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# Developing Process and Product in a Housing Company

CREDIT Case SE02



Danish Building Research Institute  
AALBORG UNIVERSITY



CREDIT<sup>®</sup>

Construction and Real Estate -  
Developing Indicators for Transparency



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CREDIT Case SE02

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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.

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

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# Summary

This case study explores the process of understanding unknown end-users requirements. The purpose with the case study is to map out how a franchise housing company continuously develops product and project when the end users are not known from the beginning. The focus is on the enterprise system level.

Though the customers are not known from the start, the housing company is putting a lot of effort trying to understand their future customer, and evaluate the fulfilment of the customers' expectations in occupancy. The company is using a system of surveying and evaluating methods to improve and develop product and project process to better meet the needs of the customers. When the project starts is a survey of how customers want to live on that specific market performed. This survey is followed by a parallel work with product and project development from a customer perspective. The development of the product initiates and ends with different kinds of surveys. The development of the project is initiated with a market survey and is followed by a positive customer index survey. Besides these parallel surveys is customer surveys done on projects that are two years or older, of both product and area.

The company has learned some lessons from the evaluations and surveys and changes have been made. But there is a need to better connect the inputs and outputs of the activities, in other words, to make the system more efficient.

The company finds it difficult to know what brings value to the customers and how are their needs changing? The company is today striving to offer a modern but general product that most people can afford. The products should though be so flexible that they admit the customer to change it after their needs. But it is regarded complicated to balance the costs of surveying and improving the product towards the willingness of the customers to pay for that added value.

The company is continuously comparing their work with their competitors but not in a systematic benchmarking procedure.

# 1. Introduction and objectives

This case study describes the work established in a housing company for improving the products and projects in order to bring value to the customers. The customers are not known from the beginning, which makes different kinds of surveys, like market surveys and post evaluations, key factors for the development and improvement of work.

## 1.1 Objectives and work packages of CREDIT

Sir Winston Churchill once said, “We shape our buildings, afterwards our buildings shape us” (28<sup>th</sup> 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 chosen housing company in the study is a franchise company founded in 1996 and is today active in Sweden, Denmark, Finland, Norway and Great Brittan. The company is working continuously with different methods to understand the customers' needs and improve the performance of the company and suppliers.

The purpose with the case study is to map out how a housing company continuously develops product and project when the end users are not known from the beginning. The focus is on the enterprise system level. The objectives of the research are to study the:

- methods and tools used in capturing end-users requirements
- challenges in creating an effective system for capture and create knowledge of end-users requirements

## 1.3 Research design and methods applied in the case study

The different methods are described on an enterprise level even though some of the methods are used on a project level as well. When the company is developing a product the questions are of course adapted to the product and whom the product is directed to. The main interest of the focus is though to focus on an enterprise system level. The company is comparing and keeping an eye on their competitor, but no structured benchmarking system is used.

This case study primarily uses two kinds of data:

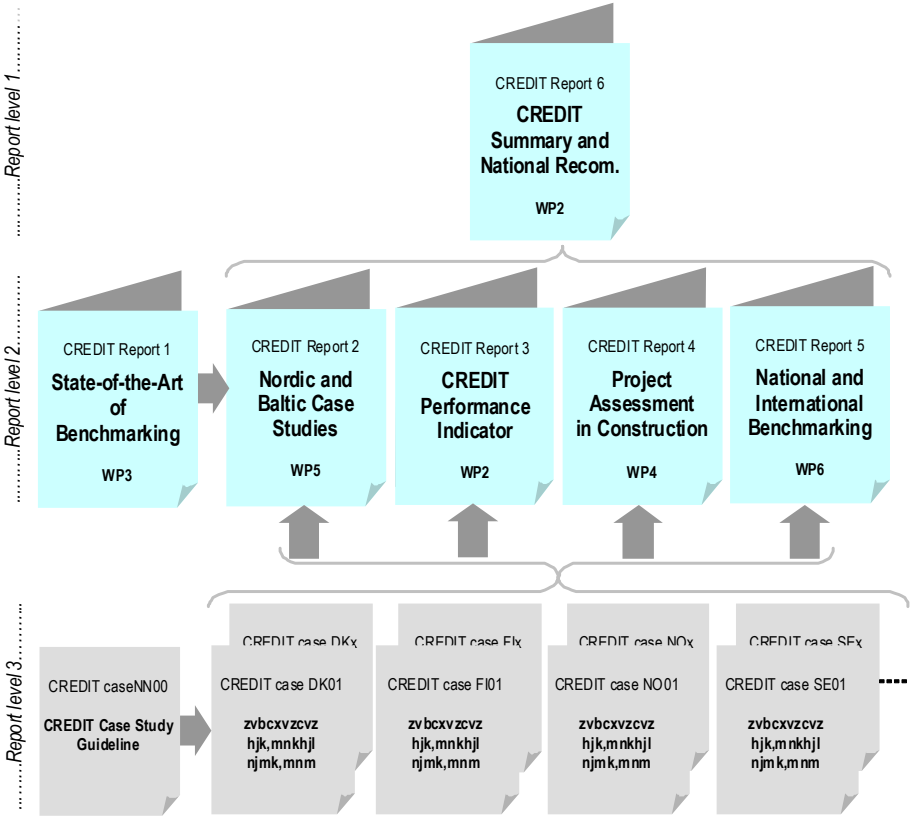
- Documentary material, results from evaluations
- Qualitative research interviews with two company employees

