

CHALMERS



Value Adding Resource Consumption as Perceived by a Client: A Case Study

*Master's Thesis in the Master's programme Design and Construction Project
Management*

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Department of Civil and Environmental Engineering
Division of Construction Management

CHALMERS UNIVERSITY OF TECHNOLOGY
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ABSTRACT

Ineffective, unproductive and expensive are adjectives that increasingly have become associated with the Swedish construction industry. Measures taken to remedy the situation have been widespread and the industry has lacked a common understanding of the origin to the perceived deficiencies. Rarely have the used resources been analysed in retrospect and their individual contribution to the constructed building been evaluated.

The conducted case study sought to elucidate the situation through attempting to identify value creation from the perspective of the client during the brief and design phases of a Swedish construction project. A literature review, interviews and a documentary data collection enabled mapping the resources used throughout these phases. The literature review enabled defining the use of labour resources into three categories: directly value adding, indirectly value adding and not value adding. During subsequent interviews the client allocated the used resources to these three categories. Making it possible to not only review the clients perception of the contribution of each resource but also the review the clients perception of the brief and design phases.

The results revealed that 17 % of the consumed resources were considered directly value adding, 32 % indirectly value adding and 51 % was not seen as value adding by the client. The study also revealed that the client mainly perceived value as having been added during shorter periods of time, separated by longer periods where little value was added. The project progress could not be considered continuous but rather halting.

Key words: Value, value creation, brief, design, client perspective, resources, construction.

Värdeskapande resursförbrukning ur ett byggherreperspektiv: ett praktikfall

Examensarbete inom *Design and Construction Project Management*

FREDRIK CHRISTIANSEN

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SAMMANFATTNING

Den svenska byggindustrin har beskrivits som ineffektiv, oproduktiv och dyr. Det har funnits en stor bredd i de åtgärder som vidtagits av industrin för att förbättra situationen samtidigt som en samlad bild av källan till de uppfattade bristerna har saknats. Sällan har de förbrukade resurserna analyserats i efterhand för att utvärdera deras bidrag till byggnadens formgivning.

Den genomförda studien har haft för avsikt att försöka bringa klarhet i situationen genom att identifiera värdeskapande i program- och projekteringsskedena ur ett byggherreperspektiv i ett svenskt byggprojekt. Med hjälp av en litteraturstudie, intervjuer och dokument erhållna från de studerade organisationerna kartlades de förbrukade resurserna. Baserat på litteraturstudien definierades tre kategorier av resursförbrukning: direkt värdeskapande, indirekt värdeskapande och inte värdeskapande. Under de efterföljande intervjuerna fördelade byggherren de förbrukade resurserna till de tre kategorierna. Detta möjliggjorde inte bara en utvärdering av byggherrens uppfattning av varje resurs utan även av program- och projekteringsskedena som en helhet.

Resultaten från studien visade att 17 % av de förbrukade resurserna ansetts direkt värdeskapande, 32 % indirekt värdeskapande och 51 % inte värdeskapande. Av studien framgick det även att byggherren uppfattade projektets framskridande som stapplande där värde främst tillfördes under korta och intensiva perioder som skiljdes åt av långa perioder under vilka lite värde tillfördes. Projektet som helhet kunde inte anses framskrida kontinuerligt.

Nyckelord: Värde, värdeskapande, programskede, projektering, byggherreperspektiv, resurser, bygg.

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Preface

The reported research began in June 2009 and ended in April 2010. It has benefitted from the support provided by supervisor Per-Erik Josephson (Chalmers University of Technology) as well as Magnus Borglund (White arkitekter AB), Hans Reich (Chalmers School of Continuing and Professional Studies) and Lars Medbo (Chalmers University of Technology). I would like to thank David Johansson (Chalmersfastigheter AB) whom made data accessible and contributed to the study by sharing his thoughts. The results of the study were greatly reliant on the cooperation of Lars Mauritzson (Chalmersfastigheter AB) whom deserves appreciation. Jerker Engman (Chalmersfastigheter AB) and Leif Blomkvist (Liljewall arkitekter AB) contributed to the study through their accounts of the project. Anna Eckerstig (Chalmersfastigheter AB) contributed to the project by sharing her thoughts on the preliminary results and the brief and design phases of construction projects. Nanna Carlsson (Peab Sverige AB) and Susanne Lundberg (Peab Sverige AB) elucidated the process from the contractors' point of view. They contributed with their recollections of the tender process and data included in the study. Anders Svensson (the city planning office in Gothenburg) explained the detailed development planning process and supplied data. Torbjörn Borglin (the city planning office in Gothenburg) described the process of acquiring a building permit. The cadastral procedure was clarified by Rose-Marie Winsenius (the city planning office in Gothenburg). Harald Pleijel (Familjebostäder i Göteborg AB) made value through a client's perspective a bit less ambiguous. Without the help of these people the study would not have been feasible and I would like to thank you all.

This study has been reported through a conference article constituting Part I of this report and by publishing the research material produced throughout the study composing Part II of this report. The second part is meant to complement the article by providing a more extensive recollection of the study.

Göteborg August 2010

Fredrik Christiansen

Part I: Article

VALUE ADDING RESOURCE CONSUMPTION AS PERCEIVED BY A CLIENT
– A CASE STUDY

Fredrik Christiansen

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VALUE ADDING RESOURCE CONSUMPTION AS PERCEIVED BY A CLIENT: A CASE STUDY

Fredrik Christiansen¹

ABSTRACT

Ineffective, unproductive and expensive are adjectives that increasingly have become associated with the Swedish construction industry. Measures taken to remedy the situation have been widespread and the industry has lacked a common understanding of the origin to the perceived deficiencies. Rarely have the contribution to the design of a building from consumed resources been assessed in retrospect.

The scope of the conducted case study covered the brief and design phases of a Swedish construction project. The resources used were mapped through a documentary data collection and interviews with the client, a contractor and the city planning office. There were three categories (directly value adding, indirectly value adding and not value adding) to which time consumed by resources was allocated during interview.

A summarised assessment over time of the consumed resources constituted a part of the result. The hypothesis that qualities that potentially could be considered valuable by the client were continuously added throughout the brief and design phases was tested and proven false. The study revealed that the client regarded only short periods of time as having been directly value adding. In turn separated by long periods of time where the client only saw small amounts of value adding time. In total the scope of the study covered 17,040 worked hours. 17 % of these were regarded as having been directly added value by the client. Out of which 78 % took place during 27 % of the time.

KEY WORDS

Value, Value creation, Brief, Design, Client perspective, Resources.

INTRODUCTION

A negative development of the reputation of the Swedish construction industry has been attested in literature and governmental reports. Finansdepartementet (2002) stated that construction is an industry displaying low productivity development, high costs, low quality and low profitability. Simu (2007, p. 1) described the industry as suffering “from poor performance and a lack of control in various stages of the process”. While efforts have been made to investigate the origin of the industries perceived deficiencies, e.g. Josephson and Saukkoriipi (2007), little of the research has focused on identifying the contribution made by each project participant.

A decision to initiate a construction project is reasonably “rooted in a wider set of beliefs of how the firm competes”, i.e. the business strategy, and expected to increase its profitability (Bowman and Ambrosini 2000, p. 3, Thomson, Austin, Devine-Wright and Mills 2003). Furthermore, the business strategy “defines what the project must deliver to be successful” (Thomson et al. 2003, p. 340). However, as specialisation within the Swedish construction industry has increased steadily since

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the early 20th century, clients may have found it increasingly difficult to assure that a project progresses in line with the business strategy as intended (Nordstrand 2000). That clients, according to Finansdepartementet (2002), have lost strength within technical and legal issues only strengthens the argument. If competence, and hence the ability to cope with uncertainty, have found new carriers the power balance within project organisations may have shifted (Clegg, Kornberger and Pitsis 2005). This may have lessened the influence exercised by clients during the projects. Firstly upon completion of a construction project is a client able to assess the value received in relation to the value needed, an assessment that is influenced by the values held by individuals (Bowman and Ambrosini 2000, Thomson et al. 2003).

While there are numerous representations in literature of construction project progression there is a lack of research on the client's perception of the same progression. Commonly, construction projects are described as relay-races depicted by adjoining arrows, in which each arrow represents a separate phase (e.g. Nordstrand 2000, Nordstrand and Révai 2002, Sporrang 2006). A construction project can also be seen as a dynamic and continuous reduction of uncertainty over time (e.g. Winch 2002). Together these two types of illustrations can be interpreted as portraying continuity in project progression and in uncertainty reduction. The focus of this study has been on elucidating the clients understanding of project progression. Thomson et al. (2003, p. 334) have argued that "the construction industry needs to engage stakeholders in a dialogue of value delivery to understand what they need from their products". This study could serve as a basis when discussing the alignment between the services offered by the construction industry and the needs of the client. The studied hypothesis was that qualities that potentially could be considered valuable by the client were continuously added throughout the brief and design phases.

LITERATURE REVIEW

In line with Winch (2002, p. 5) investments in construction can be regarded as value adding since "they create something where there was nothing, create new assets to be exploited for private benefit and public good". However, value "is not a measurable product attribute" but an assessment of product qualities (Thomson et al. 2003, p. 337). The amount of value assigned to a product can be said to depend on the extent to which it meets the needs of a customer (Bowman and Ambrosini 2000). Even so, "objective interpretations of value are commonplace" as monetary amounts, i.e. prices, are assigned to products (Thomson et al. 2003, p. 337). Price is seen as objective as it is based on "the relationship between benefit and expense", while had the assessment been based on values held by an individual it would have been considered a subjective interpretation of value (Thomson et al. 2003, p. 339). However, the price of a product is not solely set on the basis of a products capability to meet the needs of a customer. It is also determined by the relative power balance between buyer and seller, in turn affected by the to a varying degree imperfectly competitive factor market (Barney 1986, Bowman and Ambrosini 2000). Purchasing decisions are no longer considered rational, as the economic man has come to be regarded as a simplification, decisions are commonly seen as based on expectations (Bowman and Ambrosini 2000, Eklund 2004). During design "value is envisioned" by the client, based on expectations the client assigns a value to the future asset, however, it is not until construction works are completed and the building is handed over that these expectations are replaced by an assessment of the actual building (Thomson et al. 2003, p. 340). Nevertheless, when a sale takes place, the value realised in the form of a monetary amount is called exchange value (Bowman and

Ambrosini 2000). In a real estate context it has been defined as the “amount the property is realistically likely to sell at in the open market” by Miller and Geltner (2005, p. 252) and as the “open market price of a building” by Thomson et al. (2003, p. 338).

Neither exchange value nor costs for production represents the value acquired by a client when commissioning a building (Aniander, Blomgren, Engwall, Gessler, Gramenius, Karlson, Lagergren, Storm and Westin 1998, Bowman and Ambrosini 2000). Instead, the value created in a construction project can be considered two-dimensional, the first dimension being exchange value and the second dimension being perceived use value (Bowman and Ambrosini 2000, Miller and Geltner 2005). The latter represents a subjective valuation of the amount of utility or the functions in a building by a client (Aniander et al. 1998). In a real-estate context, it was defined as the most productive use of a property identified by a prospective buyer by Miller and Geltner (2005) and as the “value of a building to the organization performing activities within it” by Thomson et al. (2003, p. 338). In a general context it was defined as “the specific qualities perceived by customers in relation to their needs” by Bowman and Ambrosini (2000, p. 2). While similar to the definition of quality by Thomson et al. (2003, p. 337), “the quality of a product is an assessment of how well its qualities (that is its features or attributes) meets the customer’s needs”, the latter lacks the subjective valuation underpinning the definition by Bowman and Ambrosini (2000). It becomes evident though that the perceived use value of a product is based upon the qualities of a product in relation to the needs and perception of a client or customer.

The project stakeholders “determine the functional, physical and symbolic product characteristics that are necessary to achieve customer satisfaction” (Thomson et al. 2003, p. 334). According to Aniander et al. (1998) product development should begin with these product characteristics, and if so, any improvement to that process would make the development more cost-effective. In construction product development is commonly resembled to a relay-race (Sporrong 2006). Carried out by a temporary organisation, their first task is to identify the needs of the client during the brief and to thereafter specify a product, i.e. a building, that meets those needs during design (Nordstrand 2000, Winch 2002). The brief is intended to lower the level of inherent uncertainty in the project, partly through various investigations but also through frequent interaction in-between the participating actors, including the municipality (Nordstrand 2000, Winch 2002, Sporrong 2006). The temporary organisation commonly consists of the client, a project manager, an architect, consultants, specialists and occasionally future tenant representatives (Nordstrand 2000). The process results in a building programme that should include all known conditions and requirements affecting the building while reflecting what the client values and serving as an input to the client’s decision of whether or not to proceed (Nordstrand 2000, Nordstrand and Révai 2002, Thomson et al. 2003). If the client decides to proceed, design commences, commonly divided into three phases: concept design, scheme design and detailed design, successively lowering the level of uncertainty and increasing the level of detail (Nordstrand 2000, Nordstrand and Révai 2002). The objective of the design phase is to design a building that meets all the requirements presented in the building programme while adapting to the known conditions and avoiding collisions in the design (Nordstrand 2000, Winch 2002). Throughout the process the consultants deliver proposals to the client as to acquire additional feedback and approach a solution to the problem (Winch 2002).

While “a firm’s resources at a given time could be defined as those (tangible and intangible) assets which are tied semipermanently to the firm” it is only the members of the temporary project organisation that are able to create value for the client (Wernerfelt 1984, Bowman and Ambrosini 2000, p. 172). Yet, “construction is essentially a service industry”, meaning that neither consultants nor contractors sell results or products but a capability to produce those (Bowman and Ambrosini 2000, Winch 2002, p. 181). This capability though is uncertain as “performance varies from staff member to staff member” (Bowman and Ambrosini 2000, Winch 2002, p. 182). Peteraf (1993, p. 180) described these “productive factors in use as having intrinsically differential levels of ‘efficiency’” which can be manifested in their varying ability “to meet customers’ needs” (Bowman and Ambrosini 2000, p. 2).

Based on the aforementioned arguments (the influence of the power balance between buyer and seller on price, the imperfectly competitive factor market, the influence of expectations on early assessments of value and the varying performance of labour) exchange value and costs for production are seen as unfit determinants of value. The reasoning is supported by Bowman and Ambrosini (2000, p. 4) who stated that “exchange value is not transferred into the organization’s production or distribution process, only use value is”. To clarify, a client receives use value equal to the amount perceived. The use value available for a client to perceive will be found in the qualities of a building, and these qualities exist as a result of the use of human labour to whom value creation is attributable.

METHOD

The object of this case study was the brief and design phases of a five-storey office building to be constructed in Gothenburg. As it was conducted detailed design was being finalised. The study was designed so that it would test the hypothesis and extract the client’s assessment of the resources consumed throughout the studied phases.

Interviews guided by an aide-mémoire were held with the client, the contractor and the city planning office to gain an increased understanding of their roles in the project. As the city planning office included many sub organisations, each of the following were interviewed once: the surveyor, the plan architect and the building permit administrator, all assigned to the project. As “the generation of an intensive, detailed examination of a case” was sought for each interviewee was instructed to describe the sequences of the project from their organisations point of view (Bryman and Bell 2007, p. 62).

To construct a timeline of past events in line with Bryman and Bell (2007) documents produced, acquired and received by the interviewed organisations were studied. These documents included invoices received by the client, minutes from meetings held by the project steering committee, a diary for the registration of property, records of the hours allotted to the project by the plan architect and the contractor and a copy of the granted building permit. With these documents and interviews it was possible to map the use of resources throughout the studied phases of the project. Daily averages, based on the period of data, of the hours consumed by each resource were calculated and plotted in graphs ranging from January 1 2008 to October 31 2009. Descriptions of the kind of services acquired by the client were added based on the interviews and literature.

As nearly all of the resources consumed throughout the studied phases were mapped and descriptions of each were added it was possible for a representative of the client to assess the extent of each resource’s contribution to the project. Based on the

stated arguments cost was disregarded and time served as a basis for this assessment. This enabled the representative to focus strictly on the contribution made by each resource without taking its associated cost into account. The evaluation took place during interviews in which the representative was instructed to also further elucidate the kind of contribution each resource had made. It was designed so that the representative allocated time consumed by the resources to three different colour-coded categories. The assessment was based on the premise that, in line with arguments by Thomson et al. (2003) and Bowman and Ambrosini (2000), all value created throughout the studied phases could be found in the qualities, that was the designed features and attributes, of the building. Therefore, there was no definite amount of value assigned to neither the building as a whole nor any specific attribute or feature of it. By doing so the study was also able to circumvent the argument by Thomson et al. (2003) that clients are incapable of evaluating a building prior to its completion. The three categories to which time consumed by the resources was allocated were: light grey, dark grey and black.

Time that was consumed by a resource producing a feature or attribute that at the time of the study could be found in the design of the building was represented by the colour light grey. The category though, also included preceding work that had led up to the final design. Time consumed by resources belonging to this category was termed directly value adding. This since, in line with Bowman and Ambrosini (2000), use value has been created if the consumed resources result in a feature or attribute of the design, however, the final assessment does not take place until the client receives the finished facility. Up to that point it remains uncertain whether or not the client perceives it as use value or not.

Time that was consumed by a resource to make the project feasible, however, without producing a feature or attribute that at the time of the study could be found in the design of the building was represented by the colour dark grey. Allocated to this category was time consumed to either enable a subsequent step, to comply with requirements by authorities, to enable the use of current methods (Saukkoriipi 2005), to bring the design of the building forward without being a part of it or time that could not have been removed without having affected the perceived value acquired by the client. Time consumed by resources belonging to this category was termed indirectly value adding.

Time that was consumed by a resource without affecting the project was represented by the colour black. The result of the consumed resources belonging to this category either came to be scrapped or re-worked and time consumed by resources belonging to this category was termed not value adding (Bowman and Ambrosini 2000, Roper 2003).

EMPIRICAL FINDINGS

Although the project had existed within the client organisation prior to the period covered by the scope of the study, it was not until January 2008 that an architect and a project manager was hired, followed in February by a structural engineer and in March by a heating, ventilation and plumbing consultant and an electrical engineer. During an interview the client described how the architect had been given the mission to design a building “that was about 4000 m², would connect two adjacent buildings and have a striking design”. That several conceptual suggestions were produced prior to the brief ending at March 31 greatly affected the clients assessment of the work conducted as only 20 % was considered directly value adding, the remaining 80 % was considered not value adding. The 20 % represented the client’s assessment of the

time spent by the architect producing the conceptual suggestion that came to be adopted. On February 8 the client applied for a change in the municipal detailed development plan as the site on which the building was to be constructed was a public square.

During the two subsequent months a soil mechanics engineer, an acoustician, a telecommunications consultant and an environmental consultant was added to the project group that were occupied with a first, simplified, version of schematic design finalised on May 31 2008. Initially the soil mechanics engineer relied on previously available information, but as this proved to be unreliable once drilling began, a large quantity of work came to be scrapped. This was reflected in the clients assessment of the time spent as 50 % was considered to have been indirectly value adding and 50 % was considered to not have been value adding. A large part of the work functioned as the basis for design of the foundation. However, as no suggestions were made from the soil mechanics engineer the client did not regard the efforts as value adding.

Approaching summer the extent of the project teams' engagement was reduced until the end of July where it picked up again as efforts to develop a deepened schematic design were increased (see Figure 1). This deepened schematic design also formed the basis for tender documents received by contractors on September 26. The procurement was subject to the Swedish Public Procurement Act and an open-competitive tendering process was chosen by the client. There were six contractors that supplied tenders, as these began working the project teams' involvement in the project decreased substantially. Tender documents were due to the client on November 27. In total only 2,5 % of the time spent by the contractor during this tendering period was considered to have been directly value adding, this in turn represented 75 % of the time the structural engineer hired by the contractor spent on developing an alternative tender that later came to be adopted by the client. 25 % of the time was estimated to have been indirectly value adding and 72,5 % was considered not value adding.

