies (e.g. De Luca *et al*, 2008) have specifically focused on the explicit search for a synthesis. We address this knowledge gap by focusing on the creation of the synthesis by casting the antithesis not as a negation of the thesis, but rather as complementary to it. In other words, both sides of the dialectic are needed for creating a joint satisfactory outcome (c.f. Carlo *et al*, 2012; De Luca *et al*, 2008).

The rest of the paper is structured as follows: the next section explains public procurement and the main procedures in the EU. Although not a member of EU, Norway has to follow these regulations because it belongs to the European Economic Area or EEA, which is governed by EU regulations. We then present dialectics, followed by a description of our research method and the presentation of our cases and analyses. We then present our findings and discuss them. Next, we discuss the implications of our study, highlighting our contribution to the literature and we end the paper by offering implications for both research and practice.

## Public procurement

Procurement can be categorized into two broad forms: “partnership sourcing” and “adversarial competition” (Parker & Hartley, 1997). Partnership sourcing implies outsourcing (e.g. systems development work on a more or less regular basis to the same vendor). Adversarial competition implies rivalry between two or more vendors for a contract. This is done through a tendering process, which can be defined as making an offer, bid or proposal, or expressing interest in response to an invitation or request for tender. The focus of our paper is on adversarial competition, because public procurement generally requires open competition.

Public entities in many parts of the world are subject to strict regulations on procurement. At the time when we conducted our studies, two public procurement directives were in effect in the EU and EEA (EU, 2004a, b). Since we conducted our case analysis, the EU has promulgated two new directives (EU, 2004a, b). These will govern public procurement from 2016 onwards, and we will discuss the consequences of this change later in the paper.

Underlying the regulations are the principles of transparency and non-discriminatory competition (EU, 2004a, b; Cox, 1994). In the EU member countries, all public procurements above a threshold level have to be

announced through the EU's Tender Electronic Database. This makes the call visible worldwide, and vendors are given the same opportunities, irrespective of location. Some countries have additional national threshold levels beyond which a call has to be announced on the national tendering database. For example, the threshold in Norway, as of spring 2016, is NOK 500,000 (approximately €58,000). All procurements that are expected to be above this threshold have to be announced on the national tendering portal, DOFFIN. The legal regulations lead to a more complex procurement process in the public sector. We next elaborate the main procedures used under the EU regulations.

### Procurement procedures under the EU regulations

At the time we conducted our studies, EU regulations allowed four tendering procedures: *open tendering*, *restricted tendering*, *tendering with negotiations*, and *competitive dialogue*. The first two prevent any form of dialogue with the vendors, while the third allows for negotiations and the fourth allows for dialogue. The simplest procedure is **open tendering** (Figure 1), where all vendors can compete based on a tender announcement and a "frozen" requirements specification. Vendors can be excluded on the grounds of certification, financial stability and technical ability, if these are stated explicitly in the tender announcement. After selection, the process is basically the same for all the procedures. Hence, the final two phases (implementation and completion) are not shown in Figures 2, 3 and 4.

In **restricted tendering** (Figure 2), vendors are invited to submit documentation as part of the pre-qualification process. The procuring entity can specify a maximum number of vendors allowed to compete, as well as the selection criteria it will apply. The minimum number is five. A requirements specification may be developed in parallel with the pre-qualification of vendors.

The next two procedures allow varying degrees of dialogue to take place between the procuring entity and the bidding vendors. As with restricted tendering, **tendering with negotiations** (Figure 3) includes a pre-qualification stage. After the tendering phase, the

procuring entity can run negotiations on all aspects of an offer, including technical features, price and contract issues. This procedure is only allowed when the technical specifications cannot be established with sufficient precision. If there are three or more qualified candidate vendors, at least three must be invited to participate. Negotiations may be carried out in stages, and the number of vendors participating may be reduced through this process.

In **competitive dialogue** (Figure 4), the procurement entity can carry out a dialogue with the vendors that pre-qualify, before finalizing the award criteria and getting the offers from these vendors. This is only permitted for particularly complex contracts in markets with technical, legal or financial complexity. Legal or financial complexity often arises in connection with public-private partnerships. Technical complexity involves situations where a contracting authority may not be able to determine which of several possible solutions would best satisfy its needs (EU, 2005). At least three vendors must be invited. Unlike tendering with negotiations, this procedure does not allow negotiation to take place after offers have been submitted; however, the vendor that has submitted the Most Economically Advantageous Tender (MEAT), from the point of view of the procuring entity, may be asked to clarify aspects of the offer. The MEAT approach allows the procuring entity to decide the relative weighting of quality and price (or cost), technical merit, aesthetic and functional characteristics, environmental characteristics, running costs, cost effectiveness, after-sales service and technical assistance, delivery date and delivery period, or period of completion (EU, 2004b). The dialogue may run over several meetings with the vendors, and serves as input to the requirements specification. The number of vendors may be reduced through successive stages.

### Summarizing the public procurement procedures

Table 1 compares the four public procurement procedures.

Open tendering is the most common procedure: in the period 2006 to 2010, about 73% of all tender notices in the EU used open tendering. Restricted tendering was applied in approximately 9% of the tender notices, and

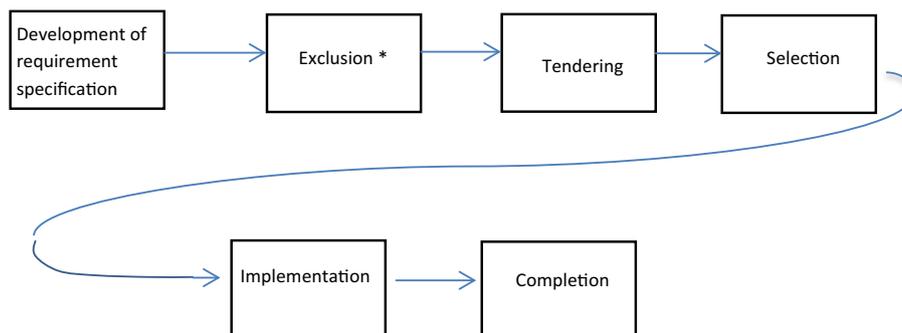


Figure 1 Overview of phases in open tendering. The exclusion phase is optional (\*).

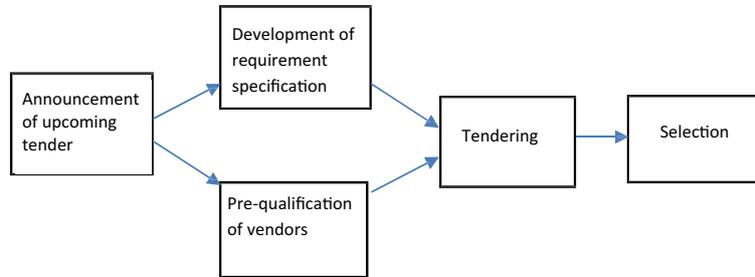


Figure 2 Overview of phases in restricted tendering.

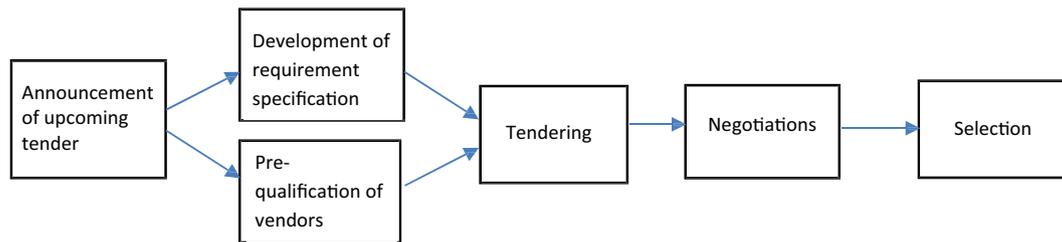


Figure 3 Overview of phases in tendering with negotiations.

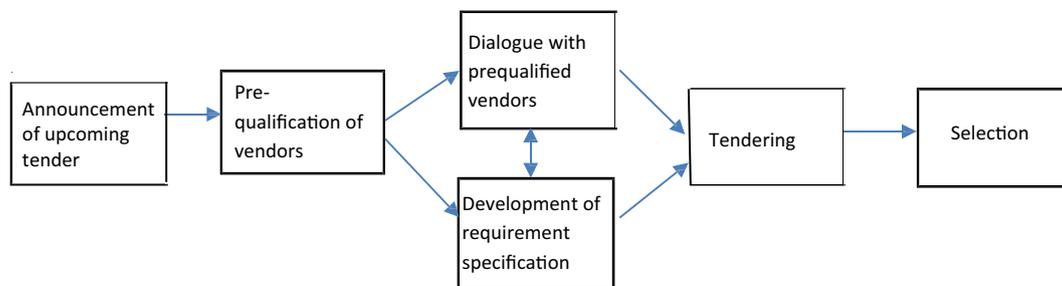


Figure 4 Overview of phases in competitive dialogue.

tendering with negotiations was used in nearly 16% of the tender notices. In 2010, competitive dialogue made up only 0.4% of tender notices, but accounted for 8.6% of the monetary value (Strand *et al*, 2011). The first three procedures (i.e. open tendering, restricted tendering and tendering with negotiations) have been in operation since 1988. Competitive dialogue was established in 2004 as an alternative to tendering with negotiations, with the aim of making public-private partnership easier (Barlow *et al*, 2010).

