Toward a Participatory Design Approach to Service Design

Daniela Sangiorgi
INDACO _ Faculty of Design
Politecnico di Milano
Via Durando 38/A, 20158 Milano, Italy
+39 02 23995918
daniela.sangiorgi@polimi.it

Brendon Clark
Mads Clausen Institute
University of Southern Denmark
Grundvigts Alle 150, Sonderborg, Denmark
+45 6550 1667
brendon@mci.sdu.dk

ABSTRACT
This paper introduces *service design* as a potential Participatory Design (PD) theme. It proposes that the success of designing good services can be increased by including the perspectives and practices of the future service participants into the design process. Through the description of an *action-research* project, the paper explores the potentials and limitations of using an ethnographic approach and Activity Theory to frame the service design process and interpret the complexity of services.

Keywords
Service design, service encounter, Activity Theory, ethnography

1. INTRODUCTION
In this paper we introduce *service design* as a potential Participatory Design (PD) theme. We describe an action-*research* project initiated under the assumption that services can and should be an object of design and that service design could benefit from the incorporation of PD principles and practices. A main objective of the research project was to introduce these concepts to our industrial partners through the development and use of service design tools derived from ethnography and activity theory.

Our contribution places itself within a research field that studies services starting from the interaction moments between the user and the supplier system, the so-called *service encounter* [4]. The *service encounter* refers to the period of time during which a consumer directly interacts with a service [11]. One of the main characteristics of a *service encounter* is the active role users play during the interaction. Users are considered as *service active participants* as they bring their resources, competencies and capacities into the interaction. Their contributions are crucial for service success. Services are therefore *co-produced* by users and suppliers and should be viewed as a type of *partnership*.

Some of the most elusive aspects of designing an intangible service that is co-produced by users and suppliers during a service encounter are to identify the *object of design* and finding a way to explain that to others. Services are *complex social systems* made up of *situated activities* where people behave and interact following and negotiating predefined roles and rules and using available tools and information. The design of a service refers to envisioning the service encounter and providing an *interaction platform* [10] (made up of the physical tools and signs, people's competencies and roles, the provided information and interaction rules) that frames and supports the way *service participants* interact.

A guiding hypothesis throughout our project is that the success of designing good services can be increased by alleviating potential conflicts during the *service encounter* through synchronizing the perspectives, goals and existing practices and capacities of *service participants*. To address this, the perspectives and practices of the service participants should therefore be included in the design process. It is our contention that models and tools can help service designers understand and handle this kind of complexity, and help them facilitate the involvement of other stakeholders throughout the design process.

After describing the context of our research and introducing how we included service participants in the design process, we will further discuss what we have found to be the value and challenges of using an ethnographic approach and Activity Theory to frame the design process and interpret the design object.

2. CONTEXT
The "cold chain service design project" was conducted for 7 months, from December 2002 to June 2003, as a collaboration between the INDACO department of Politecnico di Milano, the Mads Clausen Institute at the University of Southern Denmark, and Danfoss Refrigeration and Air Conditioning. The project was initiated and developed by Daniela Sangiorgi, an industrial design PhD student from Politecnico di Milano, in collaboration with Brendon Clark, a research assistant from the Mads Clauden Institute with an MA in anthropology. The main goal of the collaboration was to explore the relevance of a service design approach for practical application in a business setting. After a pre-study in Milan, Italy, the project was conducted in Denmark based out of the Mads Clausen Institute where the User Centered Design group, led by Jacob Buur, provided support in field studies, workshop organization and facilitation, and industry contacts.

For this project, the cold chain in a supermarket context includes the human and technical efforts that regulate the temperature of meat, dairy, and frozen food products from the time they enter the store until the customer leaves with the product. While Danfoss R/AC has a long tradition of supplying refrigeration components and supporting products, they are not an established service provider. The goal of this project was to introduce and test the service design approach with Danfoss R/AC and the Mads Clausen Institute's User Centered Design Group, while exploring and designing potential cold chain maintenance service ideas.

