

## **Rigorous Qualitative Human-Centered Methods to Inform Criteria for Broadening Participation in Institutions and Organizations**

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# Rigorous Qualitative Human-Centered Methods to Inform Criteria for Broadening Participation in Institutions and Organizations

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## introduction

2022's Creating Helpful Incentives to Produce Semiconductors (CHIPS) and Science Act [1] mandates efforts to “ensure collaboration and coordination across federal agencies, the private sector, and with state and local governments to facilitate timely and effective reviews of all federally funded projects.” The 4b requirement includes “measures of the institution’s ability to attract and retain a diverse and nontraditional student population in the fields of science, technology, engineering, and mathematics, which may include the ability to attract women, minorities, and individuals with disabilities.” To retain the workforce enabled by this act, these criteria must also be applied to organizations that hire them. Initiatives around diversity, equity, and inclusion are frequently met with derision and suspicion — and are currently targeted for elimination. The CHIPS and Science Act is a law that requires consideration of these and striking that careful balance relies on communicating impact.

*“One doesn’t have to operate with great malice to do great harm. The absence of empathy and understanding are sufficient. In fact, a man convinced of his virtue even in the midst of his vice is the worst kind of man.”*

— Charles M. Blow, New York Times journalist

As the CHIPS and Science Act requires broadening participation evidence to minimize potential harms of emerging technologies, institutions and organizations need actionable measures to meet these requirements. In this paper I examine the use of qualitative, human-centered methods for public policy processes, offer novel rigorous methods, and describe how to incorporate them for broadening participation in institutions and organizations. To deliver engineering solutions that serve all of humanity, we must ensure all voices are heard and respected through rigorous qualitative research methods. How can rigorous qualitative methods be adapted to public policy contexts to effectively broaden participation in STEM institutions and organizations?

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## defining rigorous qualitative research

The engineering community benefits from rigorous research methods, while the community continues to discuss what qualifies as “rigorous” qualitative research. Qualitative methods can be met with dismissiveness, perceived as less valid data sources than quantitative approaches. Some believe qualitative methods are by definition subjective and biased and therefore less useful than quantitative methods, yet that is not the interpretation I learned in my nontraditional career path studying with Indi Young in her advanced training and Tom Tullis on the job at Fidelity Investments. Bias infers a partialness or a singular belief. Subjective refers to data rooted in one

person's experience or interpretation of events. The criteria for qualitative methods outlined in Miles and Huberman's Evaluative Criteria [2] include, as noted by the Robert Wood Johnson Foundation Qualitative Research Guidelines Project [3]:

- **Objectivity/Confirmability**  
Relative neutrality, freedom from unacknowledged researcher bias, explicitness about inevitable bias
- **Reliability/Dependability/Auditability**  
Is the process of the study consistent and reasonably stable over time and across researchers and methods?
- **Internal Validity/Credibility/Authenticity**  
Truth value. Do the findings of the study make sense? Are they credible to the people studied, members of the research community, and others?
- **External Validity/Transferability/Fittingness**  
Do the conclusions of a study have any larger import? Are they transferable to other contexts? Do they fit with what we already know? How far can findings be generalized?
- **Utilization/Application/Action Orientation**  
What does the study do for participants? What is the pragmatic value of the research?

My design thinking mentor Jason Goodwin, Head of Experience Design at Takeda, once told me, "Qualitative data is data; we're taught that data can be proven true; design thinking doesn't buy that." Another teacher, Indi Young, noted, "most professionals understand that people are not reducible to metrics and numbers [4]." Young's Listening Sessions and Mental Models methods aim to cultivate cognitive empathy among those that read the research analysis. These two wise professionals influenced my journey to deeply value and respect lived experiences and perspectives. As a survivor of violence healing among other survivors, I discovered emotions have a factual component and reason for an individual, something to process in order to respond after reflection, not react impulsively, and are important to consider in the design of public services. In my graduate study at Syracuse University's Maxwell School for Citizenship and Public Affairs I learned that public policy success depends upon "thick" participation (defined later in this paper), where qualitative research is an example.

***"Indifference towards people and the reality in which they live is actually the one and only cardinal sin in design."***

— Dieter Rams, German industrial designer

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## public policy failures and relevance of qualitative data

When it comes to the public sector, multiple perspectives must be considered for policy effectiveness. If only quantitative data is considered, policy will fail as shown by numerous initiatives that failed to consider qualitative data [5], as evidenced by the Allegheny Family Screening Tool and illuminated by The World Bank's assessments of their successes and failures.

