INVOLVING CUSTOMER RELATIONS IN CONTEXTUAL DESIGN - A CASE STUDY

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Abstract

This paper presents a case study in the form of a contextual design project, the aim of which was to design a system for a particular organization. The starting point in the case was a need in the organization for a specific system. The case involved an analysis of the organizations customer relations. Involving customer relations in the design project had a powerful effect: it was revealed that the system the organization believed they needed was irrelevant, while they needed another system nobody had thought of beforehand. The paper presents the case by describing the setting and starting point of the design project, how the project was conducted, and which results it ended up with. This is followed by a discussion of the effects of, and lessons learned by, involving customer relations in contextual design.

1. Introduction

This paper presents a case study from a larger research program, the purpose of which is to develop *theories of and approaches to* early systems design in an organizational context [9].

We use the term 'design' in the same way as architects do - focusing on the analysis of needs and the preliminary design of functionality and form. This is in contrast to what is common within computer science, where the term 'design' is borrowed from engineering - focusing on construction and implementation.

Designing in an organizational context focuses on the application area: complex administrative, managerial, and professional work within a specific organization, and the process of designing relevant computer support for this work. This is in contrast to the designing of generic products aimed for a (larger) market.

By a design project, we refer to the early processes of systems development, where a vision of a future computer-based system is developed and outlined.

The result of a design project includes representations of visions of computer support, which thus forms a basis for the organization to decide on and, subsequently, purchase, construct, and implement computer-based systems. The results of a design project may include a conceptual design in terms of a written document with sketches, mock-ups, and/or simple prototypes illustrating key ideas. Based upon a design pro-posal, it should be possible for the organization to decide upon the suggested

computer-based systems and related organizational changes. Eventually the project may proceed to purchasing generic systems [2] and/or construction and implementation of specific systems.

It has, for many years, been accepted that systems design must be considered closely related to organizational issues [18], and that organizational analysis is (or should be) part of the design practice [1, 10, 11]. An overall business strategy should form the context within which systems design is considered [13]. Current approaches, like business process reengineering [6], emphasizes that the customer relations must be an inherent and integrated part of change processes including changes due to systems design. Approaches within participatory design [5, 8, 12, 17] focus mainly on user involvement within a design group, i. e. between designers and current/future users, focusing on learning processes and what Andersen et al. [1] refer to as performance.

Broadening up the scope of design, relating design to overall organizational changes, and involving analyses of the customer relations of an organization in a design project, are all issues that are considered within our approach to design.

A main part of our research program have been action research, experimenting with different approaches to design in industrial settings. In one organization we participated in conducting three design projects [19]. These three projects formed an explorative study of theoretical, methodological and organizational issues comprising participatory design, ethnographically inspired approaches and techniques [see e.g. 3, 7, 14, 19, 20, 21], and experimenting with a system approach known as Work Analysis [4, 16, 19]. This paper reports from one of these projects, where Work Analysis was used as the main approach.

The case-study presented in this paper focus especially on the effects from analyzing the customer relations of the organization. This is in contrast to the needs and requirements elicited by involving users from within the organization. The organization is "The National Film Board of Denmark", in short called "The Film Board". The Film Board does, among other things, offer film and video rentals.

The starting point in the case was a need for a specific system: a system providing customers with an on-line ability for making film and video rentals, thus reducing resources handling customer rental orders (see figure 1).
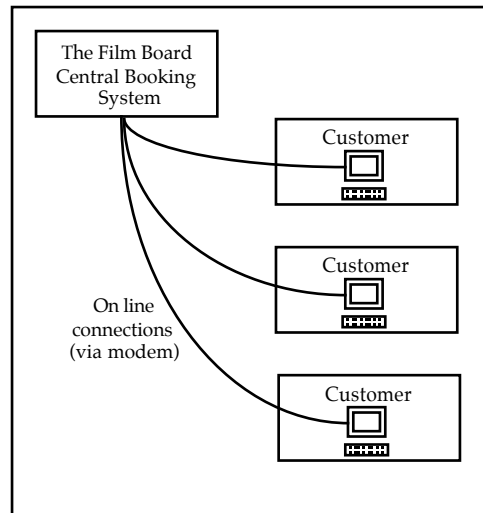
Fig. 1. The suggested on-line booking functionality, known to The Film Board as the "library system". Customers themselves could book films and videos on The Film Board's own central booking system via modem connections.

The result of involving the customer relations in the design project was remarkable: it was revealed that the system The Film Board believed they needed was irrelevant, while they needed another system nobody had thought of beforehand.

In the following we present the case, in the form of the design project, that we have been involved in. A thorough description of the case is given in [19]. The setting and starting point of the design project is described followed by how the project was conducted and which results it ended up with. Finally we discuss the effects of, and lessons learned by, bringing The Film Board's customer relations into the design project.

