



We Have Built It, But They Have Not Come: Examining the Adoption and Use of Assistive Technologies for Informal Family Caregivers

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Abstract. We conducted interviews with 14 informal family caregivers of elderly Alzheimer’s and dementia patients in the U.S. to understand opportunities to increase the adoption and use of assistive technologies (ATs) in the home. We identified three key themes: (1) Most of the caregivers were interested in adopting assistive technologies, but they did not know where to begin; healthcare providers gave little to no guidance. (2) Caregivers demonstrated a need for assistive technologies that enabled or enhanced remote caregiving, as many were adult children who worked full-time and had to leave their elderly parent at home, unattended during the day. (3) While caregivers rarely adopted assistive technologies designed specifically for caregiving, they often repurposed everyday technologies (e.g., home security systems, calendar applications) to aid in care. These findings provide insights for how we can better support the use of assistive technologies by informal family caregivers.

Keywords: Assistive technology · Informal caregiving · Alzheimer’s disease
Dementia

1 Introduction

As the number of patients diagnosed with a neurodegenerative disease rises, so does the number of family caregivers. Many Alzheimer’s disease or dementia patients reside at a home and rely only on the care of a loved one. There are approximately 43.5 million informal caregivers in the United States; 15.7 million of whom provide unpaid care for someone who has Alzheimer’s disease or dementia [1]. Informal caregivers often take care of loved ones as in-home patients, which creates significant caregiver burden, especially when care requires constant supervision [2]. Caring for a patient with a neurodegenerative disease is quite difficult and the majority of family caregivers have little to no formal training. While numerous assistive technologies (ATs) have been developed to ease this burden, the adoption and use of these technologies has been markedly low, for reasons ranging from caregivers’ lack of technical expertise to the prohibitive cost of assistive devices and monitoring services [3, 4]. This study explored in-home and remote technology adoptions and the use by the caregivers to support the

patients. We go beyond studying the adoption and use of ATs in the home to examining the unmet needs of informal caregivers and opportunities to improve assistive technologies, so they can better meet these needs.

2 Related Literature

We provide a brief summary of the literature that gives an overview of the ATs available for informal family caregiving to contextualize our study. Then, we conduct an in-depth review of the existing literature most closely related to our own.

2.1 Assistive Technologies for Informal Family Caregiving

Clark et al. [5] outlined the challenges in the long term and post-acute caregiving processes to motivate an imperative need for further analysis of current ATs to help with informal caregiving of patients with Alzheimer's and dementia. One of the areas where caregivers need support for caring for in-home patients with Alzheimer's and dementia is the need to constantly monitor patients to ensure their safety. Slip and falls, burns upon household equipment, and night wandering are realistic occurrences that cause distress to both patients and their caregivers. Past research has summarized various ATs for managing these concerns, including motion sensors with remote alarms, wireless cameras with handheld LCD and night vision, proximity range alarms, wireless home security sensors, and Global Positioning Systems (GPS) [6]. In addition, Robinson et al. [7] indicated that the role of assistive technology and Information and Communication Technology (ICT), including memory aids and home improvement modifications are seen as promising possibilities for helping people with dementia age in place at home by compensating for the patient's functional losses [8–10]. A number of studies (e.g., [11–13]) have examined ATs for in-home caregiving of Alzheimer's and dementia patients, focusing on the affordances of these technologies, and at times, introducing them into in-home caregiving situations to assess their effectiveness. However, fewer studies have studied actual use (or non-use) of these ATs when an intervention is not present. We summarize these studies, which are most closely related to our own work, in the next section.

2.2 User-Focused Studies with Informal Family Caregivers

Research that has taken a more user-centered approach to examining ATs for informal family caregivers of elderly Alzheimer's and dementia patients demonstrates an interesting dichotomy between users' perceptions versus their actual adoption and use of these technologies. In 2015, Mao et al. [14] studied the perceived usefulness of 82 assistive technology devices and, based on a survey of 72 caregivers of dementia patients, found that they were "generally amenable" to using these devices. Similarly, in 2017, Mulvenna et al. [15], examined the ethical and privacy implications of using video surveillance in the home to monitor people with dementia. They found that caregivers were generally in favor and willing to use such monitoring technologies. However, a limitation of these works is that they solicited feedback on hypothetical or

perceived use, as opposed to actual use, of such ATs. In contrast, researchers who studied actual adoption and use of in-home ATs found that it was relatively low and have identified a number of barriers to adoption. For instance, Edlund and Björklund [3] conducted a study in Sweden and found that family caregivers often do not use assistive technology because they have a lack of technical knowledge. In addition, Olsson et al. [4] found that caregivers were not able to use ATs because they were expensive, and they could not afford them. Gibson et al. [16] found that caregivers had negative perceptions about costs, were unsure the best time to adopt ATs, and were unsure how ATs could best be used. We also adopt a user-centric, qualitative approach to understanding the use of ATs by informal caregivers in the home. We extend beyond the existing literature by examining non-use [17] and remote use of ATs, which lends insight as to missed opportunities for caregiver support.

