

# **SUPPORTING VALUE GENERATION IN CHILDREN'S HOSPITAL DESIGN THROUGH PARTICIPATORY APPROACHES**

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## **ABSTRACT**

This paper presents results of an ongoing PhD research, which aims to develop guidelines to help designers incorporate children's perspectives when designing children's hospitals. The paper discusses children's hospital design through participatory approaches and links it to the lean design literature, proposing new insights into value generation. The research method is a case study, in which the process of identifying children's preferences and considering these into the different stages of design is described. Data was collected through 16 semi-structured interviews. The interviews were recorded, transcribed and along with other documents analysed using content analysis. Results indicate that participation in design provides children with opportunities for voicing their view and ensures their requirements are available in all phases of the process. Such participation enables requirements not to be lost when progressively transformed into design solutions. The paper also discusses how realistic is it to consult with children, and which approaches may help design decision making for future children's hospital design.

## **KEY WORDS**

Design process, Participatory design, Value generation.

## **INTRODUCTION**

It is becoming increasingly difficult to ignore the impact of the built environment on healthcare within the hospital spaces (e.g. Proshansky et al., 1976; Lawson, 2001; and Codinhoto et al., 2008). Patient's wellbeing, from physical to emotional and social needs, is the prominent parts of any medical consideration. In order to provide environments in which a patient is supported and encouraged to total wellbeing, all users (patients and staff) should have genuine participation in its planning and design.

Understanding children and young people's perspectives and needs as the users of the healthcare facilities can be used to strengthen the capacity of policymakers, designers, and healthcare managements to deliver supportive environments (Bishop, 2008). Also, the decisions based on assumptions made by adults about the needs of children and young people can be minimised, which in turn can increase the likelihood of designing supportive hospital environments, from the children and young people's perspectives (Bishop, 2008). Such participation should involve

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different groups of patients, such as: young children and teenagers, short-term and long-term patients, as well as other special groups such as chronically ill children who have to return to the hospital repeatedly (Eriksen, 2000).

In light of value generation, it is essential to understand what children needs and preferences are, and respond with design solutions which meet those preferences in the best possible manner. As such, participatory design approaches are suggested as the means to enable better identification of needs, supporting value generation. However, there are challenges in implementing participatory approaches in building design, especially in complex environments such as hospitals, and with delicate clients such as children.

The aim of this paper is to explore the process of identifying children's preferences in Royal Alexandra Children's Hospital in Brighton, UK, and establish how these preferences have been considered during the design process.

In the first section of the paper the children's hospital design through participatory approaches is described, and linked to the lean construction literature, highlighting new insights into value generation. This is then followed by a discussion on the process, benefits and challenges of participatory design with children. The following section presents the research method adopted and, finally, the preliminary results of the case study are discussed.

## **PARTICIPATORY DESIGN AND VALUE GENERATION**

Requirements capture and brief formulation are important parts at the front end of any construction project. According to the value generation view, value is created through the fulfilment of user's needs and requirements (Koskela, 2000). Clearly, the involvement of users is essential to allow the appropriate identification of their often evolving, needs and requirements during the design process.

There are different approaches to value generation as proposed in a number of studies, such as customer value (Woodruff, 1997) and client requirements management (Kamara et al., 2000). Client requirements are defined as needs, wishes and expectations of the client by Kamara et al (2000). The concept of customer (user) value has a strong relationship with customer satisfaction. Therefore, the satisfaction is an important indicator to understand the perceived value from the customer/user perspective (Woodruff, 1997).

Wilson et al (1997) defines user involvement as 'focus on users' and Heinbokel et al. (1996) defines it as 'participation of users'. Participatory design refers to a design process where different stakeholders are involved in the design and their tasks start from the early stages of the design and continue all through the process (Gould and Lewis 1985; Blomberg and Henderson 1990; Cherry and Macredie 1999; Maguire 2001; Gulliksen et al. 2003) Requirements can be elicited by the designers through a number of approaches, for instance workshops and discussion of design issues with users (Baeka and Lee, 2008).

Druin (1998) apud Baek and Lee (2008), has explored participatory design with children and she claimed that by applying participatory design methods, it is possible to identify new design possibilities that might not otherwise have been considered.

There are many different levels of children's participation and these might be more or less appropriate as the project evolves. Hart's (1992) ladder of children's participation is one of the most well known models. As shown in Figure 1, it provides

a typology of both non-participation and participation that may be contained in projects with children.

However, the image of a ladder was often interpreted as a hierarchy of participation- 'lower levels' of participation are not as good as 'higher levels' (CIDA, 2007). The problem of such judgment could be discouraging local partners from exploring participation if they cannot reach the top of the ladder (CIDA, 2007).

