Carbon IQ | User Centered Design Methods

The effort of designing usable, targeted, desirable and efficient products involves acquiring and analyzing user data. Selecting exactly the right method for this can be difficult without a clear understanding how each method is used, what its benefits are and how it will affect your budget. This document outlines some common user-centered design methods.

01. Inquiry

Situation
Inquiry methods are helpful for all projects because they lay the foundation for product design and development.

Objective
The objective of Inquiry methods is to become familiar with user needs and expectations, to inform business and user requirements.

Methods
1.1 Focus Groups
1.2 Log Analysis/Logging
1.3 Questionnaires
1.4 Contextual Inquiry
1.5 Surveys
1.6 Ethnographic Study/ Field Observation

02. Participatory Design

Situation
Participatory design methods are well suited for projects with complex labeling, taxonomy, or interface issues.

Objective
Participatory design methods lead to rapid verification of design iterations, which greatly reduces time and costs for fixing design flaws.

Methods
2.1 Prototype Testing
2.2 Rapid Prototyping
2.3 Card Sorting

03. Profiling

Situation
Profiling methods are particularly beneficial for projects when users are not accessible, budgets are tight, or development teams are spread out geographicially.

Objective
Profiling methods create empathy for your end users, which helps facilitate product design and leads to a clarity of the product vision.

Methods
3.1 Persona Developemnt
3.2 Scenarios
3.3 Task Analysis
3.4 Conceptual Modeling

04. Testing

Situation
Testing methods uncover usability issues. These methods provide the most value for a project when product concepts have been verified with users.

Objective
Testing methods reduce usability risks prior to product launch; create benchmarks to which future releases will be compared; and significantly reduce support-related costs.

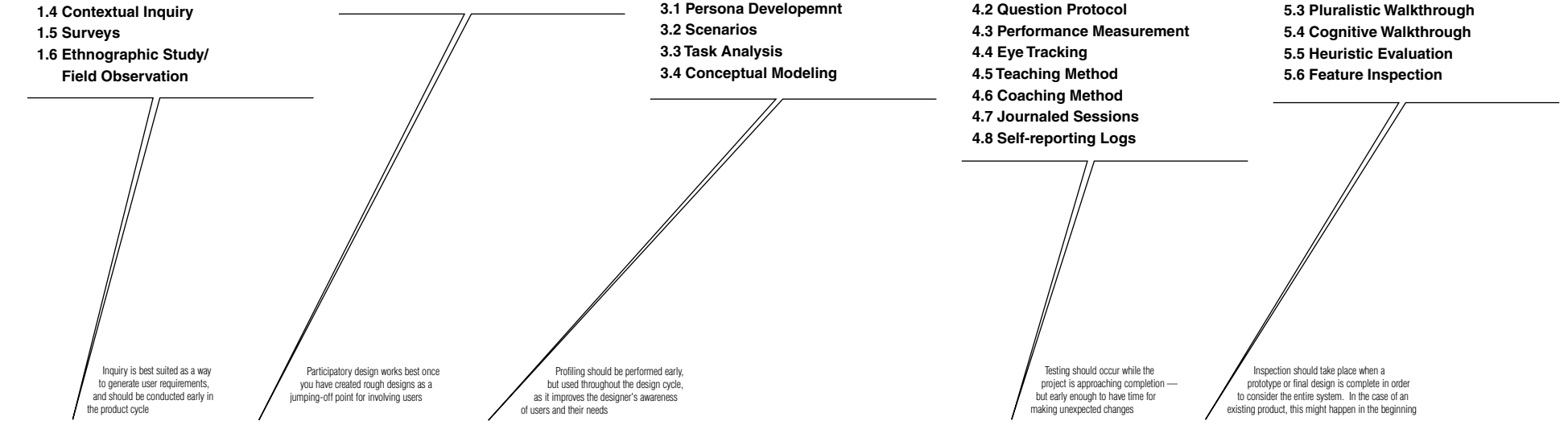
Methods
4.1 Thinking Aloud Protocol
4.2 Question Protocol
4.3 Performance Measurement
4.4 Eye Tracking
4.5 Teaching Method
4.6 Coaching Method
4.7 Journaled Sessions
4.8 Self-reporting Logs

05. Inspection

Situation
Inspection methods are "expert" evaluations. These methods are useful when users are unavailable or when objective, high-level observations are needed.

Objective
Inspection methods leverage domain expertise and best practices to provide quick and specific recommendations for product enhancements.

