

**Mapping a framework for co-design in healthcare projects:
An empirical study**

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Abstract

Rapid technological development and changing demands from a changing population call for new ways of working in the healthcare sector. As the working environment should support these new ways of working and be prepared for yet more changes, new strategies for facility planning need to be studied.

Architects have a long tradition of working with end user involvement in the early stages of building projects, but over the past ten years, a shift in focus or trend has been noticeable. Over time, the purpose of end user involvement has moved from mere participation to co-designing, making fuller use of user knowledge and experience.

This paper revisits seven healthcare building projects, now in various stages of realization but initiated in 2007–2011 using a design-driven co-designing framework, involving end users in the early stages of developing and designing their future environment.

The co-designing framework and its outcome are revisited and scrutinized here in light of four factors presumed to influence the quality of the process and its outcome: representativity, continuity, ownership, and innovation. Each case was mapped through archival studies, observations, and interviews with involved architects, project managers, and users.

The intention is to deepen our understanding of the planning framework and the consequences of user participation and co-designing by highlighting recurring factors connected to the collaborative planning process and its outcome.

The findings indicate that the framework's basic structure has proven stable and useful in several projects and, although affected by external factors such as timing, politics, and finance, still offers good conditions for involving end users in project development and ownership creation, enabling the development of innovative ideas.

Keywords: user involvement, co-designing, healthcare planning, participatory design, ownership, representativity, continuity, innovation

Introduction

The healthcare sector faces several challenges connected to its outdated building structure. Smaller, piecemeal reconstruction projects over the years have resulted in facilities lacking logical internal connections, which in turn creates a growing need for more extended reconstruction. New demands for patient safety with respect to infectious diseases (e.g., one-patient rooms), new ways of working, private sector competition, technical development, and an ageing population are some factors affecting the development of healthcare facilities at the same time as economic austerity measures are making their mark. Furthermore, the working environment of the healthcare sector houses a diverse group of professionals working together in a complex interaction of patient and resource flows. Planning and designing new facilities call for a strategic approach to identifying, collecting, and developing requirements from an organization and its users.

A key stakeholder in the front-end activities of building projects is the *user*, here referring mainly to those working within or in connection with a studied healthcare situation. The advantages of involving stakeholders in the early stage of project planning and the need for strategic approaches have been studied by several researchers (Lindahl and Ryd, 2007; Mahadkar et al., 2010)

User involvement has been practiced and researched in the area of residential and workplace planning (Olivegren, 1974; Granath et al., 1996) since the 1970s. Over the past ten years, together with increasing attention to the importance of front-end activities in general (Ryd, 2008; Blyth and Worthington, 2010), new interest in user involvement is emerging, though a change in focus is noticeable. The purpose of user involvement has shifted from mere participation to co-designing, making fuller use of user knowledge and experience. In these planning situations, users participate in creating and developing their work environments through approaches more commonly used by designers (Sanders and Stappers, 2008). In Swedish healthcare planning and design, there is a long tradition of participation and collaboration between stakeholders. The question is not whether users should be involved, but how. Consequently, there is great demand for new methods and techniques to convert participation into co-designing.

Less strategic participatory planning methods risk creating a built structure that does not support effective use of resources. The demand for efficiency in healthcare is great and methods for capturing the right specifications, working methods, and space requirements will ultimately lead to better care for patients.

One example of a collaborative planning methodology is studied here. It is an approach used by architects working on refurbishment and new construction projects. By applying designer's working methods, tools can be offered to users, helping them understand their needs and articulate their requirements for their physical work environment.

This paper deepens our understanding of how to develop collaborative planning in healthcare building projects. It examines a co-designing framework in light of four themes, studying seven cases in which the framework was used in an early stage of the project. The four themes – i.e., *representativity*, *continuity*, *ownership*, and *innovation* – are presumed to affect how participants perceive the planning process and how the process outcome is used in ensuing stages. This paper investigates whether and how *representativity* and *continuity* work, with reference to the seven studied cases. *Ownership* and *innovation* are factors that constitute the

desired outcome of the collaborative process, and this paper examines the extent to which these were achieved in the cases.

Background and description of the studied framework

The traditional planning methods of the 1960s and 1970s grew out of the linear and technically rational approach of the time and were designed to handle known and fixed targets when constructing the welfare state's hospitals and other healthcare facilities. They were normative processes based on formal methods for identifying needs and producing suitable facilities. Facility planning was a task for the expert groups, and a repertoire of standard room solutions was developed centrally. In this approach, innovation was assumed to take place centrally, in "the development department". Today, with the rapid pace of change and many involved stakeholders, more open and dialogue-based methods are used to accommodate the new demands, often to deal with vaguely known targets with variable specifications.

The healthcare organization itself plays an important role in processing user requirements, specifications, and solutions. Knowledge of what is needed in facilities comes largely from doctors and other healthcare professionals. Meanwhile, healthcare activities are constantly changing, subject to internal and external forces. Knowledge of how these changing conditions affect, for example, operations and procedures, and the built structure supporting them, needs to be developed.