### *Allegheny Family Screening Tool*

Allegheny County, Pennsylvania, developed and uses the **Allegheny Family Screening Tool (AFST)** [6], an algorithm designed to help child welfare workers decide whether to investigate neglect allegations. While the tool aims to enhance decision-making, its design and implementation raise significant concerns about equity, transparency, and accountability. The ACLU and the U.S. Department of Justice investigated issues with this tool [7, 8].

The AFST generates a "risk score" predicting the likelihood of a child being removed from their family within two years. Higher scores suggest greater need for intervention. The tool disproportionately flagged Black families and households with disabled residents as "high risk." Analysis of pre-deployment data showed that 33% of Black households would be labeled "high risk," compared to only 20% of non-Black households. These disparities stem from the tool's reliance on historical data from systems already marked by racial and socioeconomic inequities, such as juvenile probation and behavioral health databases.

The AFST displays only the highest risk score among children in a household, potentially amplifying disparities. For example, larger households are more likely to include individuals with records in systems like county jail or behavioral health services, further skewing risk scores for Black families. The tool incorporates immutable factors, such as past involvement with the criminal justice system, leaving families unable to escape systemic biases embedded in their histories. The AFST relies on government databases that disproportionately reflect individuals with more contact with public systems, such as low-income families and people with disabilities. This overrepresentation leads to biased predictions, as the tool lacks data on wealthier families who access private services.

Families are often unaware of the AFST's existence, how it functions, or how it influences decisions about their lives. Errors in government databases or glitches in the tool itself exacerbate the risks of unjust outcomes. The AFST exemplifies how algorithms can perpetuate systemic inequities in high-stakes contexts like child welfare. By embedding discriminatory policies into mathematical models, the tool risks turning historical biases into unquestionable "scientific truths." Without transparency, independent oversight, and recourse for affected families, the use of such tools undermines civil liberties and reinforces long-standing inequities in family regulation systems. The deployment of algorithms like the AFST demands urgent

scrutiny to ensure fairness, accountability, and protection of vulnerable families. Policymakers and tool designers must address these concerns to prevent further harm and discrimination.

### *assessing public policy success and failure*

**The World Bank**—a multilateral entity that pursues policy initiatives in and through over 150 governments across the world—assesses the success achieved in hundreds of unique projects every year [9]. The finding is that failure happens between 25% and 50% of the time — depending on how one defines success and failure. How do we define success and failure in public policy? If success focuses on whether planned outputs (e.g., roads, laws, training programs) are delivered efficiently, failure rate under this definition is 24%. If success evaluates whether interventions solve the underlying problems and achieve broader development outcomes, under this definition the failure rate is 51%. Organizations like the World Bank often prioritize “project and product success” because it aligns with their “plan and control” approach, but this scope does not consider whether interventions truly address societal challenges.

A broader view of success reveals higher failure rates. Combining both metrics (project satisfaction and risk to development outcomes) reveals that only 41% of World Bank projects succeed on both fronts—delivering outputs and fostering sustainable development outcomes. 59% of projects fail either in delivering outputs or in achieving broader development impacts, or both. This broader failure rate suggests that public policy interventions often fall short of solving societal problems effectively. As noted in the Harvard Kennedy School paper studying The World Bank [10], the public likely expects public policies to achieve meaningful outcomes and impacts, not just deliver planned outputs. A narrow focus on “project and product success” leads to missed opportunities for solving societal problems effectively. To reduce failure rates and improve resource allocation, public policy organizations must redefine success to include long-term impacts and sustainability, aligning their efforts with the expectations of citizens and stakeholders.

**Rigorous human-centered methodologies are needed to ensure organizations, both academic and work, include broad perspectives** to consider the spectrum of humanity’s lived experiences and expertise. Sasha Costanza-Chock’s *Design Justice* [11] provides a foundation to enhance traditional research methods. Additionally, public policy processes require different data prioritization to serve principles of justice rather than profit. This public policy evolution of Indi Young’s listening sessions and thinking styles methodology adapts a rigorous method to include aspects relevant to public sector work, reduces researcher bias in the process, weighs intersectional impacts, and includes perspectives of participants in evaluation of problem and solution space research. Policies have a greater chance of adoption and success if they align with the lived experience of the people served. Those seeking broad participation in both public and private sectors will find this methodology useful.

