HANDLE

http://hdl.handle.net/10609/149446

Document Version

This is the Accepted Manuscript version.
The version published on the UOC's O2 Repository may differ from the final published version.

Enquiries

If you believe this document infringes copyright, please contact the UOC's O2 Repository administrators: repositori@uoc.edu
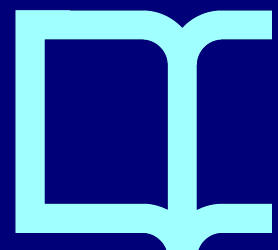
Participatory practices for co-designing a multipurpose Family Space in a Children's Hospital

Elena Bartomeu, Oriol Ventura

EINA, Centre Universitari de Disseny i Art de Barcelona, Attached to Autonomous University of Barcelona, Barcelona, Spain

elena.bartomeu@eina.cat, oventura@eina.cat,
Passeig de Santa Eulàlia 25, 08017 Barcelona

Elena Bartomeu is researcher, designer and storyteller working on design futures and design for health and wellbeing. She is co-founder of the research group Disseny per la Salut i el Benestar at EINA. She is design educator and leads the Innovative Didactics programme in EINA-UAB.

Oriol Ventura is design educator, researcher and practitioner working on design for health and wellbeing and workspaces. He is founding director of Ovicuo Barcelona, and co-founder of the research group Disseny per la Salut i el Benestar at EINA. He is head of the Product Design Department in EINA-UAB.

Participatory practices for co-designing a multipurpose Family Space in a Children's Hospital

This article presents the research and design project undertaken to develop a shared space for families and healthcare professionals in a children's hospital. The project was developed from a model of healthcare space scaled and validated at the Sant Joan de Déu Hospital in Barcelona. Initial research detected the need to gather different care services in one area. The intended use of the space was determined through qualitative ethnographic research and a quantitative analysis. Taxonomization of the collected data allowed us to define a model of healthcare activity that reconsidered the space along with time of use. It also enabled us to redefine health professionals as *navigators*. The design team created this model according to spatial characteristics and requirements. The model consisted of four types of space which we named hierarchical monodirectional, non-hierarchical circular, intimate proximity, and public proximity. From this model, a series of activities were developed that, through participatory practices and co-design processes, allowed the team to prototype the four space types. The design methodology applied has become the modus operandi of the Design Group for Health and Wellbeing at *EINA, Centre Universitari d'Art i Disseny de Barcelona*, attached to *Universitat Autònoma de Barcelona* (*UAB*).

Keywords: children's hospital; healthcare models; space for families; Sant Joan de Déu; prototyping

Introduction

In July 2016, three departments at the *Hospital de Sant Joan de Déu de Barcelona* (Innovation, Infrastructure, and Patient Experience) issued a public request for proposals to conduct a research project. The call was to design a space intended for the support and care of family members and other people accompanying hospitalized children. The request for proposals stated that 'data collection should draw up a program of uses from which to develop a space design project and a service design project'.

This article presents the research and design processes carried out, resulting in the conceptualization of a *professional-navigator*, and a care space model derived from the use of the available spaces.

A multidisciplinary design team, led by designers and researchers of *Ovicuo Design*, was selected to carry out the project. The team developed a mixed research strategy, including ethnographic research methodologies, participatory and co-design strategies, service design techniques, and architectural design processes. The initial phase of ethnographic research consisted of unstructured interviews, shadowing, and space observation. These methods allowed us to gather detailed notes relating to the problems to be solved throughout the process. The second phase consisted of three sessions of collaborative work between the researchers, users, and health professionals. A broad range of users were selected to be involved in the project in order to provide different points of view within the group.

Finally, a validation phase was performed. From its inception, the team prototyped design proposals iteratively, providing internal validation of the project's own decision-making in real time. External validation of the research results was performed by those in charge of the relevant hospital departments who, together with several stakeholders, implemented the designs derived from the research in November 2017.

18 months after the project was started, the methodologies implemented became a focus for further innovation and design projects, shaping the research strategies of the the *Disseny per la Salut i el Benestar Research Group* of *EINA, University Center for Design and Art of Barcelona.*

Research and design process

As shown in Figure 1, both the design and research processes were overlapping. This was a long and complex project which included different design activities to forge relationships between space research and production.