Methods
5.1 Consistency Inspection
5.2 Standards Inspection
5.3 Pluralistic Walkthrough
5.4 Cognitive Walkthrough
5.5 Heuristic Evaluation
5.6 Feature Inspection

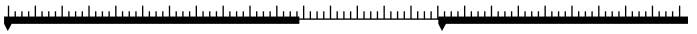


PROJECT TIMELINE
(for approximate reference only)

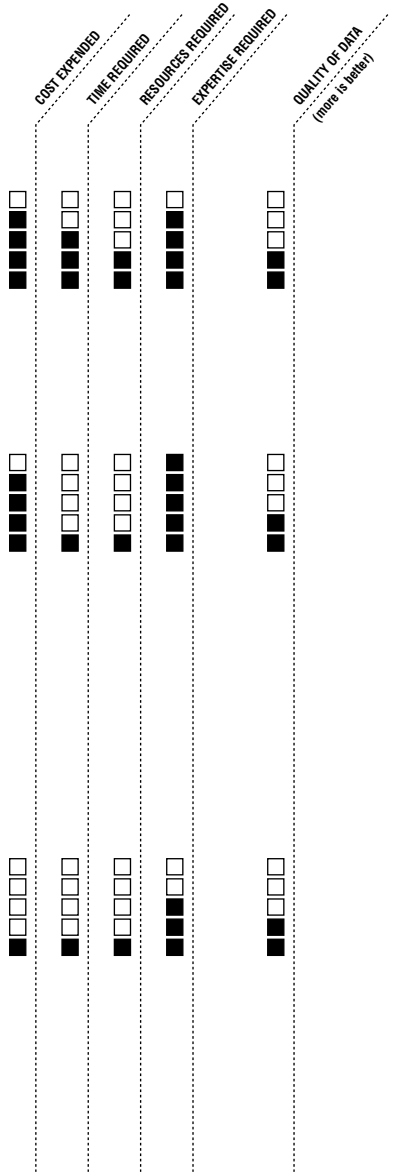
01. Inquiry

Inquiry research will be the foundation for creating feature sets and core requirements. Inquiry drives early design decisions, and is most effective if the target user is clearly and narrowly defined.

SUGGESTED TIMELINE



Before design — **Developing support materials**



1.1 Focus Groups

A small group of users are brought together to discuss their current use and /or need of a given product, and brainstorm and ideal product.

Outcome: a general understanding of user's desires from a system, including but not limited to feature sets.
Beneficial for: brainstorming new products.
Drawbacks: social dynamics may render data unreliable.

1.2 Log Analysis/Logging

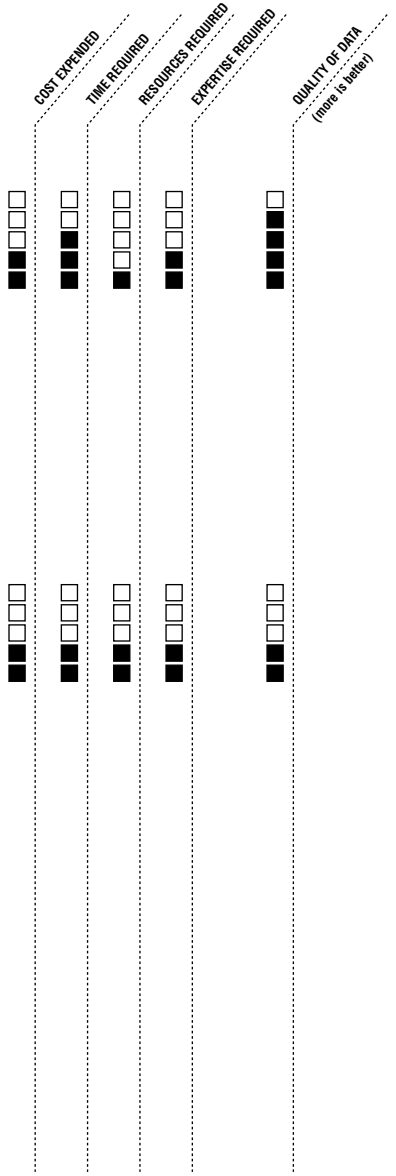
In log analysis, close attention is paid to all computer records of user activity, including statistics about the frequency of feature use and events of interest (such as error messages). Other data such as browser, OS, connection speed, etc. can also help drive user requirements.

Outcome: Knowledge of usage patterns
Beneficial for: evaluating and redesigning existing products.
Drawbacks: "Whats" are gathered, "Whys" are not. It's possible to draw incorrect conclusions from the data.
Special technology required.

1.3 Questionnaires

Questionnaires are written lists of questions that you distribute to users, to be completed at their leisure. These are especially useful for remote testing.