3 Methods

3.1 Study Overview

We conducted a semi-structured interview study with informal caregivers of Alzheimer and dementia patients. The inclusion criteria for this study was that the participant needed to be the primary in-home caregiver of a patient with Alzheimer's or dementia in the past year and over the age of eighteen. Adoption and use of ATs was not a requirement for participation, as we were interested in understanding the perspectives of both users and non-users [17]. The interview began by asking caregivers questions about the nature of the informal caregiving relationship, such as how long they had been a caregiver and the progression of the patient's condition. Next, we asked participants about their level of comfort with technology and whether they used ATs for in-home care or for providing care remotely. We followed up with questions regarding the benefits and challenges associated with using these ATs. We concluded the interview with questions related to how participants learned about or were introduced to ATs. For those who were adopters, we asked how these technologies impacted their caregiving duties. For those who reported low usage, we asked why they chose not to adopt. The study was approved by our university's Institutional Review Board (IRB), and participants received a \$20 Target gift card for their time.

3.2 Data Collection and Analysis

Participants were recruited from Central Florida via Alzheimer and dementia organizations, as well as through word-of-mouth and social media postings. Interviews took place during 2015–2016 and were conducted in-person or over the phone. We performed a qualitative, thematic content analysis [18] to extract emergent theme from the interviews that extended beyond the findings from prior literature, noting many of the themes that emerged from our interviews mirrored some of the findings from past work (e.g., [3, 4]). For instance, our results confirmed the low adoption rates and many of the barriers to adoption (e.g., privacy concerns, technical expertise, and cost) from the prior literature. These themes were noted but de-emphasized over the themes that had not

been highlighted in prior literature. The principal investigators (Drs. Wisniewski, Gurupur, and Gabriel) trained and supervised five undergraduates and one graduate research assistant to recruit participants, conduct semi-structured interviews, transcribe audio recorded interviews, and qualitatively analyze the data based on the salient themes identified from their initial analyses of the interview data. The research assistants extracted illustrative quotes from the interviews to include in the presentation of our paper. All quotes are anonymized and any personally identifiable information has been removed to protect the identities of our participants.

4 Results

Below, we describe our participants and the types of ATs used to support informal caregiving, then provide an in-depth analysis related to our three emergent themes.

4.1 Participant Profiles

Our sample consisted of fourteen informal caregivers of elderly Alzheimer's and dementia patients. The majority of participants were female with three who identified as male. This distribution is consistent with past research that shows that women are more likely to become informal caregivers than men [19]. The relationships of caregivers to Alzheimer's and dementia patients included spouses, children, and siblings. Most participants self-identified as white or Caucasian with two participants (P8 and P12) who were of Hispanic descent. Additional descriptive statistics, such as gender, age, employment status, and income level are summarized in Table 1.

Table 1. Descriptive characteristics of study participants.

ID	Gender	Age range	Relation to patient	Employment status	Income level	Patient's condition
1	Female	60–69	Daughter	Full-Time	\$50 K–\$79 K	Moderate/Advanced
2	Male	60–69	Son-in-law	Full-Time	\$50 K–\$79 K	Advanced (Deceased)
3	Male	50–59	Son	Retired	\$100 K+	Advanced
4	Male	60–69	Husband	Retired	\$80 K–\$99 K	Mild
5	Female	70+	Wife	Retired	\$100 K+	Mild
6	Female	70+	Wife	Retired	\$50 K–\$79 K	Advanced
7	Female	70+	Sister	Retired	Not reported	Mild
8	Female	60+	Daughter	Retired	Not reported	Moderate
9*	Female	50+	Daughter	Full-Time	\$80 K–\$99 K	Mild
10	Female	50+	Daughter	Part-Time	Not reported	Advanced
11	Female	50+	Daughter	Full-Time	\$30 K–\$49 K	Advanced
12	Female	40–49	Daughter	Full-Time	\$100 K+	Mild
13	Female	70+	Wife	Retired	\$35 K	Advanced
14	Female	70+	Wife	Retired	\$80 K–\$99 K	Mild/Moderate

* Both parents of P9 exhibited mild symptoms of dementia under her care.

