

Towards a User-centered Ubiquitous Customer Feedback Elicitation Framework

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Abstract: This paper suggests a customer-driven approach for regular elicitation of customer feedback for vendors. Ubiquity and user-centeredness are assumed as central enablers of customer-driven feedback elicitation embedded in customer's common consumption and/or purchase environment (e.g. point of sale). Following the design science methodology, a user-centered ubiquitous customer feedback elicitation framework is developed as an artifact that can support vendors in developing corresponding systems. The framework is evaluated by producing a concrete system instantiation realized with low-fidelity prototyping and wizard-of-oz techniques. Evaluation results indicate the suitability of the proposed approach: the framework was applicable for the development of a ubiquitous customer feedback elicitation system and the resulting low-fidelity prototype was rated as suitable for ubiquitous and user-centred feedback elicitation.

1 INTRODUCTION

Current Feedback Elicitation. Customer feedback is important for vendors for a number of reasons. For example: (1) it can provide information for product engineering processes and market research, (2) it often provides the opportunity to identify product faults so that vendors may be able to fix them and improve product quality or (3) customer's loyalty can increase through interaction by communication to the vendor (as part of customer-relationship management).

Considering different methods for obtaining customer feedback, we can differentiate between vendor-driven and customer-driven feedback elicitation. Vendor-driven is defined as feedback elicitation initiated by the vendor (e.g. surveys, interviews). In this case, it is the vendor's task to motivate and incentivize the customers for providing feedback. Customer-driven denotes the customer as the initiator of feedback elicitation. A vendor is not initially involved in motivating customers for feedback communication.

We assume that customers are most likely interested in providing their feedback when actually using a product or service. However, vendor-driven customer feedback elicitation in many cases neither takes place at the point of sale/use nor at the customer's common usage environment, e.g. at home. In addition, current approaches like interviews or competi-

tions require significant expenditure of the vendor in planning and conducting customer feedback elicitation. Thus, vendor-driven customer feedback elicitation often lacks integration into the customer consumption process. This can hamper customer feedback communication as it requires additional and dedicated effort of the customers not directly related to the time-based context of their use of the product or service. We argue that a customer driven feedback elicitation that is better integrated into the customer consumption process could help to better fulfil vendors' and customers' feedback elicitation needs.

Solution Approach and Goals. Based on the following assumptions, a customer driven approach is developed in this paper: (1) Feedback elicitation should be user-centered, i.e. use customers' intrinsic motivation (if existing) to communicate their feedback. These motivations are different from current feedback elicitation, as mainly vendors benefit from feedback so far. (2) Feedback elicitation shall be ubiquitous, i.e. integrated into customer's environment. This spans customers' purchase and usage processes. The integration is assumed to support customer's motivation for feedback elicitation.

These assumptions can be supported by related work. User-centredness, i.e. a customer's intrinsic motivation to contribute feedback, can be seen in

online-communities. It is a trust-building mechanism especially in e-commerce situations, where feedback depicts a first evaluation of the business partner's trustworthiness (cf. Dellarcas (2003) on eBay's feedback mechanism). Ubiquity can also be seen in e-commerce situations as feedback is often a part of the purchase or use processes there (e.g. Skype feedback function after completing a call). Different kinds of intrinsic motivation (such as fun, sense of community or altruism and autonomy) have also been identified as the dominant factor for user-generated content (Nov 2007, Kuznetsov 2006). Therefore, the goal is to develop a ubiquitous customer feedback elicitation framework based on user-centeredness and ubiquity as main design guidelines.

2 RESEARCH METHODOLOGY

The chosen methodological approach combines the design science paradigm with a user-centred design methodology for its operationalization. Design science as defined in information systems research is "fundamentally a problem solving paradigm" (Hevner et al. 2004) with the goal to "develop technology-based solutions to important and relevant business problems" (ibid). The solutions are artifacts (constructs, models, methods and instantiations) whose construction relies on "kernel theories that are applied, tested, modified and extended through the experience, creativity, intuition and problem solving capabilities of the researcher" (ibid). Thus, our goal is to develop a framework for user-centred, ubiquitous feedback systems as an artifact that can inform design and implementation of feedback systems in practice.

The adopted research method in pursuing this goal is depicted in figure 1. To identify the framework's requirements, a literature analysis and a user-centred requirements analysis with scenario-building and focus group discussions were performed. Two different scenarios were discussed: a product-based (books) and a service-based scenario (university restaurant). Both provided input to the requirements and to the reference process model. On the basis of the obtained requirements, a user-centred, ubiquitous feedback elic-

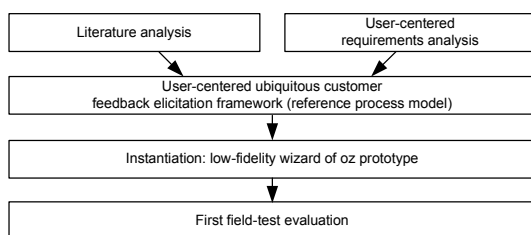


Figure 1: Research approach.

itation framework was derived. This step included the consideration of technological constraints and enablers. The derived framework was then applied to instantiate a concrete feedback system. The goal of the instantiation was to evaluate two key questions: (1) Is the framework suitable for the development of concrete feedback systems? (2) Does the derived instantiation satisfy customer's requirements for feedback elicitation? To address these questions the derived instantiation was implemented and evaluated in form of a low-fidelity prototype.