The main activities were divided into three research phases: the first one aimed to determine the study context; the second aimed to expand knowledge; and the third focused on sharing design proposals and rethinking spaces. These phases corresponded to two design iterations, the first one led by the design team, and the second by users. The implementation sphere, as shown in Figure 1, was aimed at adapting the decision-making process to the space's physical features.

Since Phase C was the most important stage for the development of the design concept, we will provide a brief explanation. The team transformed the key findings from phases A and B into design requirements and concepts.

The first approach (Phase A) to the study context revealed a high number of services and professionals already involved in the project: Customer Services (3 professionals), Spiritual Counseling (3), Social Work (11), Volunteer Services (5), and Associations (3). The workspaces and objects involved in the activity were also quantified and worked out as spaces (s), processes (p), and elements (e) for delivering care (aa), para-care (pa), non-care (nc), and research (r) activities (Table 1). Finally, the study was completed with an analysis of the architectural features, and the current state of the new Family Space site (851 m2), as established in the Spanish official gazette (Boletín Oficial del Estado) *BOE* 2017 regulations.

The main findings in this phase, for families, were the difficulty of locating and accessing services, as well as long journeys between them. This problem was also identified by professionals, who had to walk across a family waiting area. They were often approached by families while working on another patient's case. The need for private spaces for families and professionals became a significant insight.

Among the testimonies collected, we could highlight that of AA, a social worker, who stated that 'Knowing the space also helps me prepare for the development of the appointment'. The need to have spaces with different characteristics was a request. Staff wanted to be able to choose the most suitable one depending on the planned appointment.

The Patient Experience director, BB, highlighted a concern that professionals had about maintaining confidentiality when working in open spaces without physical compartmentalization. 'They are (also) afraid of not being able to concentrate', he said. This was a challenge to be solved in care as well as in non-care workspaces.

On another aspect, CC, director of Volunteer Services, stated that 'the work of volunteers should be made more visible'. This is a service involving more than 360 volunteers who help perform a series of tasks. These include, for example, 'making breakfast', a service in which volunteers stay with the children while their family members go out for breakfast.

Finally, a lack of shared projects between services was identified, along with the other problems of the shared spaces. At this point, the design team turned the key findings of the initial research into the following design requirements:

- Generate a care and a non-care area, and a multipurpose space for family members and associated services

- Make the presence of the volunteer service visible

- Propose a point of connection with the rest of the hospital and its services

- Connect the exterior and interior spaces of the Family Space and improve the visibility of access points

- Unify the two buildings into a clearly identifiable single space

- Generate an atmosphere that feels distinct from the hospital environment

Our challenge as designers was to create a shared culture of care while designing the physical space. A series of research and design activities were prepared for three workshops in order to share our requirements and shape them into design proposals.

Space Aware

The first workshop, Space Aware, was scheduled so that professionals would be aware of the space along with its limitations, strengths and possibilities. The initial planning included representatives of the families, but for organizational reasons, their attendance was difficult, and The Patient Experience Department was asked to provide feedback from the families. The workshops were organized for 12 users (Table 2).

Users had a general floor plan (A3) without features and an envelope with pieces that served as corridors, tables, offices, counters, etc. Each user arranged the pieces according to their own criteria and their previous knowledge as a social worker, association organizer, etc. The differences between the backgrounds of the users ensured diversity in the proposals and facilitated the discussion on zoning and its variants (Figure 2). This allowed professionals from different services to be involved in

project decision-making, and to feel part of the same team (Stickdorn and Schneider, 2011).

The workshop became the starting point for developing a shared culture of care for families. It also allowed the exchange of knowledge and views of different users. People who took part became aware of the volume of the spaces, and of how much space the work materials and the rooms themselves took up. In this way, the title given to the workshop, Space Aware, named the process by which users 'became aware' of the space and the implications of its occupation and use.

Users were asked to play with the program of uses and propose various spatial arrangements, including different zoning variations and distributions of space. In general, everyone proposed that their service would work together with others, although in practice, this happened in very different ways. Insofar as we understand zoning as the distribution of an area which groups together spaces with common characteristics of use, their understanding of this concept was very particular. For them the most important aspect was the team, not the furniture or the space. For example, one of the common features of all the proposals was the grouping of the work teams in their own spaces. However, these compartmentalized zoning arrangements were not the best solution for facilitating shared projects between services from a design point of view.