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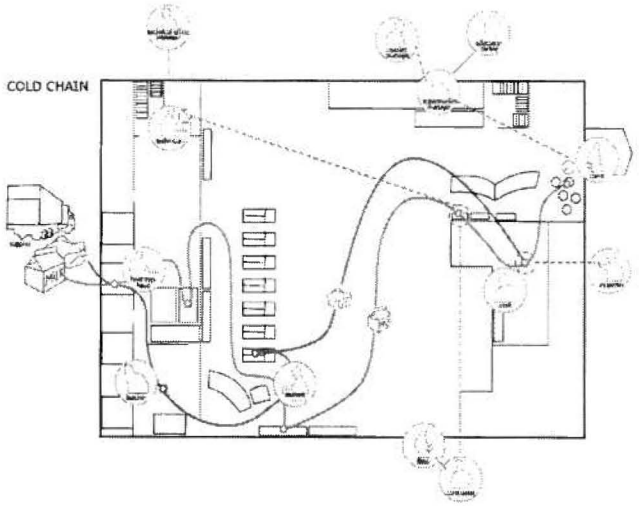

Figure 1. The supermarket "Cold Chain"

The cold chain service context includes: the equipment in the supermarket that maintains and measures temperature (refrigerators, freezers, thermometers, remote monitoring systems and their software); the people that come in contact with the products and equipment (the employees from a variety of departments including frozen foods, deli, produce, bakery, dairy); and in-house management, technicians and external contractors (the people and policies that monitor the legal and health requirements including the people who educate and train the people in all of these positions, and the state health regulators).

3. DESIGN PROCESS

We identify four iterative cycles in our service design process. Each design cycle concluded with an event (meeting or workshop) in which we received feedback from the industrial partners and provided input for the following cycle (see figure 2).

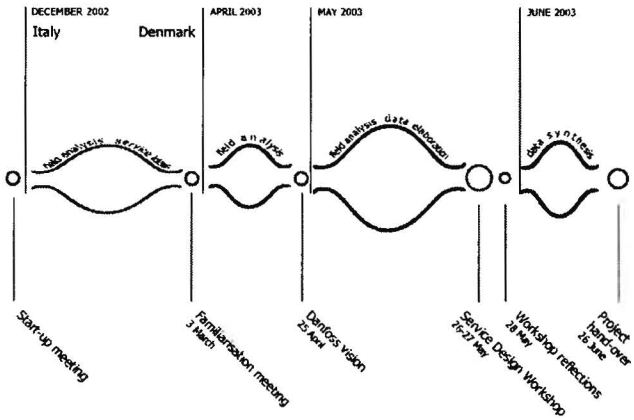

Figure 2. Design Process

For the purpose of this paper we can place our activities in two main areas of emphasis:

- the *service context* of the cold chain where we sought to understand and represent the people that would participate in or be influenced by a potential cold chain service.
- the *design context* where we focused on creating activities that used the understanding and representations from the service context as a starting point for imagining and planning new service encounters—understanding and representing how the service context would then be different.

3.1 Exploring service context

The design of effective *service encounters* asks for the analysis and understanding of the potential service participants' context and practices. For us this meant developing an overall idea of the "cold chain" system and developing a detailed understanding of the perspectives and practices of the participants in the system. Exploring and getting insight into the complexity of the "cold chain" proved to be a daunting task. It was ultimately shaped by time constraints, accessibility to various participants, and their willingness to participate in the project.

Ethnographic principles and techniques inspired the way we carried out the field analysis[1]. We sought to interview and observe people in the context of their work activities, producing documentation for analysis and to develop representations for later use. To do this we used a combination of video and audio recordings, digital photos, and field notes. By traditional ethnographic standards, our fieldwork was brief and disconnected only providing an introduction to the various contexts. In relation to the practices of our industrial partners, our approach was broad in scope and rich in detail about previously unexplored work contexts.

