22 Student Housing Estates

Stakeholder evaluation of user satisfaction, housing quality, econimy and building process CREDIT Case DK01

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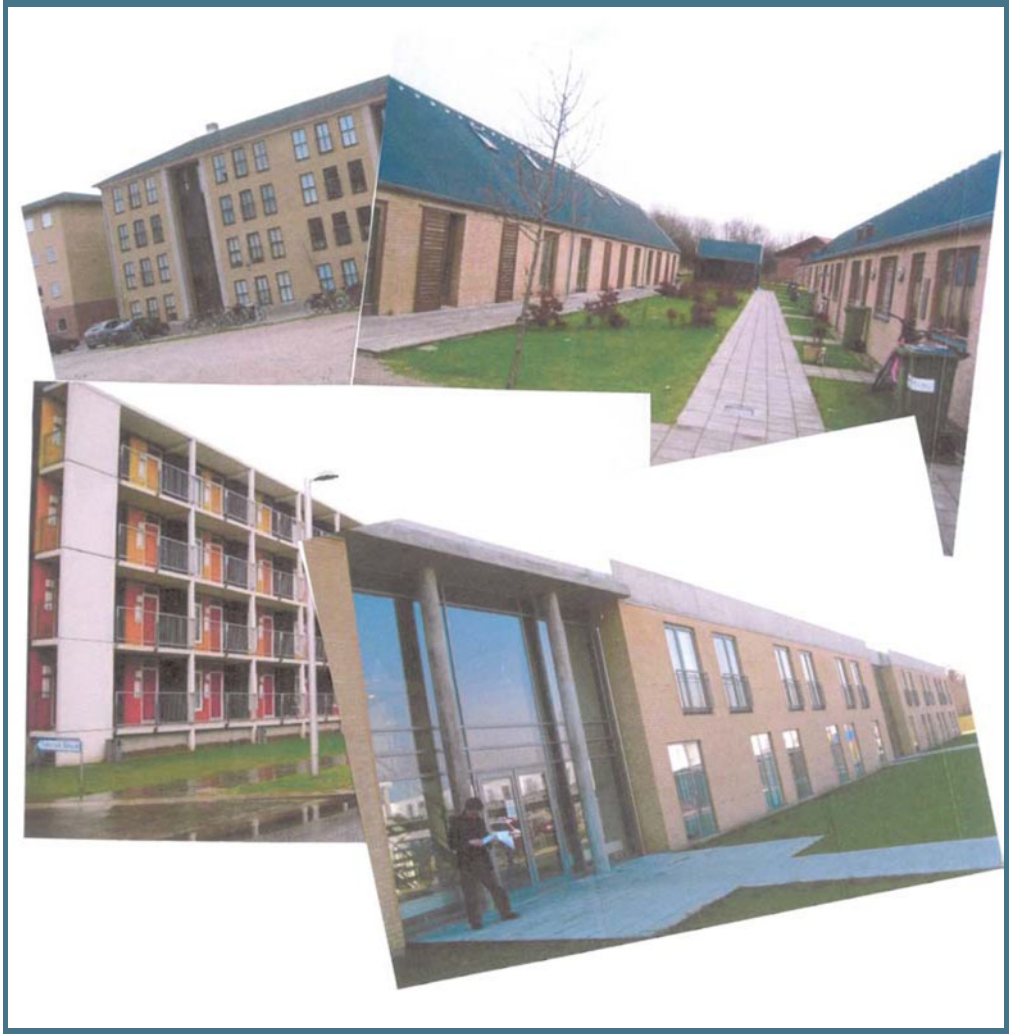

Danish Building Research Institute
AALBORG UNIVERSITY

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Contents

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).
- Pekka Huovila, VTT.
- Päivi Hietanen, Senate Properties.
- 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

The aim of the evaluation in this case was to measure whether the targets with a specific political initiative were met. The initiative was taken to increase the number of dwellings in the private housing sector for students.