For the purpose of this study, user involvement is defined as a development process incorporating ideas and feedback acquired directly from end users (in this case, children and young people) at various stages of the process (Nousiainen, 2008).

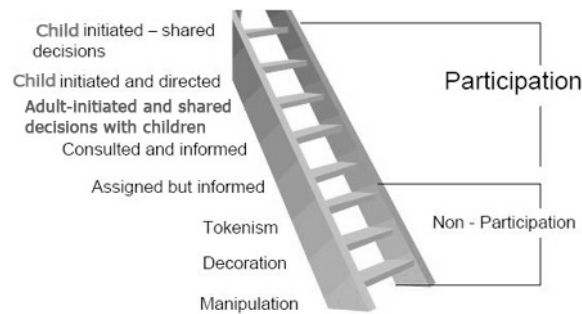


Figure 1. Roger Hart's "Ladder for Participation,"

## **BENEFITS OF PARTICIPATORY DESIGN**

Important features of participatory design that were highlighted in the literature are: 1) Quality enhancement, and 2) empowering the users. The following sections focus on these features in more detail.

### **QUALITY ENHANCEMENT**

Improving the physical environmental quality from the user's perspective is related to the type of care provided. For example the perspective of children and young people in residential care is different from those in mental health services (Dowling 1997).

Ulrich's (1991) theory has defined two major sources of patient stress: their illness and its repercussions, and the nature of the physical environment. Furthermore, he discussed that patient stress has a variety of negative psychological, physiological and behavioral impacts on patient wellness (Ulrich 1991, 2001). The core of Ulrich's argument is supporting patient wellness through minimising environmental stress. User satisfaction and acceptance of the environment can be encouraged through improved quality for its part.

### **EMPOWERMENT**

There is a large volume of published studies describing the role of participatory design on the empowerment of users, as one cornerstone of the involvement of users (e.g. Gould and Lewis 1985; Gulliksen et al. 2003; Correia and Yusop, 2008). According to Correia and Yusop, (2008:214) participatory design is 'user's democratic participation and empowerment at its core'.

With regard to the empowerment of users, the collaborative relationship between the users and designers plays an essential role (Gould and Lewis 1985; Gulliksen et al. 2003). As a major principle in participatory design, all goals and designs are not pre-assumed either by users or designers and are negotiated together (Blomberg & Henderson 1990). Promoting democracy through empowerment of users has large effects on their social life, which can lead to sustaining a healthy society. Allowing the users to have an active role in decision making gives them a sense of ownership (Cherry and Macredie 1999).

## PROCESS OF CHILDREN INVOLVEMENT IN DESIGN

Different steps of the process are (Blackman, 2003):

**Project identification:** this generally focuses on “what community/users needs are and whom they affect” (Stephenson et al, 2004:30). There are different tools for participatory activities for children at this stage, such as: Transect walks around the building, Mapping their lives, Child-to-child interviews, Daily activities chart, Focus groups, Ranking to show priorities (Stephenson et al, 2004).

**Project design:** the next step of the project cycle is to identify how to address the needs that have been elicited earlier. Therefore, it is essential to collect further information about the problem identified by or with the children, and its context (Stephenson et al, 2004). The project design stage consists of several parts. It is necessary to identify at which part and how children should be involved. At this stage of the process it might be helpful to carefully select particular groups of children to participate. Data collection tools can include drawing and mapping, traditional interviews and questionnaires, photograph and video and so on. After collection of all data, the next step in which it will involve the children is the design stage.

**Implementation and evaluation:** children should be involved in the implementation and evaluation stage of the project to ensure its views were appropriately considered.

**Celebrating and documenting lessons learned:** includes the provision of documents describing what has been learned from projects. This could be done by encouraging children to document their own experiences and learning.

## PRACTICAL BARRIERS TO INVOLVE CHILDREN

There are a number of barriers in involving children in hospital design. These can be summarised as:

**Lack of time:** consultation with children takes more time than with adults, as they tend to resist to abrupt questionings (Alderson, 2008). As projects have deadlines, one should adopt appropriate tactics to overcome this barrier.

**Lack of confidence:** Gaining insight into the children’s perspective and views might involve risks and possible mistakes, generating lack of confidence. It is suggested that parents and children are willing to work with professionals who have sincere manner and intentions, than with slick communication skills (Alderson, 2008).

**Communication:** As indicated in many studies (e.g. Cross and Clayburn Cross, 1995; Bucciarelli, 1996; Badke-Schaub et al., 2007; Alderson, 2008), one of the major problems during design in any multi disciplinary team is communication. One requires adequate skills to establish communication with children of different ages.

