

IJACT 19-12-21

## A Phenomenological Study on the Information Technology Acceptance of the Korean Baby Boomer Generation

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### Abstract

*As ICT technology develops rapidly and social and consumer interactions require more knowledge of the technology, the interest for baby boomers' ICT technology acceptance is increasing as they age. However, previous studies have limitations as they lack a systematic and in-depth understanding of this phenomenon in which the emerging elderly population embraces emerging technology. To overcome this limitation, this study carried out a phenomenological study on baby boomers' ICT technology acceptance. In addition, since existing studies have just simply listed variables or proved the relationship between a few variables, this study aimed to find the relationship between variables by analyzing the data obtained through semi-structured interviews. Through this procedure, it was aimed to construct conceptual model which illustrates the relationships between variables so that understanding the phenomenon of baby boomers' acceptance of ICT technology with a holistic view could be possible. The ten variables suggested by Lee & Coughlin (2015) that cover multiple sides of baby boomers' technology acceptance were used. As a result, we found that there is a sequential relationship between these variables and different agents can be related to each variable in sequence. Also, from an ecological perspective, we analyzed baby boomers and their surroundings to find agents involved in this phenomenon.*

**Keywords:** Baby boomers, ICT technology, Technology Acceptance, Phenomenological study

### 1. INTRODUCTION

Two of the most important changes in the world today are the aging of the world's population and the growth of the information sector. Currently, the elderly are the fastest growing segment of the population. By 2025, more than 1.2 billion people will be aged 60 years or above [1] and by 2050, that number will have risen to 2 billion. Meanwhile, consumers are undergoing the other global phenomenon, rapid growth of information technology which is changing the environment around consumer profoundly. With the development of Information and Communication Technology (ICT), which is a fusion of computers, communications, and information, consumers have experienced changes in information use and communication methods, which has led to changes in consumer life. The Internet has become common and the use of devices such as smartphones has spread due to the development of ICT [2]. In the early 2000s, ICT was used for amusement and entertainment, especially in the younger generation. Today, the use of ICT has become a life skill for running everyday life [3].

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Manuscript received: October 27, 2019 / revised: November 08, 2019 / Accepted: November 15, 2019

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Baby boomers are the first generation who are going through changes due to both aging and the growth of information technology. The baby boomers, who are newly included in the elderly, have distinctive features from those of the previous generations. They are the Korean generation that experienced rapid industrialization in their 20s~40s. Some have come in contact with computers and PC-based Internet in their middle years [4]. They encountered the smartphone based mobile revolution when some of them were in retirement and the others in late middle age. With the decline in cognitive progressing as a result of aging [5], this generation can have difficulties in using PC and mobile Internet. On the other hand, Baby Boomers differs from the previous generation in that many have relatively higher educational levels and more computer use experience than those born before the 1950s [2,6]. The literature reports both sides. That baby boomer is receptive to new technology [7-11] and that they have difficulties in accepting technologies or new innovations [11-12].

In the past, technology was known as a representative field of negative ageism for the elderly because there was a perception that the elderly belonged to the latecomers in the acceptance of technology [13,14]. However, as mentioned above, ICT technology is becoming increasingly important and older people with different background are emerging. It is known that adaptive systems are constructed based on an individual user's characteristics including interests, preferences, knowledge and goals [15]. Therefore, baby boomers' background which is different from the previous elderly generation could mean that their adaptive system could differ from that of the previous generation. Accordingly, there is a growing awareness that the existing perception of the elderly and technology needs to be changed [8,16]. In this context, it is necessary to have an in-depth understanding of the phenomenon of newly emerged elderly's ICT technology acceptance with an ecological point of view which takes into account them and their surroundings to figure out how their adoption of technology differs from the past and what its characteristics are. This paper aims to scrutinize and analyze the technology acceptance behavior of baby boomers to advance a systematic and in-depth understanding of this generation's complex choice behavior in a changing market environment. Particularly, this paper focuses on ICT technology acceptance, because of the importance of ICT in modern markets.

## **2. LITERATURE REVIEW**

Previous literature can be divided largely into two types; literature that suggests the variables that can impact the ICT technology adoption of the elderly and the literature that presents the structural model of elderly's technology acceptance.

Fang et al. (2018) [11] reviewed 55 studies and identified the key factors that influence technology adoption by the elderly. They also identified motivators and detractors to ICT use. The analysis revealed that several sociodemographic variables interacted to shape ICT access and use for middle-aged and older adults; including education, income, age, gender, disability status, immigration status, urban/rural residence, and relationship status. They also suggested information access, staying connected, personal enjoyment, social encouragement, social support and training, individual characteristics and broadening knowledge as motivators for ICT use based on the previous literature. Detractors to ICT use included superficiality of ICTs, perception of little or no added value, lack of skills and familiarity, fear of cybercrime and lack of interest. In another study, Mitzner et al. (2018) [17] used PRISM(Personal Reminder Information and Social Management) as a research framework to determine individual differences in earlier use of the system, executive functioning, and consumer efficacy predicted long-term use. Lastly, Lee and Coughlin (2015) [18] suggested 10 variables that influence older adults' perceptions and decisions around adoption and use of ICT technology. By reviewing and covering studies from various field, this study aimed to construct more comprehensive and holistic understanding of the topic. This study provided practical implication as the researchers viewed older adults as consumers in the study.

