

DESIGN RESOURCE



Design Process

1.1 Project Development Team

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1. Overview

There are two basic types of knowledge (Takeuchi & Nonaka, 2000). Tacit knowledge is that held by an individual that is learned through experience. Building users, both regular inhabitants and visitors, have tacit knowledge that is very important for a design team to tap. Moreover, experienced designers also have good knowledge about design strategies that work and those that do not. Explicit knowledge, on the other hand, is the type of knowledge gained from research. Good research on a topic is valuable for getting an overview of the issue and understanding the variation in needs and preferences among a user population. For example, while it may be possible to engage a few wheelchair users or people with visual impairments in a design project, research on the needs of a wider range of people with visual impairments will provide more reliable information on needs and preferences and how they might vary across this population.

Empirical research is time consuming and expensive to do, and to do it well requires knowledge of research methods. Thus, in most design projects, it is best to identify and utilize research-based sources of information, like systematic reviews of research on a topic, or design guidelines that have been developed by compiling and analyzing the results of many research studies. However, it is also possible to tap the available tacit knowledge through focus groups, focused interviews, surveys of potential users and the design team, and co-design activities. Ideally both explicit knowledge and local tacit knowledge should be applied in evidence-based design activities.

The isUD™ was developed to codify and organize explicit and tacit knowledge from experience in universal design. The goal is to accelerate the application of pertinent knowledge about universal design by doing the upfront searches and compilations that designers usually do not have time to do. But decisions still must be made about which solutions to adopt and how to address local issues. Further, isUD™ is a work in progress. It does not have all the answers to every problem. Thus, every design team should develop a process to help choose the appropriate Solutions and identify tacit knowledge that can be applied to a project.

A knowledgeable team is vital to bringing the perspectives of all users to bear on the design. This team should include people with specialties in different areas of design (e.g., acoustics, lighting) as well as future users (e.g., employees, staff, visitors, etc.). Elaine Ostroff (1997), co-founder of the Institute of Human Centered Design (formerly Adaptive Environments), makes the important point that inhabitants of buildings have valuable knowledge about how buildings are used and experienced. She argues that “Users of the products we design are an extraordinary and often-overlooked natural resource in the design process” (Ostroff, 1997, p. 33). Users/experts have a wide range of professional orientations, ages, abilities and perspectives and thus have tacit knowledge not known to the designers. “These experiences offer unique and expanded insights to universal designers, who tell of how real interactions with people have been memorable, intense experiences that provide usable information for the design process” (Ostroff, 1997, p. 34).

Tacit knowledge of local conditions is particularly valuable and may not be covered in the research literature. For example, transit users would know that existing conditions at a bus stop near a new building are unsafe during winter when plows pile up snow and passengers must stand out on the street while waiting.

Engaging potential users can inform designers by identifying problems and issues, but it may take further expertise to know how best to address them. Technical experts can evaluate what users say and develop technical solutions that will work. For example, office workers in an existing building might report that they frequently need to operate space heaters in the summertime because they are too cold. An expert on thermal comfort can then investigate the cause of the problem and propose a technical approach to avoid it in the new building.

Tuckman (Tuckman, 1965; Tuckman & Jensen, 1977) developed a model of group development that can be used to plan design team activities. It includes five different stages:

- Forming
- Storming
- Norming
- Performing
- Adjourning

Forming is when a project leader chooses members of a team. The project development team should include diverse stakeholders who each can provide valuable specialized tacit and/or explicit knowledge. For example, a group that will be planning renovations to city streets may be comprised of representatives from a transportation agency, urban planners, civil engineers, etc. This group would provide professional perspectives. To access tacit knowledge of end users, this team could also include people with different types of mobility disabilities, bicyclists, frequent pedestrians, street vendors, etc.

The **Storming** phase involves development of goals. During this phase, members of the group may become frustrated when conflicts are identified over priorities. When this happens, the project leader must refocus the team and reiterate that everyone's opinion needs to be heard. The team must work through this phase to move forward. Thus, discussion may need to focus on finding creative ways to address all stakeholders' issues.

In the third stage, **Norming**, team members will have established connections to each other. During this phase, the team leader should make sure that conversations are working effectively to address outstanding issues and make any adjustments needed in team composition or communications. Adding a new member of a team with fresh perspectives can be a good solution to problems with group dynamics.

During the **Performing** stage, members will increase their productivity. They will be able to use their specific skills and will have learned how to integrate their knowledge into the project. The team will start achieving goals of the project. As many goals are addressed, some members of the team may not be needed. Others may continue on, or other people may be recruited to provide perspectives on emerging issues. Thus, the team leader should be monitoring the composition of the team and adjust it to focus on the unresolved issues.

Adjourning is the phase when the team has accomplished its mission and it appears that they are no longer needed. But a universal design project does not end with the project construction. So, the team should not disband once the design is completed. At least a skeleton group should be available and meet as needed to address issues that come up during construction or in the "break in" period for several months after.