4.2 Caregiver Narratives of Assistive Technology Use and Non-use

Many of our participants were adult children who took on the caregiving responsibilities for their parents in the same home. For instance, P1 moved in to care take her mother six years ago after her father's death. She works full-time as a specialist in emerging technologies, but she still struggles to find the right in-home and remote technologies to help her care for her mother. Currently, she only uses an "ADT like Life Alert system." During her interview she said her immediate need is for remote ATs to monitor her mother while she is at work. In Sect. 4.2, we describe some of the barriers as to why she has yet to adopt many in-home or remote ATs, even though she is well-versed with technology. P11 is similar to P1 in that she works full-time and has been the primary caregiver for her mother for three years. Unlike P1, P11 uses an in-home camera system with remote monitoring from her phone, so that she can get out of the house while making sure her mother is safe at home. She also considers herself "very comfortable" with new technologies, and uses the internet to take care of her mother's needs, such as understanding her insurance benefits. Both P1 and P11 will be used as examples for the need for ATs for remote caregiving (Sect. 4.3).

Other participants cared for parents with milder symptoms, so did not feel they needed ATs at this time. P12's mother recently moved in with her after exhibiting early signs of dementia. She is quite comfortable using technology, but currently only uses a cell phone and landline to manage communication with mother. She sets reminders on her mother's cell phone to take her pills, but she often calls the landline just in case her mother did not pay attention to the reminder. She plans to install a home security system with cameras and has begun researching different options that fit her budget. She also helps her mother manage simple tasks, such as writing checks and using an ATM card. Both of P9's parents have mild symptoms of dementia. While she does not live with them, she helps manage their day-to-day affairs, such as using a calendar application to manage their doctor's appointments. Her husband helps her manage her parents' finances. Otherwise, she says she is quite comfortable with technology but does not use ATs because they are not yet necessary.

When caregivers (adult children or spouses) had loved ones in the advanced stages of their disease, many felt like constant supervision and managed care were more of a necessity than using ATs. P10 helped her father care take her late mother in the advanced stages of dementia. In the last five years of her mother's life, her mother was confined to a wheelchair and unable to walk. Therefore, she said, "*I didn't have a concern of her getting out of the home and getting away.*" The only technology she mentioned using to support her mother's caregiving was a calendar app on her phone to help keep track of her mother's doctor's appointments. Otherwise, since her mother was "*never left alone,*" human care (primarily provided by her father) replaced the need for ATs. P8 has lived with her mother as her primary caregiver for seven years. Her mother stays in bed most of the time and has a Certified Nursing Assistant that comes to administer care periodically. P8 admits that she is "not very good" with technology and prefers to keep an eye on her mother. She has an emergency security alert keychain for herself and a home security system. However, she only uses the home security system when her mother is not home, in fear that she would get scared or confused if she set it off (see Sect. 4.3).

Similarly, P2's mother-in-law recently passed away, but he was her primary caregiver for approximately a year and a half prior to her death. Due to his mother-in-law's need for constant supervision, P2 did not express the need for remote ATs (Sect. 4.3). P3's mother lives in a managed care facility, which also replaced the need for most ATs. His mother has a Life Alert and he uses internet-enabled technologies to handle all of his mother's affairs, such as "*her insurance, Medicaid, drug plan, and bank statements.*"

The remainder of our participants were spouses or siblings (P7) of the loved ones they cared for. Some of these participants made use good use of ATs in the home. For example, P4's wife was diagnosed with dementia in 2014, and ATs they use to support her care include, a Fitbit to track her daily activity, a cell phone "*as a simple means for communication,*" and calendar to keep track of important events. While he uses these technologies and considers himself "*generally very good*" with technology, he gets frustrated that his wife will only use a landline and will not use the calendar. P6's husband has become completely dependent on her the past six years. To manage his care, she embraces a number of advanced ATs; she personally installed a camera system throughout the house, as well a home security system that she can monitor and send her alerts via her mobile phone, and has her husband carry a GPS tracking device on his keychain.