The evaluation focused on the following chosen four themes: quality in the finished buildings, the building process, the economy and the user satisfaction.

Basis for the evaluation were similar evaluated aspects of non profit housing for students.

The evaluation was primarily based on registration of the quality of the finished buildings, questionnaires and interviews with all clients and persons responsible for economics in the execution of the estates, interviews with local authorities, questionnaires to students, questionnaires and interviews with persons responsible for the operation of the estates and interviews with members of the judging committee.

The indicators were tailored to this evaluation. They were used after the estates have been taken into use and the users have moved in. The results and recommendation were aiming at the governmental initiative and to get an insight into quality, building process, economics and user satisfaction of the finished estates.

In this way the indicators were mainly on an overall level and reflected the political discussions. Meanwhile they gave also indications of a more general character concerning user needs and wishes to student housing. As they were registered after the buildings were finished they aimed at a continuation of the initiative which turned out not to be actual for the moment.

The evaluation has been executed by a group of private companies in accordance with talks with the ministry responsible for the initiative, Ministry of Interior and Social Affairs

The results of the evaluation are experiences concerning the mentioned themes and recommendations to alterations. Meanwhile there is no political interest as mentioned for further initiatives of similar character for the moment

But in the case a new initiative is taken there are conclusions which also could influence the single building quality, process, economy, and user satisfaction. And the chosen topics could be a platform for a systematic evaluation of student housing.

1. Introduction and objectives

The case describes a comprehensive evaluation of a governmental initiative to increase the construction of private housing for students. The first 15 estates - new buildings and converted buildings – with 1113 flats have been evaluated concerning quality, process, economy, and user satisfaction.

For comparing the results with new non profit student housing estates 7 estates in this area with 627 flats have been evaluated.

The evaluation concludes in recommendations for alterations in the initiative.

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

This case consisting of 15 different student housing estates has been chosen, because it describes assessments of four themes in housing projects: quality, economy, process and satisfaction, (Velfærdsministeriet, Evaluering af støttede private ungdomsboliger, Juli 2008).

The idea to choose the case is the result of a meeting in the Danish reference group where user satisfaction was discussed and the participants propose to use an evaluation of student housing.

The student housing estates are the result of a state initiative in 2003 to yearly establish more flats for students in the private sector. The flats were supported financial by a percentage of the building costs.

The initiative was only open for private clients. The initiative was divided on the years 2003-2007 with a competition every year to select clients/companies who were offered a contract. The criterion was how much the companies demanded in financial support to build in comparison with the average costs in the non profit housing sector.

A part of the tender documents was some demands of functional, technical and architectural character

From 2003 to 2007 the state received 50 applications for support. 32 were accepted and got support. 15 of these projects were finished at the time for an evaluation of the initiative and have been assessed and the results are described here.

The executed estates were chosen after a competition where some conditions concerning the area of each flat, kitchen, bath/toilet, common areas with facilities and the building in general should be met.

In the competition the applied percentage of the average costs of a student flat was decisive for getting a contract with the state. Maximum for financial

support was 50% and approximately 60% of the clients applied for the full support.

The assessments of the mentioned 15 housing projects with financial state support were supplemented with comparisons with seven non profit student housing estates and one private project.

The seven non profit student housing estates were built in accordance with traditions and quality for state support to such building types. The one private student housing was a special project with a fund as client and in better quality. It was only used in discussions concerning the future for student housing.

The results of the assessments were used in the following yearly work and evaluations of new applications.

1.3 Research design and methods applied in the case study

The description here is based on the report of the evaluation of 15 private housing estates for students and 7 non profit housing estates for students. The evaluation has been executed by a group of private companies in accordance with talks with the ministry responsible for the initiative, Ministry of Interior and Social Affairs.

The group was chosen after a competition and consisted of capacent, EMCON, KPMG and sbs.

The case belongs primarily to WP4. National benchmarking. The conclusions in the evaluation report are aiming at a governmental initiative and recommend some alterations. Furthermore by the systematic evaluation and the choice of themes especially concerning quality and user satisfaction it could form the platform for a future permanent benchmarking system.

