

Chapter 10

Breaking the Digital Divide

While the ICT User Typology is a theory of technology use, it has practical implications for how to meet the needs and wants of an aging society. Split into four sections, this chapter provides (1) guidance to practitioners who work with older adults, (2) methods and considerations for overcoming the barriers to older adult participation in our digital society, (3) strategies for designers and advertisers to maximize the lessons from the typology to reach a growing graying market, and (4) lessons for childhood educational programs to impact the development of user types in childhood. This chapter is designed for a diverse audience and is meant to appeal to those who work in aging, information and library science, technology design and development, advertising, and education.

Practitioner Opportunities: Understanding and Supporting Older Adults

Many practitioners who work closely with older adults have noticed the great diversity in ICT use by their patrons, clients, patients, and customers; while also recognizing the potential benefits of digitalization (Freeman, 2005). However, it is often difficult for those working with older adults to verbalize this diversity and, more importantly, to understand how this diversity impacts older adults' access to digital services. Practitioners can use the ICT User Typology framework to customize services, opportunities, and living environments to maximize life satisfaction for each of the user types and their ideal relationship with technology.

Enthusiasts are the most technologically capable of all the user types and, therefore, the most likely of your clients to seek information online or fill out online forms. ICTs are a fundamental part of Enthusiasts' lives and inability to use them negatively impacts their life satisfaction. Given the centrality of technology to their identity, in residential/ managed care settings or when working with Enthusiasts with disabilities or age-related declines, it is important to facilitate access to appropriate and useable ICTs. Enthusiasts prefer to have their environments filled with technologies and are the most likely to accept (and even embrace) ubiquitous computing, including smart home innovations.¹ They have

¹For a review of smart home technologies for older adults, please see Majumder et al. (2017).

high expectations for organizations they interact with to be technologically innovative.

Practicalists tend to have medium to high ability to use online services and resources. Diverse as group in their technical knowledge, their skills are often tied to the ICTs they use/used in their work. Those with high and diverse ICT use in their workplaces typically have the best skill set. Therefore, it is important to recognize that some Practicalists may need additional help in completing computer-based tasks, particularly if they were in a less technologically-focused work environment or position. Practicalists, unlike Enthusiasts, do not enjoy being constantly surrounded by technology and are more likely to prefer ICT-specific spaces in institutional settings that are task-defined, such as computer rooms and separate entertainment rooms.

Socializers have a high need for social interaction, and this flows into their media and ICT use. They also have a diversity of skills, with their highest levels of skills being in communication devices and services. They, therefore, may need assistance in using other forms of ICTs or filling out online forms. Socializers do not like using ICTs alone or using ICTs they consider isolating. Television watching, for instance, tends to be too solitary of an activity for most Socializers and they would greatly prefer an interactive experience. For those with mild- to moderate physical and/or cognitive declines, but who have high socialization needs, virtual gaming in a group setting can help to engage Socializers. It is also important to ensure that in any setting (institutional or otherwise) Socializers have access to the devices and services they need to stay in touch with their large family and friend networks so integral to their identity. Often the ICTs provided in such settings are too old and too underpowered to allow effective access to social media, or social media websites are blocked. Such policies prevent many Socializers from using ICTs to fulfill their socialization needs (more on these issues is presented in the following section).

Traditionalists have the lowest ICT skills of any of the user types. They do not go online often (if at all) and are unwilling or unable to conduct online research or fill out online forms. For Traditionalists, it is critical to identify if they have a family member or friend that undertakes these tasks for them and to determine if their digital and information needs are being met. While many Traditionalists have such individuals to rely on, some do not. Telling an older adult Traditionalist to simply “go online” may be an insurmountable and unwelcome task. If a person does not have a proxy that can access the internet, this is a role that perhaps a companion or personnel at your organization can undertake.

Guardians tend to be concerned with internet security and privacy. They are overall cautious of providing their information online. For Guardians, it is important to have privacy procedures in place and have these easily and frequently explained. In institutional care settings, Guardians deeply value ICT-free spaces where they can have conversations and deepen relationships face-to-face without distraction from digital devices.

The ICT User Typology provides insight into how we can better support older adults to improve their life satisfaction. While this section has briefly

introduced how practitioners can best facilitate each type's desired use patterns, the next section examines the barriers that prevent the desired levels of ICT use. In order to discuss how these barriers can be overcome for the five user types these challenges are explored through the most common language used to conceptualize them: the digital divide.

Closing the Gray Digital Divide: Supporting Older Adult Users and Non-users

Oftentimes in the literature, there is a push to encourage older adults to adopt ICTs. Such literature seeks to close “gray digital divide,” – the idea that older individuals report lower usage rates of the internet, computers, and cell phones compared to younger people.² Even younger elders show higher rates of ICT use than older elders (Heart & Kalderon, 2013). However, such an oversimplification of the gray digital divide misses the complexity in older adult ICT use and non-use. Individuals move in and out of various user and non-user categories due to changes in their physical, mental, financial, and motivational states(s): the digital divide is not static (Van Dijk, 2005). Indeed, three groups of people are being captured in the digital divide literature at any given moment: those that are using digital ICTs, those that want to (but cannot use them at the level that they wish), and those that do not want to use ICTs (Millward, 2003; Russell, 1998; Van Dijk, 2005).

