

UNDERSTANDING POSSIBILITIES OF USING DIGITAL TECHNOLOGIES FOR SENIOR CITIZEN COMMUNITIES IN INDIA

Goal 3 - Good health and Wellbeing

^aAr. Rajendra Madhukar Tamhane,

^bDr. Supriya Dhananjay Nene

^aProfessor (Design Chair), Amity School of Architecture and Planning,
Amity University Maharashtra, Mumbai, India

^bDirector, Amity School of Architecture and Planning, Amity
University Maharashtra, Mumbai, India,

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Abstract

In today's time in India, there is an increasing number of nuclear families, considering relocation of children due to their career requirements. As such the senior citizens are left alone to take care of themselves. A Senior citizen community is then a good solution to take care of such senior citizens and becoming a popular choice among families. Leaving parents in such a good community makes the children relaxed and satisfied that a community is taking good care of parents in their absence.

A Senior citizen community in India usually is a cluster of living units spread around enclosed by a compound wall and having all the necessary amenities and facilities required for the convenience of senior citizens to make their life easy and enjoyable. The Digital Technology if used effectively can be of good use for Senior citizens living in such a community. This research paper attempts to study the benefits of digital technologies that can be of use for senior citizen communities in India.

The methodology includes a study of available digital communication devices and gadgets in the market, like health monitoring instruments, voice activated devices, video conferencing applications, automation devices, online games, etc. that can be used for senior citizens communities. A survey of senior citizens is conducted for preferences and comfort levels of digital technologies if available to them.

This research tries to prove, that there are many benefits of digital technologies that can be of use for senior citizen communities in India. These can make their life easier, safer, enjoyable and can facilitate quick interaction with children / relatives, living far away in the country or anywhere else in the world.

Keywords – Senior Citizen, Digital Technology, Health monitoring, Automation, Video conferencing

1. Introduction

Dictionary meaning of senior citizen is older person, especially somebody who has retired from work. As such senior citizens are people who have contributed something to the society during their life span of 60 + years. Now they have retired from the mainstream workforce. Yet there are many senior citizens who do not retire at all. They continue to work beyond the age of 60+ as long as they are physically and mentally fit. Such senior citizens are found to be in professions like teaching, medical profession or any profession or business of their own. There are 104 million elderly people in India out of which 53 million are females and 51 million are males. Source (Senior Citizens – Their needs and our priorities, 2020). Today many seniors are reluctant to leave their individual homes and come to stay in a senior citizen homes. This is due to the uncertainty of the living conditions, amenities, facilities and personal attention available there. An attempt is made to find if their life can be easier and more comfortable with the use of technological gadgets available today.



First and foremost, the most important criterion for senior citizens is their safety from accidents and antisocial elements. If the seniors are little tech savvy or ready to become one, then they can use several gadgets to achieve this safety easily. Here an attempt is made to compile all requirements from day-to-day life in an ideal senior citizen home that can use of technological gadgets available today.

2. Methodology

The aim of this paper is to find out the feasibility and usefulness of digital gadgets for the ease of living for the senior citizens. So, an informal survey and study was made from online and offline sources and a listing of easily available gadgets of digital technology and their uses was made. The seniors who were using such gadgets were located and discussions were conducted towards usefulness of the gadgets to them in daily life. Then a formal survey was conducted in different age groups to study their preferences to use different gadgets, with the help of an online questionnaire survey form. The idea of including all adult age groups was to see the usefulness of taking care of aging parents, in case of age groups between 25-50 years using the digital gadgets. The results were analysed to reach the conclusion.

The scope of this paper is to find out the advantages of using digital gadgets for senior citizens. The review of the potential risks due to digital technology is beyond the scope of this paper.

