THE AFFINITY DIAGRAM

The affinity diagram organizes the individual notes captured during interpretation sessions into a hierarchy revealing common issues and themes (Figure 9.1). The affinity shows the scope of the customer problem: it reveals in one place all the issues, worries, and key elements of work practice relevant to the team's focus. It also defines the key quality requirements on the system: reliability, performance, hardware support, and so forth. The hierarchical structure groups similar issues so that all the data relevant to a theme is shown together, creating stories about the customer relevant to the design problem. By reading the affinity, a designer not only
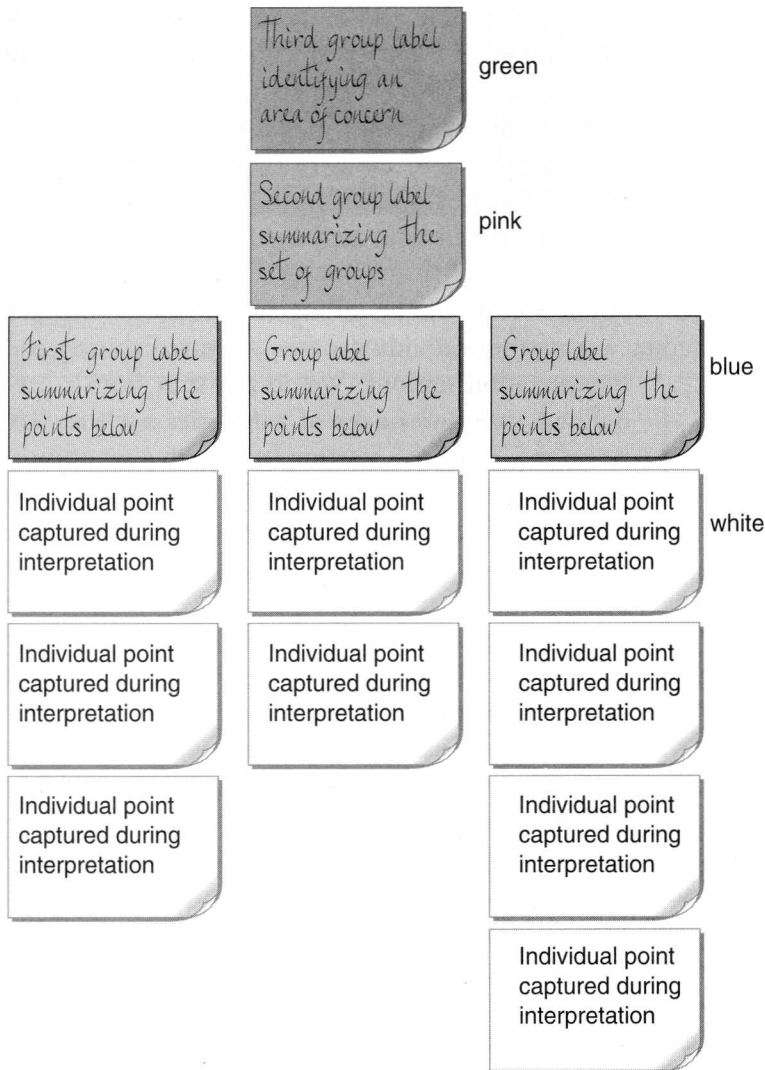
Create a bottom-up hierarchy of key points to see issues

Third group label identifying an area of concern — green

Second group label summarizing the set of groups — pink

First group label summarizing the points below | Group label summarizing the points below | Group label summarizing the points below — blue

Individual point captured during interpretation | Individual point captured during interpretation | Individual point captured during interpretation — white

Individual point captured during interpretation | Individual point captured during interpretation | Individual point captured during interpretation

Individual point captured during interpretation | | Individual point captured during interpretation

| | | Individual point captured during interpretation

FIGURE 9.1   Structure of an affinity diagram.

learns the key issues, but can see the exact data that contributed to identifying each issue in the work.