The literatures that examined the structure of the technology acceptance of elderly were not as abundant as the literatures that suggest and arrange the variables. The most popular model that studied this structure is STAM which was developed by Chen and Chan (2014) [19]. STAM is the modified version of the well-known technology acceptance mode (TAM). By adding age-related health and ability characteristics of older people to the previous model, the researchers tried to develop a model that can provide effective understanding of the acceptance of technology designed to assist older individuals in coping with the issues of aging in Hong Kong.

The results suggested that the individual attributes; including age, gender, education, gerontology self-efficacy and anxiety and health and ability characteristics along with facilitating conditions explicitly and directly affected technology acceptance. Although this model can explain the structure of technology acceptance of older adults, it has been criticized for not covering various fields that affect this topic such as social support and emotional perspective. In addition, the ICT technologies that are used by the elderly these days are not limited to gerontology technology, therefore, this model needs to be extended in many aspects.

A critical limitation of those studies is that they didn't segment the target population properly. Despite the reports that indicate baby boomers are different elderly compared to previous generations, these studies are including both the old-old and baby boomers as a single cohort. Therefore, examining the structure of technology acceptance only for baby boomers can provide a more accurate explanation, compensating the limitation of existing studies. In addition, existing studies have shown that sociodemographic variables such as age and education affect the tendency and behavior of technology acceptance of older adults, thus practical and applicable studies for baby boomers will be possible by limiting targets to only baby boomers. The other limitation of the previous studies is that most of them have only suggested variables rather than revealing their relationships. However, the process of technology acceptance is a complex procedure. Baby boomers are a complex group who show a marked difference in education and wealth from the previous generations and at the same time, the characteristics as elderly due to aging. Lastly, existing studies are limited in their lack of intrinsic exploration of the phenomenon of technology acceptance by the elderly. Most of previous studies have only focused on improving elderly's technology acceptance in technical way. Consequently, there has been little discussion on what the traits of technology acceptance by elderly are and how it occurs.

This study aims to construct a practical model of the baby boomers' technology acceptance so that their technology adoption can be increased and their welfare in later life age can be improved. To compensate the limitations of previous studies and have holistic and profound understanding on technology acceptance of elderly, phenomenological study was conducted. In addition, the variables that relate to technology acceptance of elderly which were presented by Lee and Coughlin(2015) [18] was used in this study to enable better ecological analysis. This is because these variables have holistic perspective as they cover various fields that influence technology adoption. In addition, using these variables would be meaningful to construct comprehensive and practical model as they view older adults as consumers of technology.

### 3. METHODOLOGY

#### 3.1. Conducting Focus Interviews

Focus interviews which were semi-constructed were conducted to get data. Interviews were conducted on 8 respondents who were born between the year, 1955-1963. Respondents with various occupational backgrounds were selected to reduce the potential bias of the study. Basic information was collected before the interviews are conducted. This information included; sociodemographic information including age, job, sex, residence and education which was found to be important in previous studies of older adults' technology acceptance. Among 8 interviewees, 4 of them had interviews in the cafeteria. The other 4 interviewees had interviews in the room of KWIC (Korea Welfare Info-Communication Association). KIWC is a public institution which provides education programs for elderly and retirees. It took 1~2 hours for each interview. Although income was an important variable, many respondents preferred not to answer and some of them were already retired. Table1 illustrates the sociodemographic information of the respondents.

**Table 1. Sociodemographic Information of respondents**

No.	Sex	Year of Birth	Job	Residence	Education
1	F	1963	nursing administration	Seoul	Master
2	M	1961	Retired (before retirement: a board member of technology planning department in the enterprise)	Seoul	Bachelor

3	F	1957	Retired (before retirement: public servant)	Suwon	Ph.D
4	M	1957	Public Servant	Seoul	graduated Highschool
5	M	1961	Running private business	Gyeonggi Province	Bachelor
6	F	1958	Housewife	Gyeonggi Province	Bachelor
7	M	1959	Retired (before retirement: sales person)	Gyeonggi Province	graduated Highschool
8	F	1955	Retired (before retirement: public servant)	Seoul	Master

The interviewees were allowed to express their opinions in any way they saw fit. The interviewees were encouraged to tell their story with context. The stories can be about a certain product which is relevant to the topic or the technology itself. Several common interview questions were also administered. The common questions concerned the respondents' ICT technology acceptance including the motivation, processes, and results. Although the interview questions were different for each interviewee, the common interview questions are as follows:

“What motivated you to learn ICT technology?”