Outcome: quantitative and qualitative data.
Beneficial for: gathering quantitative data.
Drawbacks: users may lie or misreport. See 1.5 Surveys.



1.4 Contextual Inquiry

The analyst conducts one-on-one interviews with customers in the physical location where they would use the product while they're using the product. The interaction provides an opportunity to ask follow-up questions, to better understand user motives, and to gain insight into the reasoning behind their answers.

Outcome: a contextual understanding of a usage, environment and behavior.
Beneficial for: new products, especially those to be used in limited situations (used just at home, just in the office).
Drawbacks: multiple use-locations can increase costs and amount of research time.

1.5 Surveys

Surveys are interviews conducted with users in person or over the phone. An interviewer asks a list of questions, and the responses are recorded. Face-to-face interviewing provides an opportunity for both follow up questions to gain further clarity, as well as a chance to observe physical behavior and reactions.

Outcome: data on user attitudes, perceptions, demographics and psychographics.
Beneficial for: garnering input for initial user-requirements gathering.
Drawbacks: users are notoriously poor at self-reporting. Questions must be phrased very carefully, and answers must be closely scrutinized.

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01. Inquiry (continued)

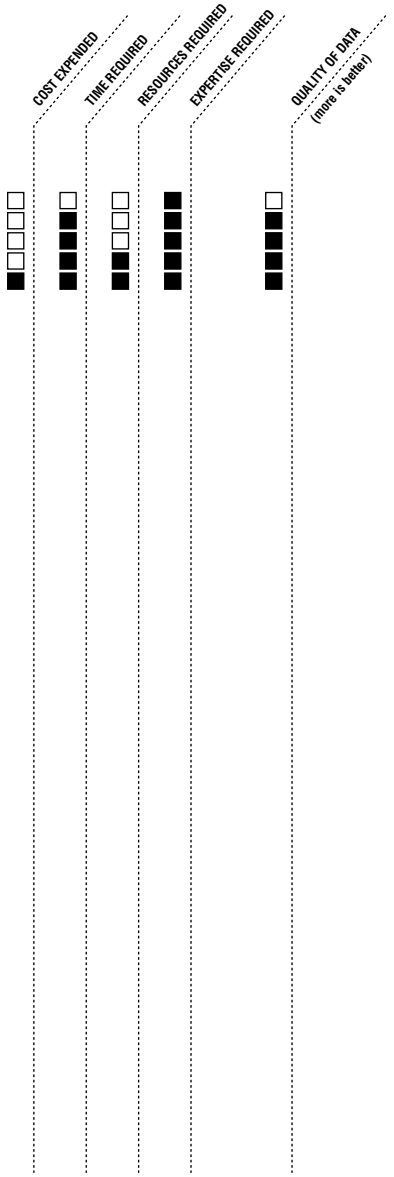
1.6 Ethnographic Study / Field Observation

Human factors engineers go to representative users' workplaces and observe their typical environment and usage behavior. The goal is to understand how they use the system and what their mental models are. This shadowing can provide an understanding of real-world, uninterrupted behavior.

Outcome: deep understanding of natural usage environment

Beneficial for: revolutionary products, daily use products

Drawbacks: time consuming.

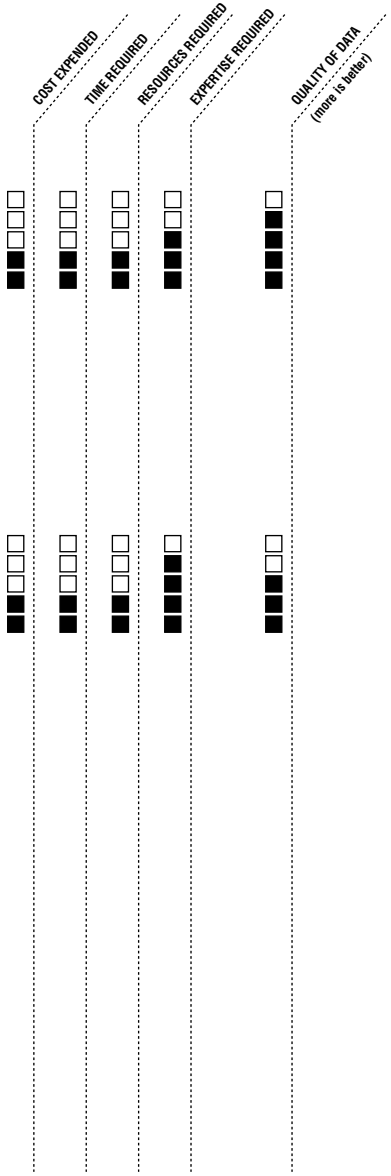


02. Participatory Design

Participatory design is based on users' active involvement in developing the product. Potential end-users are invited to interact with rough models of the product in order to provide insight into design needs and possible solutions.

