Trust, Participation and Hospital Design – Two Approaches One Result

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Abstract

This paper is based on a study of the change and design process for the surgery and radiology building at Örebro University Hospital, Sweden. The basis for the process is the tradition in the County of Örebro to carry out projects in close co-operation with the users as well as aiming for high quality buildings. Traditionally building design projects were set up in a close co-operation between core business representatives and the real estate department. The building project utilized this cooperative approach.

In the study of the process, two approaches to the co-operation were identified. One (1) trust based process and one (2) participation based process. The trust-based process is characterized by having a respected leader, or a small group, with a strong support among staff that enables them to act for others. The participation-based process is characterized by a larger number of active participants representing all tasks, often in working groups dealing with sub tasks in the design process, and a need to get feedback before any decision is made.

It was found that both of the two processes worked well and that the result is considered as a usable building. This finding is compared with a finding from another study where the issue of discrepancies between client’s goals and the outcome, is discussed. The paper discusses the two approaches, how they relate to client’s goals and how these affected the process and what can be learnt for future change and design processes.

Keywords: Usability, design processes, participation, hospital design

1. Introduction

Within the Health Care, large investments continually are made in different construction projects. As public finances fund these, it is important that they meet both functional and financial requirements as well as the public eye. Whether a project is a success or not can depend on how well the programming and design process is managed. It is therefore important to study advantages and shortcomings in these processes and develop methods to improve these.
This paper is based on case study of the Örebro University Hospital (USÖ) [1] [2] and a study on experiences by clients on the outcome of construction projects [3].

2. Background

Although the construction trade is skilled in carrying out complex projects and mastering multidisciplinary design and construction projects there is a common opinion among representatives for core business and corporate real estate that the finished projects often do not meet the goals of the core business, or add the expected value to core business [4].

In a study of USÖ, it was found that participation and co-operation between core business and the construction project group supported the development of a usable building. The hospital has a long-term experience from participative building design processes and thus the staff, in both surgery and radiology, knew that involvement was a part of the process - it was never something they had to fight for. In the study of the process, two approaches to the co-operation were identified, one trust-based process and one participation-based process. In radiology, the head of the radiology department and technical manager they were allowed to develop a radiology department, both technically and organisationally, based on digital technique. If these persons had not owned the trust of the staff, the new solution would have faced fierce resistance by staff. The trust allowed for an efficient process where few actors pushed the process and the staff participated only in meetings and were not actively involved until the new radiology department was about to get staffed and completed. In surgery however, there was an active participation in testing and working with a mock-up room where work functions for surgery could be tested for real and not only agreed upon based on a functional specification. The gap between definition of function and real use was thus bridged [1].

Granath and Hinnerson [4] notes in a study on the outcome of design processes in corporate real estate, that a vast majority of the studied real estate professionals agree with the statement that there is a discrepancy, or at least perceived discrepancy, between clients’ and core business goals on one hand and the outcome of the construction project on the other hand. The explanations to this are also elaborate and the condition is regarded as a problem. Very few participants experience however that this is a problem in their projects. Problems and threats of deviation from the goals occur but they are mostly solved during the course of the project is one of the arguments. The perceived discrepancy is thus possible due to the actions from the actors in the project itself. The participants just do not admit or realize this. Discrepancies between goals and outcome are thus a matter of communication and participation. Increased knowledge, outside interventions and ongoing development of goals is considered a natural part of the project that can be dealt with, not something that compromises the process.

As the building in the USÖ case is considered usable and appropriate for the core business Health Care, it is interesting to study the two approaches that managed to overcome ambiguous statements in the programming and the interpretations made in the transition to the design phase and how this relates to the findings from the Granath and Hinnerson study.
3. Method

This paper is based on two studies. One on USÖ [1], which focused on the process in the transition from programming to design, and one on the outcome of construction projects [4].