“Can you tell me the ICT technology or products relevant to it which you have used in your daily life?”

“Which factors most influenced you when you learned ICT technology? How did it influence you?”

Most of the participants were uncomfortable with recording, making it difficult obtain candid answers. The researcher transcribed all of the participants' words as they were speaking. The transcriptions notes of the researcher were used as the basis of the analysis. Lastly, in order to examine their attitudes toward technology acceptance, a self-evaluation was conducted and their stories were discussed.

### 3.2. Coding and Categorization

For coding, meaningful statements were selected from the data of the interviews. These meaningful statements were abstracted, coded and categorized. The manuscripts that recorded the contents of the semi-structured interview were analyzed to find common theme using a two steps process. First coding was conducted with code names that came from the literal statements (*in vivo codes*) and sociological constructs [20]. In this step, when common themes were found among the coded contents, they were categorized into sub and main category. In the second coding, coding was conducted corresponding to the ten variables presented by Lee and Coughlin (2015) [18]. The results were recorded in coding book. These 10 variables were thought to be proper to be the code name as they reflect ecological perspectives of baby boomers' technology acceptance. In addition, this study tried to explore the relationship between these variables through the processes above. The variables and descriptions for each variable suggested by Lee & Coughlin (2015) [18] are presented in Table2.

**Table 2. Definition of variables defined by Lee and Coughlin (2015)**

Variable	Description
Value	Perception of usefulness and potential benefit
Usability	Perception of user friendliness and ease of learning
Affordability	Perception of potential cost savings
Accessibility	Knowledge of existence and availability in the market
Technical Support	Availability and quantity of professional assistance throughout use
Social Support	Support from family, peers and community
Emotion	Perception of emotional and psychological benefits
Independence	Perception of social visibility or how a technology makes them look to others
Experience	Relevance with their prior experiences and interactions

Confidence

Empowerment without anxiety or intimidation

### 3.3. Analysis

The analysis followed a systematic data analysis procedure proposed by Moustakas(1994) [21] which includes a thorough description of the nature of meaning, themes, and phenomena based on meaningful statements. The main goal of the analysis was to understand the respondents' experiences and find out the meaning given to them. In detail, the analysis was done on three issues. First, the attributes of baby boomers' technology acceptance was analyzed. Second, the relationship between the variables was scrutinized. For this step, the researcher examined how 10 variables are located in the first category which was coded with *in vivo codes*. Throughout the whole analysis, the results of the coding were compared with the manuscript that contains original data. Third, ecological analysis was conducted to find out the agents involve or are involved in their ICT technology acceptance. Lastly, the results were organized into a conceptual model which can illustrate the relationship between variables clearly. The results of agents found were listed in the table.

### 3.4. Verification of Validity and Reliability

According to Creswell(2013) [22], validity and reliability of a qualitative study can be verified as follows. In the case of validity, it can be verified by listening to critics of fellow researchers, discussing the appropriacy of coding, or presenting the research results to the research participants and receiving opinions on the validity. Reliability corresponds to the stability of various responses for the researcher(s) who conducted coding. It means that coding that is accepted by fellow researchers generally becomes the key factor of reliability. For validity and reliability of this study, two independent reviewers who major in consumer science examined the transcripts and submitted their own evaluations of the material.

## 4. RESULTS

### 4.1. Results of Coding

Eight respondents gave various responses depending on their environment and characteristics. In total, six main categories were found. Six main categories and sub categories and technology acceptance variables that are included in each main category are illustrated in Table3.

**Table 3. The result of coding**

Main Category	Sub Category	Technology Acceptance Variable
Motivation for Technology Acceptance	Accomplishment, The joy of learning, Curiosity, Not to feel defeated, Self-esteem, Happiness, Not wanting to be alienated from young people,	Emotion
	Social aspects, Recommendation of others, Showing off	Independence
	[Personal level of value] Company, Job, Real life, Convenience, Comfort, Richness, Hobby, Safety, Income, Life in old age, Economic activities in old age, Interest, Practical use, Better(cheaper) price, Diverse products, Saving time, Health, Assets	Value
	[Interpersonal level of value] Communication, Communication with grandchildren, Communication with children, Communication with acquaintances, Communication with younger generation, Network, Love	

