Application of the card sorting technique associated with the storytelling approach in a PSS for sustainability

Manuela Gortz
Federal Technological University of Paraná, Postgraduate Program in Technology and Society
Av. Sete de Setembro, 3.165, 3rd floor, block D, Curitiba–PR, Brazil
manuelagortz@alunos.utfpr.edu.br
Alison Alfred Klein
SEFIT labor intelligence
Rua Sebastião Santos, 28, Curitiba–PR, Brazil
alison.a.klein@gmail.com
Evelyne Pretti Rodrigues
evelynepretti@ufpr.br
Félix Vieira Varejão Neto
felixvarejao@gmail.com
Federal University of Paraná, Postgraduate Program in Design
Rua General Carneiro, 460, 8th floor, Curitiba–PR, Brazil
Henrique Kozlowiski Buzatto
Federal Technological University of Paraná, Postgraduate Program in Mechanical and Materials Engineering
Rua Deputado Dr. Alencar Furtado, 5.000, 3rd floor, block M, Curitiba–PR, Brazil
buzatto@alunos.utfpr.edu.br
Aguinaldo dos Santos
Federal University of Paraná, Design & Sustainability Research Center
Rua General Carneiro, 460, sl 717, Curitiba–PR, Brazil
asantos@ufpr.br

ABSTRACT

Conventional data collection methods in design projects, such as questionnaires and interviews, often result in inaccurate data, which is sometimes superficial for comparison and analysis. Therefore, the use of more empathic techniques can contribute to the collection and analysis of in-depth and real data. The purpose of this research is to describe the application of the card sorting technique associated with storytelling in a Product-Service System project for sustainability. As a result, these techniques contributed in understanding the preferences of the user regarding the proposal of a sustainable urban garden PSS, with an automated irrigation system. In this way, the application of the card sorting associated

with storytelling allowed the identification of opportunities and challenges of the feasibility of implementing a service that offers an urban garden Product-Service System with a focus on sustainability.

Key Words: Card Sorting, Product-Service System, Urban garden, Sustainability.

1. INTRODUCTION

The development of new Product-Service Systems proposals, especially those related to Sustainability, requires the involvement of potential users not only in the validation and implementation phases but from the initial stages of design. Conventional data collection techniques, such as questionnaires and interviews, often result in inaccurate and superficial data for comparison and analysis and do not favor the understanding of user perceptions.

For Mukhtar, Ismail, and Yahya (2012), customer roles have evolved from passive consumers to users who contribute to successful innovations. We can observe this in the proliferation of user-centered methodologies applied to capture customer needs and requirements in order to incorporate and deliver value (in the product or service) to users. This change in the role of consumers, from passive users to collaborators in the creation and extraction of business value, allowed the improvement of customer co-creation techniques and value-creation models (Mukhtar, Ismail, & Yahya, 2012). This empowerment of the user can also bring benefits to Sustainability, since people are more aware of what they eat, wear, and manufacturing processes in general (Dick, Eden, Fischer, & Zietz, 2012). Therefore, more than ever new techniques of user involvement are essential and necessary.

New possibilities and techniques have arisen, albeit experimental ones, that allow a greater approximation with the user, in order to understand their perceptions, expectations, and sensations when enjoying a service. Techniques such as card sorting, storytelling, shadowing, paparazzi, some of which are already applied in product design, but are being adapted to the context of services and PSS.

Thus, this paper aims to describe the application of the card sorting technique associated with storytelling in a Product-Service System project for sustainability. We emphasize that there is no quick recipe since the technique can be adapted to each context and project, but here we describe the practice through its application. The techniques were used to contribute to the understanding of the preferences of a user with apartment manager activity regarding the proposal of an urban garden PSS, with an automated irrigation system, applicable to condominiums with a focus on sustainability.

2. COCRIATION TECHNIQUES IN SERVICE DESIGN

According to Wetter-Edman, Sangiorgi, Edvardsson, Holmlid, Grönroos, and Mattelmäki (2014), service design is a creative, human-centered, iterative approach to serving innovation, exploring the consumer experience to generate new service solutions converted into prototypes, tested and implemented. It was born as a conscious discipline that there is a dominant economic vision in the service sector and that there is a lack of intuitive and creative design culture (Maffei, Mager, & Sangiorgi, 2005). The service design is a multidisciplinary field that involves marketing, human resources, operations, organizational structure and technological disciplines (Ostrom, Bitner, Brown, Burkhard, Goul, Smith-Daniels, Demirkan, & Rabinovich, 2010), and orchestrates service elements such as physical environment, people (clients and employees) and the process of service delivery to help clients co-create their desired experiences (Teixeira, Patrício, Nunes, & Nóbrega, 2012).