The framework for co-designing (FfC) was developed to serve as a tool for architects seeking to involve users and their knowledge in the design process in a more strategic way. The framework consists of a structure of workshops, methodologies, and tools (see Fig. 1) and includes active collaboration between clients, users, other stakeholders, and architects. The basic concept is to use design methodology to simultaneously handle needs identification and solution development. While working together as a cross-disciplinary group, the participants use design artefacts to explore spatial relationships and new design concepts.

Every case is a refurbishment or a new construction project and as such comprises specific stages characteristic of the construction sector. FfC is used during a limited period of time and the output from that process is further studied and developed in the ensuing stages.

FfC is applied in an initial planning stage, emphasizing the production of materials that a smaller group can continue working on. FfC starts, however, by involving a broad, inclusive group, to gather all relevant perspectives and lend credibility to the output.

Every process conducted according to FfC consists of three to five workshops, similar in structure, the focus of which shifts from the current situation, inspiration, and vision to an increasingly detailed proposal.

The architects, working in teams of two or three, take the role of workshop facilitators, planning and preparing the material and workshop exercises in addition to coaching the participants during the workshop. Between workshops, the architects document the discussions, translating them into new foundations for more focused discussions, eventually leading to concrete proposals for facility layouts.

Using this framework of workshops and tools, a platform for discussion is established between the architects and the organization. The tools support the articulation of formerly tacit knowledge, and when stakeholders meet and discuss the project via this platform, new knowledge is created.

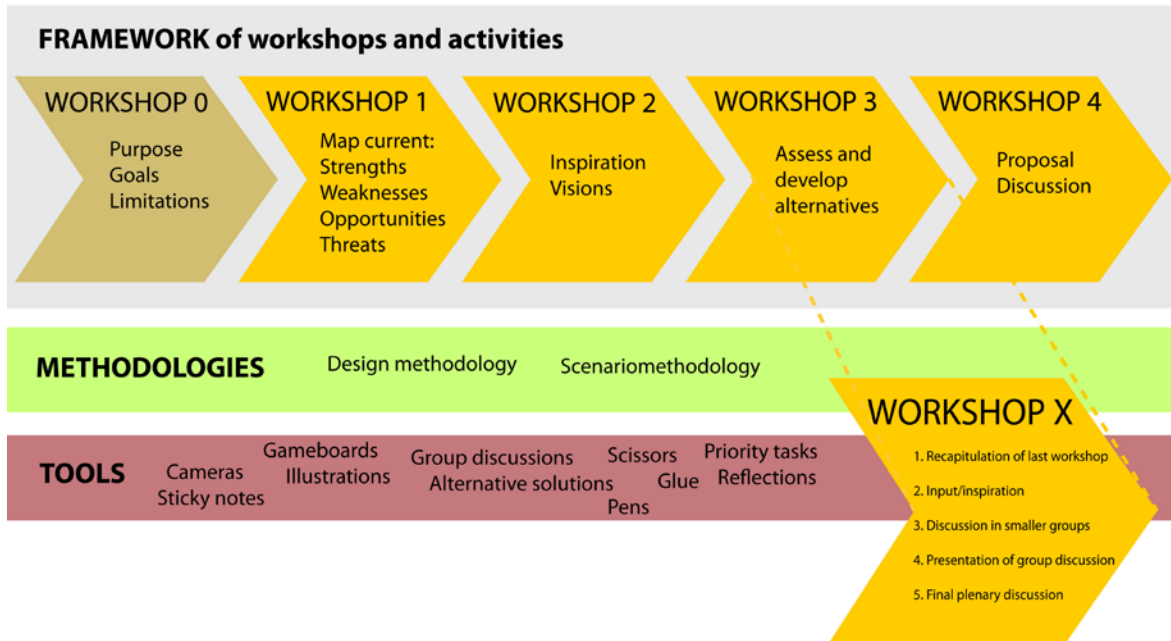


Figure 1. Schematic of the studied framework, showing its setup including workshops, methodologies, and tools, as well as of how an individual workshop is organized.

Since the group is handling major decisions, it is important that it include representatives from all workplace levels. With 12–35 participants, the group is generally larger than in traditional planning processes, and the broad representation lends credibility to the outcome. The goal is to have all stakeholders present throughout the process, so as to not miss out on important knowledge or requirements. FfC gives all stakeholders a chance to listen to each other, so they all gain a comprehensive overview and can eventually formulate an approved proposal. Participants are asked to disseminate workshop information to their organizations between workshops, to obtain new feedback for the next stage of discussion.

Participant continuity throughout the process is emphasized in the initial planning stage. One objective is to advance the work from one workshop to the next. Every new participant entering the process is asked to study the records of earlier discussions, so that the ongoing discussion will not be slowed down by requests for the review of earlier content.

Every workshop, except the first, starts with a recapitulation of the previous workshop (see Fig. 1). This is followed by an input session, such as a lecture or presentation from a study trip. After the common introduction, the group is divided into smaller discussion groups working on the workshop topic, supported by artefacts prepared by the process manager. All the groups then gather and present the results of their discussions to each other, followed by a final plenary discussion. The group presentations and the final discussion are videotaped and transcribed into informative notes describing every workshop (see Fig. 2).

