

2. Problem Definition

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Definition and Background

Design thinkers aim to create innovative solutions for users, but truly innovative problem-solving only starts with a clear, focused, insightful definition of the user's problem. The second phase of design thinking, problem definition, is the process of translating insights from user research into meaningful and actionable statements.

As they carry out *empathy* research about users' experiences, design thinkers go broad, expanding and deepening their contextual understanding of user experiences in all their complexity (see *wicked problems*). Designers then use analytical techniques such as empathy mapping and journey mapping in order to narrow their focus, generate insights about users' experiences, and define the specific user problem they will try to solve. Design thinkers frame the problem statement from the perspective or vantage point of the user or community for whom they are designing. That is, the problem definition should be cast in terms of keyword clusters that emerged during empathy mapping—"saying," "doing," "thinking," and "feeling" words and phrases from the designer's observation of user actions and interviews with stakeholders. Drawing on one's empathy research in this way can ensure the problem statement includes a unique insight about the user's context-specific experiences or needs.

Framing a problem statement is challenging but critically important (see experiences of scholars working on problem definition in Cooke et al., 2020; Tham, 2021; and Wible, 2020). Define a problem too narrowly, and it will constrain the solutions that designers feel free to generate in their *ideation* and *prototyping*; frame the problem too broadly or vaguely, however, and the designer's not likely to be creating a solution that addresses the user's deeply rooted problems or that captures a potential design opportunity. Design thinkers often draft several different problem statements in order to shed light on different aspects of the users' experiences—and perhaps even to focus on different types of users—and this experimentation can help design thinkers to see, early on, which problem definitions energize their ideation in the most vigorous ways. Problem definition also highlights the iterative nature of design thinking, for designers might generate insights through prototype testing that lead them to revise their definition of the user's problem in new ways.

Design Application

One useful tool for framing a problem definition is called a point-of-view (POV) statement (Cross, 2011). A POV statement offers an abductive-reasoning ap-

proach to unpack puzzling situations. Design theorist Kees Dorst (2011) argued that “it may be strategic to temporarily suspend the generation of ‘rich’ descriptions of design and instead take a ‘sparse’ account as [the] starting point” (p. 522), but more importantly, designers need “strategies to tackle the complex creative challenge coming up with both a ‘thing’ and its ‘working principle’ that are linked to the attainment of a certain value” (p. 524). Dorst (2011) presented the following frame of abduction, shown in Figure 2.1.

Since design thinking is first and foremost a human-centered methodology, POV statements replace the “thing” (what) with actual user personas (who) in the abductive reasoning situation to guide designers in framing a problem that focuses on what users need and value. Typically, POV statements take the templated shape shown in Figure 2.2.

Figure 2.3 shows an example of a POV statement created by professional writing students working to improve the experience of first-year faculty on campus.

There are three important tasks to keep in mind in crafting an effective POV statement with this template. First, write the POV statement from the perspective of the user, reflecting the user’s experiences, perspectives, values, and language; consequently, good problem definitions only take shape after empathy research and never at the very beginning of the design thinking process when the designer only has their own ideas and hunches about what the problem is.

Second, define the need using verbs, not nouns. Put a slightly different way, problem definition should not include the solution (the noun) in it, for that would severely constrain—indeed, even eliminate the need for—a designer’s ideation. Instead, the POV statement should be crafted in a way to focus on the ideal end goal that the user should be able to achieve or experience (the verb) with any new solution.

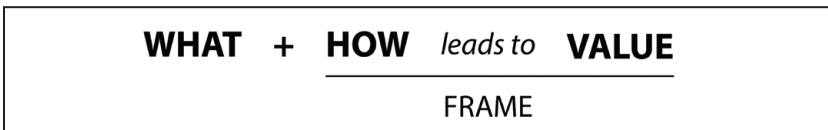


Figure 2.1. Dorst’s (2011) abductive reasoning frame.

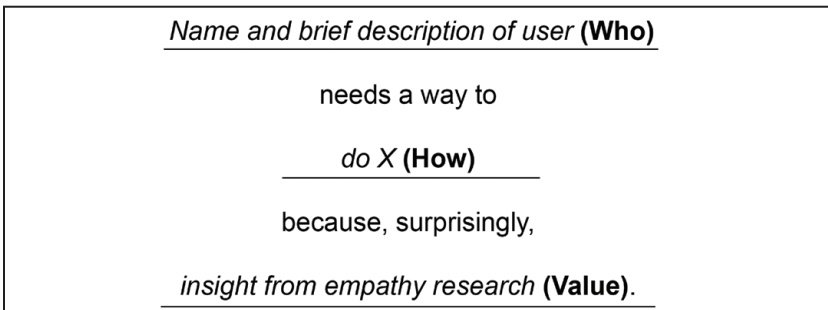


Figure 2.2. A template for writing POV statements.

Nathalie, a new biology professor starting her own research lab for the first time

needs a way to

experience connection and companionship with other researchers on campus,

because, surprisingly,

she has felt “academic loneliness” since stepping on campus and not immediately joining an already vibrant, communal research team.

Figure 2.3. A sample POV statement.

Third, incorporate a surprising insight from the *empathy* research and empathy mapping, particularly those deep insights about how a user thinks or feels about their experiences, as these insights too often get overlooked or ignored in favor of more material needs and *constraints* that users experience.

While designers should be guided by their problem definition as they work through the stages of brainstorming and developing solutions, they should also know that a problem definition statement should not be seen as finished once it’s first composed. During *ideation*, for example, a design team might discover that the problem statement has been crafted either too narrowly or too broadly to focus brainstorming in productive ways. Or, as designers are *testing* their solution prototypes with users, they might discover unique insights about users’ experiences or perspectives that add nuance and depth to—or perhaps even radically redirect—the problem definition.

■ Pedagogical Integration

While problem definition may seem parallel to the formation of a research problem in conventional TPC pedagogy, the design thinking approach requires students to employ a continuous questioning that differs from a linear progressive manner to the characterization of problems. To foster a design thinking mindset, instructors may encourage students to create a preliminary framing of the problem using the POV statement exercise. For example:

Let’s say you are working to help senior (older) users attend online courses. You have observed a few users and spoken to them about their online learning experience, and you’ve learned about some of their struggles.

Read the following persona that emerged from your empathy research:

“Maggie Smith is a retired U.S. Air Force lieutenant colonel. She has been spending a lot of time at home since retirement and would

like to participate in local nonprofit organizing efforts using her expertise in finance and accounting. However, she realized there's a plethora of new accounting software that she needs to learn in order to help her local organizations. She found out there are free online courses she can take through providers like edX, Udacity, and Coursera, but it has been a difficult experience for her to navigate those websites. She is particularly frustrated by the confusing course modules and assignment requirements. She would like to see a more straightforward structure in these online courses."

Use the template presented in this chapter to write a POV statement for Maggie.

Guided by the user requirement enlightened in the POV statement, students can formulate an initial set of design questions that would serve as an anchor to their innovation process. Given the iterative nature of design thinking, students should revisit the definition of the problem in every design review and project update meeting so they may align their effort with the exigency (i.e., need and motivation) of the project. To revisit their problem definition, students should consider a regular debrief meeting that examines the alignment of their empathy research, problem statements, and solution development, asking questions such as "What have we done so far to address the problem? That step hasn't been done, and what needs to be done?" Later in the design thinking process, as students test their prototypes with users, they should use these debrief meetings to ask, "What new empathy insights have we discovered that prompt us to see our problem definition in a new light?"

■ References and Recommended Readings

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