Co-design is a way of integrating the consumer co-creation practice, characterized by some distinct characteristics. For Steen, Steen, Manschot and Koning (2011), co-design is critical for service design because different perspectives and a productive combination of these are necessary to understand both the demand side of a service, ie the needs of users and customers, as well as the supply side, that is, technologies and processes, in order to develop successful services. Co-creation techniques can be applied to contribute to co-design and use clients as a resource for ideas or as partners in product development or co-development (Mukhtar, Ismail, & Yahya, 2012). Although they are most commonly used in the generation of ideas and prototyping, these techniques can also be applied to contribute to the research and initial data collection with potential users. Next, we explain two techniques applied in this study: card sorting and storytelling.

2.1. Card Sorting

For Spencer (2004), card sorting is a reliable and inexpensive method for finding patterns of how users would expect to find content or functionality. It is a technique that prompts users to organize items into groups and assign categories to each group. This method can be applied in the development of new services, in an interview with visual support, that allows the user to expose their perceptions, reactions, and preferences, and to the developers to approach more the expectations for requirements and criteria of a new service.

2.2. Storytelling

Services are dynamic because the customer and the service provider influence the service experience that is co-experienced and experienced in the interaction. Services can be compared to theater, as pointed by Mossberg and Nissen Johanssen (2007), where the system functions as a performance staged: trained actors populate the stage, customers experience performance, and the backstage provides invisible support. This complexity poses challenges to designers and decision makers to visualize and prototype services. Narrative techniques, therefore, such as storytelling may be useful tools to deal with this complexity (Kankainen, Vaajakallio, Kantola, & Mattelmäki, 2012).
The storytelling technique has several advantages, such as:

- User stories are brought together to inform and inspire design. The most commonly used methods include observations, design tests, and interviews. Interpretations of user data are also communicated to be projected through narratives such as personas and current action scenarios.

- For storytelling in service prototyping, storytelling is used as a means of formulating a design driver that facilitates the overall style and design of a service. A story serves as a liaison thread to connect various details of architecture and the design of the environment to communication, marketing, and customer experience.

- Storytelling can be used to create and manage contexts in which experiences happen. Storytelling is, therefore, a tool to create a specific image, to differentiate it from other similar services, and to create and maintain an attraction, an experience that triggers the imagination.

Authors such as Kankainen et al. (2012) point out that the storytelling technique combines the collaborative construction of scenarios and discussions in focus groups. It contributes to service design by providing different types of user information: users tell real stories about their service experiences, or users can create new service ideas and are also asked about their opinions and attitudes in a type of focus group discussion.

3. METHODOLOGY

For the application of the card sorting technique associated with storytelling, we surveyed potential users for the urban garden PSS. Considering the focus of the PSS project in the company-to-company (B2B) relationship and for condominiums focused on sustainability, we selected an apartment manager with experience of more than 5 years in the activity to understand the role of this user, their behavior and motivations, both in their professional function and in relation to the PSS proposal.
We developed seventeen cards, separated into four groups, with images illustrating varied conditions and characteristics that stimulated the development of the interview. We presented the cards to the interviewee in four steps, according to the cards of the same group, and in one each of these steps the interviewee's perceptions were collected according to the focused feature. During the application of the card sorting technique, the syndic was encouraged to talk about her impressions and memories about the images and cards, thus associating the technique of storytelling.

3.1. Card Preparation and Development

We created four categories of cards with the colors: blue, yellow, green and lilac. The group of blue letters, out of a total of three (Figure 1) sought to understand the role of the respondent in her role as a syndic of a condominium. Therefore, the cards sought to gather information about their responsibilities, how to deal with compliments/complaints, and about the condominium environment, especially green and shared areas.

