UNDERSTANDING CONTRIBUTION OF STAKEHOLDERS IN THE DESIGN OF A SERVICE APPLICATION

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ABSTRACT

The importance of stakeholder involvement in the innovation process has been widely addressed in research fields such as participatory design, co-design, and participatory innovation. This paper presents a case study of involving various stakeholders in the development of a service application. By looking back at the evolving of the concept, this paper summarizes 6 key contributions of stakeholders: state problem background, define requirements, provide contents, enhance the mental model, improve feasibility and resolve conflicts. It contributes to the field of participatory innovation by reporting on the diversity and different perspectives going into the design, which in turn enhances the understanding of the values of participatory approach in industry.

INTRODUCTION

Participatory approaches to design are characterized by the continuous involvement of relevant stakeholders, in order to develop functionally friendly and democratically accepted products or services. However, in industrial companies that operate on a global market with a business-to-business structure, the design of IT services can involve diverse stakeholders from multiple backgrounds. Participatory approaches have to meet the organizational challenge to find consensus across stakeholders in a design process.

The case study presented in this paper concerns the participatory development of a service application for an internationally operating Danish industrial company with a typical business-to-business structure. This application aimed at supporting end users with frequent asked technical issues occurred on site that would typically be called to solve, in order to reduce the pressure at a hotline.

In the development of this application, stakeholders such as service engineers, sales companies, product managers, global service and end-users were involved in over 38 workshops. For this paper we'll look at details of the contributions of core stakeholders at particular times, and how these contributions influenced the creation of the envisioned application.

LITERATURE AND THEORY

It has been advocated by various researchers from participatory design (Ehn & Kyng, 1987), participatory innovation (Buur & Matthews, 2008) and co-design (Sander & Stapper, 2008) to bring multiple stakeholders into innovation the process.

Participatory design is defined by Muller as "a set of theories, practices, and studies related to end-users as full participants in activities leading to software and hardware computer products and computer-based activities" (2003). It has its roots in bringing democracy to work and therefore started its practice aiming at getting the workers' needs heard in system design (eg. Sandberg, 1979; Kyng &Mathiassen, 1982 and Nygaard, 1979). But modern PD theory has become a more open-minded area emphasizing involvement of multiple stakeholders from various disciplines. It is very important to address "many-voiced nature of design" (Bødker & Buur, 2002), the complexity of human requirements and workplace democracy (Muller, 2003) as reported in various cases (e.g., Kensing et al., 1998; Korpela et al., 1998; Gärtner, 1998). One of the most important activities for researchers in PD is developing tools and techniques to enable the connection of "current and future work practices with envisioned new technologies" (Kensing & Blomberg, 1998).

Co-design, claimed to draw its roots from participatory design, is a very broad term that can be roughly referred to "the creativity of designers and people not trained in design working together in the design development process" (Sander & Stapper, 2008). It arose to face the new "network innovation" and researchers have reported numerous cases to use co-design approaches to drive innovation projects with stakeholders (Albinsson & Forsgren, 2007).

Participatory innovation, developed by Buur and Matthews (2008), is an expansion of current user-driven innovation theories. In addition to participatory design, it also emphasizes the business value and constraints in applying design methods. It looks at the organizational background behind the projects and discusses the way to include business into consideration.

DATA AND METHODS

THE CASE

The project is about developing a smartphone application to reduce hotline pressure for an international product company and it was proposed by a local sales manager. The company sells its products through global sales and service organizations, which are present in more than 100 countries, and are supported by a large partner and distributor network.

The concept of the application is: users can get basic instruction for their tasks, which were selected by customers and service staff, and request further support from the hotline through the application. The local service technicians will get the requests by email and handle them accordingly. In this way, the company can expect getting basic questions answered by this application and receiving more qualified requests, which recorded the steps of the users before the request and include detailed product data important for service.

METHOD

This paper uses the method of ethnographic study to collect data by observing workshops and project meetings of the product development process.

38 co-design workshops were studied and documented with videos, photos and notes.