The case has been written by Ib Steen Olsen, Danish Building Research Institute, after talks with Karsten Gullach and Jacob Østlund Jacobsen from the mentioned ministry

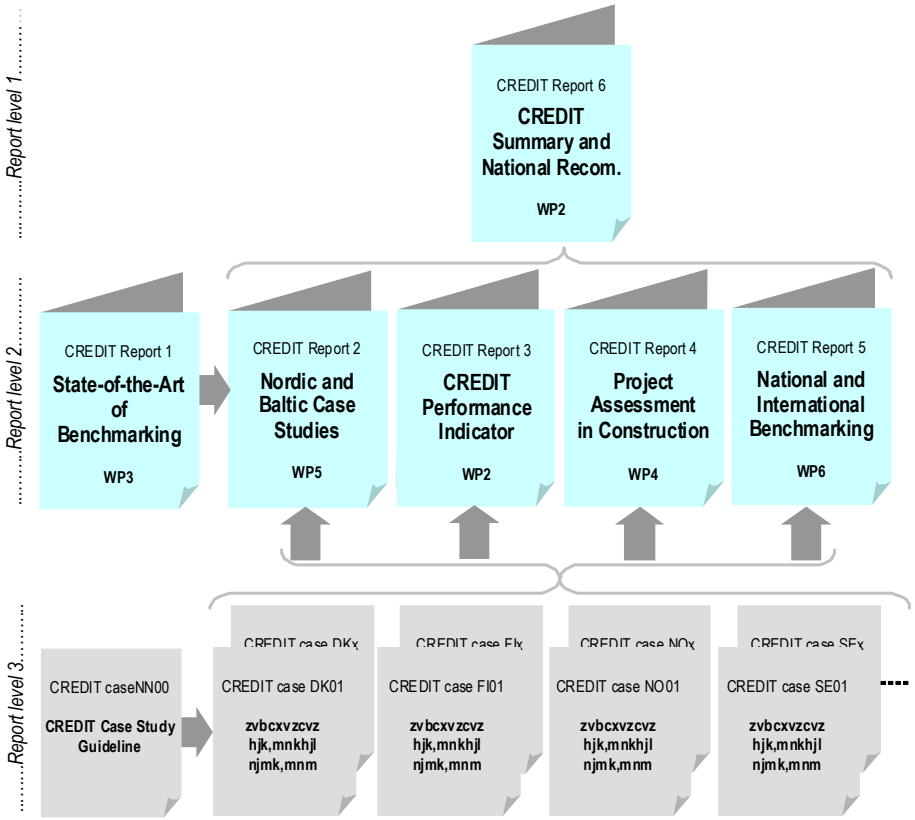
The case study has been conducted as an action research by researchers and members of the organization seeking to improve their situation (Greenwood and Levin, 1998).

Data have been conducted from multiple sources to enhance reliability and trustworthiness of the results (Robson, 2002).

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.

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



2. Buildings – assessments in construction or real estate processes

The evaluation in this case is based on registration of the finished estates, economical calculations, questionnaires and interviews. Clients, companies, local authorities, students, operation managers and members of the judging committee have been involved.

Four main themes have been evaluated: quality, building process, economics and user satisfaction.

2.1 The actual building, building parts and processes

The description of the case is based on the whole evaluation of the mentioned 22 estates – 15 private estates with 1113 dwellings and 7 non profit estates with 627 dwellings, see 1.2 "Background, purpose and focus of the case study",

Focus in the case is with other words an evaluation of a group of buildings and a comparison with normal traditional buildings of the same functions.

The private estates consist of buildings in one to ten storeys. Five of the 15 buildings/estates are renovated buildings. The apartments are from 27 to 50 square meters in average and some have two rooms. 13 of the buildings have common room and kitchen in a special room. All apartments have a smaller or bigger kitchen.

