Leveraging Digital Technologies to Improve Quality of Life for Older persons.

Case Studies from China, Japan and the Republic of Korea.

Disclaimer:

Acknowledgement

List of Abbreviations

Abbreviation	Full Name
CCRC	Continuing Care Retirement Community
CNNIC	China Internet Network Information Center
Dx	Digital Transformation
ECG	Electrocardiogram
FY	Fiscal Year
GDP	Gross Domestic Product
GPS	Global Positioning System
ICT	Information and Communication Technology
IoT	Internet of Things
KPIs	Key Performance Indicators
MIPAA	Marid International Plan of Action on Ageing
NGOs	Non-governmental Organizations
OECD	The Organisation for Economic Co-operation and Development
RMB	Renminbi
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UX/UI	User Experience/User Interface
VR	Virtual Reality
WHO	World Health Organization

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INTRODUCTION

The global demographic landscape is shifting significantly as the proportion of people aged 65 and older is set to rise sharply by 2050, especially in East Asia. This ageing trend poses challenges such as strain on public health, pension sustainability, and a shrinking workforce. However, the "silver economy" also creates economic opportunities, particularly in East Asia, by engaging older adults in society, reducing isolation, and promoting well-being.

Ageing societies require cities to be redesigned with age-friendly infrastructure, universal design, and enhanced technology and digital transformation has a role with the public, private, and nonprofit sectors each contributing. Governments by supporting inclusive policies and access, businesses through the development of senior-focused products, and nonprofit organizations by providing community and social support.

Digital adoption also faces hurdles, including connectivity gaps, digital literacy issues, and gender inequalities. Many older adults in rural areas, especially women, experience limited access and skills, leading to digital isolation. Addressing these challenges requires collaboration, digital standards, and targeted support systems.

This report reviews strategies in China, Japan, and the Republic of Korea, reviewing policies and programs aimed at improving life quality for older adults. Through case studies, it highlights trends, challenges, and lessons in creating inclusive, tech-driven ageing societies.

Chapter 1 provides an overview of the importance of age-friendly cities and the roles that a digital society plays in equipping these with improved productivity and connectivity to support loneliness and keeping families connected. This is followed by Chapter 2 which will introduce the profiles of China, Japan and the Republic of Korea as key countries of interest for the case studies in the East and North-East Asia region and their demographic transitions, including policies undertaken to adapt to this change.

Individual case studies are presented in Chapter 3 from China, Japan and the Republic of Korea, highlighting the use of digital technologies to improve the quality of life and cohesiveness of communities. Finally, Chapter 4 summarizes the importance of lessons learned in building age-friendly cities and the need for continuous review and improvement due to the ever-evolving nature of the issues faced by demographic and technological change.

CREATING AGE-FRIENDLY DIGITAL SOCIETIES

CHAPTER 1: CREATING AGE-FRIENDLY DIGITAL SOCIETIES

The global demographic landscape is experiencing a significant transformation, with the proportion of individuals aged 65 years or older projected to increase from 13.4 percent in 2023 to 21.8 percent by 2050. This demographic shift is principally attributed to a sustained reduction in fertility and mortality rates[1] and is particularly pertinent for East Asian countries such as China, Japan and the Republic of Korea, which have experienced a substantial increase in the number of older persons. However, this demographic trend is projected to significantly impact many countries around the world with more than 25 percent of their populations aged 60 or older by 2050 according to WHO projections.

Population ageing is a global and regional megatrend that has important implications for all aspects of society and can bear a number of challenges, which range from impacts on public health systems, the sustainability of pension systems, shrinking proportion of working age population. However, an older population is associated to increased relative prosperity, as there is a correlation between incomes, reflected in access to healthcare, nutrition and quality of life that results in increased lifespans. Factors such as migration, can also significantly alter the outlook for a country on the projected ageing of its population and the challenges may also be highly localized such as in large gentrifying neighbourhoods in cities or in rural towns which have struggled to retain a younger population due to migration for economic opportunities or lifestyle choice.

