CARDBOARD HOSPITAL – PROTOTYPING PATIENT-CENTRIC ENVIRONMENTS AND SERVICES

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ABSTRACT

Cardboard hospital is a co-design method and prototyping environment for creating patient-centric hospital spaces and services. The method development was situated within a building project of a hospital wing in which the aim was to find new ways for including patients in the design process. The method was developed through combining participatory design methodology with the professional capabilities of a set designer. Cardboard hospital provides an environment that supports participatory design processes and guides participants towards participation as an artistic practice. The paper is situated in the theoretical framework of pragmatic aesthetics and builds on the notion of an aesthetic experience. The results encourage towards a wider utilization of set design capabilities and aesthetics in co-design environments.

INTRODUCTION

In this paper we describe a method developed in the intersection of healthcare, architecture and service design. The case in question was about designing new, patient-centered hospital infrastructure and the services and experiences it should support. The result, 'Cardboard Hospital' is a prototyping environment and a co-design method that was developed in order to address the question of embodiment in building processes. It provides a way to explore different meanings that arise from spatial experiencing through an immersive and tangible set up of real-sized prototyping elements. In the participatory workshops the needs and experiences of the patients were explored and formulated into initial concepts of future hospital spaces. The result is an inspirational method that can be used in a wider methodological framework of research-based design process, including contextual inquiry, participatory design, product or service design and prototyping activities (Leinonen, 2008; Leinonen 2010).

The method was created for use in a real-life building process of a new hospital wing situated in a large hospital in mid-Finland. In three prototyping workshops the participants constructed hospital spaces using body-scale blocks and other materials. At the same time they reflected on the service aspects related to healthcare from a patient-centric point of view. This paper describes first the theoretical background detailing recent changes in healthcare and earlier work in the field of participatory prototyping, then details the design process and finally describes the prototyping workshops. The paper concludes with a reflection of the methodological insights and presents directions for further development.
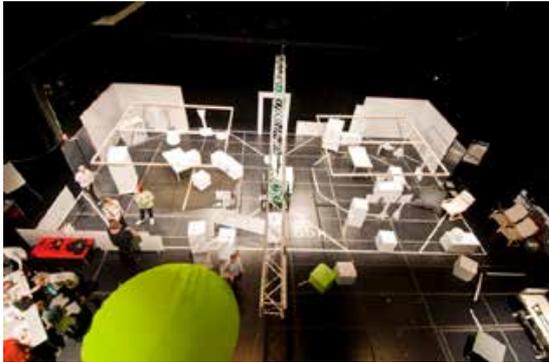
Figure 1: The cardboard hospital set-up

DESIGNING FOR PATIENT-CENTRIC CARE

Patients are an underutilized resource in the operation and development of hospitals. When developing healthcare systems the voice of the patient is often limited to rigid feedback systems or public hearings. This is partly due to the nature of the clinical provider-patient relationship, which is seen as paternalistic and characterized by rigid power structures (Teutsch, 2003). This view places the hospital staff in the role of experts and in turn assigns a passive role for the patients. Considering the historical development of hospitals to treat acute conditions, such as infectious diseases, emergencies or physical injuries where the patient expects to be treated efficiently and then quickly let out, this approach has been considered sufficient. The results of this kind of patient-provider relationship can be witnessed in western hospitals built in the latter part of the 20th century and they reflect the build-up of hierarchical hospital organizations. Hospitals are complex socio-material constructions that contain an emphasis on historically embedded work aesthetics and focus on functional aspects of hospital operations (Kronström-Johansson, 2008).

Research points out that introducing non-functional, human elements into the hospital environment such as art, natural light and elements of nature and social spaces has been proven to increase patient well-being (Ulrich et al., 2004). However, the non-participation of patients in the design of healthcare environment has created environments that are more focused on aspects of work than what constitutes a pleasant environment for the patient. Hospital aesthetics remind us of images of sterility, functionality and impersonality. Patients have described hospital as gloomy, frightening or distancing (e.g. Saarikangas, 1996). Instead of considering the service paths of the patients, the spatial layout of the hospital campus situates units according to their organizational hierarchy, often forcing patients to walk great distances within the hospital corridors.