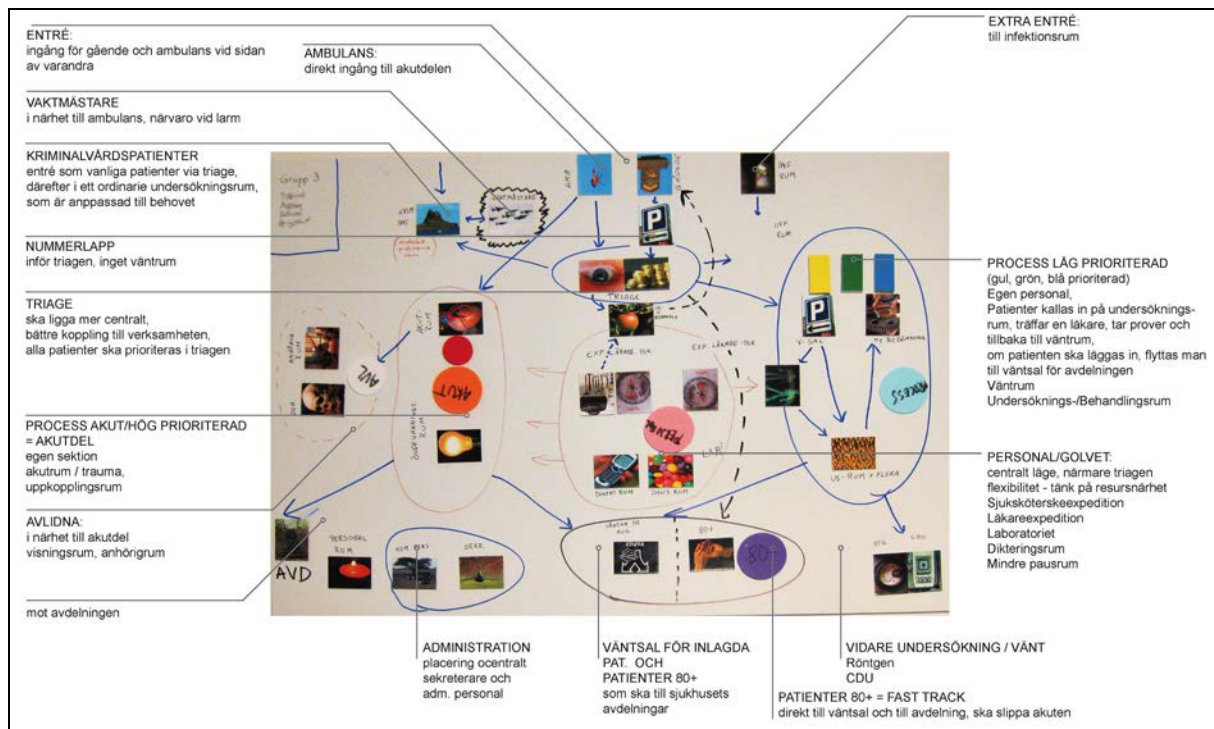


Figure 2. Example of notes taken from videotape of group presentation from case 5. The notes in Swedish describes flows and connections between activities at and emergency ward.

In the workshops, participants use various visual “design artefacts” such as video, workbooks, scenario games, and interactive real-time 3D visualizations. These artefacts help guide participants to adopt the designer’s way of working, and make the discussion open and flexible as well as accessible and engaging to those who are unfamiliar with traditional planning protocols (see Fig. 2).

The framework’s advocates claim that this way of working results in stable solutions strongly related to user needs and requirements, as well as incorporating the capacity and flexibility to accommodate future changes. This ultimately provides a physical basis for better healthcare. No formal evaluation of the approach has been undertaken until the present study.

Method

For this study, we chose to use a research design applying qualitative methods in combination with certain quantitative aspects. The research was conducted as a retrospective case study and presents a view of the course of events (Flick, 2009) reconstructed through interviews and quantitative data, such as drawings and documentation. Examining a selection of seven cases makes it possible to incorporate comparative aspects into the study.

By qualitatively investigating the cases, the researcher becomes part of the research object, both by affecting the results through participation in interviews and when interpreting the data. In this study, the researcher plays an even more active role: Two of the authors are architects well acquainted with FfC, taking part in the studied workshops by acting as facilitators in a way somewhat similar to action research (Coughlan and Coughlan, 2002). The case study started by critically reflecting on each case together with the involved architects. Validity was ensured by data triangulation, through including interviews with a representative selection of informants in all cases.

At the beginning of this study, we looked for recurring themes that would be useful when describing and scrutinizing the framework for co-designing, themes that at the same time could illustrate other participatory processes. Due to the limitations of a single paper, only four key factors were selected: representativity, continuity, ownership, and innovation. Other factors would have been equally interesting to consider, but are left for future research.

Over the past five years, FfC has been used and developed in various architecture practices around Sweden. For this study, a large architecture firm that had handled more than 60 projects was asked to select cases from its roster of completed projects, most of which are in the healthcare sector. The firm's healthcare projects were selected due to the large number of executed planning processes and the consequent range of project completion stages.

