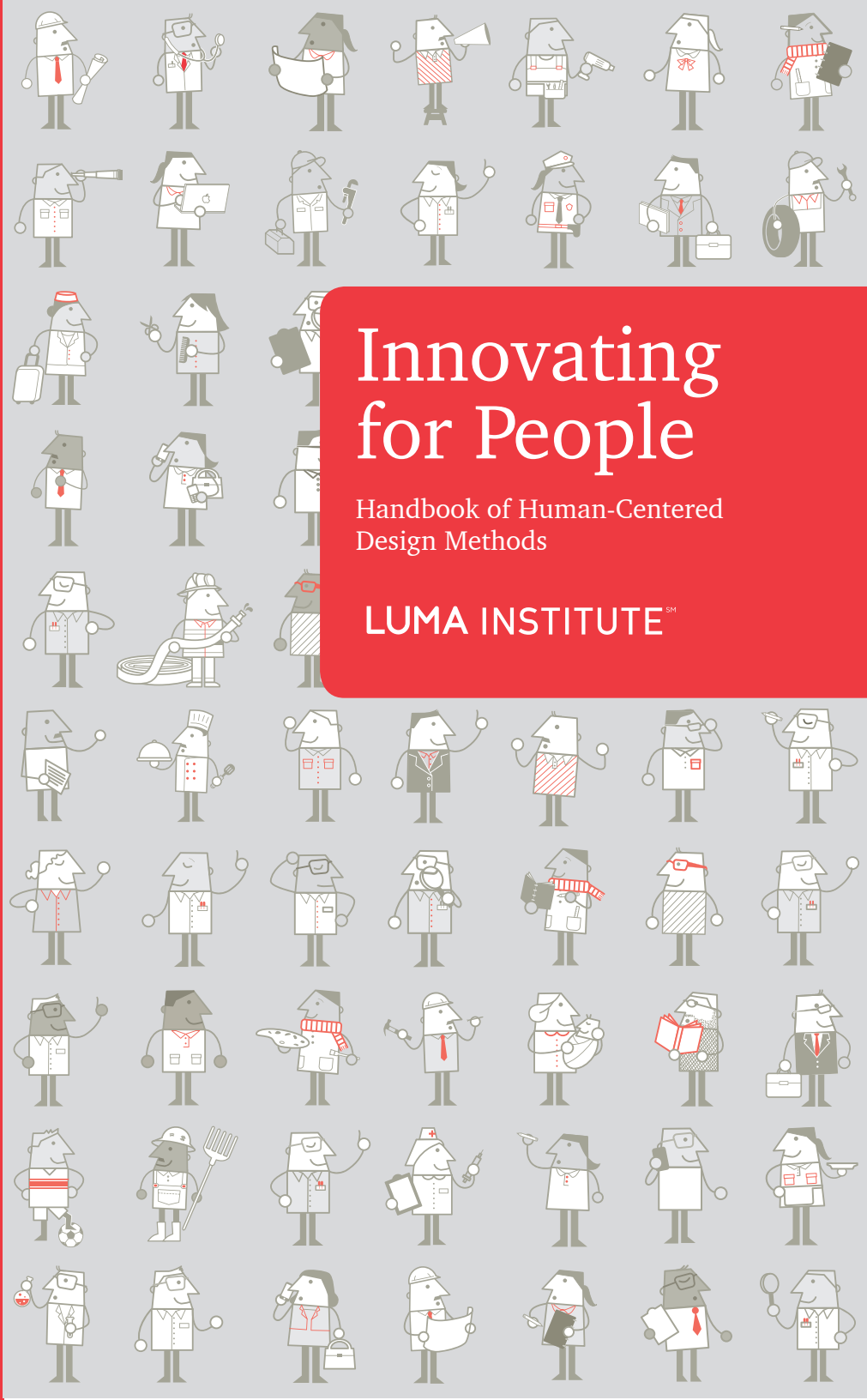
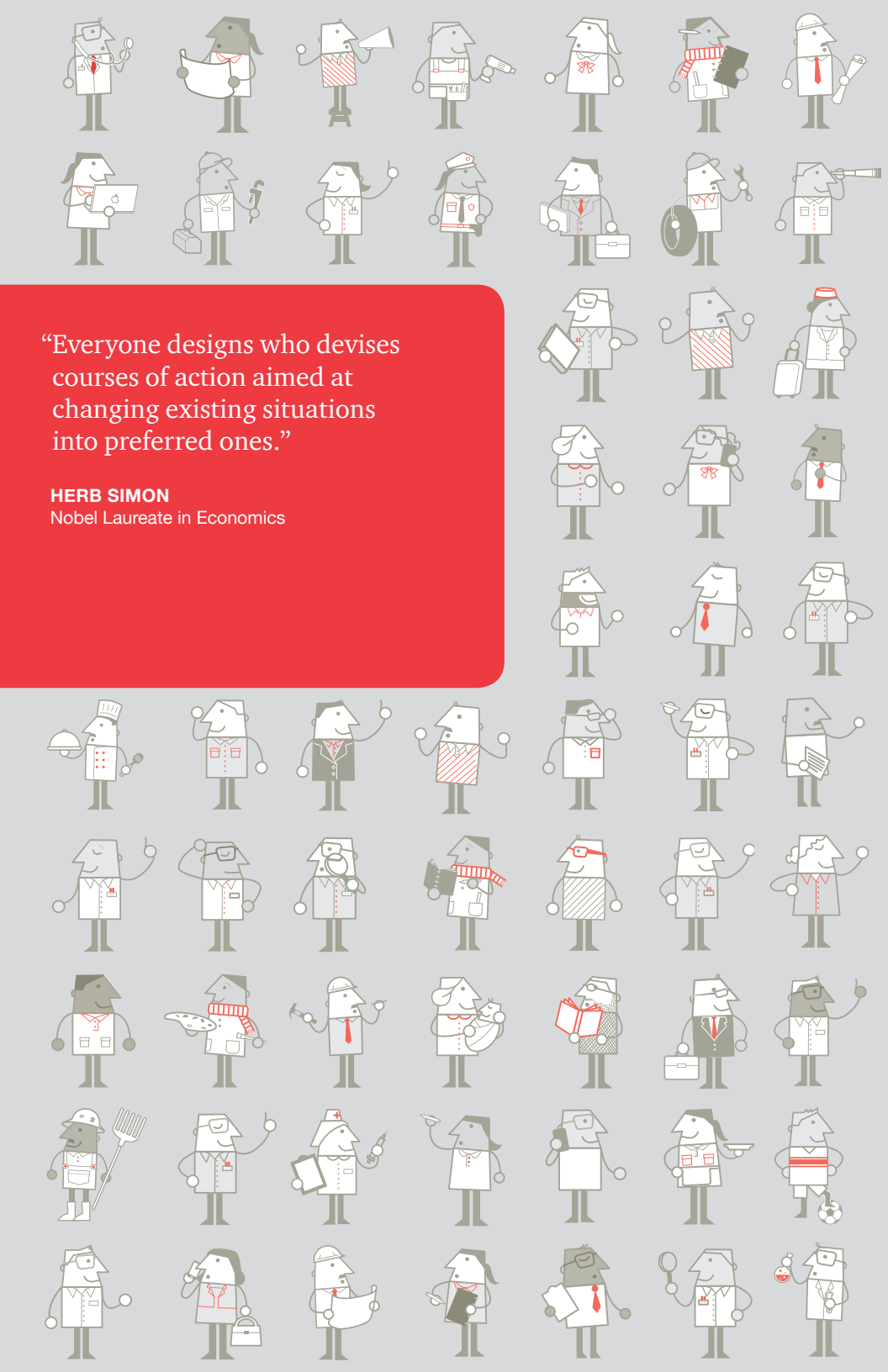