In the USÖ case study, a part of CIB/TG 51 study on Usability, the aim of the investigation was the understanding of a complicated concept rather than finding common quantitative evidence of a certain phenomenon. The study used a qualitative and practice grounded method based on several years of research. A previous and similar research project was the investigation of the multiple aspects of “the importance of spatial design to work place performance”, in which a method for this kind of research was developed [5]. The first component [i] of this investigation is to fuse practice and research together in the development of understanding. Theory developed from practice and theoretical reflection on and structuring of practical understanding are the cornerstones of the investigation. The creative process of investigating and reflecting on common situations between research and practice is essential. This method of developing innovative new concepts that challenges existing theories, as well as proven practice has been successful in earlier projects. The second component [ii] is the combination of self-evaluation by practice based on a selection of quick ethnographical research methods [6] [7] [5]. The third important component [iii] is choosing situations from different cultural contexts like countries, companies and industrial branches. Like the thematic network “Workspace”, this too is a cooperation between a numbers of countries represented by researchers and companies from different branches and to articulate these, primarily using workshops where researchers and practitioners meet.

The other study is based on the Delphi method, developed by Rand Corporation, and is often used for predicting future trends or to explain complex courses of events [8]. It is often directed to a large number of experts that is, e.g., asked how they predict the development of certain aspect in the future. A Delphi study is mostly carried out in at least three steps. The first step, included questions directed to a large number of experts throughout Sweden, including representatives from the construction industry, real estate industry, consultants, facilities management and core business representatives and users in large organisations. The second step in our study was based on the results of the first set of open questions. The answers from step one was summarized into a large number of statements and the experts were asked to react to these statements on a four-grade scale from “I agree totally” to “I disagree totally”. The aim was to identify common conceptions among a number of experts, as for an example the relation between the identified goals of a project and the outcome of projects, and the design processes itself. It was also aimed at exploring the behaviour of different actors, and show whether there is a difference in standpoint between different actors in the process.

4. Theoretical framework

Programming and design processes aim to deliver buildings usable for the client [9] [10]. When studying these processes it is important to scrutinize both content and process. Often traditional programming and design of buildings focuses on the properties of the building itself. It focuses on the functional properties of the building and assumes that usability will follow as a causal
effect of a functional design. Traditionally Swedish building research has been very successful in analysing building functionality, often with focus on housing design [11]. One of several evaluation methods related to usability is the “The Serviceability Tool” [12] [13] that uses the terms performance and serviceability where “Serviceability is about whether a building or facility is capable of performing as required” and “Performance means actual behaviour in service at a given moment”. Another important method is the Post Occupancy Evaluation – POE – technique developed by Wolfgang Preiser [14]. POE is traditionally a technique that is used for buildings in use and thus the process outcome rather than the process itself [15].

The current trend in programming has noted the poor performance of construction projects and started to view programming and briefing as a continuous process and not something, that is being done end defined at an early stage [10]. This view also affects the role of the programmer and how that relates to the interaction between users, clients and the design and construction team [10].

Participation is also related to planning of functions and performance of buildings. A growing awareness of the importance of employee participation in organizational change and workplace design is quite new in countries like US, UK and Germany. At the same time, this has been legislated and common practice in Scandinavian countries for almost thirty years, whereas in other countries it is not even considered as relevant [16] [2].

5. The hospital design case

5.1 Örebro University Hospital

The Örebro University Hospital, USÖ, is a development-oriented medical centre located in central Örebro, a medium sized Swedish town. It has extensive basic general medical facilities and provides health care for inhabitants in the region as well as to central parts of Sweden. The European Development Centre for Radiology is located at USÖ. The O-building that is the case in this study houses two main activities, surgery and radiology, and was opened in 1997. The usable area of the hospital buildings are over 200 000 m². The major development of the hospital was done in 1960: but an ongoing renovation and investment in new buildings have made USÖ one of the best-maintained hospitals in Sweden today.
5.2 The process in general

Traditionally, health care is organised in a hierarchical way. Building projects however often fall outside the ordinary relations in an organisation. The real estate unit has since early sixties had an ambitious co-operation between core business and building projects in planning and designing and have developed a culture of participatory design. They also have a long experience as a client and organiser of building projects.

