12 Beyond Audience Analysis: Three Stages of User Experience Research for Technical Writers

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Writing for your audience is foundational to all technical writing work.[1] Understanding the audience is particularly important for technical writers who must also advocate for audience's (users') needs. You have probably been asked to analyze the intended audience before, especially when crafting a message or writing a paper. But what do you really know about the intended audience and how do you know it? A multi-phase and systematic approach to user research, as described in this chapter, can help you understand audiences and develop effective products and services for them.

Advocating for audiences requires "considering our users' ways of making meaning and privileging our users' experiences and worldviews by inviting our users into the design process" (Jones 317). Social justice approaches to technical writing and engineering illustrate ways in which design can disenfranchise users (e.g., see Dorpenyo; Gonzales; "Building Access"; Leydens and Lucena; Jones and Williams; Sanchez). Technical writers must position users' experiences, physical and cognitive abilities, and cultural backgrounds as integral to effective design practices.

As advocates for users, technical writers need to know how to effectively learn about and work with audiences, but many audience analysis exercises rely on assumption rather than research (Lam and Hannah). User experience (UX) research practices provides a range of methods and tools for learning about audiences (groups of users) and how they engage with products and services. As Hackos and Redish explain, going beyond

assumptions about users to actually learning about users is an important skillset for technical writers:

> We need to study users because users decide whether to use a product, not designers or writers. Even if the users' supervisors can dictate what they must use, the way people use products is self-determined. We also need to study users because the more we know about them, the better we can design for them. They are people with likes and dislikes, habits and skills, education and training that they bring into play whenever they work with a product. (Hackos and Redish 25)

Users are people who bring their own preferences and needs to each product, service, and communication situation. What Hackos and Redish point out is that technical writers do not know enough about the needs, values, and goals of users from their own experiences and may inadvertently incorporate their own biases by relying on their personal assumptions. Conducting UX research helps technical writers, and other members of design teams, to move from relying on their individual assumptions and toward working with real audience perspectives (Johnson; Smith et al.). Bringing these perspectives into the design process is incredibly important for effective and inclusive design. As Acharya explains, "building an inclusive and just future starts with understanding the needs and expectations of all users, including underserved, underrepresented user groups from different cultures" (17).

User experience (UX) research is an extension of audience analysis that incorporates a range of research methods, seeks to include user perspectives, and positions users as experts. As part of the process for developing content and designing products for users, UX research situates a range of audience concerns, including audience goals, accessibility, and context of use. Technical writers—who design information to meet audience needs and goals—must think from a UX perspective in order to design content and navigation to support users. Without building knowledge from a user perspective, it is easy to misinterpret user needs or exclude them altogether.

Don Norman illustrates the importance of resisting assumptions about audiences and learning about audience from the perspective of a user feeling excluded product designs. He wrote about his experience as an "elderly user," describing products designed for his age group as ugly and difficult to use:

> Despite our increasing numbers the world seems to be designed against the elderly. Everyday household goods require knives and

pliers to open. Containers with screw tops require more strength than my wife or I can muster. (We solve this by using a plumber's wrench to turn the caps.) Companies insist on printing critical instructions in tiny fonts with very low contrast. Labels cannot be read without flashlights and magnifying lenses. And when companies do design things specifically for the elderly, they tend to be ugly devices that shout out to the world "I'm old and can't function!" We can do better. (Norman)

Norman is describing products as misunderstanding the needs and values of his age group, in terms of accessibility, functionality, and aesthetic. The range of issues Norman describes affects product design, user support, user orientation, interface design, information design, and typography. Norman's essay illustrates that design decisions targeting his user group are based on assumptions and not research. Learning about users and listening to users are necessary first steps to avoiding assumptions and being able to advocate for users.

This chapter presents UX research as a three-stage process to help you build on what you already know about audience analysis and to help you effectively incorporate data collection, research methods, and user documentation into technical writing processes. The three stages of user research presented here are background research, primary research, and usability testing. Background research involves collecting and analyzing existing studies (published research), available market research, datasets, and artifacts. Primary research involves designing a study to collect data that has not been collected in previous studies or to update findings from previous studies. Usability testing involves testing a specific element of a design (content, feature, navigation) with your audience.

