THE OHIO STATE UNIVERSITY
NISONGER CENTER

Smart Home Discovery Place

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SUMMARY

Overview of Project

Since the early 1990s, The Ohio State University (OSU) Nisonger Center has been home to one of Ohio's Toy & Technology Lending Libraries (T&TL). With support from an occupational therapist, people with intellectual and developmental disabilities (IDD) and their families were able to explore and **discover** augmentative communication devices, adapted toys, and other assistive technologies that best met their needs and supported development *before purchasing*.

In recent years, technological advances have outpaced our wildest dreams and Nisonger Center's experience with technology benefiting people with IDD has expanded beyond the lending library. A collaborative project between the Ohio Department of Developmental Disabilities (DODD) and Nisonger Center has investigated existing and emerging supportive technologies including assistive technology, remote support technologies, and many other smart technologies that foster greater independence for people with IDD. Understanding the increasing needs of Ohioans with IDD and the rapid advancement of technology, we have reimagined the space formerly known as the T&TL, and are modernizing it into a **Smart Home Discovery Place (SHDP)**.

Transformed into a mock-home environment, this new and exciting one-bedroom apartment space will be complete with furnishings and appliances that provide a unique opportunity to explore and discover the benefits offered by cutting-edge and innovative technologies and how these technologies can enhance one's independence, self-determination, and overall quality of life. The **SHDP** will showcase diverse technologies in a practical and hands-on environment where visitors will be able to touch, explore, and learn. It will be accessible to anyone who wishes to visit, in person or virtually, and explore these technologies at no cost. For this reason, SHDP has tremendous potential impact to improve the knowledge of these technologies and promote greater independent living and community engagement among people with IDD as well as people with other types of acquired (e.g., brain injury, spinal cord injury, dementia) or age-related disabilities. With support from Nisonger Center faculty/staff; people with disabilities, family members, and others can visit, learn, and take away ideas from SHDP to make their dreams of greater independence a reality. Visitors will participate in **interactive tours** meant to paint a vision for how the use of technology **in their own homes** may help someone with IDD live a more self- determined life.

Description of Project Need

Often, people with IDD receive support from a paid staff, typically a direct support professional (DSP). A DSP is someone who comes to the home of the person with IDD and provides assistance with daily living tasks as needed. Currently, there are serious challenges within the home health care industry as it pertains to hiring, training, and retaining DSPs. This is due in part to historically low wages but also the changing demographics of our society. Nationwide, turnover rates for DSPs are as high as 38% to 50% annually (Hetzler, 2016). Disability Matters estimated that even at a 40% turnover rate, an adult with IDD participating in both residential and day services will

receive care from as many as 164 different DSPs over a 10-year period. From age 18 to 65, that translates into more than 770 different DSPs entering and exiting the person's life (https://www.dmvote.ca/priority-issues/fair-wages). In addition, the number of people in America who are likely to need long-term services and supports is projected to more than double from 12 million in 2010 to 27 million by 2050 (ANCOR, 2014); resulting in an increasing need to find alternatives to provide safe, adequate and necessary services.

With the help of remote support (a service that provides DSP-type assistance from a remote location using technology), health, and smart home technologies, stakeholders may now have greater ability to schedule DSPs to work directly with individuals in need of hands-on or in-person supports. DSPs will always be a necessary resource for certain types of in-home health care. However, in addition to person-based resources, technology and remote support services can meet a wide range of support needs, including those for people with significant health care needs; enabling families and provider agencies to serve more individuals without dramatically increasing staff.

While the use of technology has increased in supporting people with IDD in their homes and in the community, it remains **an underutilized resource.** For example, out of approximately 40,000 Ohioans receiving DD waiver services, less than 2,000 use assistive technology and/or remote support services. Most people with IDD, their family members, and key stakeholders lack the necessary knowledge of what technologies are available, how their support needs might be readily met with the use of affordable technologies, how to access and use these technologies, and best practices for supporting greater independence and community inclusion. To help address this gap, Nisonger Center proposed the development of the **Smart Home Discovery Place**.

