1.1 Project Development Team

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- Required: Project development team selects a universal design development coordinator responsible for managing the design process and preparing the necessary materials to support certification.
- Project development team includes diverse stakeholders (e.g., employees of different job titles, gender, various age groups, people with disabilities, potential visitors, representatives from client organization, representatives from design team, etc.).
- Project development team consults with universal design specialists.
- 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.).
- 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.).
- Project development team develops marketing strategy to educate facility users on universal design.

1. Overview

When planning a project, it is essential to contemplate the project's context and user needs. Designers cannot understand and account for the needs of all possible users alone. A team of experts is vital to designing a project that creates a quality experience for all users. This team should include people with specialties in different areas of design (e.g. acoustics, lighting) as well as future users. 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." Users/experts have a wide range of professional orientations, ages, abilities and perspectives and provide valuable feedback to designers. Ostroff (1997) states, "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."

The experience of interacting with users can inform designers by identifying problems or desirable design goals, but it may take further expertise to know how best to avoid the problems or reach the goals. Technical experts can evaluate what users say and develop technical solutions that can address their needs. For example, office workers in an existing building might report that they frequently need to operate space heaters in the summer time. An expert on thermal comfort can then investigate the cause of the problem and propose a technical approach to address the issue in the new building.

Design teams will be more adept at generating creative solutions if their members have complementary areas of expertise. Dr. Bruce Tuckman (n.d.) developed a model of group development that consists of five different stages:

- forming
- storming

- norming
- performing
- adjourning

Forming the team is when a project leader chooses members. The project development team should include diverse stakeholders that provide substantial information. An interdisciplinary group is comprised of people who have different specialized knowledge. For example, a group that will be planning renovations to city streets may be comprised of people from a transportation agency, urban planners, civil engineers, etc.

Figure 1: A parking lane protects the bicycle lane from vehicles in the travel lane. Image courtesy of USEPA.

The storming phase occurs when members of the group become frustrated when arguing distracts from reaching the teams' goals. For example, when a specialist values their specialty over another's the group may become frustrated. 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. In the third stage, norming, conversations that are more meaningful evolve because team members have started forming connections to each other. In the next stage, performing, members increase their productivity. They are able to use their specific skills and have learned how to integrate their knowledge into the project. The team starts achieving goals of the project during this phase. As more goals are completed, the team will feel it is adjourning. Some members may continue on, or, other people may carry the project forward. The goal of a universally designed project does not end with the project construction; some team members should continue ensuring the goals are continually met through the use of the building.

Chris Law (2010) identified a list of practices for organizations that are seeking to successfully create and sustain an inclusive environment. These practices are listed below with some modifications that reflect the broader scope of universal design, and can be used as a guide to establish a *culture of universal design* within an organization:

1. Adopting a social model of ability and wellness 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 particular roles
6. Providing enabling resources so that all team members can accomplish their goals
7. Providing sources of expertise when required

This list, if followed, can 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.

2. Issues to Consider

Designer Bias: Designers often imagine how they would use a building or space and design it to support their goals and desires. Despite their experience and desire to achieve an inclusive solution, designers often have different backgrounds and values than the broader population of users that influence their decisions. This can bias the design to suit the designer's own abilities, values, and social status. In order to ensure more inclusive solutions, a diverse team can help to ensure that designer bias does not limit the potential of a building to suit a broader set of needs and aspirations. Future users often provide the most accurate information about how a project will be used and should be given the opportunity to provide feedback throughout the design process. Elaine Ostroff (1997) writes that users are the true experts and that they should be consulted on all projects. She says, "the experience of the user/expert is usually in strong contrast to the life experience of most designers and is invaluable in evaluating both exiting products and places as well as new designs in development." Applying ideas from the user/expert further ensures that the project will suit the people who will be interacting with completed project.

Planning for Future Needs: A building can remain in-use for many decades or centuries, and may have multiple owners and/or uses over its lifetime. The design team should be aware of how their choices could affect the lives of future inhabitants. It may be possible, for example, to add more electrical outlets than are currently required by code to accommodate the increased use of electronic technology. Additionally, movable furniture and alternative furniture arrangements can allow the users to modify spaces appropriately as their needs change. Designing spaces so some walls can easily be removed and repositioned can also increase flexibility for future use.

User Engagement: In some projects, the key stakeholders are easy to identify. For example, if a business is planning to move into a new building, the users of the new building are known to the universal design team. The employees working in the existing office building can be surveyed or participate in a focus group that can help the design team ascertain what needs and concerns they have. For projects in which a call for public comment is mandated, like a new school, it may be more difficult to get participants to complete surveys or attend open meetings. In this case, the team may want to engage experts in public relations to engage members of the community to be a part of the process. While it is not guaranteed that the participants who respond fully represent all user groups, the team can still learn from the feedback.