2.2 The applied assessment methods and tools in the processes

The evaluation is primarily based on registration of the quality of the finished buildings, questionnaires and interviews with all clients and persons responsible for economics in the execution of the estates, interviews with local authorities, questionnaires to students, questionnaires and interviews with persons responsible for the operation of the estates and interviews with members of the judging committee, see more details 4. National benchmarking – indicators, assessment and organisation.

The indicators were tailored to this evaluation.

The theme quality contained three main topics: architecture, standard and fulfilment of the demand from the ministry. The evaluation was divided into "levels" and started with the outer appearance and the individual apartments and continued with the inner rooms and components.

The theme building process focused on the more general level with the interplay between the main actors: the ministry, the client, the companies and the local authority.

The theme economics looked at the costs for construction, operation and life cycle use. Furthermore whether there has been a competition between the companies.

The theme user satisfaction focused on the users own evaluation of their apartment. They were also asked about use of common areas and social interaction. Furthermore were student movements and the use of the estate evaluated.

2.3 Cost and performance indicators applied in the assessments

The ministry decided that the evaluation should be concentrated on indicators within the following four themes: quality, building process, economics and user satisfaction. The same themes were used for all estates.

2.4 Relation to different enterprises and national benchmarking

There is no national benchmarking system in this area.

The used system was tailored to the actual situation – an evaluation of a specific political initiative to increase the number of dwellings in the private housing sector for students.

The individual client and company has only besides information of the client's/company's own building got the general report. As far it is known nobody of the clients and companies have taken initiative to specific assessments of their building and the process.

2.5 Visions and innovation for future improvements

See 4.5 concerning national benchmarking

3. Enterprises – assessments and indicators internally applied

The target for the evaluation in the case was to measure whether the political goals with a specific initiative were met. The initiative was taken of the Ministry of Interior and Social Affairs to increase the number of dwellings in the private housing sector for students.

The evaluation has been executed by a group of private companies in accordance with talks with the ministry responsible for the initiative, Ministry of Interior and Social Affairs, see also 4 concerning national benchmarking.

The results of the evaluation are some experiences concerning the mentioned themes and conclusions to alterations. Meanwhile there is no political interest as mentioned for the moment for further initiatives of similar character.

Due to confidentiality it is not possible to mentioned the concrete results for the individually estates.

3.1 The actual enterprise, company and firm

For the private student housing there were three groups of clients: self-governing institutions (4), turn key contractors (7) and property owners (4). It was up to the individual client to organize the building process and to get the necessary permissions from authorities.

The non profit student housing (7) were built by non profit client normally building housing for families and elderly people.

Of the 15 private estates 5 have been sold to special operation organization and 5 wish to sell.

3.2 Assessment methods and tools applied in the enterprise

The evaluation did not look at the assessment methods and tools at company level. For he 15 estates as a group see 4 concerning benchmarking.

3.3 Costs and performance indicators applied in the enterprise

The evaluation has - as mentioned - been concentrated on indicators within the following four themes: quality, building process, economics and user satisfaction. The same themes were used for all estates.

See 4 concerning benchmarking

3.4 Relation to building cases and benchmarking organisations

The description of the case is based on the whole evaluation of the mentioned 22 estates – 15 private estates with 1113 dwellings and 7 non profit estates with 627 dwellings.

3.5 Visions and innovation for future improvements

As far it is known nobody of the clients and companies have taken initiative to specific assessments of the building and the processes they have used.

4. National benchmarking – indicators, assessment and organisation

The target for the evaluation in this case was to measure whether the political goals with a specific initiative were met. The initiative was taken to increase the number of dwellings in the private housing sector for students.

The evaluation focused on the following chosen four themes: quality in the finished buildings, the building process, and economy for the society, client and user together with user satisfaction.

Basis for the evaluation were similar aspects of non profit housing for student.

4.1 The actual benchmarking organisation and its purpose

The evaluation has been executed by a group of private companies in accordance with talks with the ministry responsible for the initiative, Ministry of Interior and Social Affairs.