Patient-centric care is an approach that aims to address issues caused by the provider-focus of healthcare institutions. It aims to improve the quality of care through increased focus on patients and their experiences. In general, patient-centered care is seen as a move from a paternalistic, provider-focus to one that involves the patient more in the planning and execution of their care (Robinson et al., 2008). It also provides an alternative to traditional ways of collecting quality assurance, such as feedback forms or audits. Issues addressed through a patient-centric approach include patient preferences and values, emotional support, physical comfort, information and communication, coordination of care and the involvement of family and friends (Gerteis & Daley, 1993). The involvement of patients (and their families) in the hospital processes takes place on four levels. First, they should be able to participate in the organization of care and inform the staff on what should be developed. On the second level, participation should extend to the improvement of the clinical system. This includes planning, implementing and evaluating change. On the third level, patients should be able to participate in processes that aim at hospital-level changes such as building processes. Fourth level addresses participation in local policy making related to healthcare. (Shaller, 2007)

Patient-centered care guidelines advise the participation to be in the form of full membership in development teams, hospital committees and special councils, but detailed descriptions of participation methods are not addressed. In addition, committee participation might be an effective way of influencing decision-making processes in hospitals, but it does not fully utilize the capabilities of patients or hospital staff. Discussions can address some of the areas related to patient experience, but they do not necessarily translate well to new design ideas. They also do not fully address the embodied experiences that take place within the current and future hospitals, which can be seen as essential when designing for patient-centric hospital environments. While many hospitals are placing patient-centric planning of their infrastructure and services in the core of activities, they often lack the skills or tools to put this vision in practice (Robinson et al., 2008). In the next chapter we will review research on physical prototyping as an approach for stakeholder participation.

PROTOTYPING AS EMBODIED ACTIVITY

Recent studies suggest that physical sensations play a far larger role in our thinking processes than simply providing feedback or stimulus. We are engaged in a continuous cycle of reconciling ourselves with the environment as we experience it through all of our senses. Johnson (2007) points out to the inseparability of mind and body in the meaning-giving process. Physically, our senses are continuously connected to our nervous system and its ability to create order and priority, in other words to plan and design. Our thinking, both on the practical and abstract levels, derives from the interaction of our mind-bodies with the surrounding environment. In short, we give meaning to things through interaction with the world. Focusing on our inner thinking processes or a single sense can lead to an inferior result. For example, children are proven to

learn equations faster and remember knowledge for longer if they use gestures (Goldin-Meadow, 2010). The connection between our bodily sensations and thinking processes is evident in many historical design practices. They situate design within studios in which design activities are physical and knowledge is embedded in physical artefacts such prototypes or other kinds of inspirational material (Binder, 2007). Their reflective conversations with the materials (Schön, 1992) are especially evident in the practice of prototyping.

Physical prototyping have been used in participatory design to support non-designers abilities for expressing personal experiences in various projects. Notable of these, and in relation to this project, are the UTOPIA and Florence projects conducted in the 1980's (Ehn, 1993). In these projects, much attention was paid to supporting the ability of participants to express themselves using their own language and their own terminology, and through design-by-doing. Techniques such as paper mock-ups or 'cardboard computers'[1] were developed in order to create a platform for knowledge, experiences and meanings that might be difficult to articulate in a discussion. Whereas earlier dialogue-based methods forced the participants to use the language of experts, reinforcing the already existing values embedded in that language, these projects connected the terminology to the practices that were associated with it. By refocusing from 'saying' to 'doing', the emphasis shifted from verbalised and 'surface' knowledge towards tacit knowledge (Polanyi, 1966), which is embedded in our ways of acting in the world.

Physical prototyping has become a standard tool in the method pack of participatory design and co-design. Most of the early participatory design projects were situated in the work context in which the idea was to involve people doing the work in the design of their work tools and environments. In this case, the context is approached from the perspective of patients while focusing on the interplay of hospital work processes and patients' physical and mental needs.