Our zoning conception as designers and researchers was more typological. Zoning was for us the distribution of activities that share objects and spaces in the same area, no matter who is doing the activity, or which service they are from. During the workshop this divergence emerged, and everyone became aware of the collaboration possibilities through space, playing with their own materials to make a design proposal.

All the proposals obtained were quite diverse and the subsequent work consisted of unifying them all and shaping the next workshop. Meanwhile, all the input data

collected were analyzed following ethnosemantic guidelines to identify the underlying hierarchy of meaning of the project (Cranz, 2016). This led us to consider the divergence and variability of space in two broad categories: **professional profile** and **time of use**.

The common characteristics were that professionals spent all day moving from one service to another. Certain places were occupied all day long in short periods of time to develop different activities with very different users, but repeating activities in sequences. Thus, as will be explained below, the conceptualization of the project was based on the identification of professionals as *navigators* (Greene and Mayerson, 2011) and the space as a *prairie* (Ventura, 2015). An analysis of these two concepts led us to propose different polyvalent resources and changes in space, structured and zoned according to time slots.

A prairie for navigators

The use of the concept of *prairies* in space design has its roots in architecture. The Prairie Style, developed in Chicago around 1900, was developed by a young group of architects (Frank Lloyd Wright et al.) as a model for shifting the ideals of the Arts and Crafts movement towards the simplicity of nature (Brooks, 2006). In this context a *prairie* is a space with an emphasis on horizontal rather than vertical planes and stylized ornamentation. 'Holism', 'inwardness' and 'circularity' are spatial features often related to prairie spaces (Behbahani, Ostwald and Gu, 2016, 348).

Since the origins of the use of prairies in healthcare environments remain unclear, there are some sources that link the concept with office workspaces (Ventura, 2015). Oriol Ventura applied the prairies concept to open office workspaces and

described these areas where you can carry out multiple activities thanks to adaptable and multipurpose resources. According to research into non-healthcare spaces, 'Types, compositions and adaptability of modular systems in spaces' (Ventura, 2015) it was determined that the average use of prairie space for office activities is 35%, reaching peaks of 50% in the middle of an active day (Muñoz, 2015). However, what mainly connects the prairie with the hospital as a working environment is the need to foster collaboration between services, and to build a shared space to do that. Holistic and circular features are key resources to facilitate team meetings and collaboration. Open spaces also adapt well to the variability both of time slots and the activities of hospital workers and users.

Working in the Family Space required at the beginning an emotional effort from the staff, as there was a loss of individual space by not having a workplace of their own. Sharing offices is a common practice in health environments, but we found it to have a negative side.

The kind of professional that occupies this future Families Space comes close to what Greene and Mayerson term a 'navigator'. The space was being designed for a knowledge worker who, in the words of Greene and Mayerson (2011, 26-27), 'is a visitor to his own office'. Being a navigator implies displacement, but also the need to move materials and equipment, to duplicate resources, and other related problems.

The observation of this profile of worker-as-navigator made us reconsider the immobility of some equipment and favor nomadic solutions that took shape in furniture design. These types of solution could also bridge the gaps between care and non-care spaces, which would result in a significant reduction in the occupation of spaces and the allocation of activities to them.

Nomadic equipment for navigators

The case of the Child Life area was very illustrative, as it required a set of objects and toys to help children become familiar with their illnesses. Health professionals had to take care of the children's physical and emotional well-being and prepare them for any scheduled interventions. During the research, this activity was carried out in a fixed office. But rethinking it as a nomadic activity made it possible to improve the visibility of this area, reach more users, and add to the prevailing dynamics of navigability (Figure 3). The fixed office became the Kids Kit: nomadic equipment that demonstrates the mobilization of space conceived as a prairie. The service moved from a single space to the design of a transportable service using a mobile cabinet.

Design Works

The real challenge remained the space itself: information collected in phases A and B revealed a differentiated spatial need for each activity. Care, para-care, non-care, and research activities had different requirements. For example, some care activities (like spiritual counseling) were done in the corridor, or on a bench in the garden. On the other hand, sometimes an office was occupied by a volunteer issuing dining tickets.