![Organisation of the design process](image)

*Figure 1: Organisation of the design process*

From the following case description of the project, we find that this participation from core business employees was very detailed and started early enough to affect strategic issues of the building project. The health care units that were affected formed design teams to develop useful solutions for their professional activities. The real estate department set up a project organisation to support the building project. Representatives for both groups met in a co-operation group to make decisions to deliver to the project steering group. The consulting architects worked closely together with the teams in both core business and the real estate department. The process to develop and design the O-building involved a large number of people. Three main groups carried out the process, thus we distinguish between the user project, the building project and the co-operation group.

Although the two parts involved in the project had the same organisation as described above, we could detect two different ways of working; a participation based model in surgery and a trust based model in radiology.

5.3 The participation based process model in surgery

In surgery, the main organisational issue was the change from an organisation where surgery was a general resource for the whole hospital and central located. In the new organisation, the
surgery was divided into units that organisationally belonged to different departments (clinics). This change was however decided beforehand and was a prerequisite for the new building.

In the process, one user project was set up for each unit. However, the thoracic unit that was added to the project in 1995 did not have a user group. Due to Swedish legislation and praxis, the different unions were represented. One person responsible for continuity and strategic issues participated, mostly the head nurse for each unit. The chairperson of the department (clinic) participated as well as a representative for the assistant nurses and department of medical engineering. No representatives for services like janitors or cleaners were represented. The project group was well rooted in and chosen out of trust by the rest of the unit. They reported back at unit meetings. A construction project manager from the real estate department led the building project. This group also consisted of the architect, technical consultants and representatives from the hospital management. A co-ordination group was set up as a bridge between the user project and the building project. The head of the unit, the chairperson of the department and representatives from medical engineering participated from the user project and the architect, construction project manager and sometimes the hospital management participated from the building project. The co-ordination group made decisions regarding the development of the project. The architect also worked directly with the different units. The work done in the user project groups was presented regularly at meetings on unit level. There were large papers on the walls were people could comment on drawings and other material that was displayed. The comments were given to the architect.

5.3.1 Co-operation in design

The different surgery units in the user project carried through design activities to investigate alternative solutions and articulate the needs of the units. An important arena that all units could use was a room with a complete mock-up of an operating theatre. This was the arena where nurses, doctors and medical technicians could meet with architects and other representatives of the building project and investigate different solutions. The mock-ups were used for simulation where the degree of truthfulness to reality was extremely high and detailed.

Figure 2: Organisation of the design process in surgery
Most of the dialogue in the design process took place directly between individuals or groups from the user project and the building project and they often arrived at concrete conclusions and suggestions. Decisions, confirmation and policies were then forwarded to the co-ordinating group that had the formal power to take that role.

5.4 The trust based process model in radiology

In radiology, the main issue was the transition of technology. Many operators and nurses feared the new technology and the risk that their professional knowledge should be obsolete. As the more serious development in this direction took place after the briefing process for the building had started, it was also a problem for the building project. A step-by-step move of units and a thorough educational program was established to meet these problems.

![Figure 3: Co-operation in design](image)

The process of the radiology units was somewhat different. The head of the department and the head of medical engineering were at an early stage dedicated to the idea of using new digital technology. The head of the department contacted the radiology department in the county and investigated if they were willing to convert to digital radiology and to connect to a network that could transfer digital x-ray pictures. All five radiology departments concluded that this would be a great advantage to them and agreed to participate. The idea was presented to the head of the hospital and the county politicians and got support as long as they kept the time and cost limits. The first brief for the units however suggested a mixture of traditional technology and digital technology and a step-by-step conversion to the new technology. The manufacturer of digital x-ray equipment – Philips - however took an interest in the developments and was willing to use USÖ as a testing ground for development work. This situation and the parallel development of equipment made it not feasible to use the same method of a common testing arena as was done for surgery. In this case, the development of technology was done through
innovative work in all steps of the chain from Phillips laboratories to the actual radiology unit in Örebro with iterations of information and knowledge between radiology nurses, doctors and technicians on one side and engineers and researchers at Philips in the other end. The result was that USÖ became the first hospital in Sweden that totally depended on and fully utilised digital radiology technology.