The group was chosen after a competition and consisted of EMCON, KPMG and sbs.

The results and recommendations were aiming at the governmental initiative and to get an insight into quality, building process, economics and user satisfaction of the finished estates. Basis for the evaluation were similar aspects of non profit housing for student.

4.2 Assessment applied in the benchmarking organisation

The evaluation is primarily based on registration of the quality of the finished buildings, questionnaires and interviews with all clients and persons responsible for economics in the execution of the estates, interviews with local authorities, questionnaires to students, questionnaires and interviews with persons responsible for the operation of the estates and interviews with members of the judging committee.

The indicators were tailored to this evaluation. They were used after the estates have been taken into use and the users have moved in.

The theme quality contained three main topics: architecture, standard and fulfilment of the demand from the ministry. The evaluation was divided into "levels" and started with the outer appearance and the individual apartments and continued with the inner rooms and components.

The theme building process focused on the more general level with the interplay between the main actors: the ministry, the client, the companies and the local authority.

The theme economics looked at the costs for construction, operation and life cycle use. Furthermore whether there has been a competition between the companies.

The theme user satisfaction focused on the users own evaluation of their apartment. They were also asked about use of common areas and social interaction. Furthermore were student movements and the use of the estate evaluated.

The four themes were as mentioned evaluated when the buildings were finished and students have moved in.

4.3 Cost and performance indicators applied in benchmarking

The indicators were used after the estates have been taken into use and the users have moved in. The results and recommendation were aiming at the governmental initiative and to get an insight into quality, building process, economics and user satisfaction of the finished estates.

There were three goals for the evaluation:
– an evaluation of the use of the governmental initiative
– an evaluation of the quality of the finished apartments and
– an evaluation and comparison between non profit student housing and private built student housing

The ministry decided that the evaluation should be concentrated on indicators within the following four themes: quality, building process, economics and user satisfaction. The same themes were used for all estates.

"Good quality" was here in accordance with the ministry defined as whether the buildings and apartments met the requirements from the ministry which were similar to traditional student housing, had a sound economy and the users were satisfied.

On a general basis the quality was evaluated on the basis of three parameters of quality: architectural, functional and technical quality.

Basis for the evaluation concerning the quality was an agreement between the ministry and a client/developer with some demands concerning five main topics. On level one, two and three the topics were: the development plan, the building in general, common facilities (as kitchen, toilet, common area and laundry), on level four and five the apartments and the rooms in the apartment (as entrance, kitchen, bathroom, room and depot).

In the evaluation a grading with six marks was used – with 1 as worst and 6 best.

Focus for the quality was the user's opinion of access to their apartment, the apartments, common rooms, facilities as kitchen and toilet.

The technical quality - for example of surfaces, the climate façade and quality of chosen components - has been evaluated by a registration and an evaluation by an architect and a civil engineer. There were three sub criteria: the execution, the condition and the constancy

The evaluation started with a registration of all the finished estates in accordance with the mentioned division in levels. Here it was noted whether the demands were met.

A further division of indicators were used to describe the different aspects of quality as for example the layout of the building and sorting of waste and garbage.

In the quality evaluation entered also answers from the questionnaires.

The main indicators belong to Indicator 3 Building performance and indoor environment. But there are also indicators belonging to Indicator 1 concerning cost, 4 concerning building parts and 6 concerning process.

The other main themes, as the building process, the economy and user satisfaction were handled mainly on the basis of questionnaires and calculations.

4.4 Relation to enterprises, building project and real estate

The indicators were used after the estates have been taken into use and the users have moved in. The results and recommendation were aiming at the governmental initiative and to get an insight into quality, building process, economics and user satisfaction of he finished estates

The individual client/company has only besides information of the client's/company's own building got the general report. As far it is known nobody of the clients and companies have taken initiative to specific assessments of the building and the process they have worked with.

4.5 Visions and innovations for future improvements

The indicators and the chosen tools yielded a good insight in the results of the political initiative. The results aimed primarily at the agreed overall framework and not at the individual case under planning and construction.