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## novel rigorous methods introduction, details, and sample results

Using the *Design Justice* framework recruiting gaps analysis with Indi Young's Listening Sessions approach [12], adapted for the public sector, introduces a rigorous, human-centered approach to qualitative analysis, applied to the need to inform criteria for broadening participation in institutions and organizations. It builds on established practices such as environmental and literature scans, while incorporating and building upon these innovative techniques. The methodology prioritizes inclusivity, minimizes researcher bias, and centers participants' own words to generate actionable insights for public policy design and implementation.

### *The method follows these steps:*

A detailed description of the process follows this list.

1. Strategic, thoughtful recruiting and gaps analysis
2. Semi-structured interviews following the participant's lead
3. Verbatim transcript to capture the participant's own words and avoid notetaker bias
4. Analysis that prioritizes participant mental models
5. Synthesis into mental model diagrams (MMDs), a clear structure to cultivate cognitive empathy
6. Opportunity mapping activity to make the mental models actionable and align policymakers

To begin, this method emphasizes identifying gaps in recruiting and participation, particularly for strategically considered populations that may not have been represented in previous research. It includes a risk analysis to address biases stemming from limited participant pools and narrow research scopes. Identified gaps are to be prioritized in future research efforts. Insights are organized into structured tables for clarity and actionable use, as shown in Tables 1, 2.

Grounded heavily in Indi Young's Listening Sessions, this method adapts semi-structured interviews for public policy contexts. Young's private-sector approach excludes facts and opinions; this public-sector evolution retains them as they are critical for public policy success. Interview sessions begin with open-ended questions to spark conversation, with moderators following participants' leads to ensure authentic dialogue. Automated transcription captures verbatim records which are reviewed with the recording for accuracy and tone, reducing bias introduced by manual notetaking. If budget allows, opt for professional verbatim transcription. Participants' own words are then summarized into statements beginning with an active first-person verb to capture inner thinking, reactions, guiding principles, facts, examples, and opinions—note that their own words are retained throughout. Those summaries are “combed” into insights and themes in a specialized template (see Figure 1. Specialized Template), which

are used to create mental model diagrams (see Figure 2. Example Mental Model Diagram with Opportunity Mapping).

MMDs are generated from participants' verbatim words, organized into specialized templates and spreadsheets. These diagrams provide a visual representation of participants' thinking styles, needs, and perspectives, fostering cognitive empathy among stakeholders. Teams use MMDs in opportunity mapping [13] exercises to identify actionable pathways for addressing gaps, broadening participation, and documenting outstanding considerations, as shown in Figure 2.

The methodology deliberately recruits broad perspectives, prioritizing populations that were not previously represented and identifying overlapping impact patterns of intersectionality. Verbatim transcription ensures participants' voices are preserved without distortion, while the synthesis retains their exact words to highlight their needs. By focusing on participants' thinking styles and centering their lived experiences, the approach ensures human-centered outcomes that align with public policy goals.

This rigorous methodology has proven effective in surfacing nuanced insights and fostering cognitive empathy among stakeholders. Research suggests that reading first-person statements develops cognitive empathy in the reader [14]. By evolving traditional qualitative methods to include facts and opinions relevant to public policy, it bridges the gap between participant needs and actionable policy design. The use of MMDs and opportunity mapping further ensures that research findings translate into meaningful strategies for broadening participation and addressing systemic inequities.

### *ethical considerations and decision maker engagement.*

The method includes traditional research approaches to informed consent, allowing participants to take a break or stop the interview at any time, or withdraw from the study completely. The method asks the researcher to be a facilitator in conversation, not an expert—the participant is the expert in their experience. All research materials are retained in a secure environment with access limited to the researchers and all identification is kept separate from the information on a separate server. By retaining the participants' own words, the researcher bias is minimized and is further reduced by having multiple individuals review the analysis to surface the summaries, themes, and insights. Where possible, emancipatory and radical participatory research approaches [15] benefit the people served and the policy makers. Participants are well-compensated for their time, and those who represent multiple demographics that are difficult to recruit for or experience a greater burden in participating receive a higher incentive rate. The processes are evaluated by principles of justice and equity, seeking to empower communities, center their voices, consider impact, hold the research team accountable, be accessible, and seek a co-design relationship with the public. Each member of the research team is treated as an expert in their own lived experience, and tenure or rank does not weigh the input of one over the other. By sharing this research method evolution, we hope to open conversation with

communities, driving an evolving, sustainable, and community-led approach to public policy making. The grander vision is that public policy will be people-centered, thereby solving the underlying problems they were designed to address through the “project and product success” measures of planned outputs and interventions. Ethical principles that prioritize the people served can preserve resilient human-centered outcomes.

