



needfinding

design research and planning

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his situation can uncover these latent needs. Because many needs are apparent only after they've been solved, research focused on needs suggests opportunities that competitors may not be considering. Bajaj Auto, based in India, is the world's largest motor-scooter manufacturer. For decades, most Bajaj scooter owners would insist that they were happy with how the product operated. Yet before starting a Bajaj scooter, the rider would have to tilt it to fill the eccentrically mounted engine with fuel. Bajaj owners only recognized this problem after Honda introduced a model in India with a center-mounted engine that didn't require tilting.

Core Principles of Needfinding

Needs are important, but they're also difficult to see. Although previously undiscovered needs occasionally appear to designers out of happenstance, most of us aren't that lucky. Uncovering needs reliably requires an organized research effort. Needfinding gives designers and companies the tools necessary for illuminating needs and using them for product development. The following points characterize the philosophy behind Needfinding, providing guidelines for practitioners.

Look for needs, not solutions.

Looking for needs rather than specific solutions keeps all possible solutions

open for consideration, rather than prematurely limiting possibilities. Needfinding researchers state needs independently of how those needs might be served. For example, a store clerk might need to get some boxes from a high shelf. Instead of stating that the clerk needs a ladder, a Needfinding researcher would record that he needs access to boxes on the top shelf. The need leaves open possible solutions that range from using a forklift, to rearranging the boxes, to creating entirely new solutions.

Make research and design seamless.

Needfinding researchers are often designers trained in research methods or researchers taught how to conceptualize designs. They may approach the process from a traditional marketing background. In any case, these researchers are involved both in studying people and in conceptualizing new products. This approach allows for a seamless transition between research and design. The research is guided by the information necessary for product development, and the design work is conducted with a tacit understanding that could only be acquired by carrying out the research. Translation between the research and design stages of a project is greatly reduced, and both phases of the project are more effective knowing the requirements of the other phase.

Spend time in the participants' world.

Researchers obtain the richest information on people's needs by observing and interviewing customers first-hand. The researchers can then directly see many small but important details about the customer's activities and the context in which they occur, details that wouldn't be available outside of that context. By directly observing customers' activities, Needfinding avoids a reliance on customers' memory, descriptive ability, or awareness of a need. In addition, the customer's environment facilitates communication between the researcher and customer by allowing them to refer to and use objects in the environment during the discussion.

Look beyond the immediately solvable problem.

Researchers—especially designers conducting research—often don't see beyond problems that they can immediately solve. This impediment unnecessarily limits the information gathered. To gain the full value of conducting research, Needfinding asks researchers to record and analyze issues that may seem far beyond the scope of the immediate project. Recognizing and dissecting these deeper problems allows the company to plan for the issues that should be fixed down the road, even when those problems aren't currently solvable. A scooter manufacturer

discovered that customers were annoyed by how dirty their clothes got riding to work. While this couldn't be helped in their new scooter design, the problem was marked as an issue that could provide opportunities for long-term innovation.

Let the participants set the agenda.

Although researchers may go to the customer's environment knowing what kind of information is desired, it's important to give the customer leeway to guide activities and discussions. In Needfinding research, customers control the proceedings—at least to the extent that their activities and discussions relate to the research topic. This prevents researchers from prompting the customer on what to do next, and keeps the study open to serendipitous insights.

Collect eclectic forms of data.

Information about people comes in many forms. A facial expression might express a person's emotions better than her words. Keepsakes found in an office might reveal information about a person's relationship with his work. Needfinding researchers record all of these forms of data for later study away from the site, as analyzing data in the customer's environment distracts the researcher from collecting it. Researchers often pay special attention to contradictions between different sources of data, as these contradictions

often point to previously unrecognized or unarticulated needs.

Make findings tangible and prescriptive.

Written descriptions alone often don't make the customer's needs real to those who haven't been involved in the research. To make decisions based on the research, the findings must be presented in a vivid and actionable form. The needs are better understood when supplemented with drawings, photos, audio recordings and/or video. Because Needfinding leads to design, researchers also recommend what might be done to satisfy the customer's requirements. Providing the results in a prescriptive, tangible form allows for a smoother transition between studying people's needs and creating new ways to meet them.