The single estate was evaluated and the results were summarized to make an evaluation of the private student housing as a group and a comparison with the non profit housing also as a group.

In the case a new initiative is taken there are conclusions which also could influence the single building quality, process, economy, and user satisfaction.

It was decided from the start that the initiative should be evaluated. Meanwhile the evaluation was not specified in a programme with the needed data beforehand. Therefore and due to confidence concerning some data it turned out to be difficult to evaluate some indicators, especially concerning economy. Also the short period for evaluation gave problems concerning evaluation of the operation of finished buildings.

The results of the evaluation are experiences concerning the mentioned themes and conclusions to alterations. Meanwhile there is no political interest as mentioned for further initiatives of similar character for the moment

But in the case a new initiative is taken there are conclusions which also could influence the single building quality, process, economy, and user satisfaction. And the chosen topics could be a platform for a systematic evaluation of student housing.

5. Discussions and conclusions

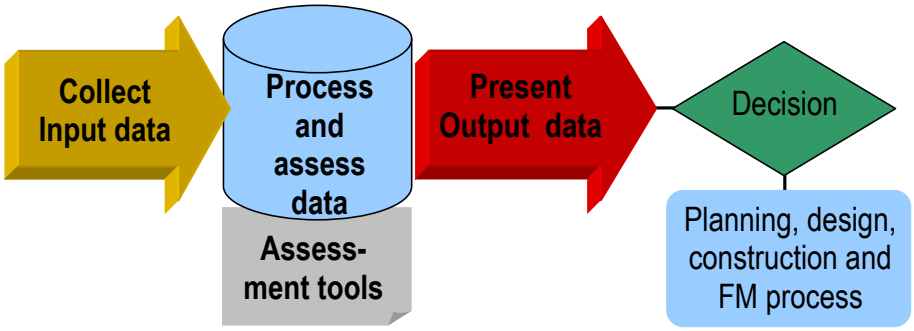
The target for the evaluation in the case was to measure whether the goals with a specific political initiative were met and give an insight into the resulting quality and the used process. The initiative was taken to increase the number of dwellings in the private housing sector for students.

The evaluation focused on the following chosen four themes: quality in the finished buildings, the building process, and economy for the society, client and user together with user satisfaction.

Basis for the evaluation were similar aspects of non profit housing for students.

The results of the evaluation are some experiences concerning the mentioned themes and conclusions to alterations. Meanwhile there is no political interest for further initiatives of similar character for the moment.

Figure 2. CREDIT information model in relation to decisions in the planning, design, construction and facility



5.1 Buildings - lessons learned and recommendations

The evaluated themes and indicators reflected the political intensions with the initiative. A broad spectrum of tools was used.

The indicators and the chosen tools yielded a good insight in the results of the political initiative. The results aimed primarily at the agreed overall framework and not at the individual case under planning and construction. But in the case a new initiative is taken there are conclusions which also will influence the single building quality, process, economics and user satisfaction.

It was decided from the start that the initiative should be evaluated. Meanwhile the evaluation was not specified in a programme with the needed data beforehand. Therefore and due to confidence concerning some data it turned out to be difficult to evaluate some indicators, especially concerning economics. Also the short period for evaluation gave problems concerning evaluation of the operation of finished buildings.

5.2 Enterprises - lessons learned and recommendations

The framework for the actual evaluation was a political wish to increase the number of dwellings in the private housing sector for students. Basis for the quality and economy should be similar to dwellings in the non profit housing sector.

After a competition a group of companies was chosen to evaluate whether the decided framework was efficient. The framework was worked out in co-operation between the Ministry of Interior and Social Affairs and organizations within the building industry. It was used for the individual estate.

The results were summarized and used to evaluate the overall framework. But there are conclusions which can be used in new initiatives of similar character with consequences for quality, building process, economy and user satisfaction of individual estates.

As far it is known nobody of the clients and companies have taken initiative to specific assessments of the building they have built and the processes they have used.