Though characterized by hierarchical workplaces, the healthcare sector is based on collaboration between various professionals and has a tradition of participatory planning that makes it especially amenable for studying methods for participatory planning processes.

The case projects were selected to represent the five-year period between 2007 and 2012, which coincides with the development of the framework in practice. Other sampling criteria were: type of activity/organization, geographical location, and client. The cases were selected to encompass both diversity for range of coverage and similarity to enable direct comparison. The selection includes finished, on-going, and paused projects (see Table 2). Since this paper investigates important themes during and after the initial collaboration, as well as how later stages and their participants relate to them, the various stages of the studied building projects give a snapshot of perspectives from various actors.

For every project, three types of informants were interviewed: at least one representative each of the architect, client, and client's customer (here called user representatives) (see Table 1). When additional representatives were able to attend an interview, they were included and interviewed at the same time. In some cases, the client and the client's customer were interviewed together; in other cases, on separate occasions. This variety of interview situations and its possible influence on answers was taken into consideration when analysing the results.

Informants from case 1 were unable to attend the interview; the qualitative data for case 1 are therefore incomplete and are not used in this study.

| CASE | ARCHITECT | CLIENT | USER REPRESENTATIVE ▪ Former title(s), now: new title |
|-------------|----------------------------|---|---|
| 1 | Architect A Architect B | Client A | User representative |
| 2 | Architect A Architect C | Client A1: Project manager Client A2: Functional planner, now facility developer | ▪ Head nurse, now project manager ▪ Nurse, team leader ▪ IT department, now project manager |
| 3 | Architect A Architect D | Client B: Functional planner | ▪ Nurse, team leader, now functional planner |
| 4 | Architect B Architect C | Client A3: Project manager | ▪ Consultant in neonatology, now clinical director |
| 5 | Architect A Architect E | Client C1: Planning manager Client C2: Project manager, took over after FoC | ▪ Head of unit |
| 6 | Architect A Architect D | Client D1: Hospital planner during FoC Client D2: Hospital planner, took over towards end of FoC Client D3: Project manager | ▪ Ward manager |
| 7 | Architect A Architect D | Client B: Functional planner | ▪ Chief nurse, branch manager |
| 8 | Architect B Architect C | Client E1: Project manager Client E2: Project manager, took over after architectural competition | ▪ Representative of the care profession in the project manager group, now project manager |

Table 1. Case informants; grey shading indicates joint interview sessions within case.

Questions asked during the interviews:

For clients only: Describe your thoughts when initiating this project.

For all informants: Describe your memories of the process. What happened?

What did you feel was your purpose for participating in the process? What were your aims?

What discussions characterized, or were recurring during, the process?

Were there any activities or procedures that you found more important, marking turning points in the process, or especially useful? Or were there any activities that were the opposite, that is, unnecessary?

Describe what happened after the process in which the framework was used. What activities were there and who participated?

What qualities were important in the most recent discussions? Did the initial discussion correlate with those discussions?

Describe the current state of the project and its relationship to the focus of the framework process output.

What is the attitude of the organization towards the current proposal?

What factors do you see affecting the design the most?

What qualities did FfC bring to the project?

How was the continuity throughout the project?

Is there anything you would have liked to have done differently?

The interviews were conducted in spring 2012, and were videotaped or sound recorded and then transcribed. Informants consented to be recorded before the interviews, and were later given the opportunity to add to and clarify their responses.

The quantitative material consists of systematic and detailed documentation of the workshop discussions, the process output, and the most recent available documents and drawings. This quantitative material was categorized and analysed to enable comparisons (see Table 2). In addition to these data and the interview material, the authors' own experience was used.

Preliminary results and observations

General introduction

Table 2 presents a compilation of selected data from the seven cases and Table 3 presents a brief summary of the four studied factors. Three of the cases are in an occupancy stage. In cases 3 and 4, the new premises are not yet being used in the way intended, while case 2 is currently starting a new construction process, as the current facilities were to be used only temporarily.

Since the projects varied in scale and complexity, the output contained various levels of detail. The greatest difference in this regard was between refurbishment projects, in which the output was more detailed and might have to be realized within a shorter time period, and new construction projects, which had less detailed output, here called "block layout" (see Fig 3).

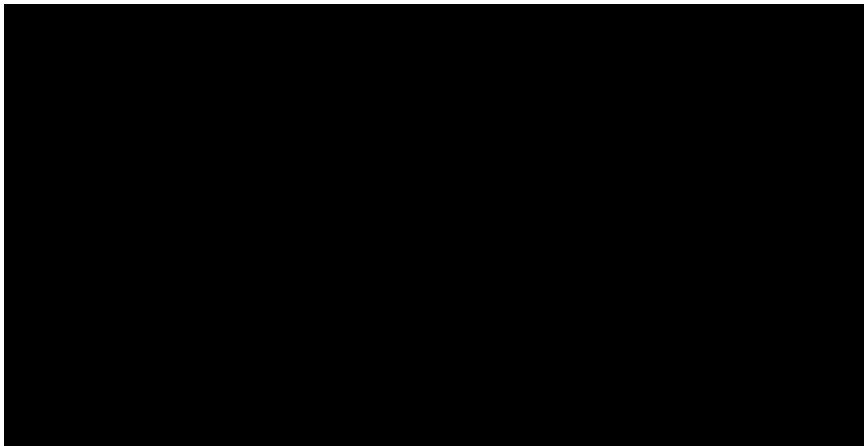


Figure 3. Example of block layouts, here from case 1. It pictures rooms or activities in scale and in relation to each other.