5.5 Important issues in the design process

A demand from the users was operating theatres with windows and daylight. This question was raised by the building project as they thought; this could be a problem for certain processes like keyhole surgery and that they would pull the curtains down most of the time anyway. The experience from the old operating theatres, located in the dark core of a double corridor building from the seventies, was however so definite that no discussion was necessary. The users were also inspired from research in environmental psychology that stressed the importance of pleasing environment for both staff and patients. A question related to this was access to outdoor terraces. This was a trickier question, as it was easy to advocate for the hygienic risks of going outdoors when working in a surgical unit. No real arguments came up that could justify outdoor terraces, but today there are terraces in the building to the pleasure of the staff. However, everyone realized that it was a calculated risk and it is now used with a strong awareness that the hygienic regulations must be followed rigorously. These issues are examples on what impact the participation process actually had on the building.

6. Discussion

Based on the USÖ case study and the two approaches it is shown that there are several ways of achieving a usable solution that satisfies the client. In the light of the Delphi study this is important as that study concludes that programming might not be sufficient. In the USÖ case, e.g., the mock-up room was used as a complement. However, as we found, the two approaches have different characteristics; participation requires a large amount of time, and the trust-based approach requires maturity from the organization in order to be possible. Studying the process that took part in the O-building case, we can clearly see the importance of participation for development of a usable building. By participation in the mock-up room work functions could be tested for real and not only agreed upon based on a functional specification. The gap between definition of function and real use was thus bridged. In radiology, the relationship between function and usability developed differently. Based on the trust for the head of the radiology department and technical manager they were allowed to develop a radiology department based on digital technique. If these persons had not had the trust of the staff, the new solution would have faced fierce resistance by staff. The trust allowed for an efficient process were few actors pushed the process and the staff participated only in meetings and were not actively involved until the new radiology department was about to get staffed and completed. The trust even allowed for drastic changes like the change of technology in the radiology department. An overall trust related aspect is also that the county has a long-term experience from participative building design processes and thus the staff, in both surgery and radiology, knew that involvement was a part of the process - it was never something they had to fight for.
Looking back at the USÖ study we find that the programming and the design phase were articulated. The organization was well prepared to manage participation and had a structured way via the co-ordination group to stay in contact with the construction project. This also allowed the users and the construction project to focus on their prime issue and direct discussions to the co-ordination group with its task of pushing the project forward. These processes were also given time as the county have incorporated an iterative and participative process suitable also to the, partly, political decision processes in public health care. This enabled those who were not directly involved to at one stage or another take a look into the project without it having to be organized as formal participation. Communication and information is essential as well in this process.

If we compare these findings with the findings from the Delphi study we find that the difficulties noted regarding un-articulated processes and lack of consistency in programming was managed through the USÖ approach that incorporated participation, openness and that the process was given time. The aspect of having time to develop and explore is, we conclude, due to the kind of decision process associated with the use of public funding. In this case we regard this as a positive effect that benefited the development in the USÖ case, depending on outset it might not. It must also be noted that the time in the USÖ case was utilized for establishing a design, the time given was used instead of passed.

7. Conclusion and further research

The experience from these two studies is that a well managed programming and design process results in a usable building. However with this somewhat obvious statement it is important to question what lesson can be learnt. From a Scandinavian perspective it is interesting that a trust-based process worked just as well, or better, than a participative one. As noted in the CIB TG51 group on usability the cultural and contextual aspects are discussed and it seems that the situation at USÖ enabled such a process to be performed. For future planning processes it is relevant to study what mechanisms that makes a trust-based approach feasible, and if it can be more efficient than a participative based one.

Another finding that raises questions is the fact that the USÖ was “given” time, it did not have to “take” time. This, we conclude, is due to the structure of decision processes regarding facilities within public health care, and in the USÖ case the stability of the organization, and led to a process where both the trust-based and participative-based process could develop. However, in times of outsourcing and change of view on clients and suppliers in public services, the question of time allocation might matter. A further study would be needed to study what resources are needed to outsource facility related services and how this relates to both client and user experience of quality.

References