Innovating for People

Handbook of Human-Centered Design Methods

LUMA INSTITUTE℠



"Everyone designs who devises courses of action aimed at changing existing situations into preferred ones."

HERB SIMON
Nobel Laureate in Economics

This is your essential resource for innovation. It's a collection of methods for practicing Human-Centered Design—the discipline of developing solutions in the service of people.

The thirty-six methods in this handbook are organized by way of three key design skills: Looking, Understanding, and Making.

We invite you to develop these skills in earnest and work with others to bring new and lasting value to the world.

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CONTENTS

Looking

Methods for Observing Human Experience

Innovation begins and ends with people. It calls for keen and caring observation.

The disciplined practice of Human-Centered Design involves careful investigation. It requires curiosity, objectivity, and empathy. You need to engage all of your senses (looking, listening, and so forth) in pursuit of meaningful findings.

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ETHNOGRAPHIC RESEARCH

Stepping out of your native environment to learn what people do in the places they inhabit is a great way to discover opportunities for innovation. The methods in this grouping are good for studying human behavior in its natural setting.

- Interviewing
- Fly-on-the-Wall Observation
- Contextual Inquiry
- Walk-a-Mile Immersion

PARTICIPATORY RESEARCH

Innovators offer solutions that people don't even know they want. This cluster of methods allows you to engage with your intended audience by equipping them with creative ways to express themselves. If you pay close attention you'll discover critical and latent needs.