The clue to finding a solution was the position of the chairs and tables. Looking at the arrangements made by users during the Space Aware workshop, one could detect different types of relationship between patients and professionals. There was sometimes a meeting of equals, and sometimes a monodirectional conversation. In the end, it was the type of conversation that was shaping the disposition of space. We identified four types of spaces that covered all the studied activities, based on observations of conversations:

(1) Hierarchical monodirectional. This is a type of space where the professional speaks to the family in order to obtain compliance with the treatment when there has been a transgression, maltreatment, or a complex situation. The location of the professional should be near the exit in case the discussion escalates into violence.

(2) Non-hierarchical circular. Circular spaces favor horizontal treatment. They can be used to help a family member find a flat to stay in during treatment, etc.

(3) Intimate closeness. This is a type of space where professionals and families share sensitive information. These spaces are usually used to give a first medical report, or for spiritual care.

(4) Public proximity. This space can be shared while the professional gives information to a family member. The use of this space does not require an appointment and does not involve sensitive information.

These spaces were designed to give consistency to the prairie and were integrated in the Family Care Space Model. The model was developed and tested in Phase C in a Minimum Viable Prototype test. This concept comes from the Lean Start-up methodology (Osterwalder et al., 2014). It is used as an efficient test of the interest that a product arouses before production, through a tangible solution. The development of the proposal can be done with a minimum use of resources.

As shown in Figure 4 (row 1), the disposition of tables and chairs was the basis of the space design. The test, with 25 users, among them staff, relatives and stakeholders (Table 2), had two parts. The first part was a full-scale simulation (row 2), and the second was a test with images and drawings (row 3).

A version of the Minimum Viable Product (MVP) was used to establish a critical dialogue with the design proposal and to facilitate the participation of users attending the workshop. The main aim was to represent all needs, and to ensure the model spaces covered all types of activity. The situations to be tested were a care activity for the families, and a non-care activity for the staff.

The places in Figure 4 (row 4), as well as in Figure 5, are the result of the implementation of the model. Figure 5, A to C, illustrates a space of each type, and D to F are examples of prairie and multipurpose areas. Other types of implementation were also performed, around the concepts 'time of use' and 'professional-navigator'. These included designing a location system for the keys for the volunteer team, designing an analogue communication system for families and professionals, and the installation of continuous pavement as a visual identifier of the unity of the Families Space, and a generator of an atmosphere distinct from the hospital context.

Discussion

We consider the model of the Families Care Space to be the main contribution to knowledge of this project. The use of the prototype as an articulator of shared knowledge was key to integrating the different points of view of users into one model. The prototype aligned the users' needs and opinions in what Amanda Bill et al. describe as an 'establishing narrative around the problem' (Bill et al., 2015, 463).

Participatory design tends to favor the achievement of objectives through the process itself, especially when it comes to community projects. In any case, the creation of a global culture of family support began to be generated within the workshops themselves, which promoted active listening and the exchange of knowledge. As Lynn

Stott emphasizes, 'the core value of service design is putting humans –their voices, their needs, deep empathy with their realities, and insights into their behaviors– into the design of services, products, organizations, interactions and, yes, experiences' (Stott, 2016, 17). In this way, according to Stott, the first output of service design is almost always organizational. We believe that this is why one of the organizational results derived from this project is the Care Space Model. In addition to being a design output, it configures a typological model with four spaces that integrate the user experience into a consistent and systematic whole. Each type of space is unique but is replicable and characterizable. Following Rafael Moneo's concept of types (1990), naming each one is already forcing its implementation due to the very nature of language.

In the definition of the model, the type has been used as a project tool to establish the similarities, extrapolations, and changes of use that are considered relevant in each case (Martí i Font, 1999). It has been chosen to name the spaces according to the main characteristics of each one, so that professionals can recognize / reconstruct the model when they are faced with each situation (hierarchical monodirectional, etc.). The ability to recognize situations and establish a model based on minimum data is one of the features that De Bono (1970) emphasizes for pre-established or archetypal models.

With the development of an integrated patient experience, what we have achieved is the creation of a system. With this model, any designer could set up a similar space with consistency.

Conclusions

After one year of implementation, the Patient Experience Department incorporated five new part-time members, resulting in a 60% service increase. Today, the professionals that make up the department are integrated into various areas of the Family Care

Service, and they represent an example of cross- and multi-disciplinary work.