Bringing business partners along through these qualitative efforts is key. One goal of the method is to cultivate cognitive empathy amongst the decision makers so they understand the short- and long-term impacts of policy design and implementation on people and communities. Engaging those served and aiming to have them as the decision makers in policy development serves the ultimate goals of any policy design. Note that, when possible, it is recommended to avoid the term “stakeholder.” It is ambiguous, as it could reference “research beneficiaries, those vulnerable or at-risk from research outcomes, research partners, or anyone with an interest in any aspect of the research process and outcomes” [16].

### *results.*

Since learning Indi Young’s Listening Sessions technique, I applied this method to a variety of work projects. While working on the U.S. Department of Veterans Affairs VA.gov modernization from 2019 through 2020, this method was used to interview Veterans and caregivers with disabilities. Speaking with people eligible for caregiver benefits, disability benefits, and seeking information on other benefits, the technique had participants open up, sharing insights with a deeply personal character. For example, one caregiver said they were afraid to say how much they struggle, because they feared the government would take their children away. Demographic data was recorded, de-identified securely, and the Design Justice gaps analysis technique used to inform recruiting for continuing research. In 2017, this method was used for a U.S. Federal Emergency Management Agency (FEMA) project to interview people who live in flood zones to examine their understanding of flood insurance options and requirements. This method enabled the project to speak with people across a broad range of lived experiences, including those that are “off-grid” and typically excluded from quantitative data.

In these interviews, participants went to “depth,” sharing their priorities that researchers would never think to ask with more traditional techniques. Following participants lead, practicing active listening, and being humbly curious are key factors in this technique. Where the results come is in the analysis. Retaining participants’ own words from the interview all the way through to the insights surfaced, crafted into first-person active verb summaries, cultivates cognitive empathy in those tasked with using the insights.

*“If you bring historically excluded groups into an environment that’s not inclusive, they are only surviving it.”*

— research participant

The process described in this paper results in “thick” participation, a greater quality of human-centered outcomes. As described in Tina Nabatchi’s *Public Engagement for 21st Century Democracy* [17], thick methods include one-on-one interviews, as the emphasis is on qualitative, ethnographic research to uncover people’s inner thinking, reactions, and guiding principles. For public policy, we also need to understand their opinions and factual experiences in order to develop successful public policy. Thick engagement tends to take more time, with more engagement between participants and researchers or policy makers. The goal is mutual understanding and co-design. Without this thick participation, and using only quantitative data, we risk harming the people we serve, as demonstrated in the Allegheny County predictive analysis example.

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## conclusion

Initiatives around diversity, equity, and inclusion are frequently met with skepticism. As the CHIPS and Science Act mandates evidence of BPC initiatives aimed at minimizing the potential harms of emerging technologies like AI, institutions and organizations need actionable guidance to meet these requirements. Rigorous human-centered methodologies prioritizing the spectrum of humanity’s lived experiences and expertise are necessary to foster collaborative environments, policies, and services that include broad perspectives.

This qualitative methodology prioritizes participants’ own words to deliver actionable insights and elements that an inclusive culture or workplace needs for robust, resilient outcomes. It provided evidence from people with disabilities that federal agencies used to evolve physical and digital services and policies.

**Rigorous human-centered methodologies must prioritize the spectrum of humanity’s lived experiences and expertise.** Deep understanding of the range of human needs, concerns, and thinking styles are necessary to foster robust and collaborative environments, policies, and services. By adopting this rigorous qualitative research method with its focus on centering the community with a humble research approach, we can broaden participation in our organizations grounded in human-centered, justice-oriented principles.

**Table 1. Example of Gaps Analysis — Recruiting Sampling Requirement**

| Sampling Requirement                  | Requested | Participants |
|---------------------------------------|-----------|--------------|
| Total !                               | 12        | 12           |
| Relevant experience                   | 100%      | 100%         |
| No college degree !                   | 1         | 1            |
| Women                                 | 50%       | 60%          |
| Men !                                 | 50%       | 33%          |
| Other gender identity !               | 10%       | 0%           |
| Not white !                           | 50%       | 90%          |
| < 35 years old !                      | 2         | 1            |
| > 55 years old !                      | 2         | 3            |
| Disability – vision !                 | 2         | 1            |
| Disability – hearing                  | 2         | 2            |
| Disability – mobility !               | 2         | 1            |
| Disability – cognitive, learning !    | 2         | 0            |
| Disability – Post Traumatic Stress !  | 2         | 1            |
| Disability – Traumatic Brain Injury ! | 2         | 1            |

The red exclamation mark (!) indicates a priority demographic, based on previous recruiting gaps in lived experience.