3 USER-CENTERED FEEDBACK ELICITATION FRAMEWORK

To support vendors in developing a ubiquitous customer feedback elicitation system, a reference process model is derived that is based on the literature analysis and user-centered requirements analysis. According to Fettke and Loos (2005), reference process models can be used for business engineering since they serve as a blue-print and can be instantiated for a specific use case. For this purpose, the framework includes the required modules for a ubiquitous customer feedback elicitation system and the module relations.

The customer consumption processes as described in Reisch and Scherhorn (2005) are the basis for the construction of the process model. They include pre- and post-purchase processes. Pre-purchase processes are (1) reflexion of one's needs, (2) information searching, retrieval and evaluation and (3) purchase decision. Post-purchase processes are (4) consumption and usage as well as (5) utilization and disposal. All requirements derived from literature and requirements analysis were mapped to the corresponding consumption process phase.

The reference process model differentiates between customer driven, vendor driven and system processes. Customer driven processes contain all interactions triggered by a customer. Vendor driven processes are such that do need vendor's initiation. System processes are those that do not require any customer or vendor initiation, but highlight specific aspects, e.g. store or display existing feedback.

According to the reference process model, a customer has only two tasks. The first is to choose a product using one or more methods and the second is to communicate the corresponding feedback during or after the consumption/usage phase. All other processes need to be vendor or system driven. A vendor should provide incentives for feedback elicitation as part of the system design. It is also the vendors' responsibility to realize mechanisms for the commu-

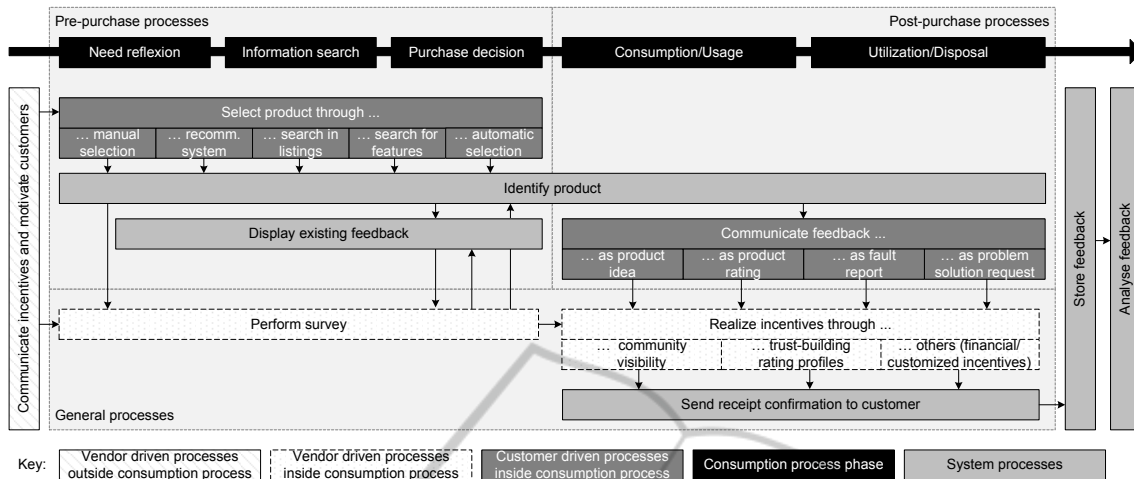


Figure 2: A ubiquitous customer feedback elicitation reference process model.

nication of incentives to the customer, for example through the customers' feedback visible in a community or through a rating profile. However, though the vendor should formulate an appropriate incentive system, its design should build on intrinsic motivational factors (such as fun, community reputation etc. (Nov 2007, Kuznetsov 2006)). In this way, the incentive system is customer-oriented and provided at design time as part of the system design. Thus, its activation is actually not vendor- but customer-driven (in contrast to other approaches such as surveys etc.).

The feedback system is then responsible for product identification, displaying existing feedback, sending a feedback receipt confirmation to the customer as well as for storing and analysing the feedback for further use. The resulting reference process model is shown in figure 2.

4 FIRST EVALUATION

The goal of the evaluation was twofold: (1) to test if the framework is applicable for instantiation, i.e. if it is suitable to generate a concrete version of a feedback system. By demonstrating this we can prove the internal validity of the developed framework according to the design science method. (2) To test if the derived concrete instantiation, e.g. a prototype, satisfies the criteria of user-centered and ubiquitous customer feedback elicitation. By proving these aspects of the instantiated prototype we can validate whether the design goals of the instantiation were reached.