In all the procedures, vendors must be given sufficient time to prepare their offers and must be granted equal access to information. Procuring entities have to keep written documentation of the process in order that competing vendors can gain access to the appropriate records after the procuring entity has chosen a vendor.

In summary, we can see that the regulations in a complex procurement process produce a dialectic between the goal of obtaining the system that best matches the requirements specification and the goal of abiding by the regulations.

## Dialectics

Dialectic and dialectical thinking have their origins in ancient Greece as a discourse between two or more people holding different points of view about a subject, and who want to establish the truth about a matter through reasoned arguments. The differing views may come from differing commitments within one group (procurement personnel in our case) or between different stakeholder groups with contradictory goals.

Dialectic is a means of understanding contradictions that pull in opposite directions. In the Hegelian understanding, dialectical thinking implies a specific search for contradictions (Mathiassen & Nielsen, 1989; Cho *et al*, 2007) in the form of a thesis and antithesis. A thesis consists of multiple assumptions. An antithesis contains assumptions that oppose one or more of the assumptions constituting the thesis. Figure 5 depicts the Hegelian understanding of the dialectic process:

As we can see in Figure 5, the dialectical process can result in three different outcomes: (1) a synthesis, which is a compromise between the thesis and antithesis (e.g.

Table 1 Comparison of the public procurement procedures

Issue/procedure	Exclusion possible	Pre-qualification	Dialogue during requirements spec.	Negotiations after finalizing req. spec.
Open tendering	✓	–	–	–
Restricted tendering	–	✓	–	–
Tendering with negotiations	–	✓	–	✓
Competitive dialogue	–	✓	✓	–

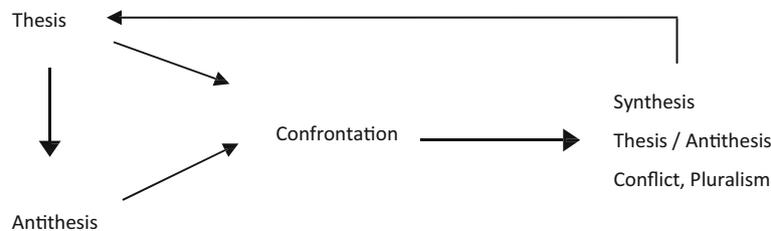


Figure 5 Dialectical process (adapted from Van de Ven &amp; Poole, 1995).

Nordheim & Päiväranta, 2006), (2) the thesis or antithesis prevails (e.g. Nordheim, 2009), or (3) no resolution, where the thesis and antithesis remain in a state of pluralism or conflict (e.g. Sabherwal & Grover, 2010). A synthesis may in turn lead to a contradicting antithesis, which may set off another dialectical process.

Significantly, time can also play a role in reducing conflicts and changing the dialectical situation (Sabherwal & Grover, 2010). Cyert & March (1963) coined the phrase “sequential attention to goals” to show how attention to political goals may shift over time in response to the perception of problems. Thus, inconsistent or conflicting goals, and consequently the dialectic, may be resolved differently at different points in time or not at all. In our cases, as we shall see later, time was a key factor in the formulation of the syntheses that emerged in the procurement process.

There is a steady stream of IS research that has used dialectics primarily to understand conflicts that underlie change processes and the associated political undertones (Sabherwal & Grover, 2010). Examples include the change processes in IS development (Bjerknes, 1991; Markus, 1983; Sabherwal & Newman, 2003), the development and implementation of enterprise content management systems (Nordheim & Päiväranta, 2006), software selection (Howcroft & Light, 2006) and the implementation of Enterprise Systems (Robey *et al.*, 2002; Soh *et al.*, 2003; Nordheim & Nielsen, 2008). In the context of packaged software procurement, dialectics can reveal conflicts (Howcroft & Light, 2002), and how power is employed by technical consultants (Howcroft & Light, 2006). Finally, dialectics has also been applied to understand contradictions in the public procurement of information systems (Moe & Sein, 2014).

As we can see from this brief review of IS literature that has used dialectics, the predominant focus has been on contradictions, conflicts and change processes. This is in

keeping with the Hegelian understanding of dialectics. Dialectics have sometimes been resolved, and often a synthesis (or multiple syntheses) has resulted. For example, in a longitudinal study of three large organizations using complex IS projects, Sabherwal & Newman (2003) focused on why the current arrangements in information systems persisted and when and why they changed. They found that change might not occur immediately, but linger in the background and emerge later and “quickly become important” (p. 90). This suggests that researchers should be aware of the importance of time and the sequencing of events. We will return to this theme in the discussion section.

However, the aim of these studies was not to search for synthesis. In applying dialectics to understand conflicts in IS (e.g. Sabherwal & Grover, 2010), researchers have taken the contradictory perspectives embodied in Hegelian dialectics. One notable exception, to this perspective although not explicitly stated as such, is Deluca *et al.*, (2008) where the explicitly stated aim was to resolve the debates about research methods in IS through a synthesis. They took the stance that the two sides of the dialectics in such debates need not be contradictory: they can be complementary. Their actual expression was that they are “the yin and the yang” (p. 52), implying a duality. This was also the position of Carlo *et al.*, (2012) in their study of the design of a building. Through a dialectic analysis, the authors showed that contradictory appropriations of IT were actually needed to come to a synthesis that was instrumental in resolving design conflicts (the evidence of the resolution is of course that the building was completed and stands today as an exemplar of iconic design).

Such studies that focus on the search for synthesis are rare in the IS literature. Our study aims to add to this small body of research. In doing so, we depart from the

Hegelian understanding of dialectics to complementarity perspectives which is in accordance with a Maoist/Confucian understanding of dialectics (Brincat & Ling, 2014). Daoist dialectics focus on the “complementarities that bind” rather than the “contradictions that repel”. As Brincat & Ling (2014) point out that while this thinking is consistent with Daoist and/or Confucian principles, it is not necessarily dialectical in the Hegelian sense. Our stance though is that the goal of explicitly searching for a synthesis is better achieved through a dialectics of complementarity. This is in line with Carlo *et al* (2012) discussed above. One criticism of a Daoist/Confucian understanding of dialectics is that it is static (Brincat & Ling, 2014). However, bringing in the role of time that shows the changing in the dialectic situation encapsulates the dynamic nature of the Hegelian understanding. Thus, our perspective itself is a synthesis of the two forms. Complementariness requires that both the thesis and antithesis must coexist. To make this explicit, we relabel the domination or the prevailing of thesis/antithesis as thesis/antithesis being in the foreground (with the other in the background). We will use this vocabulary in analysing the cases and in our discussion later in the paper. We redraw Figure 5 to emphasize our perspective and capture the discussion in this section (Figure 6).

**Method**

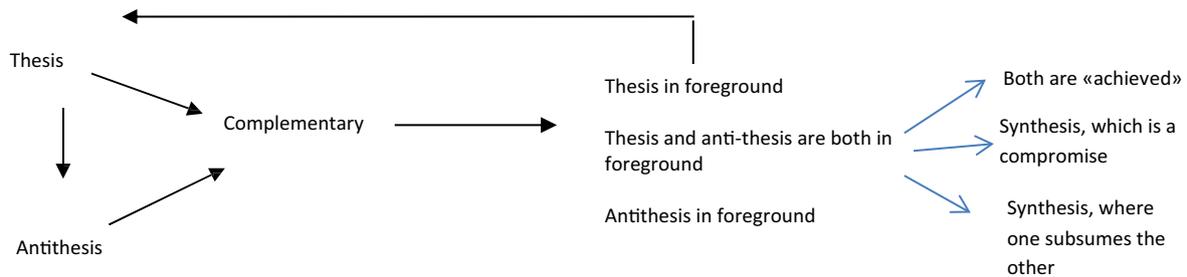
We used a qualitative research approach which is suitable to study complex research problems that cannot be explored in isolation from their human and social context (Creswell, 2013). It is the preferred method for an in-depth exploration of a complex phenomenon such as software procurement where the boundaries between the phenomenon and its context are not always clear (Yin, 2014).

Case study is a commonly used research method in qualitative research approaches (Stake, 1995) as it facilitates the investigation of a contemporary phenomenon (e.g. a programme, an event, individuals, actions) within its social context, in its natural setting (Eisenhardt, 1989; Yin, 2014). It employs multiple methods of data collection to gather information from one or a few entities (people, group, or organizations) (Benbasat *et al*, 1987,

p.370). Single or multiple case studies can be used depending on the requirements of the research problem (Stake, 1995; Yin, 2014). A single case study is suitable for a revelatory/extreme/unique case (Eisenhardt & Graebner, 2007; Yin, 2014) and is appropriate in the situation where very little theoretical insight is available into the phenomenon under study (Dyer & Wilkins, 1991). In contrast, a multiple case study approach supports the comparison between different cases for theory building, testing and generalization (Eisenhardt, 1989).