*Note:* During research planning, establish recruiting goals for various demographics that are relevant for the research goal, seeking a variety of lived experiences. Who’s involved? Who benefits? Who’s harmed? Record the data on the final participants. This gaps analysis informs future research efforts to address the disparities.

**Table 2. Example of Category Analysis —Demographics of Participants**

| Demographic category | P01 | P02 | P03 | P04 | ... |
|----------------------|-----|-----|-----|-----|-----|
| Disability – vision  | -   | -   | -   | X   | ... |
| Disability – hearing | -   | X   | X   | -   | ... |
| ...                  | ... | ... | ... | ... | ... |
| No college degree    | -   | X   | -   | X   | ... |
| < 35 years old       | -   | -   | -   | X   | ... |
| > 55 years old       | X   | X   | -   | -   | ... |

*Note:* Document demographic characteristics of each participant. Data is collected during recruiting in a screening survey. Individual participants may identify in multiple categories representing their intersectional identity.

**Table 3. Some Human-centered Methods: Universal, Inclusive, and Equitable Design Processes [18]**

| Universal                                                                                   | Inclusive                                                                                     | Equitable                                                                                                                                                                    |
|---------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Creating one design for the widest range of abilities and in the widest range of situations | Considers personal identifiers like ability, race, economic status, language, age, and gender | Includes historically underrepresented, systemic inequity, and addresses diverse identities, considers gender, sexuality, race, ethnicity, nationality, class, and abilities |
| <b>One solution</b> for everyone                                                            | <b>Equal access</b> for everyone, regardless of identity factors                              | <b>Equal outcomes</b> for everyone                                                                                                                                           |

*Note:* Consider the values and aims of the process used to design the policy, product, or service. To deliver equitable outcomes, the impact of histories of inequity and violence would be calculated and addressed in the design.

**Table 4. Matrix of Oppression [19]**

| <b>Social Identity</b> | <b>Privileged Social</b>          | <b>Border Social</b>                           | <b>Targeted Social</b>              | <b>-ism</b>            |
|------------------------|-----------------------------------|------------------------------------------------|-------------------------------------|------------------------|
| Race                   | White People                      | Biracial People (White / Latinx, Black, Asian) | Asian, Black, Latinx, Native People | Racism                 |
| Sex                    | Bio Men                           | Transsexual, Intersex                          | Bio Women                           | Sexism                 |
| Gender                 | Gender-conforming Bio Men & Women | Gender Ambiguous Bio Men & Women               | Transgender, Genderqueer, Intersex  | Transgender Oppression |
| Sexual Orientation     | Heterosexual                      | Bisexual                                       | Lesbians, Gay Men                   | Heterosexism           |
| Class                  | Rich, Upper Class                 | Middle Class                                   | Working Class, Poor                 | Classism               |
| Ability/Disability     | Temporarily Able-bodied           | Temporary Disabilities                         | People with Disabilities            | Ableism                |
| Religion               | Protestants                       | Roman Catholic (historically)                  | Jews, Muslims, Hindu                | Religious Oppression   |
| Age                    | Adults                            | Young Adults                                   | Elders, Young                       | Ageism / Adultism      |

**Table 5. Participatory Design Methods [20]**

| <b>Telling</b>                                                                                                                                     | <b>Making</b>                                                                                                                             | <b>Enacting</b>                                                                                                                                                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Storytelling</li> <li>• Future Workshop (includes “provotypes”)</li> <li>• Fictional Narrative</li> </ul> | <ul style="list-style-type: none"> <li>• Participatory prototyping</li> <li>• Probes</li> <li>• Generative tools for co-design</li> </ul> | <ul style="list-style-type: none"> <li>• Improv theatre</li> <li>• Scenarios, stories</li> <li>• Staging performance (with mockups, prototypes, and realistic context)</li> </ul> |

