Microsoft

Scenario-Focused Engineering

A toolbox for innovation and customer-centricity

Best practices

Austina De Bonte and Drew Fletcher

Praise for *Scenario-Focused Engineering*

"Breakthroughs often result when diverse disciplines collaborate to solve old problems using new perspectives. Scenario-Focused Engineering is just such a breakthrough. I'll never see software design the same."

—Eric Brechner, Development Manager, Microsoft Xbox, author of I.M. Wright's Hard Code

"If your team focus is dominated by what you want to make, without enough consideration of why or for whom, this book is for you. Revitalize your team and your product by using these rigorous techniques that put the customer at the center."

—Chris Pratley, Director of Program Management, Microsoft Office, creator of OneNote and Sway

"De Bonte and Fletcher have astute insight into how engineering teams build products today. They expertly lay out a compelling approach to the creation of desirable products and services through the embrace of Scenario-Focused Engineering. Read it and you'll want to start using Scenario-Focused Engineering in your development processes immediately."

—Gayna Williams, founder, Swash Consulting

"If you are new to customer-centricity or an expert with decades of experience, this book is a great addition to your library. It demonstrates that customer-centricity is the responsibility of everybody in the organization and gives readers strategies and ideas to make this happen."

—Charles Bennett, CEO, NextTen

"Microsoft has gradually shifted from a feature-focused approach to product engineering to a more user-centric, scenario-focused approach. The shift was both profound and difficult. The SFE training they drove was instrumental to Microsoft meeting these challenges. In this book you'll get the distilled lessons of that enormous undertaking."

—Charles Eliot, Head of Engineering Services, Skype

"In this impeccably organized book, Fletcher and De Bonte combine practical wisdom and highly refined techniques to produce a hands-on guide that will enrich the design room as well as the classroom. A smart, easy read."

—William Storage, Visiting Scholar, Center for Science, Technology, and Society, UC Berkeley

"One of the toughest challenges designers face is promoting the value behind building end-to-end scenarios rather than hundreds of glitzy, yet disconnected features. SFE throws the old engineering processes out the window and replaces them with a common language, tools, and techniques that enable development, test, program management, marketing, and design to work together to deliver a cohesive, end-to-end experience. The program transformed our organization from the top down."

—Bethany Kessen Doan, Principal User Experience Design Consultant

Kerry Bodine and Harley Manning's book *Outside In* details a variant of the user-journey technique that they developed at Forrester Research to help organizations identify the source of customer experience problems in an existing process or service experience.[10] They recommend making a variant of a user journey that graphically details each individual step of a process—both the steps that are visible to the customer and the steps in the internal processes that are invisible to customers. They mark each step in either green, yellow, or red to show how well that particular step is currently being delivered. After using this technique with many companies, the remarkable insight they report is that poor end-to-end customer experiences commonly become visible only near the end of the process, when customers complain about an incorrect bill or they arrive at a train that wasn't expecting them. But when they trace the root cause, the actual problem was caused many steps earlier in the process, often deep in the internal business of the company and, ironically, from internal processes that were believed to be working well and were rated "green." From the inside view, everything looks good, but the customer experience from the external perspective may have significant problems. This is yet another reminder of how important it is to look across the end-to-end customer experience, including at the infrastructure and back-end processes and components that enable it, and not look only at the individual pieces one at a time.

Synthesizing quantitative data

Synthesizing quantitative data requires different approaches from when you are working with qualitative data. Working with QUANT usually requires manipulation and then visualization of the data using tools such as spreadsheets, databases, and specialized programming languages. These tools focus on querying, slicing, dicing, and pivoting the data in many different ways and then using the results of those queries to identify patterns or anomalies.

Sorting, analyzing, and visualizing quantitative data is obviously a very broad and deep topic and is beyond the scope of this book. It is also an active area of continual innovation with the advent of big data. The new breed of data scientists is developing methods for sophisticated quantitative analysis on very large and often unstructured data sets. However, whether your quantitative data comes in the form of big data or in more modest data sets, visualizing the data in some sort of graph, chart, or other graphical form is one of the best ways for human brains to make sense of it. Still, the most important thing to remember is that no matter how much quantitative data you have, you should always balance it with observational, qualitative research. Perhaps the new generation of data science methods will unearth more sophisticated patterns and connections than ever before, but it will be a long while before statistical analyses figure out the deep human reasons behind why people do the things they do. Be sure you use QUANT for what it's good for, and keep it in balance with QUAL.