3. Digital Gadgets

The current generation of senior citizens have used digital gadgets quite late in their careers. Some are quite well-versed in the technology and some are not, but willing to learn if given the opportunity and training, as they understand the importance and usefulness of technology in day-to-day life. Gadgets such as laptop computers, mobile phones, smart watches are part of everyone's life nowadays. Video calls have become commonplace to get in touch with family members regularly, as most of the close family members are spread across the nation or the world due to various reasons. A new gadget in the pipeline is the Hu.ma.ne. AI Pin is an innovative, screenless wearable device to offer a range of AI powered features, potentially rivaling smartphones. Source: (Pin, 2023)

An informal market survey was conducted for checking the availability of the digital gadgets commonly used for ease-of-living in case one is living far from the close family members. These may be more useful to elderly people to connect with the younger family members on a routine basis and especially during health emergencies. These kinds of gadgets may give a peace of mind to the younger family members as they can remotely take care of the elder family members.

Following are some of the useful digital gadgets which are currently used, that were found in the market.

3.11 Panic Alarm

A panic alarm with a loud siren to attract immediate attention is an essential gadget to protect seniors and draw the attention of others nearby for medical or any other emergency. This is a handy instrument which can be very easily kept with the person all the time and may be easily used as and when required, without much effort or training.



Figure 1: A panic alarm with a loud siren to attract immediate attention.

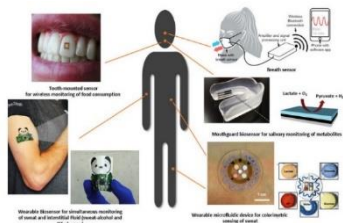


Source: (Amazon, Juvo Personal Safety Panic Alarm-Loud 120 db Siren to Attract Attention & Deter attackers / assaulters., 2023)

3.12 Wearable Devices

Medical alert wearable devices are useful to send data to a monitoring center providing GPS based solutions. In case of a fall or fire etc., the center is immediately notified, and emergency response center is activated to connect to a live operator for help. Health monitoring devices like fitness smart watch keeps track of heart rate, step count, sleep monitoring etc are very useful for seniors.

Figure 2: Wearable device for Health monitoring devices like fitness smart watch keeps track of heart rate, step count, sleep monitoring etc are very useful for seniors health monitoring and Health & Fitness Smartwatch with Heart Rate, Music, Alexa Built-in, Sleep & Swim Tracking



Source: (gate, 2023)



source: (Amazon, 2023)

3.13 Glucose Monitoring Device (CGM)

For diabetic people a Continuous Glucose Monitoring device (CGM) is useful and can be tracked on cell phone. Seeing your glucose level in real time can allow you to take diet accordingly. It helps you to take informed decisions to decide your food choice.

Figure 3: Continuous Glucose Monitoring Device



Source: (Amazon, FreeStyle Libre Sensor Pack Of 6 I Continuous Glucose Monitoring I Decrease HbA1c I No Fingertpick Required, 2023)

3.14 House call button

It is a wearable device that can send a signal to care giver, who can then respond ASAP. This is very useful gadget in case of a fall in bathroom or staircase, the medical help can be called immediately. This is also useful in case a person feels thirsty and needs water or feels hungry in the middle of the night as needs to eats something. The house help can be called for these situations with these gadgets.

Figure 4: Call button for medical or house help

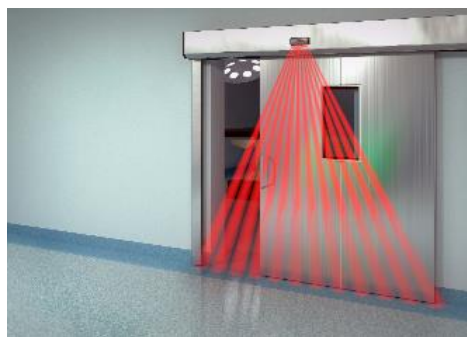


Source: (Amazon, Amazon, 2023)

3.15 Lighting with Motion sensors

Indoor or outdoor lighting of washrooms and some outside areas by using motion sensors are useful for senior citizens, as they do not have to find the switches in the dark to turn on the lights, or open and shut the doors while going in and out of enclosed spaces. The lights automatically light up sensing motion if person comes in the vicinity and switches off after the person leaves the vicinity. This also helps in reduction of power usage. Also sensors are used to open / close doors automatically when a person reaches near the door.