- What's on Your Radar?
- Buy a Feature
- Build Your Own
- Journaling

EVALUATIVE RESEARCH

When you look at things critically, with an eye toward improvement, you set your course in the direction of making things better. These methods are good for assessing the usefulness and usability of solutions meant to serve people in new and better ways.

- Think-Aloud Testing
- Heuristic Review
- Critique
- System Usability Scale

ETHNOGRAPHIC RESEARCH

Interviewing

A technique for gathering information through direct dialogue

PEOPLE GENERALLY enjoy telling stories about their experiences. A good interview helps you take advantage of this natural inclination in order to gather valuable information. Interviewing gives you an opportunity to speak directly with the people who can help you make informed decisions. Through these interviews you gain a better sense of people and their views of the world by subtly eliciting their true feelings, desires, struggles, and opinions through a few carefully crafted questions. An additional sensitivity to the unplanned and unscripted aspects of an interview can allow for equally illuminating discoveries.

A good interviewer needs to be attuned to the interviewee to know when to probe for more information, when to redirect the conversation, and how to parse what is *meant* from what is *said*. In other words, one must, as journalist Lawrence Grobel said, "converse like a talk show host, think like a writer, understand subtext like a psychiatrist, [and] have an ear like a musician."

A SAMPLE COMBINATION: This a good sequence of methods for making decisions about whom to interview, then analyzing and summarizing your findings.

Here's an example of an interviewer asking a commuter about her use of public transportation. She learned that the commuter was highly motivated by environmental concerns.

QUICK GUIDE

- Identify a topic for investigation.
- Prepare your questions and recording equipment.
- Determine your criteria for selecting interviewees.
- Identify the people you will interview.
- Set a time and place to meet them.
- Introduce yourself and the purpose. Obtain consent.
- Start with easy questions, then draw out specifics.
- Listen carefully and take good notes.
- Thank each participant.

HELPFUL HINTS

- Try to choose a location with minimal distractions.
- Don't put words into the interviewee's mouth.
- Resist the urge to conduct an analysis at this stage.

BENEFITS

- Helps you gain information directly
- Challenges your preconceptions
- Deepens your empathy for others
- Builds credibility with stakeholders

ETHNOGRAPHIC RESEARCH

Fly-on-the-Wall Observation

An approach to conducting field research in an unobtrusive manner

MINIMIZING YOUR impact can be a great way to maximize your discoveries. In situations where you cannot speak directly with people, or do not want to interrupt the flow of their activities, being a fly on the wall has its advantages.

You'll come to find that careful, unobtrusive observation provides valuable insight you cannot otherwise obtain. When left to their own devices, people are likely to say or do things that they're not aware of and would not be able to articulate, even if prompted. If you can watch and listen without interfering, you have a chance to capture people's natural behavior. Remember to pay careful attention to people's tasks and workflow, taking note of the information, tools, and people they rely upon to do what they do. Also be mindful of the surrounding environment, understanding that peripheral objects, sounds, and people may affect outcomes.

A SAMPLE COMBINATION: This is a good sequence of methods for using observations to inform the way you frame a problem. It also helps you get the right people involved in subsequent ideation activities.

In this project, a team spent time at a large conference center. They noted how the attendees invented their own ways of congregating and conducting work.

QUICK GUIDE

- Identify a subject area to study.
- Develop a plan to guide your investigation.
- Consider which people and activities to watch.
- Choose a location to visit.
- Obtain the necessary access and permission(s).
- Prepare materials for capturing what you see.
- Go out and observe.
- Record your findings in videos, photos, and notes.

HELPFUL HINTS

- Make every effort to blend in to the background.
- Take on the role of an objective bystander.
- Look at the situation from several vantage points.

BENEFITS

- Diminishes your presence as a researcher
- Deepens your empathy for others
- Challenges your assumptions
- Informs subsequent research activities

ETHNOGRAPHIC RESEARCH

Contextual Inquiry

An approach to interviewing and observing people in their own environment

"WHAT PEOPLE SAY, what people do, and what they say they do are entirely different things," observed influential anthropologist Margaret Mead. Following this wisdom, it is crucial that we pay attention to what people say and what people do in order to get a clear picture of what really happens. A Contextual Inquiry places you in the midst of a person's environment where you can inquire about his or her experiences in context as they are happening. Consequently, input comes directly from the people who have the most knowledge, saving you from making assumptions about how and why things are done.

