# Embedding the Customer’s Voice

Giving the customer the possibility to participate in the development of a product by providing him transparency regarding the overall progress and implementing its feedback is one of the most important success factors. Especially if the final results of the collaboration are not explicitly clear or if the project is some kind of research work, it is of highest importance to gather the customer’s feedback continuously. The feedback serves as an input in adapting the product or even the process of development.

Especially in the area of software development, the need for constant interaction between a manufacturer and its customer is widely acknowledged. This fact can be demonstrated by the adoption of agile methods (see figure \ref{agileAdoption}). These methods, like XP, Scrum and FDD, offer the possibility of high transparency, short feedback-cycles and increased flexibility regarding – characteristics that proved themselves good and that are strongly wanted by the manufacturers adopting agile methods (see figure \ref{agileFeatures}).

## Determining the Modalities of Collaboration

To embed a process that as well satisfies the customer as it provides the manufacturer the possibility to get as much useful input and feedback as possible, the modalities of collaboration are negotiated as a first step. The salient points in this negotiation are

\begin{itemize}

\item{Who is the customers specialist contact person and how should the communication with him/her take place?}

\item{Who is the customers technical contact person and how should the communication with him/her take place?}}

\item{In which way will the customer contact our company if necessary=}

\item{What are the customers preferences regarding the reports on the project’s progress?}

\end{itemize}

While some of these points like the contact information of a certain person in charge are only of informational kind, other points like the desired way of communication are of high importance. Since there are certain preferences in our company regarding the length of the iterations and the way how the communication should take place, the CORE value of the customer’s answers in respect of our company’s preferences is calculated.

**\subsection**{Results}

The results of the first questionnaire that serves to determine the modalities

of collaboration between our company and our customer are presented in this

section. The analysis of the results can be found in section

**\ref**{sect:q1\_results}. Answers that contain personal data like contact

information are omitted.

**\subsection**{Gained Knowledge and further Steps taken}

The result of the questionnaire is as well important as it is satisfactory to our company since the most answers given by the customer reflect the preferences of our company. This is especially true regarding the questions on the way our company will contact the customer, on the interval that is used for reporting and on the reporting’s level of detail.

While the fact that our customer wants to contact the project manager and not any other team member complies with our company’s preferences, the way of contacting him is suboptimal in our opinion. Nevertheless, our company will attend the customer’s wished in this point.

To be able to gain honest and serious feedback from following questionnaires and not to overstrain our customer’s willingness to collaborate, the last section deals with questionnaires in general. It is determined how long it took to answer the current questionnaire and how much time our customer is willing to spent in answering future questionnaires. For the simple reason that it was estimated that answering the current questionnaire would take 10 minutes, the CORE value retrieved from the answers on these questions is not highest achievable value. However, the result shows that the questionnaire’s length perfectly fit the customer’s preferences. Future questionnaires will therefore be designed in a way that they nearly have the same length. The CORE values for the options on the question how long it took to answer a questionnaire will be adapted.

## Clarification of the Requirements and Assessment of the first Design Prototype

Gathering and writing down requirements for a product requires high prudence. \cite{Young} defines 15 characteristics of good requirements. Even if high effort is expended in the process of requirements engineering, there are mostly requirements that don’t exhibit all of these characteristics. In the most cases, these requirements lack clarity and expressiveness.

The unclear requirements as well as a first mockup are the basis of a second questionnaire. It’s aims are to inform the customer how the vague requirements were interpreted in the first step, to offer the customer the possibility to give a feedback on this interpretation and to provide him a first sense of the product that will be developed.

**\subsection**{Results}

The results that help to clarify the requirements and to get a first feedback on the planned design are depicted below and interpreted in the next section (see section \ref{sect:q2\_results}). Since a mistake has been made on the creation of the questionnaire, the assessment how long it took the customer to answer it had to be done in an additional form. The results of the initial survey and the additional form are assembled together.

**\subsection**{Gained Knowledge and further Steps taken}

**\label**{sect:q2\_results}

As it can be seen in \ref{fig:resultsOverview2}, the results are very satisfying and the interpretation of the requirements fits the customer’s expectations. More detailed feedback could be gathered regarding the design of the system. In the further development, our company will focus its attention to simplify the design e.g. by shortening the presented texts and by trying to scale up the area that presents the sensor information.