Prototype System and Evaluation Design. A scenario-based procedure was chosen to develop a concrete instantiation. The instantiation itself was realized as a low-fidelity wizard-of-oz simulated proto-

type. A university restaurant scenario was chosen for the validation setting since it was one of the scenarios addressed in the requirements analysis and as it represents a recurring service that commonly lacks an established solution for ubiquitous, customer-centered regular feedback elicitation. Most often customers can only use an online feedback form or talk to the staff that usually has limited time for conversation only. Furthermore, enabling technical infrastructure such as AutoID technology RFID may be readily available if RFID chip cards are used for the payment process (as increasingly common in university restaurants). This makes it a realistic scenario both in terms of a concrete need and the realistic possibilities for eventual technical realisation.

The prototype system was realized as follows. The feedback design follows a traffic-light metaphor (red, yellow, green). A customer meal tray is supposed to have a built-in RFID chip. The customer's chosen meal is registered at the cash desk and stored onto the meal tray RFID chip there. After consumption, a customer evaluates the lunch with the meal tray by touching the feedback light on a separate table (cf. figure 3). A notebook display was used to send a confirmation receipt to the user. This display was controlled

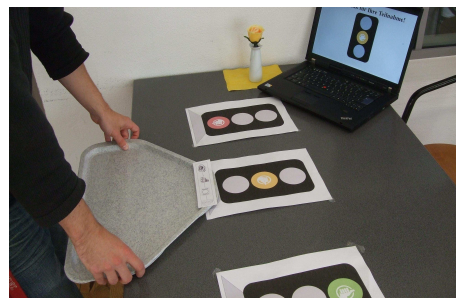


Figure 3: A customer submits feedback using the prototype.

by an assistant who was responsible for displaying the confirmation. Participants were not told that the assistant operates the display and thus had the impression of a functioning system (wizard-of-oz simulation). Restaurant staff was briefed for co-operation in advance for a more realistic simulation. Participants were asked to perform a complete consumption process, i.e. choose and pay a meal (sweets), eat and small talk (as in a typical lunch situation), and return the meal tray including feedback elicitation.

In total, 14 participants took part in the evaluation, 57% male and 43% female. All were students having lunch regularly in the university restaurant. Participants were divided into three groups with each four to five participants as smaller groups are more realistic and easier to observe. Their impressions from the test were obtained through Likert-scale questionnaires and a group discussion.

Participants fulfilled most tasks without notable problems. There was little uncertainty with the prototype's feedback lights as some participants were not sure about the correct meal tray positioning for touching the light. In such a case, either other participants gave assistance or the persons interacted with the prototype, e.g. by trying out other positions, until the notebook display showed a confirmation.

Results and Lessons Learned. In summary, the results indicate that a majority of the participants would like to have the opportunity to contribute their feedback daily (71 % completely agree (ca), 29 % partly agree (pa)), would daily provide their feedback (50 % ca, 43 % pa) and would like to know the other's feedback (14 % ca, 57 % pa). These results indicate that the design was successful in building on participant's intrinsic motivation. Prototype experience was rated as fun (43 % ca, 57 % pa), simple to use (57 % ca, 43 % pa) and feedback elicitation was rated practical (64 % ca, 36 % pa). Immediate receipt confirmation of the submitted feedback on a screen was also agreed with as a good idea, but it was noted that other customers should not see one's own rating. This points to the importance of anonymity and implies need for further research on this aspect of the framework design. Participants also favored the prototype system over traditional feedback methods and would want to have it implemented in the university restaurant.

In the discussion, participants suggested using a lamp indicating successful feedback contribution or an acoustic signal instead of showing the selected feedback light itself.

Overall, the prototype evaluation indicates that the derived ubiquitous customer feedback elicitation framework is suitable for instantiation of a concrete prototype. The prototype was evaluated as appropri-

ate for feedback elicitation by the participants and was perceived as satisfying user needs (user-centredness).

5 CONCLUSIONS

We have presented an approach to elicit customer feedback based on user-centeredness and ubiquity as principal design guidelines. A framework for user-centered, ubiquitous customer feedback elicitation has been proposed as an artifact supporting vendors in the development of such feedback systems. Through an instantiation of a concrete prototype and its evaluation by a wizard-of-oz simulation in a field-test, the internal validity and design goals of the proposed framework were validated.

The evaluation represents a first test with limitations regarding prototype implementation, participant representativeness and other influencing circumstances. Thus, the results allow only limited generalization and depict therefore a first indicator of the suitability of the proposed solution. Further evaluations with repeated tests and more participants over a longer period of time are recommended. In addition, other use cases should be included for producing different instantiations and validating more comprehensively the different parts of the proposed framework.

Future research should also address the question of feedback confirmation in more detail, as well as the integration of mobile devices (e.g. smartphones) and the integration with feedback in online-communities.

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