In contrast, other caregivers were less likely to use ATs, often due to lack of knowledge. P5's husband was diagnosed with mild cognitive impairment and symptoms of Alzheimer's about ten years ago. He is still fairly self-sufficient, able to bathe himself and take walks for up to three and a half miles a day; however, he has "*given up*" trying to perform daily functions, like managing finances, because "*he gets frustrated and angry.*" She was proficient with desktop computing technologies that allowed her to manage their daily affairs, but she was uncomfortable with more modern technologies, such as smartphones. She says that her husband "*carries a flip phone and he knows how to use it still.*" In terms of ATs, P5 was unaware of technologies that might be able to help them (see Sect. 4.2). She noted that if he got to the point where he needed a home monitoring system to ensure his safety, she would rather give up their home and move into a retirement home. P7 is the twin sister of her brother, who was diagnosed with early stages of Alzheimer's; she lived with him for three years. She emphasized that her brother's wealth was a key factor in the use/non-use of assistive technology in their shared home. Most of his needs were taken care of by hired professionals within the home, but he had a paging system in the house in the case that someone was not immediately available, so that they could come attend to his needs. P7 took only a supervisory role in her brother's care, but she also admitted that she did not use ATs "*because I am not capable.*"

Many participants who admitted not being tech savvy were also the ones who felt like they had no need for ATs. P13 is the caregiver for her husband, who is in the advanced stages of his disease. She generally does not use technology much in the home and did not report using any ATs. This was partly due to her lack of knowledge, as well as her limited income. We discuss her perspective about in more depth in Sect. 4.2. She is in constant supervision of her husband and only leaves him when the home health aid is present to supervise him. Similarly, P14 is also a caregiver for her husband, who was diagnosed with mild cognitive impairment. Similar to other

participants, she says she is comfortable with technology, but has not embraced newer technologies, such as smart phones or ATs. She explains, that at her age and her husband's mild condition, she simply does not have a need for it. Table 2 summarizes the relatively low usage of assistive technologies by our participants for informal family caregiving.

Table 2. The use and non-use of assistive technologies for informal caregiving

Assistive technologies used (or not used)	Participants
No usage of assistive technologies reported	13, 14
Productivity software (e.g., personal finance, calendars, reminders etc.)	3, 4, 5, 9, 10, 11
Cell phones and landlines	1, 4, 12
Emergency alert system (e.g., Life alert)	1, 3, 8
Camera-based home security system (with remote monitoring)	6, 11
Home-based security system (without remote monitoring)	2
Wearable health trackers (e.g., Fitbit)	4
GPS tracking device	6
Other (e.g., home paging system, remote control A/C unit)	7

4.3 A Willingness to Adopt but Real Barriers Outweighed Perceived Benefits

Overall, most of our participants recounted numerous barriers to adoption that prevented them from adopting ATs. For instance, P2 was also concerned about costs; however, he was even more skeptical of the benefits that ATs would provide given his mother-in-laws advanced stages of her disease. For cost and functionality, it made more sense to invest the funds in a professional in-home caregiver:

“At the expense of that we could make sure she had a caregiver around, that was one of the prohibitive factors with installing something like that.” –P2

P2 and P3 both highlighted the trade-off between the cost of managed care versus the need for ATs in the advanced stages of their loved one's condition, suggesting that managed care was preferable to relying on ATs for long-term care. P6, however, was an exception to this case, likely due to her proficiency with technology and desire to keep her husband out of an assisted living facility as long as possible. Meanwhile, P7 noted that her brother had enough money to have people take care of him before he was sick, so had no need for ATs now:

“He was in a position that he could afford to have help and wives. Once he got sick, he's spoiled really.” –P7

P2 also noted that, “*there is not a lot of resources,*” in terms of guidance from medical professionals or doctors. Therefore, the burden falls of the caregiver to explore technologies that might fit their needs. P5 expressed similar frustrations when we asked her about the use of ATs for in-home care:

“Well sure, if I knew what they were. What technologies are you suggesting that I should be using?... No nobody has told me anything. I have no clue what.” –P5

Similarly, P8 said, *“No one has suggested anything,”* and P12 concluded that she would rather get information from her doctor than having to search the internet:

“I try not to depend on information that I see online, I would rather get it from a doctor because there is so much out there that sometimes there is conflicting information so I would rather get the information from a doctor first.” –P12

In contrast, P6 leveraged multiple Alzheimer’s and dementia organizations to find ATs to help her care for her husband:

“I check the Alzheimer’s reading room, Alzheimer’s and dementia associations. I go to a lot of different places looking for information for him.” –P6