## 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 (see **Fejl! Henvisningskilde ikke fundet.**).

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



## **2. Buildings – assessments in construction or real estate processes**

This chapter is not included in the study.

### 3. Enterprises – assessments and indicators internally applied

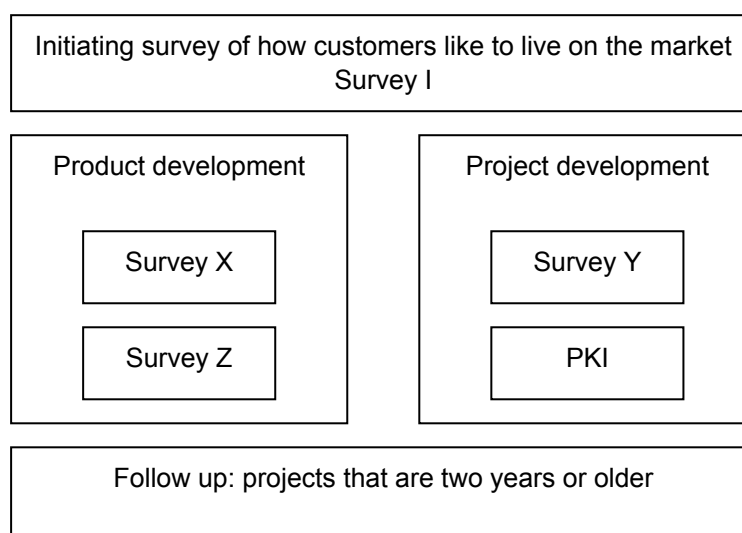
The housing company is using six different methods to develop product and project process to better meet the needs of the customers. The methods can be seen as a system of surveying and evaluations methods but there is a need to better connect the inputs and outputs of the activities.

#### 3.1 The actual enterprise, company and firm

The company was founded 1996 with the main idea of “*build quality homes at prices that allow as many people as possible to buy their own properties*”. The company is selling building concepts to licentiate takers in Sweden, Denmark, Norway, Finland and Great Brittan. The building exists of new build villas, apartments and terrace houses. 40 % of their products are delivered to several public Real-Estate owners as rental houses. The purpose of the assessments used, for better understanding their customers, is mainly to develop the products and the project.

#### 3.2 Applied assessments and tools in the enterprise

The housing company is working continuous with improving both process and product from a customer perspective (see Figure 1). When the project starts is a survey of how customers want to live on that specific market performed. This survey is followed with a parallel work with product and project development from a customer perspective. The development of the product initiates and ends with different kinds of surveys. The development of the project is initiated with a market survey and is followed by a positive customer index, PKI (positiv kund index in Swedish), survey. Besides these parallel surveys is customer surveys performed on projects that are two years or older, of both product and surrounding environment.



The company hires one consultant to perform the PKI measuring and another to perform the marketing surveys. Some of the development analyses are the company performing by themselves. The PKI measuring is directed to the end users (in this firm equally to be the buyers in other words the customer). The company has a system for managing documents. The system is performing well technically but is quite inert to use.