All informants expressed satisfaction with the order and focus of the FfC elements. They were more critical about the following stages and expressed disappointment at the outcome, in projects both in progress and in the occupancy phase.

The experience of participating in a collaborative process raised the expectations of the future stages, in case 6 beyond what those processes could accomplish: "We continued working for more than six months before we agreed", said client B about case 3, expecting to have progressed further during FfC. Client D also expressed disappointment about how far the FfC output reached. The disappointment in the post-FfC stage could be due to the comparatively fast pace of the earlier stage and the different project structure in the following stage. As one participant stated, "lack of structure slowed down decision-making" (case 6).

Some projects could apply FfC output almost directly in the next stage of the project, or use it as the basis for an architectural competition (cases 2, 3, and 8).

Though some proposals would have benefitted from more initial work, at the project stage current at the time of the interviews, all informants stated that, even given changing circumstances, the original visions and goals expressed at the beginning of the process still applied: it was only their implementations and external conditions that continued to change in some projects.

Representativity

Creating a broadly representative group lends credibility to the output, but representativity alone is not enough, as an informant in case 4 points out. He emphasized the importance of finding participants who were genuinely involved and interested in the project. An informant from case 2 notes the importance of having a cross-disciplinary group: “It was a kind of new approach for us, to let other clinics and departments join the discussion”.

In case 3, a recurring discussion focused on the role of primary healthcare in emergency care; in workshop 3, a primary healthcare representative was able to attend and participate in the discussion, adding a missing perspective.

The importance of finding “the right” participants was also mentioned by architect D: “The involved participants have a strong impact on the results, especially when considerable uncertainty is involved”. Case 6 participants said that they felt that too much of the decision-making was their responsibility, that they became hesitant whether they could shoulder that responsibility: “Why do I have power over this? I don’t know enough”.

The broad range of representation was questioned by a participant in case 7, who suggested that using a smaller group closer to the core activities of the emergency clinic would have advanced the discussion further. The case 7 group believed that the involvement of additional competences would be more relevant once there was a concrete proposal on which feedback was needed.

One participant from case 6, who had experience of two previous building projects, said that the architects should “be careful with the participants, use them strategically, and [only use] their strengths, so as not to wear them out”.

Client B (cases 3 and 6) suggested that the workshop group should not only consist of representatives from the project, but also of professionals from other cities. This would prevent interpersonal conflict, as well as recurring talk about “me” and “mine”.

Splitting the whole workshop group into smaller entities for discussions was an element repeatedly cited as advantageous. Client 1b stated that doing this reduced the hierarchical dynamics arising from the participants’ workplace positions and neutralized the influence of dominant participants.

Continuity

The continuity during the workshop series was generally good in the seven cases. In the post-FfC stage, many of the users continued to play an active part in the ongoing process but in smaller groups of representatives. In case 8, an almost completely new group of users took over after the workshops. Two workshop participants continued to participate in the process and took more leading roles, to ensure that the decisions reached early in the process were followed through.

Some projects, especially temporally extended ones, have struggled with discontinuity, as a result of both natural turnover and delays in the progress of the building project. In case 8, new architects became involved after an architectural competition and worked with the user group; as one participant recalled, “We had to explain again what we meant, because we had new architects who didn’t know our initial thoughts”.

Turnover occurs most commonly and with greatest impact among participants in leading positions, such as clinic heads (cases 2, 5, and 6). These actors wield greater influence than do others and, when becoming involved in the process, are often interested in introducing their own ideas – despite the content of previous discussion. A new actor who does not acknowledge the content of previous discussion can threaten the progress of and user confidence in the planning process.

In a process in which participants share experiences and learn from each other, new knowledge is produced. As the group matures, it can discuss issues at a deeper level. The workshop members usually constitute a new grouping, meeting to discuss the issues for the first time, so group maturity cannot be expected from the beginning; it instead emerges as a result of a collaborative process characterized by continuity.

Groups that had discussed the situation before the FfC process started were likely to spend less time discussing preconditions and instead move on to implementation in workshop discussions. In case 6, a paediatric clinic consisting of several facilities located in the same building, part of the organization had been working on organizational issues before the planning process commenced. “The emergency ward had spent a lot of time talking about their role in the case 3 project (where they were initially to have belonged), which meant that they had agreed about how they would like to work”, explained one participant from case 6. The neonatal ward, also involved in the case 6 project, spent more time on development discussions in the process and had several meetings between workshops.