Even when you do have some background knowledge of a person's role or situation, it helps to approach as a novice or to think of yourself as an apprentice. At the same time, bear in mind that you are trying to gather useful information for a specific purpose, so keep the design challenge in view as you interact with participants.

A SAMPLE COMBINATION: This is a good sequence of methods for conducting research in the field, visualizing your discoveries, and determining a direction for ideation.

This example shows an observer watching a technician install a computer network. He noted that the installer skipped over many steps in the recommended process.

QUICK GUIDE

- Identify a location and the people to be involved.
- Prepare your questions and recording equipment.
- Go to the site.
- Introduce yourself and the purpose. Obtain consent.
- Ask the participants to do tasks in a normal way.
- Observe their actions in an unobtrusive manner.
- Interject questions at opportune moments.
- Record your findings in videos, photos, and notes.
- Thank each participant.

HELPFUL HINTS

- Ask people to do activities, not just give you a tour.
- Use more than one researcher to get multiple views.
- Stay focused on your goals, yet open to discovery.

BENEFITS

- Reveals what people actually do and say
- Deepens your empathy for others
- Challenges your assumptions
- Builds credibility with stakeholders

ETHNOGRAPHIC RESEARCH

Walk-a-Mile Immersion

A way of building empathy for people through firsthand experience

AS ATTICUS FINCH teaches us in *To Kill a Mockingbird*, "You never really understand a person until you consider things from his point of view—until you climb into his skin and walk around in it." While any research method can help you better understand people and their needs, Walk-a-Mile forces you to take a person's journey and experience their joys, conflicts, and weariness. In other words, you must not only *see*, but also *feel* what it is like to live in the world as someone else.

Practically speaking, this could mean any number of things: donning the equipment someone uses and performing a task, artificially altering one or more of your senses, foregoing (or perhaps experiencing) some of life's luxuries, or even living among people of a different society. Whatever the extent, the idea is to deepen your empathy for others, and to use that experience to better inform your decision making. If you can begin to understand people's motivations, you will better understand their needs.

A SAMPLE COMBINATION: This is a good sequence of methods for identifying whose experience you want to replicate, conducting an immersion, and setting a direction for problem solving.

Here's an example of a young researcher using special eye-glasses and a glove to simulate physical impairments. This activity informed his designs for elderly consumers.

QUICK GUIDE

- Identify whose experience you want to replicate.
- Choose the tasks and activities you will perform.
- Assemble what is needed to run a simulation.
- Determine the best location.
- Obtain the necessary access and permission(s).
- Conduct the targeted tasks.
- Do each activity as realistically as possible.
- Note your findings along the way.

HELPFUL HINTS

- Commit to the activity fully. Don't give up early.
- Ask another observer to help you capture findings.
- Use an *Empathy Suit* to simulate human conditions.

BENEFITS

- Helps you gain firsthand knowledge
- Fosters an attitude of humility
- Deepens your empathy for others
- Informs subsequent research activities

PARTICIPATORY RESEARCH

What's on Your Radar?

An exercise in which people plot items according to personal significance

FOR AN AIR traffic controller, bright spots on a radar screen often indicate the need for decisive action. It is the controller's job to closely monitor everything within his scope to ensure successful outcomes. Using a radar diagram as a method for discovery in design can work in much the same way. This method provides a template where people can organize items within a given scope based on how important or relevant they consider them to be. So, whether you are dealing with concrete items or abstract concepts, the diagram is a useful way for people to assign rank.

Reading the diagram is straightforward: the things people assign to the center circle (which is deliberately small) are most significant, while those in successive circles are less so, and those outside the diagram are not even blips on their radar. The format forces participants to express clear distinctions between what is primary, what is secondary, and what is tertiary.

A SAMPLE COMBINATION: This is a good sequence of methods for deciding whom to invite to a participatory design session, then using the insights from the exercise to fuel the development of new ideas.

In this example, a student was invited to plot his personal health habits. His responses were combined with others and used to inform the design of a new wellness program.

QUICK GUIDE

- Identify a topic for consideration.
- Make a large poster that looks like a radar screen.
- Include 3 concentric circles and 4-6 segments.
- Label the circles: *Primary, Secondary, Tertiary*.
- Label the segments as subcategories of the topic.
- Invite a group of stakeholders to be participants.
- Give each person a poster, a pen, and sticky notes.
- Instruct them to plot their personal considerations.
- Ask the participants to describe their rankings.

HELPFUL HINTS

- Limit the time for plotting items to 15 minutes.
- Allow participants to write in some segment labels.
- Listen closely when people describe what they did.