Furthermore, we see the role of physical activities in design processes go beyond the focus on 'doing'. Here we refer to the work of John Dewey (1934) and his notion of artistic practice as a way of expressing meaning. Following his view, art is seen as a way of conveying meanings that are embodied and emotional and artifacts created by artists are a language, albeit a different one to spoken or written one. They are able to communicate experiential meanings through interaction with their audience. However, meanings do not emerge from every object, only objects that are aesthetic and artistic, i.e. when the parts form a whole that is harmonious enough in their composition to bring out an

experience. Even though these meanings might sometimes be hard to translate into words, this type of embodied meaning is no less a meaning than an articulated one. Rylander (2011) relates this to the work of designers as 'language innovators' whose aim is to create objects that generate such experiences. What if the notion of aesthetic experiences were extended to refer to the experiences of participants in co-design processes? By doing so, one would have to consider an aesthetic dimension in addition to the pragmatic and functional aspects of co-design. In order for this to take place, the aesthetics of the co-design environment and the materials used should be given sufficient attention.

Agger Eriksen (2012) suggests that materials used in co-design should not be handled as only parts of a method, such as tools, sketches or prototypes but rather as central agents that affect the results of the collaboration. The assemblages of materials form a complex and continuously shifting entity, which has an effect in the dynamics of the co-design process. Building on Goffman's (1959) theatre metaphor, she suggests that co-design should be seen as staging performances. Also the environments guide the activities that take place in them depending on where they are situated and what meanings they do or do not embody. Marc Augé (1995) uses the term "non-place" to describe temporary, transience places that cannot be defined as relational, historical and concerned with identity. These are environments, such as unplanned wastelands, airports or building sites, that do not prescribe meanings or social relations, but can nevertheless become embedded with them, turning from 'non-spaces' into 'spaces'. He describes an "uncertain charm" in the unfinished, identity-less places and sees them as heirs to ancient adventures, generating a feeling of 'continuing adventure' and where things can happen.

TOWARDS A METHOD

The context for the project was a new hospital wing that is planned for completion in the year 2016. More specifically, the project scope addresses the designs of a patient ward and a polyclinic[2]. The brief for the project was to explore ways in which patient needs could be more fully taken into account in the building design process. In fact, the aim of the hospital was to place patients in the centre of the activities done in the hospital. We were asked to support them by creating a method through which patient participation and multidisciplinary collaboration could produce results that can be utilized in the building planning. Our design team consisted of a designer with background in participatory design and co-design methods and a designer with competencies in both set design and interior design. For us, this case gave an opportunity to explore the intersection between co-design methods and set design in a real-world case. Our aim was to study how the aesthetic and spatial understanding derived

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[1] The relation between the title of this paper and Ehn & Kyng's "Cardboard Computers: Mocking-it-up or Hands-on the Future" is not coincidental. At the time cardboard and paper were used as prototyping material for IT systems and interface design.

[2] We also organized a workshop for the design of a new operating theatre, which is not included in this paper

from the field of theatre and film could be utilized to create an experiential workshop environment.

The first meetings were held when the architectural planning process of the building was still in the early phases. This allowed for the inclusion of co-design workshops in the start of the design process before any specific plans for the building were created. The first decisions in the project related to the planning of a series of workshops and adding of a clause in the contract that required the architects to participate in the workshops and to utilize the results in their planning. In this way, the workshops allowed for the architects to learn of the needs of patients before they started to create the first drafts of the building. These aspects laid the framing criteria for the project and guided the design of the participatory method and the co-design environment.

Traditionally, participation in the building project is organized as a series of stakeholder meetings during which architectural plans are discussed and commented on. However, most patients and staff are not experienced or educated in reading blueprints as they require specific professional understanding. Thus commenting is easily reduced to addressing individual elements in the design, not the experiences these elements will create as a composition. These types of hearings also force the stakeholders to use language and terminology they are not familiar with, further reducing their possibilities for influencing the design outcomes.