The first two groups, those older adults that are using digital devices and those that want to, cut across four of the user types: Enthusiasts, Practicalists, Socializers, and Guardians. Within these four user types, you will find many individuals using the devices they would like, in the ways they would like, for the purposes they would like. However, you will also find individuals who are not able to access the ICTs they desire due to a lack of technological literacy, functional or cognitive declines, or financial barriers.

Improving Technological Literacy: Helping the Wants

Lack of knowledge, and particularly support for learning new ICTs or new functions, is a particular problem for many older adults (Morrison, 2015). Among the Lucky Few, there is a great diversity in exposure to ICTs through the work environment, so retired older adults in this generation are left with very differential ICT knowledge in elder age. For instance, both George (Guardian) and Dan (Practicalist) found that, because of their relatively high positions in organizations (a vice president and a director, respectively), they had not been exposed to

²The literature on the digital divide and older adults spans several decades (Czaja & Lee, 2007; Czaja & Sharit, 1998; Friemel, 2016; Gilleard & Higgs, 2008; Jacobson, Lin, & McEwen, 2017; Millward, 2003; Paul & Stegbauer, 2005; Peral-Peral et al., 2015; Pick et al., 2015; Van Volkom et al., 2014).

computers and the internet through their work. Both wanted to learn computers once they reached retirement, but found learning without a supportive work environment difficult.

Dan was starting his own consulting business following his retirement from his career in a global non-profit. One of the factors in the timing of his retirement had been the cognitive decline of his mother due to dementia. He returned to the rural area in which he grew up to serve as her full-time caregiver. Even though Dan was happy to return the loving care he received from his mother as a child, the experience was often isolating and heartbreaking. (Dan's mother died shortly after the conclusion of our interviews.) He sought to create a consulting business and to advise graduate students not only to engage his brain, but as a welcome "escape" from caregiving activities. However, his connections to these individuals were virtual by necessity and he found himself struggling to use the computer technology that he had not learned in his prior work.

Due to Dan's rural environment, there was no formal place within easy driving distance he could turn to for help. Instead he relied on his wife to help him learn. However, he found it frustrating that while he could give a fantastic presentation, he struggled to create digital slides. (See Chapter 3 for a more in-depth discussion of Dan's experience.)

For George, he found using a computer challenging. He relied on the two of his children who lived locally to provide technical assistance, although he often wished that there was someone he could hire to provide technical lessons on specific software and applications he wanted to use. While George worked part-time at a big box retailer (for, as he put it, "something to do"), the vast majority of his position did not require nor provide the opportunity to use technology. As a Guardian, there was some technology he was interested in (mostly the computer and internet) but other technologies he was not. He indicated that he would like tailored lessons, particularly on online shopping and internet security, which were more complex topics than the local library offered in their senior computing course.

Lack of training is often cited in the research as being one of the greatest barriers to older adults learning ICTs (Friemel, 2016; Padilla-Góngora et al., 2017) and research has focused on developing specific strategies to accommodate older adult learning needs (Boechler, Foth, & Watchom, 2007; Slegers, van Boxtel, & Jolles, 2007). The need for better and more customized technical training for older adults is clear. Rather than seeing the offering of more content as a challenge for already underfunded community programs, such needs can be instead seen as an opportunity to promote intergenerational understanding and communication.

As our populations age worldwide (Kinsella & Velkoff, 2001), there will be many aging-related employment opportunities (Rosowsky, 2005). These positions will not only be in healthcare but across all industries – from housing to tourism, marketing to design, and government to business (Plawecki & Plawecki, 2015). Such a population shift will require those entering the workforce to be prepared to work with an aging clientele and meet the demands of an aging market. A potential solution to meeting the demands of an aging-savvy

workforce *and* to provide technical literacy to our aging population is to have young people (secondary and post-secondary students) help older adults to learn new technologies (under the guidance of teachers and professors). Such older adult technological literacy programs could be modeled on STEM programs³ – insofar as they encourage younger people to consider a new career path – in this case an aging career path. Such experience with older adult clients and/or consumers will be considered an asset in any young person’s chosen career given societal aging trends. Taking into the account the growth of older adult markets (particularly, as Boomers begin to age into elderhood (Coleman, Hladikova, & Savelyeva, 2006)), such exposure not only benefits the older adults, but also organizations seeking workers to serve an aging clientele and young people seeking employment.

When creating such a technological literacy program, it is important to involve older adults, who best understand their needs and desires (Lenstra, 2017). While many libraries and senior centers have offered computer classes for older adults (Anger, 2005; Eaton & Salari, 2005; Xie & Jaeger, 2008), one of the issues of this common model is the lack of customizability. Practicalists and Guardians are not interested in learning every possible function they can complete with their computer and would prefer learning about targeted features. Dan particularly wanted to learn office software as he was interested in starting his own business. George wanted to learn about information security and online shopping.