Figure 5: Motion sensor for door opening and lighting Source



Source:(Amazon, 2023)

3.16 Motorized wheelchair

It is very useful for specially-abled persons and for some patients during treatment periods. It is operated by a control stick and brake. Motorized wheelchair propels the chair using battery operated motor which eliminates manual energy to operate. The advanced models have features that control elevation, recline, adjustable seat and safety tools.

Figure 6: Vissco Zip Lite Power Wheelchair with Single Battery (6 Months Battery Warranty), 10Km Per Charge, Durable & Long Lasting, Weight Bearing Capacity 100kg.



Source: (Amazon, Vissco Zip Lite Power Wheelchair with Single Battery (6 Months Battery Warranty), 10Km Per Charge, Durable & Long Lasting, Weight Bearing Capacity 100kg, 2023)

3.17 Digital exercise equipment

like tread mills and cycles provide information of distance covered, calories burnt, heart condition and have different programs to run as per speed & inclination requirements.

Figure 7: Gymnasium equipment,



Source: (beatxp, 2023) Digital Tread mill and cycle

3.18 Main door digital lock



The digital lock on the main door is used to eliminate keys. They can be used by a digital card or code number or finger print sensor or iris scan or face recognition. This eliminates the possibility of losing the keys and a person not being able to enter the housing unit, as the lock may be opened by their finger prints or in some cases the face recognition.

Figure 8: Digital door lock,



Source: (YALE, 2023)

3.19 Video conferencing

The senior citizen home must be equipped with a video conferencing center with a large screen where seniors can communicate with their children / relatives / friends who are out of town or are abroad. This facility monitored by a tech savvy tutor & attendant can be very useful and important for seniors. Communication.

Figure 9: Video conferencing room to have visual talk with children/relatives and friends

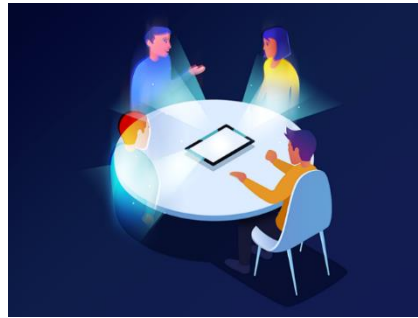


Source: (India Mart, 2023)

3.20 Holographic projections

The holographic projections are already in use today. In future, this technology will make communication with holographic projections more interesting and near to real time meetings. The holographic projections can be so real that it feels like the other person is sitting or standing next to you. This can benefit the senior citizens to feel that their children are with them and they can talk to them in real time.

Figure 10:Hologram meeting,



Source: (Dribbble, 2023)

3.21 Online gaming devices

facility can provide an interesting place for seniors to operate games they like and also play them remotely with their children / relatives and friends. Here, the time is well-spent and games can be enjoyed. A tech savvy attendant is required to set up the games.

Figure 11:Online Gaming,



Source: (PTI, 2023)

3.22 Public transportation apps

App based taxi service is very useful and convenient to travel now a days. It is a Boone for seniors as the app is very easy to operate and uses the services like of Ola and Uber. This helps people who do not own a vehicle, but get a vehicle with the driver to take them to the places they want to visit and safely get them back without a hassle of owning and maintaining a vehicle and paying regular salary to the driver.

Figure 12:Ola / Uber by cellphone apps



Source (Rule, 2023)

3.23 Food delivery apps

App based food delivery service is very useful and Swiggy Zomato, daily basket, milk basket are major operators. A little study to operate these apps open up a unlimited cuisine that can be ordered very easily.

Figure 13: Apps for online food



Sources: (Times, 2022) swiggy Zomato (Enterprise, 2023) Daily Basket (Milk Basket, 2023)

3.24 Digital HVAC control

Heating Ventilation and Air conditioning (HVAC) control panel is very helpful for temperature and humidity control in the house. This can be operated without getting up at all. Nowadays, many airconditioners are also available with the mobile apps for climate control features.