Tender documents were then examined, processed and balanced by the client aided by the project manager throughout January and February 2009. However, once the client had awarded a contractor the contract the project was efficiently put to halt until late April as a competing contractor appealed the awarding process. This greatly affected the clients' assessment of the work conducted by the hired project manager. During March and April 90 % of the time spent was considered as not having added value. The remaining 10 % was considered to have been indirectly value adding.

On January 16 the client had applied for a cadastral procedure to secure future construction. However, as the building being designed was to connect two adjacent buildings through footbridges it required for the cadastral procedure to include three-dimensional spaces which prolonged the procedure.

The project team gained momentum once again as July came to an end and the third deepened schematic design was produced in collaboration with the awarded contractor (see Figure 1). That version of the schematic design was the last element of design covered by the scope of the study.

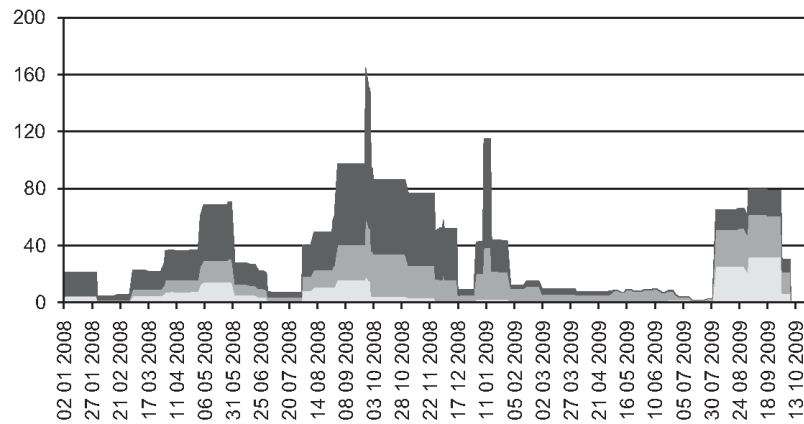


Figure 1: The client's assessment of the contribution to the design of the building from the resources consumed throughout the project.

The detailed development plan enabling the future construction works gained legal force on July 22 2009. Although necessary by law the client regarded no part of the detailed development planning process as value adding, instead parts of it was seen as not having been value adding. During the consultation process several changes were brought about but these efforts did not add any value according to the client whom regarded the consumed resources as not having added value for 40 % of the time up until November 28 2008 and for 10 % during the remainder. The cadastral procedure was approved and registered by the city planning office on September 17 2009.

In total the scope of the study included the client's assessment of approximately 17,040 hours consumed by consultants, the awarded contractor, the city planning office and others. Compiling the assessments reveals that almost 17 % of the consumed resources were regarded as having directly added value, roughly 32 % was seen as indirectly having added value and the remaining 51 % was considered as not having been value adding (see Figure 1).

DISCUSSION AND CONCLUSIONS

Not all resources consumed on behalf of the project have been included in the study which constitutes a limitation. Those excluded are the clients' internal resources, the building permit administrators, the lawyers engaged in the appeal, the five contractors that were not awarded the contract and the sub-contractors and material suppliers that supplied all the construction contractors with tender documents. Assuming that the other contractors spent an amount of time equal to that of the awarded contractor on their tenders and that the client would not have considered it value adding another 23,600 hours could have been added.

The stated hypothesis proved to be false during the study. As can be seen in Figure 1, value was not conceived as having been continuously added throughout the project. The time considered value adding by the client was concentrated to three periods of time: between April 1 and May 31 2008 16 % of the time spent was regarded value adding, between August 1 and September 26 2008 19 % of the time

spent was considered as value adding and between August 3 and September 30 2009 43 % of the time spent was seen as value adding. In total 78 % of the time consumed by resources regarded as having been directly value adding was spent during 27 % of the time covered by scope of the study. These periods all coincide with the periods during which the project team were working with the schematic design.

The relay-race model of construction projects carries with it several decision points at which a client decides whether or not to proceed (Nordstrand 2000, Nordstrand and Révai 2002, Sporrang 2006). These decisions are made by clients based on the information currently available to them. However, while the brief is intended to elucidate all known conditions affecting the project, the brief and the design is a process of uncertainty reduction. It became evident when the client assessed the soil mechanics engineering work that some decisions were made with great uncertainty still present. Otherwise half of the work conducted would not have been regarded as not having added any value.

A process of conjecture was identified in the project prior to work commencing on the first, simplified, version of schematic design in April 2008. Nordstrand (2000) described this process of producing conceptual designs already in the brief as a process of assuring the feasibility of certain elements of the building programme. Winch (2002) described how conceptual designs are approved or disapproved firstly within the architectural firm and secondly by the project group including the client. Since the symbolic design of the building was a key issue for the client this process could be regarded as in line with the description of the cost-effective product development by Anlander et al. (1998). It also exemplifies the clients influence upon the level of uncertainty in the project being a source of information. Originating from the client during these phases information is then spread and processed throughout the project organisation also placing demands on coordination.

To determine the performance of project teams during the brief and design phases of construction projects further research is needed. If additional, similar studies enabled comparisons, it could be possible to identify key factors affecting the level of work resulting in features and attributes, and possibly use value. It could also benefit the industry in its efforts to respond to the critique it is experiencing.

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Part II: Research Material

1 Introduction

Yearly investments in Swedish construction represents 8 % of the gross domestic product and the industry employs 6.2 % of those gainfully employed (Sveriges Byggindustrier 2007). While the largest share of the industries turnover is likely found in on-site works there is still a substantial amount of resources consumed throughout the brief and design phases.

Since the early 20th century, when the master builders came to be accompanied by specialists and architects, the industry has become increasingly specialised (Nordstrand 2000). Most of these specialists have the brief and design phases of construction projects as their main arena. Phases that rarely have been analysed in retrospect as to evaluate the successfulness of its completion.

The reputation of the Swedish construction industry has suffered lately, it has become perceived as displaying low productivity, high costs and low profitability (Finansdepartementet 2002). It has also been described as suffering “from poor performance and a lack of control in various stages of the process” (Simu 2007, p. 1).

While a wide variety of origins to these deficiencies have been found, e.g. Josephson and Saukkoriipi (2007), little of the research has focused on identifying the contribution made by each project participant. The focus of this study has therefore been to investigate and analyse the process of value creation throughout these phases.

2 Method

A five-storey office building to be constructed constituted the case of the study. The study incorporated several research methods: a literature review, interviews and a documentary data collection with subsequent analysis. Use of several methods was described by Bryman and Bell (2007, p. 63) as a common approach within case study research as to avoid “too great a reliance on one single approach”. Within this study the main objective was to avoid overseeing issues not coming forth using one particular method, i.e. obtaining a wide understanding of the processes. The scope of the study corresponded to the time period, ranging from January 2008 to October 2009, during which the studied phases took place.

The study commenced with an iterative literature search where articles relating to definitions of value, value creation and construction were sought for in electronic databases. Resulting articles were initially evaluated on their abstracts: those deemed applicable were read in full. Several of the articles read primarily related to property valuation, not the assessment of resources in use. However, in an article by Bowman and Ambrosini (2000) the value creating ability of resources in use was elucidated. The article, incorporating aspects of value as well as resources, was based on a strategic management theory called the resource-based view of the firm (RBV). The search for applicable theories was from here on replaced by a search for articles that related to RBV. The list of references in Bowman and Ambrosini (2000) proved to be a vital source of further reading. Articles that criticised RBV, e.g. Priem and Butler (2001b, 2001a), were included in the literature review. The literature review enabled defining the use of resources in three categories that were used in the subsequent interviews during which the client assessed the use of resources. Construction related literature was also studied as to gain an increased understanding of the context in which the studied processes of value creation took place. But also to increase the understanding of the various roles held by the different project participants.

The client, the city planning office and the awarded contractor were interviewed to elucidate their respective contributions to the project. As the city planning office included many sub-organisations, each of the following were interviewed once: the surveyor, the plan architect and the building permit administrator, all assigned to the project. All interviewees had been contacted in advance, either by phone or e-mail, and had received a short description of the study. As the interviews began this was repeated, partly for the respondent to gain an understanding of the subject but also to facilitate the reception of answers to unasked questions. The interviewees were then asked to describe the sequences related to the project from their organisations point of view. Shorter transcripts were written after each interview.

To investigate the extent of each participant’s involvement in the project a documentary data collection was conducted. Documents produced, acquired and received by the studied organisations constituted a substantial part of the collected data. These were gathered as to acquire an insight to where, when and with what purpose resources had been consumed. Some of which were publicly available while others were not. As described by Bryman and Bell (2007) these were used to construct a timeline of past events. At the clients premises all invoices related to the project were reviewed and dates, origin and content was written down. Additionally, the client supplied minutes from all meetings held by the project steering committee. These were all documents that could be regarded as internal to the organisation, not publicly available. From the surveyor at the city planning office a project diary for the

registration of property was received. It contained dates for some of the events as well as excerpts from correspondence. The plan architect supplied a list of the hours spent on the developing the new detailed development plan as well as a copy of the project diary. The building permit administrator at the city planning office supplied a copy of the granted building permit. These documents were official and to a varying degree easily accessible.

The documentary data collection and the interviews were used as a basis when producing documents used in the subsequent assessment by the client. These were documents that included a graphical representation of the extent of the use of the resources over the time period covered by the scope of the study and a descriptive text. These were used by the client during the assessment of the used resources conducted during the interviews.

During these interviews the client allocated parts of the used resources to the three categories: directly value adding, indirectly value adding and not value adding. Directly value adding meant that the results of those efforts were incorporated in the building as it was envisioned at the point in time of the study. These were the consumed resources that turned a blank sheet of paper into the design of the building. In the graphical representations of the consumed resources in Figures 1-23, this is represented by the colour light grey. Indirectly value adding was such use of resources that neither contributed to the design of the building nor created any utility. However, without these efforts the project could not have proceeded. It could have been such efforts that enabled a subsequent step, were required by current methods (Saukkoriipi 2005) or were required by the state or the municipality. In the graphical representations of the consumed resources in Figures 1-23, this is represented by the dark grey. Not value adding represented such efforts that were not represented in the design of the building, required re-work or were scrapped. In the graphical representations of the consumed resources in Figures 1-23, this is represented by the colour black. These interviews enabled the graphical representations of the used resources to be colour coded and enabled a summarised presentation of the client's assessment of all the resources consumed throughout the project.

3 Literature Review

The reported study has included a literature review which began with a search for literature relating to value and value creation. After a wide search for applicable theories the resource-based view of the firm was found. It is a theory based in the field of strategic management that focuses on the competitive advantages of firms. It bases its reasoning on the value creating capabilities held by firms through their resources.

In this section the three areas covered by the literature review are presented one by one, beginning with the brief and design phases of construction projects, continuing with the resource-based view of the firm and ending with value and value creation.

3.1 The Brief and Design Phases of Construction Projects

The brief and design phases of construction projects in Sweden could be considered a transformation of information. Departing at the client the information travels through the two phases prior to arriving at the site (Nordstrand 2000). A process that commonly is portrayed and performed in a way that resembles a relay race (Sporrong 2006). When the information reaches the site it has gone from being requirements stated by the client to being descriptions of “what is needed to be done” (Fearne and Fowler 2006, p. 284).

3.1.1 The Brief Phase

The brief is conducted from a client’s point of view, it is meant to describe the needs of the client while taking influencing conditions into account (Nordstrand 2000). Winch (2002, p. 183) described the brief as “the process of turning the client’s desire for a facility into a clear brief”. By identifying the desired end-state, resources can be mobilised (Winch 2002). The undertaken investigations: of the building itself, its surroundings, overall project economy and time aspects, has a large influence upon conceived project success (Nordstrand 2000, Winch 2002). A project manager, aided by the client, and possibly one or several specialists subordinate to the project manager, carry out the brief (Nordstrand 2000). A close cooperation and a common understanding of the project goal can be a result from frequent interaction and communication among the participating actors (Sporrong 2006). If activities are conducted in such a way that they are interdependent of the client as well as the other participants interaction is enhanced and friction may be reduced (Roper 2003). Keeping the organisation small has been described as a key feature of the brief by Söderberg (2005) and Sporrong (2006). Throughout the brief the project organisation communicates with authorities and the municipality, especially regarding the future location of the building (Nordstrand 2000).

The motive behind investing in buildings was described by Winch (2002, p. 50) for clients as “providing a utility which can be exploited by themselves or others to provide goods or services which generate benefits, thereby providing the returns on the investment”. Nordstrand (2000) and Winch (2002) have both described business process analysis as the common means of identifying the needs of the future activities. It means analysing the current and future operations in detail, including aspects such as staff, organisation, machinery, activities, spatial needs, material flow and future working environment (Nordstrand 2000). Spatial needs can according to Winch

(2002) be identified through analysing material and people flows. While neglected in Nordstrand (2000), Winch (2002, p. 52) has recognised another dimension of spatial needs, as being possible enablers of interactions among people, especially important for “organisations whose competitive advantage comes through innovation”. Spatial needs are listed in comprehensive internal plans, added to which functional and other demands for certain rooms are listed (Nordstrand 2000). Indoor environmental quality was described by Winch (2002) as an important factor affecting among other things productivity. Besides which Nordstrand (2000) has listed demands on fire protection, requirements on supply of electricity, electronic communications and control systems as well as complying with the Swedish Planning and Building Act 1987:10, the Act on Technical Requirements for Construction Works 1994:847, the Swedish Environmental Code Ds2000:61 and the Work Environment Act 1977:1160. The environmental policy of the client is given importance when defining requirements in terms of function and quality in the buildings environmental programme (Nordstrand 2000). Commonly included are aspects relating to natural resources, indoor environmental quality and the outdoor environment (Nordstrand 2000).

Miller and Geltner (2005, p. 58) stated: “location is what makes one urban land parcel worth more than another” and added that “you compare one site to another for the location that produces the highest productivity for your expected use”. If the future location of a building is uncertain an investigation is conducted to determine what the most beneficial location for a certain kind of building would be, taking into account: communications, access to energy and raw materials, labour market, housing situation, municipal service, municipal plans and environmental demands among others (Nordstrand 2000). As Anstey (1973, p. 22) wrote: “location is often, and rightly said to be a prime factor in demand because people want to be ‘near’ to things – to their friends (or social equals or superiors), to shops, to transport, to open spaces and sports grounds, to theatres, to schools, to their work, to the sea, to the country, to airports, to a host of other things, sometimes highly specialised, and ‘far from’ other things – far from smoke, fog, industry, from airports (especially airports!)”. To summarise, Tunstall (2006, p. 118-119) stated that “the design and use of many buildings is also influenced by factors outside the site boundary, by conditions in the immediate locale and beyond in the surrounding neighbourhood”. Communication with authorities and the municipality is often required for issues concerning: water, sewage and electricity as well as assuring compliance with the Swedish Planning and Building Act 1987:10 and the Swedish Environmental Code Ds2000:61. Once a site or several are chosen, an investigation regarding the consequences from the sites topography, accessibility, and geometric shape is conducted (Nordstrand 2000). Taken into account are also results from a geotechnical survey and costs to acquire the site (Nordstrand 2000).

“The budget is the most important single measure of project performance” (Winch 2002, p. 232). As the brief comes to an end, more information has been gathered and it is possible to increase the accuracy of the budget (Nordstrand 2000, Winch 2002). It is also common practice to renew the projected schedule as it serves to guide the future works (Nordstrand 2000).

As investigations are completed and budget as well as schedule has been updated, all results are gathered in the brief (Nordstrand 2000). Nordstrand (2000) lists the following as commonly included; a description of the project, a operational description, a comprehensive interior plan, a site investigation, the results from a geotechnical survey, sketches, an environmental plan, a quality policy, a project

schedule and a project budget. Based on the brief the client decides whether or not the project will continue past this point (Nordstrand 2000).

3.1.2 The Design Phase

Subsequent to the brief is the design phase, commonly divided into three parts: concept design, scheme design and detailed design (Nordstrand 2000). Having as its purpose to describe a building that meets the needs of the client, it remains essential throughout the design process to receive feedback from the client and the other members of the project coalition (Nordstrand 2000).

As in the brief, there is a project manager assigned to the design, among the responsibilities are: organising, planning and coordinating the participants efforts, handling the procurement of contractors and consultants, supervising the clients demands in regards to quality and the environment, communicating with authorities and the municipality as well as updating budget and schedule estimates (Nordstrand 2000).

Designing the building so that it is at once aesthetically pleasing and functional, thereby suited for the activities that it will house, is the task of the architect (Nordstrand 2000). For instance, “spatial configuration can provide utility through enabling efficient and effective business processes”, but the architect is also responsible for suggesting room designs and façades, choosing materials, colours and parts of the interior (Nordstrand 2000, Winch 2002, p. 52). As the architect attempts to ensure that the needs of the client are met, “that an office encourages interaction between staff, while allowing quiet space for activities requiring focus on privacy, is an inherently spatial problem” is only an example of the influence an architect has on the creation of value (Winch 2002, p. 52). If successful, informal channels of communication can be created, listed by Bruzelius and Skärvad (1989) as one of five components of culture. Culture was described as the key source of competitive advantage for the Swedish branch of a consultancy called Ramböll in an article by Dickson (2009). Furthermore, that the complexity of the social settings can provide a competitive advantage, i.e. increased efficiency and effectiveness, was recognised by Barney (1991) as well. By visualising the results of their work through perspective images and models architects should enable clients, members of the design team and future users to picture the building in operation and make better informed decisions (Nordstrand 2000).

Besides a project manager and one or several architects, several other professionals contribute to the design process: e.g. structural engineers, soil mechanic engineers, interior architects, water supply and sewerage consultants, and electrical consultants (Nordstrand 2000). Soil mechanic engineers examine soil conditions, document and analyse the results and suggest an appropriate type of foundation (Nordstrand 2000). A structural engineer is responsible for designing the structure of a building so that it withstands loads, but also cold, heat, fire, sound and moisture (Nordstrand 2000).

Concept design may commence in the brief already, with the purpose of assuring certain aspects of the design from the clients point of view, however, if concours are used to appoint architects it is handled separately and submissions are based on the brief (Nordstrand 2000, Winch 2002). Concept design is meant to answer several questions, e.g. how the building will be situated on the chosen site, how exterior communications will be arranged, where entries shall be placed and how to assure

sufficiently and efficiently interconnected rooms (Nordstrand 2000). The process is commonly led by the architect, who sketches suggestions of the future building, these are then analysed by the other members of the design team as to assure conformity with the clients brief (Nordstrand 2000). Besides being analysed on a functional, environmental and managerial level, suggestions are also analysed from an aesthetical point of view, including issues of harmonic proportions, room character, material surfaces, colour scheme and construction details (Nordstrand 2000). The result of concept design is a main alternative, presented through a site plan, floor plans, façades, and drawings of important cross sections (Nordstrand 2000).

As in concept design, the brief functions as a basis for scheme design as well, the purpose of which is to design and decide upon the buildings structure and components so to assure accordingly performance (Nordstrand 2000). A buildings dimensions are set by: the spatial needs of components, necessary vertical shafts, horizontal pipe passages, horizontal channel passages, horizontal cable passages and structural components, commonly the final requirements are set by certain cross sections (Nordstrand 2000). Once completed, scheme design is supposed to present a current view of the project to the client, as to enable a decision whether or not to proceed, but also constitute a complete product design, lacking only detail design (Nordstrand 2000).