Iterate to refine the findings.

Needfinding uses many quick passes to study people, rather than a single, long research effort. This approach allows design work to proceed in parallel with the research. After each pass, the researchers offer a "draft" of the findings, outlining their current understanding of customers' needs and contexts. Preliminary design work can then begin, based on this early hypothesis. When more information is needed to complete a design, researchers return to the field for further study. As the researcher-designers gain a better understanding of

people's needs, they also refine the products created to serve those needs.

Collaborating Across Disciplines

Companies face constant pressure from competitors to improve their offering. This has pushed product development organizations to optimize their processes around incremental improvement. As the traditional link between a company and its customers, marketing professionals have asked end users to articulate opportunities for immediate improvement. Design and engineering has then been chartered to make these improvements real. This approach has had notable success in industries where linear improvements in performance – faster, smaller, cheaper, using less power, etc. – are most desired.

However, this approach breaks down when companies seek to completely rewrite a product's specifications or create something entirely new. While people can easily express their preferences among a set of known options, solutions that aren't immediately apparent can go unvoiced. Companies can find that their customers express a desire for an improvement only after a competitor has created it. This forces marketing into the reactive role of asking for things that the competition already has. Developers, in turn, are then working to a timeline that is, by definition, already too late. When

linear improvements fail to provide a decisive advantage, new opportunities must be discovered in advance.

Needfinding offers designers a different dynamic for understanding customers, one that has a role for both marketers and designers. The methodology outlined here is a broad overview of how those involved in product development can preemptively discover opportunities for competitive advantage. Needfinding isn't the exclusive territory of any one discipline. Both marketers and designers need to work together to discover customers' needs. These needs, in turn, suggest areas of innovation for designers, as well as new markets that await development. The result is a dialog between company and customer, rather than between marketing and design. In this way, both groups can work together to create innovative new solutions, and leap past competitors devoted to incremental change.

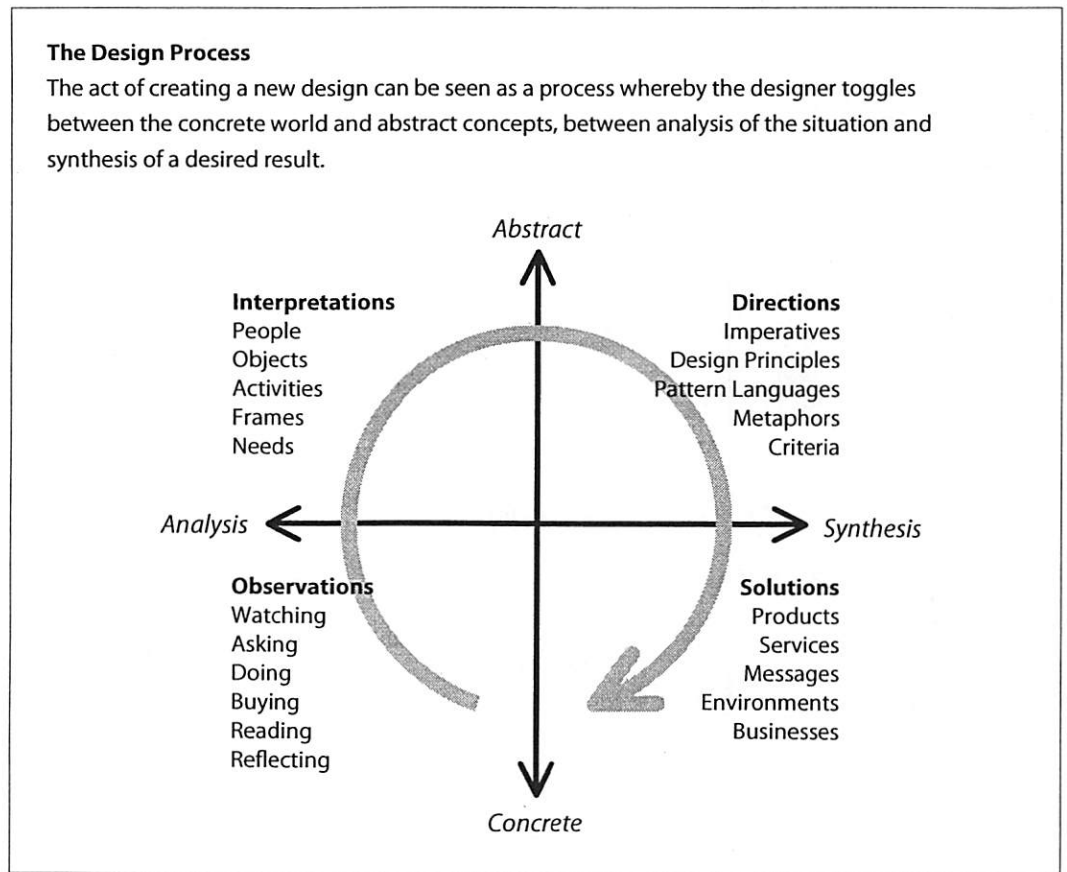
The book you're now holding is intended to be an introduction to Needfinding methodology for the novice designer or design thinker. In actuality, it's really just a loose amalgamation of Needfinding methods. Reading it won't really teach you how to do Needfinding. Like so many aspects of design, Needfinding as a subject is less like History and more like Golf. You learn it by doing it. Treat this text like a reference guide to a subject that really exists in out in the world and in the actions you take.