Our field studies in Denmark included interviews and shadowing:

- *Interviews (1 to 4 hours each)* 18 people from three supermarkets (managers, department heads, staff, technician), a European supermarket corporation (sector managers), a supermarket education center (manager), and a refrigeration service contractor (manager and technician)
- *Shadowing (half day each)* four people from two supermarkets (Frost & fruit department, deli/meat department, restaurant) and refrigeration service contractor (technician)

We looked to Activity Theory as an analytical filter to interpret the collected data as it proposes a set of concepts and a basic model, the *Activity System*[6], for the analysis of human activity.

Ethnography and Activity Theory share two main principles in the way they approach human behavior: the *holistic approach,* according to which human action should be understood within the larger context in which it occurs (in this case the "cold chain" activity system), and the *members point of view,* that underlines the importance of gaining the perspectives and "voices" of the people studied (potential service participants).

However, ethnography and Activity Theory answered to different necessities in the design process. While we needed to explore and describe the complexity of the service context, we also sought to develop a handy model with stable categories to synthesize and

communicate during design activities. Consequently, as we will describe below, the richness of contextual data has been collected through ethnographically inspired approach and interpreted through the main categories of the *Activity System* model: *subjects*, *artifacts* (technical tools and psychological tools like *knowledge* and *experience*), *roles*, *rules* (explicit rules or implicit rules like *habits*) and *objectives*.

3.2 Design activities

Toward the end of the project we held a 2-day *service design workshop* as the main design event during the action-research project. The workshop provided us with the opportunity to introduce contextual *representations* [5] of *service participants* into the design activities conducted with representatives of our industrial partners to actively envision potential design encounters. Inspired by the "design by doing" participatory approach [8] we acted as the workshop facilitators proposing design materials and "hands-on experiences" [3] to collaboratively design service ideas with the workshop participants.

The design activities aimed at defining what kind of services Danfoss could offer to supermarkets in order to improve the cold chain maintenance activities while incorporating service participants' needs and perspectives.
We therefore faced the challenge of how to incorporate the service participants' perspectives and practices into design activities using the categories from Activity Theory and the exploratory ethnographic inquiry, the part of the workshop we will address in this paper.

In line with our understanding that *active workshop participation* should be based on an appropriation process of the contextual data [9], we held two activities as a way of facilitating the sharing and personal interpretation of the information we had collected:

- *Activity System Map discussion*. We had prepared four poster-sized maps that synthetically represented the Activity System of each of the four main organizational contexts we visited. (2 supermarkets, 1 technical service contractor, 1 education center). During this session, we briefly introduced the Activity System concept and then used the posters as mediating tools exchange information and stimulate conversation.
- *Service Participant Appropriation*. We had prepared written *portraits* and short *video* clips for each of *service participants* we had interviewed. After the maps discussion, the workshop participants were each asked to read the portraits and watch the video of two people and then return to the group to report what they had discovered and discuss the various service participants.

The context appropriation activities and tools were intended to level the workshop participants' knowledge of the cold chain system and actors before they engaged in idea generation activities. We used this background knowledge together with another tool, the *issue cards*, as a basis for the service idea generation activities.

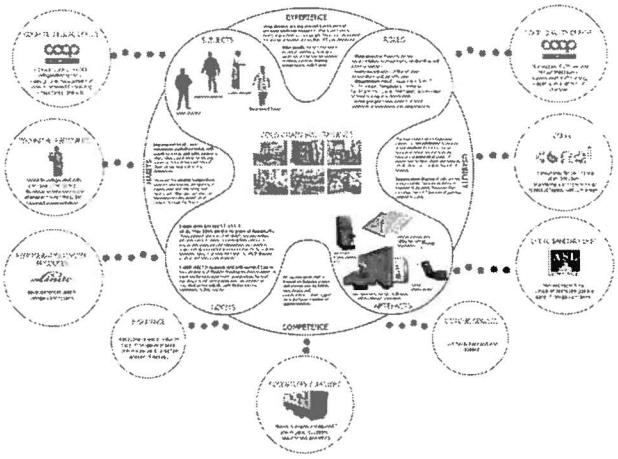

Figure 3. Activity System Map

The *issue cards*, inspired by the *video card game* developed by Buur and Soendegaard [2], used the Activity Theory concept of *contradiction*. The cards represented, through a brief text and a representative image, existing problematic situations and conflicting perspectives of the service context and participants. We used the cards as a stimulus for a brainstorming activity with the aim of identifying what kind of services could be provided to supermarkets in order to address the *contradictions*.