	[Social level of value] Talent donation, Public good, Expressing political opinion Changing times, Changing society, Social needs  (-) retirement, bothersome	
Route for Information	Friend(s), Son, Children, Media, Community, Acquaintance, Company, Younger generation, Exhibition, Naturally in life	Accessibiity
Criteria for Judging Acceptability	Durability of devices, Pension, Expenses for children, Economic factors, Economic affordability, Different economic judgment according to the types of products	Affordability
	Ease-of-learning, Friendliness, Convenience, Comfort, Level of difficulty, Usability, Ease-of-use	usability
Acceptance Assistance Factors	Professional Educational Institution, ICT public educational institution for elderly, Company (human resource, system, education, customer service)	Technical Support
	Children, Junior, Friends, Young Staff, Family, Acquaintances, Younger generation, Human resources	Social Support
Background	Personal traits (curiosity, activeness, positiveness)	-
	Confidence, Confidence for learning	Confidence
	Previous experiences for using or learning technology (public or private education institution), Interest, Experience of adopting new technology, Family Successful experience, Having no experience of failure, Occupational experience, Occupational traits, Wanting for adopting technology, ICT technologies in use Past experience (e.g. childhood), Recent experience	Experience
	(-) Lack of experience, Pressure, Aging, Having no job	
Attributes of Baby boomers' Technology Acceptance	[Codes related to low acceptability] Aging, Difficulty in learning new things, Need help in the early stage, Need repetition, Simplicity for young people becomes complexity for them, Unfriendliness of newly emerged technology, Follower (when compared to younger generation), Passive (when compared to younger generation),	
	[Codes related to high acceptability] Curiosity, Higher receptiveness (compared to previous generation), Wisdom, Years of experience, Speed for learning, Activeness (in general), (generally) No difficulty for adopting technology, The first generation for using computer, Economic activities in old age,	-
	[Codes related to acceptance strategy] Minimization of disappointment, reasonable level of acceptance (not maximization of acceptance), Understanding on younger generation, Independent technology acceptance after getting help in the early stage, Existence of way of explanation that suits them	

## 4.2. Analysis for the Relationship between the Variables

The relationship between variables was examined by comparing the coding results with the manuscript that contains original data. It was found that the variables coded based on these responses have certain relationships that they can be arranged in sequential order.

### 4.2.1. The Variables Included within Motivation for Technology Acceptance

The variables that resulted in baby boomer adopting technologies were value, emotion and independence. Among these three, value was the most important. The respondents still employed answered that it was the necessity at work to adopt new technologies before retirement. After retirement, they were motivated to accept new technologies due to the necessities of life, including communication with their grandchildren.

“To work at this age, you should accept the technology. If you can’t, you cannot work there because you cannot serve as a team leader. ... You have no option other than accept them to earn money from your workplace. I think the retired people would have a slightly different paradigm, though. After all, there are a lot of demands at work. ... By accepting technologies demanded at work, you fill the demands of the workplace. If you don’t, you’ll be left behind. (Interviewee #1)”

“When you know how to shoot videos with a cell phone, you can take pictures of your grandchildren. That’s why I learn how to do it. It is not because I expect some great value from it. I learn new technologies just because I need them for my daily life and to get along with my grandchildren. (Interviewee #4) ”

“I learn them when I need them. For example, I use a computer to make official papers that I need or to process the information form the workers or the company. ... However, I don’t give even a glance to the things that I don’t need. (Interviewee #7)”

“The most important purpose for learning new technology would be the communication with my grandchildren. I think they will treat me as an old woman when they grow a little older. However, if they know that I am this capable, they won’t treat me just as an old one. ... (The purpose for adopting ICT technology is) to make a bond of sympathy with grandchildren. (Interviewee #8)”

A sense of accomplishment and dignity was part the motivation. Also, displaying or social perspective of accepting ICT technology was mentioned. However, they were less important than value.

“I think that showing off can be one the important factors. When you get older, you’ll get wrinkles on your face. For sure, the outer looking will be quite worse than in twenties or thirties. One might get less hair, more wrinkle and worse outfit. Old people may need something to cover that. ... Just holding phones can be easily exposed to others and make them be conscious to the one who has it, making the one who holds it to show off. (Interviewee #2) ”

“I don’t want to feel that I am lagging behind the others. It feels like I am a laggard when I don’t know the things that others know. I don’t want to feel a sense of defeat. That’s why I think I need to keep up with these things. Sense of accomplishment? There might be some. But just for like 10 seconds? And I forget it. ... When you get older, you don’t feel that much accomplishment. (Interviewee #7)”

Other than the motivations mentioned above, there were other interesting motivations which were less important. These include hedonic and political benefits. Some responded that they can spend time using ICT devices and get pleasure when they are lying down for a long time on the bed without things to do due to sickness. One respondent opened her own Youtube channel to express political opinion.

#### **4.2.2. The Variables Included within Route for Information**

It was found that the respondents started to search for the route that can give them the information to access to the technology or devices that can satisfy their needs after they felt the necessity to adopt new technologies. The respondents children were the most frequent and important route for information. In case of respondents who haven't retired, young workers in the company were also their route for information.

“I heard there are free phones but I've never seen such things. Actually, my son told me that I shouldn't buy it. He told me that I should pay certain amount for it to use it properly. ... I don't know what devices are in the market unless my children tell me. ... I learn new cultures through my son and daughter. They always tell me what is popular these days. It is not that I myself search for new products for purchase. (Interviewee #3)”

“I get information for those new technologies from my son or friends who are younger than me. Friends in my age are unlikely to know. In the workplace, I ask those who are born in 70's or 80's. They are much better than us in terms of using cell phones. I get a lot of information from them. (Interviewee #7)”

When the respondents have a job which is related to technology or have interest for ICT technology, they actively searched for the information.