5.3 National benchmarking - lessons learned and recommendations

The evaluation was tailored to the actual situation – an evaluation of a specific political initiative to increase the number of dwellings in the private housing sector for students.

Therefore the indicators were chosen in accordance with the framework for the initiative which was created on the basis of the political intensions in the Ministry of Interior and Social Affairs in a dialogue with organizations within the building industry.

Basis was the quality of student dwellings within the non profit housing.

The single estate was evaluated and the results were summarized to make an evaluation of the private student housing as a group and a comparison with the non profit housing also as a group.

It was decided from the start that the initiative should be evaluated. Meanwhile the evaluation was not specified in a programme with the needed data beforehand. Therefore and due to confidence concerning some data it turned out to be difficult to evaluate some indicators, especially concerning economy. Also the short period for evaluation gave problems concerning evaluation of the operation of finished buildings.

The results of the evaluation are experiences concerning the mentioned themes and conclusions to alterations in the political framework. Meanwhile there is no political interest as mentioned for further initiatives of similar character for the moment

But in the case a new initiative is taken there are conclusions which also could influence the single building quality, process, economics and user satisfaction. And the chosen indicators could be a platform for a systematic evaluation of student housing.

Table 1. Questionnaire to evaluate CREDIT Indicator Classification.

CREDIT Indicator Classification

Company:

Role:

Project: Country:

Date: Sign:

To which degree are the following indicators preferred?

Please use the following scale when answering:

2 Always - strategic and very important

1 Sometimes, depends upon the project

0 Not at all, unimportant

Cost and performance indicators	Public demands	Internal project demands	Measures during building process	Measures when finished project	During facility management	Comments and other indicators recommended
1. Cost, price and life cycle economy (LCE)						
11 Capital, investment, construction, commissioning cost						
12 Building services related to operation and maintenance						
13 Business services related the activities in the building						
2. Location, site, plot, region and country						
21 Location and address						
22 Plot opportunities						
23 Spatial solution and property aesthetics						
24 Surrounding services						
25 Social values						
3. Building performance and indoor environment						
31 Category of building, quantity, size and area						
32 Safety and security of burglary						
33 Usability and adjustability						
34 Thermal comfort						
35 Air quality and health						
36 Visual climate						
37 Acoustic climate						
38 Aesthetics of building and indoor spaces						
39 Feelings and sensations						
4. Building part and product performance						
41 Category of building parts, quantity, size and area						
42 Safety						
43 Durability						
44 Thermal quality						
45 Impact on air quality						
46 Lighting quality						
47 Acoustic quality						
48 Aesthetic quality as form, surface, colour and details						
49 Feelings and sensations						
5. Facility performance in operation and use						
51 Category of tenancy and operation and area of space						
52 Applicability of the facility						
53 Operation						
54 Services						
55 Social performance						
6. Process performance in design and construction						
61 Category of process, supplier and organisation						
62 Resource control and project management						
63 Health and safety and work environment						
64 Quality management						
65 User involvement and cooperation						
7. Environmental impact						
71 Resource use						
72 Emissions						
73 Biodiversity						

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CREDIT©

Construction and Real Estate -
Developing Indicators for Transparency

This report describes the results of a case study of 22 student housing estates. The study was undertaken as part of the Nordic and Baltic project CREDIT: Construction and Real Estate – Developing Indicators for Transparency.

The aim of the evaluation in this case was to measure whether the targets with a specific political initiative were met. The initiative was taken to increase the number of dwellings in the private housing sector for students.

The evaluation focused on the following chosen four themes: the quality, the building process, the economy and the user satisfaction. Basis for the evaluation were similar evaluated aspects of non profit housing for students.

The evaluation was primarily based on registration of the quality of the finished buildings, questionnaires and interviews with participants in the process as companies, students, local authorities, private investors and members of the judging committee.

In this way the indicators were mainly on an overall level and reflected the political discussions. Meanwhile they gave also indications of a more general character concerning user needs and wishes to student housing.

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