Scheme design is, besides complying with the brief, required to comply with the project environmental plan, the Act on Technical Requirements for Construction Works 1994:847 as well as supplying descent working conditions for construction workers and future occupiers (Nordstrand 2000). However, when reviewing possible solutions it is commonly their effect on the buildings operational costs that is decisive (Nordstrand 2000). This importance is exemplified in a report by Sporrang (2006) who described the inclusion of the facility manager in an early phase in a housing project in Göteborg where an architectural firm partnered with an contractor.

The result of scheme design is commonly presented through an overall project description, a project schedule, a geotechnical survey, technical descriptions, drawings, a budget including operational costs and possibly a basis of estimate (Nordstrand 2000, Winch 2002).

Detailed design, the final part of design, includes “the preparation of final working drawings and specifications for the total construction programme” (Sears, Sears and Clough 2008, p. 4). Measurements are fixed as final decisions are made on placements of doors, sanitary ware and electric fittings (Nordstrand 2000). Floors, walls, ceilings, interior fittings and paintwork is also finally decided upon (Nordstrand 2000). The participating actors need to cooperate closely as the briefs functional demands are transformed to technical solutions that comply with the demands in the Act on Technical Requirements for Construction Works 1994:847 and the project environmental plan (Nordstrand 2000). It is important that the detailed design documents are prepared in such an way that the contractors never doubts the clients intention (Nordstrand 2000). In addition, if conceived correctly, these documents enable a contract between the parties while disabling conflicts (Söderberg 2005). Throughout the process the project manager verifies the time scheme and the budget, once finished the project manager may produce operational- and maintenance instructions for the future use of the building (Nordstrand 2000).

Detailed design documents include; drawings, descriptions, and lists, all sharing the purpose of enabling several different actors to use the information for various

purposes, e.g. tendering and during construction (Nordstrand 2000). Since these documents pass through several organisations they are commonly formalised according to the Swedish construction industry classification system, abbreviated BSAB (Nordstrand 2000, Nordstrand and Révai 2002). Drawings are complemented by descriptions, produced according to the AMA-system, which are general material and work descriptions (Nordstrand 2000, Nordstrand and Révai 2002). The purpose of the AMA-system is to express the client's demands in an unambiguous way through prescribing conventionally practiced methods, thereby guaranteeing workmanship and material performances (Nordstrand 2000, Söderberg 2005). Façades, finishes, and equipment on walls, ceilings and floors are accounted for in room descriptions (Nordstrand 2000). The number of units that will be manufactured or acquired of a certain component is listed in bills of quantities, those not listed are acquired by the contractor from drawings and descriptions (Nordstrand 2000). From a national economic principle it would be most beneficial if the client supplied the contractors with bills of quantities instead of them all preparing their own (Söderberg 2005).

The preceding section describes the common view of purpose and objectives within the design process, however, FOBS and STD (2007) has described the process as commonly unsatisfactory. Common faults described are; unnecessary costs, technical problems, and an insufficient description of the building to construct (FOBS and STD 2007).

3.2 The Resource-Based View of the Firm

According to Barney (1991) the resource-based view of the firm (RBV) allows its resources to be used for evaluation of the firms potential for sustained competitive advantage. RBV uses resources instead of products as a basis for assessment (Wernerfelt 1984). It is the variance in efficiency between different resources in use that explains performance differences, not only market power and/or collusive behaviour (Peteraf and Barney 2003). This variance in efficiency is portrayed by their inability to generate equal levels of rents.

A basic condition for RBV is that resources are heterogeneously distributed among firms, Peteraf and Barney (2003) has described it as the sine quo non of RBV, without it there would be no theory. It is the characteristics of these heterogeneously distributed resources, especially their scarcity and their superiority in use, which leads to competitive advantage.

A defining feature of RBV is that it concerns resources and capabilities held by a firm, thereby excluding externalities such as changing market conditions or interactions between firms (Peteraf and Barney 2003). Priem and Butler (2001a) has criticised this lack of inclusiveness, however, it needs to be noted that RBV according to Peteraf and Barney (2003) and Barney (2001) is not an all encompassing theory but a complement to analysis of other levels as industry, strategic group and macro environment.

Priem and Butler (2001a) question the managerial applicability of RBV as they are unable to see any prescriptions being withdrawn from it. Their main argument being that RBV simply advises practitioners to acquire valuable and rare resources as to gain competitive advantage, and for sustained competitive advantage to be acquired those resources should be hard to imitate and not substitutable. However, not delivering any criteria upon which each resource can be evaluated. While Barney

(2001) agree that some of the criteria, such as path dependence and social complexity, are not of a prescriptive character he points to the fact that they may still be a source of competitive advantage. Barney (2001, p. 50) also acknowledges that unless a firm has valuable resources to begin with the theory will offer no guidance as to how to obtain those since the theory then would be a so called “rule for riches”. As a response to the critique from Priem and Butler (2001a) Barney (2001) has exemplified how RBV can be used by managers to benchmark their current resource base, to realize the potential of their current resources, to identify their sources of competitive advantage and how it can be used to nurture and protect rare and valuable resources. Barney (2001) does however recognize that there are limitations to the theory, especially in regards to causal ambiguity where managers of a firm are unaware of their source of competitive advantage.

Critique has been raised by Priem and Butler (2001a) regarding possible tautology in a statement by Barney (1991, p. 107): “valuable and rare resources may be a source of competitive advantage”. Priem and Butler (2001a, p. 106, p. 104) exemplify their claim by rewriting the statement using definitions from Barney (1991) leading to an analytic statement where valuable resources are those that “enable a firm to conceive of and implement strategies that improve its efficiency and effectiveness” and that firms that share an equal resource base cannot acquire a competitive advantage since “these firms all implement the same strategies, they all will improve their efficiency and effectiveness in the same way, and to the same extent”. Taken out of context this seems accurate, however, Barney (2001) describes that using definitions this way most theories can be rewritten so to seem tautological. The key being that the theory is actually empirically testable according to Barney (2001) thereby avoiding the issue of tautology.

3.2.1 Sustained Competitive Advantage

Barney (1991, p. 106) lists four specifications that a firm’s resources are required to hold if they are to be sources of sustained competitive advantage: “(a) it must be valuable, in the sense that it exploit opportunities and/or neutralizes threats in a firm’s environment, (b) it must be rare among a firm’s current and potential competition, (c) it must be imperfectly imitable, and (d) there cannot be strategically equivalent substitutes for this resource that are valuable but neither rare or imperfectly imitable”.

What constitutes a valuable resource has been described by Barney (1991, p. 106) as a resource that “enable a firm to conceive of or implement strategies that improve its efficiency and effectiveness”. Barney (1991, p. 106) emphasises that while a firm may possess other qualities that are sources of competitive advantage, those are not considered as resources until “they exploit opportunities or neutralize threats in a firm’s environment”. Thereby, affecting the purchasing decisions of customers, creating value that meets or exceeds the customers’ requirements (Roper 2003).

If the resources required to compete on a specific market are scarce enough, that market will not display perfect market competitive dynamics and such a resource will be considered rare enough to generate a sustained competitive advantage according to Barney (1991).

3.2.2 Competitive Advantage

Barney (1991, p. 102) has defined a firm having a competitive advantage as “implementing a value creating strategy not simultaneously being implemented by any current or potential competitors” and has then added “and when these other firms are unable to duplicate the benefits of this strategy” it is an sustained advantage. Since RBV assumes static market conditions, sustained implies being able to withstand competitors attempts to siege the advantage (Barney 1991).

The bargaining relationships between a firm and its customers and suppliers manifests itself in its ability to generate a profit (Bowman and Ambrosini 2000). A sale requires that the customer regards the firm’s product as more beneficial than that of the competitors, and if so, any profit will be a result from the bargaining relationship between the firm and its suppliers (Bowman and Ambrosini 2000, Roper 2003). Profits can according to Peteraf and Barney (2003) be seen as rents generated by superior resources in use. Wernerfelt (1989, p. 4) stated that a firm with superior resources “can achieve a strong market position at a lower cost than” their competitors. Rents that are attributable to unique resources are called Ricardian and are not the same as rents resulting from luck or collusive behaviour (Montgomery and Wernerfelt 1988). Economic rents has been defined by Peteraf and Barney (2003, p. 315) as “returns to a factor in excess of its opportunity costs”.

While Peteraf and Barney (2003) explicitly stated that interpreting competitive advantage as above average profits is wrong Bowman and Ambrosini (2000) have expressed their reasoning through profit differentials. The risk being inclusiveness of too many competitors as well as other sources of profits than superior resources (Peteraf and Barney 2003). This has been avoided by Bowman and Ambrosini (2000) through defining competitors as those alternative suppliers evaluated by potential customers as well as focusing strictly on labour resources. Priem and Butler (2001a) critiqued the lack of a specified context for RBV in the article by Barney (1991), however, using the description from Bowman and Ambrosini (2000) there is a context in which resources can be valued.

Competitive advantage as defined by Peteraf and Barney (2003, p. 314), “an enterprise has a Competitive Advantage if it is able to create more economic value than the marginal (breakeven) competitor in its product market”, incorporates the concept of value creation presented in Bowman and Ambrosini (2000), the generation of rents presented in Peteraf (1993) and Peteraf and Barney (2003) while avoiding the term profit as emphasized in Peteraf and Barney (2003), suggested by Priem and Butler (2001a) and argued against by Barney (2001).

3.2.3 Heterogeneous Distribution of Resources

Central to RBV is the notion that resources may be heterogeneously distributed among firms within an industry and that resources may not be perfectly mobile (Barney 1991, Peteraf 1993, Barney 2001, Priem and Butler 2001a). However, different authors have treated heterogeneity differently, according to Peteraf and Barney (2003), Peteraf (1993) describes heterogeneity as one of four conditions for sustainable competitive advantage and as a source of rents, while Barney (1991, p. 101) assumes that “firms within an industry (or group) may be heterogeneous with respect to the strategic resources they control”.

The assumption by Barney (1991) is justified with the following three arguments. Competitive advantage could not be held by any firm if resource bases were identical since firms would conceive of the same strategies at the same times, reaching the same levels of efficiency and effectiveness (Barney 1991). Unless a firm could hold exclusive insights to a business opportunity there would be no first-mover advantages, meaning that no firm could increase their competitiveness through implementing strategies prior to its competitors (Barney 1991). A firm could not be protected by a barrier to entry unless competitive firms were unable to implement the same strategies due to lack of strategic resources (Barney 1991). Furthermore, Bowman and Ambrosini (2000) state that even if factor markets, where resources are acquired, were homogenous, labour is incapable of performing homogenously.

Ricardian rents are attributable to resource scarcity, in relation to demand, and are created when competitors begin using less efficient resources, thereby a product market in which firms have heterogeneous resources bases have been established (Peteraf 1993). Peteraf (1993) attributes monopoly rents to resource heterogeneity as well, however, requiring a deliberate limitation of output as to maximise profits.

3.2.4 Initial Market Conditions

In line with the argument by Barney (1991) regarding first mover advantages and resource heterogeneity, Peteraf (1993) stipulates that competition for acquiring a resource must not be so fierce that it consumes the rent generating capabilities. Barney (1986) described imperfect factor markets as necessary for implementing rent yielding strategies, or as Peteraf (1993, p. 185) put it “profits come from ex ante uncertainty”. Priem and Butler (2001a) critiqued this requirement since they, rightfully, deemed the market value of resources as exogenous to RBV. However, unless a firm is able to acquire a resource, either through luck or novel insights, for less than its profit generating capabilities all value will be consumed in the bidding process (Barney 1986). Peteraf (1993) has extended the requirement to include untradeable assets, such as customer relations or public image, since such costs may prove to be vital. Barney (1989, p. 1513) states: “only if the value of these assets in implementing strategies is not accurately anticipated as they are developed will above normal performance be possible”.

3.2.5 Subsequent Hindrance to Entry

Being able to withstand attempts from competitors to duplicate a strategy is the essence of sustained as expressed by Barney (1991). In a similar fashion Peteraf (1993) have conditioned that the generation of rents needs to be durable. By not being able to acquire the same set of strategic resources, competitors are prohibited from implementing identical strategies, i.e. heterogeneous resources bases are preserved (Barney 1991, Peteraf 1993). If supply increases as competitors enter a product market Ricardian rents will diminish as the elasticity in the supply curve is increased (Peteraf 1993).

Imperfectly imitable resources may constitute a protection from such efforts according to Peteraf (1993) and is required by Barney (1991) for them to be potential sources of sustained competitive advantage. Imitability can be avoided in several ways, Peteraf (1993, p. 182, p. 183 and p. 183) mentioned “property rights to scarce

resources and various quasi-rights in the form of lags, information asymmetries, and frictions which impede imitative competition”, “producer learning, buyer switching costs, reputation, buyer search costs, channel crowding, and economies of scale when specialized assets are required” and stated that it may be a result of “size advantages, preferred access to either resources or customers, and/or restrictions on competitors’ options”.

Preceding activities may play an important role, possessing production experience through having executed “the experience curve strategy correctly” and thereby being able to produce more efficiently and to a lower cost can be a competitive advantage (Wernerfelt 1984, p. 174). It may also be that a resource was acquirable at a certain point in time and either not proven valuable until later or only recognised as valuable due to preceding activities (Barney 1991).

If neither a firm enjoying a competitive advantage nor its competitors can identify the source of that advantage a state of causal ambiguity exists, which remains until either unravels the source and information is spread (Barney 1991, Peteraf 1993).

While social settings within organisations are described as commonly identifiable by Barney (1991) they are complex by nature and difficulty lies within understanding how such settings are created. Resources can take time to mature, to reach a desired state of efficiency, and may be influenced by historical occurrences to such a degree that it becomes impossible to identify the specific reasons for its efficiency (Barney 1986, Dierickx and Cool 1989). However, as Barney (1989) has pointed out whether or not these resources can be a source of above average profits depend upon the cost for which they have been acquired.

Substitutability, that a competitor finds “strategically equivalent valuable resources that are themselves either not rare or imitable”, is the second concern for firms enjoying a competitive advantage (Barney 1991, p. 111, Peteraf 1993). The issue has also been brought about by Dierickx and Cool (1989) who illuminate it by describing how a competitor can make a resource obsolete by developing a substitute.

Priem and Butler (2001a) argue that above average returns could be yielded by more than one unique combination of resources, thereby illustrating a potential fallacy of RBV. However, since Barney (1991) and Peteraf (1993) both list imperfect substitutability as a condition for potential sources of competitive advantage equifinality is not an issue. Barney (2001, p. 47) stated “the existence of strategic substitutes indicates that strategic equifinality exists in a competitive situation and, thus, that competitive advantage cannot exist”. It is though noted in Peteraf and Barney (2003) that several firms within a product market may have a competitive advantage, as long as they provide more value than the marginal competitor.

3.2.6 Immobility of Resources

Peteraf (1993, p. 183) stated “resources are perfectly immobile if they cannot be traded”, Barney (1991) attributes heterogeneity to imperfectly mobile resources and describes it as a barrier to entry. A resource being imperfectly imitable and imperfectly substitutable enables it to be a sustained source of rent and if it is imperfectly mobile those rents can be sustained within the holding firm and thereby comply with one of the conditions stated by Peteraf (1993), and thereby be a source of competitive advantage.

A resource that induces greater value to its current holder than a prospective buyer is imperfectly mobile since a sale would mean that all of the value available to the potential buyer would be bid away (Peteraf 1993). An independent resource may due to high switching costs from mutual investments also be reluctant to leave the firm (Peteraf 1993)

Resources may not be able to produce value independently or produce greater value when used in conjunction, it would then be sufficient for a firm to be a sole proprietor of one of those resources to extract more value than competitors (Peteraf 1993). An employee could be such a resource, whom without the aid of other members of the staff could not realise their joint value, therefore the market value of that single employee is less than what it can create in the hands of its current employer (Wernerfelt 1989).

While Eklund (2004) explained opportunity cost as the returns from the second best option forsaken in favour of the best available option, Peteraf (1993, p. 184) uses the term to account for the value of a resource “to its second-highest valuing potential-user”. This convention enables a firm to account for the opportunity cost of a resource while not offsetting the rents generated by it (Peteraf 1993). The difference between a resources value for the firm and the opportunity cost can according to Peteraf (1993) be seen as a sort of rent, however, for this to be a source of competitive advantage rents need to be either Ricardian or monopoly.

3.2.7 Resources

Factor markets emerge “whenever the implementation of a strategy requires the acquisition of resources” (Barney 1986, p. 1232). These markets can to a varying degree be imperfectly competitive (Barney 1986). In a perfectly competitive factor market sellers as well as buyers are aware of the value generating potential of a resource (Barney 1986). If so, competition risks dispersing all possible future earnings from the resource, at the same time the seller is perfectly aware of the customers valuation of the resource (Montgomery and Wernerfelt 1988). However, if a factor market is imperfectly competitive participating parties do not share a common base of information, instead firms are able “to buy a strategy generated cash flow for less than the value of that cash flow” (Barney 1986, p. 1234). This is, according to Wernerfelt (1984, p. 175) essential, since “firms need to find those resources which can sustain a resource position barrier, but in which no one currently has one, and where they have a good chance of being among the few who succeed in building one”. Luck or novel insights are the ways in which such resources are acquired according to Barney (1986), the latter described as harder to acquire through market analysis than through analysing the current capabilities and assets a firm possesses. Resources that are developed and accumulated within and remains within a firm are central to RBV according to Peteraf (1993), and described as possible hinders to subsequent entry from competitors by Dierickx and Cool (1989). If a factor market is imperfectly competitive it may from a resource holding perspective be better to detain a resource than selling it since it would not be correctly priced (Montgomery and Wernerfelt 1988).

Wernerfelt (1984, p. 172) has widely described resources as “anything which could be thought of as a strength or weakness of a given firm. More formally, the resources held by a firm at a given time could be defined as those (tangible and intangible)

assets which are tied semi permanently to the firm". Barney (1991, p. 101) have defined resources more narrowly as "all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness", thereby excluding resources that negatively influence the firms competitiveness. Still, Barney (2001) as well as Priem and Butler (2001a, p. 32) regard the definitions by Barney (1991) and Wernerfelt (1984) as very inclusive in that "virtually anything associated with the firm can be a resource". Priem and Butler (2001a, p. 33) have therefore suggested "identifying specific resources that may be particularly effective for certain actors in certain contexts might be a helpful first step in establishing boundaries for (and contributions of) RBV in strategic management". Barney (2001, p. 51) though, contradicts this argument by stating that the purpose of RBV is not to deliver a list of the resources required for achieving competitive advantage but to "describe the attributes that these valuable resources must have if they are going to be sources of sustained strategic advantage for firms".

While not defining resources Peteraf (1993, p. 180) recognises "productive factors in use as having intrinsically differential levels of 'efficiency'. Some are superior to others". Peteraf and Barney (2003, p. 316) adds that it is neither necessary nor commonly occurring that all of a firms resources are of a superior kind, still the focus of RBV lies on those "that enable a firm to participate in its product market more efficiently and effectively". A subgroup to the resources described by Wernerfelt (1984) are critical resources, defined as "critical in the sense that they differentiate you from competition" (Wernerfelt 1989, p. 5). Wernerfelt (1984) has resembled a firm to a bundle of resources, out of which the critical can enable a firm to reach a market position at a lower cost than its competitors (Wernerfelt 1989). That these resources are scarce, in regards to demand, and "are essential to the firm's effort to generate differentially greater value" are the reasons for why RBV focuses on them according to Peteraf and Barney (2003, p. 316). They are fundamental to the heterogeneity of resource bases, if sufficiently available no firm would use less superior resources (Peteraf and Barney 2003).