“There are a lot of technologies of other fields that I want to learn. So, if there are problems that are not solved by designing or constructing, I go to exhibitions or expo. If there's any, I even go to unfamiliar one like exhibitions for interior design, furniture or medical devices. When I visit such places, I can learn useful information which is quite different from what I've known. (Interviewee #5)”

#### **4.2.3. The Variables Included within Criteria for judging acceptance**

Even after they were motivated to accept technology and acquired information from it, it was after they made a judgement on how possible it would be for them to use the technology that they actually decided to accept it. The variables that are involved in this stage were grouped in the category named as 'Criteria for judging acceptance'. Usability and affordability were included in this category. Even when respondents felt that the new technology was necessary for them, they answered that they don't accept new technologies in the end when they are hard to learn or use. This tendency was found to be stronger as they got older. In case of the respondents who were retired and have no source of income, they answered that affordability is a very important factor.

“What will be the differences I would face when I become 60 or 70 years old? Thinking about that, I guess not many things will be different from now except decreased curiosity. When you get older, you feel more tiresome for everything. That's why convenience of use must be provided to older people. Convenience of use for older people! It is not only because they feel learning is hard but also they got tiresome for learning complex things. (Interviewee #2)”

“If I had this interview when I was in my fifties, I would rate my confidence for accepting new technologies as 5 out of 7 points. When I faced a new technology which can be applied to my daily life, I adopted that. However, since I am in my sixties, it became harder for me to accept technologies like I did few years ago. For example, mobile banking... Still, it is just fine for me to do things the way I have kept doing, but learning new way that you young people are using is hard to understand. ... Sometimes, I get curious to new technologies that I didn't know when I see others using them. For times like that, I want to try it regardless of costs. Even though I cannot proceed to the next step due to costs, I sometimes have that kind of curiosity anyway. (Interviewee #6)”

Durability of the product was an important part of affordability. It was because older people don't need to change the ICT related devices as frequent as young people. Therefore, durable devices would be more



valuable for older individuals. Also, the necessity for ICT devices with high quality and low price was mentioned as the technology acceptance of older people can be increased when they become confident to use ICT devices by using good products with less error.

“The products for older people need to be made more durable. The ones in their fifties who earn money should spend their money in the market. These days, people in their sixties spend similar amount of money. However, the phone for people over 70, this kind of product should be equipped with more durable battery so that they can save money. Not many functions are needed. I think durability will be the most important for them. ... These older people cannot change the devices that frequently as they are not earning money! (Interviewee #4)”

#### **4.2.4. The Variables Included within Acceptance Assistance Factors**

When they judged that they can accept the new technology, they actually purchased the related devices and started to use them. At this moment, they needed support from others to actualize their technology acceptance. The support could be divided into technical support and social support. It was analyzed that they get support from their workplace before retirement and their children after retirement.

“There are technical supports in workplace. There are workers for supporting department and resources to help me. However, if I get retired, it would be hard for me to get that kind of support. (Interviewee #1)”

“My children are a great help for me. When I get to use new technology, I ask them how to use it. ... For now, my son is the most helpful agent even though he is in US. That’s because he is the kindest person when teaching me! (Interviewee #6)”

The communities of institutions that provide technical support can be a great help for older people who retired. Some respondents voluntarily searched for these institutions to have chances to learn and get professional supports.

“(Before retirement,) I couldn’t ask other young workers to teach me those new technologies because it felt like I take these busy people’s time. I always hoped to travel and learn how to use computer after my retirement. I was almost computer-illiterate. I really wanted to make videos using computer and use smartphones in various ways. ... (While taking classes for ICT in the institution that supports older people to learn ICT technology,) I have accomplished this dream now! (Interviewee #3)”

“Rather learning new technology is hard for me, it is hard to find the institutions that provide systematic curriculum. I learned how to use YouTube and SNS fragmentally by asking others and I felt quite sorry for that. I improved my skills for making videos while learning in this institution. I also learned coding last year after I heard that coding education in elementary school became mandatory. But I found nowhere to use it. I’m just thinking that I’ll teach my grandson coding I learned. (Interviewee #8)”

#### **4.2.5. The Variables Included within Background**

Lastly, experience and confidence were variables that affect the general process of the respondents’ technology acceptance. They were grouped and named as ‘Background’ category. How each respondent’s background affected the process of technology acceptance can be examined through the interviews.

