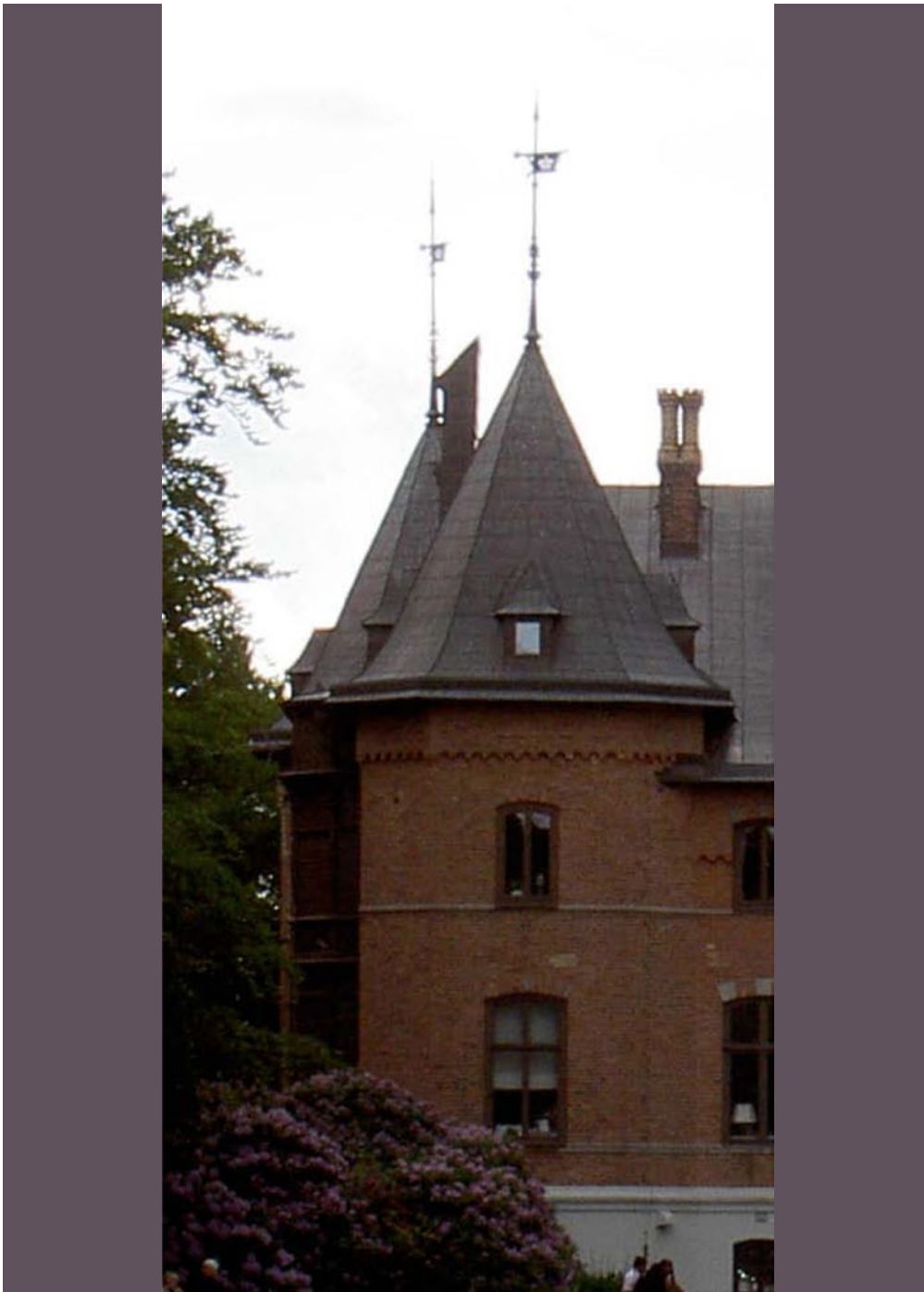


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A housing Project in the South of Sweden

CREDIT Case SE07



Danish Building Research Institute
AALBORG UNIVERSITY

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Construction and Real Estate -
Developing Indicators for Transparency



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Preface

This report describes the results of a case study undertaken as part of the Nordic/Baltic project *CREDIT: Construction and Real Estate – Developing Indicators for Transparency*. The case study is part of the work in work package 4-6 with respect to project assessment tools, application in firms and national benchmarking systems.

CREDIT includes the most prominent research institutes within benchmarking and performance indicators in construction and real estate, namely SBi/AAU (Denmark), VTT (Finland), Lund University (Sweden) and SINTEF (Norway). Further, three associated partners have joined CREDIT. The three associated partners are the Icelandic Center for Innovation (Iceland), Tallinn University of Technology (Estonia) and Vilnius Gediminas Technical University (Lithuania).