2. The Setting

The Film Board is a public organization in Denmark under The Ministry of Cultural Affairs. The Film Board has 50 employees and a budget of approximately $7.5 million a year. The Film Board has two main functions as specified by law: to promote information, education, and artistic and cultural activities by producing and buying films and videos; and to rent such films and videos for educational institutions, associations, and individuals.

Due to its relatively small size, The Film Board had no internal information technology department (IT-department), though some of the employees were trained to take care of routine maintenance of their systems. Design and development of systems were outsourced to external consultants and vendors.

The design project was conducted within a department for order receiving and marketing. This department represented The Film Board's main relation towards their customers.

The department receives orders from the customers requesting copies of films and videos. The customers are public and private institutions (e.g. schools and libraries) and private individuals. Films and videos are booked by the customers for a specific period of time, e.g. a certain date or week. The main way of ordering films

and videos was by phone, though customers also could order by mailing written forms. Traditionally, when customers call to order a film or video, they did not know exactly which film or video they wanted. The Film Board would thus, during the phone conversation, consult the customer regarding which films and videos The Film Board could offer to serve the customers specific need. All orders were entered into a central booking-system.

The marketing function of the department comprised organizing premieres of new films and videos, informing customers of new films and videos, and producing and market a yearly catalogue (in form of a book) of available films and videos. This included regular visits to their main customers and what the department referred to as "fieldwork": taking care of existing customers, and cultivating new markets for their films and videos.

3. The Starting Point

As the starting point for the design project management wanted the department to spend more resources in the marketing-effort of "getting new customers". In other words management wanted the employees in the department to spend more time doing fieldwork. In more detail, the starting point included the following:

- The booking-system in the department for order receiving and marketing was rather old, and they faced a situation in the near future where they would have to replace it with a new system.
- The libraries had, during the last few years, become one of their largest customers. Their orders (and most orders from the second largest customer, the educational sector, too) were very straightforward, and they experienced that about 50% of all orders by phone now were such kind of "automatic" orders where the customer knew exactly what film or video he wanted and, hence, did not need any consulting. If their customers had the ability to order their films and videos on-line with a library-system[1], management in The Film Board expected a significant drop in the booking-task done in the department for order receiving and marketing. They had decided to give an investment in this kind of system high priority.
- Management wanted to release resources within the department for order receiving and marketing. This to support their fieldwork taking care of existing customers, and cultivate new markets for their films and videos. Even though this was a task of a very high priority to The Film Board, the department did not take much care about it, claiming they needed more resources.

The department for order receiving and marketing thus voiced a need for a new booking system which could provide their customers with an on-line booking function-ality. This could reduce resources used in doing the booking task, and could provide resources to consolidate efforts in fieldwork and thus "getting new customers".

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[1]   As library-systems provide a kind of such on-line "booking" functionality, this solution was known to the Film Board as "the library-system".

4. Conducting the Design Project

The design project was conducted by one designer, spending 260 hours within a period of three months. The design process was organized with regular meetings with a working group with managers and employees from the department.

The main data gathering method used was unstructured interviews. All sixteen employees in the department were interviewed. Each interview was performed "in situ", and lasted for about 1/2-2 hours, and most of them were audio-recorded. In addition to the interviews some meetings in the department was observed. A thorough document analysis was performed, as the department produce a lot of written material (catalogue, status-reports from efforts doing fieldwork, statistics, booklets, leaflets, etc.).

The above mentioned activities covers about 90% out of the 260 hours the designer spend on the project. These activities, characterizing a participatory and, also, an ethnographically inspired approach, are not in focus of this paper but are reported on elsewhere [19, 20].

The overall approach to the design project was Work Analysis [4, 16, 19] which is basically a functional approach rooted in the FAOR-project [15]. Work Analysis recommends that a design project includes getting insight into the environment, or "outer world", of the work system in question in order to clarify how the function of the work system corresponds to the equivalent requirements, needs, conditions, constraints, and purpose from the environment. The environment includes what are called target or problem domains, i.e. areas which the work system needs to know about. In this case, this means to get an insight into The Film Board's customer domain in order to clarify how the overall function of the system suggested by the department correspond with the customers needs, conditions, etc.

As part of the design project the designer suggested to visit and interview some of The Film Board's main customers. The Film Board regarded this as a rather irrelevant and controversial activity for the design project, since they felt they already "knew" their customers well. The designer insisted on this activity and The Film Board finally agreed that the design project included interviewing some of their main customers. The purpose and result of these interviews should be interpreted as an inspiring and qualitative test, in contrast to a more quantitative and representative measuring. Five main customers representing the libraries and the educational sector was selected. Each of the five customers was visited and interviewed for 1-2 hours as an activity in the latter part of the design project. The focus was on the trend and prospects for their use of films and videos, and also their response to the assumptions that The Film Board, and the department for order receiving and marketing in particular, had towards their customers. The results of these interviews seriously challenged the idea of the library system under consideration, and developed new ideas for systems support not yet considered.