## **Survey I**

This survey has only been done once when the company started. The main topics in this analyse is to survey how people live. How many persons live in a household and what are the prospects of future development. What is desired by the customers? How much can the future customer afford to pay for the living and relation to the company prices? Age and family structure of the persons living in the company products?

## **Product developing**

### *Survey X*

This text shows what factors the company looked for when developing a terrace house. The company planned to develop a two store terrace house and the goal with the survey was to investigate if the company offered the right area development plan and indoor planning, to get information to further develop the terrace house concept. The survey should as well bring information that could be used in argumentation and marketing.

The houses are totally standardised so that the customer can develop the living as the customer likes. The survey focuses on; how customer values different physical aspects of their living, how it is used (pattern of use) and how the living could be improved.

The customer group for the terrace houses is younger children families (2 adults + 1-2 children) that lives in an apartment today and maybe chose a terrace house on their way to a villa. The houses are situated in outer area with cheaper land cost, living area around 100 square meters.

The survey was performed on 300 telephone interviews (100 persons in Sweden, 100 persons in Norway and 100 persons in Denmark). The persons lives in randomly chosen two stores terrace houses and had home living children below 15 years old.

The focus areas were: how they lived today, living customs, opinions of their living, like to change, possible solutions.

The solutions of the survey were that the commonalities between the countries are more common than the differences. Some points differ though: Open plan solution is more common and viewed more positive in Denmark than in Sweden and Norway. Many Swedes and Norwegian are against open plan solutions. In Sweden is it more common with toilets on both floors, but every country likes to have it. Danes have more often and want to have visible control of their cars. In general people living in terrace houses, like to have good storage areas, a proper kitchen and a sensible solution for the laundry. To combine the bathroom and laundry is consider a bad solution if the house only have one bathroom. Big glass facades towards the garden can be positive, but not towards the street. Open plan solution can be positive even though some don't like it. The bed rooms are to be collected on the upper floor. There should be a toilet on the upper floor. The parking does not need to be in connection to the house more than in Denmark.

### Survey Y

When the product is in use an evaluation is made with the purpose of getting input to further development and improvement of the product. The evaluation is conducted with ten deep interviews, duration 90 min, by a surveying company. The normal respondent was a young family with one or two children between 0-6 years old.

The interview included following areas:

How did you get in touch with the company? Why did you move to this village? Where did you live before? How do you consider the joint ownership concept as an alternative to co-operative? What is good and less good about the living? The respondent is asked about the services (public communication, shops, schools and day nursery etc), thoughts about environment and energy, an increased monthly charge and closeness to neighbours, common areas. After the external environmental aspects are internal aspects about the living asked: the heat, ventilation, material, floors, walls, functionality of the spaces, entrance, protected from view, lightening and space, bathroom, window in the bathroom, laundry. The respondents are asked questions about how they for example place their laundry basket and functionality opinions about the store, kitchen, dining table (in kitchen or living room), when having a party, the outdoor area, the windows, the furnishing, the living room (light, radiators, windows, noise level, isolation), the stair, the electrics, the multipurpose room on the upper floor, the children's room, bedrooms. Then the respondent is asked for giving remaining opinions about the living.

## Project development

### Survey Z

A market analyse is performed to ensure that the right sites are bought. The analyse exist of the following main topics; area and city, demography, existing housing accommodation, demand, tenancy, prices on the secondary market, earlier projects from the company in the area, actual new production in the local authority, the company product, saturation of the market, picture of the price and future prospects.

## Positive customer index (PKI)

The PKI is performed by a consultancy with telephone interviews. The main question areas in PKI are:

- The decision to chose the company's product
- The contact and information at sales
- The optional choices in residence
- How the contact was managed during occupancy
- Experience quality of living
- The advantage and disadvantage of the living area after moving in

The PKI survey and analysis:

- The survey took a stamp from what *requirement factors* did the customer experience as essential in connection to choosing object, buying, moving in and occupancy
- Surveying how important these requirements is experienced of the customer in a the area
- Surveying how well the contractor fulfils the *requirement factors*
- When the customer requirement have been high and the fulfilment of them low have a why question been addressed and how to fix it

The importance of the requirements was graded by the customer on a five graded scale. The customer's experiences of the fulfilment of the needs

were then asked for. Then the differences between the average of every requirement (the requirement factor) and the average of corresponding average of fulfilment. The difference is then multiplied with the requirement factor and this brings a list of actions.