The project has been managed by a steering committee consisting of the following persons:

- Kim Haugbølle, SBi/AAU (project owner).
- Niels Haldor Bertelsen, SBi/AAU (project coordinator).
- Päivi Hietanen, Senate Properties (chair of Finnish steering committee).
- Pekka Huovila, VTT.
- Ole Jørgen Karud, SINTEF.
- Magnus Hvam, SKANSKA.
- Bengt Hansson, Lund University.
- Kristian Widén, Lund University.

The project group wishes to thank our industrial partners and all the contributors to the case studies. In particular, the project group wishes to thank the four Nordic funding agencies that sponsored the project as part of the ERABUILD collaborative research funding scheme: The Nordic Innovation Centre (NICe), TEKES in Finland, FORMAS in Sweden and the Danish Enterprise and Construction Authority (Erhvervs- og Byggestyrelsen) in Denmark.

Danish Building Research Institute, Aalborg University
Department of Construction and Health
August 2010

Niels-Jørgen Aagaard
Research director

Summary

This study consists of a new build project with participating end users. The project is executed in Helsingborg (in the south of Sweden) and the client is a public housing company. The project has a joint ambition between the project participants and end users. The focus is the collaboration between the participants in the early phases of the project. The study describes the actors involved, their common goal and their way of working together. It also discusses the role of the architect and the possibilities to learn from the project.

It was found, that when involving end users in the early phases, it is important to have enough time, to be able to create effective group collaboration. It was found important to possess a number of management skills such as working towards a common goal, taking care of the knowledge the individuals possess in an efficient way and creating a safe atmosphere among the participants. If managed properly, these aspects were found to positively contribute to the quality and the price of the final product of the project.

1. Introduction and objectives

This case study is a part of the CREDIT project. The contribution is a deeper understanding of collaboration with end-users in the early phases in order to reach a product with a high quality and at a low cost.

1.1 Objectives and work packages of CREDIT

Sir Winston Churchill once said, “We shape our buildings, afterwards our buildings shape us” (28th Oct 1943). This quotation underlines how strong a building can influence an occupier or a user. Providing complex public facilities for example hospitals, schools, universities and libraries that are able to meet both the internal and external stakeholders’ needs and requirements is not without complications. The aims and demands of different stakeholders within a project can sometimes create conflict with each other’s interest. Understanding the needs and requirements of these stakeholders are essential to remain competitive in today’s market. A client that pays attention to the needs of the end-users will be rewarded with a high-performance property. Simultaneously, this shift seeks to solve many ills associated with inadequate building conditions and resulting in poor building function.

Due to the amount of both public and private money being invested in delivering public and private facilities, strong actions must be adopted. Collaboration with the relevant stakeholders will help building owners in identifying the required performance indicators to create high-performance facilities. The project aims to define a model for the implementation of performance requirements, which ensure the fulfilment of the various types of users’ and stakeholders’ needs and demands. The model shall also allow for the continuous measuring of the effectiveness of the used requirements and the model as such so that it may be improved as more knowledge and experience of it is achieved.

Following the themes of the ERABUILD call closely, the aim of CREDIT is to improve transparency on value creation in real estate and construction. Thus, the objectives of CREDIT are:

- To capture end user needs and requirements in order to identify and quantify – where possible – value creation in real estate and construction.
- To develop compliance assessment and verification methods.
- To define and develop benchmarking methods and building performance indicators in real estate and construction.
- To set out recommendations for benchmarking internationally key building performance indicators.

Consequently, the deliverables of CREDIT are:

- 1. The establishment of a network of Nordic and Baltic researchers for benchmarking and performance indicators through frequent interactions in workshops across the Nordic and Baltic countries.
- 2. A State-of-the-Art report, that will identify and critically examine a number of existing tools, databases, mandatory reporting, approaches and benchmarking schemes to capture and measure end-user needs, client and public requirements on performance and value creation.
- 3. A strategic management and decision making tool to guide the definition and development of benchmarking methods and building performance indicators in different business cases.

- 4. A comprehensive performance assessment and management tool with associated key performance indicators to capture end-user requirements and to continuously measure and verify the compliance of performance throughout the lifecycle of an actual building project and linked to building information models.
- 5. Recommendations as to how sectoral and/or national indexes for performance indicators can be designed in order to allow for international benchmarking of construction and real estate.
- 6. Dissemination of the lessons learned and tools developed through news articles, press releases, workshops with actors in the real estate and construction cluster etc.