These stages are iterative and flexible. That means that as you progress through the stages, you may continue to conduct background research (Stage One) and perhaps incorporate user tests (Stage Three) as needed throughout the design process. The first two stages help you narrow what to design and test in the third stage. For example, the first two stages might help you design the progression and instructions in an app or the navigation of a website, and the third stage can help you test those features in order to refine them. At the end of each stage, you'll organize your findings and make recommendations for next steps. This chapter does not cover each deliverable you can develop at each stage—including personas, scenarios, and journey maps—or explain each method you can use at each stage. It gives technical writers a framework for conducting UX research with content development and information design work.

From Audience Analysis to UX Research

Audience analysis is too often reliant on the writer's experience and intuition (Lam and Hannah 29). Even when audience analysis begins with identifying demographic characteristics like age, marital status, income, etc., relying solely on these characteristics often positions the technical writer to make too many assumptions about their audience based on limited information. For example, date of birth or income often tells you little about technology skills, cultural background, preferences about adopting technology (e.g., early adopters), or what kinds of features will make a product more accessible. Learning more about these audience values and goals will help a technical writer craft better technical content, provide better task orientation features, and design more effective navigation and visual information.

To emphasize the limitations of demographic information, consider the once-popular meme about Ozzy Osborne and then Prince Charles. They are very different people but have many demographic characteristics in common. They are both the same age, both from the same country, both have remarried, both have children, and both are wealthy (Ward). But, as marketing analysts have pointed out, this information is helpful, but does not offer a complete in understanding how best to address them as users. In other words, while these two users may belong to the same age group, they are not likely to belong to the same user group.

This example shows the complexity of audiences that cannot be explained solely through demographic characteristics like age, income, and nationality. Technical writers must be able to go beyond these characteristics to find out more about the values, goals, interests, and cultural backgrounds of users. Through UX research, technical writers can systematically build information and assess their research practices in order to properly support, work with, and advocate for users.

Advocating for users is an important technical writing responsibility, particularly to ensure products (including content) are inclusive and accessible (Jones; Rose and Schreiber). Accessibility should not be seen as compliance, but as a shared value ("Building Access"; "Universal Design and the Problem of 'Post Disability' Ideology"; Huntsman). Accessible design supports a spectrum of cognitive and physical abilities. As the World Wide Web Consortium (W3C) points out, web accessibility supports a range of users including older users, users with disabilities, and users in rural areas. Huntsman explains accessibility from a technical writing perspective:

> Every designed communication is a built environment with methods of access. The words we choose, the format we design, and the technology we use are all elements that develop access to information. (Huntsman 233)

Huntsman's definition positions design as a series of choices, and all of those choices affect accessibility. It is problematic when design teams, including technical writers, make assumptions about users and choices about designing for users from those assumptions. Instead, technical writers need to infuse their work with UX research practices so that at all stages of writing and design, they can mitigate inaccessible design choices by learning about and with users.

As Huntsman shows, accessible design advocacy is about both engaging with design decisions and with audience needs and values. Advocating for users and promoting inclusive design begins with listening to users (Smith et al), valuing their experiences and cultural backgrounds (Jones), and identifying choices in design and opportunities for intervention and inclusion.

Three Stages of User Research

Technical writers use UX research practices to collect information about audiences and test content, service, and product features. In other classes, you may have learned about primary research (collecting new data) and secondary research (consulting existing studies). Because secondary research tells you what has already been studied relating to your research questions, it helps you decide what new data needs to be collected or what data needs to be updated (primary research). These three phases—background research, primary research, and usability testing—show how secondary research sets up primary research by helping the researcher systematically identify underexplored areas of research or studies that need to be revisited. The primary research stage sets up the more usability testing stage, which is a more focused type of primary research.