Figure 14: Room temperature control panel



Source" (India, 2023)

3.25 Item tracking devices

Generally the seniors have memory issues like forgetting keys, wallet or a bag somewhere. A gadget like apple air tag can easily enable tracking of lost items. Such a tag can be kept in a pocket of a bag frequently used so can be tracked if lost.

Figure 15:Keep track of and find your items alongside friends and devices in the Find My app,

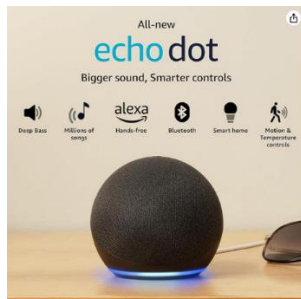


Source: (Amazon, New Apple AirTag, 2023)

3.26 Voice assistants

Voice assistant devices like Amazon Alexa, Siri, Google assistant, Cortana, Bixbi etc. are changing the trends of how we interact with digital gadgets. This is the most useful feature for seniors, very easy to use.

Figure 16:Voice assistant 3rd Generation Echo Dot-Smart Speaker with Alexa that can be operated by voice. Alexa can speak English and Hindi.



Source: (Amazon, All-New Echo Dot (5th Gen, 2023 release) | Smart speaker with Bigger sound, Motion Detection, Temperature Sensor, Alexa and Bluetooth| Black, 2023)

3.27 Kindle

Kindle is a portable electronic book or also known as e-book reader introduced by amazon in 2007. Many books, newspapers, magazines are formatted as kindle editions and can be downloaded and read on any kindle. This does away with the bookshelves required to store books as everything is accommodated in a single small kindle. The reading experience is also like reading an actual book.

Figure 17: All-new Kindle Paperwhite (8 GB) – Now with a 6.8" display and adjustable warm light



Source: (Amazon, Amazon, 2023)

3.28 Amazon ear buds

Ear buds make activities like phone calls or watch movies or listening to news or music hands free. A good option where you would not like to disturb other persons with you.

Figure 18: amazon basics True Wireless in-Ear Earbuds with Mic, Touch Control, IPX5 Water-Resistance, Bluetooth 5.3, Up to 55 Hours Play Time, Voice Assistance and Fast Charging (Black)



source: (Amazon, Amazon, 2023)

4. Survey

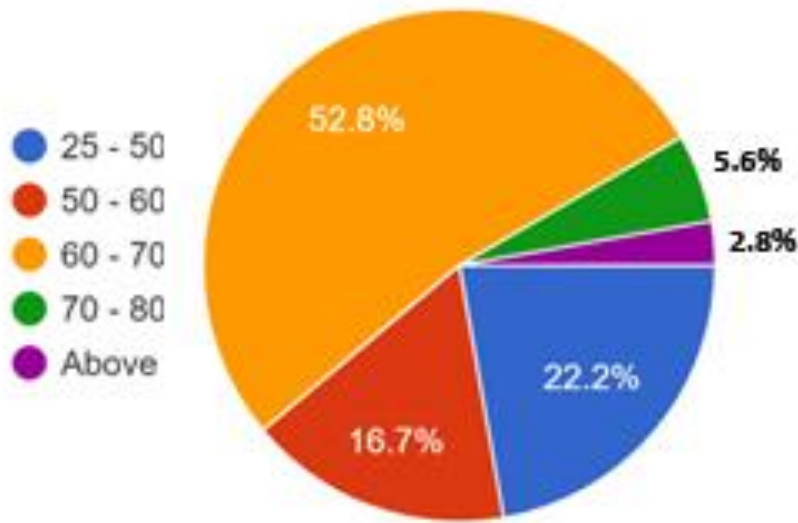
An online survey was conducted among age groups of 25 – 50, 50 – 60, 60 – 70, 70 – 80 and 80 to 90, to know their preference with some technological gadgets. 72 respondents were randomly selected for this online survey. we received valid responses from 70 respondents. The maximum respondents were in the age group of 60-70, which shows the concerns of the age group in terms of transition from the working person to adjustments of the retired life. The age group of 25-50 and 50-60 was chosen for the fact that they are the potential caregivers for their parents or elder siblings. The age groups of 60-70, 70 -80 and 80-90 were chosen to understand their own preferences of digital gadgets.