**Figure 1. Specialized Template**

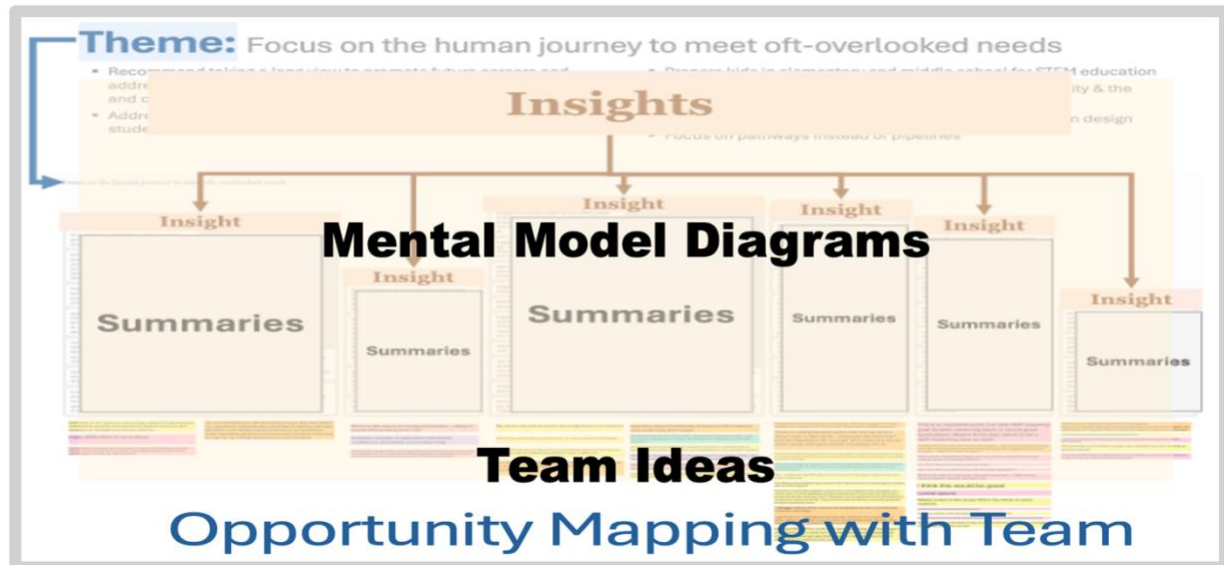
Screenshot of the specialized template, showing theme in the first column, insight in second, then summary, ID, responses, and type of insight which can be inner thinking, reaction, guiding principle, fact, opinion, or story

| Theme                                                 | Insight | Summary                                                                                                                                                                               | ID  | Responses                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Inner thinking / Reaction / Guiding Principle / Fact / Opinion / Story                                    |
|-------------------------------------------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| The theme that appears from a grouping of insights    |         |                                                                                                                                                                                       |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                           |
| The insight that appears from a grouping of summaries |         |                                                                                                                                                                                       |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                           |
|                                                       |         | active first person verb summary from participant's response with detail from their response. Each summary should be sentence that works with I + active first person verb + details. | P## | Participant's verbatim response, captured by automated transcription, broken into individual rows of separate thoughts / insights                                                                                                                                                                                                                                                                                                                             | What kind of insight is it? Inner thinking, reaction/feeling, guiding principle, fact, opinion, or story. |
|                                                       |         | felt attracted to AI in the beginning because there's always something new, another opportunity to find creative solutions to new problems                                            | P01 | [Moderator: How do you roll with the changes as they come in the tech field?] Umm, that's part of what attracted me to AI in the beginning. It's, umm, there's always something new. There's always, you know, another opportunity to, umm, you know, find creative solutions to the new problems. I mean it's what keeps it interesting for me.                                                                                                              | Reaction                                                                                                  |
|                                                       |         | ensure that AI isn't a space that is gatekept because AI requires diverse perspectives, passions, and interests as we introduce that technology into society                          | P03 | I think AI is a really important area where. A lot of different, diverse perspectives in. Majors in topics of study and passions and interests and things like that are really valuable in that space. And I just wanna                                                                                                                                                                                                                                       | guiding principle                                                                                         |
|                                                       |         | find those teachable moments don't scale at a 10k person company, where people are resistant to ethics & bias stuff for whatever reasons                                              | P02 | So in some cases it was just finding, you know, finding those kinds of things. But that's a very one on one. It doesn't really scale when you're talking about trying to like. Each you know ethics and bias                                                                                                                                                                                                                                                  | inner thinking                                                                                            |
|                                                       |         | ...                                                                                                                                                                                   |     | ...                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ...                                                                                                       |
| The insight that appears from a grouping of summaries |         |                                                                                                                                                                                       |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                           |
|                                                       |         | active first person verb summary from participant's response with detail from their response. Each summary should be sentence that works with I + active first person verb + details. | P## | Participant's verbatim response, captured by automated transcription, broken into individual rows of separate thoughts / insights                                                                                                                                                                                                                                                                                                                             | What kind of insight is it? Inner thinking, reaction/feeling, guiding principle, fact, opinion, or story. |
|                                                       |         | dolor amet elit euismod tempor veniam nulla pariatur                                                                                                                                  | P07 | Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum. | Story                                                                                                     |
|                                                       |         | ...                                                                                                                                                                                   |     | ...                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ...                                                                                                       |