Law (2010) studied how organizations responded to the goal of accessibility for people with disabilities. He identified practices of organizations that successfully create and sustain an inclusive environment. His list of practices is modified here to include other forms of inclusion as well as disability:

1. Adopting a social model of ability, wellness, and social participation, as opposed to a medical model.
2. Establishing executive-level backing for implementing and sustaining inclusiveness.
3. Establishing inclusiveness as a key priority that is not subordinate to others.
4. Taking a planned, proactive approach to address known issues and building resilience to address new issues as they arise.
5. Making universal design a shared task that all organizational members need to address in their roles.
6. Providing enabling resources so that all team members can accomplish their goals.
7. Providing sources of expertise when required.

These practices can be used as a guide to establish a *culture of universal design* in an organization. If followed, these inclusive practices will lead to a lasting commitment to inclusiveness by an organization and its leadership team. A commitment to practicing universal design is a part of organizational culture, not just part of one project. Thus, the practices implemented in one project can have an even more significant impact on the organization by influencing the way it does all its business.

2. Issues to Consider

Designer Bias: Despite their experience and desire to achieve an inclusive solution, designers often have different backgrounds and values than the broader population of users and their experience influences their decisions. They may also have inaccurate notions about the needs of others. A diverse team, including end users, can help to ensure that designer bias does not limit the potential of a building to suit a broader set of needs and aspirations. The team can provide more diverse insights throughout the design process to counter designer bias explicitly.

Planning for Future Needs: Built environments will stand for many decades and may have multiple owners. Thus, flexibility for future needs should be anticipated as much as possible. This could involve developing a plan in which uses could be easily re-allocated, including more storage, movable furniture and partitions and designing rooms in such a way that different furniture arrangements will fit well in them. Re-allocating space for addressing emergencies and other unknown temporary functions need to be considered as well.

User Engagement: In some projects, the key user groups are easy to identify, for example, when an organization is relocating intact to a new building. In such a case, employees, customers, patients or clients can be engaged as user experts and it could be relatively easy to send surveys and invitations to public meetings out to existing mailing lists. Many employers and organizations, especially those that are faith based or educational and human service providers have standing committees and task forces that work to improve inclusion. The members of these groups can be enlisted for participation in design projects. Some groups of potential users may be harder to find, for example, people with severe disabilities or transgender and gender non-conforming individuals, pregnant and nursing women. In these cases, the universal design team can recruit advocates who can speak for these groups. This will provide insights that may be overlooked otherwise. There are many advocacy organizations in most communities that can be helpful in identifying knowledgeable “user experts.”

3. Related Standards

[ICC/ANSI A117.1 2017 Standards](#) – provides accessibility standards that intend to allow a person with a physical disability to independently get to, enter, and use a site, facility, building or

element. These standards are referenced by the International Building Code (IBC) which includes scoping provisions where accessibility is required.

[2010 ADA Standards](#) – standards of accessible design that are assembled by The Department of Justice.

[OSHA Law and Regulations](#) – meant to protect the health and safety of employees (Occupational Safety and Health Administration, 1970). These standards are applicable for nearly all workplaces.

[US EPA Laws and Regulations](#) defines policies that meant to protect human health and the environment (United States Environmental Protection Agency, 2017). The agency has a guidebook to assist with compliance for businesses, federal facilities, local governments and tribal authorities. The EPA enforces regulations such as the Safe Drinking Water Act and the Renovation, Repair, and Painting Program. A higher level of environmental protection may be desired in a project, e.g. elimination of air born allergens or water purification, which could require engagement of specialists in air and water quality.

[State or federal historic preservation rules](#) – may apply to select projects. Public input is not always required by these rules. The public can be consulted on what to do with the site, but reviews are usually done by local community organizations like historic building preservation boards. Thus, in a project that requires historic preservation approval, a member of the local preservation board would be good to include in the universal design team.

It is important to note, however, that accessibility and safety standards and codes do not require processes for input from diverse users. This is a major difference between mandated standards and isUD™. The EPA does try to ensure they receive input from the public by holding forums for some initiatives, like Superfund Cleanup Initiatives. The EPA has a [Public Participation Guide](#) that can be used by business to understand different ways to engage the public. For many of their regulations and initiatives, they post their intentions on the Federal Register in the public docket. The EPA recognizes that “[p]ublic participation is not simply a nice or necessary thing to do; it actually results in better outcomes and better governance” (United States Environmental Protection Agency, n.d.). This sentiment should be instituted as a practice in universal design, not just viewed as a recommendation.

There is generally a lack of attention to public participation of end users in the standards listed above. isUD™ thus fills a gap to ensure that the public, particularly underrepresented groups, are participants in the design process.

4. Measurement and Verification

Assembling a varied team is crucial to verify that people with different needs are accommodated. By including people with diverse levels of education, religions, physical ability, races, and other experiences, the final project will address diversity in a more robust manner, leading to better success in universal design.

To extend outreach further, the team could hold public meetings or send out surveys to ascertain preferences and priorities for certain design features.