We wanted to address these issues by creating a setting in which the participants can share past experiences and create ideas for desired hospital spaces without being forced to use foreign terminology or unfamiliar representations. This setting would allow for the reflection of real experiences and quick experimentations of spatial arrangements. Moreover, we wanted to place emphasis on the aesthetics of the workshop setting in order to make the workshops more experiential. The aim was to create a learning environment for engaging in a design practice that is pragmatic as well as artistic in its nature.
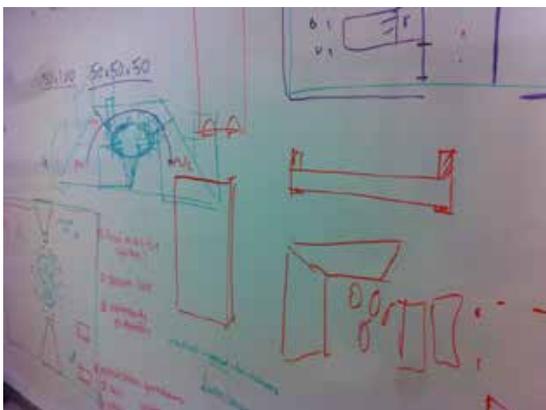

Figure 2: First drafts of the set-up

Early on it was decided that we were going to work with real-size elements. The reasoning behind this decision came from the context of patient experiences in a hospital. Even though hospital interactions can also be modelled with miniature scale models, they do not engage the whole body and were considered inadequate when dealing with holistic patient experiences in hospital spaces. A prototyping environment that engages all senses allows for the participants to be present as subjects within the environment instead of trying to project their experiences on miniature characters.
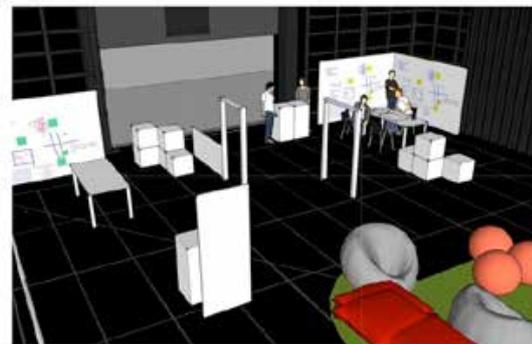

Figure 3: A 3D rendering

Workshop planning was done through meetings during which participatory methods were discussed and reflected on the set design. The main aim of these sessions was to iteratively create a vision that would combine the methods with set design. The discussions did not center on methodological issues alone. Inspiration was drawn widely from other areas such as trends in hospital design and arts[3]. After the initial meeting the workshop plans were further worked on and discussed in subsequent meetings, first as 3D-visualizations of the setting and later on as a miniature scale model. These functioned as communication devices between the team members and towards the hospital staff, but also assisted when decisions were made on the final forms of props, the layout of the space and number of items needed in the workshop. Finally, a few weeks before the workshops the set was constructed and tested with other researchers from the university.

[3] Of particular inspiration for the spatial setup was the movie "Dogville" directed by Lars von Trier. The stripped film set proved to us that the environment does not have to be strictly representational in order to allow for experiences

Figure 4: A scale model

DRAWING FROM SET DESIGN

Unlike when designing for scripted film or theatre, in the cardboard hospital it would be impossible to exactly predict the actions that would take place on the set. The aim was to create an environment for exploration so it needed to support practically anything that might come up. The solution was to provide an open-ended environment where meanings could be given and the set modified concurrently. This guided set design and set some restrictions for the materials.

The set for the cardboard hospital was built at the black box theatre situated at the university. Much attention was paid in choosing a place for the workshops, since the place needed to have not only the basic practical elements, but also an appropriate character for the workshops. The idea was to create a setting that would support exploratory and individual ways of acting and doing things while being an aesthetically inspiring environment for creative activity.

As a flexible theatre space with excellent technical support the black box was perfect for the workshops. The neutral coloured surroundings, flat and open floor and the gridding around the whole space allowed the set and the workplaces to be arranged as desired. The acoustics at the black box are typically designed to be excellent, so that the stage can be located anywhere. This provided the workshops a great environment in which even large groups could discuss, experiment and build things at the same time without causing excessively distracting noises. The lightning could be built and adjusted for the needs of every workshop individually. This also provided good conditions for the video and photographic documentation of the workshops[4].