Research has shown that private, one-on-one tailored technical training is highly desired by older adults (Friemel, 2016), so such lessons should focus on instructor and learner (rather than group) environments. Since both emotional and technical support are important to older adults successfully learning new technologies (Barnard, Bradley, Hodgson, & Lloyd, 2013), it will be important to train volunteers to recognize and be sensitive to older adults’ feelings toward technology.

While addressing technological literacy is important to facilitate many of the user types, there must not only be attention paid to providing knowledge, but also accessible *devices* that allow individuals with a diversity of ability level access to our digital society.

Facilitating Accessibility to and Affordability of ICTs: Helping the Wants

ICTs are typically created for the young (Larsen, 1993): people with good eyesight, high manual dexterity, and fast cognitive reflexes and memory (Becker, 2004). Many older adults experience cognitive (Fang et al., 2017) and/or physical declines or disabilities which make using modern ICTs difficult (Barratt,

³See Breiner, Johnson, Harkness, and Koehler (2012) for a discussion of STEM programs and partnerships.

2007; Czaja, Sharit, Charness, Fisk, & Rogers, 2001; Hill, Betts, & Gardner, 2015). While in many high-income developed nations the chronological time older adults are spending disabled at the end of life has decreased, functional limitations still begin to rise in the older population at age 70. For low- and middle-income countries, such limitations increase at even younger ages (Chatterji, Byles, Cutler, Seeman, & Verdes, 2015). Functional limitations are, and will continue to be, a major stumbling block impacting older adults' technology use in generations to come.

Across the study, individuals expressed concern that if they developed such limitations, or if their current impairments progressed, they would find it difficult to use the devices they currently used. Such concerns are not imaginary: older adults who face physical or cognitive impairments report much lower usage rates of ICTs than those without such impairments, with vision and memory declines being most impactful (Gell, Rosenberg, Demiris, LaCroix, & Patel, 2015). Those who have such impairments are often fearful that new innovations will exclude them (Okonji, Lhussier, Bailey, & Cattan, 2015).

Older adults need accessible devices that are sensitive to their lifestyle, their needs and wants in technology (Bagnall, Onditi, Rouncefield, & Sommerville, 2006). The ICT User Typology can help us to identify the wants and needs in the diverse older adult population and we can tailor and build devices to meet their lifestyle preferences – while ensuring such devices and services are accessible. The physical and cognitive inaccessibility of technology can prevent Enthusiasts, Practicalists, Socializers, and Guardians from using the technologies they desire.

While one of Gerontechnology's main goals has been the creation of alternatives for those with disabilities or impairments to use modern ICTs (Bouma, 2001), attention must be paid to ensure these devices are financially in reach. Nancy is a prime example of how inaccessible technology design can impact an older adult and prevent them from living their ideal lifestyle. As a Socializer, she wanted to be able to text, to connect her to the youngest individuals in her large intergenerational network. Living in an assisted living facility, she had no disposable income and no resources with which to purchase an alternative device and/or service that would allow her the functionality of texting. While Nancy qualified for the US government Lifeline program (which provides qualifying individuals with a free cell phone and limited monthly free minutes and data) (Federal Communications Commission, 2018), all of the available simple phone models had small buttons. The last phone she had tried she attempted manipulating with a pencil, however, even the eraser was too large. She sent this phone back, and refused to participate in the program again, as she said it was not designed for people like her – people with impairments or who were older.

One of Nancy's fellow residents, Bobbie, showed me her Lifeline phone model. A simple phone (non-smartphone) was smaller than a deck of cards (Figure 16). Although Bobbie was significantly younger than Nancy and had no eyesight or manual dexterity issues, she found the phone difficult to manipulate. In Figure 16, the cell phone is the smaller device. For size comparison, you can see the size of a normal television remote and several hard candies in a plastic



Figure 16. An Example of a Lifeline Phone.

sandwich bag. I handled the phone and attempted to dial my own number – and it took two tries to enter it correctly because of miss-struck keys.

Many older adults receive federal social welfare benefits in the US and, because of this, they qualify for a Lifeline phone. It is disheartening that the only phone models commonly available are often unsuitable for older individuals and/or those with disabilities. For Nancy, who mentioned many times over the course of the study that she just “wished they had a phone I could use to text,” the frustrations of not having an accessible device were heartbreaking. As she pointed out – it is not only older people who have arthritis or difficulty seeing who needed to use a cell phone. Such devices, too small to manipulate, disenfranchise large swathes of our societies.

While individuals with more disposable income may be able to compensate for their disabilities or declines through self-purchasing, it is concerning that the devices provided for our most vulnerable society’s members are often unusable. When researchers and practitioners speak of closing the gray digital divide, it is important that we remember to not only make ICTs available for those who do not have access – but also to make them physically and cognitively accessible for an aging population.⁴ More resources must be invested in designing more age-friendly ICTs. Importantly, there should be a focus on making sure that the cost of these devices is kept low and they are available on appropriate governmental assistance programs.

