

# Breakdown analysis

Group

Identify situations where the user does not complete the desired task or activity

## Introduction

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Once you have gathered information about users, via interviews, observations, questionnaires and other methods, you need to make sense of it. One of the most popular techniques was introduced by Strauss and Corbin (1998: *Basics of Qualitative Research Techniques and Procedures for Developing Grounded Theory*) who offer a systematic way to analyze qualitative data. They introduced the concept of *Grounded Theory* which is "a non-mathematical process of interpretation, carried out for the purpose of discovering concepts and relationships in raw data and then organising these into a theoretical explanatory scheme". Note that Grounded Theory does not refer to a theory, per se, but rather a set of techniques designed to help social scientists develop new theories, grounded in their real-world observations.

HCI researchers often use a simplified version of this method, called Thematic Analysis. Rather than theorizing about human behavior, the goal is to identify specific opportunities for design. This is a need-finding process: it is important to stay open to different perspectives and avoid designing for stereotypes and misunderstandings about the user. Designers rarely need to design multiple levels of codes and categories. Instead, the trick is to work with the specific examples that emerged from your studies of users and identify a key design concept that will drive your design.

A breakdown analysis is a variation of thematic analysis that focuses explicitly on breakdowns—situations in which the user cannot use the system as intended. Some breakdowns are technological, such when the system assumes a wireless connection and breaks when the wifi is down. Others are more user oriented, such as when a system requires 100% of the user's attention and the user is actually crossing a busy street. Identifying potential breakdowns is a critical element of design: design for real-world use, not idealized, stereotypical situations.

## What to do

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### Preparation (before)

Collect the interviews, introspection and interaction points.

### Procedure (during)

This is a subjective process: different designers will extract different categories from the same set of interviews. Look especially at the interaction points where users are not happy with their interaction with the technology.

The basic process consists of identifying and coding the categories of behavior found in interviews and observations. This is an iterative process: start with what they call an 'open spirit' and pick out examples that form natural categories. Next, write a two-three word description of the example on a piece of paper, post-it note or on a whiteboard. Then, go through the examples systematically, looking for natural categories. Find other examples that illustrate the same category. Give each category a descriptive name and a one-word code. On separate sheets of paper, or on one large sheet, write the code for each category and place relevant examples underneath. Read through and determine if higher-level or lower-level categories are more appropriate.

If you work with a transcript, chunk the participant's statements into short expressions centered around a topic (here, breakdowns). Take advantage of breaks and pauses in their answers to create self-contained expressions. Create thematic categories, for example, time, lack of information, feedback. Also consider expectations and emotions. Research projects usually require at least team members to independently code the data separately, after which they compare and discuss the categories. Next, group the high-level themes that emerge from the data and identify the key issues to address in the design.

Be sure to consider breakdowns that involve repeating a simple tasks or complex patterns of actions. Also consider breakdowns that involve cumbersome interaction or difficulty finding the functionality or determining if the action worked as expected. Finally, think about the basic interaction: is it annoying, slow or difficult.

### **Create a Design Resource (after)**

At the end of the process, you should have a bottom-up synthesis of the the behavior you observed, rich in specific details that will help you design. If you focus on interaction points, you will find that these lead directly to your use scenario and, later, your design scenario. Remember: you can always abstract from detail, but you cannot find details from abstractions. Both are important: but start with the details.