The affinity process was introduced as one of the "seven quality processes" from Japan (Brassard 1989; also known as the K-J method in Kawakita [1982]). In the quality community, affinities on the order of 200 notes are usual. We have optimized the process to handle

much larger affinities, typically about 1500 notes. We build the affinity after a good cross section of users has been interviewed—usually 15–20 customers at four to six work sites, with 50–100 notes from each customer. We always prefer to finish the affinity in a single day because it's simply too exhausting to allow it to drag on. This is possible if we have one person per 100 notes to build it. If our team is smaller than that, we invite others who are interested in or affected by the design to participate.
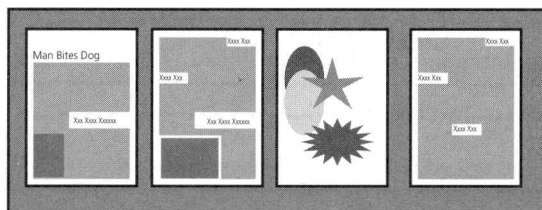
The affinity is built bottom up, by raising common structure and common themes out of the individual notes captured during the interpretation sessions. We do not start from a pre-defined structure or set of categories such as "UI issues" or "Quality." Starting from such a set of categories reduces building an affinity to a sorting task; each note goes in its own bucket, and at the end you know no more than you did before. Instead, we allow the individual notes to suggest categories they might belong to. We intentionally resist using categories that might be familiar to the team, suggested by their experience instead of by the customer data. We even ban words the team is too familiar with; for example, a configuration management group was not allowed to use the word "version." Banning the term forces the team to say how the concept is relevant to the problem and helps them to come at the problem with a fresh perspective.

Ban words to force rethinking old concepts

The affinity is the first consolidation step, and it teaches the thinking for all the rest. Building an affinity is inductive reasoning at its purest. The basic process is to put up one note, then for everyone to look for other notes that seem to go with it. There's no need to justify *why* they go together—just as you can feel an affinity for a friend without justifying why. But we do push for a certain kind of affinity: two notes have an affinity if they are saying similar things about the work as it relates to the design focus of the team—they are expressing a similar intent, problem, or issue in the user's work. So deciding if notes go together is the result of an inquiry into the meaning of the words on the note to understand the work issue they represent. When it's not clear how to interpret the words, the team can appeal to the interviewer to check whether an interpretation is valid. The team is responsible for ensuring that the data will support the claim they wish to make.

Here are some examples of using the data captured on a note to infer meaning for the work. Each example gives some of the context

```
12.                                              U6
Searches for desired text by turning pages in full page
view—big headline was the distinguishing feature
```

FIGURE 9.2   Capturing a search strategy.

(which the team would be aware of) and shows how to look at the data from a particular focus and see implications for work practice and design. If these insights occurred to team members during the interpretation session, they would be captured in separate notes; otherwise the affinity process gives the opportunity to consider the data again. These notes are all taken from an interview with a user of a page layout tool.

Inquire into the design significance of each note

The note in Figure 9.2 describes how page designers identify their pages. Even though full page view makes the page too small to see any detail, it's still possible to identify the desired page by its overall pattern and by large elements that show up even at reduced size. The work implication is that page designers, concentrating on the layout and look of pages, find it more natural to search by look rather than by text on the page.

The note in Figure 9.3 describes a UI issue, but inquiry provides deeper insights about how these users conceptualize their work. The product provides a box to contain text, but the characters in that box don't stay strictly within its bounds—risers stick up past the top, and descenders can stick out the bottom. The "snap to" guides snap the box boundary to the guide, which isn't what the page designer wants. Page designers want to align the tops of the risers, the tops of the small letters, the center of the small letters, the bottoms of the small letters, or the bottoms of the descenders. Those are the distinctions that matter to the page designer—the box is a construct that has no

Guide ---------- Sample ----------

Text box ----------

```
124.                                                        U8
"Snap to guide" snaps to the top of the text box, not to the
tops of the letters that stick up past the top of the box
```

FIGURE 9.3   Capturing a UI issue.

meaning in their work. Even product ideas such as fixing the top of the box so it coincides with the tops of the risers misses the point. A more general solution would build knowledge of the alignment points for text into the product.

