

Chance and Hindrance for Elders Toward Digital Inclusion : A Literature Review

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Abstract: *The number of older adults is significantly increasing globally. In Indonesia, the elderly represent a growing large proportion of the population. They form a thriving market for commercial products and services in this sense. On the other hand, the development of Information and Communication Technology (ICT) has transformed people's daily lives. The ability to use ICT is considered a prerequisite of the "Information Society." However, the role of ICT in determining the quality of life (QOL) of the elderly has received less attention from existing studies and focuses more on medical technology. By reviewing and synthesizing the previous 20 kinds of literature between 2017-2022, this paper aims to examine the possibilities of the internet and ICT to improve the quality of life of the elderly and contribute to their social inclusion. This study found that using ICT and the internet reduces their loneliness and social isolation, increasing self-control, providing social support and leisure, and integrating them into society. In the process of adopting ICT and the internet, the elderly have barriers intrapersonal, interpersonally, structurally, and functionally.*

Keywords: *internet, ICT, elderly, digital media, inclusion*

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INTRODUCTION

The development of information and communication technologies (ICT) has transformed everyday human life and has changed many aspects, such as education, business, and communication. Communication and marketing effectiveness has also increased using digital technology and the Internet (Rahmat, 2021). Using a typewriter is a prerequisite of the "information society." In the 20th century, developed and developing countries underwent a demographic transition caused by reduced fertility and increased life expectancy. As a result, the number of elderly residents has increased significantly. According to the United Nations (UN), the world's population is over 65 years old and is greater than the population of children under the age of five in 2018 (BBC,

2019). As the aging population increases, the class gets higher priorities in many countries' policy agendas.

In Indonesia itself, some phenomena decrease mortality and birth rates. Indonesia's age-old structure has shifted from that previously dominated by young people to old (Bappenas, 2019). As a form of government attention, May 29th, every year. It is commemorated as a national elderly (elderly) day. Welfare for the elderly is also guaranteed by the 1998 regulation of the no.13 legislation on the interest of the elderly. And associated with the ICT, viewed as a tool and media to ensure the well-being of the elderly to reduce marginalization, loneliness, and differences between generations. The old age should have access to ICT, including its benefits and benefits.

Given the increased ICT use in daily

life, it is essential to understand the role of the Internet in improving the quality of life of the elderly population. However, much of the research focuses on youth viewed as the more active Internet users. Studies that see links between older generations and the Internet still need to be improved. Kim (2008) studies Internet users from the elderly and summarizes the five related themes: motivation and barriers to computer use by the elderly, the influence of age-based differences in the learning and use of computers, the instructional design itself, the attitudes and benefits of typewriter use, and the use of the Internet by the elderly. The findings suggest that parents use the Internet to communicate with family and friends, make new friendships or maintain old social contacts, follow the news, collect information about goods and services, look for health information, shop online, conduct banking transactions, and engage in recreational activities.

Quality of life is a multidimensional concept that includes a subjective and objective appreciation of a person's life situation in the social and economic context of the environment (Phillips et al., 2010). The factors that determine the quality of life in old age vary. According to the findings of some previous studies, in general, the quality of life of older persons is associated with good health, functional capacities, personal control, social participation, intergenerational relationships, the availability of friends and social support, and economic, social status (Walker & Mollenkopf, 2007). Technology's role in determining older people's quality of life needs more attention from existing studies and is focused on medical technology (Xie, 2007). With an approach to the diffusion theory of innovation (Rogers, 2010), it is hoped that the review of some studies can evaluate how communication processes that are in strategy for innovation, the

Internet and new technologies, can be adopted by the elderly. Based on the above background, the issue of the paper is how the Internet and tik can be used to improve the quality of life for the elderly and support their digital inclusion. By doing a literature review and previous synthetic studies, the paper was intended to review Internet and tic possibilities (opportunities and obstacles) to improve the quality of life, especially in Indonesia, and contribute to their social inclusion.

The Indonesian's ICT use reached its momentum during the covid-19 pandemic. Public mobility and limited face-to-face interaction cause massively switching to digital devices. This condition also has an impact on the elderly class. The societies born before the age of digital technology have come to adapt to interfaced patterns based on the Internet. Based on Survei Sosial Ekonomi Nasional (Susenas) from Badan Pusat Statistik (BPS) in 2021, 14.1 percent of Indonesia's population already have Internet access. This figure has increased significantly over previous years.

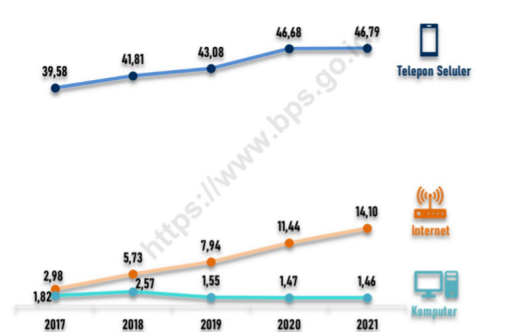


FIGURE 1: Increasing percentage of the country's individual who has ICR access by type of facility (2017-2021) (BPS, 2021)

From Figure 1, it is seen that the uptake of new technology (mobile) by the elderly is increasing in support of internet use as the era of the industry 4.0 revolution in the country. This increase is affected by individual and social factors. Individually, mobile ICT makes it easier

for the elderly to care for their needs and thus encourages them to learn how to use the ICT and access the Internet—socially, changing tools and pre-devices to digital ‘forces’ the elderly to be adaptive. The elderly presentations of internet and mobile users are also affected by household expenses. Increased household expenditures encourage increasing percentages of elderly internet users (Olphert et al., 2005).