**Mass confusion:** The project may face the complexity and mass confusion from the number of choices in the configuration process. This would create a barrier in the positive flow of process (Piller1 et al, 2003).

**Suitability/Maintenance:** As children view change, it is very important to carry on engaging with them continually. Graham (2004) apud Magee (2005) expresses his view, as “The important thing is that the child’s perspective is sustained and maintained.”

This section reviewed the literature concerning the complexities created by user’s engagement. Next section will elaborate on research method, which has been used for this study.

## **RESEARCH METHOD**

This study is based on the interpretative school of thought. “The aim of such research is to investigate the meaning of social phenomena as experienced by the people themselves.” (Malterud, 2001, p. 398) According to Prout and James (1990, p.5), qualitative methods can be used to have “a more direct voice and participation in the production of sociological data than is usually possible through experimental or survey styles of research”.

Given the nature of the research problem, the case study was considered the most appropriate strategy for this research. Case study is defined by Yin (1994:13) as “an empirical inquiry that investigates a contemporary phenomenon within its real-life context”. He discusses the importance of using case study when the researcher deliberately wants to address the contextual conditions believing that they might be highly pertinent to the phenomenon of study.

As part of the PhD research, two case studies have been developed; Royal Alexandra Children’s Hospital and Royal Manchester children’s hospital. This paper describes the preliminarily findings from one case study only, the Royal Alexandra children’s hospital in Brighton, UK. No patient data has been used at all – the researcher only asked about how patient perceptions were gathered and used in the project, the subject of analysis were not the patient perceptions per se.

Data have been collected through (a) 16 semi-structured interviews, including: designers, planners, NHS staff and the project clients (Kajima, Brighton and Sussex University Hospitals NHS Trust); (b) document analysis, including corporate publications, public web site, electronic mail and presentation material. Interviews were recorded, transcribed and analysed for theme and content.

The data analysis was done through content analysis, using NVivo software. As Krippendorff (1969, p.103) states, content analysis includes “the use of a replicable and valid method for making specific inferences from text to other states or properties of its source”. Leedy and Ormrod (2001: p.155) further define this method as “a detailed and systematic examination of the contents of a particular body of materials for the purpose of identifying patterns, themes, or biases”.

## **PRELIMINARY FINDINGS: THE ROYAL ALEXANDRA CHILDREN’S HOSPITAL**

After a major redevelopment, the Royal Alexandra Children’s Hospital in Brighton reopened in 2007. The new Children’s Hospital is one of only seven dedicated paediatric hospitals in the UK. The new development was able to transform the old hospital to a more spacious structure with more than three times the size of the

original building it replaced and doubled number of beds. The project has won 2008's Prime Minister's Better Public Building Award. The redevelopment plan was aimed to provide the best possible environment in which children could receive treatment and recuperate and creating a welcoming environment. The two key elements in the success of the development are (NHS Trust, 2007): recognising the needs of individuals, most notably young people and their families and high quality services for families and children through effective engagement with users.

This hospital has been selected as a case study for this research due to the fact that the design has taken place with a thorough consultation process, which involved a number of staff, patients and their families, aiming to balance the needs of users and providers of services, in a complex environment.

### PROCESS OF Children INVOLVEMENT

Due to the need of using appropriate methods to identify children and young people's views and perspectives and address them, the team decided to use different methods at various stages. These included: workshops, questionnaires, board meetings, and competition. Table.1 shows, for each stage of children's involvement, which methods had been used, who had been involved as well as their level of involvement.

Table 1: participatory design process at the Royal Alexandra Children's Hospital

		<b>Level of involvement</b>	<b>Methods</b>	<b>People who had been involved</b>
<b>Project identification</b>		Consultation	Questionnaire Modelling Workshops	Former and Current patients, Community representatives, Clinical staff, Design team, Volunteers
<b>Project design</b>	<b>Ambient environment</b>	Consultation	Information fed from previous step	Children board's members Clinical staff Design team Chief executive
	<b>Architecture feature</b>	Consultation	Information fed from previous step	
	<b>Interior design feature</b>	Collaboration & partnership/ Consultation	Board meeting Competition	
<b>Implementation and evaluation</b>		Consultation	Board meeting	Children board's members, Clinical staff, Design team, Chief executive
<b>Celebrating and documenting lessons learned</b>		Collaboration and partnership	DVD making	Children board members, Terrier TV (produce), representative of clinical staff and design team

The first stage, project identification, involved a wide group of former patients, current patients, staff, community representatives, clinical staff, the design team and volunteers. It was performed in December 2003. An actor's company had been hired to engage all in what the new hospital should be like. The resulting information was then fed into the design team brief. Based on Hart's ladder of participation these activities can be grouped as "Consulted and Informed". The children had volunteered and they were participating with the written approval of their parents to understand well what they were asked to do. Their opinions were taken on board and they had a

voice on the project.