RESULTS

We found that the involvement of diverse stakeholders contributed to this project with their specific knowledge and perspective.

Commonly, stakeholders in large companies hold very specialized knowledge while a digital product might cover a wide collection of information. Fig 1 shows a brief picture of how the concepts evolved with the stakeholder involvement. The bubbles in blue are the final functions while the ones in grey are the abandoned ones.

As a result, 5 main functions i.e. instruction, service request, safety information, product library, barcode scanning are included in the final concept. In the following sections, I will talk about how each function was formulated with stakeholders' involvement.

INSTRUCTION

This function is about providing all the basic instructions regarding important and common tasks on hand for users to check.

Hotline and service staff from sales companies offered the frequently asked questions and prioritized the materials. Application engineers, who are experts in technical information verified the logics of the instructions and corrected some of our misunderstanding. Technical writers provided the right source for the information. And customers tested the

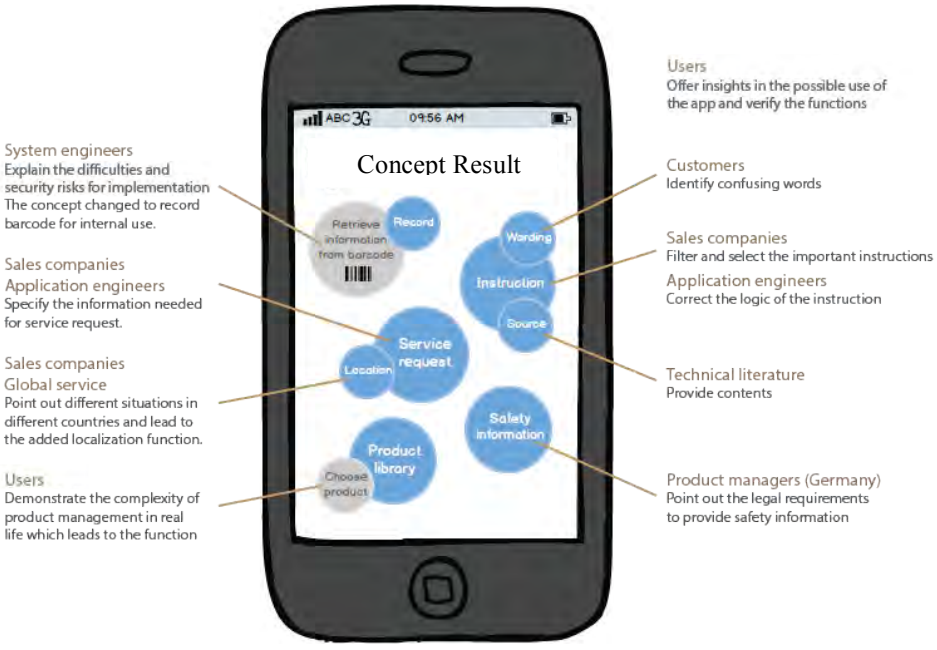

Figure 1: Function summary of the service app

prototype and identified the confusing words.

SERVICE REQUEST

In the case that the problem cannot be solved by the instructions stored, users can compose service requests following a default template and send them to specific recipients through the app.

Service staff from sales companies are the first-level hotline while the application engineers are also involved in hotline issues when the problem could not be simply solved. So they together composed the required items for users to request support.

This function got more complicated with more sales companies involved. It was assumed that the service request should be sent to the local sales companies but apparently the email addresses were not available in all countries. What is more, some sales companies were worried it might ask for more human resources to handle the request. After negotiating with global service, who was responsible for the activities of sales companies, service request function was changed to a country-by-country solution.

SAFETY INFORMATION

This function contains cautions and warnings about operating machines.

It was proposed by the product managers from Germany to include safety information. All the technical literature must include safety information according to legal requirements and it was risky to just take some parts of the manuals without including the safety information. So safety information was included as suggested.

PRODUCT LIBRARY

Users can store and manage their product information and filter instructions or request service based on each product.