Yet, the proportion of individuals who use the internet according to age groups shows a striking contrast between Indonesia’s young and old generations.

Figure 2 shows a considerable percentage of young and old Internet users despite an increase from 2017 to 2019 from each age group. The ministry of communications and information of Indonesia also notes that the level of technology absorption and internet use for the elderly is low in rural areas. Being lagging in digital society makes the elderly a target of harmful content in digital media, such as fraud and spreading hoaxes (Supianto, 2021).

The digital disparity (digital divide) can be defined as differences in magnetic access and use in different social environments. Associated with the Internet, Castells and Cardoso (1996) describes it as a divide between the net for the rich and the poor. The organization for economic cooperation and development (OECD) conceptualizes digital gaps as gaps between individuals, home economics, and geographical areas

with different social and economic levels associated with their opportunities to access ICT and internet uses for various activities (OECD, 2011). The digital disparity is also related to digital native and digital contributions. A young population that entered the digital native group has different characteristics of behavior and attitudes from the digital innovations born in the industrial age (Kurt et al., 2013). Digital innovations need to gain a digital characteristic native to dissolve a concession between the two.

Studies on internet use have focused mainly on regional and demographic variables and the regional service price difference according to the area, influencing the decision to install the internet in a household (Chaudhuri et al., 2005). Another study of 14 countries in Europe also saw that inequality exists based on individual variables in internet use (Demoussis & Giannakopoulos, 2006). A study involving socio-demographic factors also concluded that internet use might decline with age (Lera-López et al., 2009).

Some literature also deals with the relationship between Internet use with quantitative data and aspects related to the scope and scope of the elderly using the Internet (Loges & Jung, 2001). Some studies indicate a difference in Internet use between people in metropolitan and nonmetropolitan areas (Mills & Whitacre, 2003). A study also found that the difference between Internet users and non-users was work-related and age, not

Kelompok Umur	Proporsi Individu Yang Menggunakan Internet Menurut Kelompok Umur (Persen)		
	2017	2018	2019
>15	18,06	22,42	31,23
15-24	68,93	77,05	83,58
25-64	28,85	38,11	46,83
65+	1,83	3,97	5,32

FIGURE 2: Proportion of internet users in Indonesia by age groups (BPS, 2019)

gender or race (Rice & Katz, 2003). Ono and Zavodny's research (2007) found differences in Internet access to people in the United States, Sweden, Japan, South Korea, and Singapore because of gender, age, education, and income factors. A critical aspect of Internet use involving older people is a combination of such factors as lower Internet use skills among older people (Demunter, 2005; Hunsaker & Hargittai, 2018), the needs and benefits also felt lower among the aged ones (OECD, 2011) and the attitudes and lifestyles associated with different age groups (Chaudhuri et al., 2005).

Many studies focus on digital gaps between those who have access to the benefits of digital technology and those who do not. Norris (2001) indicates that there are some kinds of digital gaps: global gaps, which refer to the disparity of Internet access between the industrialized and developing communities; The social gap, which refers to the gap between the 'wealth of information' groups and 'lack of information' in every country; And finally the democratic gap, between those who do it and those who do not use digital resources to engage in the public interest.

Many studies in various countries have shown that older people are more likely to be digitally isolated than younger ones, such as Tatnall & Lepa (2003) and Holt & Morrell (2002). Although the elderly today are less represented among Internet users, they also seem to be the fastest-growing user group. It looks like data from the statistical center indicates an increase in the number of older people who access the Internet and use digital cellular technology (BPS, 2021). It is a barrier to Internet access and digital technology.

But some studies have found that significant numbers of older people, such as Fox (2001), refuse to use digital technology. Suppose the elderly want to reap the benefits of the information

community, and the people benefit from the social and economic inclusion of the elderly. In that case, it is essential to understand the factors of their refusal to engage with digital technology. So that scholars and industry leaders, and policymakers can understand how this resistance can be overcome. Five factors inhibit the use of the Internet by older people: costs and economics; Demographics and social; The need for content and information; Skills and abilities; Disability; And motivations and attitudes ((Olphert et al., 2005)).

In the diffusion of innovation theory, Rogers (1998) discussed how, along with the development of The Times, there are various innovations in many areas, and diffuse to achieve society. Innovation is an activity, object, or idea that has a novelty. Novelty itself is individual, meaning is judged anew by personal reactions. Diffusion is communicating an innovation through a communication channel to society members during a specific time (Rogers, 2010). It can also be interpreted as a form of communication with a new idea (Rizal, 2012). The diffusion of innovation is not based solely on the product of the four interlaced elements of innovation, communication channels, time, and social systems (Rogers, 2010).