Besides efficiency and effectiveness, resources can be further categorised depending on their character, Barney (1991, p. 101) described physical capital resources as including "the physical technology used in a firm, a firm's plant and equipment, its geographic location, and its access to raw materials". Wernerfelt (1989) terms these fixed assets and describes them as firm specific, as they are an intimate part of the firms operations and commonly only serves a purpose within the industry, they rarely influence strategic decisions since most often lacking excess capacity and being widely available on factor markets.

Furthermore, Wernerfelt (1989) describes "patents, brand names and reputations" as a category of critical resources that are of unlimited supply, can be used for several applications and influence strategy formulation, and subsequently calls them blueprints.

That resources are valuable depending on their "ability, inter alia, to meet customers' needs" has been described as a common denominator within RBV by Bowman and Ambrosini (2000, p. 2). Wernerfelt (1989) has described culture, effects from team work, as a possible enabler of increased efficiency. Which is recognised by Barney (1991, p. 101) when describing organisational capital resources as "a firm's formal reporting structure, its formal and informal planning, controlling and coordinating systems, as well as informal relations among groups within a firm and between a firm

and those in its environment” since it incorporates informal interactions. By allowing organic growth of the labour force, culture is passed on and can be spread within an organisation (Wernerfelt 1989).

As RBV emphasises value creation, Bowman and Ambrosini (2000) have divided labour resources into three categories, generic, differential and unproductive, depending on their ability to add value. From the description of human resources by Barney (1991, p. 101) as including “the training, experience, judgment, intelligence, relationships, and insights of individual managers and workers in a firm” it is evident that labour can perform heterogeneously. Generic labour perform tasks that are performed homogeneously across competing firms, such that are easily imitated and substituted (Bowman and Ambrosini 2000). While contributing to the value creating processes, these do not comply with the conditions stated by Barney (1991) for resources being; rare, valuable, imperfectly imitable and imperfectly substitutable, for being sources of sustained competitive advantage (Bowman and Ambrosini 2000). Notable though, is that Wernerfelt (1989) terms employees with specific training, similar to generic labour, fixed assets. Supervisory labour, those responsible for minimising unnecessary costs, defined as those not incurred by competitors, belongs to generic labour. That a firm realises a superior profit is according to Bowman and Ambrosini (2000) attributable to differential labour. By combining purchased resources with homogenous and heterogeneous labour in unique ways entrepreneurial labour perform heterogeneously across firms and belong to differential labour (Bowman and Ambrosini 2000). Destruction of value is a result of unproductive labour, it occurs at all levels of an organisation, e.g. an organisation that “engages in unnecessary supervision, or pays salaries to management levels that add nothing to use value production (including corporate level staff)” (Bowman and Ambrosini 2000, p. 6). Producing features not valued by customers or scrap as well as re-work and repairs are tasks belonging to this category (Bowman and Ambrosini 2000, Roper 2003). If the destruction of value becomes large enough, a firm will lose competitiveness and finally cease to exist as profits disappear (Bowman and Ambrosini 2000).

3.3 Value

In line with the definition of competitive advantage by Peteraf and Barney (2003), customers choose the product that deliver most value in relation to cost (Bowman and Ambrosini 2000). However, customers are not entirely rational, theories such as the economic man are simplifications according to Eklund (2004) as well as Bowman and Ambrosini (2000). Aspects such as distance to customer are also of importance (Bowman and Ambrosini 2000).

The value of a product has two dimensions, it first possesses a perceived use value to the customer and secondly it has an exchange value to the producer (Bowman and Ambrosini 2000). The former has an economic counterpart called total monetary value by Peteraf and Barney (2003) and matches up to the maximum amount the customer is willing to pay for the good in relation to the benefits received (Bowman and Ambrosini 2000). Due to competition a customer usually receive perceived use value in excess of “the monetary amount realized at a single point in time when the exchange of the good takes place” called exchange value (Bowman and Ambrosini 2000, p. 3, Peteraf and Barney 2003). The amount of value that a customer receives in excess of the exchange value is called consumer surplus by Bowman and Ambrosini

(2000), the corresponding amount available to the producer after having paid its economic costs is called producer surplus by Peteraf and Barney (2003). A customer acquires use value when a sale takes place, not exchange value which is received by the producer (Bowman and Ambrosini 2000).

If competition becomes fierce enough, depending on the efficiency and effectiveness of their process, some firms will see their producer surplus vanish as prices are lowered (Peteraf and Barney 2003). A firm can then either lower its costs or equip the product with additional perceived use value to increase the consumer surplus thereby strengthening their competitiveness (Bowman and Ambrosini 2000, Peteraf and Barney 2003).

3.3.1 Creation of Value

“The Economic Value created by an enterprise in the course of providing a good or service is the difference between the perceived benefits gained by the purchasers of the good and the economic cost to the enterprise” (Peteraf and Barney 2003, p. 314). In line with Bowman and Ambrosini (2000, p. 8), who state “added exchange value (profit) is only created where the exchange values realized on sale of the new use values sums to more than the cost of inputs”, Peteraf and Barney (2003) acknowledges that the amount of value created is the net of the customers perceived benefits and the cost for the producing firm. Whether or not the producer has a competitive advantage is determined at the point of sale when the customer subjectively values the product in relation to products from competitors, in monetary terms it takes the shape of an exchange value (Bowman and Ambrosini 2000).

According to Bowman and Ambrosini (2000) new use value can only be attributed to labour resources, and as Barney (1991) stated a valuable resource enables a firm to increase its efficiency and effectiveness, which establishes the heterogeneity of resources as firms produce to a varying cost (Peteraf 1993). A firm can acquire use value in the form of resources, but unless worked upon by labour, which is the only resource “capable of performing heterogeneously across competing firms”, all firms would produce the same things, assuming perfect factor markets (Bowman and Ambrosini 2000).

3.3.2 Allocation of Value

Labour is commonly available in excess of what is demanded, this places the individual employee in a weak bargaining position when profit has been realised and is about to be divided between the firm and the individual employees (Bowman and Ambrosini 2000). Being able to attribute a specific output to an individual employee is rare, partly because time wages are more common than piece wages (Bowman and Ambrosini 2000). Even when piece wages are used Näslund (1966) states that the cost rarely is proportional to the work carried out, due to shifting conditions. Using time wages is not only negative, while it does not stipulate productivity levels, it does allow for the firm to attempt extracting as much as possible from the agreed hours of labour, labour is traded as a homogenous commodity but has heterogeneous application (Bowman and Ambrosini 2000).

Wernerfelt (1989) commented on this issue through an exemplification of an employee, if a valuable employee is as valuable to your company as others his salary will reach such a high level that it will consume the residual value available to the company, however if this particular employee is more valuable to your company than to others he cannot expect to be freely traded thereby his salary will not reflect his actual value adding capabilities.

But these rents are not needed to be paid to the resource in full according to Peteraf (1993) and Peteraf and Barney (2003) for the user to keep the resource in use, instead the rents will be shared in an indeterminate way since both parties are in need of the other to create this rent, unless the firm uses the resource it would be worth less and likewise if the firm was not able to use it they could not produce this rent generating stream.

3.3.3 A Definition of Value

Value has two dimensions, perceived use value and exchange value. Value in this context concerns the creation of utility for the client. It is a result of labour efforts in combination with other resources. Total utility or maximum utility would be a product (or service) that corresponds to the requirements of the client in all aspects, however, separated from cost.

In practice, use value commonly passes through a number of organisations and processes prior to reaching its final destination, the customer. For there to be maximum utility all aspects of a product (or service) must conform to the requirements of the client, there must not be anything lacking nor anything not wanted. If a product delivers in excess of the specifications required by the client value has been destroyed in the manufacturing process.

A product is brought closer to the state in which the client (or customer) is willing to purchase it by the to a varying degree effective and efficient efforts from labour. That state includes such properties and qualities that the customer may not even understand but make the product the one that the customer wants.

3.3.4 Contractor Value

Winch (2002, p. 181) has stated that “construction is essentially a service industry”. Roper (2003) has described the clients choice of contractor as three-dimensional: marketing, sales and service. Winch (2002) has also described the sale of services as three-dimensional: intangible, heterogeneous, and inseparable. These dimensions are interlinked, by marketing Roper (2003) aims at describing how contractors are chosen based on reputation, which resembles the description from Winch (2002) that what is purchased is intangible, it cannot be felt, and therefore that decision is based on judgement. By heterogeneous Winch (2002) means that the successfulness is depended upon the conception of the client and how the project is carried through by the contractor. It concerns the relationship between participating parties as well as the perceived quality of the undertaken works, thereby similar to sales and services as described by Roper (2003). The final dimension from Winch (2002): inseparable, is not covered by Roper (2003), by which is meant that construction services are purchased in advance and that problems encountered are difficult to rectify.

4 Resources used during the Brief and Design Phases

In this section the resources used during the brief and design phases of the studied project are described and the results from the client's assessment are presented. The descriptions of the used resources are based on the interviews with the client, the city planning office and the awarded contractor. Added to some of the used resources are reflections partially based on RBV.

The assessments of the time consumed by the resources are presented in four sub-sections. The first sub-section includes those resources that to a great extent were occupied with the design of the building. The second sub-section covers the resources supplied by the city planning office. The third sub-section consists of the assessment of the time spent by the awarded contractor. The fourth sub-section comprises the client's assessment of the remaining resources covered by the scope of the study.

4.1 Client's Assessment of Time Consumed by Resources Designing the Building

This section covers the client's assessment of time consumed by the architect, the structural engineer, the heating, ventilation and sanitation consultant and the consultants hired for the design of the electrical systems.

Architect

Brett (1993, p. 4) has defined an architect as the "one who designs a building". In addition, when the project coalition is separated, the architect may be responsible for selection and subsequent on-site coordination of trade contractors (Brett 1993, Winch 2002). Nordstrand (2000) defined the main task of the architect as designing a building that is at once aesthetically appealing as well as functional, supplying use value to the client. The later works of consultants are to a large degree based upon the result of the architects work (Liman 2005).

The architect hired by the client was given a blank sheet and a mission to deliver a landmark building in the vicinity of 4000 m². As the architect began working several suggestions was presented until the client approved one. The work representing this phase is visualised in Figure 1 up till January 31 2008.

Thereafter the project group had a common view upon the main parts of the buildings' design so the other design consultants were brought in to work alongside the architect. Their work was focused on developing a schematic design. During this phase the design of the buildings structure changed, coming from timber to concrete. The architect was also partially occupied with the detailed development plan. Even though there was an agreement on the main aspects of design, the client had not yet decided whether or not the building would have four- or five-storeys, so consultants kept both options open. In the tender documents sent to contractors on September 26 2008 they were asked to supply prices on both options. The client later decided to construct a five-storey building. The façade was initially all in glass; the glassing was later made triangular accompanied by brick-cladding. A large quantity of the architect's time was consumed by investigating different office room designs. This phase ended at

September 30 2008. During this time there had been two versions of the schematic design, one finalised on the May 31 and another prior to the tendering documents being sent to the contractors.

During the following two months, from October 1 to November 28 2008 the architect was mainly occupied with the detailed development plan, although some study visits were also made. Then from the December 1 until the March 31 2009 the architect was occupied with colouring and the detailed development plan.

During the summer of 2009, from April 1 to July 31, the architect worked on design for certain tenants. During the following months, August and September of 2009, the hours worked were increased as a new version of schematic design was produced. In addition to basic data being supplied to the building permit application some investigations were also undertaken during this period.

The client expressed some concern when assessing the architect, especially since designing partially could have been considered as a journey up to the design that was current at the time of the study. The architect may not have reached this stage unless the earlier work would have been completed. However, the initial sketches that were very different from one another was not considered as having added any value since there was nothing remaining of them in the design of the building at the time of the study. That part, ending at January 31, was initially seen as having been not value adding for 80 % of the time since most of the sketches were scrapped, and as having been indirectly value adding for 20 % of the time. The client though subsequently changed the assessment of those 20 % to having been directly value adding as the building at the time of the study shared great resemblance to the shape initially suggested (see Figure 1).

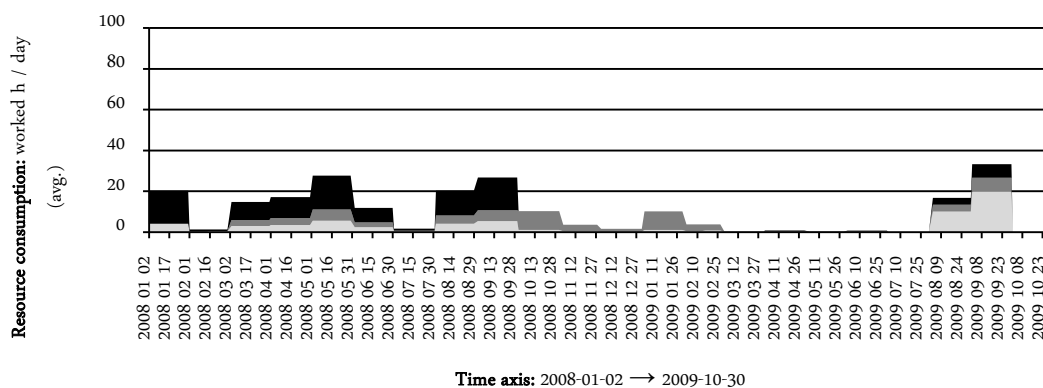


Figure 1 The client's assessment of the contribution to the design of the building from the architect.

In the subsequent phase, ending at the September 30 2008, the client regarded the consumed resources as having been directly value adding for 20 % of the time, indirectly value adding for 20 % of the time and as not value adding for 60 % of the time (sees Figure 1). The detailed development plan work was especially mentioned as not having added any value and the design of windows as an example of value adding work that at the time of the study remained.

During the following two months, the architect was mainly occupied with the detailed development plan. The client considered the time consumed during this period as indirectly value adding to 90 % and as directly value adding to 10 % (see Figure 1).

The subsequent period of the detailed development plan and colouring was seen as having been directly value adding during 20 % of the time. The remaining 80 % was considered not having been value adding (see Figure 1). A large share of the non value adding time was located in the detailed development plan. The value adding time was most likely found in colouring.

Although there were no tenants at the time of the study, part of the design had been made explicitly to suit certain likely tenants. The client was instructed to assess the earlier design works in relation to the design of the building at the time of the study, and could therefore regard 20 % of the time used during April, May, June and July as having been directly value adding. The final period covered by the study was August and September 2009. The client regarded the used resources to have been directly value adding for 60 % of the time, indirectly value adding for 20 % of the time and as not having been value adding for 20 % of the time.

Architects belong to the category of consultants termed designers (Tunstall 2006). The need for innovative and possibly even iconic design is “a function of the level of mission uncertainty” according to Winch (2002). The characteristics of the tasks for an architect can thus range from mere adaption of an existing solution till the design of something novel. Even so, supplying the client with use value is the main purpose. Whether or not use value is delivered through breaking new grounds or not, it affects the type of labour the architect could be classified as.

The imperfectness of the factor market in which an architect is procured depends on project characteristics. Design services are commonly either held in-house or procured through appointment, concours or competitive tendering (Winch 2002). Resources are consumed independently of procurement route as soon as design commences, but when concours are used the client is given a preview of what may come, thereby possibly reducing the level of uncertainty regarding quality of services provided. Nevertheless, neither buyer nor seller is aware of the results from the design process in advance and the market should be regarded as imperfectly competitive in line with the definition from Barney (1986).

When the purposes of a client are best met through the adaption of an existing design the contribution from an architect could be regarded as homogenous. It is likely that the efforts of a competing firm would have generated a similar solution. Resources consumed through such practices have the potential of being value adding as the architect would qualify as generic labour as defined by Bowman and Ambrosini (2000).

When the purposes of a client are of such a nature that novelty is required, more responsibility is allocated to the architect. The variety of outcomes is likely increased and architects as such could likely be considered as performing heterogeneously. As such, architects under these circumstances meet the definition of differential labour by Bowman and Ambrosini (2000) and can be regarded as potentially directly value adding.

Structural Engineering

Responsible for the supporting structure of the building the structural engineer shall also design a building able to withstand cold, heat, moisture, fire and disturbing sounds (Brett 1993, Nordstrand 2000, Liman 2005). Part of the work conducted by the

structural engineer is based upon the work of other consultants, such as the soil mechanic engineers to design the buildings foundation (Liman 2005, Tunstall 2006).

This was the first of the two structural engineers that at the time of the study had been a part of the project. The consultant left the project during the fall of 2008 (see Figure 2) as the client awarded the contractor with the alternative tender the contract.

In general, the alternative tender supplied by the awarded contractor led to the scrapping of the initially designed structure and foundation. While substantial parts of the design were scrapped, some parts were still kept, such as the stabilising units in the building. In total, the client regarded 10 % of the used resources as having been directly value adding, 10 % as having been indirectly value adding and 80 % as not having been value adding (see Figure 2).

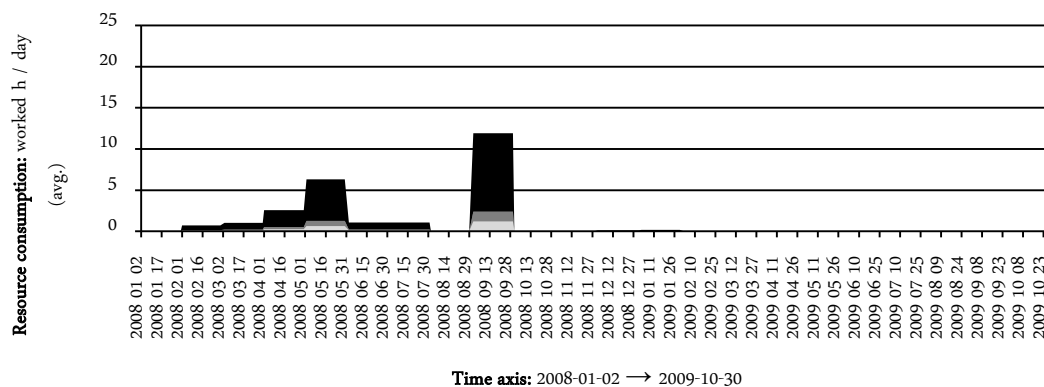


Figure 2 The client's assessment of the contribution to the design of the building from the structural engineer.

Design of Electrical Systems

The consultants hired for the design of electrical systems shall assure that performance standards for power and artificial lightning are met (Nordstrand 2000, Liman 2005, Tunstall 2006). Tasks also include systems for telecommunications, surveillance, elevators and escalators (Nordstrand 2000, Liman 2005). The results are presented in the form of drawings and descriptions (Nordstrand 2000).

The client described the consultants work as having been iterative where several ideas had been tried, some of which later were scrapped. Some of the ideas that were presented were rejected by the client whom did not approve. The resources consumed have been spent on producing drawings and investigating ideas.

At the end of May 2008 the first schematic design was finalised. Thereafter there were calculations made which ended up with several of the consultants having to revise their design as it proved to be too costly. This resulted in a more comprehensive schematic design. Included in the revise was also finalising the drawings enough to be included in the tender documents sent out on September 26 2008. There were also minor amounts of resources consumed during June 2008. The resources consumed up to this date were by the client regarded to have been directly value adding during 25 % of the time, indirectly value adding during 25 % of the time and not value adding during 50 % of the time (see Figure 3).

The last resources used covered by the scope of the study were used between August 30 and September 30 2009. The design that this period resulted in was described as very close to that used at the time of the study by the client. The client considered these consumed resources to have been directly value adding for 50 % of the time, indirectly value adding for 30 % of the time and as not value adding during 20 % of the time.