[Figure 1] *Cards from the first group (blue), translated (left to right): Responsibilities; Compliments; Ambience (Font: The Authors, 2019).*

The yellow cards (Figure 2) aimed to capture information regarding the syndic behavior and activities, from their daily routine, but also in activities of leisure, fun, and moments of rest. We also sought to identify how the interviewee uses the technology (applications, computer, smartphone) to perform their tasks or entertainment.
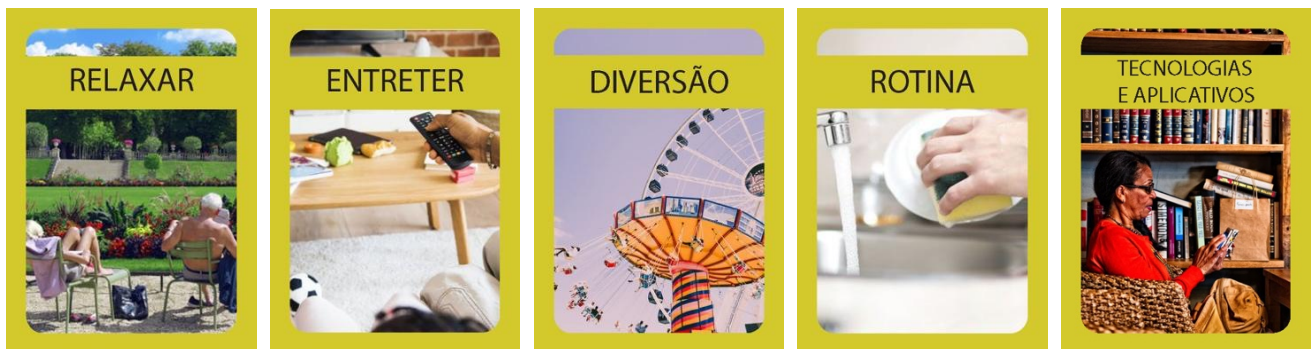
[Figure 2] *Cards from the second group (yellow), translated (left to right): To Relax; To Amuse; Fun; Routine; Apps and Technology (Font: The Authors, 2019).*

The third group, with 9 cards in green color, aimed to obtain information that could serve as possible motivations to have an urban garden in the condominium. The cards presented aspects about sources of information (how and where the syndic seeks information), plants, floriculture, condominiums, agrochemicals, organic, urban garden, garden maintenance, and plant cultivation. This group of cards sought to verify the interest of the syndic in the cultivation and care of plants and urban garden, and to know if the proposal would be well received by the residents.

[Figure 3] *Cards from the third group (green), translated (left to right): Information Source; Plants; Flower shop; Residents, Agrotoxic; Organics; Urban Garden; Maintenance; Farming (Font: The Authors, 2019).*

A final group with 4 cards in lilac color (Figure 4), aimed to obtain information about the reaction of the possible user to the proposal of the service, with information related to an automated garden, information shared among the members, commerce in the condominium (sale or exchange of organic products produced on site) and assistance provided by the company to the client.

[Figure 4] *Cards from the fourth group (lilac), translated (left to right): Automated garden; Community; Trade in Apartment complex; Assistance (Font: The Authors, 2019).*

3.2. Definition of the script for the application of techniques

For each stage and group of cards, a semi-structured interview script was elaborated, only to guide the beginning of the dynamic and to help the interviewee. As we presented the cards, the interviewee was allowed to explain her speech as she wished. We took notes and records throughout the application, including the order in which the syndic chose to talk about each card, which she considered more important and why. The results of the dynamics are reported in the next section.

4. RESULTS

After applying the card sorting session associated with storytelling, we verified that the individual with the role of an apartment manager could be one of the target audience of the PSS proposal, for having greater knowledge about the management of the condominium and dealing with routine activities of care and maintenance. For this, we verified that the assignee must show an interest in cultivation, to "buy the idea" and be motivated in installing such a system in his condominium, as well as "sell the idea" and also encourage the residents to join the cause.

However, we found that only the interest of the apartment manager in some cases is not enough. Residents themselves should also present a profile on these practices, primarily aimed at stimulating shared activities, using common areas of the building and willingness to implement new practices that promote urban agriculture and more sustainable and conscious habits.

5. DISCUSSION

This paper aimed to describe the application of the card sorting technique associated with storytelling in the development of an urban garden Product-Service System in condominiums with a focus on sustainability. The explanation of the techniques was carried out based on articles already published and based on the report of experience of the application of the two associated techniques. We highlight that there is no quick recipe since the technique can be adapted to each project context.

We consider the importance of broader dissemination of these techniques, especially for designers, whether for product or services. The use of more empathic techniques allows a better understanding of the perceptions and needs of potential users, which can contribute to projects that better meet customer expectations and satisfaction.

As a suggestion for future research, we recommend experimenting with these techniques in other project contexts. In this research, we applied the technique in the form of an individual interview, but it could also be done in a focus group with more participants. Each project has different requirements, so the importance of knowing the various techniques and possibilities of application, to adapt them according to the project.

6. ACKNOWLEDGMENTS

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