⁴Many researchers have outlined methodologies for designing with older adults with cognitive and/or physical impairments (Astell et al., 2009; Bagnall et al., 2006; Dickinson & Dewsbury, 2006; Dickinson et al., 2004).

Prior research has indicated that inability to afford ICTs impacts older adults' self-fulfillment (Hill, Beynon-Davies, & Williams, 2008). It is no wonder: technology for Enthusiasts is the center of their lives and for Socializers is how they stay connected to their important communities. Denying these user types devices because they have developed disabilities or age-related impairments is to take a strike at their fundamental identity. Studies have shown that communication technology use decreases loneliness (Czaja et al., 2018) and social isolation (Blit-Cohen & Litwin, 2004; Chen & Schulz, 2016; Clark, 2001; Czaja et al., 2018; Xie, 2008), while improving well-being (Blit-Cohen & Litwin, 2005; Czaja et al., 2018; Ihm & Hsieh, 2015; Khvorostianov, Elias, & Nimrod, 2011). Some research has suggested that among retired older adults, internet use is even correlated with lower depression rates (Cotten, Ford, Ford, & Hale, 2012). Designing, creating, and providing accessible and affordable technologies for those who put technology or communication at the center of their lives should be paramount.

Even if devices are accessible and affordable, they need to be available to older adults in their living situations. In our resident care settings, policies and dated technology can prevent older adults from engaging with our digital world. Gerontechnologists' work in such settings has often looked toward providing care or workforce solutions (Czaja, 2016; Freedman, Calkins, & Haitzma, 2005), rather than in facilitating residents everyday use. In Nancy's assisted living center, access to social media sites was blocked in order to prevent staff members from wasting organizational time. This meant that residents that wanted to use social media had to travel elsewhere to do so. Most residents were unable to travel to the nearest location that offered both free Wi-Fi and computers: the local library. A mile away and not located on any public transportation line that connected to the assisted living center, this was inaccessible to the vast majority of residents.

Providing access in such environments makes sense as growing numbers of older adults rely on social media as a way to remain connected to their families (Coelho & Duarte, 2016) and access to communication technology has been proven to ease the transition to such living communities (Waldron et al., 2005). Many of the residents of the facility I spoke with would have enjoyed access to social media; however, they were prevented from doing so because it improved overall organizational efficiency. There are a multitude of other interventions that could have been used to prevent employees from using social media during their workday: stricter policies, blocking individual devices, and collecting devices from employees during their shifts. Policies which facilitate residents' digital lives and help them to more closely achieve their ideal technological lifestyle should be a priority. The residents, as clients, should be the center of care.

Beyond allowing access, available technology in these facilities is often sluggish and outdated (or non-existent). The computers available in Nancy's assisted living facility were over 10 years old. It should be an institutional priority to provide a number of relatively recent computers to residents. These computers need not be purchased new. Individuals and organizations frequently update devices, with organizations in particular often only receiving small recycling returns.

Such devices, rather than being returned to the manufacturer could be donated to such facilities with a charitable deduction. Many organizations with older adult clients may find student groups at their local secondary school or university willing to help source devices and provide technical help.

While increasing accessibility and access are important to allowing Enthusiasts, Practicalists, Socializers, and Guardians to use ICTs in the ways they desire, it is also important to consider how to best facilitate the Traditionalists – the want-nots – in our society as well.

Supporting the Traditionalists: Helping the Want-Nots

The third important category of older individuals in the digital divide is the “want nots” – these are people choosing to not use modern digital ICTs (Eynon & Helsper, 2010; Russell, 1998). In terms of the ICT User Typology, these are the Traditionalists – those individuals who love the ICTs of their youth but have little interest in using more modern technologies.

Much of the focus in both popular media and in scholarly and practitioner digital divide literature focuses on how to motivate Traditionalists to use the modern ICTs they reject. The presumption in much of this literature is that use is good – and non-use, conversely – is, therefore, bad (Friemel, 2016; Russell, 1998). In these discussions of the digital divide, we often overlook older adult personhood (Lenstra, 2017) seeing technology as the perfect “solution” to the “problems” of aging (Parviainen & Pirhonen, 2017). Such insinuations suggest that aging is not valued, nor desirable, but instead is a state that needs to be fixed. Our aging societies do not need fixing, technology is not a bandage, nor is any technological innovation free of consequences – be they positive or negative.