Client C2, who was “taking over” the case 5 project after the initial process, found the group to be mature, although there had been less agreement in the initial stage. After FfC had finished, there had been a delay in the proceedings, and the organization had time to test some of their ideas in practice. The client in case 5 said, “Regarding the process, I would say that this is the best group I have ever worked with!” In this case, one can likely conclude that FfC, together with ample time for testing, had helped the group to mature.

Many participants had one role during the workshop stage but took on new responsibilities in the post-FfC stages. Participating in a healthcare planning process gives experience that can shape one’s career path. Two participating nurses left their original organizations to work in client planning organizations, and several of those who were initially mere workshop participants became project managers in the ongoing process (cases 2, 3, 4, and 8).

Table 2. A compilation of selected case data

| Case no | Activity | Year | Client | Type of project | Scale, sqm | Size of workshop group | Ffc output used for/Post-Ffc activity | Current status june 2012 |
|---------|---------------------|------|----------|------------------|------------|--|--|--|
| 1 | Emergency ward | 2007 | Client A | New construction | 8000 | Medium group of representatives, average 24 participants. | Process ended in block layout. Outcome transformed into a program for the whole building, constituted a base for an architectural competition. | Competition finished. Awaits investment decision. |
| 2 | Emergency ward | 2007 | Client A | Refurbishment | 1500 | Small, average 14 participants. | Process ended in detailed layout suggestion. Developed further in user group + building professionals, re-shaped, built from that. | Occupation in 2010, preparing for new construction nearby. |
| 3 | Emergency ward | 2008 | Client B | Refurbishment | 4000 | Large group, average 30 participants. | Process ended in layout suggestion. Discussion and proposal continued after Ffc. Details were studied further and reshaped, built from that. | Occupation in 2012. |
| 4 | Neonatal clinic | 2008 | Client A | Refurbishment | 6000 | Small group, average 14 participants. | Process ended in detailed layout suggestion. Output developed into formal construction document. Details were studied further and to a very small extent reshaped. Built from that. | Occupation in 2011 |
| 5 | Emergency ward | 2009 | Client C | Refurbishment | 3100 | Extended group 1st ws x5, average 13 participants, then average 16 participants. | Process ended in layout suggestion. Delays in post DD phase gave the organisation the opportunity to test some of their ideas in reality and learn more. Details were studied further and slightly reshaped. Used as base for tender document. | Ongoing project. |
| 6 | Pediatric clinic | 2010 | Client B | Refurbishment | 4100 | Medium group, average 19 participants. | Process ended in layout suggestion. Details were studied further and reshaped, currently facing new conditions due to financial reasons. | Awaits investment decision. |
| 7 | Emergency clinic | 2010 | Client D | Refurbishment | 2700 | Medium group, average 24 participants. | Process ended in detailed layout suggestion. Output needed further studies, went on to next phase and then halted. Waited for master plan. New masterplan suggests new construction and location for the project. | Awaits investment decision in relation to master plan. |
| 8 | Forensic psychiatry | 2011 | Client E | New construction | 12 000 | Medium group, average 24 participants. | Process ended in block layout. Details were studied further and reshaped. Not used directly in following architectural competition. | Recently finished architectural competition. Preliminary occupation in 2016. |

Table 3. A compilation of selected case data.

Ownership

Ownership is expressed as a sense of influence over the outcome. Many participants expressed how much they appreciated the opportunity to get involved and be heard. A participant in case 3 said that “It was a positive thing, that we were invited to have opinions and discuss our thoughts”, while a case 2 participant stated: “I think it was very important to involve those who ‘worked on the floor’, that everyone listened to us”. In case 4, which was characterized by high ownership, one participant said: “It felt as though we created this together” and “everyone wanted this to be great”.

Ownership is greatly affected by the level of continuity. Delays and uncertainties about project realization leave participants with less engagement in, and hence ownership of, the result. “We have lost the sparkle”, one case 6 participant said of herself and her colleagues, referring to the protracted project process.

Several informants said that the collaboration process marked the start of discussions about the organization and its needs, discussion that continued throughout the process and well into the occupancy stage. This discussion became an ongoing questioning regarding what could be improved. This development seemed partly positive (case 2), but sometimes impeded decision-making, as discussion became overly protracted (case 3).

Furthermore, one informant in case 4 described how some of the group members formed a smaller group within the overall group of workshop participants. This smaller group researched complementary information between meetings, sharing it at workshops to feed the discussion. He said that his boss specifically asked him to work with such a sub-group in the project: “My role was to be innovative and ensure the project took the direction we wanted ... We talked about this project every day” (case 4).

Regarding a sense of ownership, the group’s mission, preconceived ideas upon entering the process, level of commitment, and readiness to discuss the issues are all important.

Innovation

Case 4 provides a good example of innovation in which a new way of working led to the development of new support facilities unique in many respects in neonatal medicine, following a non-separated care philosophy. Informants said that the clinic receives visitors every week who want to study their new facilities. One participant, who followed the whole process and now works as the clinical director, said that this outcome arose from a combination of engaged individuals, the workshop group, competent architects, and a desire from all involved to create something really good.