Innovation is a context covering behavior changes (Suwarno, 2008). Different innovations would require various diffusion efforts. Characteristics of innovation to explain the level of adoption include perseverance, perseverance, compatibility, observability, and trialability. At the same time, communication channels are links that communicators use to convey messages to communion (Rogers, 2010). Communication channels can be mass media or interpersonal communication.

As for time, according to Rogers (2010), it could be measured by the five-

stage process of knowledge, persuasion, decision, decision, discovery, and discovery. Finally, social systems are linked units engaged in solving problems and achieving a common goal. At the same time, social systems are individuals, informal groups, organizations, or subsystems. Social systems are at the point where innovation can diffuse.

The diffusion theory of innovation sees that the diffusion process of creation runs through a predictable model. Some people will adopt innovation as soon as they know about it, and some need more time to adapt. Inside a self-sustaining social system are fickle leaders and change agents that define the adoption process of innovation.

By data, the number of older people has increased significantly, meaning to have the potential as a target for developing the policy and industry of information technology. Using the framework of the diffusion theory of innovation, researchers are trying to assess the opportunities and barriers to the involvement of older populations in the digital world from previous studies.

METHOD

To analyze the Internet and Internet opportunities and barriers to improving

quality of life and contributing to the social inclusion of older people, authors use review literature on previous studies. Galle et al. (1996) argued that literature reviews play a role in curbing research issues, getting methodological insights, avoiding fruitless approaches, identifying recommendations that could be used for further research, and finding support for the grounded theory. The stage literature review (Cooper, 1984) was formulating the problem, data collection, data evaluation, analysis and interpretation, and presentation.

The literature analyzed in this study analyses the use of tic and the Internet on the elderly. It is used in communication, education, psychology, health, and social services disciplines. The articles you seek are those who speak English and Indonesian with keywords, information and communication technology, ICT, elderly, elderly, quality of life, quality of life, Internet, computer, and computer. The search came in May 2022 using a Google scholar search engine for an article from 2007-2022. A total of 210 accessible articles studied the use of tic and the Internet on the quality of life for the elderly. As for this study, 20 papers have been reviewed after selecting some unqualified articles.

TABLE 1. The identity of the selected literature

No	Title of Manuscript	Journal	Year	Author
1	Are older adults networked individuals? Insight from East Yorkers' network structure, relational autonomy, and digital media use	Information, Communication & Society	2018	Hua Wang
2	Digital Inclusion in Older Adults: A Comparison Between Face-to-Face and Blended Digital Literacy Workshop	Frontiers	2018	Claudia I. Martinez-Alcala, et al.
3	Media-Based Leisure and Wellbeing: A Study of Older Internet Users	Leisure Studies	2020	Vera Gallistl & Galit Nimrod
4	Older adults' online social engagement and social capital: the moderating role of internet skills	Information, Communication & Society	2020	Minh Hao Nguyen, et al.
5	Reflective and Reflexive Stress Responses of Older Adults to Three Gaming Experiences in Relation to Their Cognitive Abilities: Mixed Methods Crossover Study	Journal of Medical Internet Research	2020	Najmeh Khali-Mahani, et al.

No	Title of Manuscript	Journal	Year	Author
6	Dividing the Grey Divide: Deconstructing Myths About Older Adults' Online Activities, Skills, and Attitudes	American Behavioral Scientist	2018	Anabel Quan-Haase, et al.
7	Technophobia among older Internet users	Educational Gerontology	2018	Galit Nimrod
8	High-speed broadband availability, Internet activity among older people, quality of life, and loneliness	New Media & Society	2022	Gretta Mohan & Sean Lyons
9	Effects of Virtual Reality Sessions on the Quality of Life, Happiness, and Functional Fitness among the Older People: A Randomized Controlled Trial from Taiwan	Computer Methods and Programs in Biomedicine	2021	Diana Barsasella et al.
10	Connected Seniors: How Older Adults in East York Exchange Social Support Online and Offline	Information, Communication & Society	2017	Anabel Quan-Haase, et al.
11	'Borrowed access'-the struggle of older persons for digital participation	International Journal of Lifelong Education	2018	Linda Reneland-Forsman
12	Unsung helpers: older adults as a source of digital media support for their peers	The Communication Review	2020	Amanda Hunsaker, et al.
13	Internet Use Among Older Europeans: an Analysis Based on SHARE Data	Universal Access in the Information Society	2018	Ronny König, et al.
14	A Double Burden of Exclusion? Digital and Social Exclusion of Older Adults in Times of Covid-19	The Journals of Gerontology	2021	Alexander Siefert, et al.
15	Using communication and visualization technologies with senior citizens to facilitate cultural access and self-improvement	Computers in Human Behavior	2017	Maria Dolores Meneses Fernandez, et al.
16	The Use and Acceptance of ICT by Senior Citizens: a Comparison of Technology Acceptance Model (TAM) for Elderly and Young Adults	Universal Access in the Information Society	2020	Hacer Guner & Cengiz Acarturk
17	Teaching digital literacy skills to the elderly using a social network with linear navigation: A case study in a rural area	International Journal of Human-Computer Studies	2018	Diana Castilla, et al.
18	Does Mobile Internet Use Affect the Loneliness of Older Chinese Adults? An Instrumental Variable Quantile Analysis	International Journal of Environmental Research and Public Health	2022	Zenghua Guo and Boyu Zhu
19	Internet Use, Electronic Health Literacy, and Hypertension Control Among the Elderly at an Urban Primary Care Center in Thailand: a Cross-Sectional Study	International Journal of Environmental Research and Public Health	2021	Auswin Rojana-sumapong, et al.
20	Old Dogs, New Clicks: Digital Inequality in Skills and Uses among Older Adults	Canadian Journal of Communication	2017	Eszter Hargittai & Kerry Dobsransky