SUGGESTED TIMELINE

During design



2.1 Prototype Testing

Testing prototypes is a quick way to incorporate direct feedback from real users into a design. Can be paper or HTML. Paper-based prototyping bypasses the time and effort required to create a working, coded user interface.

Outcome: a user verified early direction for interface and interaction design.

Beneficial for: testing a solution before entering the expensive phase of full design and code.

Drawbacks: natural use not possible with paper version.

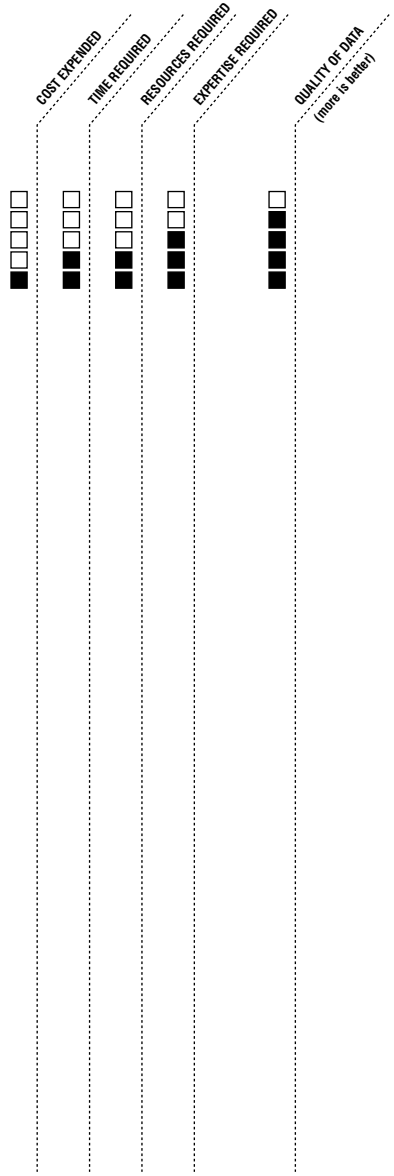
2.2 Rapid Prototyping

Rapid prototyping is the process of quickly generating mock-ups of what a system will look like, testing these mock-ups, and then modifying them based on information gained to be tested again.

Outcome: a usable prototype for an interface.

Beneficial for: early design refinements.

Drawbacks: because the prototype is changed often, statistical certainty is not possibile.



2.3 Card Sorting

Best used in the early stages of information architecture design, card sorting is a categorization method in which users sort cards depicting various pieces of information into categories. The results can then be leveraged to build an intuitive navigational hierarchy.

Outcome: data for a taxonomy, including labels and organization systems.

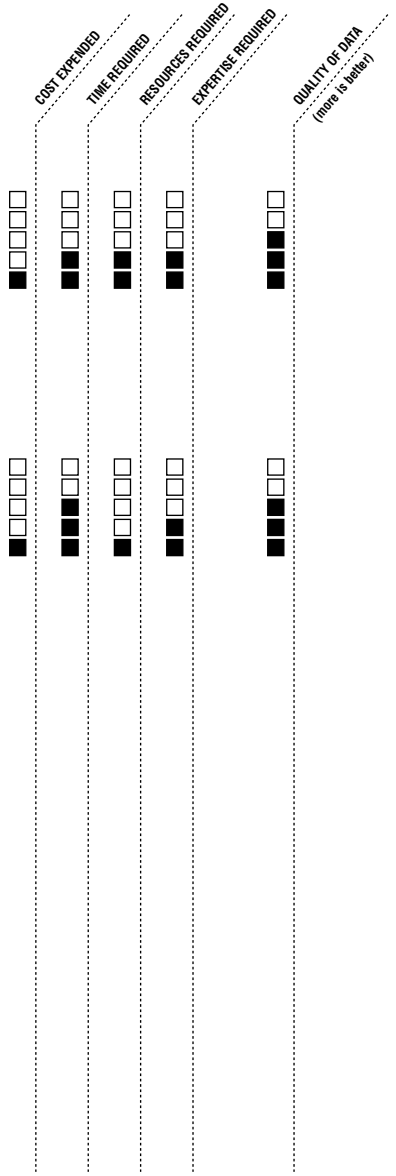
Beneficial for: content-heavy sites in which content must be both browsable and searchable.