This spreadsheet is used with [Indi's Mental Model Dataset Visualizer](#) to generate mental model diagrams, an organized representation of the themes, insights, and summaries.

**Figure 2. Example Mental Model Diagram with Opportunity Mapping**

Screenshot of the example mental model diagram with sample notes under each column of summaries that were added by team members and decision makers

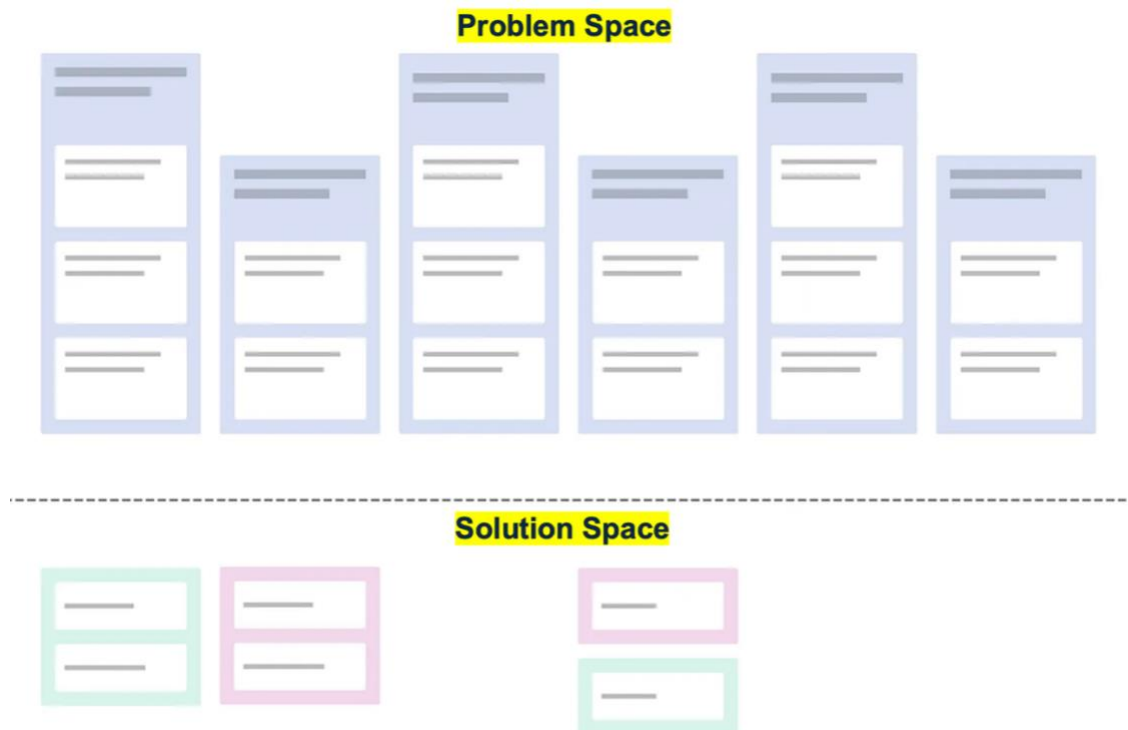


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## **glossary**

- **Design justice** “rethinks design processes, centers people who are normally marginalized by design, and uses collaborative, creative practices to address the deepest challenges our communities face.” [21] *Design Justice, Community-Led Practices to Build the Worlds We Need* is a book written by Sasha Costanza-Chock that introduced the concept and that pairs with the Design Justice Network, a community of practitioners dedicated to these principles:
  - Principle 1. We use design to **sustain, heal, and empower** our communities, as well as to seek liberation from exploitative and oppressive systems.
  - Principle 2. We **center the voices of those who are directly impacted** by the outcomes of the design process.
  - Principle 3. We **prioritize design’s impact on the community** over the intentions of the designer.
  - Principle 4. We view **change as emergent from an accountable, accessible, and collaborative process**, rather than as a point at the end of a process.
  - Principle 5. We see the role of the **designer as a facilitator rather than an expert**.
  - Principle 6. We believe that **everyone is an expert based on their own lived experience**, and that we all have unique and brilliant contributions to bring to a design process.
  - Principle 7. We **share design knowledge and tools** with our communities.
  - Principle 8. We work towards **sustainable, community-led and -controlled** outcomes.
  - Principle 9. We work towards **non-exploitative solutions** that reconnect us to the earth and to each other.
  - Principle 10. Before seeking new design solutions, **we look for what is already working** at the community level. We honor and uplift traditional, indigenous, and local knowledge and practices.
- **Emancipatory research** or transformative research is about including the perspective of people who are traditionally excluded from research. What is the perspective of marginalized people on the work that you are doing? How does your design work shift power and who does it shift power to? [22]
- **Equity** is when all have the same result. Creative Reaction Lab Founder, President, & CEO, Antoinette Carroll defines, “Equality is equal access, while ‘equity’ is equal outcomes.” [23]. Victor Udoewa describes equity as “Equity means different treatment to achieve equal outcomes.” [24]

- **Human-centered methods** focus on “better understanding of everyday user needs and experiences in professional technology design and development,” [25] centering the people served by the service.
- **Intersectionality** is “analysis claiming that systems of race, social class, gender, sexuality, ethnicity, nation, and age form mutually constructing features of social organization.... the ways in which multiple oppressions manifest in a person’s life.” [26]
- **Justice** in a democratic society is rooted in principles that prioritize the welfare of society, respect for individual freedom, and cultivating virtue, the attitudes and dispositions, the qualities of character, on which a good society depends. [27]