A 1991 technology manual published by International Business Machines (IBM) included the following statement: "*For people without disabilities, technology makes things easier. For people with disabilities, technology makes things possible.*" Almost three decades later, nothing could be truer. With the use of technology, some activities that previously required the presence of another person providing supports or assurance can be accomplished independently by the person with disabilities; for the first time! The SHDP will demonstrate a variety of cutting-edge technologies (many off-the-shelf), connect people with resources, answer their questions, and guide them in navigating the process of bringing these technologies into their (future) home.

Project Goals and Measurable Objectives

The **goal** of the SHDP is to increase the awareness and understanding of individuals with IDD, their family members as well as providers who support them about smart home technologies and other related resources that may be a viable solution for their everyday support needs and might help them to live with greater independence.

Activities of the SHDP include the demonstration and hands-on exploration of a variety of cutting-edge technologies, guided interactive tours, connecting people with resources and answering questions about these technologies, and technical assistance with the process of bringing these technologies into their home. We are also interested in feedback from those who visited the SHDP and how their visit might have influenced their decisions to adopt, reject, or abandon certain technologies and receive follow-up feedback about their subsequent experience with technologies and their use of technologies.

Objectives and anticipated outcomes of the SHDP include:

1) Increased knowledge and awareness of diverse technologies to support independent living.
2) Increased understanding of barriers to accessing these technologies and how to overcome them.
3) Increased access and utilization of technologies and related services in their homes.
4) Potential benefits of using these technologies in their home and communities.

These outcomes will be measured and evaluated with a series of follow-up conversations and surveys including:

1) Brief pre-survey assessment about the purpose for visit and needs for assistance in current home setting.
2) On-site survey assessment that collects information about interest in and experience with technologies demonstrated while on the tour
3) Post-survey assessment that collects information on change in awareness/knowledge of technologies, installation protocol, and available resources (pricing) including a series of links redirecting the user to additional information and resources (by tracking link clicks we will be able to document interest in different resources).
4) A 1-week post-tour follow-up survey will be emailed to all visitors to the SHDP that collects information on satisfaction with visit to SHDP, including if a decision was made regarding incorporating technology in their own home, what technologies or technology services (if any) were selected, why, and through what funding source.
5) Visitor log to document who visited and took advantage of the SHDP.
6) Follow-up survey will be sent 6 and 12 months post-SHDP visit to all visitors inquiring about their utilization of technologies in their home (i.e., did they purchase and implement any technologies in their home since their visit to SHDP and how much of that can be attributed to their visit to SHDP).

Technology Demonstration and Evaluation Project

Technologies designed to meet the unique needs of people with disabilities, including intellectual and developmental disabilities, continue to become more prevalent. Large technology companies such as Google, Apple, Microsoft and others have invested in this space by dedicating personnel activities. The likes of whom include titles such as, Chief Accessibility Officer and Accessible Community Program Manager.

Interest in accessible software and supportive technologies encourages additional activities to enhance the development and improvement of current and emerging technologies. People who visit the SHDP will include individuals with varying cognitive and physical disabilities, their family members/guardians, and professional stakeholders. This audience includes a potential reach of hundreds of thousands of people, in Ohio alone. SHDP is an ideal environment for introducing visitors to current and emerging technologies, many of which can be purchased fully or in-part with financial support from local organizations.

Technology designers and vendors will be invited to showcase their technology and solicit feedback from attendees of SHDP. For a small fee, which will be used for the sustainability of SHDP, technology companies can gain access to those who attend our tours in person or remotely, with promising impacts for the disability community.

Advisory Council

Two groups of advisors will be invited to guide the direction of SHDP. One group will be invited to guide the selection and use of technology and another will be devised to guide our interaction with the disability community. These two groups will each meet biannually. Council members will have the option to meet in-person or remotely through the use of teleconferencing software such as Microsoft WebEx, Zoom, or GoToMeeting. These meetings will include updates for the SHDP, group discussions with council members, and committee member presentations highlighting projects from their organization.

The SHDP Technology Advisory Council will include members who correspond to key technology areas of SHDP, including, smart home technology, digital health technology, security technology, and remote support. This group will help us demonstrate cutting-edge technologies and related services. The second group, the SHDP Activity Advisory Council, will be comprised of individuals with disabilities and their family members/guardians, experts on disabilities, service providers, and other disability stakeholders. This group will help direct the SHDP to meet the needs of people with disabilities and have the greatest impact in the disability community.