We used this latter approach and collected data from three different public procurement projects in municipalities in Norway. Although our selection was based on what cases were accessible to us, Norway is a good setting as it has to follow the EU regulations on public procurement. Thus, the findings may also be applicable to other public entities within the EU. Because of the exploratory nature of the research, we used an interpretive approach, applying dialectics as the sense-making device to understand these cases and capture the “world views” of the subjects as well as the issues at play within a specific project’s context (Walsham, 2006). In these projects, three of the four tendering procedures discussed here were used (restricted tendering was not used). We followed the projects from just after the announcement of the tender (open tendering) and upcoming tendering (the other two procedures) through to implementation and completion. We selected the cases from those listed on DOFFIN (the Norwegian national portal for public tenders). In all three cases, we were able to attend internal project group meetings, in which the requirement specifications were prepared and offers were examined, as well as meetings with vendors. We attended 25 such meetings, took notes and digitally recorded the proceedings. However, microphone problems in six of the meetings rendered parts of the recordings inaudible; hence, in those settings a full transcription of the meetings was not possible. Nevertheless, the usable parts of the recordings supported the notes taken at the same meetings.

We interviewed project leaders, members of the project groups and the winning vendors. In two of the cases, we also interviewed the losing vendors. In all three cases, we interviewed the project manager at least twice with one interview conducted a year after implementation in order



**Figure 6** Reformulated dialectical process where thesis and antithesis are complementary.

to get the full story beyond the implementation. We learnt through these interviews that there were problems in one of the cases (case 1) a year after implementation. We selected the interviewees carefully to include all significant members of the project groups, major stakeholders outside the project group (i.e. winning vendors and, in two of the cases, the losing vendor), and four members of the reference group for one of the projects, based on “snowballing”. In total, we interviewed 24 persons and conducted 31 interviews (See Appendix A for details). We applied some of the best practices in conducting qualitative interviews as part of our interpretive research approach (Myers & Newman, 2007). For example, we were able to enter the three public organizations at a high level, two of them through the CIO, whom one of the authors knew well, and the third after contacting the project manager. Consequently, we were able to gain access to staff and vendors at various levels at the organizations. We conducted eleven interviews over Skype; the others took place at the subjects’ premises. All interviewees were allowed to read the transcripts and correct or delete parts they felt were incorrect or did not wish to disclose. All agreed to follow-up interviews, if needed, for clarification purposes and further data collection. In addition, we had access to internal documents in all three cases and to e-mail correspondence with vendors in one of the cases (See Appendix B for details).

Our analysis is based on the textual material detailed above. By carefully reading and re-reading the interview transcripts, the transcripts and notes from meetings, and other material obtained, we were able to interpret the responses and construct faithful descriptions of the process of systems procurement in all three cases. We did not try to force the evidence into a single story line, but instead maintained several stories, including dissenting voices. We carefully selected several verbatim quotations (translated from Norwegian) in the findings to give readers an insight into the processes. Appendix C shows an audit trail illustrating how the responses were interpreted, and how dissenting voices were represented in case 1 and 2.

### Case narratives and analyses

The first and third cases took place in one of the ten largest municipalities in Norway. The second case was in a medium-sized municipality. Table 2 gives an overview of the cases using relevant information on the type of procedure employed, the duration of the project and resources used. We present them in detail in the following subsections.

#### Case 1: Procurement of a claims system: open tendering

**Background** The new system was intended to collect claims from citizens who had not paid for items such as public housing, children care and real estate tax. The

municipality’s legacy system was more than 10 years old and was owned by the claims department. Until 2006, the municipality used a budget and accounting system bought from the vendor who supplied the old claims system. At this point, the municipality replaced this budget and accounting system with an ERP system from a different vendor.

At the start of 2012, the vendor of the old claims system decided to bundle claims with their ERP system. Consequently, they terminated contracts with all claims system users who did not use their ERP system; hence, the municipality needed to procure a new claims system. The timeline of the process is shown in Figure 7.

The claims manager initiated the procurement project in February 2012. She led the project group, which consisted of a super user from the claims department, a super user for the ERP system and the IT technician who was responsible for ERP system operations. A super user is a user assigned the role of expert in his/her functional area, and who trains and assists other users (Karuppan & Karuppan, 2008). The group also included a procurement manager who also acted as a consultant to the group but this was a new position for him.

**The procurement process** The project group **developed the requirements specification** between February and May 2013 by first borrowing requirements specifications from two municipalities, one of a similar size and the other somewhat larger. “*It was a huge advantage for us to have a starting point, for there are an enormous number of details*” (claims manager, 14.05.13). While the two municipalities differed in terms of how they organized the claims process, the project group was still able to tailor the specifications to meet their needs. Their concern in this phase was to get the requirements right, they did not give any particular focus to the regulations. One important new feature in the system requirements was that it should integrate with their ERP system.

The call for **tender** was announced on DOFFIN in May, with a deadline for offers in June. The project group decided to run the procedure of open tendering and announced criteria to exclude vendors who were considered to be vulnerable. From then on, the concern of following the regulations was paramount for the project team. The criterion of vulnerability was included after the procurement manager learnt about the importance of this from another procurement manager at a training course (procurement manager, 01.07.14). Accordingly, vendors had to file documentation on revenue and tax issues, internal organization and overview of staff, and attach the CVs of key people for this system. The municipality received two offers.

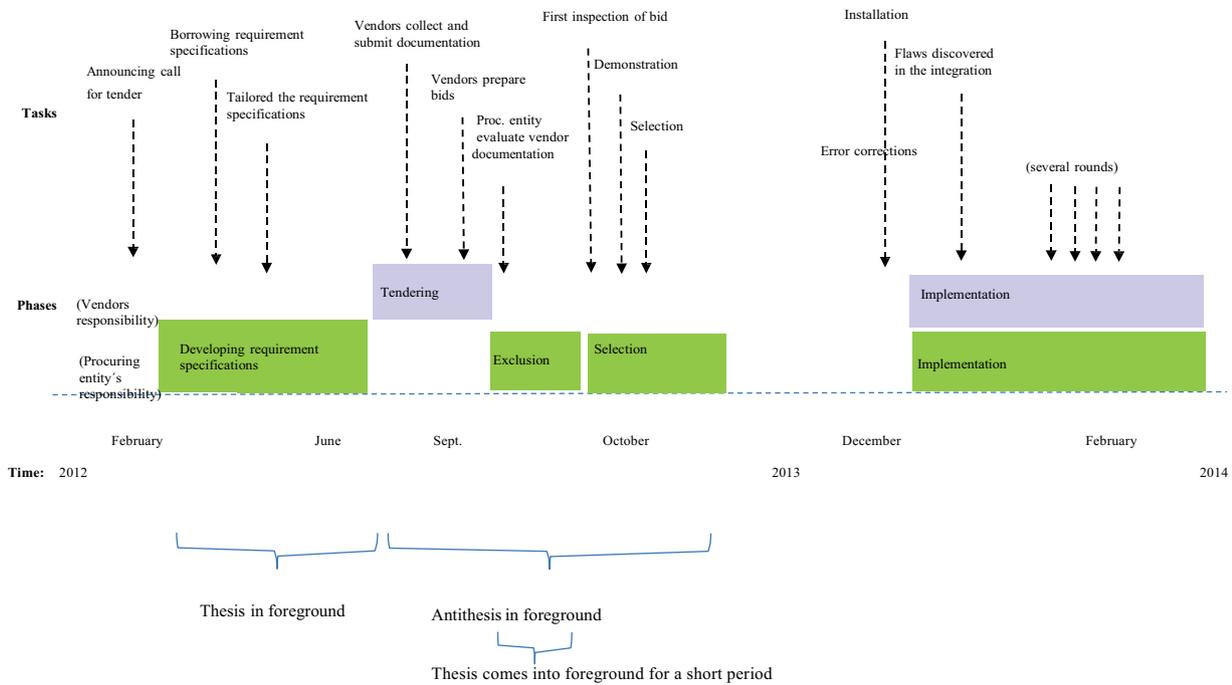
After screening the vendor documentation, the project group decided to **exclude** one of the vendors whom they considered vulnerable. This vendor was a two-person company consisting of the systems developer and his wife. The project group was afraid that if the systems developer had an accident or fell ill, the vendor would not

Table 2 An overview of the cases

Type of system	Type of procedure	Project period	Resource use*		Cost of system
			Procuring entity	Per vendor	
Case 1: Claims system	Open tendering	Feb. 2012–May 2013**	300 man-hours	50–100 man-hours	1.0 m NOK (€117,000)
Case 2: Electronic health record system	Tendering with negotiations	Jan. 2012–Feb. 2013**	4,500 man-hours	175–250 man-hours	2.4 m NOK (€280,000)
Case 3: System for backup and archiving	Competitive dialogue	Feb. 2012–Jan. 2013	540 man-hours	150–200 man-hours	1.9 m NOK (€221,500)

\* The estimated use of resources is the figure prior to implementation.