RESULTS AND DISCUSSIONS

Opportunity Innovation

Among the motivations for older people's use of the Internet and digital media is entertainment. A study was done by Gallistl and Nimrod (2020) to explore the digital media repertoire of recreation and how it relates to the welfare of Internet users in the elderly. Through a data survey

of 10,527 Internet users over 60 years of age from 7 countries (Austria, Canada, Denmark, Israel, Holland, Romania, and Spain), researchers have been able to identify four groups of Internet users based on their leisure activities through digital media: innovative traditionalists, entertainment seekers, selective content, and eclectic media users. These classifications are affected

by the background characteristics and the respondents' free time preferences. Miscellaneous media users tend to have a lower level of life satisfaction.

Another study by Khalili-Mahani et al. (2020) suggests that some older ones use the ICR digital games to release stress. The study was set against the coveted health trends, especially for older people's rehabilitation. Experimental methods have shown that playing digital games does not stress elderly participants. Some genre games have the potential for cognitive and physical stimulation of the elderly.

Digital technology provides the opportunity to increase senior well-being, according to a study done by maria Dolores Meneses Fernandez et al. (2017). Researchers are exploring the social impact and benefits of using digital visualization technologies such as augmented reality (AR), virtual reality (VR), and quick response codes. The research is focused on the potential benefits of digital technology and how older people respond. The study has provided evidence that senior citizens are more likely to be interested in using digital technology to meet their personal needs, so they are interested in learning. Senior citizens use ICT to search for information, communicate with others, and entertain.

Hacer Guner (2020) conducted a comparative study of the use and acceptance of tik by the elderly and youth in Turkey. The study showed surveys of 232 elderly pilgrims (60-96 years of age) and 235 young adults (19-40). Research findings suggest that parents and young adults use a typewriter similarly. It is coupled with the need for older citizens for more help, encouragement, and interface design. The study aims to increase awareness of the need for and importance of more senior citizens using ICT.

Channel of Communication

Martinez-Alcala et al. (2018) run a workshop to improve the digital competence of the elderly in Mexico. The study involved 98 older adults aged 60 and older. Digital literacy increases after workshops about easier use, perceived benefits, attitudes toward service, and intentions to use. These results indicate that older people can learn and acquire digital literacy skills as long as they have the strong motivation or know the functional benefits of ICT.

In 2022, Mohan & Lyons examined Internet use patterns and psychosocial results for over 3500 people over 50 years of age in Ireland. Internet use patterns among the elderly are supported by high-speed broadbands indicated by higher reported home Internet access levels, greater Internet use frequency, and more Internet activity involvement. Researchers found a higher quality of life among web-based applications such as email and video calls. The researcher also found evidence that less loneliness is felt among the user of this application.

Social Systems

Still associated with social networking, Nguyen et al. (2022) studied the relationship between elderly online social engagement and social capital in the Netherlands. Surveys show that older adults who engage more frequently in certain online social activities (such as asking questions on social media, seeing family photos, or others) enjoy more considerable social capital, both online and offline context, than those who do less frequently. Skills at using the Internet contribute to the linkup between online social engagement and social capital. Older people with excellent Internet skills benefit greatly from online social activities. Tick use by the elderly also reflects their offline life and vice versa. They want a virtual social space where

they can discuss certain things and share with group members of the same interest. Video-mediated communication for the elderly can enable them to present themselves using digital media (Palupi, 2019) selectively.

Quan-Haase (2017) examined how the elderly in Toronto, East York, Canada, mobilize social support with and without digital media. Through interviews, researchers found that digital media is helping older people mobilize social support and nurture and strengthen existing relationships with geographically and far-off contacts. Maintaining these relationships is essential for individuals and members of their networks of limited mobility because of age and health factors. When older people begin to use digital media, they regularly make it a part of their lives, spending together by telephone to maintain existing relationships but not to develop new ones. The study also found that older people view social support exchanged via digital media as tangible, unmitigated support instead of meaningless relational contact. Older people use digital media to protect friendships. They also use it for coordination, maintaining ties, and engaging in casual conversation. The study also suggests that learning to use an ICT is a form of social support that provides opportunities to strengthen the networks of the elderly.