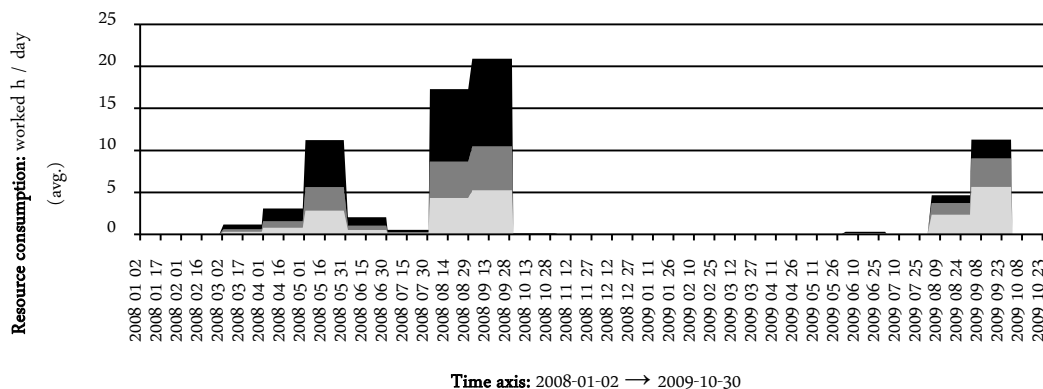


Figure 3 The client's assessment of the contribution to the design of the building from the consultants hired for the design of the electrical systems.

Heating, Ventilation and Sanitation Consultant

According to Nordstrand (2000) and Liman (2005) a heating, ventilation and sanitation consultant designs systems for energy- and water supply, air treatment as well as sewage and determine the need for control and monitoring systems. Fire safety and sprinklers include designing measures, e.g. fire doors, escape routes and assuring structural integrity as well as clarifying risks, sections and possible water source (Tunstall 2006). That these systems meet performance standards is according to Tunstall (2006) and Abel and Elmroth (2006) the responsibility of the consultant. Designing cooling- and heating systems as to acquire the correct indoor climate is also the task of the consultant. It is especially important for these consultants, according to Abel and Elmroth (2006), that the client and architect is made aware of the consequences design has on performance.

The consultancy hired designed heating, ventilation and sanitation, sprinklers and fire safety. They conducted a climate investigation and designed outdoor water and sewage. As the process unfolded they also updated the tendering documents.

The period between the March 3 and the June 20 2008 was described by the client as mainly consisting of designing and finalising the drawings of the current state of the building. The consultants have also assisted other consultants, e.g. the architect with solar studies.

The climate investigation was conducted during the second schematic design, prior to the release of the tender documents on the September 26 2009. After that period the consultants were occupied with heating, ventilation and sanitation, climate investigation and answering questions from the contractors during the tendering process. Design work was not prioritised.

Thereafter the consultants were engaged in investigations of exterior water and sewage, for the detailed development plan and the cadastral procedure between May 4 and June 12. The final resources visible in Figure 4 were used to update the tendering documents.

In Figure 4, the resources consumed visualized to the left, between March 3 and the June 20 2008, was seen as having been directly value adding for 25 % of the time, indirectly value adding for 25 % of the time and as not value adding for 50 % of the time by the client. The assessment was based on the fact that at the time of the study there were still elements that had been kept, e.g. the design of the ventilation. The client assessed the subsequent phase equally, during which schematic design was worked over. That phase ended when the tender documents were sent out on the September 26 2008.

From there on, the client changed the grading, till February 27 2008 only 20 % was seen as having been directly value adding, the remaining 80 % was equally divided between indirectly value adding and not value adding (see Figure 4). Likely due to the change of phase that the project was in, design works were during this period not prioritised, but rather kept on halt, awaiting tenders from the contractors.

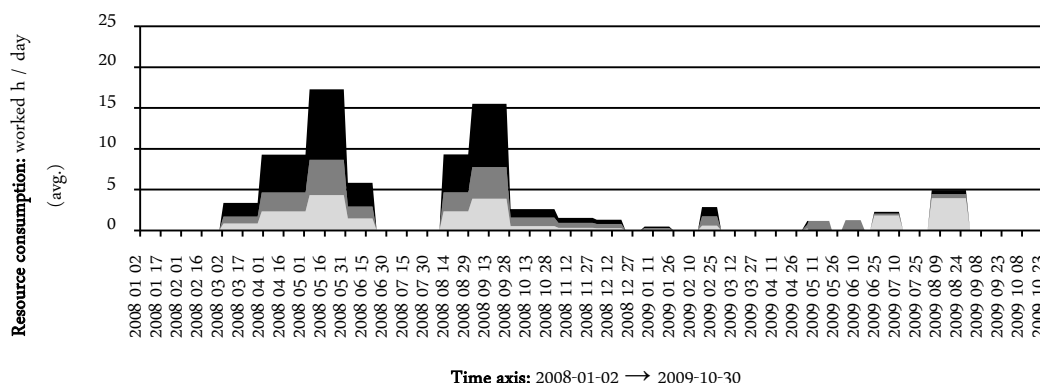


Figure 4 The client's assessment of the contribution to the design of the building from the heating, ventilation and sanitation consultant.

An investigation carried out for the detailed development plan and the cadastral procedure was regarded as having been indirectly value adding for 100 % of the time (see Figure 4). The assessment was based on the fact that from the clients view it had not had any effect on the design of the building.

The final update of the tendering documents was considered to have been directly value adding for 80 % of the time, indirectly value adding for 10 % of the time and not value adding for 10 % of the time (see Figure 4). Mainly due to the large resemblance to the building as it was designed at the time of the study.

4.2 Client's Assessment of Resources belonging to the City Planning Office

This section includes the client's assessment of time consumed by the civil servants at the city planning office, handling the cadastral procedure and the detailed development planning process.

Cadastral Procedure

The cadastral procedure began when the client applied for reallocation and an establishment of joint facilities on January 16 2009. The task of the civil servant, according to the client, was to based on the detailed development plan investigate the space that would be occupied by the building and the possible interfaces towards neighbouring properties and thereafter assure that it harmonized with current legislation and finally produce legal documents that clearly showed the intention of all parties. The studied case was particularly complicated as the building passed over land owned by the municipality and the neighbouring property owner as well as connecting to the neighbouring property through a footbridge.

In addition, according to the civil servant, that included studying the project drawings, preparing agreements, investigations of the rights the new property would need to hold. As supply of water, sewage and electricity could have included easements if they would have been drawn through other properties these were also needed to be investigated by the civil servant. Access by road was dealt with through a regulation in the detailed development plan. It was also necessary to verify that the applicant held the correct title deeds and to investigate the size of the property, accompanying easements, as well as other rights and possible joint facilities.

To complete the cadastral procedure the civil servant had to go through several steps. Preparatory meetings were held with owners of all effected properties to discuss any potential questions related to the cadastral procedure. According to the civil servant the procedure then proceeded by the municipal cadastral authority receiving a computer model of the building, a land drawing and documents from the application for building permit on April 15 2009. Complementing documents were received by the cadastral authority on April 21 and May 4 2009. Among these were plans for water- and sewage pipes, a detailed drawing of the connection to the wall of the neighbouring building, floor plans and cross sections.

As the building was designed at the time of the study there would be two footbridges that were to be constructed, but the client also wanted to be able to construct a culvert if they in the future would construct another neighbouring building. However, in between those two there would be land owned by the municipality through an earlier donation by the client, although the latter had not claimed it. The client then needed to recapture part of the land to construct the building studied. However, as the municipality had not yet claimed the land the client wanted to make sure that they would be able to recapture the three-dimensional space required to connect to the possible future building. This proved to be more complicated than anticipated. On May 11 2009 the civil servant at the municipal cadastral authority received a draft of an agreement for realisation from the civil servant representing the municipal real estate committee. However, the suggested three-dimensional spaces for footbridge and culvert to the building could not be registered as construction works were not imminent. As a response the client suggested that access to these three dimensional spaces would be secured through easements. There were two possible types of easements; land parcelling easement and agreement easement. Neither the former nor the latter was applicable as the former required the easement to serve the purpose of the buildings future use and the latter required the easement to be of permanent importance. As the arrangement turned out, the municipality claimed the land that they had received by the client earlier and then sold part of it back to the client, this

enabled constructing the studied building. To create the three-dimensional spaces required for the footbridges that would be constructed imminently design was required to be taken close to its final state. Those footbridges also passed over property owned by the owner of the neighbouring building. The spaces connecting to the possible future building was for a number of years ahead secured through an agreement between the municipality and the client. At the time of the study, the client was in possession of these spaces and an area surrounding the building.

On June 16 2009 the building committee passed the detailed development plan for the planned building. The municipality then applied for a reallocation on June 25 2009, on the same day an agreement on reallocation between properties owned by the client and the municipality was presented. On June 26 2009 an agreement on reallocation and establishment of joint facilities was presented between neighbouring properties, in addition the client supplemented their application for registration of property with an establishment of joint facilities and easement.

While having requested a letter of attorney from the company owning the neighbouring property on July 16 2009 such a form was not received by the civil servant at the municipal cadastral authority until September 1 2009.

In order to reach a decision in the cadastral procedure the civil servant at the municipal cadastral authority decided to summon representatives for owners of the affected properties for a meeting to be held July 23 2009. However, prior to the meeting there were several questions that called on attention: e.g. contradictory heights were specified for footbridges, easements for future maintenance of footbridges were lacking, easement to access locks in doors on footbridge connecting to neighbouring property was absent and agreements on compensations for easements had not been agreed upon. At the meeting a principle sketch of the three-dimensional property was presented, along with plane sections and sketch of the three-dimensional space consumed by the buildings corbelling.

As can be seen in Figure 5 until the civil servant at the municipal cadastral authority received notification that the municipal real-estate committee had approved the agreement on reallocation and planned realisation on August 24 2009 little activity took place.

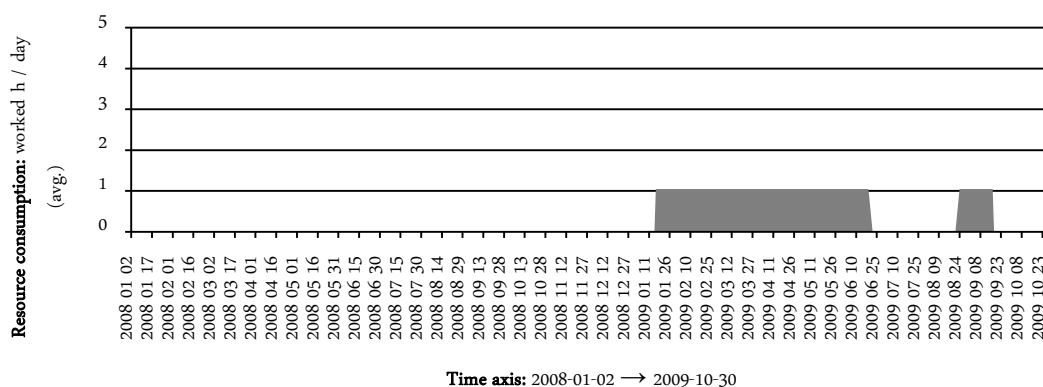


Figure 5 The client’s assessment of the contribution to the design of the building from the civil servants at the city planning office handling the cadastral procedure.

On September 7 2009 the following documents were presented: decision protocol, real estate juridical description, technical description with coordinates, boundary description, general map, cadastral procedure map for the first reallocation of land, cadastral procedure map for the second reallocation of hollow three dimensional spaces, easement for pillars, attachment of footbridge, easement for access and new joint facility, cadastral procedure map for the third reallocation of easement for parking spaces, cadastral procedure map for the boundary description and a notification of the completion of the cadastral procedure. On September 11 2009 the cadastral procedure was approved and on September 17 2009 it was registered.

Initially the client was not certain whether or not the use of these resources had been not value adding or indirectly value adding. But as the client reasoned the cadastral procedure had to be completed, however, it in no way contributed to the design of the building. The donated land described earlier also influenced the decision since the client needed to recapture the land to actually construct the building. The use of resources was seen as having been indirectly value adding, with the argument, that if they would not have completed it, then it could have been considered as not value adding, since then all efforts would have gone to waste (see Figure 5).

Cadastral procedures are on a monopoly basis administered by the municipal cadastral authority. Barney (1991, p. 103) stated: “firms, in general, cannot expect to obtain sustained competitive advantages when strategic resources are evenly distributed across all competing firms and highly mobile”, thus these services cannot be expected to generate more value to one firm than another.

As the initiation of a cadastral procedure consists of an application fierce competition is not to be expected. It is a municipally supplied service that everyone is entitled to. It is arguable that the future building depends on the successful completion of the cadastral procedure but it does not enable a sustained competitive advantage, i.e. generate rent and create value. Instead it is more likely, as noted by Peteraf (1993, p. 185) that “a superior location [...] could be a source of above normal returns” however, that concerns the acquiring of land, not a cadastral procedure.

Besides heterogeneity and initial market conditions Peteraf (1993) required that any potential rents generated by a resource to be sustained for there to be a competitive advantage. However, as this resource is supplied to all by the municipal cadastral authority there is not a need to neither imitate nor substitute it, as would be with a resource held exclusively by a firm. Hence, no competitive advantage could be generated by this resource as it fails to meet any of the criteria listed.

Furthermore, the factor market on which it is acquired is at once perfectly as well as imperfectly competitive. It is imperfectly competitive as there is no proper market valuation of the value generating capabilities of the services as the price is set by the Swedish government. It is perfectly competitive in the sense that buyers and seller both are perfectly aware of the content of the services.

The cadastral procedure is administered by a civil servant that meets the definitions of generic as well as unproductive labour. Tasks are performed homogeneously across competing firms, and hence meet the description of generic labour, while also not contributing to use value and thereby meeting the description of unproductive labour by Bowman and Ambrosini (2000).

While the use of the resource fails to meet any of the criteria listed above for enabling a competitive advantage it is considered as indirectly value adding. Without a successfully completed cadastral procedure the project would have been put to a halt.

Detailed Development Planning Process

The detailed development planning process is meant to verify the appropriateness of land use and influence the design of the built environment (Nordstrand 2000). A completed detailed development plan consists of a drawing of the planned area, conditions, a description of the plan and a description of the planned realization (Nordstrand 2000).

The detailed planning process has three main parts: consultation, display and approval (Nordstrand 2000). In the studied case the client applied for a change in the existing detailed development plan on February 8 2008, however the civil servants at the city planning office did not record any time denoted to this project until May 2 2008 as can be seen in Figure 6. The municipal building committee sanctioned the application on May 27 2008. Statements were thereafter received from a large number of parties between October 23 2008 and January 15 2009. The municipal building committee thereafter decided to display the suggested detailed development plan on March 31 2009 and received additional statements during that phase. The detailed development plan was then passed in the municipal building committee on June 16 2009, and gained legal force on July 22 2009.

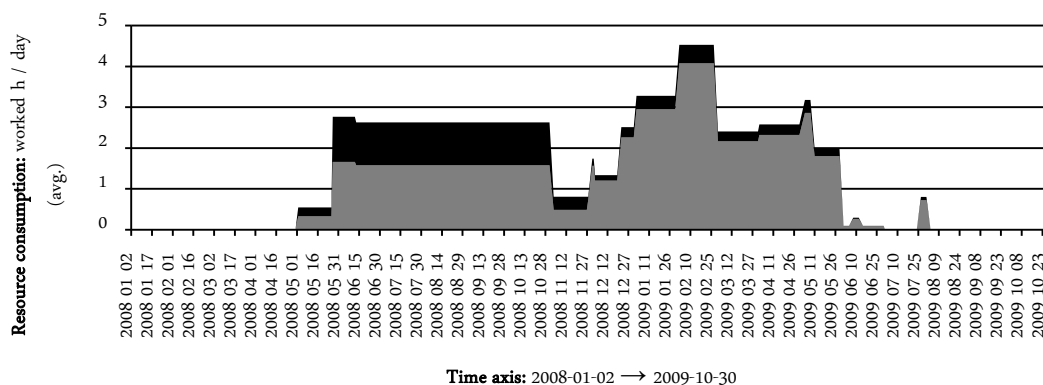


Figure 6 The client’s assessment of the contribution to the design of the building from the civil servants at the city planning office handling the detailed development planning process.

Fearne and Fowler (2006, p. 284) have divided permissions in three categories: “planning, building regulation and statutory authority approvals”. The Swedish Planning and Building Act 1987:10 regulates planning of land and water as well as construction (Miljödepartementet 2008). It supplies municipalities with two of its main tools affecting planning and construction, the comprehensive plan and the detailed development plan (Miljödepartementet 2008). In large scale the comprehensive plan accounts for the municipalities view upon future use of land and water, although not legally binding it is seen as guiding (Miljödepartementet 2008). In addition to the use of land and water the detailed development plan can regulate the design of buildings. It is, similar to the UK, legally binding in Sweden (Winch 2002, Miljödepartementet 2008).

In general the client has not been able to identify any value adding activities through this process. The detailed development plan did not go on display until March 31 2008, however, the client regarded most of the changes brought forth during the consultation to have influenced the work up till November 28 2008. These efforts were by the client regarded as having been not value adding for 40 % of the time and indirectly value adding for 60 % of the time (see Figure 6).

The detailed plan did according to the client during the latter phase resemble the final one to a much greater extent. 90 % of the time spent during this phase was by the client considered as indirectly value adding (see Figure 6). The remaining 10 % was seen as not having been value adding (see Figure 6).

Municipalities are in Sweden required by law to plan the use of land and water through the use of detailed development plans (Miljödepartementet 2009). As the municipalities possess a monopoly right to these processes a competitive factor market does not exist.

The process can influence the shape of future buildings to a varying extent, statements from various parties may need to be incorporated in the future building. However, it is not likely that it will influence the perceived use value of the client to any greater extent.

It is a well known fact that the value of property largely depends upon its location. The detailed development planning process could be regarded as a protection against damaging exploitation for existing neighbouring property owners. Since the purpose of the process is to assure appropriateness it serves more a common good than the needs of the client. The plan affects the market value of land since it stipulates what can be built, however, only valid for five till fifteen years it is time limited (Samuelsson and Åslund 2009). To a large extent that value is based upon the right to build, but it also depends on the assurance that neighbouring properties will not be allowed to be transformed into something counterproductive.

It could be seen as valuable to, through the passing of a detailed development plan, receive the right to exploit land. However, had not the legislature organised the use of land and water this way there would not have been such a need anyways.

It is not possible to build unless having received a building permit which requires a detailed development plan that allows the proposed structure. It cannot be considered to be directly-value adding, but rather potentially indirectly value adding. It should not be considered as being not value adding, since that would require of us to scrap, rework or otherwise undo what has been done. In this case the project requires the completion of this process.

4.3 Client's Assessment of Resources belonging to the Awarded Contractor

This section includes the client's assessment of time consumed by awarded contractor during tendering for the first and second phase and producing the alternative tender for the first phase.

Resources Consumed During the Tendering Process for the First Phase

The contractor consumed resources when information was received, a budget was produced, a tender was produced, a presentation was held, participating in interviews and attending contractual meetings.

On August 28 2008 the contractor attended a presentation of the project by the client. Immediately thereafter the contractor initiated preparations to produce a tender by planning the process, contacting an advertising agency and contacting a structural engineer etc. It is according to Nordstrand (2000) required that senior management at the contractor decides whether or not to enter the competitive tender based on their evaluation of the project, the client, the competitive situation and their own available resources.