Those invited will be asked to commit to participating in 4 meetings (2 years), with opportunities to recommit after that time. Council members' responsibilities will include twice-per-year meetings that will last no more than 2 hours. Aside from reading related materials, including reviewing and providing feedback for surveys and resources, council members will not have any extra work outside of the Council meetings.

Extending the Reach of the Smart Home Discovery Place – Social Impact

Due to the continually evolving list of technologies and services demonstrated in the SHDP, we think that it is important that remote participants have complete control over what they are viewing and have the ability to navigate the SHDP environment. We will include the use of telepresence robots, such as the double robotics' Telepresence robot for iPad tablet; a two wheeled vehicle (likened to a Segway) with adjustable heights. On the top of the vehicle is an iPad with a camera and live two-way video feed. With a device like this, operators can tour the SHDP with groups or individually from anywhere with an internet connection. Realizing that some remote areas may continue to have difficulty with internet connections, we will partner with community organizations, including local public libraries, County Boards of Developmental Disabilities, hospitals, and Area Agencies on Aging to create hubs where people can visit and use connected computers to virtually explore SHDP.

The marketing campaign for SHDP will include a myriad of opportunities to reach the right audience. We have established partnerships with stakeholders from the aging community, rehabilitation for people with traumatic brain injury (TBI) and spinal cord injuries, and developmental disabilities. Leveraging these relationships and others through OSU, we have tentatively planned the following events and resources to disseminate information about the SHDP.

- Online advertisements
    - Social Media blasts
    - Optimized online search engine accessibility
    - Stakeholder organization listservs
- Special events
    - Grand Opening event
    - Annual open-house
- Media Venues
    - Work with OSU media relations to develop press releases for various formats including:
        - NPR
        - Local televised news stories
        - Local newspaper articles
        - OSU Alumni Magazine
- Stakeholder and advisory group event participation
    - Engaging with self-advocates, family members, and stakeholders with conversations
    - Speaking at events
    - Participating in provider fairs
- Conference advertisements
    - Speaking engagements at local and national conferences
    - Exhibitor Tables