The survey gives a total PKI and separate PKIs for three main areas:

- PKI before moving in
  - o gives you information about how a tenant owner's association is working and what it means to you who lives there
  - o gives good and continuous information
  - o can show a credible time schedule for the project
  - o are easy to contact before and during the building period
  - o are service oriented and obliging before and during the building period
- PKI at occupancy
  - o hands over a binder with information about declaration of material, guide for using and contact list for technical errors for your residence
  - o gives a careful review of the home residence in connection to occupancy
  - o deliver totally completed resident when moving in
  - o keeps promises of material choices (not the optional material)
  - o manage to keep promised time for occupancy
  - o taking responsibility and fulfil given promises
  - o are easy to contact when the building is completed
  - o are service minded and obliging after occupancy as well
  - o hurry up and are flexible to finish uncompleted work, keeps promises of material choices (not the optional material),
  - o hurry up fixing technical errors and complaints
- PKI for the residence
  - o the residence is well structured and the surfaces is well disposed
  - o the kitchen and the dining place is properly planned and good
  - o the sound insulate is enough
  - o the residence have functional laundry and equipment
  - o the bath room is well functioning and good
  - o the ventilation system is good
  - o the residence have a high quality of interior details

The survey also includes questions about safety, finishes, energy and technology, outdoor environment. Besides asking about the experience of the company/product/process general information about the customer (gender, age, family structure, number of cars in the household, size of income, loan ratio, how you found out about the project etc.) is asked for as well.

The results from the PKI are used in two ways: The first is to improve the production and are transmitted to the production-line. The second is to use the result as an inspiration to develop the concept and the product.

### **Follow up**

The company is surveying the quality of living in their residents that are two years or older. The different object (apartment, villa etc.) have unique questions in the survey. For example the survey addressed to apartments, 2004, included totally 200 respondents (5 respondents per project). These surveys are managed by the same consultancy company as for the PKI surveys. The method is the same; telephone interviews.

The survey exists of the main areas:

- Background variables
- Quality of living - the kitchen
- Quality of living - the bathroom
- Quality of living - the living room, bedroom or vestibule
- Quality of living - the storage
- Quality of living - the laundry/equipment
- Quality of living – ventilation/sound insulation
- Quality of – façade
- Other aspects that the respondents like to change
- Changes made in the apartment
- Changes made on the balcony/out-door sitting
- Image of the company
- Living economy
- Product development
- Recommend the Company
- Moving plans
- Rebuy the products of the Company
- Remaining (if the respondent have anything to add)

### 3.3 Costs and performance indicators applied in the enterprise

The most obvious indicator in use is of course PKI described above. The parts of the building being asked for in the evaluation are: ventilation, sound insulation, functionality of rooms, equipment in bathrooms, technical equipment and energy consumption.

It is concerned quite difficult to know what technical aspects that brings added value to the customers. If we take one finish detail away to save money will the customer notice it and be less happy with their products? It is hard to know.

### 3.4 Relation to building cases and national benchmarking

The company do not use any structured benchmarking system. They are though keeping an eye on the competitor and analysing how they are marketing themselves, what their products look like and trends on the market.

The different evaluation gives inputs to the developing process. When developing one product the company directed themselves towards one customer segment of people born in the 1940. When following up who actually lived in the houses it showed that it was a mix of people. To the next project the company did not address so specifically to a segment of people. The company is striving to make their products as standardised as possible to fit as many as possible. It is concerned to be too costly to focus too detailed on one segment.

When evaluating the project the result is sent to the licentiate takers. The company interferes if the brand is hurt of the licentiate takers actions. Minor faults are the company relying on the licentiate taker to manage by themselves. The improvements from the PKI rely quite much on that the licentiate taker reads PKI and adapts the outcome.

### 3.5 Visions and innovation for future improvements

The company feels that it is hard to connect information from the different surveys to their organisation, in other words create knowledge of the information. The company has an interest to further develop the different surveys and analysis and connect them more clearly to customer groups and their ways of life pattern. The company likes as well to get a better connected system of the different components of the surveys.