This book is also a work in progress. Like in any healthy practice, new methods are constantly being developed and old ones fall out of favor. I hope that you find exceptions and callouts to what's presented. I hope you scribble in the margins and add in your own insights from the field. Most of all, I hope you give it a try. If you do, you may just find that Needfinding is a great approach, not only to make better things, but to make things better.

The Design Process

Needfinding is the act of discovering people's explicit and implicit needs so that you can create appropriate solutions. Often, these needs aren't so easy to find. Moreover, when we can find out a reasonable set of needs, we often have difficulty translating them into appropriate solutions. To both find important needs and develop them into compelling solutions, it's necessary to move beyond what we can tangibly sense into more abstract realms of concepts, frameworks and ideas.

Charles Owens at the Illinois Institute of Technology developed the following two by two matrix to describe the cyclical process that designers move through as they understand a situation, conceptualize a solution, express it, and test it. It includes four quadrants:



Observations.

Observation is about looking out into the world and into yourself to understand the situation. See the world with fresh eyes. Listen & Learn. Find new points of view. There are six different ways that we can observe ourselves and others.

- *Watching*
- *Asking*
- *Doing*
- *Buying*
- *Reading*
- *Reflecting*

Interpretations.

Interpretations are about making sense of what you see. Notice patterns. Build mental models, maps & metaphors. Use needs to highlight opportunities. Typically, these patterns are described in the form of frameworks. There are five different kinds of data that we organize into frameworks to make interpretations, in order of increasing abstraction.

- *People*
- *Objects*
- *Activities*
- *Frames*
- *Needs*

Directions.

Creating directions is about determining an appropriate approach for design. It's about defining what would be good to make, at varying levels of detail. There are five different kinds of directive information that we can create, in order of increasing concreteness and specificity.

- *Imperatives*
- *Design Principles*
- *Pattern Languages*
- *Metaphors*
- *Criteria*

Solutions.

The solutions phase of the process is about creating the tangible product, service or system to fill the need. It's about making concepts tangible so you can have an impact and get feedback. Doing this is really a whole book in itself, and we therefore can't cover all of it here. That said, there are six different kinds of solutions that designers create.

- *Products*
- *Services*
- *Messages*
- *Environments*
- *Experiences*
- *Businesses*

Observations

Observation is about looking out into the world and into yourself to understand the situation. See the world with fresh eyes. Listen & Learn. Find new points of view. There are six different ways that we can observe ourselves and others.

- Watching
- Asking
- Doing
- Buying
- Reading
- Reflecting

Seeing

The secret to observing is to **watch, get bored**, then **watch some more**. Giving yourself time allows you to get past your own filters.

