

A Preliminary Exploration of Technology Necessities Among Elderly Living Alone

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Abstract. There were three in five of the elderly living alone in Taiwan considered continue living alone would be an ideal way of living in the future. Products and services not only support elderly living alone have the ability to live independently, but also to influence social network to the elderly living alone. Due to the lack of product and service targeting especially for elderly living alone that related to care and assist them to live independently, this research was designed as a preliminary exploration of technology necessities to provide insight into the issue. The findings suggest that (1) Life of living alone need to be simple for the elderly. (2) Sharing behavior might be the most opportunities to care . No matter how form of the product or service was, only in association with the encourage from stakeholders that elderly living alone would have more courage to try new things or to accept assistance.

Keywords: Elderly living alone · Living technology · Caring

1 Introduction

As aging society has been on a rise, and under the background of society with fewer children, marriage status, refuse to go to the care center, living apart with family, or personal choice, more and more elderly living alone. According to the statistics by National Development Council, Taiwan would reach “super-aged” societies in 2025 which means more than one in five of the population is 65 or older.

Particularly, with the rapid development of the internet, communication technology and smart device, lifestyle and the needs of care had changed into multivariate ways. There were three in five of the elderly living alone in Taiwan considered continue living alone would be an ideal way of living in the future (Ministry of Health and Welfare 2013). Elderly living alone would like to live without relatives, and would put less effort on them. Even in response to this trends, technology turns out to be one kinds of socialization pipeline, and this would help the formation of a new individual thinking value at the same time (Shun-Hsiang 2015).

Even though elderly living alone can stay contact with society at home, most of them went out to do activities (Klinenberg 2013). Due to the lack of product and service targeting especially for elderly living alone, this research was designed as a preliminary exploration of technology necessities to provide insight into the issue. The purpose of this study was to investigate whether the technology necessities and lifestyle difference influence the social network of elderly living alone or not.

2 Literatures

2.1 Difference Between Elderly Living Alone and Living with Others

Definition of Elderly Living Alone. By the definition from WHO, the United Nations, and recently research (Bishop 1986; Cabinet Office of Japa 2014; WHO 2015), most developed world countries have accepted the chronological age of 65 years as a definition of ‘elderly’ or older person. We define that the “elderly living alone” as the older person above 65 years and lived alone, or, elderly lived with relatives but the people lived together frequently not at home for at least three days a week.

The Potential Risk of Elderly Living Alone. One of the more intriguing issues prevailing throughout the last few decades of elderly living alone research is the question of how much focus in the mental and physiological status should be placed on quality of life (QOL). Nowadays, elderly living alone encounters more risk of cognition problems, chronic diseases, dementia, loneliness, depression, low income or disability than elderly living with others. These reasons were related to high suicide risk, bad quality of life and non-interaction of social network especially on rural community and woman (Arslantaş et al. 2015; Fukunaga et al. 2012; Ortman et al. 2014; Poudel-Tandukar et al. 2011; Klinenberg 2013; Cabinet Office of Japan 2014; Paddock 2015; Shih 2010; WHO 2015).

2.2 Research Related to Elderly Living Alone

The Importance of Social Support. The research mentioned above indicated that social support has gathered great importance in recent years. To date, within many care service studies of elderly living alone, ICT, ZigBee 3D accelerometer sensor network, human-type communication robot, WSN technology (Hung et al. 2013; Peruzzini and Germani 2014; Shimokawara et al. 2013; Tanaka et al. 2012) have been used to build or create interaction with others.

In recent years, United States and European countries had implemented services like home care/home help, home nursing, meals on wheels, day club, day care or emergency wiring (the health care system - life rescue, firefighting or police - police or security alarm connection, civil society contractor) or formal government agencies and types of organizations involved in providing care and other services, income-based subsidies (Huang et al. 2010; Kim 2015). Such services not only let elderly living alone have the ability to live independently, but also improve the willingness for elderly to live alone.