Deep dive: Creating an affinity diagram

Over the years we have gotten a lot of mileage out of creating affinity diagrams. It is a particularly approachable and straightforward technique that can yield some great benefits both in identifying patterns and insights and in helping a group of people wallow in data, build empathy, and develop a shared understanding about their needs. Creating an affinity diagram is a technique that helps you

discern patterns and insights from a large set of qualitative data by physically sorting all of the data into groups, where each group is alike, or affinitized. Usually, affinity diagramming is a group activity.

It's important to understand that gaining insights by using an affinity diagram is a dynamic process. The full implications and meaning of the data may not be immediately apparent, even after you have created the affinity diagram. You will discover that with affinity diagramming, the meaning tends to emerge over a period of time. Perhaps you can think of the affinitized data as a primordial soup from which life will eventually emerge. Remember to be open to the idea that new insights may emerge from this activity, not just the ideas and insights that you've already been thinking about.

Preparation

First, there's a bit of prep work to do. However you collected the data, it needs to be printed on paper, with each individual quote, each separate thought, action, or behavior observed represented on a separate piece of paper. Do not attempt to summarize any of the data while doing this. If you come across the same idea in your notes multiple times, that's okay. Print each item on a separate piece of paper. One practical step is to simply print your observation notes. Then take some scissors and start cutting—per paragraph, per sentence, whatever makes sense—to end up with one idea on each piece of paper.

TIP

When you observe customers, take notes so that each idea ends up on a separate sticky note. This practice makes affinity diagramming as simple as possible later on.

As we walk through the steps in affinity diagramming, we'll show examples that use data from a recent study we did of hikers on a trail in Washington State's Cascade Mountains. Figure 5-3 shows what our unsorted pile of data looked like.

Next, you need to set up a room in such a way that a handful of people can sort through that pile of paper. You need a table large enough to spread out the printed notes, and you need a whiteboard or, better, a large swath of butcher paper where you eventually tape up groups of notes. You also need a bunch of sticky notes, a lot of tape, and some Sharpie pens. A basic conference room should suffice for space.

FIGURE 5-3 Unsorted notes taken while we observed and interviewed hikers on the trail.

Step 1: Initial sorting

You are now ready to begin sorting through the data. Have everyone on the team pick up and read through individual notes. It doesn't matter where you start, just grab a few and get going. Soon, you'll begin to find notes that seem like they belong together. When that happens, shout out to the group "Hey, I'm starting a pile here that's kind of centered around people being too busy." Put those notes into a pile, labeling it with a sticky note that says "*I'm too busy.*" Others will do the same, and in very short order you'll have a set of piles that represent an initial sorting taxonomy.

TIP

Do this initial affinity sort quickly. Don't stress about the categories or worry about not getting it right. It will work out, and you will have time later to adjust and re-sort. The first step is just an initial grouping. Most affinities will shift categories substantially after the initial sort.

After the initial sort, you will probably have a small pile of leftover notes that are oddballs and defy categorization. Just set those aside for now; you'll come back to them later. It's common and expected during this sorting routine that people discuss (or perhaps even argue a little) about the meaning of a particular pile and whether certain notes fit in. "*This pile is about people being too busy, it's not about the number of tasks they have to do . . . that's an entirely different thought . . . make a different pile!*" Raucous engagement from all corners of the room is a sign that the process is going well.

MINDSHIFT

Let the data guide the categories. An important word of caution is needed here. Affinity groupings often fail when people enter into them with a set of categories already in mind and then try to assign the data into the categories. It's okay and desirable to start having an opinion about how the different notes should be grouped. But the tendency will be to do this backward—to quickly come up with a handful of categories and then go through the data and assign each note to the closest-fitting category. This will not generate the results you want. Instead, you want the data itself to suggest the categories. Be open. Start some categories, and be open to changing them or breaking them up. Do not let the categories rule; let the data tell you what to do. This can take a little bit of time, and it can take a few passes. From personal experience, we know that it is particularly difficult to let go of your conclusions when you have deep domain knowledge of the customers you're observing. If you are feeling uncomfortable at this point or feel that you aren't doing it right, you're probably on the right track.

TIP

Invite at least one person who has little to no domain knowledge into your affinitizing session. This person's view of the data may be much clearer and more objective than yours. Listen and don't worry; your domain knowledge, ideas, and the connections that occur during the affinity will be invaluable later when you try to make connections and discern the deeper meaning of the data.

Step 2: Summaries

The next step is to go back to each pile and look in more detail at which ideas ended up in them. Read through each item in the pile and attempt to summarize the essence, main thought, or theme of each pile on a single sticky note. You're aiming for a sentence or two at the most—less than a paragraph and more than just a couple of words. As you do this, you will surely find notes that are lost and that do not belong in the pile they're in after all. Move those notes to where they belong and adjust piles as needed.