Separate out what you **observe** from what you **interpret**. Sometimes your interpretations can lead you astray. Sometimes they can tip you off to what's really going on.

Note things that are interesting, notable or unexpected. Then spend time analyzing **why** you think they're special.

Figure & Ground

Painters originally developed the idea of focusing on the figure, or center of attention, versus the ground or surrounding context. In Western Culture, we tend to place a tremendous amount of importance on figures, and ignore much of the surrounding contextual information. That often leads us to be challenged by the sorts of illustrations shown below. For instance, in the picture below, are we looking at two people? Or a vase?

This concept is incredibly important when we start to observe the real world. While the world outside may not have literal black and white figure and ground arrangements to toggle between, it may have all sorts of valuable contextual information that we would otherwise ignore if we gave overwhelming emphasis to our "center of attention."

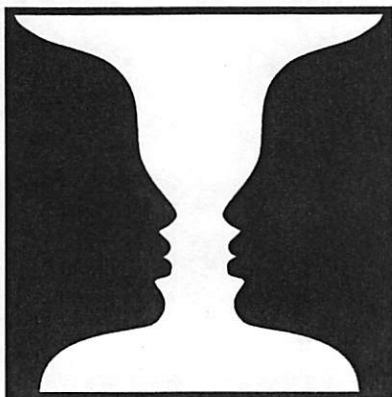
When making observations, it's a good idea to determine your frame of observation:

What's in the frame?

What's out of the frame?

What's important?

What isn't important?



A.E.I.O.U.

One of the basic challenges of an observation exercise is simply recording all of the data. While video and audio recordings can help to capture a lot of what's going on, the resulting "raw" data still needs to be codified to get to the basic elements of the scene. Rick Robinson, the founder of E-Lab developed A.E.I.O.U. framework as a handy way to put the mass of observational data into some simple buckets. When you're out in the field, a good place to start your observations is by noting the following five elements.

Title SOUTH YARRA date 17/1/... project ...

Location LOT time 1:20 a.m. video camera/zip ...

Situation, main event describe in a sentence or two
 WOMAN FILLING GAS INTO MIATA
 MAN PICKS UP RUCKSACK
 WOMAN PARKS ON SIDE, ENTERS STORE
 MAN W/ SATCHEL CUTS CORNER BY
 WALKING ACROSS TARMAC
 CAR GOES TO LOT TO PARK, STOPS TO
 LET OTHER CAR OUT
 CAR PULLS UP TO 1 PUMP, PULLS OUT & REVERSES TO OTHER SIDE

Interpretation, zoom out

Description describe in detail

Activities	Environments	Interactions	Objects	Users
GETS OUT OF CAR TURNS DOWN NOZZLE PULLS OVER TO OTHER SIDE OF CAR FILLS REPLACES WALKS NS/D	BOOTH BOARDWALK STEPS - TRANSITION SPACE	CAR ↔ PUMP ISLAND ↔ STORE	SUPERCARD SATCHEL MIATA PUMP GAS TANK CAP	MIATA WOMAN MAN W/ SATCHEL MAN #2 SUPER DUDE

byte #

Activities

What are the actions and behaviors that you can observe taking place? These can be listed at multiple levels, from the overall objective-based description (i.e. filling the car up with gas) down to the minute activities (i.e. opening the gas cap cover, unscrewing the gas cap, placing the cap on top of the pump, etc.)

Environments

Describing the venues or overall setting that you're in can help to provide useful context. Note that this can include multiple environments, for instance when following a person along on a shopping trip.

Interactions

Record the basic interactions between the people you see, between people and objects, and even between objects. This is one category that may be more useful if it's linked to other factors such as a timeline.

Objects

What are all the objects that you see? This may include both natural objects and man-made artifacts. Use this list as a jumping off point to describe particular objects in greater detail. As a designer, you may start to see some basic patterns in what exists where and why. The entire discipline of material culture concerns itself with using descriptions of objects to interpret the values, behaviors and meaning structures of the people who use them.