The distribution of percentage in the age groups of respondents is as follows:

Figure 19: Distribution proportion of respondents as per age groups

Your Age group

72 responses



age group – 60-70 – 52.8 % respondents

age group – 25-50 – 22.2 % respondents

age group – 50-60 – 16.7 % respondents

age group – 70-80 – 5.6 % respondents

age group – 80-90 – 2.8 % respondents

The respondents were asked to give ratings from 1 to 5; 1 being the least useful to 5 being the most useful. The table below shows the questions and the results compiled from the survey in a tabulated format, showing the averages of all the responses for each question and each age group.

Figure 20: Chart showing average linear responses of 1 to 5 across age groups.

Sr.No.	Gadgets using Digital Technology	Age Group					Total average linear responses from 1 to 5, 1= Least useful 5= Most Useful
		25 - 50 Average	50 - 60 Average	60 - 70 Average	70 - 80 Average	80 - 90 Average	
1	Usefulness of wearable panic gadget with alarm	3.6	4.1	3.6	3.0	4.8	3.8
2	Usefulness of Medical alert system with a wearable device after pressing a button to get help quickly in an emergency from a base and monitoring station.	4.1	4.3	3.8	3.5	4.7	4.1

3	Usefulness of health band for self and central monitoring	4.1	4.1	3.6	2.8	5.0	3.9
4	The usefulness of Continuous Glucose Monitoring for specific health conditions.	3.7	4.0	3.6	2.3	4.0	3.5
5	The usefulness of the Call button in your house for a house or medical help	4.1	3.8	4.0	3.8	4.7	4.1
6	The usefulness of motion sensors for door opening and lighting	3.4	3.5	3.6	2.5	5.0	3.6
7	Usefulness of motorized wheel chair with digital panel for the disabled / specially abled	4.1	4.3	3.8	4.0	5.0	4.2
8	Usefulness of digital fitness exercise equipment for maintaining fitness.	3.8	3.2	3.4	4.0	1.8	3.2
9	The usefulness of installing digital lock for main door entry.	3.7	3.2	3.3	3.0	4.0	3.4
10	The usefulness of video conferencing, social media console to keep in touch with family/relatives/friends also help in using/troubleshooting.	3.4	3.9	3.9	4.3	5.0	4.1
11	How would you like to have augmented reality & holographic communication set up to have a realistic meeting experience?	3.5	3.4	3.1	2.3	4.8	3.4
12	How would like to have an online gaming facility to play games with your children/grandchildren/relatives/ friends?	3.2	2.8	2.9	1.5	3.7	2.8
13	Usefulness of digital app for booking private or public vehicles	4.1	4.1	4.4	4.5	2.0	3.8
14	Usefulness of Online shopping app for foods, groceries, and goods	4.0	4.2	4.1	4.3	4.2	4.1
15	The usefulness of temperature and humidity control for your rooms.	3.9	3.8	3.7	3.3	4.3	3.8
16	Usefulness of tracker device to Keep track of and find your items in the Find My app on your cell phone	4.1	3.4	3.6	3.0	4.3	3.7
17	Usefulness of voice assistant facility like Amazon Alexa, Apple Siri, Google Assistant, Microsoft Cortana, and Samsung Bixby.	3.1	3.8	3.2	3.3	4.0	3.5
18	The usefulness of an system with a app like MyGate for digital recording entry/exit of visitors in the campus	4.2	3.9	4.1	3.8	1.8	3.5
Total average linear responses from 1 to 5, 1= Least useful 5= Most Useful		3.8	3.8	3.6	3.3	4.1	
Percentage		76	76	72	66	82	