Older adults have a right to self-determine their level of engagement in our digital world, including if that level of engagement is zero. They have the right to make choices about their lives and this includes the choice to disengage from more modern forms of technology. The focus on encouraging computer and internet use in much of the literature infantilizes older adults, playing into ageist stereotypes which suggest that they are not capable of making their own decisions (Cutler, 2005). Older adults are not children and encouraging them to use a computer should not be analogous to telling a toddler that they should eat their spinach.⁵

Older adults are well aware of what technologies can do. Traditionalists, who consume high amounts of traditional media, are well aware of many new

⁵In the United States, there is much fascination with religious subcultures that have rejected and/or restricted their ICT use, including the Amish. Our acceptance, and even fascination with individuals from a subculture that rejects and/or strictly controls their ICT use (see Umble (1994) for a discussion of the telephone), stands in contrast to our societal non-acceptance of the older adults among us who choose to not use ICTs.

technologies: they have seen/read/listened to advertisements, stories, articles, and programs about them and still they have no interest in using these modern forms. Traditionalists have little self-motivation to use such technologies in their elderhood, as their lives are simply full of the traditional media they love. In many cases, Traditionalists are already being pressured by friends and family members to adopt more modern ICTs. They find themselves inundated with well-meaning but unwanted technological gifts, yet they continue to resist this pressure to use them. With Traditionalists' more modern technologies gathering dust and frequent inquiries from loved ones, there is not much more on a societal level that can be done to encourage Traditionalists' use.

Those of us who identify as Enthusiasts cannot let our love and passion for technology blind us to the agency of our elders. If we would like to have agency in the final decade or two of our own lives and to be able to make our own choices about the technologies we use, we should start by respecting the technological choices of our own elders now.

Traditionalists from the Lucky Few generation are mostly unharmed by their decision to disengage from the virtual world. They tend to be very happy about their choices (although they are often frustrated by the pressure they feel from others to use modern technologies). These individuals have survived, adapted, and thrived for over 70 years; if they are happy being unengaged from modern ICTs in the last decades of their life, there is a strong argument that we should allow them to do so.

There is an important caveat to this discussion. Much of our information and services are moving online, leaving people who are not internet users at risk. Successful older adult Traditionalists tend to have a strong network of people who use ICTs and they rely on these direct users to get them information they may need, file things online, or digitally communicate with others. These direct users are similar to the "warm experts" previously identified in the literature – individuals who provide technical assistance and/or access to older adults (Wyatt, Henwood, Hart, & Smith, 2005). In this way, Traditionalists are "indirect" or secondary users of online services, computers, and other digital technologies, relying on these warm experts for actual use.

If Traditionalists lose their relationship with the direct user they rely on, they are at extreme risk in a digital society. Mindy Jean relied on her husband to go online, including to file taxes and look up information. June relied on her children and a man who worked at the front desk at her low-income apartments to look up information and print off forms she needed. If these Traditionalist older adults were to lose these individuals, or never had these contacts in the first place, they would be at risk of not being able to complete these tasks. This speaks to the need for our societies to provide services that facilitate "indirect" users of systems: a social safety net for the indirect users of the internet. When asked what they would do if they no longer could rely on their direct users, Traditionalists volunteered they could go to their local library and the librarian would help them to get the information or to sign up for the services they needed. These types of library services need to be funded.

To truly facilitate the needs of Traditionalists, professionals and volunteers in such programs need to be willing to set aside any “pro-technology agendas” (Margaret) and ageist stereotypes. Often, particularly among those who are Enthusiasts, there is a tendency to act as technological evangelists, to encourage digital technology use and to view such use as the desirable end goal. Such a pro-technology agenda is unnecessarily harmful to Traditionalists. Traditionalists often feel shamed for their choices in ICT use, and any program that hopes to engage older adults in our digital society should avoid passing any such judgment.

In a similar vein, it is also important to support Guardians’ choices in using ICTs in a limited way. While Guardians are far more willing to use more modern ICTs than Traditionalists, they tend to be very cautious in their use. Due to their knowledge of potential technological pitfalls when it comes to information security and privacy, many simply need reassurance that the ICTs they want to use are safe. Such reassurance must occur in verbiage that is appropriate for the individual Guardian’s skill level. Technological language, particularly when used to speak down to Guardians, tends to be very off-putting and causes disengagement. However, there are numerous examples of Guardians being “coached” out of their original comfort zone by kind and understanding IT professionals. Margaret began online shopping after a positive experience with an employee she contacted on the phone, who described in detail (in terms she could easily understand) the security in place for online purchases. While Margaret was certain she would buy very few items online, she purchased exclusively from this online retailer as she understood their security procedures. As a result of a retail employee taking the time to discuss Margaret’s concerns about privacy and information security, the company won a life-long dedicated customer.

As a society, we need to accept that choosing to *not* use a technology is a valid response. A person’s value and their ability to engage in society should not be based on their technical expertise or their willingness to use the latest gadget. It is not Traditionalists and Guardians that necessarily need to change their views, but perhaps rather the rest of us.

Addressing concerns over ICT literacy, usability, and access are important to facilitate older adults using ICTs in ways that come naturally to their user type. There is also an opportunity for those who are interested in appealing to the graying market to use the ICT User Typology to better understand, design for, and market to the older adult population.