For parts of Asia, Guo & Zhu (2022) conducted research to test whether mobile Internet use affects loneliness in China. Studies indicate that loneliness on the Internet is 33.1 percent lower than that of a parent who is not. Heterogeneity in the effects of mobile Internet use is found in loneliness among the aged, educational, and marital status. The use of Internet phones is having a lonely impact on 60-70 - year - old, those with lower levels of education, and senior couples. Quantile regression analysis suggests

that high levels of loneliness in older adults benefit from mobile Internet use. Further mediation analysis indicates that using the Internet cell can improve parent and child relationships, increase offline interaction with children, and reduce the load of children of the elderly directly to support them offline. These findings point to potential Internet use mechanisms to reduce parents' loneliness.

Barsasella et al. (2021) studied virtual reality's effects on the quality of life, happiness, and physical fitness among Taiwanese seniors. With experimental methods with 60 participants from the college's senior center. The results of this experiment suggest that the quality of life and happiness increases significantly in the intervention group compared with the control group. Diana concludes that virtual reality sessions can potentially affect the well-being and well-being of the functional elderly and support healthy and active aging.

Related to health services in Southeast Asia, a study from Rojanasumpong et al. (2021) explored the relationship between Internet use and electronic health literacy among seniors over 60 years of age in Thailand and hypertension. A cross-sectional survey was conducted at the clinic in Chiang Mai, Thailand. 50.9% of the respondents are Internet users. 37 of the 56 classified participants have high electronic health literacy. Research shows insufficient evidence to support a link between Internet use and hypertensive control. This creates new opportunities for education and e-health interventions for future Thai seniors.

A study by Hunsaker et al. (2020) gives a different picture of the elderly group. This group is not people who know nothing about technology. The use of ICT taking by the elderly, according to what this study has found, is effective because of support from their fellow seniors.

Based on interviews conducted in four countries, there is both mutual and mutual support given by senior citizens when using ICT, especially when experiencing technical difficulties.

Obstacles

Innovation

Digital studies of dividends point to a gap between senior users and younger ones by treating the elderly as homogeneous groups. This needs to include the differences in digital skills and media use. Quan-Haase et al. (2018) interviewed 41 older people over 65 in East York, Toronto, to develop a typology of elderly non-digital media users. Researchers found a nonlinear relationship between the skill level and online involvement of older adults. The story of digital skills does not affect respondents' involvement or online activities. They remain involved in online activities despite limited skills; some want to learn while using digital media.

Galit Nimrod (2018) presents a term of technophobia among older people: fear of modern technology or discomfort with modern technology. It can limit the online activities of elderly Internet users and the benefits they receive. The literature on your technophobia then focuses on non-users and neglects older individuals who already use sophisticated technology. Galit's research was done through an online survey of 537 Internet users aged 60 and above to explore the extent of the technophobia restricting the online activities of older adults. The results of this study indicate various levels of technophobia between the user and significant connections between the technophobia and the pattern of internet use, including the type and complexity of use. It also relates to the user's education level, health perception, and well-being. People who have technophobia tend to be less content with their lives. Galit concludes that technophobia plays a role

in digital gaps among older people.

The study of Reneland-Forsman (2018) examines older people's involvement with interfaces as one of the most critical ways to achieve social inclusion. By conducting interviews with 18 men and women regarding their daily interactions with digital interfaces. Interviews indicate that older people use knowledge from social networks or previous workplace contacts to access digital technology and practice. Knowledge limitation and acceptance of digital lifestyles are a source of fragility that endangers social inclusion for older people who are both autonomous and active participants in society (digital).

Channel of communication

Regarding digital skills, Castilla et al. (2018) are doing a study on digital literacy for the elderly in the villages. Older people living in rural areas face telecommunication infrastructure obstacles that increase their difficulty accessing ICT. These populations also tend to have traditional learning modes based on linear information models such as textbooks, their ignorance of the internet can become an inclusive digital barrier. With training and teaching, urgent seniors positively respond to the digital type. One of the mental connections is the emergence of a fear of using ICT, damaging a computer, or feeling stupid. Mastery of ICT can ultimately boost the confidence of the elderly.

Social systems

The findings suggest concerns about the older people's position as the group that remains within the network. Hua Wang (2018) researches to explore whether older groups belong to individual networking. So far, in the literature, personal networks refer to young internet users. There is a fear that older adults must adapt to this networking

individualism. Using a data interview of 41 seniors in the East York region of Toronto, Wang analyzed the structure of social networks, relational autonomy, and digital media use. The study found three spectra of networking individualism among older people: net-connected individuals, socially disconnected but not networked individuals, and socially restrictive individuals. Digital media use is not enough to get a person into a networked individual, as most of East York’s residents integrate digital media into their daily lives.