Figure 5-3 shows an unsorted pile of qualitative data collected while observing and interviewing hikers on a trail outside Seattle. Here's a closer look at some of that data after the first round of sorting:

Gear/10 Essentials	GPS	We rely on experts	I did research ahead of time	How much farther?
10 essentials? I saw that on a sign down there	My phone GPS isn't showing us here	We need someone to tell us what to bring	I google stuff	The trail was longer than I thought
We have protein bars, sunscreen	We recently bought a GPS for Utah	I'm interested in contacting Pro Ski Service for a guide	I bought a guidebook	I want to know what elevation, how much farther
I always carry a cell phone	I carry a GPS if it's more than a short day hike	What would you do if you got lost? I'd ask him... (pointing)	I picked the hike based on difficulty	It seemed a lot longer than the trail description
Just water, it's a short hike		He's pretty good with a sense of direction (I rely on him)	Because of what I read; it was a pretty popular trail	

Did you notice that one of the summaries ("We rely on experts . . . ") is starting to look something like an insight? None of the hikers actually said, "Hey, I need a leader to feel safe" or "Yeah, we always rely on the expert to guide us." However, many of them indicated that in their hiking group, one person was indeed identified as the leader and expert who they all trusted to pick the trail, navigate to the summit, and make sure the group was prepared. That idea of "we rely on experts" is completely unarticulated, yet it shows up in a lot of the data.

TIP

As you sort through the data, if you have aha moments where you discover a potential unarticulated need or make a connection between several seemingly disjointed groups of data, mention it to the group. Jot the idea down on a sticky note, preferably in a contrasting color, and stick it to your diagram for deeper discussion later.

Now take a look at the first column—"Gear/10 Essentials." All of the data sorted under that category relates in some way to what gear the hikers carried with them. Is this pile of data meaningful as it is? Probably not. The category "gear" doesn't tell you anything particularly insightful, but maybe something deeper is lurking in that list of what people were carrying in their packs that day. This category would be a great candidate to break up in the next round of sorting to see whether a deeper meaning exists beneath the specific data.

Step 3: Read out and re-sort

Once the first sort is done and each pile has a short summary, have each "summary author" read out loud what he or she wrote about the pile. Have each of them also read a few of the most relevant notes that led them to the meaning of the pile. Allow some time for team members to comment on what they hear and discuss ways that it might be related to other piles. Do this one pile at a time until you've covered all of them. This step helps the whole room become familiar with the total data set and will help people start making connections between ideas. At this point, some of those oddballs you set aside earlier may start to find a home.

As you continue the readout discussion, you might need to refine the statement of the pile's meaning. If necessary, modify or rewrite that statement. You might even create a new category for some of the notes that didn't quite fit in a group. With some group discussion, you will begin to have new clarity and precision around the meaning behind those notes. It's even more exciting when you discover through discussion that a deeper, underlying theme is running through several categories. You may choose to re-sort and relabel the piles based on this realization, or you may simply note a cross-category insight or meta-theme. You may also discover that two piles are really referring to the same thing, so you might merge them. Or the inverse might happen, so that you split a pile if you realize that it represents two distinct ideas.

TIP

At this point, summaries for each column should reflect an attitude or behavior of the customer. For example, "I can . . . ," "We try to . . . ," "We believe that . . . ," and "How does . . . " are all beginnings of descriptive statements. If you have a summary column that simply lists related facts, such as "Demographics," "Equipment used," or "Experience level," you need to do more work to find the meaning behind those factual lists. You may end up removing the list entirely and moving each entry to a different pile, or you may merge several related lists that share a meta-theme.

In the example, something needs to be done with the "Gear" pile from the first sort. Currently, it's just a list of related facts indicating what each hiker carried that day. Can you go one by one and move each of the stickies under "Gear" to find a new home? Or can you find a "why" behind the list of gear? For example, why is it that the hikers are carrying so few of the 10 essentials?[11] When we looked across the data, we noticed that while most of the hikers carried a minimal amount of gear, they did so intentionally. Check out the "I did research ahead of time" grouping. Other data also indicates the hikers' intention about the location, length, and difficulty of the trail they chose. In the GPS list (which is another fact-based list that needs to be reassigned), one hiker said, "I carry a GPS if it's more than a short day hike." Once we realized this connection, we combined the data in the "Gear," "GPS," and "I did research columns" and created a new heading that reads "I made a conscious decision about gear, safety, and route."