In the second stage, project design, a children and young people's board was set up. This stage of involvement included consultation and collaboration. The interior design team suggested different options, and one was selected through board discussions. The other level of involvement at this stage was collaboration, such as designing the curtains around the beds. A competition was set up between members of the children's board, and the team selected the best idea. Based on the experience from their board meetings that were run by children themselves, the children felt ownership – “this is our group”. This can be labelled as the ‘Child Initiated-shared Decision’ of Hart's participation ladder – as an activity initiated by children but where responsibility and decision making is shared with adults.

The third stage, implementation and evaluation, was based on consultation through the children's board. There was a standard agenda for their meetings which had standard items such as minutes of previous meeting, matters arising, issues raised by the children and young people, PFI Project Director's report, and other issues.

The last stage, celebrating and documenting lessons learned, was based on collaboration with the children. They were involved in recording a DVD about both process and the environment of the hospital.

The next section will present the issues and challenges identified during the participatory design.

## **ISSUES AND CHALLENGES**

A main principle of the design process of the Royal Alexandra Children's Hospital was to make the planning and design process transparent to everyone and to be very clear about the extent of children's involvement in the process. The children's participation in this project corresponds to one of the five types of participation depicted on the top five rungs of the Ladder. The case study project team tried to involve children and young people at the highest level of their ability. The project team carefully selected age-appropriate methodologies through the use of a diverse range of media, verbal, written and visual aids in order for children to participate at their level of ability.

Despite all the success of the project, there is still need for improvement to the design process based on information gathered from the interviews and documents. With regards to communications, the project team appointed a number of trained staff, understood how to communicate with children, while maintaining respect. The interviewees suggested that the process could have benefited from a facilitator who has all the skills and isn't stranger for children and carries out the meetings with children on a regular basis. The children always had guidelines for what was possible and what wasn't. The architect, project leaders and head of paediatric nursing would provide this information.

Due to a number of technical issues in the hospital design, such as cross infection, the team decided to involve the children at the stage of pre- design phase and the interior design stages. There were difficulties in getting all the children on the board activities in the same time due to school pressures, family commitments on weekend and other common issues during the consultation period.

The children and young peoples board comprised of 10 members – this was set as a small group in order to prevent the ‘mass confusion’ problem. There was an aim to

include a diverse range of children of different ages, races and minority groups. However, there is still need for a more comprehensive participatory approach, as described in the interviews, with wider opinions from children. There were only 10 children involved and that is not a proper representation of the whole communities affected by the hospital.

“Strategies for sustainability” should be included in the methodology of the project. The project team tried to keep the board of children and young people alive but as some of the members are now older than 18, the board doesn’t have enough members. On the other hand, as the construction of the building has been finished there is no motivation for new children to join the board, as a way to keep improving the environment continually. Therefore, motivation at this stage is an issue, which would be better to think about it at earlier stages of involvement. A comprehensive plan is required in this case to develop a clear method to follow up on involvement of children to keep the environment of hospital current.

Based on the case study it is possible to say that Hart’s Ladder is a useful method for participatory design through identifying some fundamental principles of participation. This typology has for example proved to be a good tool to discover quality differences in participatory activities, as depending on how one has implemented the model could rank on quite different rungs on the ladder. However, detailed level ladder describing tools are needed for a comprehensive data analysis. At this stage of analysis one can suggest the usability of the Hart’s model in the participatory design. However its reliability on user participatory principles can be more elaborated and investigated in further researches (data).

## **CONCLUSION**

This paper has investigated the participatory design approach as a solution for meeting user’s needs. The findings suggest that consultation with children needs to be planned very carefully prior to the design. This investigation however, offered new insights to the design process. It has been found that involving children at the early stages of the design process, before the building takes shape could be a good solution to capture information for brief formulation. Moreover, the stage of their involvement is inevitable part of consideration. For example, involving them right at the start of interior design process can be a better way to do it rather than involving them in the middle stages of the process as it may take much more time. It was shown that the level and methods of involvement (as expressed by Hart, 1992) are playing an essential role in participatory design. The use of different methods can help to facilitate responses from children and young people of all ages. The results of this study indicate that due to the technical issues of hospital design the level of involvement should be investigated and decided carefully for different stages. It can be started from consultation in early stages and continued with collaboration in some area such as artwork design. Participatory design approach is directly related to value generation; through exploration of user’s preferences, it was possible to recognize it as a solution for meeting user’s needs in the central importance of enhancing the customer’s satisfaction to support value generation.

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