A contractor engaging in a competitive tendering will calculate the costs of erecting the building given the conditions stated in the tender documents (Nordstrand 2000). These calculations constitute the basis for the price presented by the contractor to the client in the tender (Nordstrand 2000). The process commences with reading in on and getting familiar with the project by studying the tendering documents (Nordstrand 2000). Thereafter the first task is to consider the method of production: e.g. work sequences, crane requirements as well as weather and seasonality considerations (Nordstrand 2000). Material quantities required are then calculated based on drawings and descriptions, resulting in a bill of quantities (Nordstrand 2000). Commonly the bill of quantities also serves as a basis for the calculation of direct construction costs together with tenders supplied from subcontractors (Nordstrand 2000). The former enables the contractor to estimate the time required for construction which in combination with the planning of site layout enables the contractor to determine costs for establishing on site (Nordstrand 2000). Based on all of these the contractor then calculates the need for time, supplies, machinery and labour management (Nordstrand 2000). Finally production time and time for establishing on site is multiplied with the appreciated cost of labour and added to the costs of other resources, e.g. materials and subcontractors resulting in total production cost (Nordstrand 2000). Prior to determining the price presented in the tender, an estimate is required of the utilisation of central administrative resources as well as an desired profit margin (Nordstrand 2000).

The design-and-build contract was divided into two phases: design being the first and on-site production the second. The project as described in the tendering documents would not truly meet the description of design-and-build, as that would require for the client to have procured the contractor based on the brief (Nordstrand 2000, Liman 2005, Tunstall 2006). If the client would have chosen to have gone along with the design as specified in the tendering documents it would have qualified for being a guided design-and-build contract (Liman 2005). The tendering documents were distributed to the contractors on September 26 2008. Producing the tender was according to the contractor an arduous task, especially documents requested by the

client in the tendering documents: e.g. quality and environment, idea for cooperation and descriptions of the client's organisation and system for follow-up. An alternative tender was prepared in parallel with this work. While resources belonging to the contractor used when producing that tender are herein included the structural engineer used for the alternative tender is not. Tenders were requested in a large scale by the contractor for materials and subcontractors, e.g. 25 blacksmiths were asked to submit prices according to the contractor. The tender that included a number of reservations due to what the contractor perceived as unclear boundaries was submitted to the client on November 27 2008. As can be seen in Figure 7 activities decreased once this was handed in.

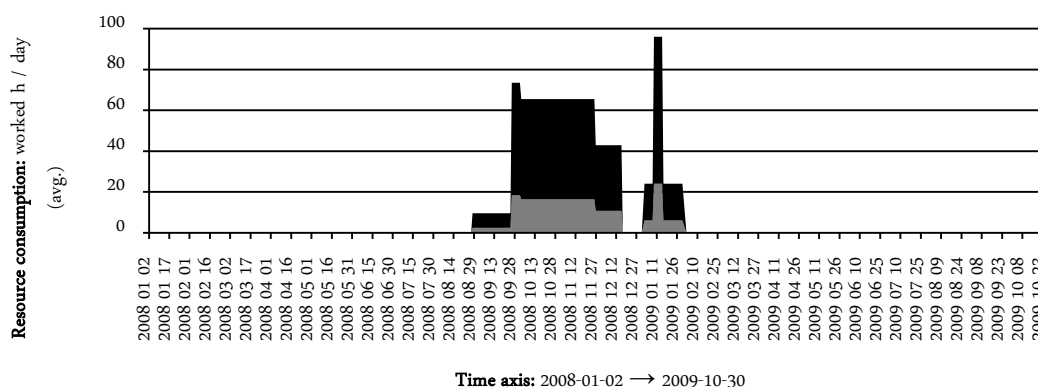


Figure 7 The client's assessment of the contribution to the design of the building from the awarded contractor during tendering for the first phase.

Shortly thereafter the contractor began preparing for the subsequent presentation that would be held in the vicinity of the future site. While not having the cheapest bid the contractor managed to win the tender through points earned for the alternative tender.

The client did not regard any of these efforts as having been directly value adding. The results of the used resources were based on earlier design work undertaken by consultants and did not contribute to the building. The main task of the contractor was to use that information when developing a tender. A tender they are, through the procurement route chosen by the client, required to supply. This was however recognised by the client who stated that the Swedish Public Procurement Act 2007:1091 that they had chosen to oblige, due to their owners requirement, was partly to blame. The client, however, still believed that had they simply chosen a contractor most of this work would still have been required. In total, the client regarded 25 % of the used resources as not having been indirectly value adding and the remaining 75 % as having been not value adding (see Figure 7).

The client administered the procurement according to the Swedish Public Procurement Act. An open procurement was chosen, which means that subsequent to advertising all those interested were allowed to submit tenders and that the client was not allowed to negotiate prior to awarding a contractor the contract (Nordstrand 2000).

There are according to Winch (2002) two main problems associated with the procurement of construction services: moral hazard and adverse selection. The problem of moral hazard has been described by Winch (2002, p. 122) as "...how can the client be sure that the firm, once hired, will fully mobilize its capabilities on the client's behalf, rather than on behalf of the firm itself or of some other client?. The

problem of adverse selection, also known as the lemon problem, is particularly common when procuring construction services through competitive tendering according to Winch (2002). Based in asymmetry of information, it occurs when “sellers [...] have more knowledge about the quality [...] than the buyers” (Akerlof 1970, p. 489). Services of good as well as bad quality are available on the market, however, it is impossible for the procuring unit to tell the difference, and hence bad quality services tend to lower the prices and possibly force good quality out of the market (Akerlof 1970, Winch 2002). As portrayed by Bowman and Ambrosini (2000) and Peteraf and Barney (2003) the clients perception of the quality of the services offered affect their valuation of the consumer surplus available, if misled, the client may receive less than intentional. As a consequence, if this is carried on, clients will perceive services as containing less total economic value, and will be willing to pay less as their consumer surplus will otherwise diminish and finally force good quality products out of the market. It is in this context the activities undertaken by the client needs to be considered. The contribution of these activities may not be the building itself but to the clients management of the project.

The client’s procurement of construction contractor could be seen as consisting of two interrelated phases: firstly till the point in time where the contractor receives the tender and secondly till the point in time when the contractor receives the contract.

The first phase consists of the contractor’s reception of information and tendering documents from the client and the resources consumed by the contractor’s organisation when producing the tender. However, unless worked upon by labour no value could be generated (Bowman and Ambrosini 2000). Hence, with the objective of producing a tender, labour resources were devoted to the process. As described in the preceding section most of the efforts within this phase are related to pricing and estimating. However, there were according to the contractor three descriptions requested in the tender documents that required the contractor to write descriptive texts for the tender. These were a description of the contractor’s environmental and quality plan, an idea for collaboration and a description of the contractor’s planned project organisation and system for follow-up.

As the foremost of these focuses on quality, the request could be interpreted as an attempt to mitigate the lemon problem. An idea for collaboration between the contractor and client could be interpreted as an attempt to bring the goals of the respective organisation together, thereby attempting to avoid moral hazard. That the client requested a description of the staff planned to participate in the project could be seen as an effort to avoid the contractor from improper staffing, i.e. supplying lemons. A system for follow-up which enabled the client to constantly observe the projects current financial status and full disclosure of purchasing material and subcontractors could be regarded as an attempt by the client to ensure that it is their needs that remain in focus. The client has had good intentions when requesting these descriptive documents, however, it resembles what Winch (2002, p. 122) has described as the “the traditional answer [...] to use complex contracts”. It is possible that the arrangement results in a catch-22 though, as the production of these descriptions and the operation of these systems for follow-up require resources, the possible gain in production may be consumed.

While the outputs described in the preceding paragraph can be regarded as heterogeneous in between firms the majority of the resources consumed in this phase result in a tender that is homogenous regarding content, not price, when comparing competitive firms. The use value acquired by the contractor consists of drawings and

descriptions of the building. Throughout the process these are static, once completed: the building is no more defined then before.

The second phase commenced after the client’s reception of the tender. It included a presentation held by the contractor, interviews with personnel and contractual meetings. Once again the problems described by Winch (2002): moral hazard and the lemon problem, could be presumed to have influenced the contents as a presentation and interviews were held. The preceding tender that enabled this phase for the specific contractor could be regarded as the acquired use value: hence, without it none of the activities in the second phase could have occurred. Also, these activities are based on the tender.

Neither the design nor the utility of the building is affected by the resources consumed throughout this phase. Arguably it is understandable that the client would not commence with a project without having any sense of the costs therein involved. And given the contextual structure the use of these resources could be considered indirectly value adding.

Resources Consumed Developing the Alternative Tender During the Tendering Process for the First Phase

A structural engineer designs a buildings supporting structure (Brett 1993, Nordstrand 2000, Liman 2005). Also commonly responsible for the buildings protection against cold, heat, water, moisture, fire and disturbing sounds (Nordstrand 2000). Based on an geotechnical investigation performed by the a soil mechanics engineer the structural engineer also designs the foundation (Liman 2005, Tunstall 2006).

The client regarded the work of the structural engineer as having been directly value adding for 75 % of the time (see Figure 8). The remaining 25 % was seen as indirectly value adding by the client as it was believed to have been spent on investigation (see Figure 8).

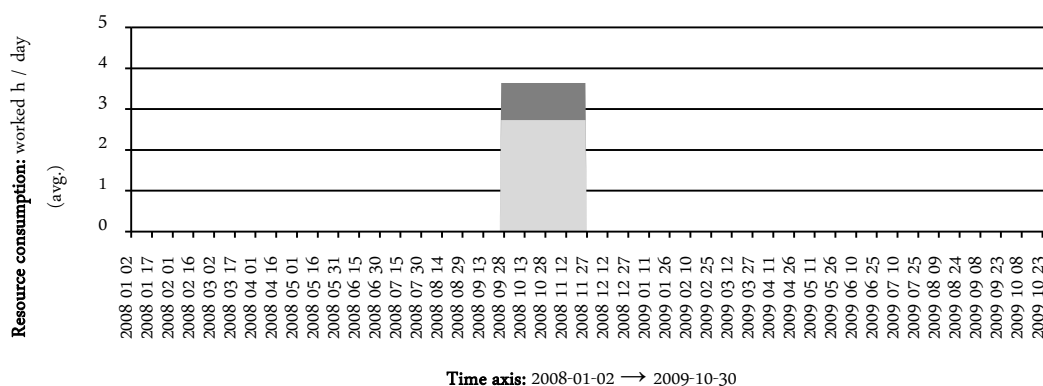


Figure 8 The client’s assessment of the contribution to the design of the building from the awarded contractor producing the alternative tender for the first phase.

The structural engineer hired by the client had specified a supporting structure consisting of a central concrete frame, on top of which steel beams would span the buildings with and support the floors below. However, that method required the central concrete frame as well as steel beams to be raised prior to constructing the

floors. The solution presented by the contractor was more traditional in the sense that it only consisted of concrete and could be constructed from the bottom up. There was a problem identified with the settling of the building as initial calculations indicated a final settling approximately 700 mm. The contractor suggested an alternative method, where piles reaching solid ground would end one to two meters below the foundation and cohesion piles would be attached to the foundation but not reach solid ground. This would according to estimates reduce the settling dramatically, stopping at 150-200 mm. Besides lowering costs these alternative suggestions would according to the contractor also reduce project duration.

Resources Consumed During the Tendering Process for the Second Phase

This tendering process took place subsequent to the resolution of the appeal of the initial tender as can be seen in Figure 9.

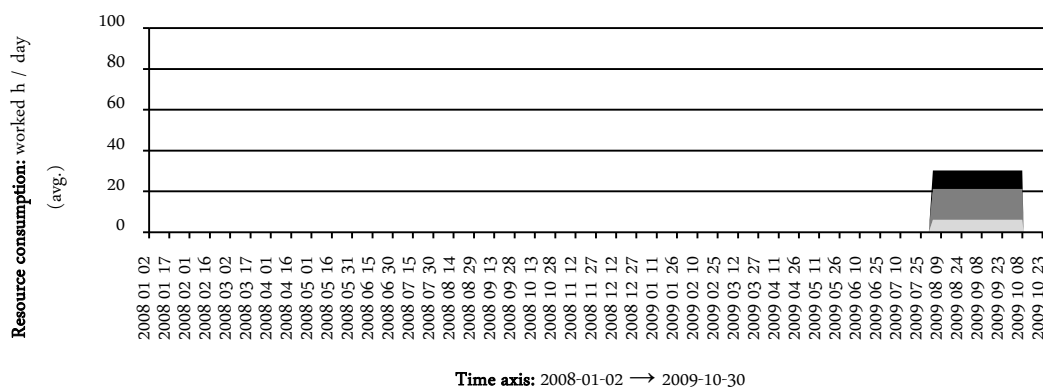


Figure 9 The client's assessment of the contribution to the design of the building from the awarded contractor during tendering for the second phase.

This procurement concerned the actual on-site construction works and was based on a positive cooperation when finalising scheme design and budget. During this phase the changes from the alternative tender produced by the contractor was dealt with and resulted in a new schematic design. A part of the resources had been used to calculate the costs of the changes in the project.

Initially during the interview the client was not certain whether or not any value had been added during this phase. Although changes were made the client was not certain whether these were initiated by the contractor or by themselves. The client regarded the resources used by the contractor as having been directly value adding during 20 % of the time, indirectly value adding during 50 % of the time and as not having been value adding during 30 % of the time (sees Figure 9). The client also expressed an impression of the phase as perhaps having been intended to generate a more fruitful contribution than what it did.

4.4 Client's Assessment of Various Resources

This section includes the client's assessment of time consumed by various resources.

Project Management

Nordstrand (2000) has described how a project management consultant commonly is hired early on to lead the realisation of a project. The client described the consultant as a guide, having had influence on issues concerning the detailed development plan, the cadastral procedure, design and procurement. The consultant was also engaged in the processing of tenders. It is although important to notice that while the project managers task is to ensure "the effective delivery of the project mission for the client" it is still the client that either accepts or rejects propositions presented by the project manager (Nordstrand 2000, Winch 2002, p. 8).

A project manager is required to be knowledgeable in building technology and the administrative aspects of construction (Nordstrand 2000). In design-and-build construction projects it is common for the client to hire a project manager as an aid through the investigations leading to a clear description of the requirements for the building to be constructed (Nordstrand 2000, Nordstrand and Révai 2002). Nordstrand and Révai (2002) especially stress the need for a project manager to act independently and question, if necessary, the will of the client as duty lies with the delivery of a sound building.

The client was not entirely certain regarding the period between January and July in 2008 but did consider it as having been 25 % directly value adding, 25 % indirectly value adding and 50 % not value adding (see Figure 10). During the assessment the client expressed a great respect for the consultant whom was described as very competent. During the interview the client also recognised that the consultant had made several technical recommendations that subsequently had become a part of the building as it was designed at the time of the study. This was likely taken into account during the client's assessment. Also influencing the assessment was the project manager's influence in actually enabling the detailed development planning process.

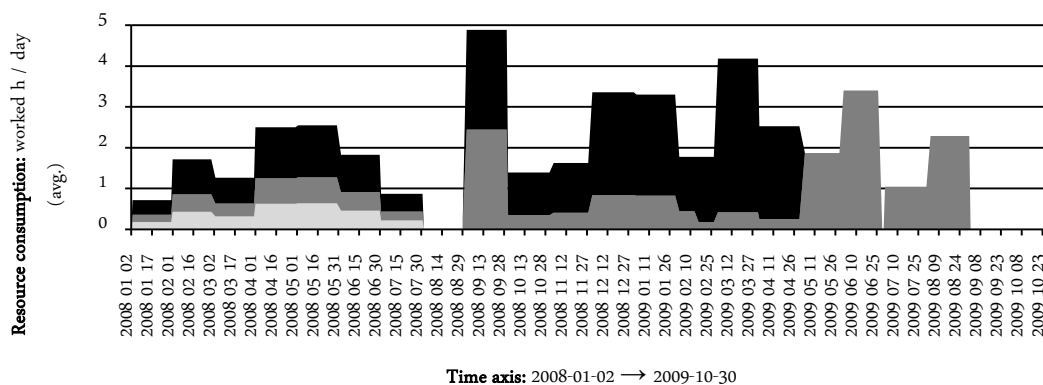


Figure 10 The client's assessment of the contribution to the design of the building from the project manager.

As can be seen in Figure 10 the consumed resources during September 2008 stand out as the consultant spent close to five hours a day in average on the project. The client recognised this as the period when schematic design was updated and regarded it as

indirectly value adding to 50 % and not value adding to 50 %. The consultant as such could, if the client had not made any further changes to the design been considered as indirectly value adding to 100 %, but since parts of the design since then came to be scrapped this effected the client's perception of the project manager as well.

A similar reasoning was held by the client when reviewing the subsequent phase, from the first of October 2008 till the last of February 2009, during which a contractor was procured. It was said that since a large share of the project managers time was spent on evaluating tenders from contractors that were not chosen only 25 % could be considered as indirectly value adding, the rest constituted not value adding use of resources.

The consultant was then occupied from the beginning of March till the end of April 2009 with the appeal, during this period the client regarded the used resources as not having added value during 90 % of the time and as having been indirectly value adding for the remainder.

During the final phases, up till the point of the study, the client regarded the used resources as 100 % indirectly value adding. During this period the client had begun working together with the procured contractor and was in the process of finalizing the detailed development plan and the cadastral procedure. The client described the role of the project manager as a guide and leader in the ongoing processes.

As such a construction project manager is hired as to assure the purposeful delivery of a construction project according to specification. The purpose may not be to create utility in the building to be constructed for the client but to utilise experience and knowledge to enable a structure that step by step increases project specification and decreases uncertainty.

Winch (2002) described a part of the complexity in which the profession operates when exemplifying how the regulatory context varies between countries, not aiming at specific rules but rather the degree of negotiation that may be possible, or even required. Partly basing the reflections on that statement it is apparent that experience and knowledge of tacit conditions may prove to be vital. Such services cannot be regarded to be sold on perfectly competitive factor markets.

The profession itself could be regarded as a response to the structure in which construction projects are conducted. That would qualify it as an indirectly value adding use of resources. But partly it also meets the definition of supervisory labour by Bowman and Ambrosini (2000) as minimising costs not being incurred by competitors.

The analysis is complicated as there is no legal requirement for the hiring of project managers instead the need exists as the specific competence only is available outside the client organisation. The bottom line though is that the profession is not aimed at creating utility in the form of functional buildings, but through functioning organisations. As such, the profession cannot be regarded as directly value adding, but rather a profession rooted in the industry structure. And as Winch (2002, p. 8) stated "construction project managers cannot operate effectively as an external add-on harrying those responsible for actually adding value".

Calculation

The described consultant was hired as to deliver estimates to the client during the phases covered by the scope of the study.

As design progressed the client needed estimates of the costs, however, as the design on which the initial estimates were based subsequently came to be scrapped a large share of the time spent was seen as not having been value adding by the client (see Figure 11). Estimation was based on the first version of schematic design till the end of July 2008. Although elements of these estimates came to be re-used and eased subsequent estimation the client, after some hesitation, regarded the resources used as having been indirectly value adding during 20 % of the time and not value adding during the remaining 80%. The client assessed the work conducted during the production of tender documents during September 2008 the same way.

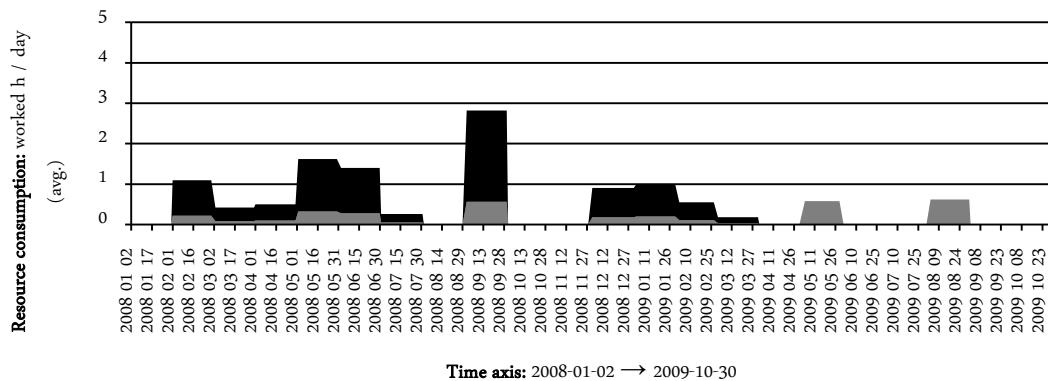


Figure 11 The client's assessment of the contribution to the design of the building from the calculation consultant.