The black box as a space has a very intimate feel due to its acoustics and twilit, black surroundings. This was considered an important factor when choosing a place

for the prototyping. We considered this type of setting as ideal for sharing thoughts and ideas of intimate experiences. The environment needed to have a private and warm feel, while at the same time allowing for practical work.

One challenge was what kinds of materials we wanted to use in the workshop. The aim was to design a set of human-size tools and props, which could be flexibly used to build the surroundings needed. In smaller scale prototyping and scale models the material consumption, budget and things like material resolution are easier to handle, but since the prototype was built in real size and used in a relation to real actions it needed to be durable, practical and easy to handle yet creative and well finished. For fast and easy prototyping by people with very different kinds of physical capabilities things needed to be lightweight enough to be easily movable. To be able to actually try things out, the structure also had to be strong enough to support body weight in case of e.g. sitting or standing on. Total expenses and the way of recycling the elements after the prototyping were also under consideration.

Rigid cardboard called Re-board was chosen to be the main material for the structures. Even the biggest elements like doorframes and big cubes could be easily moved by one person because of its lightweight yet firm quality. Since the built things would be given new meanings during the prototyping activity, there needed to be an easy way to point out what is being made. To enable writing and drawing straight onto the material the cardboard was laminated with a white glossy surface. In this way all the surfaces could be drawn and written on with a whiteboard marker and easily wiped for re-naming or re-using. The material was completely recyclable, so all the elements could eventually be recycled as cardboard waste5.

[4] The documentation video for the cardboard hospital can be accessed at https://vimeo.com/juhak/cardboardhospital

[5] Most of the materials were stored and were later on used for smaller scale prototyping workshops. At the time of writing, six months after the workshops, they are still in a workable condition.

Figure 5: Examples of props used

There were 7 types of cardboard elements: doors, boxes of two sizes, walls, screens, signs and small screen-like props[6]. All the parts were designed to respond the measurements of everyday environments so that the essential spaces, furniture, and props could be marked with more or less real-size counterpart. For more spatial feel there were six movable cardboard doorframes built to mark the entering in and out from spaces. Besides the cardboard, the toolkit had white tape and rope to attach things together or mark larger areas by lining the floor. For adding colour, texture or more organic shapes there were some coloured quilts, pillows, fabrics and beanbag-furniture available. For making and modifying tools there was a tool-table with cutters, markers, iron wire, extra re-board and few other materials. A guiding principle in planning the props was that we should ourselves be able to come up with at least five different meanings for each piece.
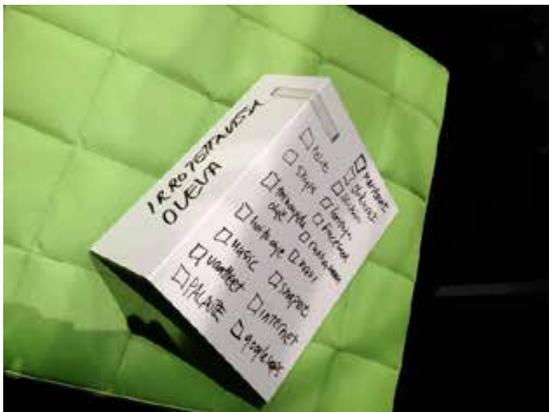

Figure 6: Screen-like prop

The main elements were tested before the final order as prototype-versions. According to these tests the bigger cube shrank to 100cm height (from 120cm) for easier handling and hand-sized holes were added to both sides. Doorframes and their supports were widened for stronger structure and supporters for the screen props were made bigger to balance them better when standing. In addition four bigger re-board walls were built into the corners of the prototyping space. These corners formed working areas with tables and seats while the walls provided space to write and draw on. When moving from talking to actual prototyping the corners with the notes could be used as a part of the spatial models.