It is also supported by a study by Seifert et al. (2021) on the expulsion of seniors, especially during the COVID-19 pandemic. Older people are isolated from physical and social contact and are more likely to be excluded from digital

services because they choose not to use technology. Among these populations are elderly care facilities with social and digital exclusions. The covid-19 pandemic is a reminder that digital gaps are fundamental, with some of the facts that the elderly and other groups are excluded from digitally linked societies.

The geographical, educational, economic, and background factors of the elderly affect their skills with the Internet. Hargittai & Dobransky (2017) explored online behavior from elderly groups in the United States. The findings of this study reveal the diversity among older people in Internet use. Those with higher education and higher incomes have higher web-use skills. Higher social and economic status groups also use the internet for varying and beneficial activities to improve their

TABLE 2. Elderly opportunities and barriers to digital inclusion

Opportunities	Barriers
The elderly population has increased significantly over the years globally. Older groups become a significant number of Internet and digital media users yearly.	Geographical factors, differences in access, and Internet facilities between urban and rural areas. Older groups become a significant number of Internet and digital media users yearly. Uneven socio-economic factors, such as education, income, and previous experiences with ICT. The higher education, economics, and elderly expertise in the ICT, the more confident they are in interacting with the Internet and can benefit from improving their quality of life
Older people have the desire to learn to operate ICT.	Such lack of training and teaching about digital skills (digital literacy) has frightened the elderly into adopting the Internet and digital media.
Internet and tic use by older people is motivated by a desire to reduce loneliness, search for information, and entertainment.	Anti-new technology/technophobia causes some elderly groups to be unable to take advantage of the Internet and is excluded from digital society.
Increased intensity of application and adaptation of ICT can improve the quality of life for the elderly.	Digital service interfaces are less friendly to older people with physical limitations like myopic eyes and tremors.
Elder support of each other can reduce ICT drag from the technical side.	

quality of life.

Konig et al. (2018) studied internet use among the elderly in Europe. The study aims to investigate internet use by elderly humans in Europe. By way of the survey of health, aging, and retirement in Europe, researchers have gained a yield that 49% of the population (61.2020 people) use the internet. However, the situation varies among European countries. In addition to individual indicators, such as gender, age, and social class, results show that previous experiences with computers during one's time at work are positively linked to old-age internet use.

Furthermore, internet use between individual social networks has positively affected its use. Broader contextual structures, such as areas of living and countries' specific wealth and communications technology infrastructure, also tend to encourage internet use by the elderly in Europe. Data from share suggests that personal resources, previous experiences with technology, social connections, and contextual influences, drive the use of the private internet among European seniors.

Of the 20 such studies, it could be classified as show as Table 2.

CONCLUSION

The use of ICT and the Internet can improve the quality of life of older people according to appropriate policies and strategies that can encourage older adults, in Indonesia in particular, to use computers and the Internet, which can prevent their exclusion from society. In the process of ICT adoption and the Internet, seniors have intrapersonal, interpersonal, structural, and functional barriers. Intrapersonal factors have to do with their confidence in using the Internet and computers. At the same time, interpersonal effects are associated with the role of others in digital literacy. Structural factors deal with the costs

of ICT, and functional factors related to older people's physical states deal with memory loss and logic and spatial orientation.

Digital inclusion is not about computers, the Internet, or technology but rather about using technology to improve the skills and quality of life, support education, and promote economic prosperity across communities. Digital inclusion also means social inclusion. The elderly who are currently marginalized in the information /digital society should be enabled to participate actively in determining their life chances. Older people need to be actively involved in the design of future technology by considering the purposes of their use of technology, needs, and aspirations.

In the future, comprehensive research will be required to explore internet use patterns by the elderly in Indonesia, analyzing such identity factors as gender, social class, and education. It is hoped that such measures can map the motivation of older people to use the Internet, the effects of the Internet and the ICT for Indonesia's seniors, and the opportunities and obstacles to implementing ticks for those in Indonesia. From the standpoint of public policy, to achieve digital inclusion as well as for the elderly, 'friendly' policies and features of government services such as providing websites for services that are easily used by the elderly. In addition to digital gaps, digital literacy training is needed for older adults to avoid anti-new technologies. Outreach surveys from the elderly need to be made and used as the basis for future technological design and communication.

REFERENCES

Bappenas. (2019, August 29). Pemanfaatan Demografi Indonesia di Sektor Kepariwisata, Kebaharian, dan Ekonomi Kreatif. <https://www.bappenas.go.id/files/11c5b418-7d16->