Technical writers often work in collaborative environments, often work on multiple projects, and often work on both short-term and long-term projects. Therefore, it is incredibly important for technical writers to document their research findings and make recommendations at each stage. This will help others understand how they collected their data, help others on the project use the data, help managers and project managers make decisions using the data, and help others collaborate with the data collection. That is why each stage describes the research to be done as well as how to organize the

findings and write recommendations. The findings of research at each stage need to be organized in a way that can be used by others as well as help the technical writer track what they've learned.

As you move through these stages, it's important to regularly pause and consider what perspectives and experiences are being left out and how to best directly include those perspectives. Because technology often has embedded racial, gender, and ability bias (Broussard), regularly trying to incorporate additional perspectives is important. In their argument for direct collaboration among designers and people with disabilities, Oswal and Palmer argue that including users with disabilities:

> . . . employ their distinct know-how about disability which originates from their bodily differences and diverse contexts of purpose and use. In the case of "context of use," design work with disabled users differs significantly from design work with other users because most participatory studies do not focus on this aspect of design. Disabled people bring viewpoints of their own of being in and with the material and social world which shape, at least in part, their human desires, needs, and expectations. Disabled bodies traverse through these worlds at a different pace, in diverse ways, and for succinct purposes to fulfill these needs, desires, and worldly goals which might appear odd, out of place, or even undesirable to a non-disabled eye and a presumably fit body. (Oswal and Palmer 251)

The immersed disability perspective Oswal and Palmer describe helps technical writers and designers understand both user goals and context of use (Stage Two).

These three stages are designed to help technical writers systematically gather information about users, to involve users directly in design, to listen to users, and to treat users with respect and dignity. While every approach will have flaws, focusing on building reciprocal relationships with user groups, particularly marginalized communities, helps minimize issues (Cardinal et al; Smith et al).

Research Stage One: Background

The first stage of UX research is to gather information from previous studies or existing artifacts: background research. Conducting background research is a focused activity, and technical writers should start with studies that are specific to a group of users and studies specific to the technology or service being developed, including accessibility concerns.

To begin, technical writers need to identify at least one audience or group of users. You may be studying multiple audiences and should gather information about each separately before synthesizing their findings and recommendations. As technical writers, you need to decide what you want to know about the audience (research questions). The research question(s) becomes important because it helps you identify key words and focus your search. Your research question helps you define your group of users as well as related technology, product or service questions. It's okay if your research question is general, but you want to make sure you push beyond demographic questions to get at values and needs of users.

For example, a group of users might be adults 65 and older. This is the user group that Donald Norman discusses as being underserved at the beginning of this chapter. It is a very larger user group, spanning multiple generations, and as you conduct background research, you may wish to divide this large user group in to multiple user groups based on what you learn. Possible research questions to get you started conducting background research about adults aged 65 and older and their technology use include:

- What do adults aged 65 and older value about technology?
- Why do adults aged 65 and older adopt technology?
- What technologies do adults aged 65 and older adopt?
- What accessibility or design features have been developed to serve adults 65 and older?
- What accessibility or design features have been tested with adults aged 65 and older?

These example research questions address accessibility, technology or service adoption, and value separately. By asking them separately, you will be able to find studies related to each of these items, which may or may not overlap and identify a wider range of key phrases. For example, finding studies about what the audience values about technologies or services may or may not give you information about what makes technologies or services accessible to your audience. The phrase "technology adoption" + adults aged 65 and older may yield different results than "technology values" + adults aged 65 and older. These questions can also be refined to explicitly include services or be more focused on a particular product category.

As a technical writer, you may use a range of methods to conduct background research, depending on your research question and the facilities you have available to you. For example, your organization may have a

technical library or you may have access to a relevant archive or database. You will be also able to access a range of scholarly articles, trade publications, and databases through your local or university library. Consider also using available market research and government databases to help you begin to develop an understanding of the users and user groups.

Developing key search terms can be challenging. Start with the user group itself as well as other names for the user group. For adults aged 65 and over, you may want to use search terms connected to the generations that age group represents, e.g., Baby Boomer Generation or Silent Generation). As you are reading, be mindful of search terms that are emerging. Norman's article uses the terms "elderly users" and "seniors," which may also be helpful in developing additional search terms.