Using the ICT User Typology for Tailored ICT Service and Product Design

As our population ages, the older adult market for technological devices and services grows. Gerontechnological researchers are just beginning to recognize this potential (Hough & Kobylanski, 2009; Kashchuk & Ivankina, 2015), although there have been very few studies from the business or marketing perspective

(Mostaghel, 2016). Technologies for an aging population not only need to be adaptable to overcome cognitive and physical limitations and disabilities, but also must keep in mind the diverse motivations, needs, desires, and lifestyles of older adults (Bagnall et al., 2006; W. A. Rogers & Mitzner, 2017). As a diverse group there is no single “older adult” design that will appeal. Instead, such design must be tailored to this diversity (Righi, Sayago, & Blat, 2017). The ICT User Typology segments the older adult market, allowing targeted design and advertising to these differing tastes, wants, and lifestyles; unlocking the meanings older adults apply to technologies. It is meanings that are critical to understanding older adult technological acceptance (Hauk, Hüffmeier, & Krumma, 2018).

Each of the user types finds different aspects of ICTs interesting to them, and as a result, have different design specifications that appeal. The ICT User Typology provides guidance in designing and marketing effectively to the older population as a diverse group of individuals, rather than ineffectively to older adults as a single market. Table 3 provides guidance on what appeals to each of the user types in devices and services, how these products can be best framed for marketing purposes, the level of support that will be necessary to engage this part of the older adult market, as well as main takeaways.

Enthusiasts love technology and, in particular, love its fun aspects: they love to experiment with a new “toy,” and they are very much self-supported. To appeal to Enthusiasts, it is important to make sure that any product, device, or service you offer truly is fun to use. Enthusiasts are geeks (and they are proud of it!). They enjoy showing off this geekiness. It is very important when looking to appeal to Enthusiasts that you do not talk down to their skill level. Many Enthusiasts are or were IT professionals, and many of them built technologies and networks. They do not need to be told how to use a device, but rather they are very capable of being able to open a box or subscribe to a service without much help at all. Because technology is central to their lives, Enthusiasts with impairments or disabilities represent a large market for adaptive technologies that facilitate their continuance in using digital devices. They are the most likely of the types to adopt smart home or ubiquitous computing and embrace technological solutions for age-related declines.

Enthusiasts are researchers and base their purchases off their own research as well as feedback and recommendations from fellow Enthusiasts. They pay attention to advice from their technical friends and read various technical blogs and magazines. They have the skill set necessary to use popular devices and are uninterested in technologies that will stereotype them as “non-technical people.” Since Enthusiasts place ICTs in the center of their lives and throughout their homes, functional beauty is very important to them. They want their technologies to look sleek and beautiful; to be showpieces. They love their ICTs and the fun they have using them, but they do not like ugly things in their living spaces.

You may be wondering why it is important to market to Enthusiasts, who are likely to try most technologies on their own. Such marketing is critical as Enthusiasts spend a disproportionate amount of their income on technology and technological services compared to the other types. Appealing to their tastes is important. Technology is, after all, their main hobby (and often their job as

Table 3. Designing Products and Services for the Five User Types.

User Type	Is Drawn to	To Sell to	To Support	Takeaways
Enthusiasts	Fun, play, newness, experimentation	Emphasize the fun Present use as play	Requires little support; can “turn on and go”	Enthusiasts are not trying to be hip, they genuinely want to use the latest and greatest
Practicalists	Functionality, practicality, usefulness	Emphasize the functionality Present use as practical	Requires substantial support; prefers documentation and help services	Practicalists are not explorers; you must prove to them it is useful and how it is useful to them
Socializers	Connection, community, relationships, socialization, Engagement	Emphasize the connectivity Present use as bridging	Requires little support; relies on large social network	Socializers want what young people have; facilitate their ability to use what young are using
Traditionalists	Nostalgia, technology and media of their youth	Emphasize the nostalgia Present use as comforting and traditional	Needs technology that functions like old standbys	Traditionalists love the older ICT forms; still a market for new devices that “function” like the old
Guardians	Security, control, relationships, unobtrusiveness	Emphasize the security of device/service Allow individuals to control their own use Unobtrusive devices	Requires substantial support; reassurance technology is safe	Guardians are concerned that technology is all-consuming and unsafe; give them the ability to control their use

well). Enthusiasts are well versed in the technological landscape and are well aware of your service and product – and your competitors. They are often the “technical help people” among their family and friends, no matter their age. When Enthusiasts recommend a device, the other user types listen. Earning older Enthusiast customers, therefore, can help to bring in other user types as customers as well.

Enthusiasts greatly dislike advertising that presents older adults as non-technologically capable. Specifically, they dislike advertisements that suggest that older users have no technical skills or need simplified technologies. These they view as very stereotypical and are unlikely to try any technology they feel is oversimplified and dodgy. Older adult Enthusiasts, however, are not just carbon copies of younger people with the same tastes and preferences. When asked, many Enthusiasts would like to see more “positive” portrayals of older adults in technological advertising – portrayals that match their skill levels. Older adults who are portrayed as capable technology users having fun using the device, service, or product will particularly appeal to older Enthusiasts.

Practicalists are focused on the functional and practical aspects of the ICTs they use or are considering using. They do not play with ICTs, they do not experiment, and they do not see technology as fun or a toy. Technology is a tool. Appealing to Practicalists involves outlining the functional aspects of a technology – how it can be used in Practicalists’ daily lives and how it is an improvement over their current technology. Practicalists are drawn to devices that offer greater functionality and usefulness than their current forms. They tend to be very definite in the ways they want to use a technology and have little interest in devices that stretch across every aspect of their lives. Practicalists’ tend to see certain ICTs as leisure devices, and others as work tools or community builders.