Aiding the project manager with the processing of tenders occupied the consultant from December 1 2008 till March 31 2009. The client regarded these efforts as having been indirectly value adding for 20 % of the time and not value adding during 80 % of the time. Upon having awarded a contractor the project the client began reviewing the schematic design as to fit with the suggestions from the contractor. During this period the consultant was required to assist the client in the decision making process by supplying them with calculations. The period began in early May 2009 and ended at the end of August 2009. These efforts were seen as entirely indirectly value adding.

Geotechnical Investigation

A geotechnical investigation was conducted to investigate the state of the supporting soil. Initially though, the consultants did not drill any holes in the soil, instead they relied on existing information and old drill holes when supplying the client with their first assessment. Later, in March 2009, the consultants drilled holes of their own to develop a more accurate description of the composition of the soil, including the type of soil, its stability, its water content, and other parameters functioning as input to the structural engineer. The consultants did not suggest a type of foundation to the client.

Initially the client considered the resources used during 2008 as having been directly-value adding for 50 %. However, as the result of these labour efforts is an up-to-date estimate of the current geotechnical conditions the client instead regarded the

consumed resources as having been indirectly-value adding for 50 % of the time and not value adding for 50 % of the time (see Figure 12). That half of the work was not seen as value adding was according to the client due to the fact that once holes were drilled the initial information provided was scrapped.

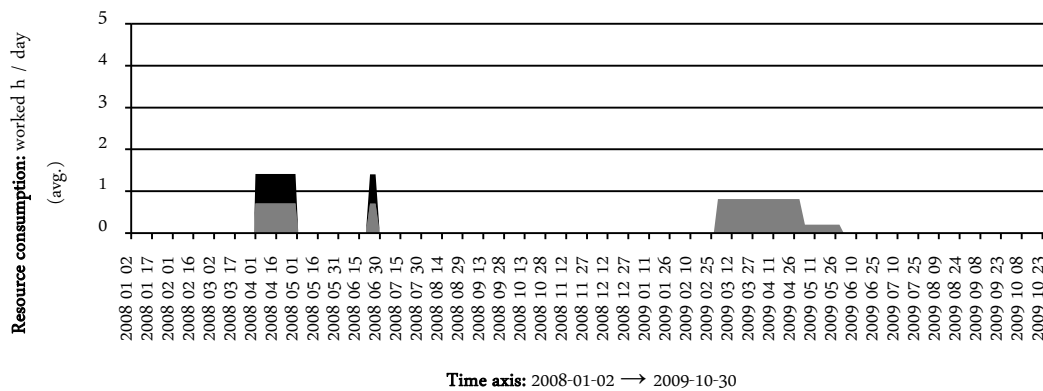


Figure 12 The client’s assessment of the contribution to the design of the building from the soil mechanics engineers.

However, the work conducted during 2009 served as an input to the structural engineer and the design of the building and was considered to have been entirely indirectly value adding by the client (see Figure 12).

A geotechnical investigation is required to design a buildings foundation. Inputs to the survey are the site and the soil mechanics engineers. The soil mechanics engineers translate the actual soil conditions on site to documents that serve as input to future design. Sometimes the consultant may suggest a foundation but that task formally lies with the structural engineer. As described by Bowman and Ambrosini (2000) value can be created through the combination of labour resources and materials, in this case the site and the consultant. However, while the creation of value usually requires of human labour to actively work on the material purchased this is not the case. The human labour instead passively studies and describes the purchased material (i.e. the site) as to inform the client of the state and quality of what has already been purchased. In one sense one could resemble the geotechnical survey to an assessment of the consumer surplus received when acquiring the site.

It may also be required so to assure that future design incorporates the sites characteristics in an economical and aesthetical sense. Unless investigated in due time costly rework may be required to adapt to the conditions of the site. From that point of view the consumed labour resources meets the description of supervisory labour by Bowman and Ambrosini (2000).

To summarise the survey needs to be completed in due time as to allow sound economical, aesthetical and structural decisions to be made. The information needs to be gathered as to assure maximum utility being designed by the structural engineer, but it can be regarded as a passive contribution, not active. Therefore it could be concluded that the contribution by the geotechnical consultant was indirectly value adding.

Client's Representative and Person Responsible for Quality Matters According to the Swedish Planning and Building Act 1987:10

The consultant described has had two roles, as the client's representative and as the person responsible for quality matters according to the Swedish Planning and Building Act 1987:10. The former of the two was described by the client as managing the practical issues related to the actual construction works on site and functioning as an interface in-between the client and the contractor. In line with Hansson and Olander (2004) who described the client's representative as being responsible for coordination, costs, procurement and follow-up (Hansson and Olander 2004). A role that in time lies subsequent to that of the design manager and is commonly held by someone with experience from on-site production (Nordstrand 2000). A construction management consultant is responsible for the cost effective delivery of a project from the procurement of contractor till the delivered building. As can be seen in Figure 13 the representative did not commence this role until late in the studied phase.

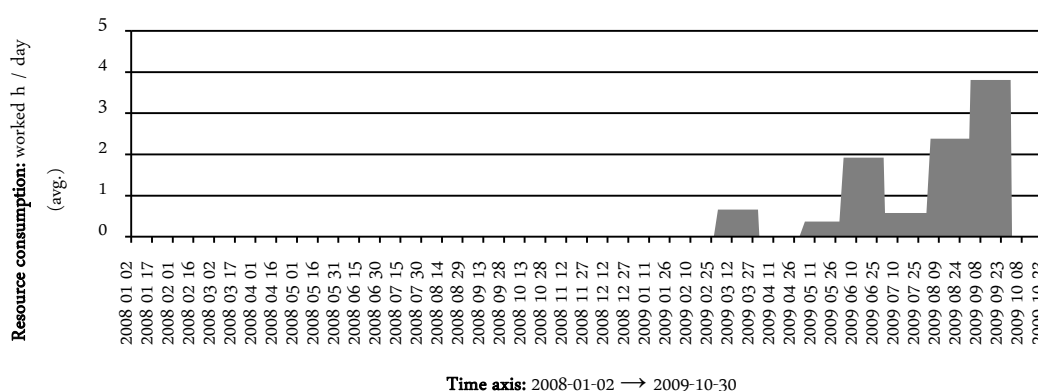


Figure 13 The client's assessment of the contribution to the design of the building from the consultant hired as a client's representative and person responsible for quality matters according to the Swedish Planning and Building Act 1987:10.

According to Boverket (2009) and Nordstrand (2000) the purpose of appointing a person responsible for quality matters is to assure that the client is in possession of the required knowledge base as to assure compliance with current technical quality demands. Once the municipal building committee has decided upon the content of the project control plan it is the person responsible for quality matters task to assure that these are carried through and documented (Nordstrand 2000, Boverket 2009). Other tasks include assisting the client, participating in building consultations and being present at controls and inspections (Boverket 2009).

The person responsible for quality matters is, depending on the project, required to have one of three different certificates: simple, normal or complicated (Boverket BFS 1995:5). As the studied project consisted of a five storey building the chosen person responsible for quality matters would have had to qualify for a certificate allowing complicated projects (Boverket BFS 1995:5).

The client regarded the consumed resources as not directly having added value as can be seen in Figure 13.

According to Nordstrand (2000) there are besides the project manager two more managerial consultants involved in a traditional construction project, a design

manager and a construction manager. In this project the client decided that there was no need to hire a design manager, a construction manager though was. It is during the on-site production phase that the construction manager mainly operates (Nordstrand 2000). As in this project the role commonly has two areas of focus: the contractors and supervision and inspection (Nordstrand 2000). The role can be expected to incorporate planning and budgeting in addition to representing the client when in contact with the contractors (Nordstrand 2000).

The consultant role could be considered as providing the client with expert knowledge and experience from mainly on-site production. Possibly with the purpose of assuring that the client makes well informed and rational decisions without incurring unnecessary costs. Well-managed and successful construction projects places requirements on the clients as well as the rest of the project organisation. If constructing a building would have been easier the role handled by the construction management consultant would have been established in-house. However, as this is not the case a market has established where these services are traded. The role can be considered a natural response to the demands the current processes places on the client organisation. As such it would qualify as being caused by the industry structure and common practice. Naturally all involved in a construction project may suggest and share their view on the utility of the building, but regardless of whether the client incorporates these suggestions and comments, the purpose of the organisation excluding the design consultants is not to create utility but manage the processes and structure of contemporary construction projects. And given that organisational members devote their efforts to the tasks that they have been hired for they will not engage in design matters. And as such cannot be considered directly value adding. The use of the resource should not be considered as not value adding either since there is no rework required if the tasks are not undertaken properly. However, a failure of the consultant could present the client with additional costs which themselves would equal the use of not value adding resources.

To a large extent, tasks undertaken by the person responsible for quality matters are decided upon by the municipal building committee. It reduces the manoeuvrability available to the professional as well as the client. As these tasks are of a supervisory kind, assuring compliance with legislation, they should not be regarded as directly value adding. However, the purpose is twofold, not only to assure society in general of buildings being secure, but also to reduce the clients risk of receiving a faulty building. Nordstrand (2000) wrote that partly the purpose is to assure that the building has sound qualities. That quality meets legislation can be seen as avoiding costs not incurred by competitors, assuring that scrap is not produced and avoiding rework. Even though these are all tasks affecting the overall project economy, not through the charged consultancy fees, but through avoiding unnecessary costs it does not contribute to the constructed facility in any other way than meeting societies lowest standards.

Given the arguments put forth by Bowman and Ambrosini (2000) the type of professional described fits generic labour. However, the distinction of purposefulness of tasks is complicated as it remains unclear on behalf of whom these are undertaken. Is it to assure compliance with legislation, to assure the government that clients and contractors build what society needs, to assure the client that it receives a sound building, or is it to assure the client minimal inference by government bodies? An interpretation could be that it to a large degree depends on the kind of client, whether it is a professional and experienced client with a long term ownership intention or a

client interested in short-term property development. In the studied case the client was an experienced real-estate company that initiates projects to meet the demands of their tenants. It is unlikely that they would not assure that the building constructed is sound and secure. I would therefore regard it is a necessary service acquired in order to comply with the legislation, however, not contributing to the quality and characteristics of the building to be constructed. However, it may be considered as serving yet another purpose, of assuring the real estate market of objects complying with at least minimal requirements. Both of these tasks fit the description of an indirectly value adding resource.

Environmental Soil Survey

It was a survey conducted to investigate and estimate any potential existence of polluted soil on the site. The survey consisted of diggings conducted on site and resulted in a report. It was conducted once, even though, Figure 14 may appear to indicate differently. The client could not completely recollect the results of the survey but was fairly certain that nothing particularly harmful to the environment was found.

As can be seen in Figure 14 the client considered the output of the labour efforts as entirely indirectly value adding. Initially though, the client was not certain whether or not these efforts could have created any value, but finally decided that the survey itself did not contribute to the building. It was rather regarded as a prerequisite for subsequent phases and required by law and as such could only be regarded as indirectly value adding.

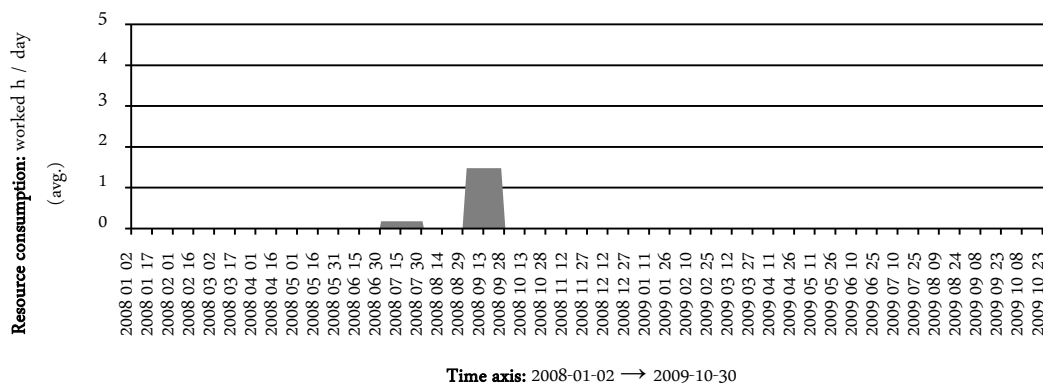


Figure 14 The client's assessment of the contribution to the design of the building from the consultants hired to perform the environmental soil survey.

Environmental Services

The consumed resources were provided by an environmental consultant that acted as a sounding board and a reviewer of the in-house capability responsible for developing an environmental plan and a plan for building damp and during the subsequent update as schematic design progressed. The consultant also assisted in the evaluation of tenders. The client was not sure what the consultant had performed between February and June of 2009.

At the time of the study the environmental plan and the plan for building damp was by the client assessed as largely consistent with the one developed between April and

August of 2008, and hence, the client regarded the consumed resources as having been directly value adding for 80 % of the time and not value adding for the remaining 20 % (see Figure 15). The latter represents the parts of the plan altered during the subsequent schematic design between August and October of 2008, out of which all had been kept up to the point where the study was conducted. Between November of 2008 and February of 2009 the consultant assisted in the evaluation of tenders. However, as only one out of six tenders was chosen 80 % of the time spent was considered not value adding by the client, and the remaining twenty as indirectly value adding (see Figure 15). The indirectly value adding part of the time spent could be regarded as an attempt by the client to assure compliance with the stated requirements. As the client was unable to recollect the resources consumed between February and May of 2009 it was decided that those would be considered as indirectly value adding. The client did not consider this a problem as the consumed resources only constituted a limited amount of hours.

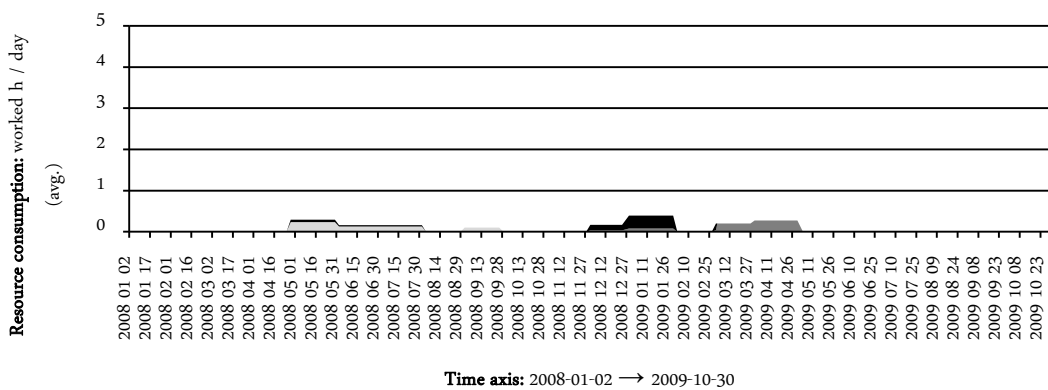


Figure 15 The client’s assessment of the contribution to the design of the building from the environmental consultant.

Commercial Advertising Consultant

This was a consultancy hired to aid the client in producing brochures as well as information published on the internet among other things. Work was conducted during several periods as can be seen in Figure 16.

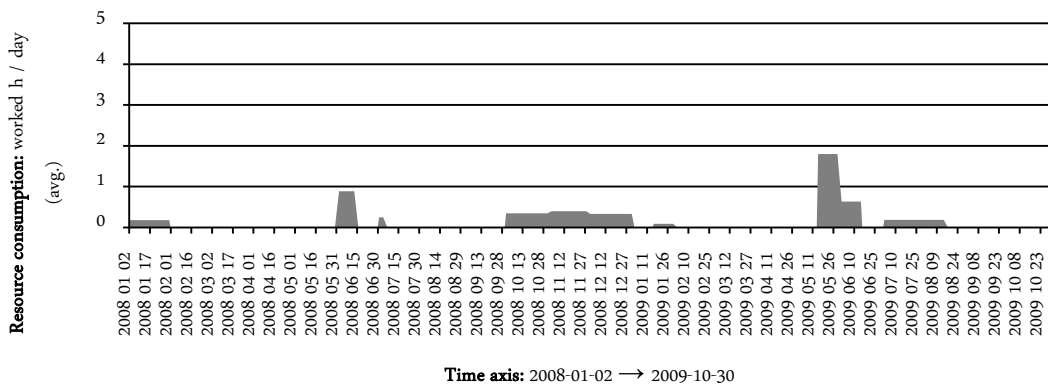


Figure 16 The client’s assessment of the contribution to the design of the building from the commercial advertising consultant.

The client regarded all of the resources used as having been indirectly value adding (see Figure 16). But that also implies that they were considered necessary to bring the process forward. According to the client it has been necessary to create interest and inform a larger public on the plans laid forward.

Statement of Chalmers University of Technology's View regarding the Development of Chalmers Lindholmen for the Brief

Representatives of the university were invited to contribute with their views on the suggested development. However, the contribution consisted mainly of critique and lacked suggestions on the design.

The client described the statement from the university representatives as not having included any suggestions, although there were changes made afterwards, none came from suggestions from the representatives. In summary the client regarded all the time spent as not having added any value (see Figure 17).

The representatives were invited to contribute and reflect upon the proposed design of the building and thereby had a chance to influence the utility of the future building. Given the representatives background they ought to be suitable for such an activity and thereby possibly being directly value adding.

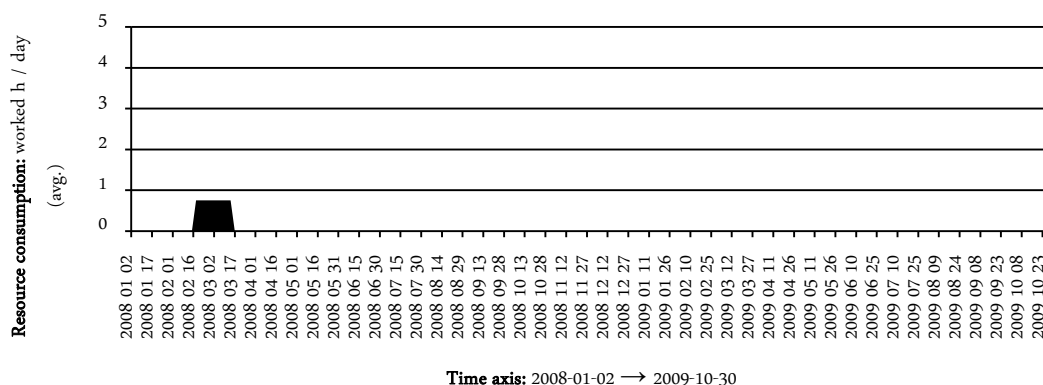


Figure 17 The client's assessment of the contribution to the design of the building from the representatives of Chalmers University of Technology.

Workshop Facilitation

These were resources used by a company that facilitated a workshop which had as its purpose to bring forward factors that the client should consider when developing the area.

The client was initially considered quite a lot of the used resources as having been not value adding, but since the only time included was that of the facilitators, the client changed its mind and regarded it as indirectly value adding (see Figure 18). Basing the assessment on arguments similar to those used when considering the commercial advertising consultant it was considered helpful when bringing the project forward.