BENEFITS

- Reveals what people are thinking
- Shows how people prioritize
- Challenges your preconceptions
- Yields documents that inform ensuing work

PARTICIPATORY RESEARCH

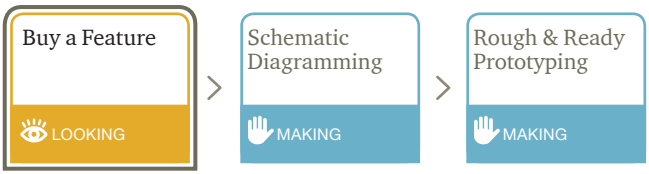
Buy a Feature

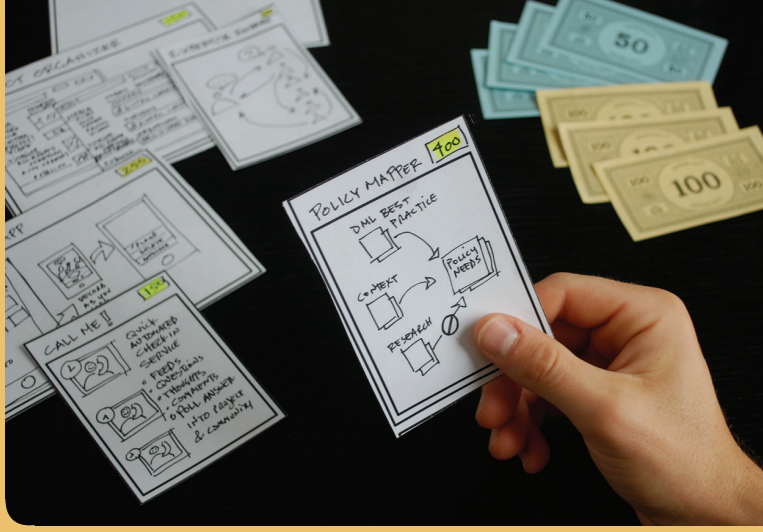
A game in which people use artificial money to express trade-off decisions

OFTEN WHEN WE talk about price what we're really measuring is *value*. In real estate you'll often hear that a property is only worth what someone is willing to pay for it. This is the idea behind Buy a Feature. The game is designed to help elicit the truth about what people value, not just what they *say* they value.

This method is based on a system of constraints that create tension by offering choices that exceed available resources. It aims to simulate the conditions that exist when people have to budget their resources to get what they truly desire. Because you provide people with a limited amount of currency with which to buy items, participants must pick and choose which are most important. The resulting decisions are valuable in assessing what features or concepts should be present in the final design. Additionally, you can monitor the decision-making process, asking questions about why participants make certain choices. Those answers may be just as meaningful as their purchases.

A SAMPLE COMBINATION: This is a good sequence of methods for discovering the value people place on various features, then forming suggestions for improvement.





Here's an example of an educator considering a new feature for an online tool. The design team noted the value he placed on making new policies for education.

QUICK GUIDE

- Identify a product, service, or policy to focus on.
- Generate a list of potential features.
- Make playing cards for the various features.
- Include a price for each feature.
- Invite a group of stakeholders to play the game.
- Give each player a set of cards with price tags.
- Give them a limited amount of artificial money.
- Ask them to purchase features within the budget.
- Encourage them to articulate their deliberations.

HELPFUL HINTS

- Pricing can be based on the actual cost of execution.
- Listen for evidence of motivations and priorities.
- Have participants make buying decisions in pairs.

BENEFITS

- Reveals what people value
- Shows how people deliberate
- Uncovers latent and unmet needs
- Yields documents that inform ensuing work

PARTICIPATORY RESEARCH

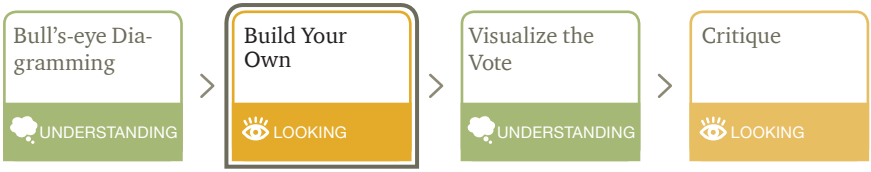
Build Your Own

An activity in which people express ideal solutions using symbolic elements

BUILD YOUR OWN is a method that helps people express their "what ifs" by putting tools for creativity and communication literally in their hands. It equips them with a kit of tangible symbolic elements that makes it quick and easy to create a physical representation of an idea. What you end up with are illuminating artifacts that provide a reference for what they desire or expect of your team's ultimate solution.