Technical writers also need to be mindful of evolving language practices. It is important to get feedback from audiences about how they want to be identified. Style guides including *Chicago Manual of Style, Associated Press Stylebook,* and *Conscious Style Guide* offer specific guidance for talking about groups and using sensitive language for describing the identity for groups. Organizations like the National Association of Black Journalists and National Association of Hispanic Journalists also offer guidance when it is not possible to talk to a group directly. Technical writers should be cognizant of respectful language and possible conflicting opinions about identity from multiple communities, even within the user group.

Conducting background research will help you, as a technical writer, focus your search terms and questions. If your topic is about a specific technology, like virtual assistant technologies, you should also look for studies that have tested these technologies with a variety of audiences and compare to what you have found that is specific to your audience. As you analyze previous studies, you can start making connections and synthesizing your findings in order to narrow your search terms, identify other key areas of background research, and proceed to the next phase.

Conducting background research is a complex process. You'll want to organize the research effectively so you can use it to help you move to the next stage. The deliverables you develop at this stage should be chosen and designed to best support the next stages of research and product development. A literature review matrix is particularly helpful in identifying gaps in the literature and studies that need to be updated. It can provide a better snapshot than an annotated bibliography and may be easier to update.

Use a spreadsheet to document the following items:

- Citation information
- Methods used in the study
- Sampling – who was included in the study, how were they recruited?
- Major findings
- Relevance to the project
- Relevance to the user group
- What can/should be updated about the study?

You can list other categories, depending on your research questions. For example, the technology or product or service studied alongside the user group might be really important and might require its own column.

Stage One is an opportunity to explain studies that would be really relevant to this group of users if only they were more recent. Use the matrix to identify what needs to be updated and why. For example, if you were conducting research about readable font choices for older adults, a 20-year-old study (e.g., Bernard et al.) that addresses both the user group and the product feature may be relevant to the project, but further research would be required to test fonts using current screen technology and mobile devices. This stage is also an opportunity to analyze recent studies to identify gaps that have not been addressed in the research thus far and thus studies that would benefit this user group. These gaps in the research—studies that need to be updated and data that still needs to be collected—should connect to the recommendations you make for the next steps for research.

When you are finished conducting background research or when you have collected enough background research to identify important gaps for additional study, you can proceed to the next phase. Keep in mind that conducting background research is an ongoing process that you will do throughout a project, but make sure you are critically analyzing your background research regularly so you can identify opportunities to move to other stages of research.

Document your work in an analytic memo. In your memo, make sure you include a summary of your findings; a description of your background research method, including keywords, research questions, and databases; and recommendations for next steps. You should identify gaps in the research, prioritize the next steps to addressing them, and explain how addressing those gaps will benefit the user group and the overall design process. At this time, you should also start documentation that will be used to define user groups—including journey maps, personas, use cases, and scenarios—as relevant. You will refine these documents throughout the process as you gather additional information.

Research Stage Two: Primary Research (Feedback, Observation, Gathering Information from Users)

In the background stage, you've identified gaps for additional research as well as research that needs to be updated. These gaps may includde missing information about the users. In Stage Two, you have a variety of primary research methods available so you can observe, evaluate, and gather feedback.

In Research Stage Two, you want to find out more about user goals and context of use. These are two areas that require primary research or gathering new data. In this stage you will want to design an approach that includes talking with users about their goals, direct analysis of the digital and physical context of use, and observations of how users approach the physical and digital spaces of use.

User goals and context of use are overlapping areas of inquiry but address them separately before comparing data. By addressing them separately, you can better understand the context of use, instead of relying on the user's perspective on the context of use.

Technical writers want to talk to users directly about their goals, usually through interviews or focus groups. To find out about user goals, you'll get better information from users if you practice effective interview techniques that draw the users to tell stories about using products or their experiences (Portigal). While users might have particular goals in mind, getting this additional detail can often help users think through their goals and provide richer data about their likes, dislikes, values, and interests. Focus groups allow users to riff off each other's answers, which may be helpful for your study.