“In terms of technology development, there can be experience of failure. However, there is no experience of failing to adopt technologies. If experience affects the choice of technology, experience of engineer in IT field has an absolute impact. This experience functions as background. When judging whether to accept the technology or not as a consumer, this experience of engineer does have impact. For example, I sometimes think that it didn’t cost much to develop that technology or devices and in the market, they are sold in such high price! (Interviewee #2)”

“I sometimes think that it would be better for me to accept new technologies if I kept working even after marriage. Housewife life is just simple. Acquaintances who are still working say ‘I am having difficulties in accepting new technologies.’, however, I’m not sure how large the gap is. In case of my older sister, she is better than me in using cell phone and computers. I guess that’s because she had job related to these. (Interviewee #6)”

Baby boomers are the generation that experienced the first computer when they started to work. Although there have been remarkable developments in ICT since then, it was found that their experience with computers in their youth was a foundation of great confidence in their current adoption of new ICT technologies. Most of their experiences with technology have been successful. In addition to experiences with technology, learning experiences in a variety of settings, such as workplaces and educational institutions, have had a positive impact on the adoption of new technologies. On a seven-point scale, the subjective evaluation of each respondent’s technology adoption scored 4.4 on average. Even the respondent who rated herself with the lowest score of 2 said that she could fully accept new technology once she learns it. Most respondents didn’t think of themselves as older people and said that they considered the elderly to be about 70 years old. In addition, baby boomers who were educated or have expertise in this field thought that even after retirement, they could contribute their talents to society.

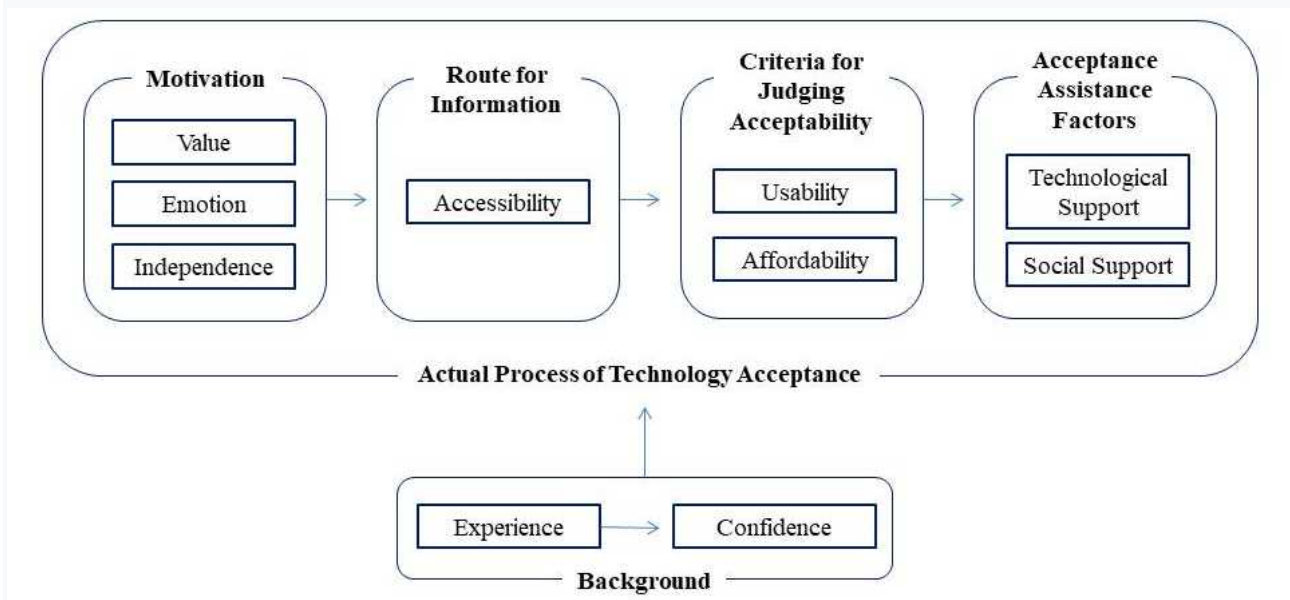
The analysis showed that baby boomers are complex in terms of technology adoption as they have both passive attitude caused by process of aging and active attitude that makes them different from the older generation due to their knowledge and experience. It was suggested that usability becomes more important in their adoption as new ICT technologies become more difficult to accept than ever. However, their relatively high technology acceptance seems to be due to their experience and confidence. It was confirmed by all eight respondents who answered that they can adopt technology by learning although it is not very comfortable. They ignored technical issues as it was not their goal to compete with the younger generation. Rather, it was found that they aim to accept ICT technology as a follower to catch up with the flow and changes of society and enable communication with young people. In addition, baby boomers were either parents or grandparents in their family. Therefore, their acceptance of technology encompasses the value of love for children and grandchildren.