As a whole the set design embodied the idea of moving from saying towards doing. From our experience workshops easily resort to verbal communication and participants are often hesitant when it comes to physical activity. In this setting, we created places for discussing

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[6] In addition to these, a couple of specialist healthcare devices were modelled for the operating theatre workshop

from where it is easy to move towards trying out and evaluating ideas on the spot. In this way, the set design supports and inspires both envisioning activities in future spaces and building the setup to match these activities. The set design becomes a way of communicating and inspiring, showing and telling, and sharing stories and ideas in a creative way.
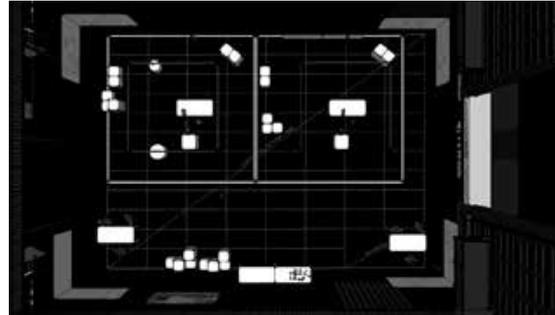

Figure 7: The set-up from above

4. WORKSHOP STRUCTURE

The cardboard hospital was built at during a two-week period, during which it hosted three workshops. Two patient-centered workshops (patient ward and polyclinic) roughly followed the following structure.

Pre-workshop sensitizing task

We received tens of photos embedded with rich meanings. The contributions included images of summer porches, forest views, cluttererd TV corners, New York traffic signs and playful statues, to mention a few. The photos placed emphasis on creating hospital spaces that allow for everyday routines, set up shared rules for behaviour, convey human emotions such as humor and utilize color and composition to create aesthetic environments.

The participants had been given a task a month before the workshops in order to sensitize them for the task and to collect material to be used in the workshops. They were asked to take photographs of environments that were important for them, both within and outside hospitals. In addition, they were asked to answer a few questions related to their choices. The resulting photos and descriptions were printed as a deck of cards that was used in the workshop. In this way the participants had already thought about how their surroundings affect their lives and we were able to tie their experiences in a tangible form into the workshops.

Entering the workshop

The entrance to the space was through a cellar-like foyer and a small door, after which the space opened up to over ten meters high. We wanted to use this quality to create an experiential first impression and to frame the design challenge. Since an open, empty space might be hard to start with, the doors were leading to 'opening sets' designed to be something to begin with. Upon entering, one first saw a composition framed by some of

the props that resembled some of the forms found in hospitals such as corridors or a lobby. This hinted at ideas of what you actually could do with the pieces. The participants were also invited to explore the space and try moving, lifting or writing on the materials themselves before the workshop commenced.

As facilitators, we did not want to present any rigid proposals to start with. However, we did want to stage the workshop space so that just through experiencing it, one could get a feel of the general type of space that we were designing for. So, for the patient ward workshop we divided the space into two square-like areas along the longitudinal side to resemble a space for 'being in' and when organizing for the polyclinic we created two long sides to signify 'walking through' a process. As said, these were not clear-cut propositions but rather loose assemblages constructed with the material props in the space that could be easily changed and modified.

Introduction to workshop activities

The workshop started with an introduction to the case, aims, working methods and timetable. The workshop is framed as early study into the patient needs and the methods are explained sufficiently for the participants to understand what is expected of them. The props and their roles were described and demoed to the participants. Special care was taken to to point out the open-endedness of the material. To set the context, the participating architects had a presentation about inspirational hospital environments and design solutions.

Sharing and discussing the theme

After the introduction the participants were assigned into two groups and given slightly differing tasks. Both groups had to design for the same functions, but their focus was different. For example, with the patient wards the other group was designing for efficiency while the other was focusing on the quality of the service. The task started with a general discussion on the theme, which was documented on the wall by the facilitator. The aim was to identify central themes that the participants consider important in their hospital experience.

Figure 8: Discussing experiences in the workshop

Constructing a conceptual tool

During the workshops the image cards gained new meanings through exposure to other participants. For example, a kitchen meant to convey orderliness came to signify homeliness or routines of dining. By pointing out images and explaining their meanings the participants discussed and shared what they thought hospital environments should look like.