\*\* The project groups were formally dissolved, but some informal project organization remained. In case 1, the implementation was not finished until well into 2014 due to integration problems.



The dotted lines from the tasks indicate when the tasks were carried out. The brackets ( ) indicate when the thesis or antithesis is in foreground.

Figure 7 Case 1 – Procurement of a claims system.

be able to maintain and update the system in line with new requirements. The project group notified this vendor of the exclusion in mid-September. The excluded vendor filed a complaint, but a Norwegian Complaints Board for Public Procurement later decided that the municipality had acted according to the regulations.

As a consequence of the exclusion, there was only one vendor in the race for **selection**. This vendor was invited to give a demonstration of the software in early September. The super user of the claims system commented: “You get some answers, but you end up having more questions. But when 70 municipalities already use this system, how

much time should you spend on checking if it can be applied by us?” (13.05.13). The project group contacted several of the municipalities already using the system to learn of their experiences. The decision to **select** this vendor and procure the system with add-on modules was made in early October.

The contract was signed in the second half of October. Installation was set for 1 May 2013.

In the **implementation** phase, it was emphasized that an important feature of the claims system was its integration with the ERP system already in use. A few days prior to the installation, the project group

discovered that the claims system was incompatible with their existing version of the ERP system; hence, a new version of the ERP system was needed.

Consequently, the new claims system was not installed until a month later. At this juncture, flaws in the integration were discovered, which required manual checks to be made to the output from the claims system. More than a year later, the claims department was still experiencing problems.

**Analysis** The choice of the open tendering procedure was made by the procurement consultant. It is the most common procedure used in public procurement, although perhaps not the most appropriate in terms of IS because it allows little or no dialogue with the vendor. Here, at first glance, it appears that the antithesis was prevailing. One explanation for this resolution lies in this quote: *“they had done a good job on their requirements specifications”* (winning vendor, 08.03.13). However, prior to the formal tendering process, the procuring entity had borrowed requirements specifications from other municipalities and tailored them to their own needs. Essentially, at this pre-procurement stage, we see the thesis of “getting the system that best meets their requirement” came to the foreground without being shackled by the antithesis of following regulations which remained in the background. At the later stage, when the formal process started, the choice of open tendering procedure, which is the most restrictive form in terms of dialogue with the vendor, indicates that the antithesis was in the foreground. The antithesis appears to be also in the foreground when the procuring entity decided at a later point to exclude a vendor, which was allowed by the regulations. However, it was explained to us that the real reason for exclusion was that the procuring entity had doubts about the vendor’s ability to deliver future upgrades. This focus on the vendor’s vulnerability clearly brought the thesis of getting the right system to the foreground. Thus, both the thesis and the antithesis were in the foreground.

The strategy the entity followed was to learn from its network of peers, and this appeared to be quite effective. However, the limitation of this strategy was also revealed in this case. While the project group had carefully checked with other public entities that had acquired the same system, none of them had purchased the version designed to integrate with the version of the ERP system in the case. It was thus quite unique for them and integration with ERP system made it quite complex as well. This led to the problems that the procuring entity was experiencing for as long as one year after the installation.

## Case 2: Procurement of an electronic health record (EHR) system: tendering with negotiations

**Background** The procuring entity was a slightly smaller municipality and had been using an EHR system bought from a local vendor for 15 years when the procurement project we studied started.

The procurement was initiated to meet new government regulations promulgated in 2010, mandating message exchanges between the EHR systems of municipalities, local GPs and public hospitals. The municipalities were given three years to comply. Accordingly, this municipality established a message exchange project in 2011. The vendor of the existing system was unable to upgrade it to meet these new requirements, and in February 2012, the municipality established a subproject to procure a new EHR system. The timeline of the procurement process is shown in Figure 8.

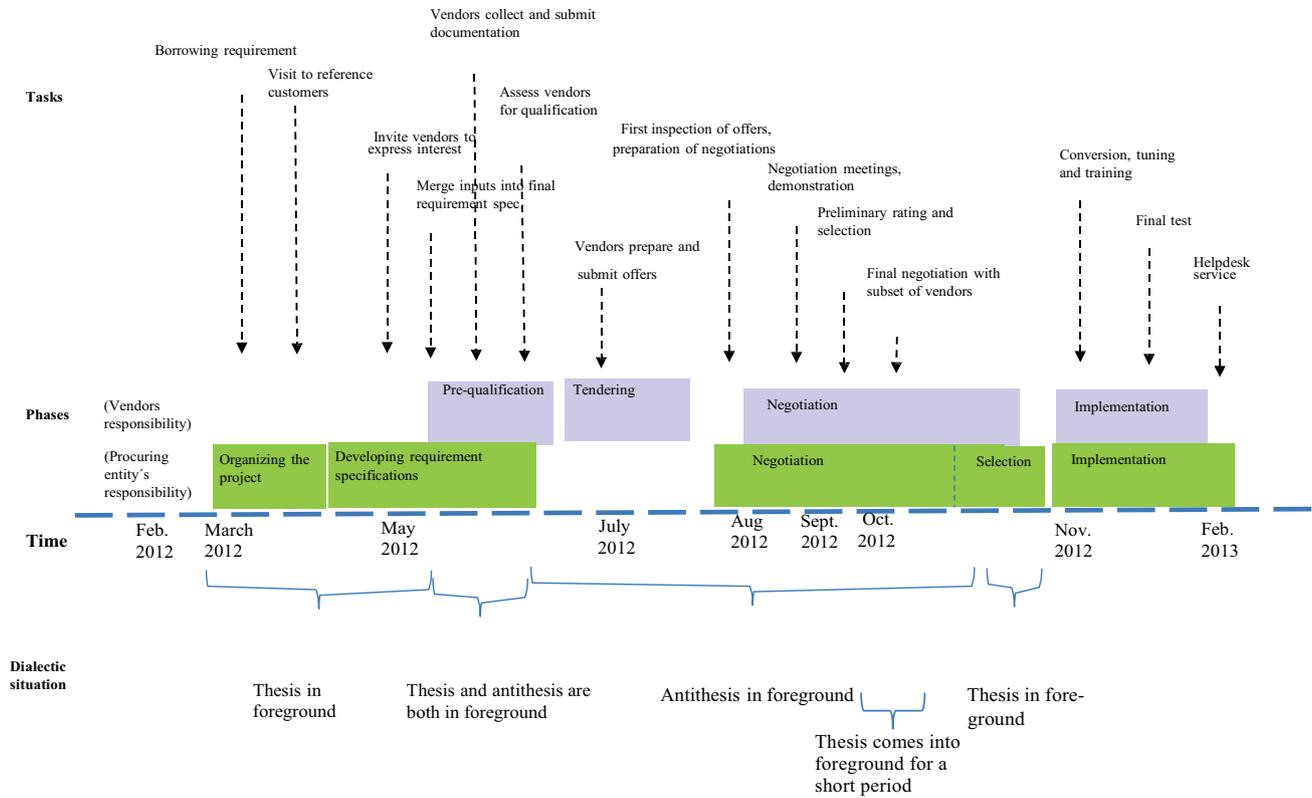
The project group consisted of four internal staff members: the leader of the message exchange project, the leader of the procurement project, a super user of the old EHR system and the designated super user of the new EHR system in the municipality.

This municipality was part of a formal network of adjoining municipalities, who cooperated on procurement. The network had established a shared procurement entity. The procuring municipality invited the network members to take part in the project. One smaller municipality joined in May. The project group was expanded to include two members from this municipality. The project group consulted with the shared procurement entity, who assigned one of their employees as a consultant for the project. This employee had experience of several IS procurements, including the procurement of an EHR system by another municipality in the network.

The project group experienced internal conflicts. The super user of the old system wanted to postpone procurement of a new system. According to the procurement project manager, this resulted in some discussions that she described as “heated”. However, since we did not attend these meetings, we are left with her interpretation of the discussions. The project group also established a reference group of 16 members that served in an advisory role.

**The procurement process** The process began with the **development of requirements specifications** in February 2012. The project group based their work on a requirements specification from one of the municipalities in the formal network of adjoining municipalities. Members of both the project group and the reference group also visited three municipalities of approximately the same size, which were using systems supplied by the three main vendors of EHR systems in Norway. As the EHR system required integration with other Information Systems that were already in use, the proposed system was complex and served many groups. The project group developed the requirements specification based on these inputs, finishing the task in mid-May. The overriding concern in this phase was to get the requirements right.

In April, the municipality announced a call for tender with negotiations, asking interested vendors to submit credentials for **pre-qualification** by early May. The procedure of tendering with negotiations was chosen



The dotted lines from the tasks indicate when the tasks were carried out. The brackets ( ) indicate when the thesis or antithesis is in foreground.