The meaning a designer reads in a note and the way he groups them together is driven by the project focus. A single note will often suggest different aspects of customer work. The designer wants the meaning that will give the affinity the most insight, allow it to tell the best story about the customer for the focus. For example, consider the notes shown in Figure 9.4, collected from people in grocery stores and legal offices during an inquiry into search strategies.

Group Post-its to reveal new insights into the work

Note 110 could be paired with either 214 or 360. The thinking behind pairing 110 and 214 would be that both notes are about legal cases and how they are found, so they should go together. The thinking behind 110 and 360 would be that the two notes are about using a similar search strategy to find things: the more recent the thing, the better. Given the focus on how people find things, pairing 110 and 214 doesn't lead to new insight—it's no surprise that legal cases are searched in law offices. The only aspect of work that the group reveals is details about the job of the paralegal staff, which is better represented on work models. Pairing 110 and 360 raises up a common search strategy. It's the more interesting pairing because it shows how this strategy pertains across work domains (searching for cases and searching for groceries). It might be combined with other data to make the strategy explicit, as in Figure 9.5.

```
110.                                                    U2
The more recent a legal case, the more persuasive it is
```

```
214.                                                    U2
Legal case precedents are searched by paralegal staff
```

```
360.                                                    U4
At milk case, buys 1 gallon or 2 quarts depending on
expiration date
```

FIGURE 9.4   Grouping notes to reveal design significance.

Recent stuff is best

```
110.                                                    U2
The more recent a legal case, the more persuasive it is
```

```
360.                                                    U4
At milk case, buys 1 gallon or 2 quarts depending on
expiration date
```

```
720.                                                    U8
The most recent house listings are the most desirable; good
houses sell quickly
```
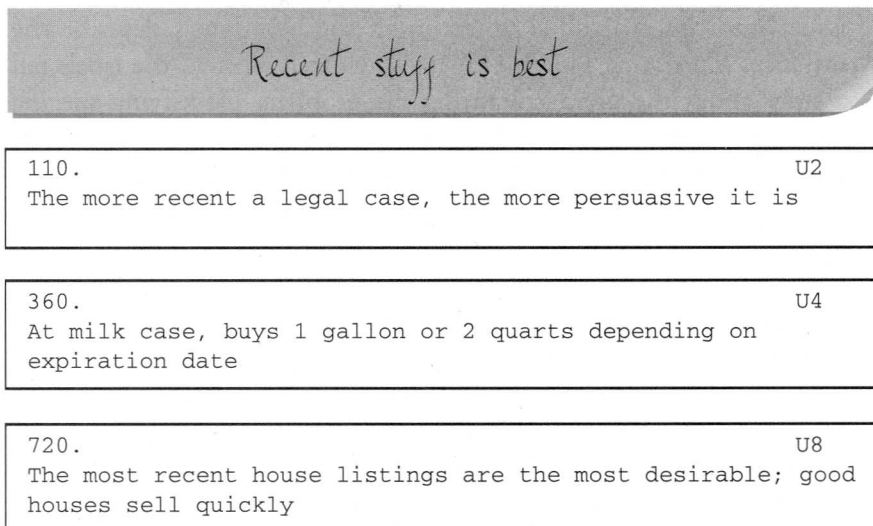
FIGURE 9.5   Revealing a common theme.