Technology Applied on Elderly Living Alone. As result of living apart with children, elderly living alone releases responsibility of family then frequently involve in social participation (Teerawichitchainan and Pothisiri 2015). Some studies use sensors to detect behavior patterns so the caregivers, family and elderly could interact with each other with the aspect of health (Live!y 2015). Furthermore, this method was applied to daily necessities such as blender, toaster grilled in the kitchen, heater, TV, telephone, bed in the dorm (Bruzek et al. 2014). No matter which ways, caring for elderly living

alone would affect by the factors of culture, experience, region, social economy or social network (Suryadevara and Mukhopadhyay 2012).

Thus, the product or service designed for elderly living alone could be a chance to technology, which could meet needs of social support and improve social connection of elderly living alone and the society.

3 Method

This research adopted service design process to study technology necessities among elderly living alone. The method was proposed by Service Science Society of Taiwan (Taiwan 2015), which combined “hear - create – deliver (HCD)” process from IDEO and the Double-Diamond Design Process Model (discover - define – develop - deliver) from UK Design Council. Our process mainly focused on the stage between “discover service area”, “analyze and collect thoughts” to “define design problem.”

3.1 Participants

The participants for this research were selected from the population of elderly living alone lived at least three days without relatives the in Douliu city and Kaohsiung city in Taiwan. Six of the elderly living alone participated in the study (one of the participants were male and five were female). Their ages ranged from 65 to 92 years. One of the participants (subject a.) involved in this study can be further categorized by the independent living ability (need someone to take care of the daily life). Most of them were lived alone more than 15 years and half of them would use smart devices (internet) in daily lives. Participants were given a \$10 honorarium. Every subject was randomly named from alphabet a–f. The Table 1 is participants’ basic information survey.

Table 1. Basic information survey of the participants

Subject	a	b	c	d	e	f
Gender	F	F	M	F	F	F
Age	92	65	79	78	75	81
Education	None	College	None	Junior high school	Senior high school	Junior high school
Income (economic independently or rely on allowance ^a)	N	Y	N	N	Y	Y
Years of living alone	32	20	20	34	15	26
Usage of Internet and Smart devices	N	Y	N	N	Y	Y

^aN (No): Economic Independently, Y (Yes): Rely on Allowance

3.2 Procedure

We used a semi-structured interview with averaging 40 min to collect qualitative data of each subject. Additionally, participants took interviews at a local day club or at home. The following were the content of the interview questions:

1. Basic information survey included Gender/Age/Education/Income (economic independently or rely on an allowance)/Years of living alone/Internet and Smart devices usage situations – this helped researcher to find out if different lifestyle had related to social networks.
2. The reason why they live alone/interaction ways of family and social network or any relationships with others – in this step, knowing stakeholders of elderly living alone matters to the service/product they used.
3. Understanding participants' social participation situation about eating (cooking and eating habits/behaviors), shopping (frequency or the place buying things and what they shopped), housing (used home care service or not), transportation (how would they move and what transportation they used), learning activities (interest/volunteering), entertainment (leisure activities), and other suggestion to improve or difficulties of service/product – by collecting the information, we discovered the service/product could be the new chance of technology necessities.

After the interviews, we used affinity diagram to classification and collect needs. Then analysis the reason why elderly living alone had the need. Finally, gather similar insight together to form several topic about technology needs.

4 Results

4.1 Diet Situations

In this aspect, elderly living alone more or less had some diet preference. Among the duration of diet, elderly living alone kept connection to different kinds of products or service' stakeholders. Hence, diet could help subjects maintain certain scope of their social networks. The following can help enlighten us on this:

1. Elderly living alone preferred to enjoy the diet in a convenient and simple way regardless of cooking at home or going out to eat: While cooked at home, the majority of elderly living alone (4 of 6) tended to buy much quantities of ingredients like fish, meat and vegetables for several meals. With this way, they could reduce cooking and buying frequency to save time and eat whatever they want. As two subjects separately said, "If I cooked for every meal, it would be not much food for one meal but wasted times." Or "I only cooked one time and ate the dishes for three times a day." For the most important of all, 5 of 6 subjects were used to take out the dishes already cooked from refrigerator and then re-heating it by using kitchenware such as wok, electric rice cooker or microwave oven, so that they could eat right away. By contrast to diet at home, went out to eat not only can change moods but to have diversity selections of food and restaurants that consistent with their diet

habitations (“I went to some restaurants because I don’t need to cook and the food there were relatively fresh and easy to chew”).