Reframing the healthcare professional as a navigator helped us look at the immobility of equipment and led us to find nomadic solutions. The open workspace improved performance per square meter, and reduced the resources (tables, chairs, etc.) required. Users identified common needs for different areas, and the team could develop a model to give visual and functional consistency to space design. In applying the model, designers managed to compensate for the initial loss of individual space identified by medical staff with areas for intimate closeness.

However, there have been different parallel insights in the combination of research and design. Research from participatory processes makes sense if each of the agents and teams becomes involved in the project. Conversations were at the basis of the process, but also important to the form and function of the project. Often the design team's role is focused on identifying the tools and strategies needed for data collection, interpretation, and the production of the solution set. But we must not forget the ways in which these solutions bring knowledge closer to the user groups (full-scale prototypes, renders and drawings). In this sense, moving from individual imaginaries to a recognizable product requires a strategic planning effort and a visualization of processes and results. Given the fundamental role of this design information in both the process and results the design team needs to make it visible and disseminate it accordingly. Finally, to ensure the continuity of the project, the traceability of the implemented processes and designs must be maintained, including the performance of each square meter and the percentage use of the zones in the different time slots.

Acknowledgements

References

Amini Behbahani, P., Ostwald, M.J. and Ning Gu. 2016. A syntactical comparative analysis of the spatial properties of Prairie style and Victorian domestic architecture. *The Journal of Architecture,* 21 (3).

Bill, Amanda, Collier, Guy and Stephen Reay. 2015. Making things happen: experiments in prototyping from a hospital design lab. Cumulus Association. Aalto University School of Arts, Design and Architecture: 455-467.

Brooks, H. A. 2006. Prairie School, Frank Lloyd Wright and his Midwest contemporaries. New York: W.W. Norton.

Cranz, Galen. 2016. Ethnography for Designers. New York: Routledge.

Douglas, Reid, Reay, Stephen, Munn, Joshua and Nick Hayes. 2018. "Prototyping an emotionally responsive hospital environment." *Design for Health* 2 (1): 89-106. https://doi.org/10.1080/24735132.2017.1412689

Short, Eden, Reay, Stephen and Reid Douglas. 2019. "Designing wayfinding systems in healthcare: from exploratory prototyping to scalable solutions." *Design for Health*, 3 (1): 180-193. https://doi.org/10.1080/24735132.2019.1575659

de Bono, Edward. 1974. El pensamiento lateral. Manual de creatividad (ed. Original 1970). Programa Editorial. Colección MMLB: Barcelona.

Greene, Catherine and Jeremy Mayerson. 2011. Space for Thought: designing for knowledge workers. Benne-Helen Hamlyn Center of design. Emerald: London. DOI 10.1108/02632771111101304

Lederer, Marilyn, Goode, Tracy and Jane Dowling. 2005. Origins and development: The critical care assistance program. *Chest*; 128 (3): 66-75.

Ley 12/2017, de 6 de julio, de la arquitectura, Boletín Oficial del Estado, 187, 7 Agosto de 2017, pp. 77674-77687. https://www.boe.es/eli/es-ct/l/2017/07/06/12

Stott, Lynn. 2016. "Bridging the Gap: Service Design is the Means to Customer Experience Success." *Touchpoint*. 8 (1).

Martí Font, J. M. 1999. Introducció a la metodologia del disseny. Barcelona: Ed. Universitat de Barcelona.

Moneo, Rafael. 1982. "Sobre la noción del tipo." in V.V.A.A. Sobre el concepto de tipo en arquitectura. Madrid: Escuela Técnica Superior de Arquitectura

Muñoz, Francesc. 2015. "Senderisme sense deixar l'oficina". *El Punt Avui*: february, 28.

Osterwalder Alex, Pigneur Yves, Bernarda Greg and Alan Smith. 2014. Value Proposition Design. United States of America: Wiley.

Stickdorn Marc and Jackob Shneider. 2010. This is Service Design Thinking, Basics-Tools-Cases. United States of America: Wiley.