5. Design Considerations

- i. Project development team affirms Compliance with all applicable accessibility and safety codes. This could include OSHA Regulations, ADA accessibility standards, building*

codes, planning or zoning codes. isUD™ builds upon the foundation of these codes. Some team members may be aware of the necessary codes to follow from experience, but an expert consultant is still desirable to include on the team. If there are questions about what codes are applicable or technical standards, the team can consult with building officials or local advocacy organizations.

- ii. *Project development team selects a universal design development coordinator responsible for managing the design process and preparing the necessary materials to support certification.* As with LEED Certification, there needs to be a leader who can manage the process of isUD™ certification. This person should be responsible for documentation of the isUD™ solutions included. One person on the development team must be assigned this responsibility. It could be an owner's representative, a design professional, an advocate for universal design or a specialized consultant. The isUD™ program should also include education and accreditation for team leaders if no experts are available to lead the team.
- iii. *Project development team includes diverse stakeholders (e.g., employees of different job titles, men and women, various age groups, people with disabilities, potential visitors, representatives from client organization, representatives from design team, etc.).* This solution addresses the need to have diverse input in a project. A multi-disciplinary team of professionals is important for even smaller projects. Even an interior renovation may benefit from a team that includes health and safety experts, supervisors and representative employees. The team can also invite selected local official and stakeholders to discuss a project when needed, e.g. local code officials. Most importantly, the team should include or at least involve end users of the building or their advocates. Incorporating more types of people into the design process will enable the project to better suit the needs of varied users. Professional and advocacy organizations can help to recruit diverse stakeholders. For example, the Center for Communities by Design of the American Institute of Architects (AIA) provides free technical assistance and design expertise to communities trying to address local ecological, economic, and social equity concerns (Simmons, n.d.). The Center hopes to assist local residents advocate for positive change. Universities are another good source of stakeholders. For accessibility issues, local independent living centers (ILCs) or other disability advocacy groups can be contacted to provide advocates or representatives of specific groups. Similar advocacy groups are common in local communities that represent minority groups, women, and other stakeholders.
- iv. *Project development team consults with universal design specialists.* It is easy to overlook some issues, especially if the team is not familiar with the isUD™ program. In order to prevent oversight, a specialist in universal design can be enlisted to review the plans and help rectify any issues found. It is important to note that accessibility consultants, often engaged for design reviews, are familiar with the accessibility codes but not necessarily the concepts of universal design that underlie the isUD™ program. So, it is important that the development team distinguishes between someone knowledgeable about accessibility and someone knowledgeable about universal design as it is conceived here. Many experts think universal design is just enhanced accessibility, e.g. larger clearances, more reserved parking spaces. These things are important but there is a lot more to it.
- v. *Project development team conducts research with future facility users to identify and prioritize issues (e.g., confidential survey, design workshop, focus group, open meeting, etc.).* Designing for the facilities current needs is a common practice. But potential needs and users also need to be considered. Surveys and focus groups of stakeholders can

assist the team in learning about existing and potential needs and desires for the project. Users will be able to contribute valuable ideas because they are invested in the outcome. It is important that employees and residents are engaged in ways to ensure confidentiality because otherwise, the quality of information will be compromised. Saying negative things about an existing building or a design could jeopardize someone's job, or their relationship with management.

- vi. *Project development team conducts research on best practices in universal design, with particular attention to examples that demonstrate integration with other human centered design goals (e.g., sustainability, active living, environmental health, etc.).* The eight Goals of Universal Design can be used to generate questions about a project and how design issues and features relate to other human centered design goals. The more that universal design features also contribute to these other goals, the more valuable they will be to the stakeholders. For example, ensuring usability of controls and displays used to monitor energy performance will be supported by stakeholders who are concerned about sustainability as well as usability. And stairways designed to promote active living must be safe and accommodate as many people as possible to ensure that they will benefit all building users and that they will not increase the risk of accidents. The Goals of Universal Design are a good framework to help identify issues that overlap universal design and other human centered design issues.
- vii. *Project development team develops marketing strategy to educate facility users on universal design.* When facility users are unaware of universal design, they could use building features inappropriately or modify parts of the building unknowingly resulting in reduced usability, health or social participation. For example, an employee may move a trash can close to their desk, but the new location may introduce a tripping hazard for those walking by. If the facility users are educated about universal design, then they can take pride in their building and be more supportive. In cases where the facility user is uncertain if a modification is in keeping with universal design goals, they will also be more likely to reach out to the universal design team for assistance. This marketing strategy can also be a means to involve users of the building in making improvements. One organization crowd-sourced the introduction of universal design across its international workplaces. Local employee volunteers met and identified ideas to improve their own workplaces. They got credit as part of their job evaluations for contributing good ideas, which were also recognized publicly.

The Center for Inclusive Design and Environmental Access (IDEA Center) has published a book on the process of universal design of buildings, *Inclusive Design: Implementation and Evaluation* (Maisel, Steinfeld, Basnak, Smith, & Tauke, 2017). This concise book is filled with recommendations on how to manage a universal design project.

6. References

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