“I don’t proceed technology acceptance as a leader. Rather, I take a position as a follower. It means the technology acceptance in my age is not active. ... The purpose is to keep up with the demand of this society. I cannot surpass the younger generation in technical aspect. However, I can understand and catch the meaning of the results. I can assess the meaning and importance of them. That’s why I think I don’t need to know the whole technologies in this age. However, young people feel that these newly emerged technologies to be very attractive and accept it very fast, so I need to keep up with it. ... People in my age can’t have all the depth or breadth that the younger generation has regarding new technologies, but we can imitate it. (Interviewee #1)”

“The reason for learning new technology is... Well, when older people have boring and dull life, then it becomes burden for their children. My children have hard time living in this competitive society. I try to learn new technologies not to burden them. I also expect that it might help me to live my own life with self-esteem and communicate with my grandchildren. ... In the end, the real reason to learn those technologies is to be loved. (Interviewee #3)”

Taken together, it was found that the ten variables that were presented regarding technology acceptance by older people have a sequential relationship. First, experience and confidence, which are variables that belong to ‘Background’ category affect consciously and unconsciously throughout the process of technology acceptance. The actual process of technology acceptance begins with the motivations that include variables such as value, emotion and independence. When a motivation is created, the information on the market is

obtained through information agents such as children. The variable involved in this step is accessibility. When they get information and access to the technology or devices, they judge whether they will be able to accept the technology based on two variables, usability and affordability. After purchasing the technology or devices thinking that they are able to accept it, they tried to actualize their technology acceptance with technical support and social support. This flow can be illustrated as the conceptual model below. The arrow indicates sequential relationship.



**Figure 1. The conceptual model for procedure of technology acceptance**

In Figure 1, variables were distinguished into two types: one that directly affect the process of baby boomers' technology acceptance and the other that indirectly influence the process yet not included within the actual process of technology acceptance. Experience and confidence which are included in background category are the variables that influence the process of technology acceptance indirectly. However, their role in this process is important as baby boomers' experience and confidence from these experiences cause them to have different characteristics from previous generations in the process of technology acceptance. Variables that directly affect the technology acceptance process at the earliest stages are value, emotion, and independence which are included in motivation category. According to the analysis, if there is no motivation, no consideration of new technology adoption begins. Therefore, the variables within motivation category are put in the first order of the actual technology acceptance process. Next, the variable included in the route for information is accessibility which largely depends on the communication with their children. After this process of searching and accessing for information, baby boomers' direct contact with the tangible material such as devices or practical services begins. In the process of baby boomers' technology adoption, the direct contact between baby boomers and the devices or services does not necessarily mean complete success of technology adoption. After direct contact with tangible devices or practical services, they go through the stage of judging acceptability in actual use. This stage was named as Criteria for judging acceptability. Usability and affordability are the variables that are included in this stage. Considering usability, devices or services should be easy to use and learn. In addition, as many of them had or are about to retire, the cost for using new technology should not be too burdensome. When the baby boomers judge that they can accept this new technology, they purchase or pay for the new technology to use it directly in their daily lives. Lastly, they need repetitive support in their lives to fully embrace the new technology. Support is divided into social support and technical support. Social support is achieved through their children, friends or acquaintances in younger generation in their lives context. They go through the process of asking questions and attempting to use the new technology until they became familiar with it. Once they get used to it, they are able to use themselves

actively which indicates that they have finally successfully accepted the new technology. In the case of technical support, baby boomers can get professional support from ICT technology education institutions. They can ask questions about the challenges they are going through while using the new technology. Also, they can be taught and trained to use new technology from professional instructors.

#### 4.3. Analysis on the Agents Related to Each Variable

Through the analysis, it was found that the agents' involvement is important throughout the whole process of baby boomers' technology acceptance, especially human intervention. Baby boomers' experience in society has given them difference characteristics than previous elderly generation, such as prominent confidence and activeness in technology acceptance. However, aging and retirement have made them to need the repeated support and help of the agents. When the agents involved in each stage and variable were playing the role properly, baby boomers could move on to the next stage of technology adoption. Otherwise, they encountered significant difficulties. Based on the results of the interview analysis, the agents involved in each step of the sequence were modeled. The finding is summarized in Table4.

**Table 4. The agents involved in the process of technology acceptance**

Step	Variable	Related Agent(s)
Motivation for Acceptance	Value	Family(children, grandchildren), Company (as workplace), Young generation, Acquaintances
	Emotion	Family(children, grandchildren)
	Independence	Others
Route for Information	Accessibility	Family (children), Media, Acquaintances, Exhibition
Criteria for judging Acceptability	Usability	Company (as provider)
	Affordability	Company(as provider), Family (children)
Acceptance Assistance Factors	Technical Support	Public Institution, Private Institution, Company (as workplace)
	Social Support	Family (children, spouse), Friends, Acquaintances, Young generation
Background	Experience	Company(as workplace), Family, Educational Institution (public & private)
	Confidence	The agents that influenced experience

Among all the agents, family, company and public and private institutions were found to be particularly important. Family was found to be relevant to every stage of the sequence and every variable except technical support. Company, as a workplace, was a relevant agent to 'background.' In addition, company as a product manufacturer or technology provider was the agent that is relevant to the variables in criteria for judging acceptability and actualization of adoption. Lastly, public and private institutions were agents that are relevant to experience and technical support.