When notes are collected together, they are given a name to represent the group. A good group name states the work issue that holds all the individual notes together. It is a succinct phrase that summarizes the content of the group. "Different ways of searching" would not summarize the content in the above example; it would just say what you could learn by reading the content. "Recent stuff is best" states the issue; then the individual notes give examples of this

Labels are the customer's voice speaking from the wall

general statement. A good group name is written as though the user was talking to the designer; direct, immediate language has more impact than third-person language. When the notes use the user's language, the whole wall speaks the user's issues to the design team—they become a central communication device.

First-level groupings like the above are themselves collected into a group of groups, which are grouped into higher-order groups. The result is a hierarchical structure that breaks the data about the user into manageable chunks. We use green Post-its at the highest level, which describe a whole area of concern within the work practice. Under this, pink labels describe the specific issues that define that area of concern. Blue labels describe each aspect of the issue. And the individual notes under the blue labels describe the instances illustrating the blue label. When well written, the labels tell a story about the user, structuring the problem, identifying specific issues, and organizing everything known about that issue. The labels represent the new information in an affinity. We limit each first-level group to four notes to force the team to look deeply and make more distinctions than they would otherwise be inclined to. It pushes more of the knowledge up into the group labels.

Labels become the meaning we design from

For example, Figure 9.6 is a section of an affinity describing delegation. It's part of a larger story about why people communicate in doing their job—one reason is to delegate (individual notes have been skipped for brevity).

This section of the affinity brings together data from many customers and many work situations to tell the story of delegating work. When sharing the data or reviewing the wall yourself, you might read it like a story: "People delegate work either because they don't have time to do the work themselves or because they choose not to deal with it. They pick someone else to do it either by who has time, who reports to them, or is otherwise appropriate given the organization. Different ways of delegating have different styles: people can delegate doing the work but remain responsible for it, they can delegate a task by assigning it during a meeting, or they may pass it on informally." Each pink label names an issue that is described by the blue labels underneath it so that each section of the affinity tells a coherent story about part of the work,
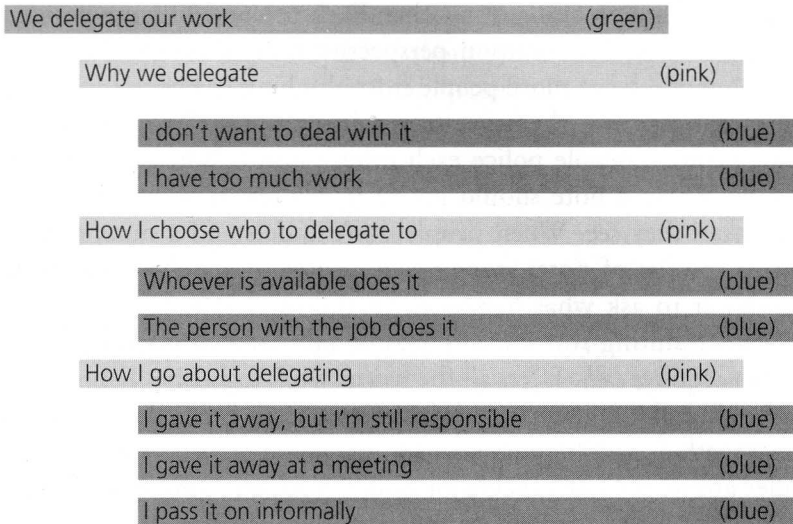
The affinity tells a story of the customer that matters for design

We delegate our work	(green)

Why we delegate	(pink)

I don't want to deal with it	(blue)
I have too much work	(blue)

How I choose who to delegate to	(pink)

Whoever is available does it	(blue)
The person with the job does it	(blue)

How I go about delegating	(pink)

I gave it away, but I'm still responsible	(blue)
I gave it away at a meeting	(blue)
I pass it on informally	(blue)

FIGURE 9.6   A section of an affinity diagram.

and the whole wall brings together all issues and observations to tell a single story about the customer population.