Drawbacks: difficult for sites with a lot of different content, as it's time consuming and it requires a larger user sample.

03. Profiling

Profiling methods allow the designers to "channel" the end users, keeping their needs and desires front-of-mind throughout the design process.

SUGGESTED TIMELINE



3.1 Persona Developemnt

A hypothetical, archetypal user is created based on user and market research to guide design.

Outcome: a set of archetypal users created for guiding and evaluating design decisions.

Beneficial for: prioritizing features, generating empathy for the user in a design team.

Drawbacks: humans are quirkier than we can imagine.

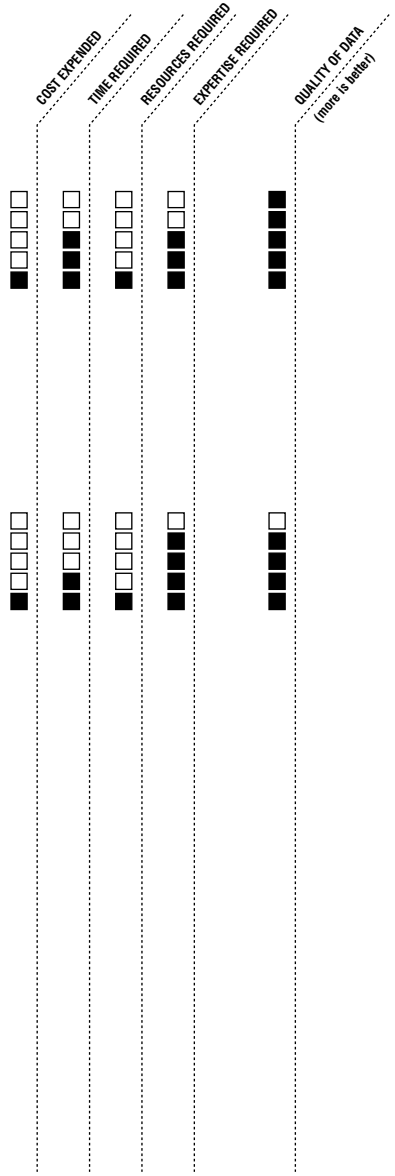
3.2 Scenarios

A scenario is a description of a persona's interaction with a system. Scenarios help focus design efforts on the user's requirements, which are distinct from technical or business requirements.

Outcome: heightened awareness of user needs at the beginning of interaction design.

Beneficial for: designing an ideal interaction for a forthcoming system; mapping and understanding interactions of multiple user types.

Drawbacks: time consuming to develop every possible scenario. Actual use may reveal new scenarios.



3.3 Task Analysis

Task Analysis is the methodical dissection of a scenario into discrete and precise tasks and actions.

Outcome: an understanding of necessary interactions, interface elements and affordances for application design.

Beneficial for: close analysis of specific interface and interaction requirements, such as decisions about GUI objects and error handling.

Drawbacks: time consuming, requires a high level of attention to detail.

3.4 Conceptual Modeling

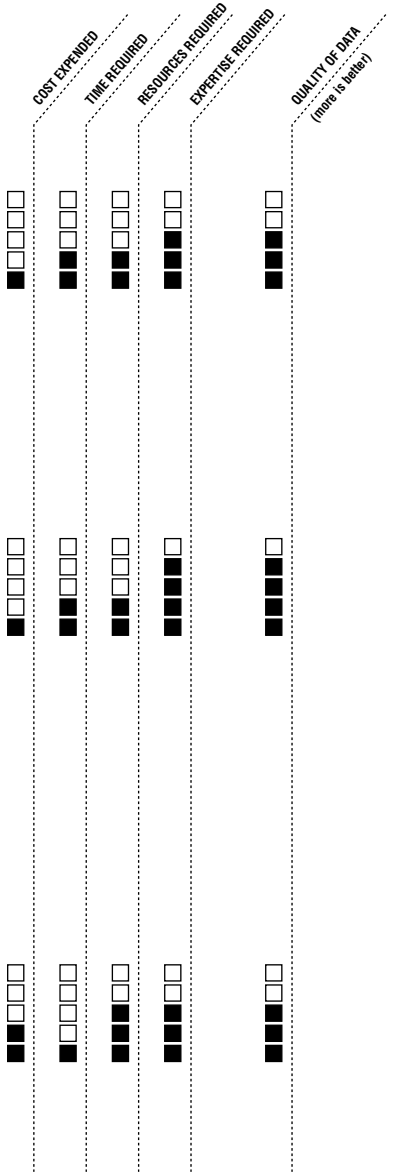
A model is a representation of the user's perception of the way something is organized or works. As a design tool, it promotes clear and critical thinking about the core nature of a project. It's also useful for communicating user mental models to the development team.