Figure 8 Case 2 – Procurement of an EHR system.

because “systems such as this are usually so complex, that it is hard to describe everything in a requirements specification. There will always be questions, and clarifications may be needed, clarifications that may tend towards negotiations” (procurement manager, 26.02.13). Three vendors submitted the required documentation and all qualified. All three vendors received the requirements specification in mid-May and were invited to submit their **tenders** by early July, in line with the regulations. They all submitted offers within the deadline.

Each of the three bidding vendors was invited to a series of three individual day-long, face-to-face **negotiation** meetings, which took place in August and September. All vendors received the same information, the same time to prepare, and the same agenda for their meetings. Prior to the first meeting, the project group went through the requirements and the submitted offers. In the first meeting of the series, the project group ran through the requirements and asked each vendor to explain how they had addressed each issue.

The second meeting concerned price and contract terms. The municipality had, as part of the requirements, asked for a contract in line with the government’s standard contract. However, one vendor had their own standard contract, which the project group did not accept, because it did not meet important criteria. This

vendor was given five days to provide a new contract. The vendor sent a new contract within the deadline, but the project group was still not satisfied. The procurement manager warned against disqualifying this vendor: “they have good lawyers and have a record of filing complaints” (procurement manager, 14.09.12). He told us later that they let them stay in the competition because if vendor A did not live up to expectations, it would be better negotiating with this vendor than with vendor C. The reason was that they felt that both vendor A and B had better offerings than vendor C. Consequently, the project group did not disqualify the vendor.

In the third meeting, each vendor demonstrated their system to most of the project group and the whole reference group. The reference group rated the system on a number of criteria, which the project group used as input for their evaluation. Subsequently, the project group carried out a short round of telephone negotiations with two of the vendors, before **selecting** a winner.

The winning vendor initiated the implementation phase in November. The process included the conversion of a limited amount of data from the old system. This proved to be challenging. However, the system went live in mid-February 2013 as planned.

**Analysis** The choice of tendering with negotiations was made by the procurement consultant from the shared procurement entity. He had prior experience with procurement of Information Systems, being “usually so complex”, and the need for a process that opened for “questions and clarifications, clarifications that may tend towards negotiations” (procurement consultant, 26.02.13). Just as in case 1, the municipality had borrowed requirement specifications from one other municipality and tailored them to its needs, prior to announcing the call. In addition, they had even visited three other municipalities of similar size to get their input on user needs. These three municipalities used EHR systems from the three main vendors. Essentially, at this pre-procurement stage, we again see that the thesis of “getting the system that best meets their requirements” was in the foreground.

Once the formal procurement process started with the announcement of the upcoming call for tender with negotiations, the procuring entity was very careful to ensure that all competing vendors had equal opportunity. All vendors were provided exactly the same information, the same duration for demonstrating their system and same possibilities to ask for questions and clarifications. It appears that the antithesis was in the foreground at this stage. However, the requirements specification was also being carried out in parallel (Figure 8), and the learning from networks played an important role. Thus, the thesis coexisted during this period, revealing the complementarity of the dialectic. Once the requirement specifications were set, the regulations mandated by the “tendering with negotiations procedure” were strictly followed indicating that the antithesis came to the foreground. However, when the question of disqualifying one of the vendors occurred the thesis came into the foreground again, coexisting with the antithesis. Later on, after the negotiations with the vendor ended, the municipality sought to validate their decision by consulting other municipalities who had used the same vendor. The thesis is in evidence here. In summary, this case reveals that in the emergence of a synthesis the complementary nature of the dialectic was vital and it played out differently over time.

### Case 3: Procurement of a backend system: competitive dialogue

**Background** The procuring entity was the IT department in the same municipality as referred to in case 1. The procurement concerned a backend system for backup and archiving, as the old backend system was not expected to be able to cope with the growing amount of data. The users of this system were IT staff, and subsequently there were only IT employees in the project group. The project group was uncertain of the requirements before starting the process. Thus, it chose

the competitive dialogue procedure. The municipality’s lawyer confirmed that the selected procedure was in line with regulations. The timeline of the procurement process is shown in Figure 9.

**The procuring process** A notice of the **upcoming procurement was announced** on DOFFIN in March 2012. Vendors were invited to express their interest and submit their credentials for **pre-qualification**, in line with the EU regulations. Sixteen vendors expressed an interest in participating and, by mid-May, a total of seven vendors had asked to qualify for the next phase by submitting credential documentation, together with a suggested solution. Some vendors suggested two alternative solutions. Based on the vendors’ prior experience with similar projects, five vendors were selected for the second round, which included dialogue.

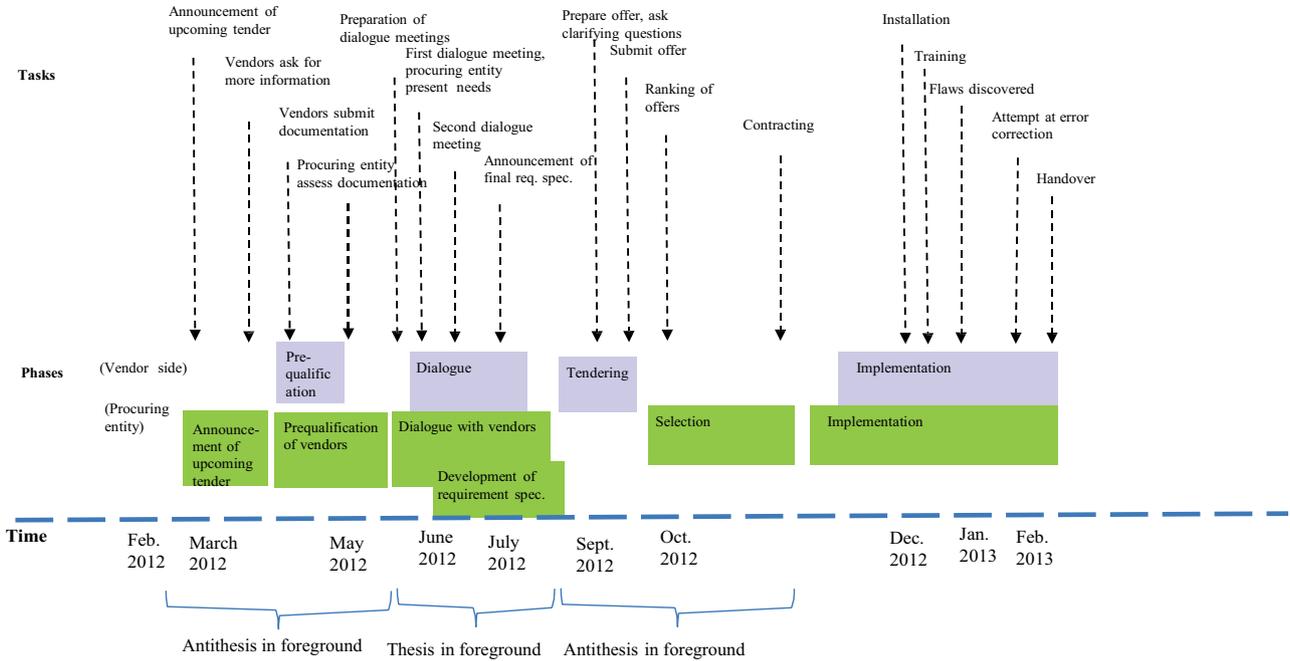
The project group met each vendor separately in two dialogue meetings **to develop a requirements specification**. The format of the first round of meetings was: two members of the procurement entity’s project group ran a presentation about possible needs for archiving and backup, and the existing infrastructure, followed by questions from the vendors. At the end of these meetings, the vendors were told about the rest of the process and asked to set aside time for two more meetings.

In the second round of meetings, vendors were asked to present ideas on what the municipality needed and their solution. Although given the opportunity to run the meeting by telephone, all vendors travelled to the municipality, “because they were afraid of losing opportunities for more information or better presentation of their solution” (project manager, 13.11.14). The project manager decided not to run a third meeting, as she did not want “them to incur more costs” (project manager, 26.10.12).

Based on these dialogue meetings, a final **tender announcement**, which included a finalized requirements specification, was sent to four vendors in June 2012, and from then onwards the major concern was following the regulations, with equal access being provided to information for all competing vendors. The deadline for offers was mid-August. Five offers were received from the four vendors, as one vendor offered two solutions.

Based on a ranking of the offers, the project group **selected** one of the vendor’s solutions in September. The contract was duly signed, and the system was implemented by mid-December.

The **implementation** included a training course for two employees from the municipality and a week’s work for one of the vendor’s technical experts. In January 2013, the project group met with the vendor to clarify whether everything had been delivered according to the contract. One add-on module was found missing, and



The dotted lines from the tasks indicate when the tasks were carried out. The brackets ( ) indicate when the thesis or antithesis is in foreground.

Figure 9 Case 3 – Procurement of a backup system.

one flaw was found. Consequently, the system was not fully accepted and the municipality held back part of the payment for a period. However, within three weeks these issues were resolved.