Ventura, Oriol. 2015. "From greenland to cottage: metaphors, design and workspaces." *Journal of design processes,* 1: 28-33.
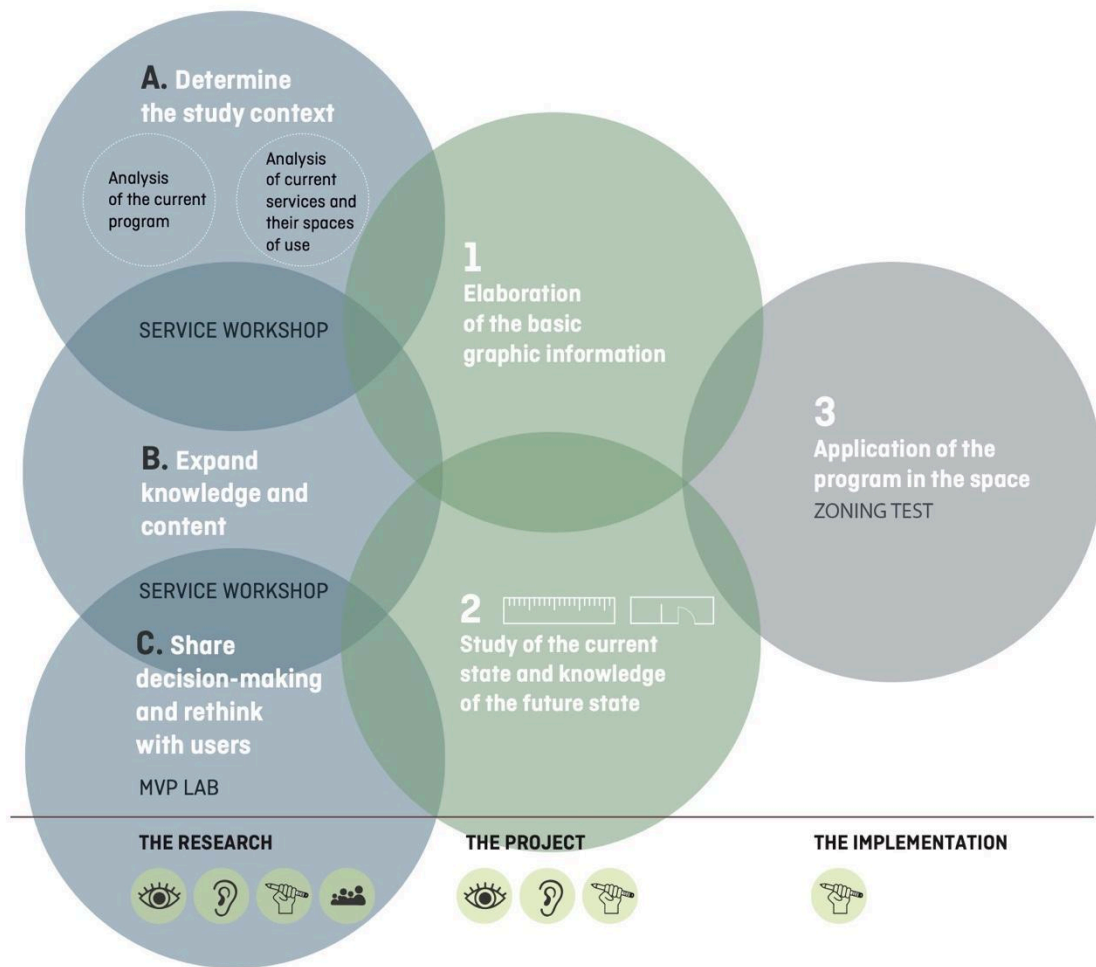
Figure 1. Research and design process.

Care	This activity involves staff and patients. It is aimed at patient healing.
Para-Care	Activity carried out by professionals to improve attendance. Patients don't participate in para-care activities.
Non-Care	Activity carried out by professionals, not aimed at a specific patient. It can be performed with patients.
Research	Activities carried out by professionals to improve knowledge and processes. It is held without patients.

Table 1. There are four different work activities within the hospital.