## 5. DISCUSSION

Examining the results below, the phenomenon of baby boomers' technology acceptance can be discussed as follows. First, baby boomers' technology acceptance is the phenomenon that includes the combination of experiences as a leader in the society and elderly who is going through aging. The statement of respondents that the acquisition of new things slowed down as they became 60's reflects the acceptance of technology as an elderly. However, the knowledge they have as the first generation using computer related technology and the experience of being leaders in the workplace and society granted them confidence and activeness. As a result, even though they struggled and needed help in the early stages of technology acceptance, they were actively using technology to satisfy their needs once learned. In addition, their activeness could be found in that the reason for having difficulty in adopting technology doesn't mainly come from cognitive decline but

difference in the way of understanding. Because the simplicity for young people was complexity for older generation, they found it hard to understand when how to use the technology was explained in young people's way. On the other hand, they felt much easier to understand the technology when the explanation was in the certain way that they can understand.

Baby boomers expressed themselves as a follower. This seemingly implies passiveness in their technology acceptance, but on a closer look this can be seen as a wise aspect of technology acceptance. They pursued a reasonable level of acceptance, not maximization of technology acceptance. In other words, they adopt technology only as needed, not competitively. Rather than fully embracing many technologies, they focused more on integrating and understanding the results obtained through the technology and ultimately achieving their goals. Therefore, in considering the relationship between the elderly and technology in the future, the view of the elderly simply as a vulnerable target of technology is needed to be revised. Although they do not show a strong yearning for technology like young people, they are autonomous individuals who feel a certain level of challenge and accomplishment about technology and can use it wisely in society, markets and their daily life.

Second, baby boomers' acceptance of technology is a phenomenon that should be viewed from an ecology perspective. Baby boomers look for drivers of technology acceptance in their families, acquaintances and the environment surrounding them, and promote the process of technology acceptance through exchanges with them. The whole process of their technology acceptance is also characterized by the underlying love and concern for their children and grandchildren. For this reason, some of the respondents showed uncomfortableness to the statement, adoption of technology for promoting their welfare, as they concerned that their children would be taxed more for increased welfare. In addition, they were also interested in exercising their good influence on the environment around them through technology that they've learned. Thus, various levels of ecological aspects such as family, community, and society were closely related to their acceptance of technology. This suggests that further studies will need to look at not only their mechanical manipulations but the ecological factors surrounding them in their adoption. These findings, in combination with previous research findings that communication plays a very important role in improving the quality of elderly lives [23], give meaningful implications to the welfare of the lives of baby boomers as elderly people.

## **6. CONCLUSION**

As ICT technology develops rapidly and social and consumer interactions require more knowledge of the technology, the interest in baby boomers' ICT technology acceptance is increasing as they age. Many studies have conducted on this issue. However, these previous studies have limitations as they lack a systematic and in-depth understanding of the phenomenon in which the emerging elderly population embraces emerging technology. To overcome this limitation, this study carried out a phenomenological study on baby boomers' ICT technology acceptance. In addition, since existing studies have just simply listed variables or proved the relationship between a few variables, this study aimed to find the relationship between variables by analyzing the data obtained through semi-structured interviews. Through this procedure, it was aimed to construct conceptual model which illustrates the relationships between variables so that understanding the phenomenon of baby boomers' acceptance of ICT technology with a holistic view could be possible. The ten variables suggested by Lee & Coughlin (2015) that cover multiple sides of baby boomers' technology acceptance were used [18]. As a result, we found that there is a sequential relationship between these variables and different agents can be related to each variable in sequence. Also, from an ecological perspective, we analyzed baby boomers and their surroundings to find agents involved in this phenomenon.

This analysis also provides a practical understanding of which subjects should intervene with what kind of response in the complex process of baby boomer's technology adoption. For example, in case of affordability, the companies which manufacture the devices can improve the durability of the product to help baby boomers to embrace ICT technology. From a policy point of view, the government can provide technical support as it can establish or provide policy support for institutions that specialized in education and assisting baby boomers' technology adoption. Motivation for technology acceptance was the main category that was the most revealing and most important part of baby boomer's technology adoption. This study is meaningful in that it adds the

depth of understanding on the baby boomers' technology adoption by finding and modeling the structure. It is also meaningful that this study has rediscovered baby boomers' value by examining and analyzing them as individuals who try to communicate with changing society and express their love for their family by using ICT technology and important consumers of the ICT technology.

Nevertheless, this study has limitations. First, this study is based on a small sample size. This was a qualitative study with 8 respondents. Second, although sample was constituted with baby boomers of various backgrounds, they had relatively high levels of education and other socioeconomic variables. A study that examines the differences in composition of variables, tendency and contents of each sequence and the agents that relate to each sequence according to various socioeconomic levels could be conducted using quantitative methods to verify the finding in this study.

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