You can also use surveys and questionnaires at this stage, which can be effectively combined with methods that help draw out user stories. For example, surveys and questionnaires can help you gather information at scale, but you'll want to gather enough data directly from users in order to write effective questions. They can also be used to gather demographic information or easily answered closed-ended questions that do not require a lot of writing.

St.Amant explains context of use as "the environments in which individuals employ an item" ("Of Scripts and Prototypes" 115). He describes context of use as including physical and digital settings and cultural values and expectations. St.Amant is writing about products created for a global market, which must consider a wide range of localization factors. Beyond localization concerns, context of use is an important consideration. Consider, for example, medical devices designed for lab environments or for assisted use that need to be used at home and sometimes without assistance ("Cultural Context of Care").

Context of use involves physical, social, and cultural environments and factors (Hackos and Redish 93-97). If you can narrow the environment of use (e.g., a particular space), you can observe users in that space. Early on, you may want to observe without any guidance to best capture how users approach tasks in that environment. More focused testing (Stage 3) should be designed from what you know about how users usually approach tasks in their environment. You also want to observe as much as you can about the context of use and try to make initial observations without disrupting regular activity or directing users in any way.

User goals do not always align with the use of a single product, service, or system. In fact, they rarely do. Further, context of use is rarely what designers have imagined. To better understand the importance of both user goals and context of use, consider the following example: One goal of college students is to graduate on time. In order for an institution to understand whether they are properly supporting this goal, it would first need to acknowledge the range of systems (e.g., course registration systems), documentation, and processes (course scheduling procedures, advising procedures, course rotations, etc.). These systems are affected by context of use. Do they require students to be on campus? What are the hours of availability? Can they be accessed effectively through mobile technology? Does documentation (e.g., instructions) assume access through a laptop instead of a mobile device? Finally, what is the starting point and how is that communicated? There are several stakeholders in the goal for students to graduate on time, and an institution will need to understand several factors related to context of use to effectively support this student goal.

Write a summary and recommendation memo or report for each study you conduct at this stage. If you conduct multiple studies, write an additional report that synthesizes the findings across the studies and makes recommendations for next steps. In your recommendation report, you'll note the findings of your research, your methods, and how the context of use and user goals could affect the overall design. Continue refining user documentation, such as personas and journey maps. You are ready to move on from Phase Two when you have research questions that you can test with audiences (usability testing).

Research Stage Three: Testing

The first two stages of UX research should take place early in the technical writing process. You are ready to start testing your product or service (e.g., content or a website) when you have gathered enough information

about the user group and the context of use to develop something to test. Uusability testing is not the end of the technical writing process; rather, technical writers test their work with audiences when they have enough information to develop an effective prototype to test but are not so far along that they cannot make substantive changes based on user feedback.

Usability testing assesses how a user interacts with a particular feature of a product. For example, you might test how they interpret content, how they complete an activity, or how they navigate a website. You may go through multiple rounds of testing as well as gathering additional information from users as the prototype (e.g., a draft of content, wireframe, etc.) progresses. Testing after the design is complete makes it difficult to implement changes that can support users.

Card sorting is an early stage method you can use, though some would not classify it as a true usability test since the user is not interacting directly with a product. This activity focuses on user preferences in relation to the product but should be conducted early in the design process. The iterative nature of the three stages means that you can conduct activities in any stage as needed for the project and return to other stages. You can also combine a card sorting activity with your Stage Two interviews. The stages are flexible and your decisions should be based on using participants' time efficiently as well as having enough information about them and their context of use to make activities like card sorting effective.

Card sorting can be conducted in Stage Two or early in Stage Three, but placing it in Stage Three illustrates card sorting and think aloud protocols as complementary methods that can be done at different points in the design process. If you are unfamiliar with usability testing, these two methods are a great place to start.

Card sorting is incredibly helpful for thinking through possible approaches to information architecture, content categories, and information hierarchies from a user perspective. Card sorting involves using note cards with words and phrases (either physical or using software) and allowing users to organize them as they see fit.

A think out loud, think aloud, or talk aloud protocol involves prompting a user to share their thoughts while using a product or feature. This product or feature might be navigating a website, completing an activity, or using a set of instructions. It is a very common usability test and requires careful preparation for both the user and the moderator since prompting people while they're doing something can seem "unnatural" (Barnaum). A think aloud protocol helps you understand the extent that your design addresses audience needs.