Space Aware (12 users)	MVP test (25 users)
Patient Experience (2)	Families and relatives (6)

Associations (1)	Patient Experience (4)
Volunteering (3)	Associations (1)
Customer Services (1)	Volunteering (1)
Social Assistance (2)	Customer Services (1)
Design team (3)	Social Assistance (6)
	Stakeholders (3)
	Design team (3)

Table 2. A summary of participant details for the Space Aware and MVP test workshops.
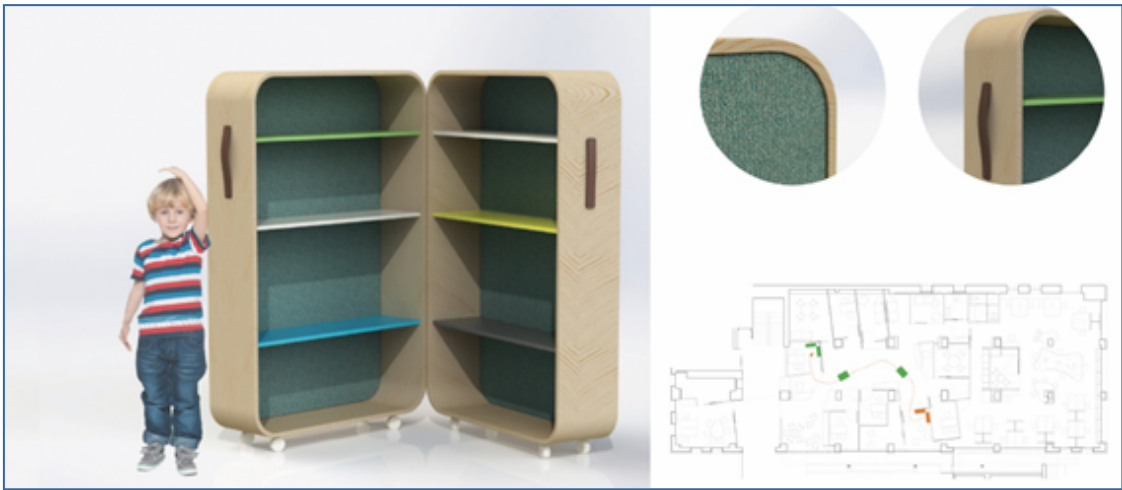

Figure 2. Space Aware workshop.