P1 was interested and highly capable of using ATs for caregiving her mother, but a number of critical factors prevented meaningful adoption. First, she simply did not have the time or energy to research the available options. Working full-time and caregiving her mother left little time for anything else. She admitted that she knew of community Alzheimer’s and dementia resources that provided this type of information but never had a chance to go. Another issue was having to make *“decisions by consensus”* with her brothers and sisters. Even though she had power of attorney and was her mother’s trustee, she felt like she had to be diplomatic on the decisions that were made about her mother’s care. She also expressed concerns related to violating her mother’s privacy and personal finances, which both contributed to her non-use of ATs. Being a specialist in emerging technologies, she was somewhat frustrated by these barriers, concluding, *“I need to just get something implemented.”*

Multiple participants (P1, P3, P4, P7) noted that a barrier to adoption was their loved ones’ inability or unwillingness to use ATs that would benefit them. Therefore, any technologies that would be a viable solution would need to be targeted solely to the caregiver, not requiring any interaction on the part of the patient. P13 summarized all of the above themes to show how many caregivers simply felt the benefits did not warrant the costs of adopting ATs in the home:

“I don’t know, because I don’t know what’s available. And if it was anything that he had to use at the other end, he wouldn’t know how... Well, I don’t see how it would help me. I have to be with him all the time anyway.” –P13

She did not know what technologies were available, did not see the need for them, and since she acted as her husband’s constant companion, could not justify the cost.

4.4 The Need for Assistive Technologies for Remote Caregiving

A number of participants (e.g., P1, P4, P5, P6, P11) were interested in ATs that helped them get out of the home, rather than technologies for enhanced in-home care. P1 explained why she made so many sacrifices to keep her mother at home, which came with conflicted emotions of whether continuing her job was sustainable:

“I’ve curbed a lot of things to take care of her, but I promised my dad I would. [She] deserves to be taken care of. Her main desire is to stay at home. I enjoy my work, but there is part of me

saying maybe I should retire early and help my mom, but then there is part of me that just loves what I'm doing.” –P1

Being a technology specialist, she offered a number of ideas that she thought would be beneficial to her. For instance, she suggested a wearable blood pressure monitor for her mother, so that she could automatically monitor her mother's blood pressure when she was not home. She emphasized the importance of ATs that she could use but did not have to be used by her mother. A number of other participants reiterated the idea that any ATs they used would have to not require interaction from the patient.

Similar to P1, P11 also worked while caretaking her mother. A remote monitoring camera system gave her a peace of mind about her mother's safety when she was not home, but she desired a better solution that did not require her constant attention:

“I wish I had something where my physical eyes don't have to be on her, so I can focus on trying to work because I still have to make a living and try to be a caregiver.” –P11

P6 was also able to leverage ATs, combined with hired part-time caregivers, to gain some freedom from her constant caregiving duties for her husband:

“I can leave depending on the time of day and what's going on. Generally, I do not leave him alone. I have the security system on my phone, so I know where he is at all times and I also know what the caregivers are doing at all times.” –P6

In contrast, even though P5's husband was only in the early stages of Alzheimer's, she felt that his condition greatly altered her life, and she was unaware of ATs that might be able to give her more independence:

“My retirement is totally different than I thought it would be. I like to go out and do things, I like to play tennis, golf, but I can't do that anymore... Here you make your plans your whole life for when you're going to retire, your career, and it changes, this diagnosis. It changed my whole life.” –P5

P4 is also retired, but there are times when he would like to make sure his wife is safe and can reach him in case of an emergency when he is away from her. Therefore, he also expressed the need for communication mechanisms that allowed him to know how she was doing when they were apart. With similar backgrounds (fairly affluent, 70 + year-old retired women caretaking their husbands) P5 and P6 illustrate a stark contrast in how ATs have the potential to improve the quality of a caregiver's life.

4.5 Repurposing Every Day Technologies to Aid in Caregiving

A number of participants opted to repurpose every day and fairly low-tech technologies to aid in caregiving. The most common was the use of home security systems to prevent their loved ones from wandering:

“We have an alarm system that we don't use except for (noise) an alarm system we don't typically use or haven't used except for when mom started to get into the wandering stage...it's like a wander guard for personal home.” –P2

Some participants (e.g., P7, P8), however, expressed concern about home security systems because their loved one could inadvertently set them off:

"I could put on the alarm, it says 'stay,' but I'm afraid that my mother would get up and open the door, and it would set off the alarm. You know that was the toughest thing about the alarm, if she happened to be walking around." –P8