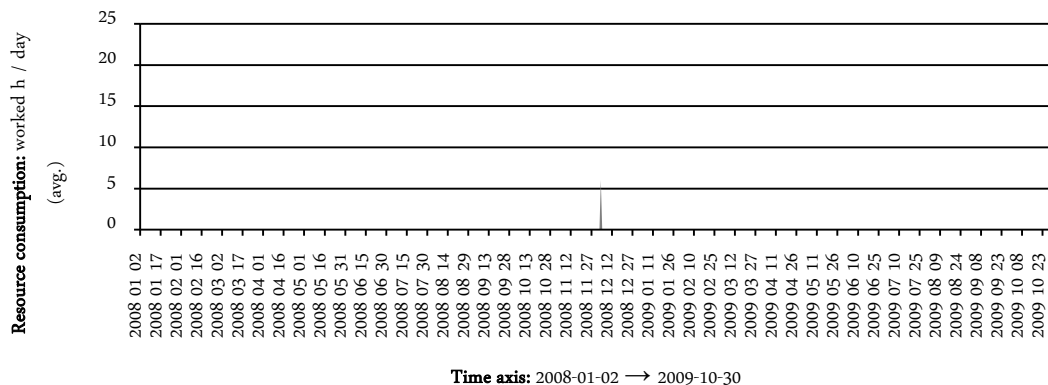


Figure 18 The client's assessment of the contribution to the design of the building from the company facilitating the workshop.

Acoustics

These consultants assisted the client, the architect and others to design a building that had good acoustics.

The resources used during 2008 were by the client regarded as having been directly value adding during 25 % of the time, indirectly value adding during 25 % of the time and not value adding during 50 % of the time (see Figure 19). During 2009 75 % of the time spent was estimated to have been as directly value adding and 25 % was seen as indirectly value adding (see Figure 19).

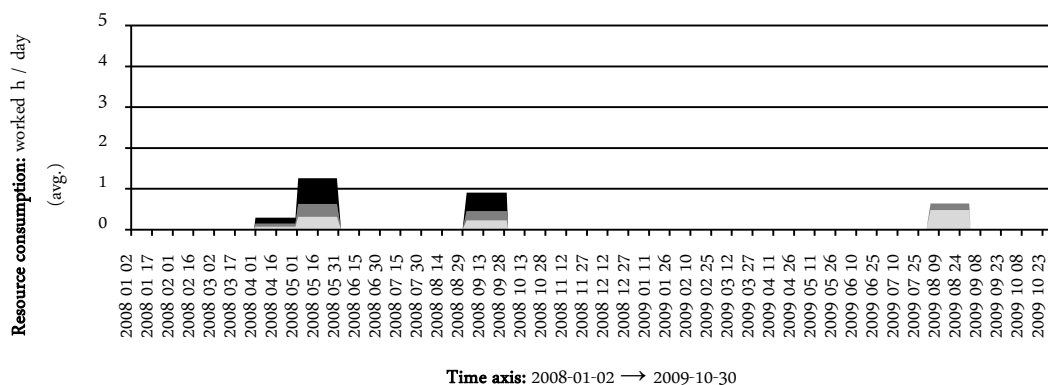


Figure 19 The client's assessment of the contribution to the design of the building from the acoustics consultant.

GreenBuilding

There were a limited amount of consultancies in Sweden that, at the time of the study, were allowed to advice clients on issues related to GreenBuilding. However, the main product of these efforts was the actual application: the design work was conducted by other consultants.

The client did not regard any part of the time spent in preparing the application for GreenBuilding as directly value adding, as can be seen in Figure 20. Instead it was required to acquire an official recognition of the buildings energy efficiency.

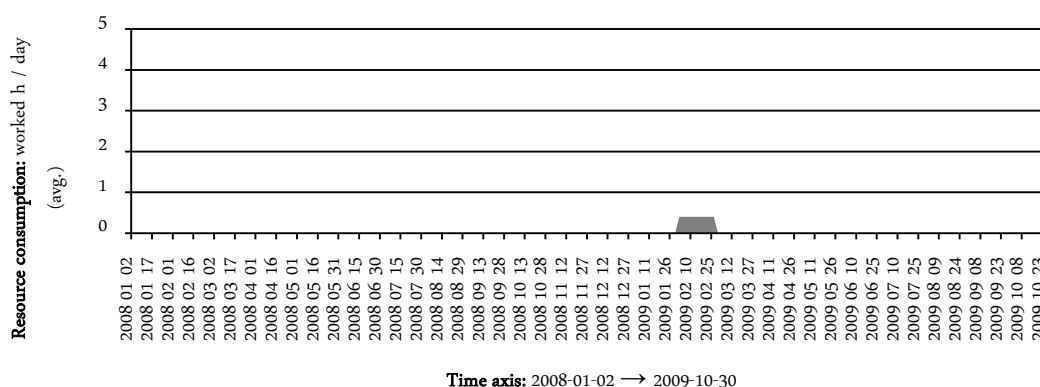


Figure 20 The client's assessment of the contribution to the design of the building GreenBuilding consultants.

There were according to Fastighetsägarna (2009) at the time of the study eleven consultancies that were eligible as GreenBuilding endorsers. Whether or not these constitute a perfectly competitive factor market remains uncertain. What the client has procured is not clear from the guidelines presented by the European Commission (2009) as the role of endorser only requires that the company promotes GreenBuilding and assists in the classification of at least one building per year. Further description of tasks or responsibilities is lacking.

Based on the description of the consultancy's commitment it seems more appropriate to regard it is a source of information regarding the GreenBuilding standards. As design works are undertaken by other consultants, these efforts cannot be regarded as potentially directly value adding, merely indirectly value adding. It is possible that the client places a lot of value in a future GreenBuilding certification and that these efforts are required as a natural consequence of such an ambition. While the design solutions enabling the building to meet the standards are developed by other consultants these efforts may be required as to receive the certificate.

Reuse Dismantling Drawings

These were documents prepared as to guide the removal of the ground tiles covering the square on which the building would be situated. They fit the description of design services as they influenced the future appearance of the square, however, not in the traditional sense of the word design. The documents also included a description of the order in which ground tiles were to be removed.

After having hesitated, the client regarded the used resources as having been directly value adding (see Figure 21). The result of these efforts was regarded as having been

incorporated in the design of the building at the time of the study. As such, the drawings instruct future works on site and without these the design of the building would have been incomplete. As such, the drawings, instruct future works on site and without these the design of the building would have been incomplete. An analogy to drawings and instruction for sheeting was made by the client when evaluating the consumed resources, without those the building could not be constructed.

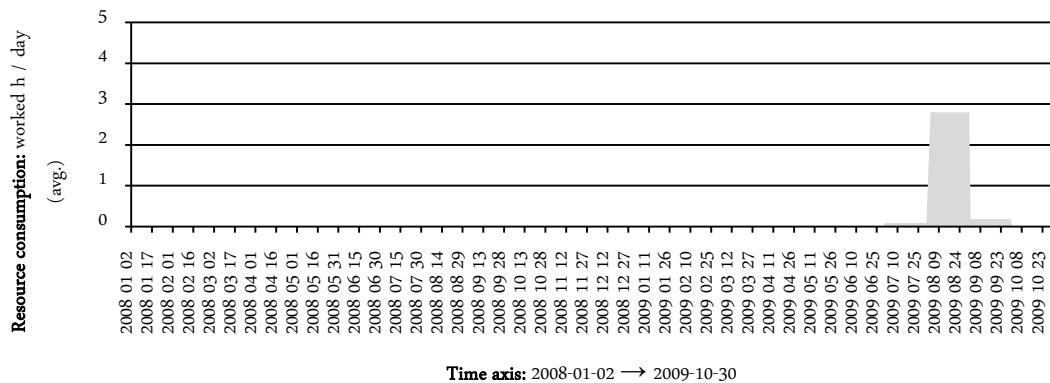


Figure 21 The client’s assessment of the contribution to the design of the building from the consultant producing the reuse dismantling drawings.

Legal Advisory on Issues relating to the Cadastral Procedure during the Detailed Development Planning Process

This consultant supplied information and advice regarding a potential common facility to the client regarding the realisation of the detailed development plan in relation to the cadastral procedure. As no such common facility ever was established the client considered the use of this particular resource as not value adding (see Figure 22).

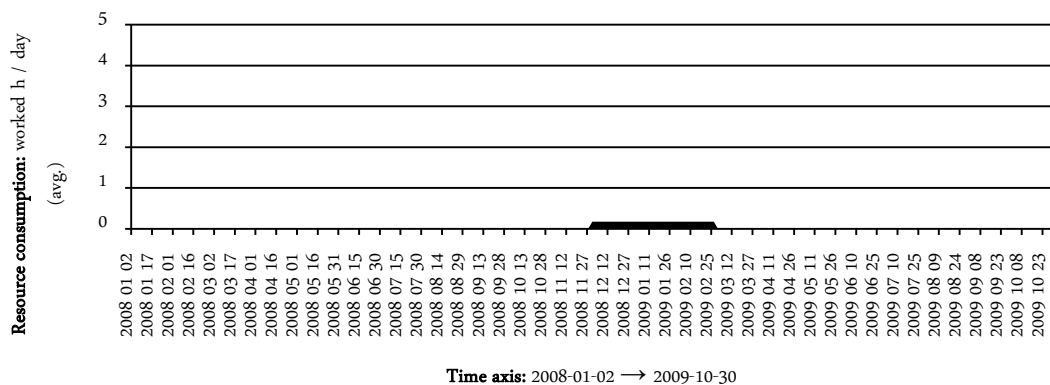


Figure 22 The client’s assessment of the contribution to the design of the building from the legal advisory.

The client received advisory services and was able to tap the consultant on information and experience. However, assuming that the purpose of acquiring these services has been to avoid unnecessary delays, costly rework and procedural surprises later on there was no responsibility attached to it. If there would have been it is possible that it could have qualified as supervisory labour.

Bowman and Ambrosini (2000, p. 6) stated that performing work that is not required in comparison to competing firms is unproductive and exemplify with “management levels that add nothing to use value production”. If the need resided in a lack of transparency coupled to uncertain outcomes from the combination of the detailed development planning process and the cadastral procedure then it could have been regarded as indirectly value adding as it would have been caused by the industry structure.

Unproductive labour is also those involved in unnecessary supervision according to Bowman and Ambrosini (2000). Assuming that the municipal processes were transparent enough then this could constitute unnecessary supervision and hence not value adding.

4.5 Summarised Assessment

All of the assessments conducted by the client have been compiled in Figure 23. In total the used resources covered by the scope of the study included 17,040 hours. Out of which 17 % was considered as having been directly value adding. 32 % was seen as indirectly value adding and 51 % was not regarded value adding.

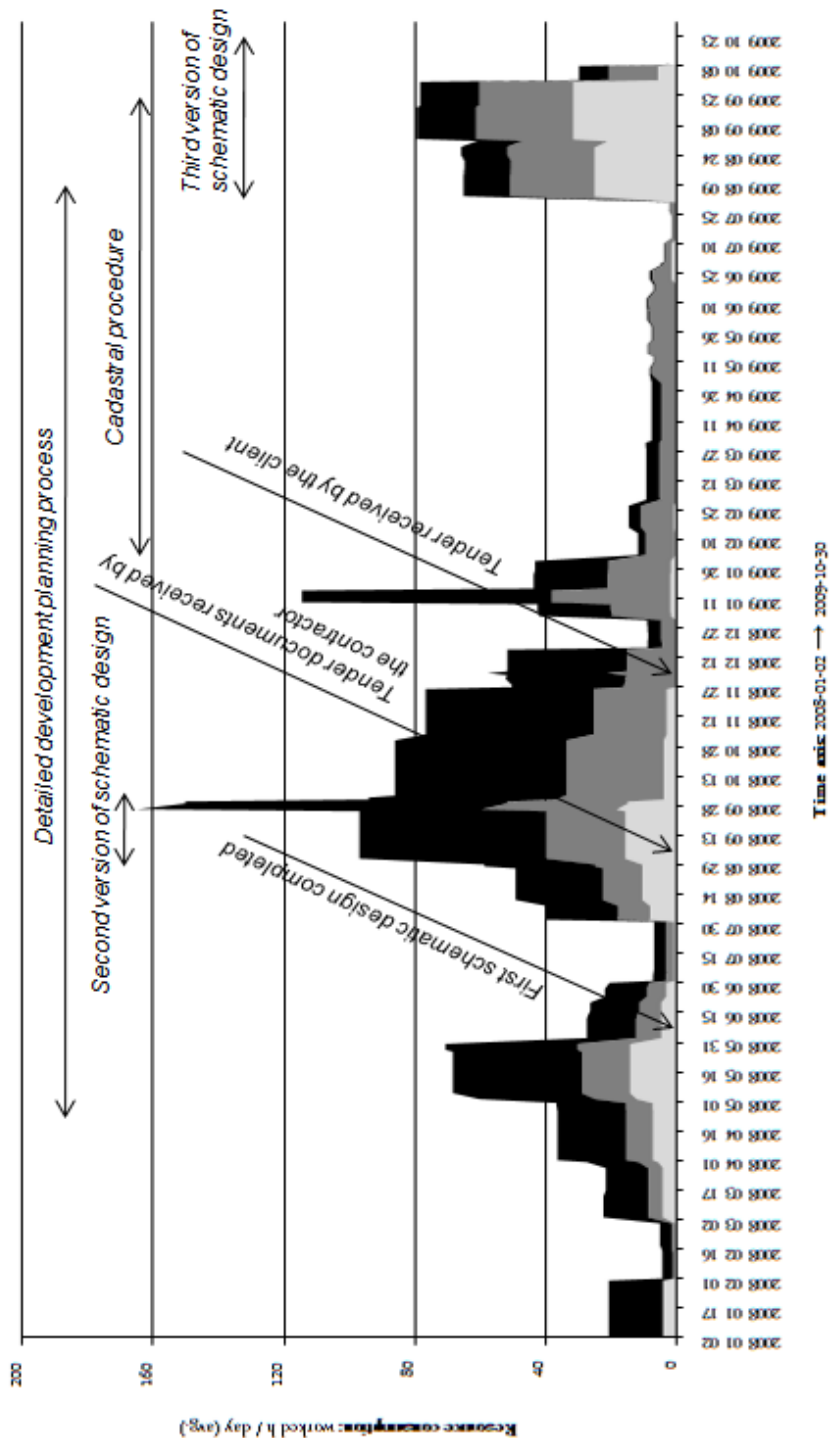


Figure 23 The summarised assessment by the client of time consumed by resources during the brief and design.

5 Discussion and Conclusions

The relay race model of construction is commonly visualised through interconnected arrows. However, as can be seen in Figure 23, the distance in between the active phases can be substantial. The project progression should perhaps not be considered as continuous but rather halting. In the studied project value had mainly been added during three periods: between April 1 and May 31 2008, between August 1 and September 26 2008 and August 3 and September 30 2009. These periods coincided with the periods during which the project group was occupied with schematic design. Subsequent to each such period it is likely that the client has analysed the project progression and consciously decided whether or not to proceed. However, as mentioned earlier, the inherent uncertainty in construction projects has likely increased and these decision points have likely become more complex. This could be one plausible explanation to the relative length of these periods.

The tendering process was not seen as value adding by the client. The client did not appear to regard the Swedish Public Procurement Act as having benefitted the project during the interviews. But there was also a lack of perceived alternatives. The client mentioned the possibility of not adhering to the act, but then stated that they would have had to conduct several of the steps anyway. In retrospect though it is possible that through having avoided the Swedish Public Procurement Act the project duration could have been reduced by four to six months as that would have meant that there would not have been an appeal. Phase two of the project was supposed to start in the middle of July 2009, however, as the appeal pushed the schedule forward that phase was not initiated until the winter of 2009. Having avoided the Swedish Public Procurement Act, or made sure that the selection of contractor was completely transparent, could have reduced the project duration dramatically. The tendering process is very peculiar as the client evaluates different tenders to identify the most beneficial offer. But as construction is a service industry, the design of the study, does not allow for such values to come forth. But it may also be that, a common image is that the contractor supplies a building, but yet, they really do not. They only supply the service of erecting it.

While the market on which the consultancy services are procured meet the description of perfect competitiveness from Anlander, Blomgren, Engwall, Gessler, Gramenius, Karlson, Lagergren, Storm and Westin (1998) by including a multitude of sellers and buyers it is not. This is due to the buyers' inability to be ascertained of the content of these services, described as a characteristic of perfectly competitive factor markets by both Anlander et al. (1998) and Barney (1986). Instead Barney (1986) has described a successful procurement, i.e. acquiring value generating capabilities for less than their realisable value, as a consequence of luck or novel insights. By and large, these services are procured in good faith, partly displayed through fees being paid by the hour (Liman 2005). The work of consultants in the design phase is commonly based upon drawings produced by the architect (Nordstrand 2000, Liman 2005). Consultants are procured to design systems, solutions and assure compliance with performance standards: however, this process is rarely defined by the procuring client (Liman 2005, Tunstall 2006). And hence, the results largely depend upon the procuring unit's choice of consultant, either through luck or novel insight.

Liman (2005) stated that a large share of the project costs are decided upon in the design phase and that the choice of consultants may have a large influence upon these. The final result of the consultant's efforts is drawings and descriptions: however "it is

impossible to define the outcome of this phase in advance” (Winch 2002, p. 184). While the end may be known, e.g. through performance requirements, the means of achieving that end are unknown. As such, consultants in the design phase cannot be regarded as performing homogeneously across competing firms, nor can their efforts easily be imitated or substituted. The design phase includes defining the future building and as Winch (2002, p. 183) states: “unless mission uncertainty is low, it is likely that there will be at least some aspect of the design which will require a novel solution”.

The design phase could be seen as resembling a picture transforming from blurry to sharp as the engaged consultants gradually approach a completely defined building. Their efforts result in drawings and documents used by subsequent actors for purchasing, constructing and finally operating the building. These documents could be seen as definitions of the future use values the client will be receiving as the building is handed over by the contractors.

As the process consists of the transformation of the clients initial desire for a new building to a completely defined structure it is a process of use value generation. However, always present is the risk of designing features not wanted by the client. If so, resources will be consumed, and hence value destroyed. While the risk is evident, the purpose of the phase is to generate value, and as it is characterised by a lack of solutions known in advance these consultants would seem to fit the description of differential labour by Bowman and Ambrosini (2000) and thus possibly be value generating.

Even though merely 17 % of the used resources were considered value adding by the client they still regarded the project as successful and on track, disregarding the appeal following the competitive tendering from contractors. This could be interpreted in several ways, if based on the preceding theoretical section two plausible explanations exist. The resulting use value received by the client could be considered so valuable that it exceeds the cost of the resources used when developing it. The factor markets on which these consultancy services are acquired are so imperfect that the client has acquired them under great uncertainty. And that the design process is so uncertain that it simply cannot be completed without using a lot of indirectly- and non value adding resources. It is though, also likely that the results reflects the design of the study. As the study focuses on those efforts resulting in design elements those resources that carry the project through its context are not considered value adding.

5.1 Limitations of the Study

The project was subject to an appeal subsequent to awarding a contractor the project. The lawyers hired to represent the client was not included as there were no records of the duration of their engagement in the project.

The civil servants engaged in handling the application for planning permission was not included either as they keep no records of the hours allocated to a specific project. During the interview with a civil servant at the city planning office the interviewee was asked for an estimate of the hours consumed, the civil servant was however unable the estimate the consumed hours.

The cost of acquiring resources has intentionally been neglected in the study. Instead the focus in the study has been placed on the time spent on the project by various

resource holders. This has affected the assessment by the client. Had the client been instructed to evaluate the resources consumed in relation to the cost, the results could have differed. It would have meant that the competitive situation of the construction market would also have come into play. What was evaluated in the study was the client's impression of how much of the time spent by consultants, the awarded contractor and the civil servant at the city planning office on the project that actually was perceived as value adding.

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