Together with urbanization, ageing also requires us altering the way cities are designed, including the tools and infrastructure to ensure that they are age friendly. This concept of age-friendly cities and built infrastructure, calls for a proactive approach towards planning and designing cities to aid their transformation towards age-readiness in the following areas as outlined by Das, Chapman, & Jain, 2022:[2]

- **a.** Universal design,
- **b.** Housing solutions,
- **c.** Creating multigenerational spaces,
- **d.** Better transportation,
- **e.** Technology,
- **f.** Efficient spatial forms, and
- **g.** Inclusion and progress toward age-readiness

1 United Nations Department of Economic and Social Affairs, Population Division (2022). World Population Prospects 2022: Summary of Results. UN DESA/POP/2022/TR/NO. 3

2 Silver Hues: Building Age-ready Cities, 2022, World Bank, Available Online: https://openknowledge.worldbank.org/entities/publication/d4b84e5a-8d31-5b32-b8ad-3d23b7f0c61e

Many of those reasons such as an inclusive society for older persons and disability are highly interlinked, including tapping into the growing economic and consumption power of adults at the peak of their careers.[3] The move towards smart and well-designed cities, also works in favour of retrofits to minimize energy losses and improving overall productivity and security. Many of the reasons for designing age-friendly cities also highlight the importance of linking the development of new tools towards overall policy objectives while also ensuring the literacy and capacity building efforts to utilize such tools are well developed.

Figure 1: Action areas to enhance age-friendly cities (World Bank, 2022)[2]

1.1 Sectoral Roles in a Digital Society

In recent decades, amidst the digital transformation, East Asia has experienced a significant demographic shift characterized by an ageing population. This demographic change has resulted in a growing interest in and recognition of the "silver economy" – a term referring to the economic activities and opportunities associated with older persons. As the proportion of older persons increases, East Asian countries are faced with numerous social, economic, and healthcare challenges and opportunities. The Silver Economy provides opportunities for economic growth and social inclusion for older persons. It is not only about creating economic opportunities for older persons but also about promoting social inclusion and

ensuring they can participate fully in the society.[4] The Silver Economy provides opportunities for them to remain active and engaged in their communities, which can help to reduce social isolation and promote social connectedness.[5] Moreover, it can empower older persons by providing them with opportunities to participate in the labour market and contribute to society.[6]

Adapting to these changing circumstances, the different sectors of societies each have their own unique role to play in this digital transformation promoted by the silver economy. This can be seen in Figure 3 below, highlighting key sectors which the public, private sectors and civil society influence.
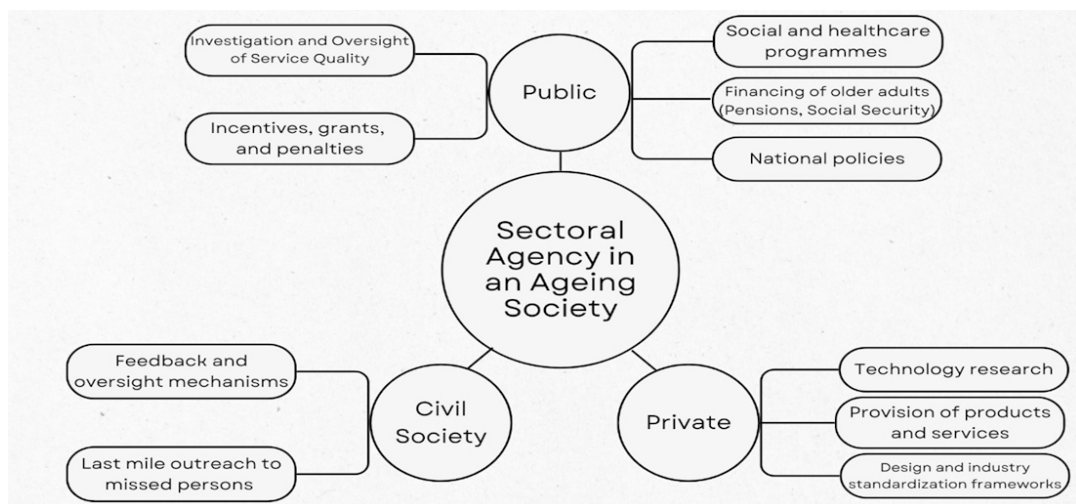
Figure 2: Figure showing the key areas that the public sector, private sector and civil society typically exert influence over.

The public sector plays a crucial role in developing policies, regulations, and legislation that promote the well-being of older persons. Governments can establish frameworks for age-friendly communities, social security systems, healthcare provisions, and prevention of abuse and ageism. Public sector initiatives often focus on providing universal access and equitable distribution of services. It also has critical financing roles for services for older persons.

The private sector brings innovation, entrepreneurship, and market-driven solutions to address the needs of older persons. Businesses can develop products, technologies, and services that enhance the quality of life for older individuals, such as assistive devices,

4 Active Ageing: A Policy Framework, WHO , 2002, Available Online: https://iris.who.int/handle/10665/67215
5 From Exclusion to Inclusion in Old Age: A Global Challenge, Scharf and Keating, 2012, The Policy Press
6 Active Ageing in Asia, A. Walker and C. Aspalter, 2015, Routledge

home modifications, healthcare technologies, and personalized services. Private sector involvement can drive economic growth and create employment opportunities in the ageing-related industries.