Many employers and organizations, especially those that are faith-based or human service providers, have standing committees and task forces that work to improve inclusion in their organizations, both from an employment and outreach perspective. The members of these groups can be enlisted for participation in building projects. Some groups of potential users may be underrepresented for many reasons. For example, people with severe disabilities or who are transgender may not be represented in planning exercises. In addition, workspaces often have few people beyond retirement, and pregnant and nursing women may be underrepresented in some organizations due to outdated social norms. In these cases, the universal design team can make an effort to recruit advocates who can speak for these groups, even though they may not actually use the facility. This will provide insights that may be otherwise overlooked. There are many advocacy organizations in most communities that can be helpful in identifying knowledgeable "user experts."

3. Referenced Standards

Accessibility Standards. The ICC/ANSI A117.1 Standard provides baseline accessibility standards and includes some safety standards. The 2009 version of this standard is referenced by the International Building Code (IBC) and is similar to the technical criteria in the American with Disabilities Act (ADA) Standards, but it is updated more often. The ICC/ANSI A117.1 standard does not have scoping requirements, i.e. how many elements have to be accessible for which kinds of buildings. The IBC and the ADA include scoping requirements and cover new construction, alterations, and additions. The ADA Standards serve as the enforceable standards issued by most Federal agencies (U.S. Access Board, 2014). The Fair Housing Act Accessibility Standards are the key accessibility standards for multi-family housing. Their provisions are incorporated into the ICC/ANSI A117.1 standard. It is important to note that all of these standards are minimum requirements and do not address all the needs of people with disabilities. It is recommended that design teams include an accessibility expert who understands the complexity of the applicable codes and standards and the difference between code compliance and universal design, which seeks to achieve a higher level of accessibility.

OHSA Law and Regulations are meant to protect the health and safety of employees (OSHA, 1970). The code covers topics such as noise exposure and hazardous materials use. Arguably the most applicable component of the code is the General Duty Clause. It states that each employer "shall furnish to each of [their] employees …a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to [their] employees…" These standards are applicable for nearly all workplaces. Again, it is good practice to go beyond the minimum requirements of workplace safety and health using good ergonomic design. For workplaces, or buildings where health and safety risks are present, like amusement parks, an expert in design for health and safety should be included in the team.

US EPA Laws and Regulations defines policies that are meant to protect human health and the environment (USEPA, 2017). The agency has a guide book to assist with compliance for businesses, federal facilities, local governments, and tribes. The US 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 airborne allergens or water purification, which could require engagement of specialists in air and water quality.

Historic Preservation rules also do not require public participation. Individuals are able to petition state historic preservation boards to add buildings to historic registers. Evidence needs to be provided that a site has historical importance, possibly through past occupants or being an important example of an architectural type. The public can be consulted on what to do with the site, but this kind of outreach is usually done by community organizations.

It is important to note that standards and codes do not require processes for input from diverse users and this is the major difference between mandated standards and the *isUD Solutions*. 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 businesses 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 dockets. There is time for the public to write comments; however, it does not appear that the EPA advertises these input opportunities further than posting in the Federal Register. The EPA (n.d.) recognizes that "[p]ublic participation is not simply a nice or necessary thing to do; it actually results in better outcomes and better governance." This sentiment should be instituted as a practice in universal design.

4. Measurement and Verification

Different abilities and experiences inform the way a person designs. Assembling a varied team is crucial to ensure that people with contrasting traits are accommodated in the design. By including people with differing types of education, religions, physical ability, and other experiences, the final project will address diversity in a more robust manner, leading to more effective design strategies.

In order to establish a diverse range of perspectives, the development team could send out a confidential survey to potential team members or a panel of user experts. The survey should include questions about personal influences and interests. This would allow the leader to assemble an appropriate team. It is important to survey people who will use the space in addition to design team members. Adapting a space to allow access to one group of people should not impair another group. For example, when designing a bank, speaking with only ambulatory users about their needs and wants is not appropriate. Wheeled mobility device users, among others, should be able to provide input as well.

Most design reviews are ad hoc sessions that could benefit from a more systematic approach. Workshops or focus groups can be organized to engage the stakeholders of a project even before a design has been conceived. Intensive workshops are often called “charrettes” in design fields. After the design team has decided that workshops are appropriate for understanding future users’ needs, the team defines the information that needs to be gathered and what will be done with the results. These goals guide the rest of the process. The target audience should be identified, and are the people most effected by the project. Other demographics that have been historically disenfranchised should be considered, as well. Some members of the target audience should be identified and asked questions to inform the design (DPZ, n.d.). The target audience should be asked about proper meeting places, what days or times are good for meeting, and what they can do to encourage people to attend.