A well-planned, easy to use kit of parts makes it possible for people to build what they imagine. The components you provide need to be simple and relatively nondescript, but should be appropriate to the type of solution you desire. For instance, a toolkit comprised of building blocks and figurines could work for urban residents invited to imagine their ideal use of pubic spaces. However, a toolkit consisting of pre-drawn user-interface elements and a sheet of paper would work better for IT professionals imagining their ideal network-monitoring interface.

A SAMPLE COMBINATION: This is a good sequence of methods for prioritizing which items to include in a participatory design exercise. It also helps you engage participants in analysis.



This example shows a photographer using a kit of generic parts to express his desires for a new video camera. The design team noted his interest in a handle for steadiness.

QUICK GUIDE

- Identify a product, service, or policy to focus on.
- Make a kit of representational building blocks.
- Include a variety of basic shapes and symbols.
- Invite a group of primary stakeholders to participate.
- Divide the group into teams of two people.
- Give each team a construction kit.
- Ask them to build an expression of an ideal solution.
- Encourage them to “think aloud” as they construct.
- Ask each team to present their final model.

HELPFUL HINTS

- Make units easy to build with magnets or Velcro.
- Limit the amount of time for building (15-30 min).
- Listen carefully as teams express wants and needs.

BENEFITS

- Shows what people want and desire
- Uncovers latent and unmet needs
- Challenges your assumptions
- Yields models to inform subsequent work

PARTICIPATORY RESEARCH

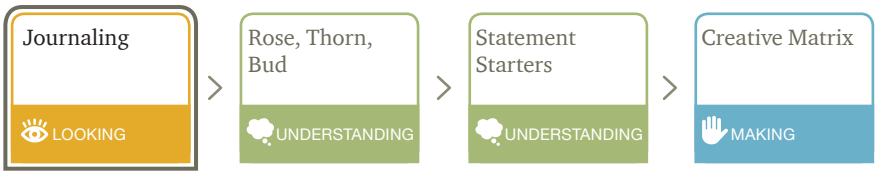
Journaling

An activity that invites people to record personal experiences in words and pictures

PEOPLE HAVE BEEN putting pen to paper in daily diaries for centuries as an act of reflection, confession, or documentation. As a research method, Journaling is a powerful way to learn about the inner workings of people as they document their personal experiences with a particular product or issue. In contrast to activities that require face-to-face interaction, journaling is done privately, typically over the course of days or weeks. This allows time for deliberative reflection that other methods may not. Often people will share greater detail about their feelings and opinions when they do not have to do it in person, yielding very thoughtful and thought-provoking responses.

But don't think that a journal is just a blank book. In fact, a journal doesn't have to be a book at all! A journaling activity could ask participants to take photographs of their interactions and describe them, narrate a series of short videos, or provide written responses to open-ended prompts. Whatever the chosen tools, craft them carefully to facilitate good findings.

A SAMPLE COMBINATION: This is a good sequence of methods for collecting data from key stakeholders, then using the research to inform a search for new ideas.



Here's an example of a homeowner recording concerns about the status of her house when she is away. This input informed the design of a new home security system.

QUICK GUIDE

- Identify a subject area to study.
- Make a kit of materials for record keeping.
- Include a paper diary and/or access to a blog.
- Invite a group of primary stakeholders to participate.
- Explain the purpose and duration of the study.
- Distribute the kits with simple instructions.
- Include a guide for capturing pictures and video.
- Ask them to fill the journal and send it back to you.
- Perform an exit interview with each participant.

HELPFUL HINTS

- Take advantage of the devices people already carry.
- Send periodic reminders to create journal entries.
- Provide the postage needed for returning the kits.

BENEFITS

- Accumulates research from remote regions
- Gains information over time
- Reveals what people think and feel
- Deepens your empathy for others

EVALUATIVE RESEARCH

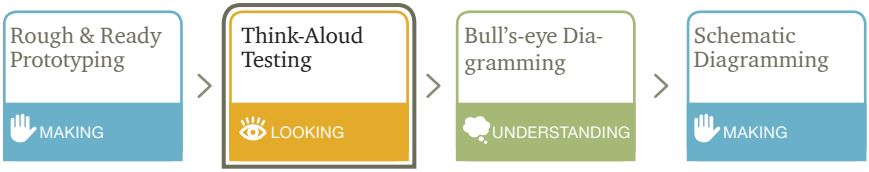
Think-Aloud Testing

A testing format where people narrate their experience while performing a given task

THIS STYLE OF evaluation doesn't just ask for a play-by-play, but rather a thought-by-thought account of an experience. People's articulation of a typically unspoken thought process not only helps the team pinpoint where the success and failure points are in their system, but it also diagnoses the causes. When successful, a Think-Aloud Test reveals important insights and inferences that would otherwise be unknown to a design team.