2. Activities could gather elderly living alone and their relatives or social organizations’ caregivers together: Family reunion specially on holidays, were one of the significant days to diet with relatives together. At that period of time, included friends, families or social organizations’ caregivers turned out to be interact more often than usual with elderly living alone. One subject who joined day club commented that, “Every time I went to day club, my friends would bring foods here and we just have tea time there. I even carried my steam cooker with motorcycle, so that everyone could taste the taro cake I made, and it’s still hot! They enjoy my snake very much. Other friends’ food were always cold.” Another subject a, who were not able to walk to long, “My grandchildren would buy vegetable and other ingredients I need for me, if my condition turned well, I would go out to eat.” Subject a accepted home care service, the caregivers cooked lunch included rice and one dish, but the subject would eat the food within three meals.

4.2 Shopping Situations

Of all the subjects, the most place they went for shopping were traditional market (to buy food, ingredients and groceries), the second was local supermarket like PXmart (to buy daily necessities) in Taiwan. The others such as convenient store (to pay bill, telephone fee and buy newspapers at 7–11), night market (to buy daily supplies, hardware), retailer (Carrefour). Each place was unique in terms of the communities it located and the demand of which it solved.

4.3 Housing Situations

In regard to housing issues, elderly living alone mostly concerned about cleaning their house and fixing household facilities.

1. Home maintenance were complex to the elderly living alone: “If there were too dirty or under a mess than I won’t let my friends come inside my house. Sometimes I just so lazy that I didn’t hope anyone else know, it’s not a good thing to say.” The elderly living alone with friends stated that “I cared every little thing of my house. Once I hired a housekeeper on clean, but I didn’t like the way she did of my house. Unfortunately, the one corresponded to my request didn’t willing to come because it’s far away from her home.”
2. Household facilities’ status were associated with fixing and basic life smoothness among elderly living alone: When product broke, elderly living alone would change light bulb or try to fix other things. However, subject a usually forgot which button should her push on washing machine to do laundry. Thus, her grandson mark the button for her. Even occasionally happened the situation that she needed to rely on calling grandson to help her activating the machine. As she couldn’t recognize, she would afraid to miss use.

3. Couldn't get used to different living environment: Elderly living alone didn't get accustomed to new dwelling place. For instance, even though traveled with relatives, subjects couldn't get used to new places to sleep and couldn't sleep well. Moreover, moved house were inconvenient and difficult. Therefore, local life experience was what they expected.

4.4 Transportation Situations

Limited mobility influences elderly living alone with social network. Once elderly fell down or encountered knee degeneration, the interaction frequency became less than their life before. Subject a had limited mobility and couldn't go out to find friends. Only family would take her out or friends would come to visit her with some gifts. Additionally, the subject couldn't join community activities as usual, as result of lumbago and pains on knee. In contrast to the elderly living alone with motorcycle or still used public transportation, they could be more initiative on relationships. Besides the problems mentioned above, if there were emergency situations, elderly living alone needed to recruit housekeeper or ask other relatives for help.

4.5 Learning Situations

Participated in activities hold for the elderly will be the mainly social life of all day long of the elderly people living alone. Apart from this, the subjects almost did not participated in other activities. Being alone have created more time of life, which gain the opportunities to them into learning. By dedicated the time to community involvement, subject felt a sense of pride. Owing to the sense of substantial, elderly living alone could teach the skill they were good with to last the learning passion onto other elderly. Subject were likewise absorb health knowledge that kept them stay more and more healthy.