Outcome: designing an interaction system or support system to explain (or camouflage) an extremely complex underlying technology system.

Drawbacks: may unduly influence the technological model.

04. Testing

A variety of methods for conducting usability tests and evaluations to assure usability prior to release.



4.1 Thinking Aloud Protocol

During the course of a usability test, the test users are asked to verbalize their thoughts, feelings, and opinions as they interact with the system.

Outcome: report on behavior and perception of usersí interactions.

Beneficial for: understanding user conceptual models and the reasoning behind user actions; collecting quotes to underscore the weight of a usability problem.

Drawbacks: users cannot always articulate their perceptions. Articulation may inhibit natural use.

4.2 Question Protocol

During a usability test, the subject is asked direct questions about the product. Moderator uses this to suppliment the thinking-aloud protocol to better understand the user's mental model of both the system and the tasks — as well as trouble points in understanding and using the system.

Outcome: report on behavior and perception of usersí interactions.

Beneficial for: understanding motivation of actions and perceptions.

Drawbacks: questioning may inhibit natural use; questions must be phrased carefully to avoid influencing subject.

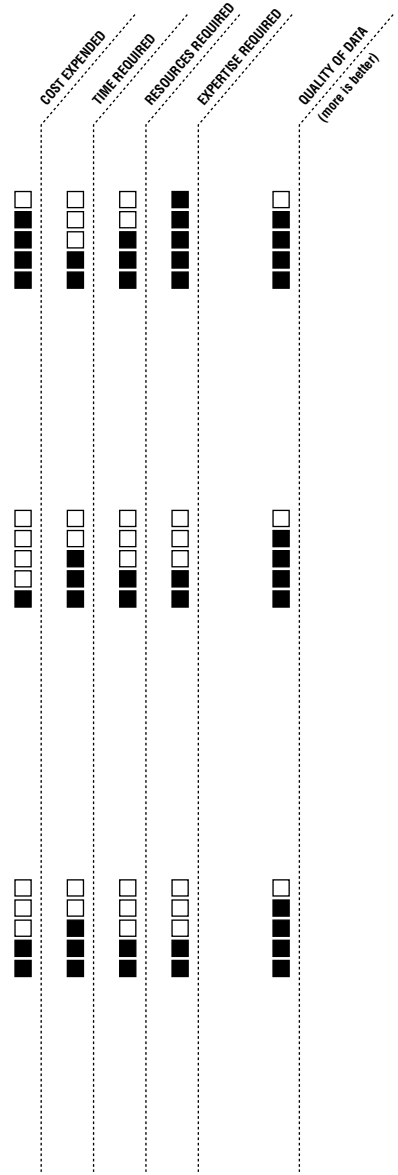
4.3 Performance Measurement

This technique is used to obtain quantitative data about test participants' performance as they attempt tasks. During a usability test the quantitative data — such as time to completion and number of errors — are recorded.

Outcome: hard data on error and performance time.

Beneficial for: productivity tools.

Drawbacks: "whys" are not answered.



4.4 Eye Tracking

Eye tracking allows testers to identify what participants look at during the course of a usability test.

Outcome: accurate data on which GUI elements are viewed and for how long.

Beneficial for: branding analysis; enriching qualitative tests.

Drawbacks: best used with qualitative testing to garner supplemental insight.

4.5 Teaching Method

During a usability test, let one test participant interact with the system, so that they can acquire some expertise in using the system. Then, introduce a new participant to the system; have the experienced participant explain to the novice how the system works and to demonstrate a set of pre-determined tasks.

Outcome: excellent data on mental models in users' own language.

Beneficial for: documentation and help.

Drawbacks: time consuming.

4.6 Coaching Method

The participants are allowed to ask any system-related questions of an expert coach who will answer to the best of his or her ability. The purpose of this technique is to discover the information needs of users in order to provide better training and documentation.

Outcome: a list of commonly asked questions and answers.

Beneficial for: providing better training and documentation.