Effective sessions—those in which comfortable reviewers offer lots of clear information—require the sensitive moderation of a well-prepared testing team. You will come to appreciate the mindset, intentions, and expectations of people, which will in turn help you decipher what specific attributes of your design are causing certain reactions—and how to address them. Fortunately just six to nine of these tests will usually reveal 80% of the issues with a design, so it is a low-investment opportunity to make a significant impact on the efficiency, effectiveness, and satisfaction of a solution.

A SAMPLE COMBINATION: This is a good sequence of methods for rapid iteration. It helps you develop and test new ideas quickly, then use what you've learned to refine and test again.



In this project, a driver used a rough prototype of an in-car entertainment system. The design team noted her inability to find and play a prerecorded program.

QUICK GUIDE

- Identify what you will be testing and a few key tasks.
- Invite 6-9 different people to be the respondents.
- Schedule a testing session with each person.
- Introduce yourself and the purpose. Obtain consent.
- Remind each respondent, "We are NOT testing you."
- Instruct them to conduct each task one at a time.
- Ask them to think aloud.
- Keep quiet, listen carefully, and take good notes.
- Thank each participant.

HELPFUL HINTS

- Defer any direct questions until the end of the test.
- Avoid the temptation to conduct a demonstration.
- Mimic functionality if the design is still in progress.

BENEFITS

- Reveals what people are thinking
- Deepens your empathy for others
- Uncovers opportunities for improvement
- Lowers development costs through early discovery

EVALUATIVE RESEARCH

Heuristic Review

An auditing procedure based on ten rules of thumb for good design

A HEURISTIC is also known as a rule of thumb—a generally accurate guideline based on the experiential knowledge of how something works best. We use countless heuristics day-to-day to help simplify our lives and avoid complications. Rules like these provide a quick safety check in our daily activities.

In much the same way, designers use heuristics as a way to formulate and evaluate solutions. Drawing from experience, experts have learned that a design's failure or success can often be predicted by how well it addresses the following principles of good design:

1) Match mental model; 2) Minimize perceived complexity; 3) Use consistent form, words, and actions; 4) Provide a sense of place; 5) Account for user and environmental constraints; 6) Anticipate needs; 7) Use clear and concise language; 8) Give feedback about actions and status; 9) Prevent errors and provide graceful recovery; 10) Strive for appropriate and minimal aesthetics.

A SAMPLE COMBINATION: This is a good sequence of methods for conducting an evaluation of an existing system. It helps you analyze the findings and prioritize your plans for improvement.

Here's an example of an evaluator operating a piece of industrial equipment. He discovered many occasions where the rules of thumb for good design were broken.

QUICK GUIDE

- Identify the subject of your review.
- Form a team of reviewers with multiple perspectives.
- Get everyone familiar with the ten heuristics.
- Select a small number of key tasks.
- Instruct each reviewer to conduct each task.
- Remind them to keep the heuristics in mind.
- Give each reviewer a pen and a sticky note pad.
- Ask them to note all of the issues they discover.
- Tell them to cite one heuristic for each issue.

HELPFUL HINTS

- Ask the reviewers to add their initials to the notes.
- Encourage them to describe each issue clearly.
- Discourage the inclusion of solutions at this stage.

BENEFITS

- Leverages proven principles of good design
- Helps you identify problems quickly
- Yields data in the absence of test participants
- Shows opportunities for improvement

EVALUATIVE RESEARCH

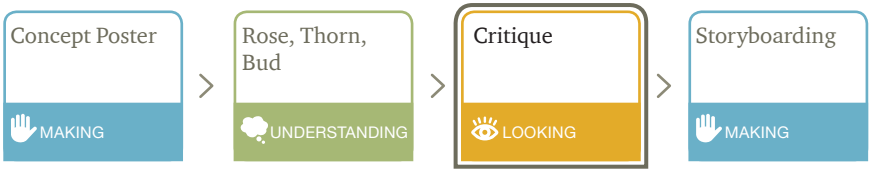
Critique

A forum for people to give and receive constructive feedback

EVERYONE'S A CRITIC these days, but not everyone truly knows how to critique. There's more to the practice than simply sharing opinions. According to Dave Frances and Don Young, authors of the book *Improving Work Groups*, "Critical feedback is most effective when it is audible, credible, and actionable." Critiques, therefore, should follow a structure that encourages efficient, productive discussion, thus spurring collaboration and objectivity and advancing improvements more quickly.