Unfortunately, the customer was not able to answer the questionnaire within 5 minutes as preferred, although the open questions on the optional requirements were already omitted. Since this was expected and the clarification of the requirements is a very important point, it is acceptable in the case of the current survey. Nevertheless, there has to be some effort made in the future to keep the questionnaires as short as possible for not deceiving the customer again in this regard.

@INBOOK {Young,

author = "Young, Ralph R.",

title = "The Requirements Engineering Handbook",

chapter = "The Importance of Requirements",

publisher = "Artech House Inc.",

year = "2004"

}

As it was determined in the first questionnaire (see section

**\ref**{sect:firstQuestionnaire}), our customer wishes to get biweekly information about the project's current progress. The information included should exhibit a low level of technical detail and only reflect the relevant design decisions. A sample report can be found in figure \ref{fig:interimReport}.

Dear Customer,

We’re glad to present you the information about our current progress. Please let us know if there are any questions or remarks on the recently made decisions or on the progress itself.

\subsection{Recent Activities}

The recently completed activities include:

\begin{itemize}

\item Refinement of the Scope according to our most recent agreements (see the email, 7\textsuperscript{th} April 2017)

\item Refinement of the final Requirements according to you feedback

\item Finalisation of the market analysis regarding the competitors on the market as well as regarding the available hardware parts

\item Finalisation of System Analysis including the gained knowledge from our last feedback form

\item Finalisation of the needed algorithms' analysis

\item Creation of improved skins for day- and night-mode

\item Implementation of the data storage

\end{itemize}

\subsection{Current Timeplan}

Unfortunately, as you were informed by the Email of the 13\textsuperscript{th} April 2017, we ran into some problems regarding the implementation of the data storage. These problems, causing an initial delay of 3 days on this tasks, could now be overcome. Since the implementation of the depending systems could nevertheless be continued with only little overhead of abstracting the real data storage, the total delay is currently only about one day and will be compensable by time buffer we included in our project plan.

\subsection{Cost Estimation for a Hardware PoC}

As you required, we made an estimation about the costs to create a Hardware-PoC. Please let us know if you are interested in the justification of the used components.

\subsection{Final Results of the System Analysis}

The context of the system is depicted below. It shows you all the systems that we expect to get input from and all the components we plan to actuate. If you need further insights into the analysis we conducted, we will send you the complete analysis in a separate document.

\subsection{Improved Skins}

According to your feedback, we improved the available skins of the system. In addition to the first presented skin, we created a brighter skin that might be used in the day-mode. We also included your feedback regarding the simplification of the outputs extended the area where the relevant sensor information is represented.

{Next Steps}

Our next steps will be final inclusion of the data storage as well as the enhancement of testing. In parallel, we will refine the current documentation and prepare the review / presentation of the developed product.

Up to this point, Satistica was mainly used to clarify open questions. After the termination of the project, it is important to determine the customer’s satisfaction to be able to perform better in subsequent projects. The main points that are examined in the questionnaire are:

\begin{itemize}

\item{The customer’s satisfaction with our communication}

\item{The customer’s satisfaction with the process of gathering and implementing its feedback}

\item{The customer’s satisfaction with the reports provided}

\end{itemize}

The feedback results are again depicted in the following section and the gained results are discussed in the section \ref{sect:q3\_results}.

The knowledge that could be extracted from the last questionnaire cannot be applied to the current project since the questionnaire. Nevertheless, the gained knowledge is very important in regard to the aim of continuous improvement of our company and can be applied to subsequent projects.

One of the questionnaires outcomes is that the interim reports should be improved. The two-columns-layout implicates the problem of pictures being two small. In some points, e.g. if the progress of the project is stated, textual descriptions might be avoided by using expressive charts.

In addition, our company will cherish the idea of face-to-face communication being the most efficient way of clarifying open questions. The overall result of the last feedback form is depicted in figure \ref{fig:resultsOverview3}.