1.2 Background, purpose and focus of the case study

The case study was chosen to find out the characteristics of end user collaboration process in a housing company. The purpose of the study is to find improved collaboration procedures, between all actors involved in the construction process, in order to achieve an effective process that leads to an outcome characterized of good quality at low cost. The objectives of the study are to:

- Explore the characteristic of working with a joint ambition
 - Effects on the process
 - Effects on the product
- Investigate the role of the architect in the process

1.3 Research design and methods applied in the case study

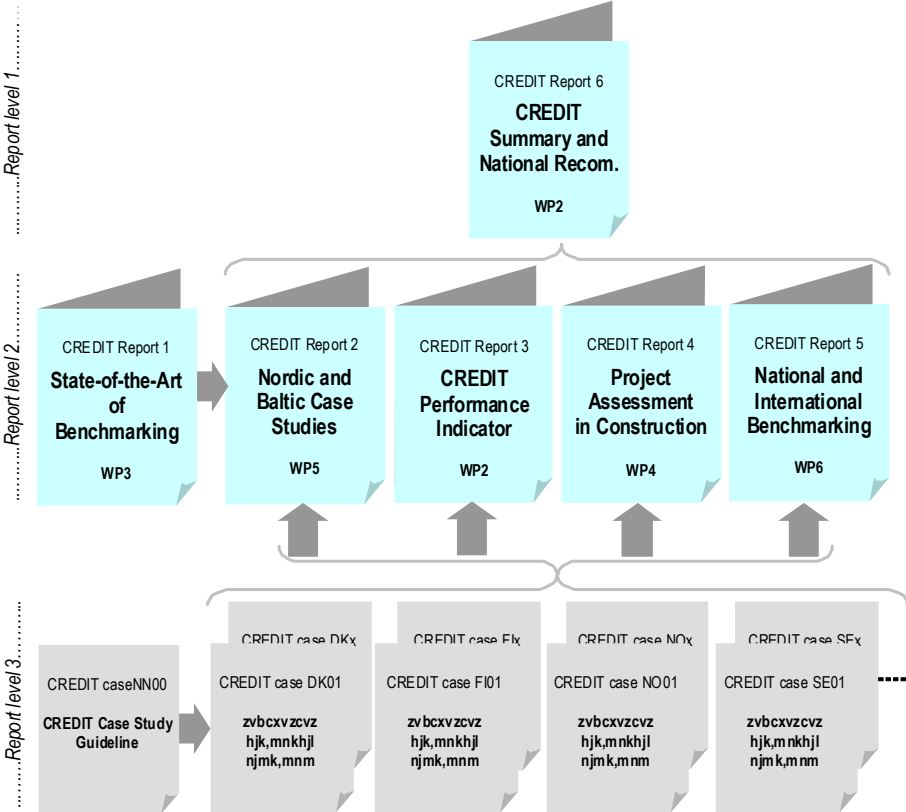
To find better collaboration procedures were action research used. The research was based on two theoretical assumptions of creating an effective process; (1) dialogue and cooperation and (2) collected competence. The action research involves observations and collection of information (drawings and memos) during the meetings in the early stage of the project. The action research was combined with a literature study and Svetoft's earlier professional experiences as an architect. The case study is part of Svetoft's doctoral thesis.

1.4 Reading instruction

Chapter 2 in this report addresses issues relevant to WP4 on assessments at project level. Chapter 3 addresses issues relevant to WP5 on the application of assessments in firms. Chapter 4 addresses issues relevant to WP6 on sectoral, national or international benchmarking systems. Chapter 5 discusses and concludes on the lessons learned with respect to the three levels of projects, firms and systems.

The work of each work package (WP) is documented in various other reports, articles etc. Below, a graphical illustration of the hierarchy and linkages between the individual reports is given.

Figure 1. Graphical illustration of the hierarchy of the CREDIT reports.



2. Buildings – assessments in construction or real estate processes

The study is based on the assumption that there is a need to find new working procedures in the construction process, as the end-user is not always satisfied with quality and cost of the product. The real estate company, in this study, has a culture and tradition of a close relation to their tenants. The company attempts to continually response to the tenants changed demands and requirements.

2.1 The actual building, building parts and processes

The project was initiated in February 2004 and was finished in December 2008. The project was delayed due to infrastructural planning in the municipal planning office. The project includes a housing area consisting of 200 apartments in the south of Sweden. The area will consist of dwellings, multi-storey houses and detached houses. The goals of the project were set from an end user perspective at an early stage.

2.2 The applied assessment methods and tools in the processes

The project was initiated by several workshops and meetings with a number of actors such as the local authorities, the architects, the caretaker, the construction firm and representatives for the future tenants. To achieve a creative planning process the actors strived to use the individual knowledge and experience as efficient as possible. The organization's culture and history of possessing a close relation to the end-users colored the process. The process was characterized of having a high level of co-operation and was customer driven. The professionals mainly based their work on experiences. The project data was collected and shared among the participants through a web-based portal.