**Analysis** The procuring entity chose the procedure of “competitive dialogue” partly to test the procedure and see if it could be useful in other procurements. In doing so, they were very careful to check that the choice was within regulations. They were also very careful in announcing it accurately, and in not violating the rules in the pre-qualification, as they were concerned about possible complaints. At first glance, the antithesis appears to be in the foreground. However, this procedure also allows maximum dialogue with vendors up to setting the requirements. The dialectic is complementary here as the thesis of “obtaining the system that best fits the entity’s complex information requirements” is not in violation of the regulations and the dialogue with the vendors was precisely to get the requirements right. The synthesis at this stage is coexistence of both the thesis and the antithesis and was achieved by choosing the appropriate procurement procedure. However, after setting the requirements, negotiations are prohibited. In addition, the procuring entity was careful to provide all competing vendors equal access to information. As an example, every response to one vendor concerning questions on the entity’s infrastructure and requirements was copied to all the other vendors. At this stage, the antithesis moved to the foreground. In summary, the resolution to the dialectic and the synthesis took different forms across time.

**Findings**

The research question we set out to examine was:

*How does a public procuring entity procure the Information System best suited to its requirements and simultaneously follow the regulations?*

To make sense of our data, we used dialectics and framed our research question as the following thesis and antithesis:

**Thesis** *Obtaining the system that best meets a public entity’s complex information requirements, irrespective of any constraints*

**Antithesis** *Abiding by the principles of EU regulations on public procurement (i.e. openness and transparency, equal opportunities for all vendors)*

It should be pointed out that our three cases involved a conscious effort to study procurement as a longitudinal process. Thus, our research findings are based on evidence derived from these longitudinal studies. These studies were carried out over a period of 2 years. Data were collected in meetings, by interviews during the process, and after the procurement projects were completed. In the final interviews, the respondents were asked retrospective questions to get their historical reflections.

Our cases reveal that public procurement entities deal with this dialectic by seeking a synthesis that can take one of two forms, either by selecting a tendering procedure that allows a degree of dialogue with the vendors, albeit regulated, or by learning through a formal or informal network of public entities.

### Synthesis through selecting an appropriate tendering procedure

In two of our three cases, the procuring entity selected the most appropriate procedures. In case 2, the negotiations identified which requirements were actually met, and the ranking and selection were quite straightforward. The procuring entity was very certain of the decision made, and there were no big surprises after implementation. However, it took a long time to develop detailed requirements specifications. In case 3, the dialogue helped the procuring entity to decide on their needs. The tendering process gave them enough information to make a decision. The project manager felt, however, that the procedure required too much work and resources for the vendors in terms of dialogue meetings and travelling.

In case 1, with hindsight, the selected procedure was not appropriate. The entity struggled with getting the requirements for system integration. This was discovered only after implementation. A constant dialogue with the vendor, possibly through demonstrations with real data, may have revealed the issue earlier. The most appropriate procedure would have been tendering with negotiations. Instead, restricted tendering was applied. The procurement manager, though experienced in the workings of the municipality, was new to procurement. Indeed, this was his first IS procurement. We suggest that experience and competence within the procuring entity is a critical factor in successful procurement.

In dialectical terms, this synthesis takes the form of meeting a part of the antithesis while trying to satisfy the thesis. The “principles of EU regulations” are not a single concept, rather it is a range of mutually exclusive choices (following one of the four procedures means one cannot follow any of the other three). Although the procuring entities wanted to satisfy the thesis, their best solution was to find a synthesis that also satisfied the antithesis. They had to get the system best suited to its requirement *within* the bounds of the regulations. This synthesis thus reveals that the thesis and antithesis are not mutually exclusive and can be framed as complementary (c.f. Carlo *et al*, 2012). Even when an appropriate procedure is selected, time played an influential role and the nature of the synthesis varied across the phases of the project.

### Synthesis through learning from networks

When procurement entities lack internal competency, they may determine requirements by learning from networks of similar entities that may be formal, semiformal or informal. An example of a formal network is seen in case 2 where a group of municipalities established a procurement network to share resources and collaborate on actual procurements. An example of a semiformal network is seen in case 1 where the claims manager participated in an annual conference with claims managers from the 10 largest municipalities in Norway. This network enabled her to borrow requirements specifications. In both cases 1 and 2, procurement entities also learned through informal networks by contacting other

municipalities and visiting those nearby to learn from their experiences with different vendors and systems. In our cases, we uncovered a rich seam of evidence about the use of a network of procurement experts who were willing to share both their requirements specifications and experiences. This strategy requires less dialogue with vendors and hence ensures stricter adherence to regulations.

The synthesis here reflects the role of time in the procurement process (c.f. Cyert & March, 1963). The learning through networks represents the thesis and the thesis only. However, this occurred before the tendering process actually started. The goal of the procuring entity was to specify requirements as accurately as possible. Thus, the thesis remained in the foreground up to the point in time when the tender was announced. After that, it was the antithesis that moved to the foreground. That is, the EU regulations had to be followed through the mechanisms of the selected procuring procedure. The primary goal was to follow the regulations, however, as we have seen, the procedures applied in cases 2 and 3 allowed dialogue with the vendor during parts of the process, and hence there was an opportunity to ascertain that the requirements were correct. Thus, we see a synthesis that was aligned to the changes in goals brought about by the passage of time.

### Discussion

The two syntheses that we uncovered are by no means the only ones possible. There are surely others (e.g. solutions that are acceptable to the various stakeholder interests represented by the different members of the project groups). This is a natural outcome of following a dialectic approach that results in multiple syntheses. However, for our cases this is not a flaw, because we would suggest that a public entity is interested in a plausible synthesis that works. Moreover, the research stream to which we are contributing is the explicit search for a synthesis and not *the* synthesis itself. Each synthesis may trigger a new cycle of dialectics emanating from new goals that may be inconsistent. Future research can investigate this through further longitudinal studies.

Our paper makes two contributions to the literature. The first is the practical problem of challenges faced by procuring entities in getting the system that meets their needs while simultaneously following strict regulations set by regulatory bodies. Such regulations change. Since we conducted the study, EU has come out with new regulations. From 2016, the process will be regulated by a new directive that allows a new procedure: *the innovation partnership*, which can be awarded only after running a tender with negotiations (EU, 2014a, b). This new procedure allows partnering suppliers to develop construction works, goods or services not currently available in the market in long-term partnership with contracting authorities; however, the procuring entity has to pay for this development. The rationale is stated as, “better use of

public procurement in support of common societal goals" (EU, 2011). If we trace the development of the allowed procedures, we can see that the EU has gradually relaxed the prohibition on interaction with the vendors. One may ask whether this trend will ultimately result in making our practical problem moot. To examine whether this may be the case, let us take a deeper look at the root of this dialectic. The antithesis in our case arose out of the principles of a regulatory body of ensuring fairness, transparency, probity, competition and fighting corruption (EU, 2014c). Regulations (such as the allowed procurement procedures) are the means for achieving these objectives (Snider and Rendon, 2008). Behind these principles is the premise that there is power asymmetry – vendors know more than the procuring entities. This logic is deep-rooted and will be unlikely to disappear. Hence, no matter how "liberal" new regulations become, they will always embody these principles. The new EU directives of 2014 put it succinctly "The competitive procedure with negotiation should be accompanied by adequate safeguards ensuring observance of the principles of equal treatment and transparency" (EU, 2014c). On the other side, the thesis is equally deep-rooted. In trying to get the system that best fits their needs, the procuring entity is acting to maximize its self-interest and they will keep on doing this, whatever the regulations are. Consequently, while the dialectical situation may change, the dialectic itself will remain. The challenge for procuring entities as framed by our practical problem will endure. The dialectic of balancing organizational objectives against EU regulations is not limited to procurement. The coordination challenge of implementing EU policies in member states where local objectives need to be advanced has been illustrated by Egeberg & Trondal (2016). In short, as long as transnational organizations such as the EU exist, and regulatory bodies under them continue to promulgate policies, the dialectic situation we revealed in this study will remain.

Our theoretical contribution is a nuanced picture of how dialectics play out over time. First, by focusing on the explicit search for synthesis, our study is one of the very few that goes beyond specifically searching for contradictions (e.g. Nordheim & Nielsen, 2008). The syntheses we uncovered were premised on the complementarity of the dialectic tensions. This is a departure from the Hegelian understanding of dialectics which is premised upon contradictions that pull apart to revealing complementarities that bind. There is a similar discourse in quantum physics where Niels Bohr introduced the notion of complementarity to resolve the seeming contradiction between the wave and particle theories of matter. It is beyond the scope of our paper to examine deeper into that discourse. However, we point out that one of the resolutions is that at various periods of time, the behaviour of matter can be explained by using one theory, while at a later period, it can be equally well explained by using the other. Our nuanced understanding of the role of time in resolving dialectical situations is

along the same lines. This perspective is in line with prior work where thesis and antithesis were seen as a duality (Carlo *et al*, 2012) or generate a synthesis through a compromise (DeLuca *et al*, 2008). Such a focus gives dialectics a premise for action (what can we do?) in addition to understanding the process (the story as it unfolds). In contexts such as public procurement, it is paramount to find a synthesis. Procurement entities are more interested in finding out what they can do rather than how they ended up with a contradictory situation.