Many caregivers (e.g., P3, P4, P9, P10, P11, P12) also relied on online and technologies and client-based applications that helped them manage their loved one's affairs since the patient could no longer do so on their own. This was true for patients who ranged from early stages of Alzheimer's and dementia to advanced stages. For instance, P4's wife only exhibited mild symptoms of dementia, so could handle most self-care tasks, such as bathing and cooking, but he refused to maintain higher level executive functioning tasks, such as finances, scheduling, taking pills, and shopping. Therefore, he had to manage daily schedules for the two of them:

"Calendaring is very important to me. We go over a weekly calendar and have her write down what are the important appointments from now. Being able to track appointments. Being able to make her aware that we do have things to do on certain days and time. This way is not shocking to her. Even though she won't necessarily remember it. That removes the disturbance factor." –P4

In contrast, P3's mother lived in managed care due to her advanced condition, so he did not need ATs to keep her safe in the home, but he did use technology to remotely manage all of her daily affairs:

"I handle her insurance, Medicaid, drug plan, and I'm using technology to do all that. Lots of paperwork. I can get her bank statements online." –P3

Participants consistently highlighted the need for tools to help them manage their parents' daily affairs more so than the need for traditional ATs that directly aided with patient care. Therefore, we discuss the implications of this finding and our other themes in the next section.

5 Discussion

All of the caregivers in our study were unique in terms of their needs, the needs of their loved one, their level of proficiency with technology, and their perspectives about the benefits and drawbacks of ATs. Overall, we found what appeared to be a curvilinear relationship between the need for ATs and the patient's condition. Generally, ATs were not perceived as needed in the early stages of the patient's disease (e.g., P4), but were also less useful in advanced stages (e.g., P2, P3) when constant supervision and managed care was necessary. We saw the greatest need and benefit of ATs for caregiving when patients were in the moderate stages of their condition and their caregivers needed to be away from the home for extended periods of time. For instance, in the cases of P1 and P11, who were both adult children who had to work full-time while caregiving their mothers.

Our three themes highlighted in this paper illustrate: (1) the need for reduced barriers to adoption for ATs, especially in the sense of doctors and other organizations providing caregivers the necessary resources to assess whether various ATs meet with unique needs, (2) the need for ATs that aid in remote caregiving, which can give

caregivers more freedom to leave the home and simultaneously maintain their caregiving duties, and (3) the need to reconceptualize ATs based on existing systems to enhance their capabilities for caregiving. To address these needs, researchers, practitioners, and clinicians should form partnerships with non-profit and community-based organizations to possibly create an easy-to-use website built on top of a recommender system [20] that takes into account the unique needs of each family (e.g., income, stage of disease, technology expertise, task-orientation, etc.) to suggest the best ATs based on these given parameters. Doctors or case managers could potentially walk patients and their caregivers through this process to help them find the ATs best suited to their needs. Additionally, ATs that aid in remote care need further development because this was a pain point identified by many informal caregivers. Many of our interviewees had to balance their day-to-day obligations, including full-time jobs, with providing care. As such, more solutions need to be designed that take into consideration the unique context of care in a way that is respectful of all families, especially those who may not have significant financial resources.

Finally, most of our participants expressed the need for technologies that are generally not considered “assistive” but are necessary for managing the day-to-day affairs of their loved ones. Therefore, we recommend future research consider designing collaborative software that meets the unique needs of caregivers and their loved ones, such as calendaring applications that allow caregivers to keep track of important doctor’s appointments electronically, but are connected to a physical in-home scheduling display for the elderly loved one. A digital-physical hybrid display would better meet the needs of caregivers who are more comfortable with technology and their loved ones who are unable to interact with technology. Further, financial account management and other important application-based or online platforms should consider having a way to transition ownership from the patient to the caregiver. Similar to how Facebook now provides an option for legacy account management [21] (so that others can manage the account upon the death of a loved one), these products should give caregivers the ability to manage the day-to-day lives of Alzheimer’s and dementia patients, who are no longer able to take care of their own affairs while they are living.

6 Conclusion

As a society, we should work to make assistive technologies more accessible to caregivers who could truly benefit from them. This means reducing barriers to adoption, which include knowing where to get started, lower costs, and making ATs more intuitive and usable for novice technology users. One way to do this may be to integrate AT capabilities into existing technologies, such as home security systems, so that as users age, systems evolve to meet their needs. Another missed opportunity is patient and caregiver education for ATs by physicians and social workers caring for these patients. At the same time, it is equally important that we continue to develop programs and policies to support caregivers who opt to not adopt assistive technologies to care for their loved ones.

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