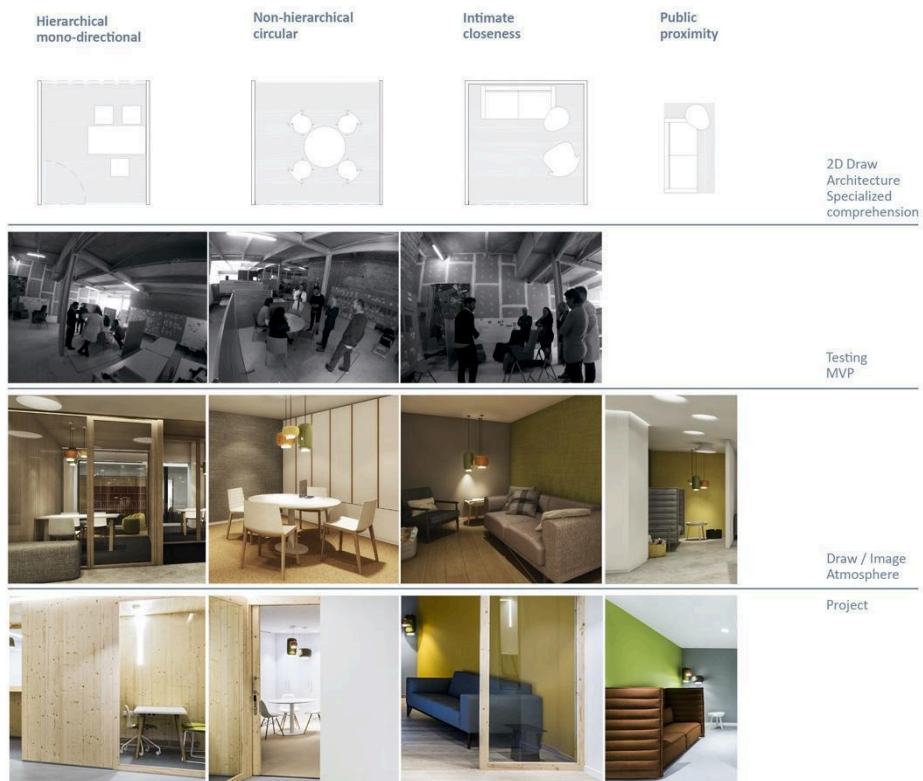Figure 3. Kids Kit for the Child Life.
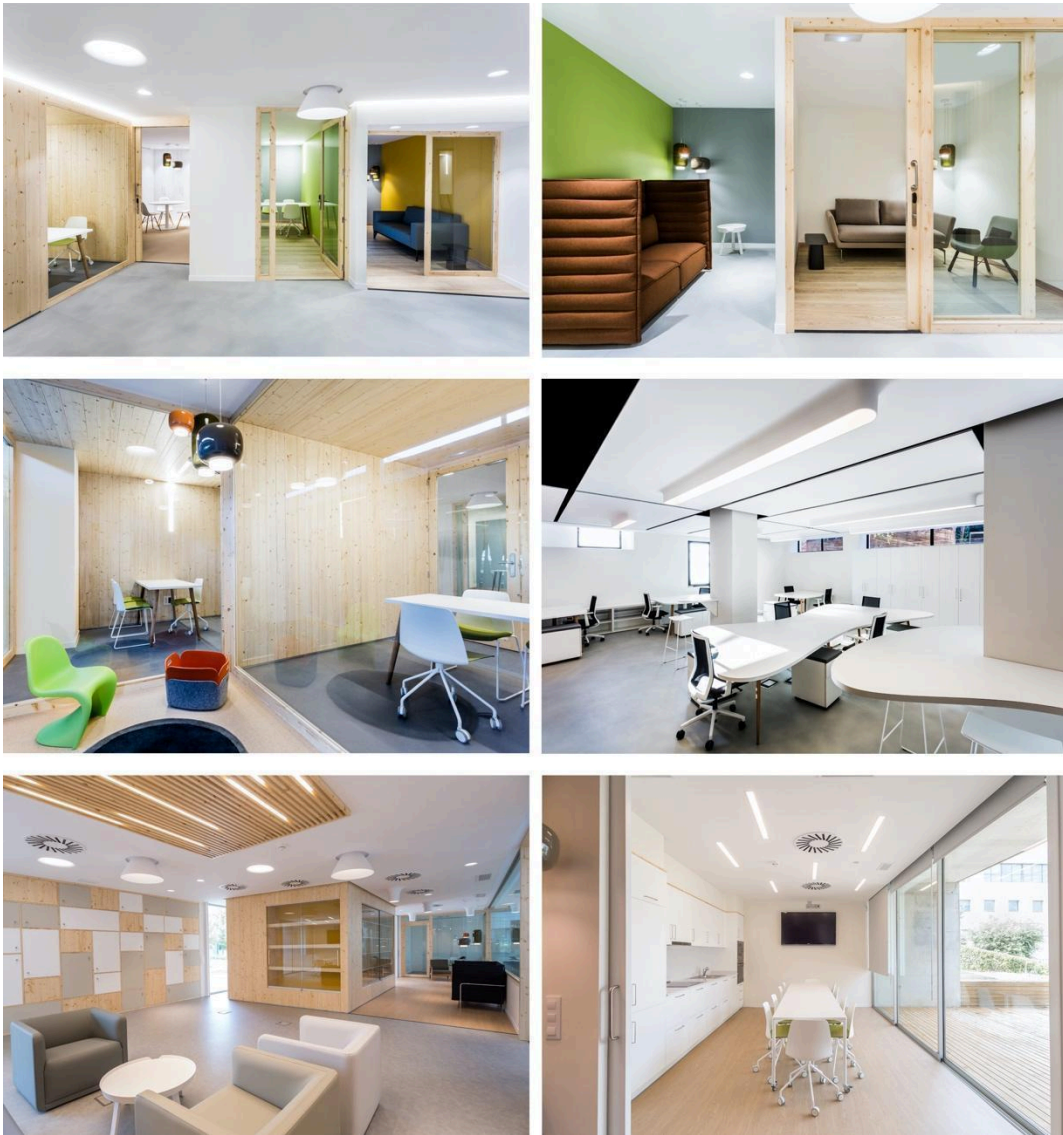

Figure 4. Model of space for care activity.

Figure 5. Images of the new designs (from left to right, top to bottom). A. Non-hierarchical circular (white wall), hierarchical monodirectional (green wall) and intimate proximity (yellow wall). B. Public proximity (green wall) and intimacy (white wall). C. Multipurpose controlled play area and hierarchical one-way office. D. Staff prairie. E. Multipurpose non-healthcare area with living room, lockers and library. F. Multipurpose non-healthcare area for cooking, education or training.