All the instructions and service request function are based on a specific product but require different level of details. Product library does not have direct business values so it was added to the picture until we got a deep understanding of the users' work. Every user is dealing with a big number of machines in the factory and each service partner is also supporting many users. This makes the process of choosing a product and re-using the previous product information rather complicated. So we added the function of product library, which allows users to manage their product information.

BARCODE SCANNING

The function is to allow users to scan the barcode for service purpose.

This function had a big change from retrieving information from barcodes to simply recording barcodes. From the user experience point of view, it was proposed in the beginning that use could get all the product specific information through barcode scanning. This idea arose the excitement of both designers and other business stakeholders. But diving into technical details, currently all the information was stored in internal systems, which made it a complex task to interrelate systems and at the same time it might bring security risks. After re-considering the use cases, the concept was changed to scanning barcode and included it in the service request, which is exposed to internal service staff only.

Besides the direct influences, the participation of users supported all the functions because they were the final deciders of whether or not the functions were valid. For example, some internal stakeholders questioned why users would take the time to compose a service request instead of calling hotline directly. An endless debate was much less effective than just talking to users. In this case, users told us that only very basic questions could be answered by phone directly while most of time they needed to write emails or follow up with emails. The service request function could work better than emails firstly because it offered guidance in filling the required information. This was particularly important for service partners who might leave the users' site right after and could not add more product information anytime easily. Secondly, it allowed requesting support on-site easily. Emails were still mainly used on computers, which were normally left in office.

HOW DO STAKEHOLDERS CONTRIBUTE TO THE DESIGN

The concept was evolved through participant of stakeholders. Based on the result of the product talked about in the last section, I will discuss the values of stakeholder's involvement perceived in this case study.

STATE PROBLEM BACKGROUND

The project started from an idea proposal by a local sales manager. The proposal offered rich background about the hotline staff overwhelmed by the repeated issues, which supported the goal setting of this project.

DEFINE REQUIREMENTS

Target users, namely end users and sales companies, presented their requirements for the system - providing important instructions offline and supporting further service request.

PROVIDE CONTENTS

The knowledge experts, which in terms of this case are application engineers and technical writers, fulfilled the needs and built up the content of the concept. Compared with service engineers who are mainly dealing with inquiries on site, applications engineers with a broader view about machines and technical writers are involved as the official provider of the information. The involvement of the experts guaranteed the information to be accurate and up-to-date.

ENHANCE THE MENTAL MODEL

The stakeholders enhance the mental model by improving the logic and flow of the system. For

example, the function of product library came into the concept after we understood the challenges users are faced due to the big numbers of the machines. Similarly, various local sales companies explained the different ways of doing services in different countries, which changed the standard flow to send service request through emails.

IMPROVE FEASIBILITY

Feasibility is important for turning an idea into the real product. In this case, the involvement of system engineers made the concept of scanning barcode feasible by avoiding data exchange with internal systems.

RESOLVE CONFLICTS

Conflicts and dilemmas appear in different stages of the design and some stakeholders play key roles in the decision-making.

The management team plays a key role in interpreting the information and making strategic decision. Taking the service request by email as an example, the manager of the global service had to decide whether to push the standard email services. As a result, a switch was added to the system to allow each country to decide whether or not users can send service request to them by email. This was because of the strategic planning and the respect to each local organization in a flat organization.

Users were crucial in verifying the functionalities. As discussed in last section, when the function of service request by email was questioned, the users' feedback solved the conflicts and saved the function.

CONCLUSION AND LIMITATION

This paper looks at a case study of developing a service application in a industrial company to demonstrate the values of various stakeholders to the development of a concept. It reported 6 key contributions of stakeholders: state problem background, define requirements, provide contents, enhance the mental model, improve feasibility and resolve conflicts.

This paper contributes to the field of participatory innovation by demonstrating the values of diverse roles in the innovation process, which in turn enhances the understanding of the values for adopting participatory approach in industry.

The project that this paper took place in a Danish company with a flat organization. This might influence the roles of stakeholders and their possible contribution.

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