On the other hand, participants from other projects expressed disappointment at the lack of innovation and new ways of thinking, and in cases 6 and 7, even felt trapped by their building’s limitations. A case 6 participant commented that she felt that “users lack knowledge of new solutions”.

Dividing the larger group into smaller discussion groups made those who were hesitant to speak their minds in the larger group more likely to express their ideas. Breaking up hierarchies in this way, together with holding cross-disciplinary meetings, led to new perspectives. A case 2 participant expressed it as follows: “Someone from another discipline came with other ideas and I saw it was possible to think like that as well. That was very enriching”.

Table 3. Four studied factors

| Case no | Activity | Representativity | Continuity | Ownership | Innovation |
|----------------|---------------------|--|--|---|--|
| 1 | Emergency ward | Uninsufficient data | Uninsufficient data | Uninsufficient data | Uninsufficient data |
| 2 | Emergency ward | Representative and engaged participants. | Good continuity during FfC. When architects changed immediately after the FfC ther was a period of overlap. Discontinuity among users during following process, up to occupancy. | Strong ownership. | New ways of working were discussed. |
| 3 | Emergency ward | Good representativity. | Good continuity during FfC. Head of unit changed several times. Later change of architect. | Ownership not specifically expressed, but much of proposal is said to belong to workshop group. | New ways of working were discussed. |
| 4 | Neonatal clinic | Good representativity. | Good continuity during FfC. Good continuity within organisation, change of architect. | Strong ownership. | New ways of working were discussed. New concept for neonatal care. |
| 5 | Emergency ward | Good representativity. | Good continuity during FfC. Change of head of unit, change of architect. Change of project manager. Somewhat discontinuity among users as well. | Delay in progress created convincing ideas about ways of working. Fairly good ownership. | New ways of working were discussed. |
| 6 | Pediatric clinic | Good representativity. | Good continuity during FfC. Change of director in one clinic. | Participants tell of decreasing engagement. | New ways of working were discussed. |
| 7 | Emergency clinic | Good representativity. | Good continuity during FfC. Change of projects manager. | Hesitant ownership due to haltered progress. | New ways of working were discussed. |
| 8 | Forensic psychiatry | Good representativity. | Good continuity during FfC. Change of architect. Change of project management. Small user group (2-3 p) continued to next phase. | Representatives with clear agenda from the beginning, though somewhat hard to engage since development discussion had FfC. been going on for years. | A previously developed requirement plan was evaluated and illustrated in |

Table 3. An overview of four studied factors.

Discussion

The examined FfC cases demonstrate how healthcare building projects can benefit from participatory planning conducted in cross-disciplinary groups, developing requirements and solutions for new work environments using various design methodologies. FfC is in this way connected to a history of participatory processes used in various situations, ranging from product and computational design to citizen empowerment. It is also relevant to examine the FfC process in the context of knowledge production as analysed by Gibbons et al. (1994), who explain the shift from mode 1 to mode 2 knowledge production. Mode 1 is the traditional way of working within academic specialties; in mode 2, the discussion is opened up to other specialties, both from within research and from elsewhere in society. This meeting of disciplines leads to new knowledge production relevant to what is happening in the studied framework.

An obvious result of the use of the framework is the involvement it created in the workshop group. This involvement is beneficial, creating a sense of ownership, but could also raise false expectations future participation and the quality of the finished building.

Representativity is stressed as a key factor in the initial planning stage of the framework. Broad representation is used, not only to ensure that all important considerations are raised in discussion, but also to lend credibility to the outcome. In the studied cases, a high level of representativity was desired and achieved. When a perspective or competence was lacking, efforts were made to locate and involve the needed expertise as soon as possible. Cross-disciplinary meetings were used to increase engagement and provide a hotbed for the emergence of innovative ideas.

Stressing participants' function as representatives also enables them to step out of their personal roles and reflect on issues from a professional perspective, avoiding personal opinions. This was not always sufficient, however, as informants suggested other ways to rise above the personal and subjective. Broad representativity could also slow down the process, as a participant in case 7 suggested. In addition, the process could well lose in depth what it gains in breadth by overly broad participation.

Participants in the studied cases represent professionals working within or near a healthcare environment. Additional stakeholders are the patients, the end-users of healthcare, who, together with their relatives, also use the premises. That patients and their relatives are important stakeholders was mentioned in almost every project, but only case 4 offered them their own workshop, inviting parents of former patients to evaluate the proposal. When a patient workshop was held, it strengthened the confidence of the other participants that they were working on the right solution. It is possible that all participants to some degree regard themselves as patient representatives.

It would be interesting to study in greater depth how representativity works, i.e., whether and how participants collect information from their organizations to feed into the development process and how discussions are communicated back again to their organizations.

The primary continuity considered here is the continuity of participants throughout the series of workshops. Secondly, the study follows how continuity on all levels (i.e., users, project managers, and architects) is handled in the post-FfC stages and how discontinuity affects the project.