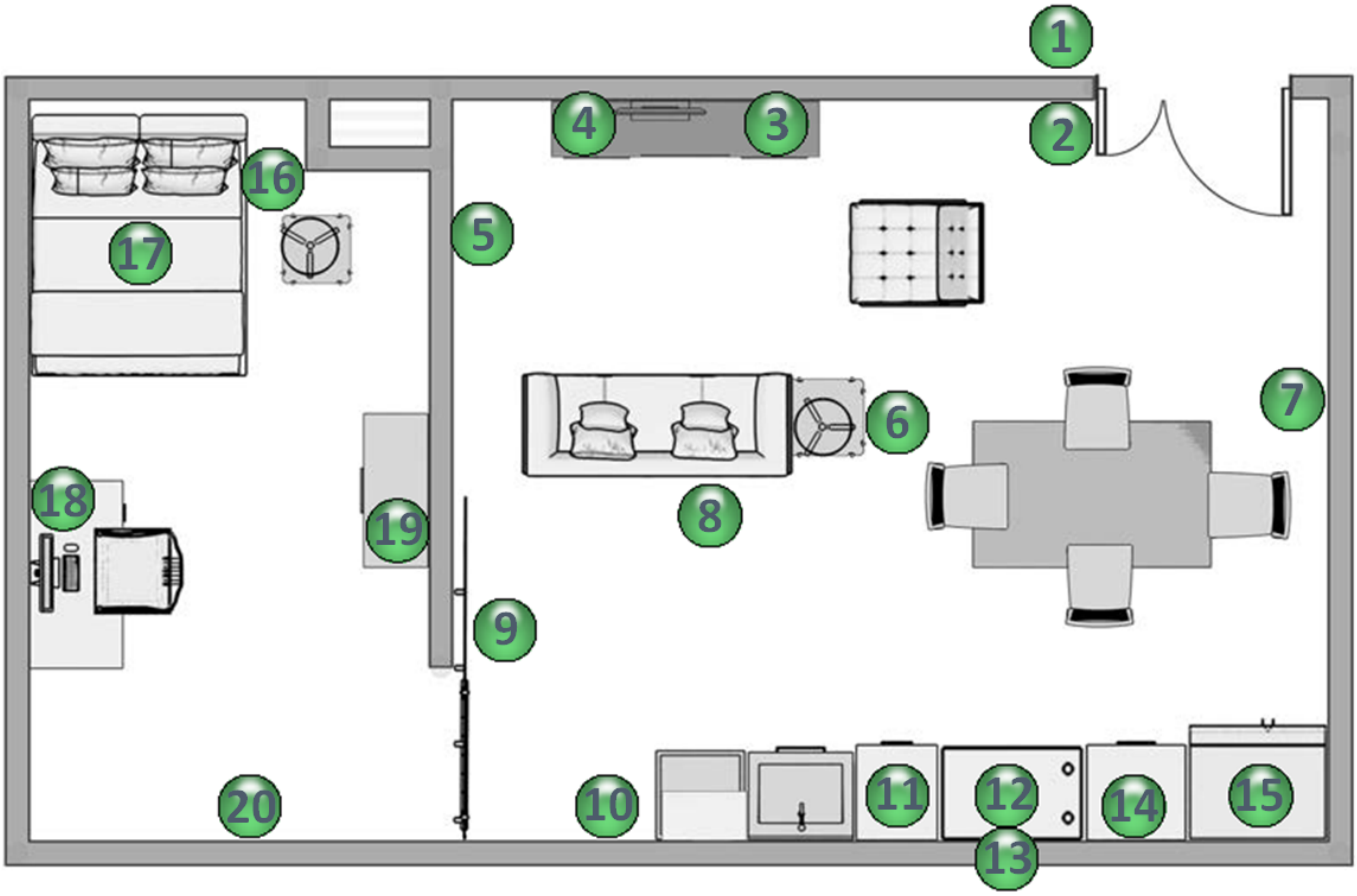
Plans for Project Sustainability

The Ohio State University Nisonger Center – UCEDD is committed to providing quality education/training, clinical services, and research. Almost 3 decades ago as evidenced by the opening of the T&TL, Nisonger Center recognized early on that technology could play an important role in augmenting the quality of life for people with IDD and their families. Technology will continue to be an important component throughout the life-course for people with IDD, just as it is for people without disabilities. We see the role of technology increasing – not reducing, thus a space to educate people with IDD and allow them to see and explore these innovative technologies will always have a place at Nisonger Center.

Ongoing support for the SHDP will include support from partner organizations (e.g., Assistive Technology of Ohio, Knights of Columbus of St. Brigit of Kildare), earned revenue, and grants. Initial investments of more than $110,000 from the above listed organizations, The Columbus Foundation and The Ohio State University Wexner Medical Center IT Techarities fundraiser will fund the renovations, purchase of initial technology, and a year's worth of personnel time. Additionally Google, Dose Health and Total Homecare Solutions (THS) have donated technologies and services to the SHDP. Annually, we will actively seek ongoing grants and in-kind (e.g., technology companies and vendors) collaboration opportunities to maintain the relevance of SHDP's technologies.

A partnership with AT Ohio has been established to share technology so tours can be further personalized for individuals who come through the SHDP. We have also been in discussions with a number of technology companies/vendors, for technical assistance, technology donations, and upgrades of devices.

SMART HOME DISCOVERY PLACE



1a	Smart lock	**7a**	Video camera	**15**	Camera inside refrigerator
1b	Smart doorbell	**7b**	Video of smart bathroom	**16**	Smart lamp
2	Door sensor	**8**	Smoke/CO detector	**17**	Bed sensor
3	Remote support	**9**	Door sensor	**18**	Accessible desktop computer
4a	Smart television	**10**	Voice assistant enabled microwave	**19a**	Medication dispenser
4b	Voice assistant	**11**	Tablet with waterproof case	**19b**	Smart watch
5	Smart thermostat	**12**	Range with induction stovetop	**19c**	Blood pressure cuff
6a	Reminder clock	**13**	Motion detector for range	**19d**	Seizure detection bracelet
6b	Smart lamp	**14**	Tablet	**20**	Motion detector