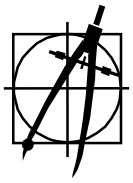
Eliciting Input



Eliciting customer input is key to ensuring that the product being developed is focused on customer needs - both hidden and explicit. Careful and thorough attention to gathering customer needs will mitigate the risk of missed requirements and provide the basis for the product specification. Interaction with the customer is an invaluable exercise that will lead to superior design solutions including those that a customer may have conceptualised but has never had the forum to present. The process used to elicit customer input is equally as valid and useful for soliciting information from other sources such as domain and technical experts.

Project activities in which eliciting input is useful:

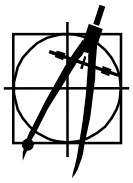
* Identifying customer needs
* Determining functional requirements
* Concept development
* Analysing competitive products

Other tools that are useful in conjunction with eliciting input:

* Design Reviews
* Kano Model
* Prioritization Matrices
* Presentation Aids; Presentation Design; and Presentation Logistics and Delivery
* Requirements Management
* Quality Function Deployment
* Sources of Ideas and Information

Introduction

There are a number of methods by which customer input can be gathered including surveys, interviews, focus groups, and observations. Each method has strengths and weaknesses, and there are differences in opinions of the usefulness of each, therefore a combination of methods should be considered. Ideally, the development team should strive to have frequent interaction with the customer, both formal and informal, and each meeting should be looked upon as an opportunity to gather input and feedback.



Application of Methods for Gathering Customer Input

Identifying the Customer(s)

It is very important to identify all of the stakeholders of a product design early in the development cycle. The stakeholders are the people who will be affected by any of the product's attributes. The list of stakeholders can include, but is not limited to:

End user/Consumer	Purchaser	Manufacturer/Production
Retailer	Installers	Legal Bodies (e.g., Canadian Standards Association)
Maintainers	Sales and Marketing	

- Input should be gathered from a cross-section of customer demographics. To ensure adequate representation, it is often useful to create a matrix that takes into account various customer characteristics appropriate to the product, then complete the matrix with persons to elicit input. Characteristics may include age, gender, occupation and familiarity with legacy products. If possible, back-ups for participants should be identified to ensure adequate cross-representation in the event one or more participants become unavailable.
- Identify contacts within each customer group. Make every effort to be in contact with the actual customer, not a customer representative, so that valid information can be obtained. For example, be wary of managers that want to speak on behalf of end users or production employees as they may not be aware of real issues and may have different priorities.
- If applicable, try to include "lead users" in the information gathering process as they are customers that are ahead of the majority of the marketplace in their needs, may be able to better articulate current and future needs, and will likely benefit the most from product innovations.
- There are no definitive guidelines as to the number of customers from which input should be gathered. The number of contacts for any given product development will depend on availability of contacts, resources, schedule and complexity of the product. As a rule of thumb, data collection should cease when new information is not revealed.

Eliciting Input

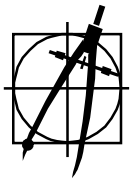
Developing Questions

One of the most important aspects of eliciting input is careful planning to ensure useful information is obtained.

- Determine objectives for questions. Each key question should have a specific objective that it addresses.
- Design questions in accordance with the following guidelines:
    1. Use complete, clear and brief sentences.
    2. Do not combine questions.
    3. Do not ask leading questions.
    4. Use terminology familiar to customers. If in doubt, avoid using terminology altogether.
    5. Design questions for the least knowledgeable customer.
- The format of the questions is dependent on the method used to elicit input.
    - Written surveys should allow quick responses to questions such as provided in the following formats:
        - Yes/No/Don't know/Not applicable
        - Scales of choices ranging from one extreme to another (e.g., Strongly Agree/Agree/Neutral/Disagree/Strongly Disagree). If a definitive positive or negative response is desired, avoid odd numbered scales. Customers may have a tendency to select neutral responses.
        - Multiple choices
        - Ranking
    - Questions for interviews and focus groups should be more open ended to facilitate discussion (e.g., why, what, where, when and how).

Tips on eliciting input:

1. Be careful about influencing customer responses. Ask open-ended questions in a manner that avoids leading a customer to a specific response (e.g., "Would you prefer Product X to be purple?" versus "What colour would you prefer Product X to be?").



2. Uncover the real needs. Sometimes customers will provide a solution without relating the problem. Ask questions to uncover the problem that needs to be solved.
3. Be flexible. If customers are providing valuable information, do not cut them short in interest of maintaining an agenda or schedule. Also, if the customer identifies an unexpected potential need, probe for further information.
4. Use props. If possible, bring the product or a visual of the product you are improving, competitors products, or products similar to that being designed as a stimulus for discussion.
5. Inquire about non-typical circumstances. Customers often will describe or demonstrate typical use conditions and need to be prompted to describe non-typical applications or use conditions.
6. Observe non-verbal communication. Excitement when describing certain functionality or grim facial features can reveal a great deal about how a customer feels about a product even though not verbally expressed.

Surveys

Surveys are one of the most common methods of gathering customer input. They are usually conducted in interviews in person or by telephone, or as written questionnaires delivered and completed in either hardcopy, or electronically by e-mail or Internet. They are relatively inexpensive and quick to apply. Surveys are good for asking specific questions on existing products or new, well-defined product domains however they are not ideal for revealing unanticipated needs, allowing further exploration or providing information on the use environment. Moreover, surveys tend have a very low return rate. If surveys are employed, great care should be taken in developing the questions and should be tested prior to their use.