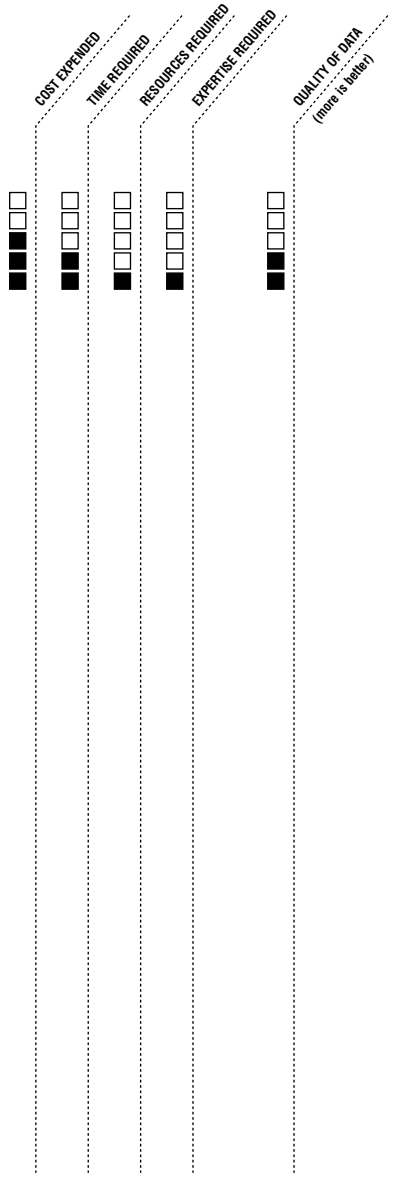
Drawbacks: time consuming.

04. Testing (continued)

4.7 Journaled Sessions

Users perform several tasks with a prototype, much as in formal usability tests, and their actions are captured with special journalizing software that allows users to annotate their experiences.

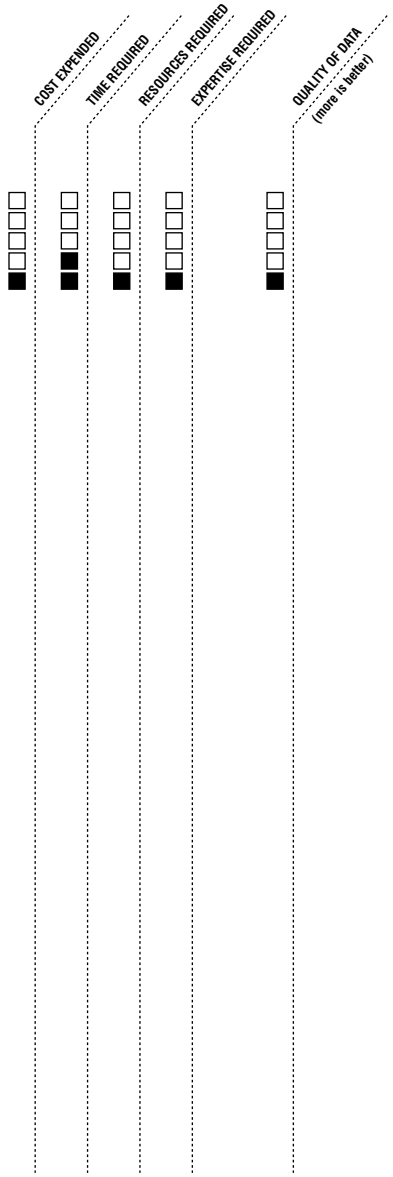
Outcome: quantitative and qualitative data on usage.
Beneficial for: remote testing.
Drawbacks: keeping a journal for qualitative data may interfere with natural use. Follow-up questions are not feasible.



4.8 Self-reporting Logs

Self-reporting logs are paper-and-pencil journals in which users are requested to log their actions and observations while interacting with a product.

Outcome: first-hand perspective of the user's experience with the software.
Beneficial for: remote testing.
Drawbacks: users are notoriously poor at self reporting, logging may inhibit natural use.

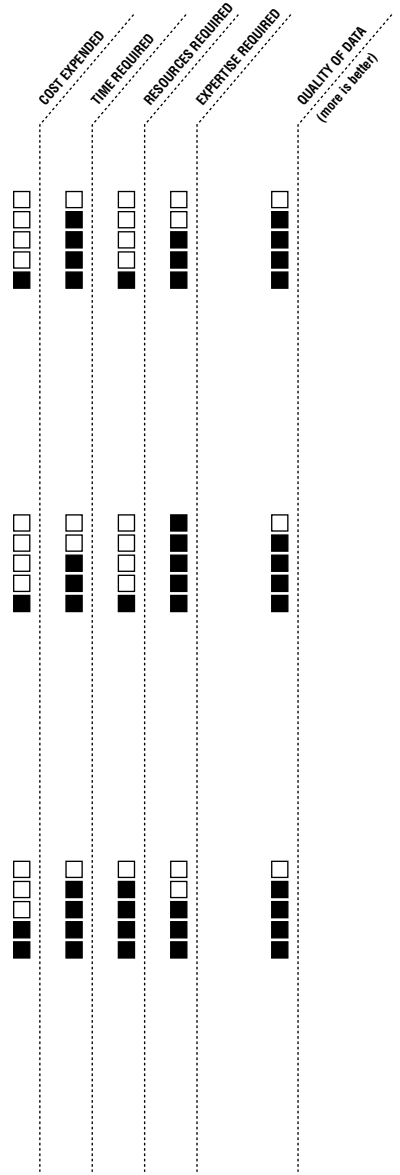


05. Inspection

In lieu of user testing (or in conjunction with limited testing) an expert is brought in to evaluate the usability of the product and make recommendations to improve it.