STEPS

- Print the notes captured during interpretation sessions in a 3 × 5-inch grid and cut apart so each is on its own label-sized slip of paper.
- Put notes up on the wall one at a time. After each note goes up, add notes that go with it.
- When there are too many groups to keep track of, start labeling them with blue Post-its.
- As groups accumulate individual notes, break them down so there are no more than four notes in a group.
- Add pink- and green-level notes to collect groups.

Others who use the affinity process forbid talking while building the affinity; we encourage it. We view this process as an opportunity to gain team consensus, which is best supported by discussion. All work is done in pairs so people can discuss their insights with each other and get someone else to check their thinking. Writing the labels reveals what you're thinking; if anyone disagrees they can object. All the data instances are there to

The affinity captures the insight of all the brains on the team

support one interpretation or another. Each person's different perspective is shared, and a common perspective built through discussion. Discussion also helps move people from thinking in buckets (all notes with "legal case" on them get tossed in one group) to thinking in work practice—people police each other's notes. When people can't agree on where a note should go, they talk about what underlying work issues they see. When people don't understand a note, they go back to the list of notes from that interpretation session or to the interviewer to ask what happened in the interview. We've seen no problems resulting from letting people talk, and doing the inquiry together requires talk. It lets all the brains work together.

Building the affinity in a day creates a team event that binds the team together and encourages creating new perspectives. Building smaller affinities more quickly, or building up one affinity over time, would allow team members to incorporate each piece of data before having to deal with the next; as we discussed above, this leads to assimilation instead of promoting a paradigm shift. Instead, in a single day the team has to face a whole new way of looking at things. As a team process, the affinity forces the team to learn each other's points of view and discuss their differences. But like the interpretation session, it puts strict bounds on disagreement; team members talk about the different meaning they draw from one note at a time. When they are done they have a single structure representing all their customer data, which organizes their knowledge and insight and gives them a basis for design.

Building a 1500-note affinity is exhausting. It's an entire day of reading and conceptualizing hundreds of little bits of data and matching them with other little bits of data. It's like a combination of "Concentration" and translating Shakespeare into Latin: the words on a note have to be interpreted to translate them into the underlying work practice issue; then the note has to be matched with the note you saw five minutes ago and you know is on the wall somewhere. Everyone's working at once, moving back and forth along the wall, discussing notes with each other, yelling general questions to the group at large ("Who interviewed U4?"). Some team members will be more comfortable with the apparent disorganization than others. But the result is exciting for everyone: a single, sweeping reorganization of the customer data arranged like a

The affinity organizes hundreds of Post-its into a story in a single day

story. You can read a good affinity from beginning to end to see every issue in the work and everything about it the team has learned so far, all tied to real instances. There's no better way to see the broad scope of the problem quickly.

WALKING THE AFFINITY

The affinity diagram was structured to tell the story of the customer—to arrange all the customer data to present the issues and concerns coherently. "Walking" the affinity gives the team a chance to review and think about this story. It can be done immediately after building it or right before doing the visioning. It's the team's first chance to see the whole scope of data together and to consider how to respond with a coherent design solution.

Anyone can walk the affinity: the whole team together, individual members on their own, or outsiders, interested parties, and other teams building related products. Each person reads the affinity silently. Often the team will designate an appropriate starting point, a place in the affinity that introduces the major issues well. To make the affinity easier to digest, teams do well to spend a little time cleaning it up. Some decorate the large divisions of the affinity with pictures, clip art, or artifacts illustrating the issue that part addresses. Groups can be directed to those parts of the affinity most immediately relevant to them, and they can work from there to the rest of the wall. Seeing the part they care about gets them interested; from there, they can see how it hooks into the larger work context.

Walk the wall to balance individual thinking with team discussion

Participants read starting from the green, then the pinks, then the blues, so they start with the high-level statement of an issue and work down to the specifics. They read the individual notes as necessary to get examples and details summarized in the blues. If several people are reading at once, they read quietly, like people in a museum; each person is following their own thread, building their own understanding of the data, and loud discussion would be disruptive.