4.6 Entertainment Situations

Most subjects had daily entertainments and social participation experiences. We separated entertainment into two main topics as following:

1. Entertainment could help enrich common sense and inner beauty: Watching foreign traveling channels on TV, reading books or listening to the radio news report would gain the lively sound in the house. When those electronic device or equipment broken, some of the subject could fix by themselves, but those who didn't would need to rely on relatives or neighborhoods. In some condition, a problem of the karaoke machine at home could reduce the opportunities elderly living alone being together with friends. Additionally, recite scriptures (religion factor), volunteering in school or society, could straighten inner peacefulness, honor and confidence.
2. Social activities could be chances to encourage elderly living alone participated in societies or to trouble the willing of social interaction: "When I went to a volunteer,

there were some else (direct seller) just want to grab benefit from us, this was not correct on account of we didn't have too money to waste.”

3. Visiting relatives and friends could enhance the opportunities elderly living alone went out to travel: “I seldom went to travel, but I'll attend my grandson's wedding ceremony.” Or the condition like” I can go hiking with my family or visit my friends who lived far away from me.” Thank to every family member had different kinds of interest, elderly living alone would choose the schedule they had abilities to do. Therefore, they trust the travel plan made by day club instead.
4. Maintained relationships well may have contributed to the instant messaging apps usage on smart phones: Without smart device, half of the subjects use home phone to contact. The other half used internet on mobile or computer. For those who had smart phone with internet, thought that instant messaging app such as Line, was an ideal way to share things with relatives and friends. Due to the free call function design in the instant message, video phone shorten the distance between elderly living alone and the relatives and friends. In one subject word, “By using video-phone, I can see my cute grandson far away from me, and they can say hello to me too.” In addition, some of the subject would ask the sellers to questions of operating the app function and setting up personal preferences like big font to view content on the screen clearly and loud sounds to listen more directly while buying smart phones. Therefore, as the new era for them to adapt, elderly living alone started to send messages, read article, learn songs and watch video through the apps. Yet this might put them to the danger of privacy or scam, although some relatives support elderly living alone to use instant messaging apps to interact with others, they couldn't know the detail privacy settings or the way to protect themselves. The situation happened to them really increased uncertainty and safety issues from using smart phone without liberty.

5 Discussion

5.1 Life of Living Alone Need to Be Simple for the Elderly

Simple ways of living are the first of this findings worth summarizing. The results indicated that elderly living alone had regular and routine life. On one hand, the issue of life privacy, liberty and self-dignity are important concerns of having safe life. On the other hand, this could be a great chance for product or service provider to use technologies to meet the unmet needs. The ability to balance safety and danger will result to totally different consequence. With regard to housing situation, our findings match to the concept of aging in place, although there are differences regarding other aspect of the life style.

5.2 Sharing Behavior Might Be the Most Opportunities to Care

At the moment of sharing, are also the opportunity to care each other. Sometimes subjects considered that caring would bother life of other people. The major finding is

that elderly living alone feel concern about the way they do or the appearance people think about them. Activities let elderly connect to the communities and mainly, to the social support and social networks. Despite technologies' advantages, it does have some points we need to improve, such as the invisible computing or data analyzing behind screen cause complex situation and the misuse of app function that confuse the elderly living alone and without instant assistance.

6 Conclusions

To conclude, the resource of local communities where elderly living alone are important, but for them, living conveniently are the biggest challenge. Much more also needs to be known about the household facilities, belongings, communities service and even behaviors from different culture.

These findings lead us to believe that technologies from the aspect of diet, shopping, housing, transportation, learning or entertainment, were beneficial to build the relationships into the life of elderly living alone. No matter how form of the product or service was, only in association with the encourage from stakeholders that elderly living alone would have more courage to try new things or to accept assistance.

Finally, this kind of preliminary exploration of technology necessities though discovered unmet needs, but much more has yet to be done. There is a continuing need for more extensively investigation for the detail part into care product or products. Further research is therefore warranted in different life style unmet of technologies.

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