“Brain-storming” meetings, workshops and study tours were found fruitful events to start discussions and to formulate the project goals. The goals with the collaborative events were to establish an efficient project team by:

- Receive a common understanding of the end-users needs and requirements
- Reach an agreement of the goals and the “rules” of the game
- Ensure an effective partnering process by performing a common declaration (the moral contract).

In the invitation to the meetings, the involved actors were requested to read the addressed information of the other actors. The meetings furthermore enabled the initiation of the socialization process of the co-players in the group. The workshop agenda contained information of co-operation procedures and norms in partnering projects. During the workshops were commonly existing prejudices of roles and responsibilities in the construction management discussed.

2.3 Cost and performance indicators applied in the assessments

The real estate company gave a clear directive, a goal, concerning the costs of producing each square meter. It was, though, found to be a challenge to maintain a high level of collaboration in the group, as well as awareness of the economical frames during project execution. The study showed that investing in time and efforts in the early stages can lead to good results. It was also found that creation of a “safe” atmosphere, where knowledge was shared and discussed, had a positive effect on the final product. By participating in the project, the end-users and future tenants had possibility to affect the rent level. Their participation gave an ability to create the “right” product with a higher constructability which could possibly bring positive economical effects.

The project succeeded in reaching the goals set concerning product quality and low production cost. Another beneficial result of the project was that the tenants did not report any problems or faults in their apartments. This is maybe a result of the emphasis on collaboration in the project. For example gave the building inspector feedback to the craftsmen after finishing the first apartment. The craftsmen improved their work; the same mistake was not made twice. This tool of continual dialogue and discussion seemed to result in higher level of quality of the end product and of job satisfaction.

2.4 Relation to different enterprises and national benchmarking

2.5 Visions and innovation for future improvements

The case study indicates that by focusing on end-users requirements and working with a joint ambition can bring positive effects on the product and process. There is though still a need to improve the collaboration process. But the study highlights the importance of finding new forms of collaboration and learning in organisations and teams.

The architect could take responsibility for initiating the dialogue and maintaining communication between the users and the professional team. If the appropriate role is given to the architect and if the architect’s attitude towards the task is appropriate, user involvement in the design process can be positively affected. Different working models and methods can be used to obtain effective communication. Both full-scale models and 3D modelling at the computer can be used to describe to users how designs are proceeding.

The architects in this case study clearly expressed the challenge to work with the restrictions and frames given by the goal to produce houses with a fixed cost. Other colleges would find these circumstances as a restriction to the artistic and creative process. There is a need to change the attitudes held of the different actors. The different actors’ roles could be discussed during the time of the student’s architectural education in order to broaden their perspective. Maybe it is time to raise the level of respect for different competencies and the value of creating a generous and safe atmosphere. Time pressure and stress is an obstacle for the creation of this prolific environment. A more customer driven processes will hopefully bring smart and elastic working model that can change these conditions. To improve the organisational development would be beneficial both for the companies and the individuals.

3. Enterprises – assessments and indicators internally applied

This chapter is not involved in the study.

4. National benchmarking – indicators, assessment and organisation

This chapter is not involved in the study.

5. Discussions and conclusions

This case study indicates positive effects of working together with a joint ambition in the construction process. Each actor has different interests and it is necessary to draft out what goals can be shared at an early stage of the process. The discussion aims to answer the objectives of the study to:

- Explore the characteristic of working with a joint ambition
 - o Effects on the process
 - o Effects on the product
- Investigate the role of the architect in the process

5.1 Buildings - lessons learned and recommendations

This section is not included in the study.

5.2 Lessons - learned in construction and real estate processes and recommendations

Effects on process and product

The case study indicates that the performance of the individuals can be explained as the product of company values and team-member co-operation and collaboration. Every actor and individual involved is therefore important when working together in a project. Using each others competence in a safe and encouraging atmosphere can bring positive effects on both the process and the product.

The study showed the importance of putting a lot of effort at an early stage in the project to start the socialization process among the co-players. Used tools and methods to improve the collaboration were meetings, workshops and study tours.

The role of the architect in the process

In order to improve the collaboration between the users and the professional team the architect could possibly take a bigger responsibility. The architect has a number of tools for visualisation that could be beneficial for this matter. There is though a need to change the existing attitudes among the actors in the construction process to succeed with this arrangement.



This case study explores the characteristics of working with a joint ambition in a housing project. It was found, that when involving end users in the early phases, it is important to have enough time, to be able to create effective group collaboration. Furthermore it was found important to possess a number of management skills such as working towards a common goal, taking care of the knowledge the individuals possess in an efficient way and creating a safe atmosphere among the participants. If managed properly, these aspects were found to positively contribute to the quality and the price of the final product of the project.

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