SUGGESTED TIMELINE

Inform design | Evaluation of design | Evaluation of final product



5.1 Consistency inspection

Evaluates the consistency in interface/interaction design across multiple products in the same product line. Consistent design conventions reduce the learning curve and minimize usability problems.

Outcome: report revealing inconsistencies.
Beneficial for: companies with a line of products, companies entering a field with existing standards.
Drawbacks: does not reveal usability flaws in pre-existing conventions.

5.2 Standards Inspection

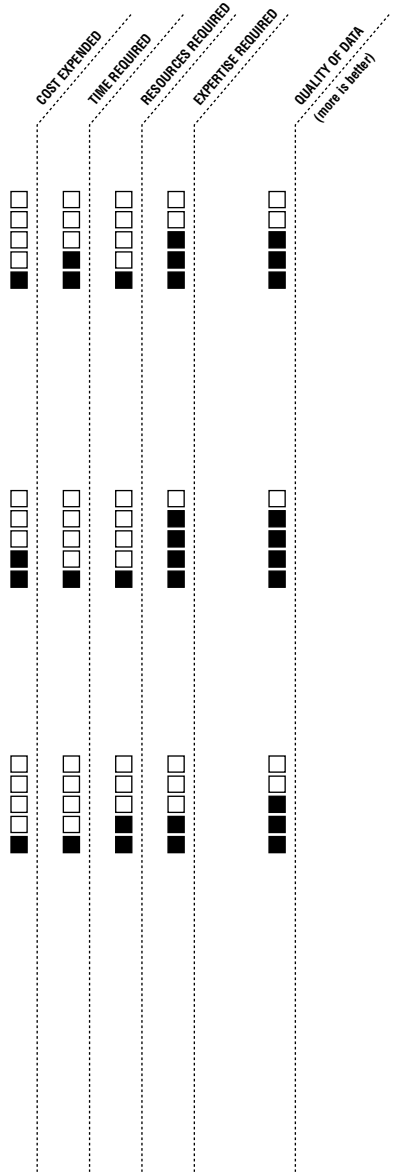
Standards inspections ensure compliance with industry standards. In such inspections, a usability professional with extensive knowledge of the standard analyzes the elements of the product for their use of the industry standard.

Outcome: report revealing adherence to existing standards.
Beneficial for: companies with products in a field with existing standards.
Drawbacks: does not reveal usability flaws in pre-existing conventions.

5.3 Pluralistic Walkthroughs

Pluralistic walkthroughs are meetings in which users, developers, and usability professionals step through a task scenario, discussing and evaluating each element of interaction. Group walkthroughs have the advantage of providing a diverse range of skills and perspectives to bear on usability problems.

Outcome: product quality report from multiple perspectives.
Beneficial for: acquiring a diverse range of skills and perspectives in assessing to usability problems.
Drawbacks: time consuming, need good moderator to make this resolve conflicts arising from discipline bias.



5.4 Cognitive Walkthrough

A less formal method of inspection in which one or more evaluators scrutinize the design while "walking through" a set of key tasks.

Outcome: report on possible usability issues.
Beneficial for: speedy evaluation, generating empathy for the user.
Drawbacks: quirks of evaluator's own user-style may bias data. Personas can mitigate this issue (see Personas).

5.5 Heuristic Evaluation

A type of usability inspection in which a usability specialist judges each element of an interface according to established usability principles.

Outcome: report on possible usability issues.
Beneficial for: speedy evaluation.
Drawbacks: may not reveal usability issues beyond the heuristics scope.

5.6 Feature inspection

Feature inspections analyze only the feature set of a product, via user scenarios. Each set of features is analyzed for its availability, understandability, and general usefulness.

Outcome: report evaluating features for availability, understandability, and general usefulness.
Beneficial for: evaluating feature sets before design (to reduce development cost), evaluating prioritization of features during design (to understand when and where to reveal feature availability), evaluating effectiveness of features after design (but prior to release).
Drawbacks: won't expose all usability issues.

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