- 463a-9b62-310085b5bd3d/download
- Barsasella, D., Liu, M. F., Malwade, S., Galvin, C. J., Dhar, E., Chang, C.-C., Li, Y.-C. J., & Syed-Abdul, S. (2021). Effects of virtual reality sessions on the quality of life, happiness, and functional fitness among the older people: a randomized controlled trial from Taiwan. *Computer Methods and Programs in Biomedicine*, 200, 105892.
- BBC. (2019, April 7). Dunia punya lebih banyak “kakek-nenek” dibandingkan cucu-cucu, apa dampaknya? <https://www.bbc.com/indonesia/majalah-47804425>
- BPS. (2019). Proporsi Individu yang Menggunakan Internet Menurut Kelompok Umur (Persen), 2017-2019. <https://www.bps.go.id/indicator/27/1228/1/proporsi-individu-yang-menggunakan-internet-menurut-kelompok-umur.html>
- BPS. (2021, October 11). Statistik Telekomunikasi Indonesia 2020. <https://www.bps.go.id/publication/2021/10/11/e03acale6ae93396ee660328/statistik-telekomunikasi-indonesia-2020.html>
- Castells, M., & Cardoso, G. (1996). *The network society* (Vol. 469). Oxford: Blackwell.
- Castilla, D., Botella, C., Miralles, I., Bretón-López, J., Dragomir-Davis, A. M., Zaragoza, I., & Garcia-Palacios, A. (2018). Teaching digital literacy skills to the elderly using a social network with linear navigation: A case study in a rural area. *International Journal of Human-Computer Studies*, 118, 24–37.
- Chaudhuri, A., Flamm, K. S., & Horrigan, J. (2005). An analysis of the determinants of internet access. *Telecommunications Policy*, 29(9–10), 731–755.
- Cooper, H. M. (1984). Cooper, Harris M., *The Integrative Research Review: A Systematic Approach*. Beverly Hills, CA: Sage, 1984.
- Demoussis, M., & Giannakopoulos, N. (2006). Facets of the digital divide in Europe: Determination and extent of internet use. *Economics of Innovation and New Technology*, 15(03), 235–246.
- Demunter, C. (2005). ICT SKILLS MEASUREMENT IN EUROSTAT'S INFORMATION SOCIETY STATISTICS. *Journal of the European Union*, L183.
- Fernández, M. D. M., Hernández, J. D. S., Gutiérrez, J. M., Escuela, M. R. H., & Fino, E. R. (2017). Using communication and visualization technologies with senior citizens to facilitate cultural access and self-improvement. *Computers in Human Behavior*, 66, 329–344.
- Fox, S. (2001, September 9). *Wired Seniors*. <https://www.pewresearch.org/internet/2001/09/09/wired-seniors/>
- Galle, M. D., Borg, W. R., & Gall, J. P. (1996). *Educational research*. White Plains, NY: Longman.
- Gallistl, V., & Nimrod, G. (2020). Media-based leisure and wellbeing: a study of older Internet users. *Leisure Studies*, 39(2), 251–265.
- Guner, H., & Acarturk, C. (2020). The use and acceptance of ICT by senior citizens: a comparison of technology acceptance model (TAM) for elderly and young adults. *Universal Access in the Information Society*, 19(2), 311–330.
- Guo, Z., & Zhu, B. (2022). Does Mobile Internet Use Affect the Loneliness of Older Chinese Adults? An Instrumental Variable Quantile Analysis. *International Journal of Environmental Research and Public Health*, 19(9), 5575.
- Hargittai, E., & Dobransky, K. (2017). Old dogs, new clicks: Digital inequality in skills and uses among older adults. *Canadian Journal of Communication*, 42(2).
- Holt, B. J., & Morrell, R. W. (2002). Guidelines for web site design for older adults: The ultimate influence of cognitive factors. *Older Adults, Health Information, and the World Wide Web*, 109–129.
- Hunsaker, A., & Hargittai, E. (2018). A review of Internet use among older adults. *New Media & Society*, 20(10),