After the general discussion the task moved towards introducing a conceptual tool that allows for the structuring of the discussion before moving towards prototyping. For this purpose, in the polyclinic we utilized the customer journey map onto which the discussion could be framed. Together with the participants we constructed and discussed each stage in the journey both from the point-of-view of services offered and the infrastructure in which services take place.

Next we utilized the sensitizing cards to prioritize and identify those environments that could support the ideas and themes identified earlier. Several decks were spread on the table and each group picked up six cards that they felt were important in the design of the environment. These were then placed on the wall and identified with a theme. After this the participants were asked to work by themselves for a while, familiarizing themselves with the information that was created and adding ideas on post-its to the wall.

Figure 9: Repurposing props

Building and testing prototypes

Initially the groups seemed at loss and not knowing how they should begin. Encouraged by the example of a few, the participants started to move the props in the space. Materials were moved in spaces, repositioned and discussed. The position of walls, door frames and boxes started to suggest different meanings, from patient rooms to nurses on duty. The groups diverged with some working on a different part of the space while others were finalizing other parts by writing or drawing on the elements or refurbishing the rooms with canvases. Discussions were held on how the spaces should operate after which the elements were moved to correspond accordingly.

After a small pause the groups started to work on a shared vision for their desired space. The architects were asked to help draw an initial outline of how the space could look. The group was asked to provide pointers and comment on the drawing.

After the group had agreed on a general vision they were asked to start prototyping the spaces with the material available to them. They were instructed to repurpose the props in any way they felt possible and to write or draw on the props to signify the meanings of the compositions. The facilitators guided the process by asking questions and making suggestions, but largely refrained from the building activity. This was done in order to prompt the participants towards action instead of doing things on their behalf. Slowly forms started to emerge and the groups alternated between building the environments and reflecting on how they worked. Towards the end of the prototyping activity the group guided others through the structures and explained their functions.

Figure 10: Drawing on props

Sharing the results

During the last phase of the workshop the groups shared their results via a walkthrough of the environment. The participants explained to each other the decisions, ideas and functions that they had created in the space. The facilitators guided the discussion and prompted questions regarding the solutions.

Documentation and reporting

After the workshops the results were documented and photographed. They were collected in a report that is circulated among the building team of the hospital. This report presents the results and can be used later on in the project to reflect on the building plans.

REFLECTION

The workshop setting was designed to allow for the various interactions and tasks that we thought would take place during co-design. The idea was to design for activities beyond those directly related to task-oriented collaboration and to consider the event as an experience in itself from start to finish. As a main characteristic, we wanted to allow for an experience that would inspire the

participants to create something new while being still grounded in their everyday lives. From the activity that we witnessed a few aspects supported the notion that the set-up of the workshop space had an influence in the way the participants collaborated during the workshops.

Scale-wise, the set was designed to refer to our everyday things to enable regular actions and building the basic environments. Tables, chairs, beds, walls, lamps, equipment and props could be size-wise identified, but their forms were simplified and they did not directly refer to anything particular. This guided the participants to use the set creatively and flexibly to meet the needs of their own particular plans and visions. By choosing a visual style very different from our everyday places we also helped people to set themselves out of the familiar. The hospital environments have many historical conventions according to which they are built and arranged. By stripping the self-evident and obvious from the elements we framed thinking from how-things-are to how-things-ought-to-be. The props used in the workshops were designed so that they could be repurposed and combined according to different functions that the participants had in mind.

Figure 11: Detail of a patient ward

There were a few things brought in from the existing hospital environments to the cardboard hospital. A hospital bed, walking support and a wheelchair were there for testing the interiors with real assistive devices. What we learned is that bringing in too realistic things seemed to frame thinking too much in existing solutions in early design-phase workshops. This became obvious during the patient ward workshop where the placing of the hospital bed immediately became the centre focus of one group. While the hospital bed certainly plays an important role in patient rooms, placing it in too prominent role early on could be seen as hindering the emergence of other, more creative solutions. When we removed the hospital bed from use in the second workshop, the activities seemed to focus more on the patient experience rather than where the bed should be located. However, 'anonymous' and non-specialized furniture that can be found in any interior such as chairs, tables and benches worked fine when added to the

cardboard prototype. It seemed important to maintain a specific kind of visual concept through choices in material substance, form and composition. Items that break this concept can disrupt the mindset and guide towards conventional solutions based on current set-up of hospital spaces.