5. Result

The results from this design project were presented at a meeting with a steering committee and participants from the involved department.
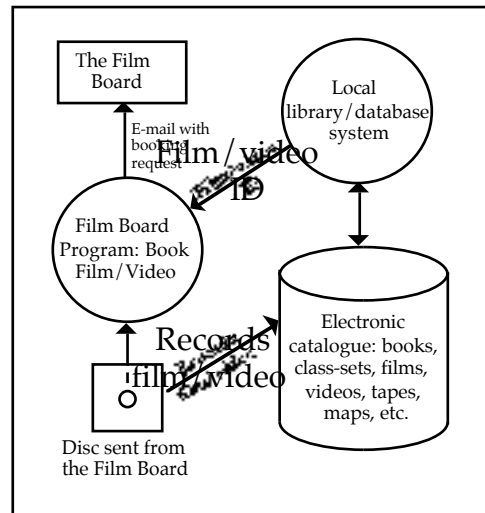
Fig. 2. Diagram from the presentation of the final design report showing how customers could be supplied with an electronic catalogue of films and videos. The diagram outlines how The Film Board could supply libraries and schools with a disc, containing their catalogue of films and videos, to add to the customer's local database. Also, on a longer view, it could contain a program that e.g. could send an e-mail to The Film Board with a booking request. This program could receive an ID of the requested film/video from the local library/database system through a simple cut/paste-function.

Visiting and interviewing the customers resulted in a drastic change of focus on which systems they needed. The library system turned out not to be relevant, and the need for technological innovation found a focus in another area:

• The Film Board could forget about their plans of investing most of their budget on a library system for the next years, as they were ready for. It would simply not be used (or even bought) by their customers. The Film Board needed it, but their customers did not have an equivalent need. The Film Board had experienced a dramatic increase of "routine" bookings requested by phone (estimated to be 50% of all calls), mainly due to the libraries becoming one of their main customers. Viewed from The Film Board this was a radical change in a few years: the total number of booking requests by phone had increased substantially and these requests were mainly from customers that knew exactly which film or video they wanted. Viewed from the customer's side, though, they only seldom requested The Film Board's films and videos. All The Film Board's routine requests for booking films and videos came from a corresponding high number of different customers. One library visited was one of their largest single customers. They had only 1 or 2 requests for films and videos per day. In this situation, they viewed the telephone as the relevant technology for ordering films and videos. They would resist paying for any on-line connection and training their staff to use The Film Board's booking system. As a future possibility (on a longer term) would be to receive requests for booking by e-mail. This possibility, though, had to await when their customers would start to use e-mail.

• The Film Board urgently and very quickly needed to hand over their catalogue (which was currently in paper form) in an electronic form. Their two main customers (to whom more than 50% of all films and videos were distributed) are the

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educational sector (mainly municipal schools) and libraries. All libraries had, or were about to convert, their paper files into electronic databases. Schools had the same trend, as the education gets more and more organized into projects, where many subjects are studied in an interdisciplinary form. This creates a need for queries across traditional dictionaries (divided by subject). The trend within the educational sector is to bar-code and record all educational materials into databases, creating the possibility to search by key-words and query for all different materials available at the same time: books, class-sets, videos, tapes, maps, laboratory-equipment, etc. The Film Board had to provide all these local databases with the possibility of being supplied with their electronic catalogue as well (see figure 2). If not, their main customers would search for needed materials by computer while the products offered by The Film Board still only would be available by looking them up in their paperbased catalogue.

6. Discussion

Involving an analysis of the customer relations as part of the design project had a powerful effect: the need for on-line booking, expressed by The Film Board, did not correspond to an equivalent need on the customer side. Instead, innovation on the customer side focused on a need for electronic catalogues, which was not identified by The Film Board beforehand. Even though The Film Board felt they "knew" their customers, they did not know them from such a technological design perspective.

The planned investment in a new booking system would not have the expected effect (reducing resources doing the booking task). Instead they needed to respond to changes by their customers' general handling of catalogues by providing their own catalogue in an electronic form.

If the design project only had involved user representatives from The Film Board and excluded the analysis of the relations to the customers, it could have resulted in a design-solution recommending an investment in an irrelevant system.

Three lessons might be learned from the case study: first, in what kind of situations might there be a potential for effect by involving customer relations in contextual design; second, how can we determine when it might be relevant to involve this issue in a design project; and third, how can we then conduct this analysis.