Users

Finally, and often most importantly, who are the people that you see in your observation? People is, after all, a better word but, hey, it doesn't start with a U...Who are the people? What are their names? Their relevant job titles? The role they play in the community or social network? Is one a fireman? A sister? A bully?

Asking Questions

Let your participants **set the agenda**. Follow their lead and you might learn things you didn't know that you didn't know.

Spend time **building rapport**. Always respect and acknowledge the responses you get.

Ask simple, **open-ended questions**. Avoid "leading the witness" or challenging their statements.

Record what you see and hear. Record quotes **verbatim**.

Remember that for you, this is a class. For your participants, this is their lives. It's important to maintain your **respect** for them even as you maintain your **distance!**

Questions to Ask

Asking questions is the basic way in which we can find out what people are thinking. More importantly, our questions serve as prompts for people to tell us stories about their lives. Here are different types of questions you may want to use.

Starter Questions

Introduction. "Why don't you start by telling us a little about yourself...?"
"What specifically do you do here?"

Sequence. "Walk me through a typical day..." "Then what do you do next?"

Specific Examples. "Let's take last night for example, what did you make for dinner?"

Detail and Overview Questions

Tasks and organizational structures. "Can you draw me a diagram of your computer network?"

Exhaustive List. "What are all the different exercises you do in ballet class"... "Are there any others?"

Quantity. "How many of your customers fall into that category?"

Investigative Questions

Suggestive Opinion. "Some people have really negative feelings about mobile

phones while others don't at all. What are your feelings about them?"

Native Language. "Why do you call it the 'Batcave??'"

Clarification. "...and when you say easy to use, you mean what?"

Empathic Questions

Participation. "Can you show me how I should make a Whopper?"

Naïve Outsider Perspective. "Let's say that I've just arrived here from another country, what can you tell me about the typical American breakfast?"

Questions to Spur Reflection

Changes Over Time. "How are things different than they were a year ago?"

Projection. "Do the other cashiers feel that way, or differently?"

The Why Question. Use with great care, "why didn't you look both ways before crossing"

Ethnographic Interviews

Ethnography is the rigorous study of the routine daily lives of a group of people. It was originally developed by empires to better understand their conquered subjects. Today, it has far more benign applications. More than anything, ethnography is about thick description – getting it all down.

An Ethnographic Interview

Ethnographic interviews are extended “open ended” interviews exploring the behaviors, context and meaning of an experience.

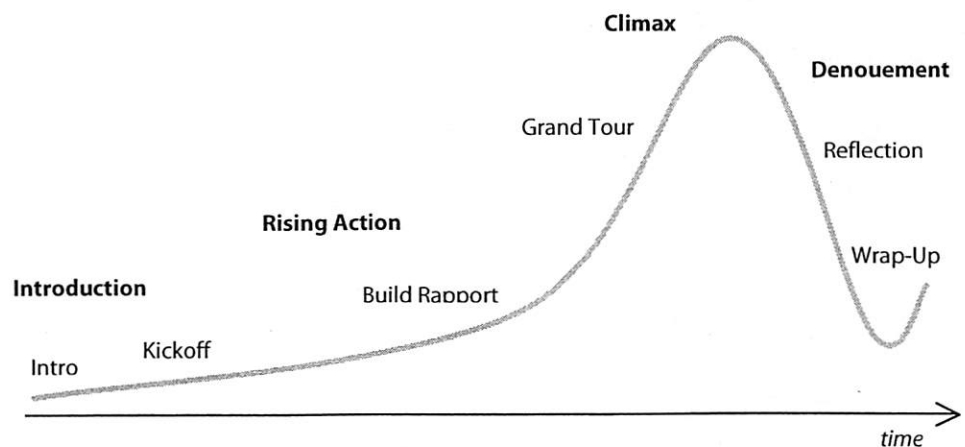
Specific techniques include making the interview feel like a conversation, alternating between different types of questions, moving from “outside” to

“inside” (actions vs. thoughts), encouraging stories over short answers, gently guiding the interview towards topics relevant to your interests.

The general flow of an interview can often follow the flow of a good story.