- **Mental Models** illustrate how people act, think, and feel in pursuit of their goals. The ways that individuals reason, make sense of the world, and how they update these internal representations inform actions and can be used to discuss potential outcomes. They can be used to develop a deeper understanding of the people served. Mental model diagrams are a visual map of people’s experiences.
- **Opportunity Maps** consist of the Mental Model Diagrams mapping the “problem space” on the top with the “solution space” on the bottom where the opportunities and related information are captured [28].



- **Participatory design** is an approach to design that invites all stakeholders (e.g., customers, employees, partners, citizens, consumers) into the design process as a means of better

understanding, meeting, and sometimes preempting their needs. How can your design process include all stakeholders? What opportunities exist to have stakeholders share perspectives in creating outcomes? [29] See Table 5.

- **Qualitative research** seeks to “understand human knowledge and experience... as individuals by nature... experienced the world qualitatively.” As Dewey described it, “what we act for, suffer, and enjoy are things in their qualitative determinations... it is safe at the outset to refer simply to [qualitative thought as that] which has to do with objects involved in the concerns and issues of living.” [30] As thoughts and reactions are how people experience life, they are inseparable parts of the people we serve, necessary for consideration in any effort to understand the people served.
- **Radical participatory design (RPD)** “is participatory to the root, in every aspect. Regardless of who initiates a project, RPD fully includes the community members in all activities of all phases of the design process and in all interpretation, decision-making, and planning between design activities. In RPD, the community members not only fully participate, but they fully lead and drive the process. RPD is not a method, way of conducting a method, or a methodology; it does not define any design methodology. The community chooses the methodology. It is a meta-methodology, a way of doing a methodology. There are three characteristics of RPD.... (i) Community members are full, equal members of the research and design team from the beginning of the project to the end. There are no design team meetings, communications, and planning apart from community members. They are always there at every step and between steps because they are full, equal design team members. (ii) Community members outnumber non-community, professional designers on the design team. (iii) Community members retain and maintain accountability, leadership, and ownership of design outcomes and narratives about the design artefacts and work.” [31]
- **Trauma-responsive practice** incorporates “a deep understanding of trauma’s impact on individuals... focuses on how to effectively address and support individuals based on their trauma experiences... ensuring that individuals who have experienced trauma are not subjected to additional harm within a care environment.” [32]
- **Thinking styles methodology** is a term coined by Indi Young. It refers to a form of “archetypes or behavioral audience segments” that are grouped by inner thinking, reactions, and guiding principles people use as they seek their purpose. It typically takes the form of concise four-sentence descriptions and may be evolved through continued research. “A thinking style is exactly those two or three top-of-mind guiding principles or inner thinking.” [33]

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