Wearable gadgets with panic alarm was found most useful by the all age group of 80-90, (4.8) where as medical alert system in the wearable device was found useful across all the age groups.(average 4.1) Central monitoring of health (average 3.9) and glucose (average 3.5) was found most useful across all age groups, respondents said this is the most important device, as their health can be monitored remotely by the doctors and their children or care givers as well. The usefulness of the call button was found useful across all age groups.(average 4.1) Motion sensor devices (average 3.6) and motorized wheelchairs (average 4.2) were found moderately useful for the first four age groups, but 100% of respondents gave it the highest rating. Digital fitness devices were found least useful in the age group of 80-90 (average 3.2) but was found moderately useful in all the other age groups. Digital locks.(average 3.4) were found moderately useful in all age groups Video conferencing .(average 4.1) and holographic projection facility.(average 3.4) and was found the most useful in the age group of 80-90, and moderately useful in all the other age groups Online gaming (average 2.8) was found least

useful in all the categories of gadgets by most age groups. Online apps for booking vehicles (average 3.8) was found least useful in all the age group of 80-90. shopping apps (average 4.1) were found moderately useful in all the other age groups. Temperature and humidity control (average 3.8) was required by many. Tracker devices (average 3.7) and voice assisted devices (average 3.5) were found moderately useful in all age groups. Digital entry/exit apps (average 3.5) were found moderately useful in the first four age groups, while was found to be the least useful in the age group of 80-90. Kindle and earbuds were not included in the survey since they are well-known and used by many

5. Results

Survey results over all show a mixed response towards the use of digital technology, yet on an average 66 to 82 percent people prefer using gadgets of digital technology. A marked trend shows majority of the elderly preferring health related gadgets and apps, online gaming and Hologram meeting facility. Younger people do not prefer health monitoring apps for now but they do prefer other gadgets.

6. Discussion

In research paper by Magdalen Velciu and others, on “How Technology-Based Interventions Can Sustain Ageing Well in the New Decade through the User-Driven Approach, the authors have made a survey on an important aspect of use of common digital devices like smart phones, tablet etc. The results show that the seniors are open to adapting to digital technology gadgets, especially the common ones. (Magdalen Velciu, 2023)

An important change is observed if we compare the seniors of this decade, i.e. 2020s, to the seniors of earlier decade. The seniors of this decade are more likely to adapt to digital technology, as they have used electronic gadgets and computers in their professional lives, at some point or the other. Some of them are likely to be tech-savvy and even may be pioneers in their own field of work. They have seen the world without gadgets and understand the usability of and advantages in daily life.

The second aspect that emerged out of this research is that physical abilities of people get reduced due to aging and digital technology can be used to compensate for this. A lot of research is being done world over, on this issue in terms of wearable technology and related software, to better understand usefulness of digital devices for ease of living of senior citizens.

In research paper by Gaja Zager on “Assistive digital technology to promote quality of life and independent living for older adults through improved self-regulation: a scoping review” the author discussed ways and means to use ICT enabled applications and gadgets to successfully manage their daily activities using digital technology. (Gaja Zager Kocjan ORCID Icon, 2022).

The third aspect emerged out of this research is that of security of data that is captured in these gadgets, and the secure way to store it. Not enough understanding is available on this issue, but as more and more people or senior citizens start using this technology, the data security may emerge as a critical aspect of research, and it may be taken up by the authors of this paper in their further research.

7. Conclusions

The pandemic of 2020 accelerated the use of digital technology, and many seniors also used the same. This research tries to prove, that there are many benefits of assistive digital technologies that can be of use for senior citizen communities in India. These can make their life easier, safer, enjoyable and can facilitate quick interaction with children / relatives and friends living far away in the country or anywhere else in the world. Help, guidance and training in using the electronic gadgets is necessary. If digital technological gadgets are made available to seniors, then the survey shows that majority of



senior citizens in India may prefer to use them. Although it may take some time to get used to the gadgets, they will get used to them then eventually will use them with ease to make daily chores easy and hassle free.

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