Anatomy of an Interview

Ethnographic interviews tend to follow a common pattern, similar to a storyline.



Introduction and Kick Off.

Set up a comfortable place for the interview. Describe your purpose. Let them know their knowledge is important. Establish partnership between you and the participant.

Build Rapport.

Ease defensiveness through reassurance. Start with general concrete questions, and then explore their experiences. Let them tell the stories they want to. Build rapport through description of an average day of contacts. Choose a particularly interesting contact experiences.

Grand Tour,

Ask interviewee for a narrated tour of the setting. Ask questions, act out scenarios. Probe for details and emotional issues.

Reflection,

At end of interview explore more abstract feelings and thoughts. Repeat back what you heard to evoke further response. What are successes & failures around that contact? Get them to reflect upon challenges & contradictions.

Wrap-Up.

Expect important information after interview is officially "over."

Doing

Observe first, by watching, asking, or reading. Then try something out for yourself. This gives you context to the situation.

Observe not just the situation, but also **observe yourself** and your reactions. What did you see? What did you think? What did you feel?

Look for discrepancies between what people say—and believe—and what actually happens.

Get someone to be a **guide** through your experience. Be **safe**. Don't do anything that puts yourself in danger.

Reflecting

If you give yourself the **time and space** to reflect, you'll often discover that you know more than you think you do.

Use your **idea log** as a **thought partner**– a sounding board to capture ideas and show your thinking to yourself.

Use **mindmapping** to help you draw out what you experienced and put it on paper.

Use **powers of ten** to change the scale of your thinking up or down.

Ask **why** again and again to get to what's really going on.

Idea Logs

Everyone has great ideas. Great Ideators write them down. They maintain a log of their ideas—both the inspired and the absurd ones. Used most effectively, the log is not just a means of recording ideas; it also acts as a triggering device to help generate even more concepts. Random observations and half-baked thoughts recorded in the logs are used as inspiration for new, more promising ideas, or even pulled out months later when an ideator finds a suitable application.

The mere act of flipping through an idea log provokes new ideas, but this triggering mechanism can occur in a variety of other ways as well. The spatial relationship of two seemingly disparate ideas on a page can stimulate new idea combinations and new ways of thinking about a problem.

Ideators who experience the most benefit from their logging also feed the outcomes of experiments and lessons they learn back into their logs, creating branches of inquiry and development to continue indefinitely.

The Origins of Logbooks

Historically a logbook was a journal that was kept by a captain to record the progress and condition of his ship. It was a watch to watch record of ship's speed and direction, meteorological conditions, and condition of the crew (including punishments and deaths). It was a compulsory document that was

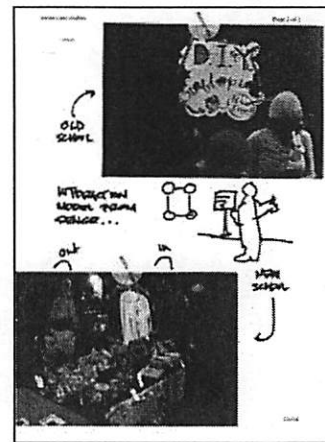
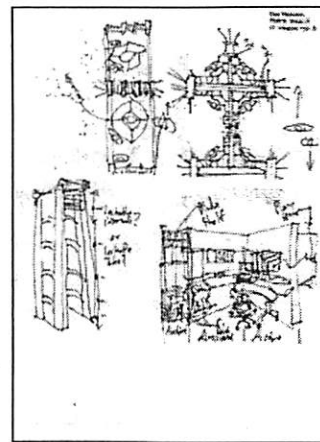
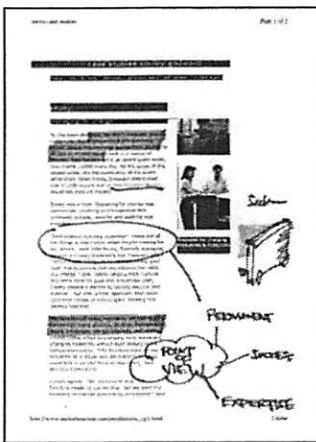
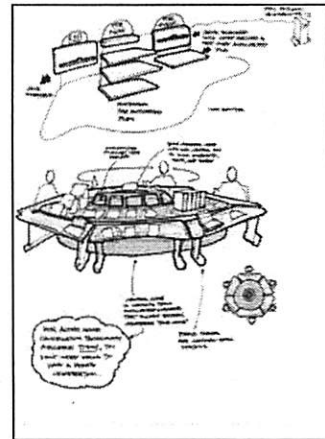
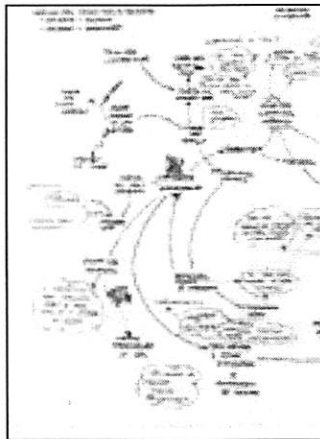
sent to the proper authorities after each voyage. Captains who failed to keep an accurate log, or falsified entries after the event, were disciplined. And in those storied years, discipline was harsh.