- 3937–3954.
- Hunsaker, A., Nguyen, M. H., Fuchs, J., Karaoglu, G., Djukaric, T., & Hargittai, E. (2020). Unsung helpers: older adults as a source of digital media support for their peers. *The Communication Review*, 23(4), 309–330.
- Khalili-Mahani, N., Assadi, A., Li, K., Mirgholami, M., Rivard, M.-E., Benali, H., Sawchuk, K., & de Schutter, B. (2020). Reflective and reflexive stress responses of older adults to three gaming experiences in relation to their cognitive abilities: mixed methods crossover study. *JMIR Mental Health*, 7(3), e12388.
- Kim, Y. S. (2008). Reviewing and critiquing computer learning and usage among older adults. *Educational Gerontology*, 34(8), 709–735.
- König, R., Seifert, A., & Doh, M. (2018). Internet use among older Europeans: an analysis based on SHARE data. *Universal Access in the Information Society*, 17(3), 621–633.
- Kurt, A. A., Günüç, S., & Ersoy, M. (2013). The current state of digitalization: Digital native, digital immigrant and digital settler. *Ankara University Journal of Faculty of Educational Sciences (JFES)*, 46(1), 1–22.
- Lera-López, F., Izquierdo, M. G., & Billón-Currás, M. (2009). El uso de Internet en España: Influencia de factores regionales y socio-demográficos. *Investigaciones Regionales-Journal of Regional Research*, 16, 93–115.
- Loges, W. E., & Jung, J.-Y. (2001). Exploring the digital divide: Internet connectedness and age. *Communication Research*, 28(4), 536–562.
- Martínez-Alcalá, C. I., Rosales-Lagarde, A., Alonso-Lavernia, M. de los Á., Ramírez-Salvador, J. Á., Jiménez-Rodríguez, B., Cepeda-Rebollar, R. M., López-Noguerola, J. S., Bautista-Díaz, M. L., & Agis-Juárez, R. A. (2018). Digital inclusion in older adults: A comparison between face-to-face and blended digital literacy workshops. *Frontiers in ICT*, 5, 21.
- Mills, B. F., & Whitacre, B. E. (2003). Understanding the Non-Metropolitan—Metropolitan Digital Divide. *Growth and Change*, 34(2), 219–243.
- Mohan, G., & Lyons, S. (2022). High-speed broadband availability, Internet activity among older people, quality of life and loneliness. *New Media & Society*, 14614448221095218.
- Nguyen, M. H., Hunsaker, A., & Hargittai, E. (2022). Older adults' online social engagement and social capital: The moderating role of Internet skills. *Information, Communication & Society*, 25(7), 942–958.
- Nimrod, G. (2018). Technophobia among older Internet users. *Educational Gerontology*, 44(2–3), 148–162.
- Norris, P. (2001). *Digital divide: Civic engagement, information poverty, and the Internet worldwide*. Cambridge university press.
- OECD. (2011). *Understanding The Digital Divide*. <https://www.oecd.org/sti/1888451.pdf>
- Olphert, C. W., Damodaran, L., & May, A. J. (2005). Towards digital inclusion—engaging older people in the 'digital world.' *Accessible Design in the Digital World Conference 2005*, 1–7.
- Ono, H., & Zavodny, M. (2007). Digital inequality: A five country comparison using microdata. *Social Science Research*, 36(3), 1135–1155.
- Palupi, P. (2019). Selective Self-Presentation on Video-Mediated Communication: A Study of Hyperpersonal Communication. *Mediator: Jurnal Komunikasi*, 12(1), 102–112.
- Phillips, J. E., Ajrouch, K. J., & Hillcoat-Nallétamby, S. (2010). *Key concepts in social gerontology*. Sage.
- Quan-Haase, A., Mo, G. Y., & Wellman, B. (2017). Connected seniors: How older adults in East York exchange social support online and offline. *Information, Communication & Society*, 20(7), 967–983.
- Quan-Haase, A., Williams, C., Kicevski, M., Elueze, I., & Wellman, B. (2018). Dividing the grey divide: Deconstructing myths about older adults' online activities, skills, and attitudes. *American Behavioral Scientist*, 62(9), 1207–1228.

- Rahmat, A. M. (2021). Effectiveness of Marketing 4.0 in the World of Online Advertising. *Mediator: Jurnal Komunikasi*, 14(2), 195–202.
- Reneland-Forsman, L. (2018). ‘Borrowed access’—the struggle of older persons for digital participation. *International Journal of Lifelong Education*, 37(3), 333–344.
- Rice, R. E., & Katz, J. E. (2003). Comparing internet and mobile phone usage: digital divides of usage, adoption, and dropouts. *Telecommunications Policy*, 27(8–9), 597–623.
- Rizal, F. (2012). Penerapan Teori Difusi Inovasi dalam Perubahan Sosial Budaya. *Hikmah*, VI (1), 130–140.
- Rogers, E. M. (2010). *Diffusion of innovations*. Simon and Schuster.
- Rojanasumapong, A., Jiraporncharoen, W., Nantsupawat, N., Gilder, M. E., Angkurawaranon, C., & Pinyopornpanish, K. (2021). Internet Use, Electronic Health Literacy, and Hypertension Control among the Elderly at an Urban Primary Care Center in Thailand: A Cross-Sectional Study. *International Journal of Environmental Research and Public Health*, 18(18), 9574.
- Seifert, A., Cotten, S. R., & Xie, B. (2021). A double burden of exclusion? Digital and social exclusion of older adults in times of COVID-19. *The Journals of Gerontology: Series B*, 76(3), e99–e103.
- Supianto. (2021, October 22). Waspada! Lansia Rentan Penipuan dan Hoaks Teknologi Digital. <https://www.jurnas.com/artikel/104129/Waspada-Lansia-Rentan-Penipuan-dan-Hoaks-Teknologi-Digital/>
- Suwarno, Y. (2008). *Inovasi di sektor publik*. Jakarta: STIA-LAN Press.
- Tatnall, A., & Lepa, J. (2003). The Internet, e-commerce and older people: An actor-network approach to researching reasons for adoption and use. *Logistics Information Management*.
- Walker, A., & Mollenkopf, H. (2007). International and multi-disciplinary perspectives on quality of life in old age: Conceptual issues. In *Quality of life in old age* (pp. 3–13). Springer.
- Wang, H., Zhang, R., & Wellman, B. (2018). Are older adults networked individuals? Insights from East Yorkers’ network structure, relational autonomy, and digital media use. *Information, Communication & Society*, 21(5), 681–696.
- Xie, B. (2007). Older Chinese, the Internet, and well-being. *Care Management Journals*, 8(1), 33–38.