Practicalists strongly dislike (even to the point of “hating”) having to search out new features or uses; they do not play with their devices – their devices are tools. It is important, therefore, that if your device or service has features which are not readily apparent but are highly functional that you use walkthroughs to show Practicalists how to use these functions on their newest tool. Practicalists do not experiment to discover “cool things” your ICT can do; they are typically told, so be sure to do the telling through various support documentation. A lack of such documentation frustrates Practicalists. They will not open a device or service and begin poking around; they need and desire some level of guidance. If a competitor proves that their device is more easily used and more useful, you have likely lost Practicalist customers.

Practicalists need a high amount of support, particularly since they do not experiment with ICTs. When they run into issues they need a place to turn to for answering their questions. This can include support such as a help line, manuals, and/or web support. Practicalists often have relatively high skill levels in those technologies they use frequently, so the need for such support is not necessarily remedial. Instead, if Practicalists have questions about a device or service, such as how to change a setting that is not readily apparent, they would like to be able to look such information up, rather than exploring how to do it on their

own by selecting various menus or icons and experimenting. Practicalists are frustrated when they receive an ICT with no manual or instructions on how to find help online. Technologies should be easy to use and help should be readily available in Practicalists' minds.

Many Practicalists were exposed to ICTs in their work. They often adopt versions of these ICTs for their home life, if they see a relevant application. They are not impressed by others simply owning a device, or a device being "hip" or "popular." They want to know a device works, and for what purposes, and seek out advice from friends and coworkers, as well as information in blogs, news articles, and reviews that help them determine the functionality of a device. They are uninterested in advertisements that are unsubstantial and do not detail functionality.

Socializers are focused on the connectivity of their devices. They love to socialize, meet people, and build connections with others. Of all the types, they are most likely to be influenced in their use by those around them. They have large intergenerational networks and, as a result, tend to adopt the ICTs being used by the young people in them. Many older adult Socializers text (or would like to text), but those who have arthritis or other disabilities (such as visual impairments) are prevented from doing so. Creating adaptive devices that allow Socializers with impairments to mimic the way young people communicate would do much toward facilitating their everyday lives and be highly appealing to this group. Socializers' interests are highly geared toward technologies such as social media and mobile communication technologies such as smartphones, tablets, and other portable communication devices.

Socializers are the most likely to find advertising targeted toward younger individuals appealing. As a result of the intergenerational nature of Socializers' networks, they are always observing which technologies are being used by and marketed toward their youngest family members and friends. They place little to no value on technologies, devices, and services that isolate; greatly preferring those that enable connection. Much of this value is not inherent in the ICT itself, but rather in how the use of the ICT is framed. For instance, while video games and other forms of digital gaming are largely seen as an isolating activity, those which can be played in a group setting and are marketed as a social activity can be quite appealing to Socializers.

Socializers do not use the devices young people do to be young or hip. Instead, they understand that they are adopting the ICT use patterns that have been established by younger people. Learning these patterns is extremely important to Socializers, as they credit these technologies with strengthening their relationships. Marketing that focuses on creating and building bonds with their large families (such as with their grandchildren) is particularly effective. They have no interest in nostalgia or stigmatizing devices created solely for older adults.⁶

⁶Stigmatizing adaptive technologies are unwelcome among older adults on the whole (Gitlin, 1995; Yusif & Hafeez-Baig, 2016).

Traditionalists are the most likely of the five user types to focus on nostalgia. They fill their lives with the more “traditional” forms of media they encountered when they were young. Traditionalists are the most difficult segment of the older adult population to market new devices and services directly to, given their resistance toward using new technologies.

There are two opportunities for those who are interested in tapping the Traditionalist market, however. First, highly nostalgic, Traditionalists deeply enjoy using the media of their youth and young adulthood. This includes the music, television, and movies from their younger days. There are a multitude of opportunities to market such nostalgic experiences to Traditionalists, particularly if such experiences are coded within technologies that have the appearance and user interfaces of older ICT forms. While older adult Traditionalists would not be willing to adopt a digital music player presented as such, they would be keen to purchase a player that looked and acted like a regular radio but was pre-loaded with their choice of nostalgic music. Presenting nostalgic technologies that most importantly *act and function* like the ICTs Traditionalists know and love is incredibly important to appealing to this user type. These nostalgic devices can also be marketed to the family and friends of Traditionalists, who are often keen to introduce the Traditionalists in their lives to more modern ICTs, but find their efforts rebuffed. Devices which mimic the functionality of the Traditionalists’ beloved ICTs of their youth while incorporating new technologies may be a suitable middle ground. Second, while Traditionalists are typically not primary users of modern ICTs (when at all possible), they often rely on others to access online information and services. There is an opportunity to provide these services to Traditionalists who do not have a friend or family member to access this information directly.