The usefulness of such a "proactive" view of dialectics was also raised by Nordheim & Päiväranta (2006: 660) who suggested that "A conscious strategy of looking for contradictions and pursuing constructive synthesis could help manage large scale IS projects". This proactive view is also visible in DeLuca *et al* (2008: 48) whose stated objective was to "advance the maturation process of AR (Action Research) and move it into a more prominent position in mainstream publications". It should be noted that they were only trying to explain the implementation of Enterprise Content Management system, not consciously looking for a synthesis. Our study, on the contrary, looked specifically at the search for synthesis.

We add to this understanding of dialectics by revealing a more nuanced picture of how time plays a role in resolving a dialectical situation. Our findings are in line with Cyert & March (1963) that the thesis and antithesis show a pattern of "serial dominance" whereby at one point in time the thesis dominates while at other times the antithesis dominates. We posit, however, that the picture is more subtle than that. Even in periods where Cyert and March's vocabulary would suggest that one dominates, the other does not fade away. Using our vocabulary, we would reframe it as "when the thesis supposedly 'dominates', it simply means it is in the foreground". The antithesis is present but in the background.

This coexistence may or may not be uneasy, it may just be a way to deal with the situation at hand. The different phases of a procurement project make it an excellent context to illustrate this ebb and flow. We draw a parallel with Cyert and March's example of profit and safety goals as a helpful illustration (Cyert & March, 1963). Profitability is the normal foreground goal with safety treated as a background issue; important but not to the fore. However, when an employee is killed at the factory the norm changes dramatically. Thoughts of profitability become subordinated to safety considerations. Safety issues (programmes, retraining, new literature, etc.) dominate for a while but over time, almost imperceptibly, the profit motive reasserts itself. Thus, by not considering them simultaneously but in sequence (i.e. "sequential attention to goals"), both goals can be maintained. In our cases, the foreground goal of software procurement (i.e. the thesis) is normally to achieve the best affordable software solution which meets the needs of the municipality. For example, from our research we noted that when the municipalities are small, they may use a

network of larger municipalities and “borrow” the best practice software specifications and thereby speed up the process. However, the entities know the rules and these are present, but in the background in the early phases. The picture that emerges is that the thesis and antithesis are in a state of “dynamic balancing” (as Carlo *et al*, 2012 also found) because one is in the foreground but the other has not disappeared but lurks in the background. The balancing can also be in the form of both the thesis and the antithesis in the foreground. For example, in our case 1, the procuring entity decided to exclude one of the vendors due to vulnerability issues. This indicated that the thesis was in the foreground. However, this was in accordance with the regulations, which meant that the antithesis was also in the foreground. This is depicted in Figure 7.

To illustrate this nuanced understanding of dialectical situations, we revisit Nordheim & Päiväranta (2006). The dialectics they identified, dialectics of learning and dialectics of adaptation emerged at different phases of the project and resulted in different syntheses. Moreover, their synthesis of both dialectics was actually the antithesis incorporating part of the thesis. The dialectic of learning was resolved by new knowledge engulfing old knowledge, while the dialectic of adaptation was resolved by adopting part of an out of the box solution supplemented with new routines and modules being added.

## Implications

Interesting implications emerge from our study, both for research and practice. First, we point out its limitations. Although our findings are from Europe, the insights into the public procurement process are arguably relevant to other parts of the world with similar regulations. Our selection of the cases may have been skewed. In cases 1 and 2, the procuring entities took some time before deciding to allow us to follow their procedure. We can speculate whether procuring entities that are ready to bend the rules would allow researchers to follow their work closely. The processes appeared open and transparent – except for the internal conflicts experienced in case 2. We were mindful to assure all respondents that the findings would be anonymized and that the results from the interviews would not be disclosed to any of their colleagues. We were also careful to be as unobtrusive as possible when we attended the meetings. Nonetheless, our presence may have influenced the process in the sense that the project groups in the procuring entities may have been more careful in abiding by the regulations.

## Implications for research

Our findings on public procurement also shed light on some key areas of IS research. The tendering procedures reveal implications for the specification of systems requirements. There is a large body of research on

techniques for specifying requirements and requirements gathering (see e.g. Young, 2002; Davis *et al*, 2006). Evidence suggests that taking users as a primary information source is an effective means of requirements capture (Kujala, 2003). In public procurement, however, the problem is turned on its head – the procuring entity itself is the user and it is the user who is unclear about requirements. One way to achieve clarity about requirements is interaction with vendors.

More interaction with vendors gives procuring entities a greater opportunity for learning and discovery. The procedure that allows most interaction is competitive dialogue; however, this is not a very common procedure. We found that only 0.4% of tender notices in the EU area used this procedure. It is significant, though, that such tenders accounted for 8.6% of the monetary value in 2010 (Strand *et al*, 2011); hence, it was applied to larger and more expensive procurements where the specifications were probably unclear and complex.

Essentially then, the task of requirements specification becomes a collaborative effort between the vendor and the procuring entity. There are obvious pitfalls here. More reliance on the vendor means more power to the vendor, and the resultant information asymmetry leaves open the danger of exploitation by the vendor (Dawson *et al*, 2010). However, the long-term benefits of a sustained relationship are also important for the vendor (see case 3).

The strategy of learning through a network of fellow public entities is a means of evening out the power imbalance. Essentially, this strategy allows the procurement entities to define the requirements of unfamiliar systems without relying on vendors. Whether this is a conscious effort to minimize their disadvantage vis-à-vis the vendor in terms of information asymmetry poses an interesting question for future research.

The strategy of selecting the most appropriate procurement procedure often proves to be challenging. In an early study of IS procurement strategies based on transaction cost economics, Saarinen & Vepsäläinen (1994) found this. They developed an a priori principle of software procurement which uses two variables, one to represent the skills of the developer and the other the type of Information System being acquired. In essence, for routine applications, companies should buy a well tried package. In contrast, for acquiring high risk, speculative Information Systems, they should use internal development employing highly skilled innovators (p. 195). However, their empirical study of IS acquisition revealed some significant deviations from their principle. For example, a significant number of routine IS were developed in-house employing highly skilled innovators (p. 199).

Other directions emerge for future research from our study. We need to operationalize precisely what “uniqueness” and “complexity” of requirements mean in systems to be procured. Case studies and a Delphi study of experts and procurement managers, followed by quan-

titative surveys, are possible approaches. Alternatively, researchers could study how procurement entities use their networks to learn and to explore the challenges associated with following this strategy.

Whether dialogue with the vendor reduces information asymmetry is another intriguing question. As our cases indicated, there were several stakeholders associated with any procurement. This has the potential to raise conflicts because of various stakeholder interests and goals. This can be a fruitful area for future research.

### Implications for practice

Based on our findings, we propose a framework that can serve as a guideline for procuring entities to select an appropriate strategy and tendering procedure (see Table 3). Our framework is based on two dimensions: complexity in requirements and uniqueness of system. Both concepts are defined relative to the knowledge of the procurement group. To illustrate, in case 1 the request included integration with an ERP system. Integration of software is not new. However, integration of a claims system with the legacy ERP system was a completely new challenge both for the vendor and for the procuring entity, and hence it did prove to be complex and unique. Case 2 included an EHR system for a municipality with a high number of interdependent organizational units, and the procuring entity's requirements included a goal of integrating with several different systems. The requirements were complex but not necessarily unique. In case 3, the initial requirements was for a unique system, as it included both archiving and backup.

If requirements are not complex and the system is not unique, the procuring entity is likely to have sufficient internal competence to specify the requirements. If not, requirements can be "borrowed" from other public entities. However, these requirements need to be tailored. The most efficient procedures are open or restricted tendering.

If requirements are complex but the system is not unique, or the procuring entity has limited competence, learning from a network of other public entities is an effective strategy. Dialogues with vendors may still be required to validate that the requirements are met. This calls for a procedure such as tendering with negotiations.

If requirements are not complex but the system is unique, learning from other public entities is less likely to produce results. This situation requires more dialogue with the vendors. An appropriate procedure would be tendering with negotiation or competitive dialogue.

If requirements are complex and the system is unique, it is more likely that the procuring entity does not have internal competence; nor would other public entities. Consequently, dialogue with the vendors may be the only solution. There are two procedures that allow learning from the vendors. One is competitive dialogue, and the other is the new procedure, innovation partnership. Such projects place heavy resource demands on the vendors. Thus, only large vendors can be expected to participate.