The *potential for effects* by involving customer relations in contextual design seems related to the power relation between the organization and its customers: i.e. on how dependent the organization is on its customers (or other business partners). The idea and rationale behind the design project in The Film Board are similar to the Ford case described by Hammer [6]: outsourcing some of your own work (or business process) to your business partners. Hammer describes how Ford reengineered its accounts payable process with the support of information systems. This resulted in an "invoiceless processing" where work and problems, previously handled by Ford, now were outsourced to Ford's vendor. If Ford's vendor doesn't send the goods ordered as one deliverance, the vendor has a problem: "If receiving [at Ford] can't find a database entry for the received goods, it simply returns the order [to vendor]" [6, p. 105]. Since the vendors obviously are quite dependent on selling goods to Ford, they have to accept this. The Film Board did not have such an advantageous position towards its customers (and in this we believe they are in line with the mainstream business). The

Film Board's need to outsource its booking task to its customers did not correspond with an equivalent need by the customers. To the customers, film and video rental from The Film Board only made up a small fraction of their overall "business": they are not dependent on The Film Board. In this situation, offering an on-line possibility via modem was not attractive to the customers (and anyone who has tried to search literature on external databases, on an irregular basis, can approve that this might not be an easy task at all). On the contrary, The Film Board was dependent on the technological innovation and needs of their customers: if The Film Board did not provide their catalogue of "goods" in an electronic form, which their customers easily could include in their local database systems, their customers would not retrieve their films and videos when searching for needed materials. Providing their customers with an electronic catalogue could, at the same time, form the ground for a future "bait" serving The Film Board's need: a booking functionality could be provided through a simple and standardised email request, which might be as easy to use as the telephone. In a generalized statement: the more dependent an organization is on its customers, the higher potential for effects might be expected when involving customer relations in contextual design.

We have experienced, that a *guidance to determine to which extent it is relevant* to involve customer relations in contextual design, may be to analyse the scope of the design project in terms of "sub-optimization" [20]. The aim of designing systems in an organizational context is to support users who support (parts of) specific business processes, which in turn support (parts of) overall goals of the organization. The scope of a design project might be rather narrow, e.g. a problem as it is perceived in one department, or it might be broader, e.g. analysing which organizational functions should be supported by technology, or which overall business processes (or even organizational goals) should be analysed and redesigned with support from appropriate information systems. On the basis of the initial scope of a design project, the design team should critically question, what the project aims at optimizing, for example, whether supporting a part of a business process (included in the project scope) also optimizes its function and purpose in relation to the overall business process. If there are no obvious answers to this, the design project might only result in a sub-optimization with no or few effects on the overall process. In this situation the scope of the design project may be too narrow. Questioning the scope of a design project is far from a trivial task and it is not always possible to conduct by the project members: in a recent study we performed in The Danish Radio Broadcasting Company, this task was in the hands of another organizational unit and thus excluded from the design project's mandate. Also The Film Board questioned this part of the design project since they felt they knew their customers well. If the systems in question in a design project have more or less direct links to the customers, analysing customer relations (at least implicitly) becomes part of the project scope and mandate. This was the case in the design project in The Film Board: the users voiced a need for an on-line booking functionality. Designing such a system, which should be offered as a service for customers, brings relevance for analysing customer relations from a design perspective, e.g. which infrastructure, standard systems, and user interfaces, etc. they are using. Hence, discussing the relevance of involving customer relations, might be guided by analysing the risk of sub-optimization if this issue is excluded from the project.

Involving customer relations in contextual design raises the question of *how to conduct this analysis.* In general a wide spectrum of techniques spanning from quantitative to qualitative approaches are available. A quantitative approach, e.g. using questionnaires, might be relevant if the analysis needs explanatory and representative data. Such an analysis could also be followed up by a later similar analysis testing e.g. if the designed systems had the expected effect. A qualitative approach, e.g. using unstructured interviews, may be relevant if the purpose is to achieve an explorative and deeper understanding of - some of - the customers situation in relation to the organization and its design project in question. One must, of course, be very careful in choosing important and representative customers. The strength of a qualitative approach is that it provides a rich picture of the customer relations, though only representing a (small) sample. This might lead to valuable and at the same time unexpected information which you would not have asked for in e.g. a questionnaire. The case shows, that the unstructured interviews gave such a result. Only very few resources (10% of the effort spent by the designer conducting the design project) were needed to achieve a rich picture of some important technological trends from representatives of their main customers side. Though this analysis did not include a statistical representative sample of the customers, it did provide an insight into the customer relations which could not be ignored and which formed the basis for radical change in the ideas for design-solutions. A final lesson to be learned from this case study is thus, that valuable information may be obtained by involving customer relations in contextual design even when this only implies a small resource in terms of a few sample interviews.

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