Interviews

Teams embarking on a new design project often conduct interviews early in the process to obtain information about the design problem, customer needs and potential solutions. Although more time-consuming than surveys, they are relatively inexpensive to conduct and allow for greater exploration of information and ideas.

Employing context-free questions is useful for eliciting information from customers that they may not think is important or know about on existing products or future requirements. (See Attachment A for sample questions). This question type can be used for any product with little prior knowledge of the product or the persons being interviewed.

- Interviews are best conducted in use environment, lasting one to two hours in length.
- Interview between 10 and 50 people, stopping when no new information is being discovered.
- The interview team should consist of at least two people – one to interview and another to take notes. It is useful to include a third person on the interview team to take notes on non-verbal reactions of the persons being interviewed.
- Interviewing two or more people together allows comparison and exploration of differing replies. However, when interviewing more than one person, be wary of one person's answers inhibiting others. If this occurs, private follow-up interviews may be necessary.
- It is advisable to offer interviewees the opportunity to review the transcribed interview for accuracy and completeness.

Focus Groups

The synergy of group dynamics created through focus groups is beneficial when gathering customer input for product improvement or generating ideas for new products. Listening to others' comments will lead participants to recall information or build upon ideas. Focus groups can be costly if a specialized meeting room with a one-way mirror is used and the participants expect a fee ($50-$100) for their participation. One weakness of focus groups is the design team may not have the opportunity to experience the expected use environment of the product as focus groups are generally conducted in meeting rooms.

- Focus groups should consist of 6 to 12 participants and generally last one to two hours, depending on the complexity of the product.
- One member of the design team acts as a facilitator and the others as notes takers. The role of the facilitator is not to control the discussion but rather guide it through open-ended questions. This person must also monitor the participation of the individuals and encourage input from the quieter participants. Given that facilitation is a skill that is developed over time, it may be beneficial for a "coach" to provide assistance during the sessions.
- The session should be recorded, then later transcribed if possible.

Eliciting Input

Observations

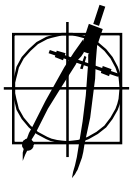
If the product under development is an improvement to an existing product, a great deal of information can be gained by observing the legacy product in use. If the product under development is an innovative, new product, observations of the process to which the product will be introduced are still useful. They can reveal potential needs that have not yet been identified but the new product could eventually satisfy. Observations are beneficial because they allow discovery at a system level – that is interactions with the user and the use environment can be observed. The downside of observations is that they may require a fair amount of time (i.e., anything from hours to days per observation) depending on the complexity of the product.

- The key to observation is to have the person/people who are being observed go about their activities in a normal manner.
- If it would not be disturbing, ask the persons being observed to verbalize what they are doing, and indicate any likes, dislikes or suggestions.
- Use judgement to decide whether to ask questions during the observation period (for immediate feedback) or record these questions to be asked immediately following observation (for minimal disruption).
- If possible, have more than one observer to increase the information captured, however be cognizant of intimidating the person being observed.
- The use of video allows the entire development team to observe the product in use but has the inherent risk of not capturing external interactions out of the camera's focus.
- Look for adaptations in process or modifications that have been made to accommodate for a lack of understanding of customer needs or use conditions.
- If possible, members of the design team should use the product in order to develop firsthand experience. As first time users, design team members may detect poor design features that experienced users have adapted to and forgotten.
- All observers should maintain notes throughout the observation process. These notes should include any functional requirements, observed or potential problems, design constraints and design ideas. The use of videotaping does not make note taking any less important.

Analysing the Data

The team should conduct a debriefing session shortly after each survey, interview, focus group or observation while information is still fresh.

- All notes taken should be consolidated into a single report. Any audio taping or videotaping should be reviewed and included in the report.
- Review the data gathering process and modify the process or the questions in order to elicit the desired information.
- Analysis of the customer input should be conducted as a design team activity.
- Customer statements and observations made during surveys or focus groups are evaluated to determine underlying needs. These needs should be recorded using the following guidelines:
    1. Avoid jumping to design solutions by expressing needs as functionality rather than as a design feature (i.e., "what" not "how").
    2. Be specific.
    3. Express needs in a positive manner (i.e., what need the product will satisfy rather than the needs it will not). However, occasionally a negative statement will be necessary to convey a requirement.
    4. Express needs as an attribute of the product rather than an attribute of something external to the product (e.g., "Product can be lifted by a single person" versus "A single person can lift the product").
- For each need statement, maintain a record of whom the customer represents (e.g., consumer, production) but not the name of the customer to ensure anonymity.
- Consolidate the data to remove redundancies.
- If there are unmanageable amounts of data after removing redundancy, conduct an affinity exercise to further consolidate data.



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Attachment A

Examples of Context-Free Questions[1]

Design Process Questions

Who is the client?

Where else can the solution to this design problem be obtained?

Can we copy something that already exists?

Product Questions

What problems does this product solve?

What problems could this product create?

What environment is this product likely to encounter?

What kind of precision is required or desired in the product?

Interview Process Questions

Are you the right person to answer these questions?

Is there anyone else who can give me useful answers?

Is there someplace I can go to see the environment in which this product will be used?

Is there anything else I should be asking you?

Is there anything you would like to ask me?

May I contact you if I have more questions later on?

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[1] Gause, Donald C. and Weinberg, Gerald M., *Exploring Requirements: Quality Before Design*, Dorset House Publishing, New York, NY, 1989. Pp.59-67