One of the main results of this collective reflection was identifying that many of the conflicts came from the opposite and co-existing demands of local versus remote control or supermarket staff empowerment versus the atomization of work. For instance, the push for local responsibility and awareness of food quality issues (by a large supermarket chain's Quality Manager and the State Agency), in contrast to an increase in delegation of remote responsibility for refrigeration system efficiency and maintenance (as favored by the supermarket managers, the supermarket chain's technical office and the external service contractors).

During the following design activities for envisioning potential service encounters, workshop participants proposed service ideas that focused on *alleviating these existing conflicts* of exigencies and perspectives working on the main theme of the "integration between local and remote".

4. DISCUSSION

In the action-research project described here, we introduced and further developed a service design approach with industrial partners based on the assumption that the design of successful services depends upon a holistic and participatory approach. During the project, with these ideas in mind, we attempted to use and develop tools that both helped us and others appreciate the richness and complexity of a service context and to incorporate those understandings during the service design process under realistic industrial and research constraints of time and resources. While this was a project that concentrated on the idea generation phase of service design, and not the final design and implementation of services, we will discuss some of the challenges we faced during the project and some of the feedback from the project participants. We conducted two reflection

activities with project participants after the workshop and at the end of the final hand-off meeting at Danfoss. Through these sessions we learned that:

- integrating existing perspectives and practices of the potential service actors (portraits, video clips, issue cards, activity system maps) helped the workshop participants (in particular the industrial representatives) go beyond their previous stereotyped ideas of supermarket staff roles and their needs.
- highlighting existing conflicts, mainly through the *issue cards*, proved to be a stimulus for service idea generation.
- the holistic approach to the analysis of the "cold chain" system provoked the workshop participants to widen their perspectives from a product focus (refrigeration components) to that of services (cold chain maintenance).

This last point is particularly important to us, as the workshop participants had notably experienced resistance and difficulties to think in terms of services. We initially had hoped that the introduction and application of Activity Theory model, describing and explaining the main elements that characterize a *service action,* would support this change. The intention to provide predefined categories to frame and support both the analysis and the design of services resulted in contradictory results for both the workshop participant and us. During the field studies it quickly became obvious that the strict application of the Activity Theory would come at the expense of a less exploratory attitude. We therefore used the *Activity System* model as a sort of background reference to help guide our activities. Along the same lines, for the workshop we prepared both static representations such as the Activity System maps complemented by fluid materials such as the *portraits* and *videos*. As summarized below, the feedback from the participants was encouraging:

- The balance of the different kind of tools worked well as the maps gave a good "birds-eye perspective" of the contexts while portraits and videos were useful to gain a direct understanding of service actors' roles and interests (Danfoss Refrigeration/AC European Development Manager commented that, "portrait descriptions, based on field studies, are very useful in understanding tasks, responsibilities, and priorities of all involved persons"). Additionally, while the Activity System maps were reported to be difficult to understand at first glance ("as a presentation tool"), and too complex to understand, the workshop participants reported that the maps worked well once they got used to working with them.
- Activity System maps proved to be a good analytical and design conceptual tool as they actually helped to frame and organize the service context information (Danfoss Refrigeration/AC Marketing manager said, "Activity System forces you to structure information and relations") and to describe the service system (a designer noted that, "the Activity System map is a good visual figure to explain a complex idea or concept")

The results of the *action-research project* offer insight into the potential value of bringing the service participants, via representations, into the design process during strategic decision and planning activities. At the same time, they also highlighted the necessity to further develop tools and methods that support the communication and design of the 'complexity' of services. While using ethnography and Activity Theory provided encouraging results, more must be done on the *compromise* between two opposing demands: the necessity to understand and represent the richness and complexity of a service context, while creating a design and communication language able to handle it.

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