The log itself was originally a large wooden board attached to a line knotted every 7 fathoms or so. At the change of every watch it would be tossed overboard at the same time as a 28 second sandglass was turned over. When this time "ran out" (note the source of this metaphor), the line was stopped. This gave a time and distance from which the ships speed could be calculated, or actually just read off in "knots". Today, a log is any device that measures a ship's speed.

A Designer's Logbook

A design logbook applies these ideas metaphorically, less the hanging that accompanied doing a poor job. A logbook need be nothing more than a record of the progress of your thinking.

A logbook isn't something that should need to be done after the fact to 'present' your thinking. Such journals are the bread and butter of any person involved in the development of ideas.



What Makes a Great Idea Log?

Sometimes, folks confuse idea logging with a scrapbook exercise. That totally misses the point. Let's talk about what design thinking is supposed to be, since a logbook is really a tool for that.

Design thinking is about visual manipulation.

A logbook should provide a space to express your ideas with as much clarity as you'd express a physical form.

Design thinking is about exploration.

A logbook should allow you to travel down multiple roads, continuously reflecting the roads you took, not merely the place you ended up.

Design thinking is about iteration.

A logbook's size is a reflection of multiple attempts, understanding that most endeavors get better with practice.

Design thinking is about capturing serendipity.

Everyone has great ideas, but great ideators actually write them down. A logbook should effectively help you to capture your thoughts whenever and wherever you have them.

Design thinking is about making implicit thoughts explicit.

A logbook should draw out the subtler nuances inside your head onto the page so that you yourself can react to them, and surprise yourself with what you didn't know you knew.

Design thinking is about pattern identification.

A logbook should include both a plethora of material, and the application of tools to tease out the bigger picture.

Design thinking is about moving beyond initial observations to hidden insights.

A logbook should build on a thought or observation, analyzing what's presented to create greater meaning.

Mindmap Thought Starters

Still not sure how to build a Mindmap? Put down a concept that you'd like to contemplate, and start to build branches off of it. Here are some thought starters...

Powers of Ten.

Can you zoom out or in from the last word? (Ex. out might be "Pets" or in might be "Kittens")

Examples.

Are there specific illustrations of the concept? (Ex. you might "Socks" the name of your cat.)

Attributes.

Is there a particularly evocative trait? (Ex. you might "Highly Independent")

Induction.

Can you generalize the concept to what it means in the bigger picture? (Ex. "People need companions")

Deduction.

Can you infer how the concept applies to a specific case. (Ex. "Good pet for apartment dwellers.")

Cause and Effect.

Does the concept result because of something else or result in something else? (Ex. "Allergies")

Reflection.

What does the concept make you think and feel personally? (Ex. "God, I hate cats.")

Questions.

Does the concept provoke a particular inquiry? (Ex. "What percentage of people in the US has cats?")

Visualizing Abstract Ideas

A logbook is a great format for representing ideas visually. Here are some thought starters to get you going.