The resulting method can be seen as something between a practical toolkit and a narrative stage design. The idea was to build an environment for trying out the actions taking place in the future hospital without being too faithful to existing aesthetics. The visual concept of the setting was inspired by the minimalistic and open-endedness appearance of the black box theatre. As an aesthetic environment the cardboard hospital situated itself in a non-place, as it does not especially refer to any specific place making it open for new meanings and change through the interaction of the participants. Although the space was recognizable as a generic architectural construction, most of the visual elements did not point towards a specific place or time. This temporal and geographical ambiguity created a state between times, which can make it easier for participants to imagine alternative states of things. Like in a movie or theatre, one has to be faithful to the era/style/genre that is chosen not to break the illusion of the story telling.

Similarly, the notion of non-spaces was adopted to the set design as a concept of 'non-things'; pieces of a set that could be used in many different ways and named or changed rapidly into another. Even though they hint at possible functions, they do not embody ready meanings or functions and could be repurposed by the participants. During the workshops the props readily assumed various meanings through being combined, turned, stacked, drawn or written upon or taken apart. They became ways for signifying experiences that should be allowed by hospital spaces: aquariums or fireplaces generating a feeling of homeliness, signs or monitors for guiding behaviour or small enclosed spaces for supporting patient privacy.

It was important that practically anything could be marked or built and changed and rebuilt as the ideas developed. The set invited itself as a tool to think and experience the possible outcomes. It would not be a ready-made as a solid settlement but a platform for different developing different kinds of solutions. Bringing in too realistic materials or things can break this illusion and thus hinder early phase prototyping when ideas are still developed freely. In this case, the hospital bed was an element referring too strongly to something that already exists. It wasn not a 'non-thing' or something where meanings could be created but a thing with already defined specific meanings in today's hospital environment. As such it did not easily allow for expressions of artistic practice: it did not invite drawing, writing or modifying. Thus, a hospital bed stayed a hospital bed form the start of the workshop to the end of the workshop.

We believe that creating an aesthetic setting at this point of the design process supports the emergence of creative and artistic practices. In addition to creating conditions in which needs from the user context can be discussed, the setting needs to create conditions in which the creativity of the participants can flourish. Thus, the workshop setting has a dual role of framing and inspiring the action. On the other hand the set design guides behaviour and interactions within the workshop, on the other it invites participation in an artistic practice not as an outsider, but as a creator and a designer.

CONCLUSION

This paper describes a method that was developed for prototyping hospital environments and services. It builds on the notion of aesthetic experiences and co-design as artistic practice and aims to incorporate these notions in the design of the workshop setting and elements. From a research perspective the case was done to explore the ways in which Dewey's notion of the aesthetic experience can be utilized when conducting prototyping workshops. From the workshops we learned that the focusing on thinking about the aesthetics of the setting does have an effect in the dynamics of the co-design activities by inviting the participants to take part in artistic practices. We introduce the notions of non-space and non-things to point towards environments and objects which do not point towards fixed or established meanings and are open for reinterpretation.

From a design process perspective, the case could have benefited from a possibility to extend the workshops to continue along the building design process and to refine the results gained from the first workshop. In this way the cardboard hospital would follow the design process and as a prototype gain more fidelity with each testing phase. This would open the possibility for combining the method with other existing evaluation methods such as virtual simulations and test prototypes constructed of wood panels. We also noticed, that people who participated in several workshops quickly became more competent and encouraged to use the props for prototyping. Based on this observation, combining the cardboard prototyping method with existing practices of forming stakeholder panels in hospital development processes would make sense. We suggest this as a possibility for further studies.

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