As teams of cross-disciplinary users meet and hold discussions, new knowledge of the project is created and that knowledge is lost when there are breaches in continuity. Consequently one user is not as good as another one, as soon as the process starts. Discontinuity of participants can slow or stop the process and lead to more superficial discussion, as time is wasted repeating issues from previous workshop meetings or relevant input is lacking because a significant participant is absent.

Ownership is here used to refer to the user's perception of influence over the outcome. Strong ownership of a project will result in users' regarding the project as their own and expecting a structure that will meet their requirements.

The seven cases display various levels of ownership (see Table 2). Smaller groups like those in cases 2 and 4 seem to evoke a strong sense of ownership, while cases with larger and more diverse groups of representatives tend to engender weaker ownership. When there is discontinuity of participating actors, such as architects or project managers, in the post-FfC stages, a strong sense of ownership appears to reduce the risk of losing the collectively formulated concepts. Healthcare reconstruction projects are often characterized by a fragmented planning process, because the sector is politically governed. After the initial planning stage, any reconstruction or new construction project may encounter stoppages or delays for financial, political, or organizational reasons. A strong sense of ownership seems to make an often messy building stage easier for the participants, since they are waiting for something they already believe in. Ownership also seems to be affected by the attitude towards the process conveyed by architects and management, which shapes the extent to which participants feel that their involvement is meaningful.

Innovation here refers to a definition from OECD (2005): "an innovation is the implementation of a new or significantly improved product, service ... or a system, or a new organisational method ... in workplace organization".

The innovation aspect was not explicitly present in all projects, though the renewals of working methods or organizational improvements were consistent topics. Three cases are in an occupancy stage and both cases 2 and 3 are implementing their new ways of working with emergency healthcare. Case 4 represents a process in which innovation was an expressed goal from the outset and, for this reason, went further in terms of innovation, creating a completely new structure for neonatal healthcare. In that case, innovation and ownership seemed strongly connected, as it was the presence of a small devoted group that enabled innovation. These three cases might lead one to conclude that FfC does not promote innovation in itself, but that it does offer a structure and tools that could facilitate innovation.

The participating architects also influence the quality of the process and its outcome. As a case 4 participant said, "It was essential that those who worked on our project had some kind of emotional interest in what we were working on – that was important". He added that the competence of the architects was a key factor in their success.

One participant explained what he felt were the two most important factors influencing project development: first, how the architects translated their ideas into visualizations of solutions for group evaluation; second, how these visualizations revealed the need for extra space to accommodate all requirements (case 4).

The architects working as process managers facilitating FfC share traits with researchers working in action research. Coughlan and Coughlan (2002) describe the difference between a consultant and a researcher. Tighter time and budget constraints, for example, prevent the consultant from being as rigorous as the researcher in inquiry and documentation, though FfC does use a fairly rigorous documentation procedure. The difference is further evident in terms of contrasting modes of justification, where “researchers require theoretical justifications while consultants require empirical justifications” (Coughlan and Coughlan, 2002). Finally, consultation is often linear, while action research is cyclical. Here, the cross-fertilization between FfC and action research is apparent: FfC is characterized by its iterative design methodology and works cyclically in its problem solving, just like action research.

Conclusion

The user co-designing framework has been used in various situations; here, seven cases in the healthcare sector were studied. The study demonstrates that FfC functions in a complex context with many external factors influencing the outcome and realization. Nevertheless, the approach has proven consistently able to gather and engage stakeholders and direct their discussion in a productive way.

It is obvious that FfC’s basic structure, methodology, and tools facilitate collaboration both between the cross-disciplinary participants themselves and between the commissioning organizations and the architects. The setup of activities and tools boosts engagement and directs participant attention towards relevant issues. The case studies demonstrate that the framework itself does not generate innovation, but could be used to emphasize that innovation is needed or as a tool to develop innovative ideas. The framework is instead a structure to be filled with a range of content concerning desired qualities. The quality of the outcome depends on the judgment and initiative of the facilitator together with external factors such as timing and policies. Seen in this light, FfC enables the desired discussion.

Broad representativity is emphasized as a factor increasing the credibility of the outcome. To achieve broad representativity, FfC workshop groups tend to be larger than in traditional workplace development meetings, i.e., 12–35 participants in the studied cases. Although broad representativity is sometimes advantageous for larger group discussions, one can question (and some informants do) the need for most stakeholders to follow the whole process, as in the studied framework. A balance must be struck between the larger extended, inclusive group and the smaller, focused group.

The case study indicates that smaller groups are better able to develop ownership of the project among participants.

Healthcare reconstruction planning and development projects are often characterized by a fragmented process, because the sector is politically governed. Developments in related activities, internal processes, and changes of leading actors can all affect the progress of construction projects. A strong sense of ownership within the organization decreases the risks associated with discontinuity in the abovementioned, and other, factors. Nevertheless, a project that is making insufficient progress can wear out its participants, especially users who work with the process in addition to their primary tasks as healthcare professionals.

The healthcare sector requires planning tools that can handle constantly changing organizations; in this regard, a design-driven methodology has the potential to work simultaneously with solutions and requirements.

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List of illustrations

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