To introduce intranet with best practice examples with text and picture is another vision.

One problem with the PKI system is that if there is one not satisfied customer that their opinion gets a bit too big weight. It is hard to read out how many that is having negative opinions. You can not tell if it comes from one grumpy person or from different persons.

The customers are given a guide of their house when moving in. The guide is however being improved to be even more customaries. The guide exits inter al. of inspirations material (how to furnishing), guaranties, drawings, user's guide, worth knowing etc.

The list of indicators provided by the Finish research team was shown to the interviewed person. For the company the Location and the Building performance indicators would have been interesting to measure. The remaining indicators are not of current interest for this company though it is a franchise company. The respondent is though missing one indicator: general trends. When is a trend so important/ interesting that you should pay attention to it? There is a need for some kind of guarding system.

## **4. National benchmarking – indicators and organisation**

This chapter is not included in the study

## 5. Discussions and conclusions

This chapter discusses the special circumstance of not having known customers from the start and the difficulty of bringing value to them. The focus is mainly on an enterprise level but the discussion connects to the project and national level (benchmarking) as well. The discussion aims to answer the objectives to study:

- methods and tools used in capturing end-users requirements
- challenges in creating an efficient system for capture and create knowledge of end-users requirements

### 5.1 Lessons learned in enterprises, companies and firma and recommendations for WP5

Working as a franchise company is a special situation, though the concept is sold to a licentiate taker. The customers are never known and the performance towards the customers from the licentiate takers side can not be fully controlled.

#### **Challenges in creating an efficient system and methods used**

The system of surveys and evaluations is ambitious and probably necessary when not having known customer. The problem with the system appeared to be the difficulties in connecting information from the different activities, in the value adding process. One reason for this could be that three different operators are performing the surveys; two different survey companies and the company themselves, so there is maybe a lack of holistic perspective. It is possible that the different surveys could be polished but the main issue seems to be the need of a more efficient system. So that there is a plan for how to manage every data collected in order to bring added value. The company seems though to be very sensitive in responding to the outputs from the survey. The willingness to improve and change is high. The company is quite young and has already been rethinking the focus of several aspects, for example “who” their customers are and the level of generality of spatial and material solutions.

The company is putting a lot of resources on actually performing the interviews; by telephone and face to face in their customers’ homes. In the surveys the company is focusing on the satisfaction with the products, letting the respondent argue why and trying to understand the customers’ behaviour in the products. This procedure results in a more rich mixture of inputs, both with photos, seeing the family in action and getting more varying answers to their questions, than a more general SCI questionnaire would have brought.

Another challenge with the aspect of being a franchise company seems to be the control of the licentiate takers performance. The company is though handing the result of the PKI survey to the licentiate takers but can only truly affect their work if the brand-image is threatened. The concern about this matter is; what added value do the questions give the company? If the questions are exhausting the customer, so that they do not have motivation for answering all questions seriously, then maybe only the most relevant questions for the company should be asked. The company, though, tells that the

customers seem to be interested in answering the questions; maybe thanks to the more interactive form of surveying with telephone or face to face interviews.

One other relevant aspect that the company brought up, that is interesting to the CREDIT project as well, is the need of knowing what is happening on the market. What are the trends are they relevant to notice or are they just a short aspect of fashion? The company is today not benchmarking in a systematic way. But they are comparing their products and external communication with their competitors. The company is striving for offering modern, light and roominess products that are so general that they can fit as many as possible. The products should, as well, be affordable to most people. They learned that the people moving in are not often the segment of people directed to at the start of the projects. To be able to offer affordable products to their customers, too detailed customer segmentation was concerned too costly. Knowing the differences of preferences on the national markets is though important for them. Knowing what technical/finishes details that bring customer value is also of importance but very hard to identify.





This case study explores the process of understanding unknown end-users requirements

The company is using a system of surveying and evaluating methods to improve and develop product and project process to better meet the needs of the customers. The study shows the difficulties in getting an efficient system that links together the different parts into a whole. This complicated the learning in the company and the knowledge creation of end-user requirement and thereby the understanding of there constantly changing requirements.

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