As opposed to casual conversation about a project, a Critique allows the designers to present their current solution and then express concerns or ask specific questions about it. Reviewers are invited to respond in a clear way that addresses the designers' needs. In the context of a structured Critique—which allows for both positive and negative feedback—people are more likely to share suggestions for improvement, since the design team has formally solicited them. A good Critique can be both eye opening and inspiring.

A SAMPLE COMBINATION: This is a good sequence of methods for developing an initial concept and inviting feedback from others. It also helps you advance the concept in more detail.



This example shows a team giving feedback on plans for a new office environment. The designer noted the comments and then reconfigured the seating arrangements.

QUICK GUIDE

- Identify a project and a group of reviewers.
- Pick a time and place for the session.
- *Presenter:* Describe what has been done and why.
- *Reviewers:* Ask questions.
- *Presenter:* Provide clarification.
- *Reviewers:* Start with warm feedback (positive).
- *Reviewers:* End with cool feedback (negative).
- *Presenter:* Invite suggestions from reviewers.
- *Presenter:* Thank everyone for participating.

HELPFUL HINTS

- Invite reviews from people who didn't do the work.
- Don't wait for completeness to invite critique.
- Get in the habit of asking for feedback often.

BENEFITS

- Facilitates constructive discussion
- Reveals blind spots in your design activities
- Shows opportunities for improvement
- Builds organizational alignment

EVALUATIVE RESEARCH

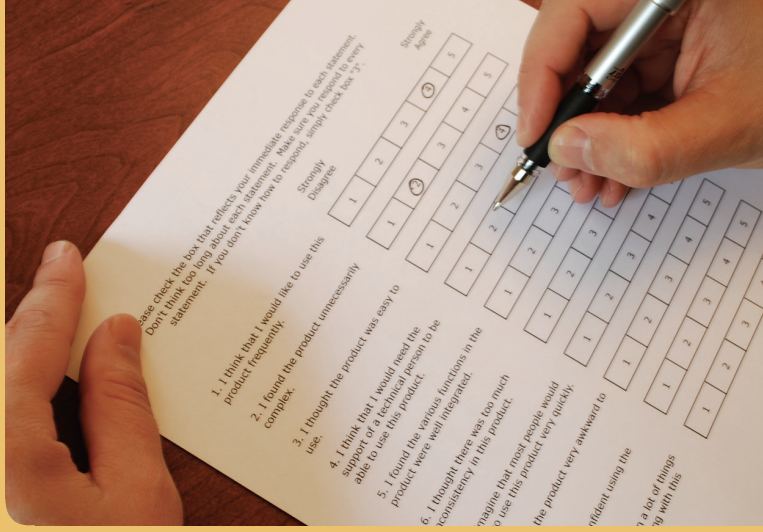
System Usability Scale

A short survey for quantifying feedback from subjective assessments of usability

THE WAY PEOPLE *feel* when using something is just as important as *how* they use it. In order to effectively evaluate a design, then, you may need to measure people's subjective *and* objective feedback of an experience. To ensure reliability, the System Usability Scale (SUS) provides a good option. It is a freely available questionnaire originally developed by John Brooke for Digital Equipment Corporation. The SUS uses the Likert Scale, which asks participants to evaluate each question by choosing between five attitude responses, ranging from "Strongly Disagree" to "Strongly Agree." This is a particularly effective way of benchmarking a given design against later iterations, and is highly versatile across many product and service realms.

To score the SUS, first subtract one point from the user response for each odd-numbered item. Then, for even-numbered items, subtract the user response from five. This scales all values from zero to four, with a four being the most positive response. Finally, add up the converted responses and multiply the total by 2.5. Any score above 68 is considered above average.

A SAMPLE COMBINATION: This is a good sequence of methods for benchmarking the usability of a current design. It also helps you envision improvements.



In this project, online shoppers were asked to fill out a questionnaire after using an e-commerce site. The scores were combined to form a baseline for improvement.

QUICK GUIDE

- Identify what you will be testing and a few key tasks.
- Invite a group of participants.
- Conduct a task-based usability test.
- Administer the SUS questionnaire after the test.
- Instruct the respondents to answer every question.
- Ask them to record their first response to each item.
- Calculate the total score for each questionnaire.
- Average all of the scores to obtain the overall value.

HELPFUL HINTS

- Give the participants a printed or an online form.
- Tell them to mark the center point if undecided.
- Don't allow them to think about each item too long.

BENEFITS

- Leverages a proven measure of usability
- Standardizes your evaluations
- Provides a manageable numeric score
- Helps you make quick assessments