Nonprofit organizations play a crucial role in addressing the social, emotional, and community aspects of ageing. They often focus on advocacy, community engagement, social services, and volunteerism. Nonprofits can provide support for caregivers, establish community centres, organize educational programmes, and promote social inclusion among older persons. They also fill gaps in services not covered by the public or private sectors.

1.2 Challenges in Digital Adoption and Adaptation

Digital Innovations provide the means to improve productivity, through automation, remote monitoring and offsetting labour requirements, helping to drive down supply side costs and allowing better provision of goods and services to the whole society while adapting towards the new demographic realities. In the implementation of the Madrid International Plan of Action on Ageing (MIPAA), there is need for developing and implementing policies and programmes that support active ageing and the creation of age-friendly environments that promote social inclusion and health needs. At the 2022 review and appraisal of MIPAA across the Asia-Pacific, member States welcomed the role of civil society, including organizations of older persons, academia, research foundations, faith-based organizations, community-based organizations, caregivers, and the private sector, in supporting older persons and Governments in Asia and the Pacific on issues related to ageing and related capacity building programmes.[7]

However, challenges exist towards the implementation of transformative digital technologies in improving the life of older persons. In East Asia, connectivity challenges have been significantly improved, although some gaps still exist, for example in China, which has a large land mass and population, urban and rural divides with regards to connectivity access still exist, even as 5G coverage exceeds 90 percent for the country. [8]

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7 Report and Outcome Document for the Asia-Pacific Intergovernmental Meeting on the Fourth Review and Appraisal of theMadrid International Plan of Action on Ageing. Online: https://www.unescap.org/events/2022/asia-pacific-intergovernmental-meeting-fourth-review-and-appraisal-madrid-international#

8 The 52nd Statistical Report on China's Internet Development, August 2023, CNNIC, Available Online: https://www.cnnic.com.cn/IDR/ReportDownloads/202311/P020231121355042476714.pdf
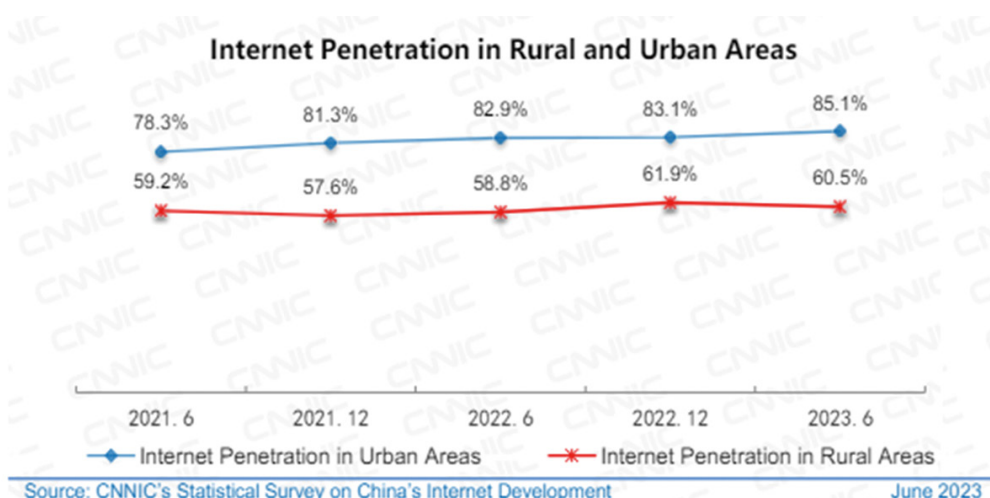
Figure 3: Internet Penetration in China for Urban and Rural Areas as per CNNIC Statistical Survey.

