



A Designer's Roadmap to User-Centered Activities

How the Common Industry Format Can Help You
Focus on Activities with the Greatest Payoff.

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Usability professionals often work on projects that are insufficiently funded or staffed. Although seasoned specialists often find ways to work within these constraints, new practitioners may not. In such instances, user-centered design activities often default to basic usability planning and testing. While these activities are critical, they may not be enough to help the product team develop an understanding of the users, and the manner and context in which the product will be used.

The User-Centered, Common Industry Format's Design Process

When a user-centered design process has not been adopted, activities can be implemented piecemeal. The question is, how do we choose activities that hold the greatest possibility for payoff?

Fortunately, we can use the Common Industry Format (CIF) to guide us in choosing these activities. The CIF was developed by a government-industry group led by the National Institute for Standards and Technology (NIST). This article reviews how the process described in the CIF can assist you in choosing user-centered design methods for your projects.

Develop User Profiles

The CIF recommends developing user profiles first. This enables us to design for the needs, strengths and limitations of the target user population. However, product design is often focused on a target market segment or a set of technical features, with perhaps a passing concern for the actual people who will be using the product. Some practitioners (e.g., Cooper, 1999) recommend that the product team consider whether it is designing for a specific person or an idealized persona who represents a segment of the user population.

The CIF suggests that the intended user population be identified, including relevant demographic information (e.g., special needs and training). Context of use should also be identified, including such factors as the physical environment, social environment (e.g., whether the product is used individually or with a group of people, who the secondary users are), and task characteristics such as frequency and criticality.

Here are the recommended activities for developing user profiles.

- **Conduct naturalistic observation and ethnographic interviewing.** Observing and interacting with representative users helps establish an understanding of user needs, potential usage environments and variation in the types of people who will be using the product. Principles of contextual inquiry (Beyer & Holtzblatt, 1998) and ethnographic interviewing (Wood, 1996), such as adopting a “user as mentor” relationship, are especially helpful for these activities. The data retrieved, such as user quotes, observed behaviors and environmental artifacts, can serve to drive future user profiling activities. It can help develop a common understanding of the users across the development team as well.

- **Develop user profiles and find user representatives.** Compile data gathered from user research activities and present the profiles in a location that can be referenced by product team members.

- **Create task scenarios from user data.** Develop realistic task scenarios by working with users, mining any existing user data and conducting task analyses (Hackos & Redish, 1998; Kirwan &



Ainsworth, 1992). Key tasks generally consist of frequent, routine tasks performed by users, as well as infrequent, critical tasks that must be carried out to complete one's job.

- **Document and communicate key findings to the product team.** User information is most effective when brought directly to the entire development team, which can use user-based examples to identify product features that are supported, and those that are not. An effective method for many teams is displaying posters for each user profile.

Plan the Usability Test

Early development of the usability test plan is essential to optimizing the value of the usability test. While the CIF offers considerable freedom in terms of specifying how data should be collected and analyzed, it specifies that three categories of data be included:

1. **Effectiveness**, which is related to how well a product can be used in terms of accuracy and completeness.
2. **Efficiency**, which represents the resources expended to accomplish a task.
3. **Satisfaction**, which measures the participant's subjective assessment of a product's ease of use, its usefulness and preference for the product.

Although the scope of a test may not include collecting data for each category, the practitioner should consider how data for each category could be measured and obtained, in the event that such data may be helpful in the future.

Here are the recommended activities for test planning and data collection.

- **Write the script.** The usability test script provides the basis for how the test will flow in the eyes of participants. At a minimum, the script should identify the tasks to be performed and the people needed for the test—for example, a test facilitator who sits with the participant, a data recorder who captures key time and error measurements, and an observer who takes notes and records key quotes from the participant. For each task identified in the script, the necessary materials should be identified, and instructions for the participants should be provided.

- **Verify that the data will be meaningful and informative.** Before running the pilot test, verify that the data to be collected will be meaningful. To help understand if the data will be useful, simulated data can be generated for each task and measure. The simulated data can then be analyzed as if it were actual data. This “practice analysis” can help highlight problems associated with data collection and data definition, such as measuring task completion in minutes instead of seconds, or defining errors in terms that are too vague to be meaningful.

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- **Determine benchmarking needs with the product development team.** Usability benchmarks, such as the completion time or number of errors associated with a task, are helpful for demonstrating improvements or costs associated with interface changes. These benchmarks can be used as a basis for conducting cost-benefit analyses.