When you've completed a round of usability testing, write up your results in a memo or short report. Include enough information about your usability test design for another person to repeat it. Be sure to describe the study's limitations and recruitment strategy, which can be useful as the project moves forward and as you pursue other tests. Continue honing your user documentation deliverables, such as personas. Make recommendations for further research and any design recommendations based on your results.

CONCLUSION

UX research is central to technical writing work. The three phases of user experience (UX) research—background, primary, and usability testing—presented in this chapter are intended to help you see research as both a fundamental and ongoing part of technical writing. This chapter provides a foundation for building your knowledge of research methods and when to use them as a technical writer. It touches on some methods and provides a framework for incorporating others. Methodological approaches are constantly emerging. This three stage UX research process is useful for effectively incorporating and situating traditional research methods as well as testing methods. For example, it can be used to incorporate emerging methods in community-based research, which foreground relationship building and reciprocity with users (e.g., see Shivers-McNair et al.).

This chapter also touches on important topics like accessibility, disability studies, identity, inclusive language practices, and inclusive design because they are central to all technical writing work, including UX research. Building your knowledge in these areas is never finished. A central requirement for technical writers' ability to advocate for users to constantly build and maintain this knowledge and to continue to learn about and from users as people.

Integrating UX research practices and building reciprocal relationships with communities is essential for technical writers and design teams to effectively serve users and build inclusive and effective designs. User communities are complex and finding out about them and listening to them requires time and commitment and reciprocity (Cardinal et al.; Smith et al.).

This work does not always easily align with corporate structures. Smith et al describe reciprocity as working with a community, for example helping with technology questions or providing other expert knowledge and engaging the community with your findings. Acharya's integrative literature review shows usability studies, guidelines and methods are evolving

toward addressing social justice concerns and not just corporate concerns. He argues that "usability is not limited to what makes a product expedient to use, but also considers how the product can play a key role in improving peoples' lives" (Acharya 18). Technical writers will need to rethink metrics like speed and argue that the quality of a product or service is best measured in how it enhances the quality of life for users.

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<div align="center">TEACHER RESOURCES</div>

OVERVIEW AND TEACHING STRATEGIES

Audience is infused in technical writing practice and pedagogy. UX research is a formal and systemic approach to audience analysis that can be incorporated into your courses where you would normally focus on audience.

The three stages of UX research are designed to be flexible in practice but are also flexible for classroom pedagogy. For example, as a teacher you may choose to make Phase One a collaborative project where the class completes a literature review matrix together. This project can be set up with classroom activities like reading and analyzing at least one research article together and comparing audience assumptions with actual data.

UX research and the concepts from this article may be incorporated into the following topics:

- Introducing rhetorical concepts of audience and audience analysis
- Writing complex information for audiences
- Biases and assumptions about audiences
- Case studies about design failures
- Introducing concepts of usability, readability, and accessibility
- Introducing ethics and social justice approaches to technical writing
- User documentation like use cases and journey maps as project management tools

DISCUSSION QUESTIONS

These discussions and activities can be scaled for class discussion, group activities and projects, or individual assignments.

- Choose a generation (e.g., Baby Boomers, Gen X, Millennials, or Gen Z) and write down what you know or think you know about them. Conduct background research to check your assumptions.
- Create a literature review matrix with at least 6 sources (See Stage One). Write an analytic memo or create a persona based on your findings. For information about creating personas, visit https://digital.gov/2015/04/06/using-personas-to-better-understand-customers-usa-gov-case-study/.
- Read a usability study as a class. Identify and describe the research question(s), method, and sampling approach. What remains relevant about the study and what can be updated? Consider different user groups, technologies, and contexts of use.

- Choose a campus process to evaluate. Consider processes associated with transportation, registration, financial aid, the library, or advising. Identify design decisions and how they connect to various stakeholders and audiences. What is assumed about the context of use? Design a card sorting exercise or think aloud protocol to test one of these processes.