### Conclusion

Having stated our research question as a dialectic, we posit that it is the thesis that is of paramount importance to a public procuring entity. The entity's prime goal is to

**Table 3 Framework to guide the selection of strategy for procurement of IS**

	<i>Non-complex requirements</i>	<i>Complex requirements</i>
Non-unique system	<p>Example: payroll system</p> <p>Recommended strategy to specify requirements: Borrow requirements specifications from other public entities.</p> <p>Interaction with vendors: Not essential</p> <p>Appropriate procedures: Open tender or restricted tender.</p>	<p>Example: EHR system</p> <p>Recommended strategy to specify requirements: Learn from other public entities.</p> <p>Interaction with vendors: Carry out dialogue with vendors to evaluate the systems.</p> <p>Appropriate procedure: Tendering with negotiations.</p>
Unique system	<p>Example: Web design with non-complex requirements for interface to the public.</p> <p>Recommended strategy to specify requirements: Learn from other public entities</p> <p>Interaction with vendors: Carry out dialogue with vendor to clarify requirements.</p> <p>Appropriate procedures: Tendering with negotiations or competitive dialogue.</p>	<p>Example: System for backup and archiving.</p> <p>Recommended strategy to specify requirements: Engage in dialogue with multiple vendors.</p> <p>Interaction with vendors: Carry out constant dialogue with vendors, until requirements are specified</p> <p>Appropriate procedure: Competitive dialogue, or, for completely new systems, innovation partnership</p>

procure the most appropriate system that fulfils its requirements. However, it cannot just go and purchase whatever system it believes is most suitable. A public entity is heavily regulated and has to follow strict rules and procedures. This makes it all the more difficult to acquire a complex information system.

The search therefore is for a synthesis which satisfies both the thesis and the antithesis. By revealing that framing the dialectic not as that of an opposite but as complementary, and that time plays a vital role in the unfolding of the resolution, our study indicates how such syntheses can be achieved.

New regulations that are periodically promulgated change the situation by allowing more freedom for procurement entities. The newest regulations (EU, 2014a, b), which we described earlier are an example of

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this trend. However, as we elaborated, regulatory bodies are bound by their institutional logic to limit the degree of interaction.

The question remains whether new procedures such as these can ease the dilemma faced by procuring entities when acquiring information systems. Requirements specifications will remain difficult to state with precision a priori. In the end, it will be the skill and acumen of procurement managers that will determine the extent to which public entities are able to obtain the system they need while remaining within the bounds of regulations. As Egeberg & Trondal (2016, p. 579) state it starkly, they have to learn to “live with it”.

how to improve the effectiveness of research interviewing.

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**Appendix A: Overview of interviews**

See Tables A1, A2 and A3.

**Table A1 Case 1**

<i>Subjects</i>	<i>Age</i>	<i>Gender</i>	<i>Date</i>	<i>Medium</i>	<i>Duration</i>
Super user of the legacy system	55	Female	23.10.12	Skype	34 min
Excluded vendor	55	Male	05.02.13	Face-to-face	83 min
Winning vendor	50	Male	08.03.13	Skype	52 min
Super user of the legacy system	55	Female	13.05.13	Face-to-face	63 min
Project manager	45	Female	13.05.13	Face-to-face	79 min
Project manager	45	Female	20.06.14	Face-to-face	35 min
Super user, ERP system	45	Female	30.06.14	Face-to-face	61 min
Procurement manager	62	Male	01.07.14	Face-to-face	59 min

**Table A2 Case 2**

<i>Subject</i>	<i>Age</i>	<i>Gender</i>	<i>Date</i>	<i>Medium</i>	<i>Duration</i>
Procurement project manager	45	Female	10.09.12	Skype	11 min
Change project manager	50	Female	19.09.12	Skype	21 min
User representative, ref. group	Unknown	Male	02.10.12	Skype	36 min
User representative, ref. group	Unknown	Male	02.10.12	Skype	20 min
User representative, ref. group	Unknown	Female	08.10.12	Skype	18 min
User representative, ref. group	Unknown	Female	08.10.12	Skype	22 min
Super user, "other" municipality	40	Female	06.11.12	Skype	35 min
Procurement project manager	45	Female	15.11.12	Skype	24 min (interrupted due to another meeting)
Procurement project manager	45	Female	22.11.12	Skype	45 min (continuation from former interview)
Super user, legacy system	65	Male	30.01.13	Face-to-face	56 min
Change project manager	50	Female	30.01.13	Face-to-face	68 min
Winning vendor	40	Female	11.02.13	Face-to-face	54 min
Procurement project manager	45	Female	26.02.13	Face-to-face	46 min + notes
Procurement managers (two, at the same time)	40 and 45	Both male	26.02.13	Face-to-face	73 min
Super user, new system	40	Female	23.09.14	Face-to-face	60 min
Change project manager	50	Female	23.09.14	Face-to-face	59 min

**Table A3 Case 3**

<i>Subject</i>	<i>Age</i>	<i>Gender</i>	<i>Date</i>	<i>Medium</i>	<i>Duration</i>
Lawyer*	45	Male	10.09.12	Skype	9 min
Project manager	45	Female	26.10.12	Face-to-face	50 min
Super user, archiving	38	Male	29.10.12	Face-to-face	48 min
Super user, backup services	60	Male	29.10.12	Face-to-face	30 min
Project manager	45	Female	13.11.12	Face-to-face	24 min
Losing vendor	40	Male	04.02.13	Face-to-face	54 min
Winning vendor	38	Male	24.05.13	Face-to-face	66 min
Project manager	45	Female	15.11.14	Face-to-face	53 min

\*The recording software did not work properly during this interview.

**Appendix B: Overview of internal documents**

Case 1: Four e-mails with notes from reference checks, twelve internal e-mails, minutes from four meetings, and the final requirements specification.

Case 2: Plan of the procurement and of the change project and minutes from the first negotiation meeting.

Case 3: Letter from the lawyer stating that competitive dialogue could be applied. Memos from two internal meetings. Instructions to vendors for the dialogue meet-

ings. Question concerning the procedure from one vendor, which was answered and sent to all vendors. Final requirements specification. Offer from all vendors. E-mail sent to all vendors with a redacted offer from the winning vendor, and ranking of all offered solutions and procurement protocol.

**Appendix C: Emergence of thesis/antithesis from the interviews and observations**

**Case 1**

Point in time	Original text	Goal	Position of thesis/antithesis
1	Claims manager, 14.05.13: "Prior to announcing the tender we borrowed requirement specifications from nnnn (name of municipality). It was a huge advantage for us to have a starting point for there are an enormous number of details"	Get the requirements correct	Thesis is in foreground (focus on getting the requirements right) → Thesis is in foreground
2	Excluded vendor, 05.02.13: "When the tender was announced over DOFFIN, we enrolled and received the tendering documents"	Transparency	Ant-thesis is in foreground (transparency, equal opportunities) → Antithesis is in foreground
3	Internal meeting, 03.05.12, procurement manager: "If the systems developer has an accident or falls ill, the vendor will not be able to maintain and update the system in line with new requirements".	Get a system which can be updated according to new requirements	Thesis comes into foreground → Thesis and antithesis are both in foreground
3	Internal meeting, 05.07.12, procurement manager: "Equal opportunities are required. If he (the owner of the excluded vendor) is included in the competition, there will not be equal treatment of the vendors that have considered themselves to be too small"	Equal opportunities	Antithesis stays in foreground

Case 2

Point in time	Original text	Goal	Position of thesis/antithesis
1	Internal project meeting 07.08.12, the procurement manager: "We should try to develop equal layouts, so we have a template when we meet the vendors".	Provide equal opportunities	Antithesis is in foreground (equal opportunities for all vendors) → Antithesis alone in foreground
2	Negotiation meeting with vendor 07.09.12, the procurement manager: "There are a lot of precautions (in the contract you offer) and we are not able to see the consequences. Either we use the governments standard contract, or we reject your offer". The vendor was sent home, and given a short deadline to come up with new contract terms.	Get a contract which is satisfactory	Thesis comes into foreground
3	Internal project meeting (14.09.12): The procurement manager warned against disqualifying one vendor, as: "they have good lawyers and a record of filing complaints; we risk they delay the process".	Get a new system within the specified timeframe	Thesis still in foreground, but for a different reason → Thesis and antithesis both in foreground
3	The procurement project leader told us (22.11.12): "we let them stay in the competition because if "vendor A" didn't live up to expectations, it would be better negotiating with this vendor than with "C". "However, we felt frustrated with writing in a memo that if the precautions were not corrected they would be disqualified, without carrying this out".	Decided to keep the second-best alternative in the competition	Thesis still in foreground, but for a different reason
3	The procurement manager explained more than five months after warning against disqualifying one vendor (26.02.13): "it (the offer) included a lot of precautions, but they corrected the terms for our next meeting".	Approved the new contract terms	Thesis apparently not in foreground, but the data is in contrast with data from the meeting 14.09.12 and the interview 22.11.12
4	The vendor that offered a contract which was not considered acceptable got the same cases as the other vendors for their third negotiation meeting.	Provided equal opportunities	Antithesis still in foreground

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