- **Develop a contingency plan.** Often problems arise before or during testing, and testers sometimes cancel the test until the problems can be fixed. However, canceling a scheduled test imposes a risk that the recruited participants may not return, and it imposes delays that can hurt the chance for critical usability problems to be identified and fixed. If problems occur during testing, or a prototype is not sufficiently detailed to carry out the test as planned, valuable data can still be collected from participants. For example, you can interview participants to develop a better understanding of the user profiles, tasks and context of use. If prototypes are not complete, consider holding a short participatory design session to develop interface ideas and a better understanding of the user's mental model.

In a recent project, we were missing the screen shots the user would need to complete a task. Instead of delaying the test, we asked the test participant to diagram her expectations of what the interface would look like based on what had already been experienced. In so doing, we were able to develop an understanding of her mental model and her expectations for how the remainder of the interface would be designed.

- **Make the test interesting and realistic.** Many tests require that a participant sit in a room while the script is read by the

participant or a test facilitator. Although this can be an effective method for testing, we have found benefits from increasing the interactivity of the test. For example, in one recent test of a product developed for technical support personnel, we created a virtual help desk environment where simulated customers called participants on the phone with problems. The test participant had to solve each caller's problem using the product prototype. This approach helped improve test validity by replicating aspects of the target user's environment, and the participants were engaged by the interactivity of this approach. (Many users said things like, “Uh-oh, this is just like work.”)

Communicate Results

After the test data have been analyzed to some extent, the results should be shared with the product development team. While the CIF is meant to be used as a tool for communicating usability data among usability professionals, most development team members will not have the time or interest to read the CIF report. Indeed, the CIF does not even contain a discussion section, as the goal of the report is to com-

municate objective test results, not an interpretation of the results by the usability tester or team. Therefore, it is important that the usability professional discuss the results of the test with the team—and interpret the results in the context of the tasks performed, the users who performed them and the context of the intended product's use.

Instead of sending the report to the product team, the usability professional should communicate key usability needs and findings in an efficient and targeted manner. Most usability reports go unopened and unread. Discuss results during a short debriefing session with product team members. Such a session ensures that key issues are discussed and can serve as an effective catalyst for identifying future research and validation needs.

Before the debriefing, distribute a “quick and dirty” report to team members, pinpointing highlights and lowlights from the test. If you wish to send the report to the team as an e-mail message, do not send it as an attached document. Feedback from our product team indicates that e-mail messages are more likely to be read (or at least skimmed), while attachments are either ignored or filed away for reading “when there's time.”

A Sample “Quick and Dirty” Report

Our e-mail reports contain five sections designed to be written in a sound-bite

CIF TEMPLATE ONLINE.

A full treatment of the goals of the NIST CIF effort, and the most recent version of the CIF template, can be accessed at <http://zing.ncsl.nist.gov/ius>, the Industry Usability Reporting Web site.





fashion to facilitate skimming. Paragraphs are not allowed and complete sentences are discouraged. Each section is composed of a short, bulleted list outlining the following information:

- **Required actions** calls out assignments for various product team members, such as changing a word in the interface, adding an item to be documented in the installation guide and researching an unknown competitive product that a user has mentioned.

- **Highlights** lists tasks that were carried out with particular ease, requirements that were supported by users' needs and test methods that proved particularly effective.

- **Lowlights** identifies tasks that most or all users failed to complete, task measures that were worse than those for a competitor or a previous release, and requirements that were not found to be valid for users in a given profile.

- **Key quotes** presents quotes that users said while performing tasks and during pre- and post-test interviews.

- **Research leads** specifies topics and products that should be explored and investigated.

By providing user data and usability information in a condensed, targeted format, information is rapidly disseminated

across the product development team. At the post-usability test debriefing, all participants are then aware of topics of interest. Note that this may present a risk when dealing with team members who are particularly zealous about some part of the project. We have been surprised to see key quotes forwarded to upper-level management to support the addition or subtraction of requirements for a project. Although this risk is inherent with most usability test reports, the risk appears to be greater with this method because more people on the product team are likely to read about the findings. To discourage misuse of reports, set some ground rules with the product team regarding how the findings can and should be used.

A Useful Roadmap

While the CIF template does not dictate the activities that must take place for user-centered development, it provides a useful roadmap. Following it can help you identify information that will ultimately increase the likelihood that products are developed in the context of real user needs. The activities recommended here have been used effectively for several products. However, any activity's success depends on the product team's receptivity to the need for user-centered design. As is often the

case with user-centered designers, finding allies across the product team is one of the best ways to increase the chances that user-centered issues will influence the final product outcome.

Regardless of the level of user-centered commitment inherent to an organization, it is hoped that the activities outlined here to help usability practitioners influence team members and product development so that the ultimate benefactors will be the users themselves.

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