Guardians are interested in ICTs that are secure, can be easily hidden, and are controllable. Unlike Enthusiasts, who are in love with ICTs not only for their function but form, Guardians enjoy having ICT-free spaces. They have absolutely no interest in ubiquitous computing, and the idea of smart homes that they do not directly control is frightening to them. They like to have absolute control of the technology they use – including the ability to turn it off and place it out of sight. For designers, there are opportunities to develop ICTs that are easily hidden that retract into spaces or mimic other objects.

Guardians have a large diversity in skills, ranging from beginners to more advanced users. Since they tend to be naturally hesitant to try new technologies and place emphasis on face-to-face interaction, they tend to need high levels of technical help and support. In particular, they prefer having as contact-rich methods of seeking help as possible – being able to speak to someone over the phone or in-person is preferred to a web-based chat.

When marketing a device or service to Guardians, it is very important to ensure that the technology is secure⁷ and controllable. Guardians need

⁷Overall, for older adults, security is very important for their use of ICTs, and these security protections must be clear and easily understood (Jung, Walden, Johnson, & Sundar, 2017).

explanations of how their information will be protected and reassurance that the technologies are secure and private. Any such information should be an important part of any marketing plan, as they avoid ICTs which they believe risk their privacy or security. Similarly, they resist investing in smart appliances, as they are well aware of the potential information security threats these devices pose.⁸ In developing ICTs for Guardians, it is important to develop secure technologies. Once a Guardian has had their security breached, they will be unwilling to continue using your device or service.

While the ICT User Typology informs more targeted design and advertising to the older adult market, it also has practical implications for those interacting with younger individuals, due to user types developing early in the life course.

Moving Beyond Older Adults: Using the ICT Typology in Primary and Secondary Education

The ICT User Typology highlights the importance of child and young adulthood experiences to the development of a person's user type. Enthusiasts credit strong positive childhood memories of ICT use, being encouraged to tinker, and having a technological mentor as being critical to developing their love of technology. An open question, however, is if such childhood experiences can be manipulated to influence a person's user type. If so, such experiences can be designed to encourage larger portions of Enthusiasts in the population, but also possibly inoculate against other user types developing.

There is a well-documented need for STEM (Science, Technology, Engineering, and Math) professionals (Directorate-General for Internal Policies, 2015; Gonzalez & Kuenzi, 2012; Kuenzi, 2008; Marrero, Gunning, & Germain-Williams, 2014; Microsoft, 2017). Creating tinkering environments with technological mentors for young people could influence user type development, resulting in more Enthusiasts in the population.⁹ Such exposure to the many potential uses of ICTs could also result in a higher percentage of Practicalists, given the importance of understanding application to this type. Since both Enthusiasts and Practicalists are likely to be involved in careers which use a large amount of technology, there are many potential advantages to increasing their numbers. Indeed, evidence exists that providing early positive technological experiences, messages, and mentorship can prevent or inoculate individuals from developing negative technological viewpoints (Stout, Nilanjana, Hunsinger, & McManus, 2011) and, therefore, such programs could prevent many Guardians from developing their cautious attitudes toward ICTs in later life.

⁸See Rowe and Trejos (2017) for a discussion of smart appliances and information security risks.

⁹Evidence already has suggested the importance of mentors in influencing interest in STEM (Tillinghast et al., 2017).

Many programs are already in place that are trying to accomplish the goals of providing tinkering opportunities and technological mentorship to children and young adults. These include primary and secondary programs (Directorate-General for Internal Policies, 2015; Gonzalez & Kuenzi, 2012; Kuenzi, 2008) and community-based programs (Tillinghast et al., 2017), which are often aligned with higher education institutions (Breiner et al., 2012). Such programs should be encouraged. It would be of immense value to institutionalize these programs in primary and secondary schools, free-of-charge to participants.

However, we must recognize that each of these user types has a place and role in our society. Enthusiasts are our eager innovators and Practicalists our productivity-focused colleagues. Socializers connect us generationally. Traditionalists provide us with a sense of a grounded past while Guardians are protective watchers of our society and safety. Life without all of these five types would be boring and unbalanced. We need protective Guardians who are watchful of privacy concerns and rights online as much as we need innovative Enthusiasts; we need Traditionalists in order to be grounded in our historical context as much as we need Practicalists' functional focus. And, as our societies become more age diverse, it is more than nice to have a few Socializers who keep us all connected and communicating intergenerationally.

While it is unlikely that technological education and mentorship would cause the extinction of some of these user types, the goal of such education should not be to extinguish any one type through social engineering. Such programs should, instead, be designed to meet the needs of an ever-increasingly digital workforce, while recognizing the value these diverse user types bring to our societal tapestry. Variety in user types, as in all things, is the spice of life.

The final chapter of this book provides a detailed discussion of the methods used to generate the ICT User Typology and provides helpful hints to researchers seeking to replicate this study in other cultures or populations. It also discusses some of the lessons learned working with older adult participants and provides a detailed discussion of how to use the interpretative interactionist methodology to develop theory and theoretical constructs.