As they read, each reader writes two kinds of notes: holes and design ideas. One records additional information and questions the reader would like answered. These are holes the team might fill in future interviews. The other records ideas for responding to the data. Initially, these ideas will be vague and respond to specific points, but as the readers see more and more of the scope of the data, their ideas will get more detailed and cover more of the work. The readers try to build up their ideas so that rather than responding only to a single blue or pink, they end up

The challenge: address the whole wall of issues with a single design idea

with ideas for how to address entire greens—or the whole wall. These notes are posted on the affinity next to the part of the affinity that they respond to. On a second pass, people can read each other's notes and see how others are responding to the data.

Writing design ideas on the wall is a way of interacting with the data. It provides a way to capture design ideas so that the design team can act on them, and everyone can feel they contributed something to the design. Posting ideas clears people's heads to go on to something new or to build an idea up into something larger. The nature of the affinity pushes people toward systemic thought. The first ideas may tend to respond to single notes with point fixes to small problems. But as people see more and more of the whole work practice revealed by the affinity, they naturally start to weave together themes and develop ideas that address larger aspects of the work expressed in the pink and green labels.

Walking the data: to see the different aspects of work and synthesize them mentally

Visioning: to invent multiple possible responses to the data

Evaluation and integration: to develop a single corporate response

Concurrent action: to move all parts of the organization forward in parallel

WALKING THE DATA

The first activities are designed to explore the data and its implications for the design. At this point we aren't looking for specific design solutions; we just want to enable team members to think about the data in detail and explore all the different ways they might respond to it. Just as we set focus before going on an interview so people know what to look at, we use these activities to set the team's focus for design so they know what to build. When the customer data is understood and internalized, team members will find it natural to design solutions that respond to the primary issues it raises.

The first activity for immersing yourself in the data is to read the affinity from end to end—what we call "walking the wall." Walking the affinity right before visioning ensures that the customer issues are fresh in the designers' minds— that the solutions they invent will be grounded in the customers' work practice. Then when they review each other's ideas and see how other people are reacting to the data, they start to build a shared sense of how to respond. We discussed the detailed process of walking an affinity in Chapter 10—everyone who will be involved in the visioning session walks the affinity this way before visioning.

Anyone who visions must be steeped in the customer data

After walking the affinity, the team uses the consolidated work models to do the same kind of thinking as the affinity on the different perspectives on work. Each model represents a different point of view, a different dimension of work practice. When people walk one after another, they naturally synthesize all the different dimensions into a single three-dimensional picture of the customer. The previous chapter discussed in detail the kind of issues the team might consider for each type of model; designers do this individually or in small groups, discussing the model and how they should respond as a team. Each

model will generate a set of goals: values to encourage; negative feelings to eliminate; roles and activities to support, combine, or eliminate; and so forth.

Once individuals or small groups have discussed each model, they share their discussions with the rest of the design team, and the team marks parts of the model that they want to support or eliminate. At this initial stage when the team is still deciding on a design direction, they are more interested in the "what matters" type of issue than the structural issues. So they look at flow and cultural models in detail; they look at constraints and primary intents on the physical; and they look at intents, activities, and strategies of high-level structure in the sequence and artifact models. As they read and discuss each model, issues from the other models and from the affinity are naturally incorporated into their discussion. What started as point solutions to individual problems weave together into a synthetic response to the whole work problem.

Walking the affinity diagram and work models focuses the team on specific aspects of work they want to respond to. The team can have an explicit and public conversation, recording the issues right on the affinity and models. You can include others in the discussions by allowing them to participate in reading and responding to the models. And they ground your vision for redesign in real work issues.

Walking the data creates a team focus for the vision

After walking the affinity and each model, crystallize your thinking by making a list of the most important issues from that model. This gives you a single, crisp statement of the issues that you can return to as a reminder of your focus for the vision. When the lists are made, the team is primed to start the vision.