The workshop leader, either a consultant or member of the universal design team, should develop a plan that includes the study’s purpose, potential questions, a timeline, and a budget (DPZ, n.d.). A draft of questions should be reviewed by the team. Each question should be open ended. The participants can be recruited through organizations, like local independent living centers, senior centers, or PTAs. Fliers can be posted in local businesses and on social media. The team can attend and recruit participants from other events that attract the types of people desired (DPZ, n.d.). An experienced moderator should lead the workshop and direct the conversation to stay on topic. Another member of the team can take detailed notes. Audio or video recording systems can be valuable in helping the team verify information in their notes. Transcripts can be made of the recordings for a comprehensive review.

Workshops should end with the findings being summarized aloud and asking the group if there are any other points that should be mentioned. This allows the participants to list any final thoughts. Real time captioning on a large screen can be used to communicate with people who have difficulty hearing and to maintain a complete record of the proceedings that all can see as it evolves. It is important that all participants feel equal and comfortable. The analysis of the data should be put in a report, and the findings applied to the project. There are consultants to help teams develop and run workshops, focus groups, and charrettes which tend to be longer and more participatory. Conducting these outreach events can provide the team with information about future users they would not otherwise have access to. Implementing the data collected will make the users more accepting of the project and increase the likelihood of user satisfaction.

Focus groups are generally more structured than workshops. A sequence of focus groups are often used in product design at the “user requirements” stage (alpha), the prototype design

stage (beta) and working prototype stage (gamma). There are experts in planning and implementing focus groups and considerable literature on how best to run them (Caplan, 1990).

5. Design Considerations

1. *Required: 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 should be a leader to manage the process of isUD certification. This person should be responsible for documentation of the methods used to create a universally designed building. 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 can include education and accreditation for team leaders if no experts are available to lead the team.

2. *Project development team includes diverse stakeholders (e.g., employees of different job titles, gender, 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 multidisciplinary team of architects, urban design professionals, economic development specialists, land use experts, etc. is important for all projects. Even an interior renovation can 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 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 organizations can provide assistance in involvement of 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 advocating 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.

3. *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. To prevent these oversights, 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 concept of universal design that underlies the isUD program. The development team should distinguish between someone knowledgeable about accessibility and someone knowledgeable about universal design as it is conceived here. Some experts in accessibility think universal design is just enhanced accessibility, e.g. larger clearances, more reserved parking spaces. These issues are important but universal design addresses a much greater range of issues.

4. *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.).* It is common practice for designers to address existing needs when designing a new facility. But potential needs and users should also be considered. Surveys and

focus groups of stakeholders can be used to learn more about existing and potential needs and desires for a project. Users are able to contribute valuable ideas because they are invested in the outcome of the project. It is important that employees and residents are engaged in ways that ensure confidentiality. Otherwise, the quality of information could be compromised. People may fear that saying negative things about an existing building or a design could jeopardize someone's job, or their relationship with management.

5. *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 how design issues and features relate to other human centered design goals. The more universal design features contribute to these other goals, the more valuable they will be to the stakeholders. For example, stakeholders concerned about sustainability would likely support improved usability of controls and displays used to monitor energy performance. Similarly, stairways designed to promote active living must be safe and accommodate as many people as possible. This ensures that they will benefit all building users and not increase the risk of accidents. The Goals of Universal Design are a good framework to help identify human centered design issues that overlap with universal design.

6. *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 without proper insight. Such a change could result in reducing usability, health, or social participation. For example, an employee could move a trash can closer to their desk for convenience but the new location may introduce a tripping hazard for those walking by or reduce wheelchair clearance. If the facility users are educated about universal design, then they can take pride in their building. If the users feel pride for the building they occupy, they will be more likely to support the Goals of Universal Design. 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 crowdsourced 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 on Inclusive Design and Environmental Access (IDEA Center) has published a book on the universal design process, *Inclusive Design: Implementation and Evaluation*. This concise book is filled with recommendations on how to facilitate a universal design project.

6. Definitions

The following definitions are adapted from DPZ , Merriam-Webster Dictionary, UX Matters, and University of Hawai'i at Manoa.

Confidential survey	to query someone, whose identifying information will be kept from public access, in order to collect data for the analysis of some aspect of a group or area (Merriam Webster, n.d.)

Charrette	Intensive workshops with interest groups and agencies to engage participants in design and seek feedback on designated parts of a project. Results will be compiled into a report and used to finalize the project (DPZ, n.d.).
Design workshop	a meeting where a diverse group of stakeholders can work together to generate solutions to a common problem (Szuc and Wong, 2010)
Focus group	a structured facilitated discussion with participants who are asked a series of carefully constructed open-ended questions about their attitudes, beliefs, and experiences (University at Hawaii at Manoa, 2011)
Interdisciplinary	involving two or more fields of study or subjects of interest
Open meeting	an assembly of people available to for public access

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