This is especially true for rural communities, which are widely dispersed and account for a significantly smaller share of the population, as reflected in Figure 5. With urbanization increasing, there is a concern that rural populations will be left behind regarding digital connectivity.
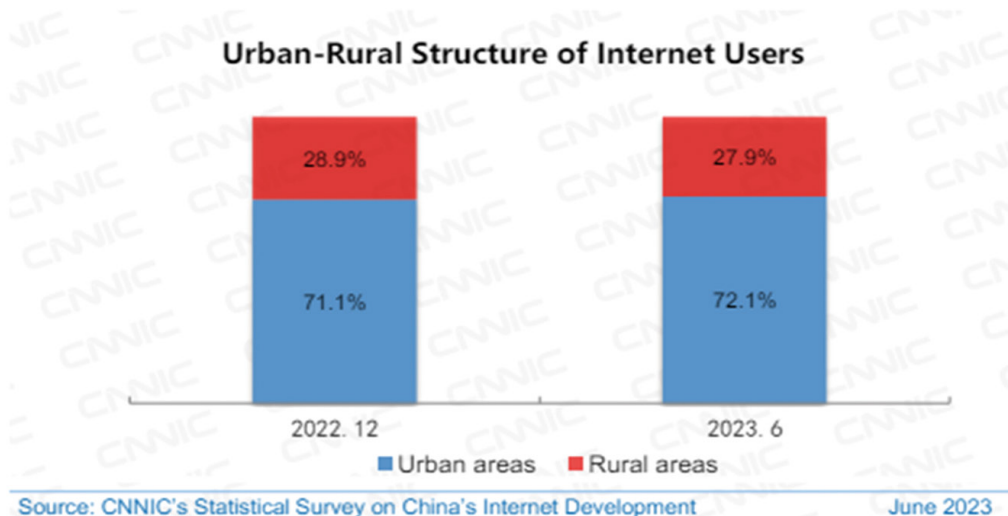
Figure 4: Urban and Rural Users in China as per CNNIC Statistical Survey 2023.

This discrepancy between differential access to the internet between urban and rural areas and the decreasing costs of connectivity hides a challenge which is highlighted by GSMA[9], which is the usage gap, with key reasons being not having the relevant digital skills to utilize

9 The State of Mobile Connectivity 2023, Global System for Mobile Communications (GSMA), October 2023, Available Online: https://www.gsma.com/r/wp-content/uploads/2023/10/The-State-of-Mobile-Internet-Connectivity-Report-2023.pdf

computers or smartphones, concerns over safety and privacy, as well as a lack of relevant content and services for individuals or groups.

One of the key areas that is being targeted in East Asia is digital literacy which is also supported by ESCAP.[10] Digital literacy ensures that individuals are well equipped to use computing devices in their everyday lives as digital mediums are increasingly becoming prevalent for use in commercial, retail and government services. It also helps to maintain connections between family members and friends, with increasing rates of urbanization and migration, and to safely understand how to obtain information and use digital services safely.

To improve internet utilization, closer collaboration is needed with the private sector in the development of both content and services for all age groups but also for digital standards in user interface or UX/UI design to ensure compatibility between devices and for ease of use, such as design for disability and older adults.[11] Another key challenge is also the deployment of artificial intelligence, where training biases could exist, that could lead to reduced quality of service, as a result of databases and training methods that could lack input from older persons.[12]

Notable gender challenges arise where longer term gender discrepancies already existed, such as lack of education, discrimination, income access and statistically as women in general tend to outlive men.[13] Thus, women at this present point in time, are more likely to face challenges with digital literacy and loneliness in their later years of life as their partner passes away. Practical policies in resolving digital literacy issues, community and tools to support older persons as they age and forming support networks, would also need to consider gender dimensions and how to approach men and women issues as they age.

1.3 Objective of The Report
This study seeks to provide insights into the strategies, policies, technologies, and programmes adopted by East Asian countries to leverage digital technologies to improve the quality of life for older persons, including efforts led by the private sector and civil society in creating sustainable and inclusive development in the face of an ageing society.

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10 Digital literacy support encompasses education from young children, through to older adults and also includes supporting dialogue and knowledge sharing of programmes amongst countries of the Asia-Pacific.

11 UX Design Proposal for Educational Software Service Middle-aged and Elderly, YJ Yoon and KS Ha, 2021, The Journal of the Korea Contents Association, Volume 21, Issue 10, Pages 227-239.

12 Age-related bias and artificial intelligence: a scoping review, Chu, C.H., Donato-Woodger, S., Khan, S.S. et al., 2023, Humanit Soc Sci Commun 10, 510 (2023). Available Online: https://doi.org/10.1057/s41599-023-01999-y

13 Gender and Ageing Briefs, Help Age International, 2022, Available Online: https://www.helpage.org/silo/files/gender-and-ageing-briefs.pdf

A series of case studies including/related to policies, technologies and programmes will be presented to highlight interesting learning experiences in China, Japan and Korea on means to improve the quality of life for older persons in the context of rapid population ageing. In addition, analysis of trends, opportunities and challenges for improvements increasing availability and access to digital technology will be provided.

An inclusive ageing society requires a comprehensive approach that addresses the diverse needs and preferences of older persons. Exploring public, private and nonprofit sectors can leverage the strengths and resources of each to provide a wide range of services, programmes, and support mechanisms. The report adopts an analytical framework from public sector, private sector and non-profit sectors to discuss the policies, implementations and lessons learned to promote an inclusive society for older persons.

COUNTRY PROFILES AND POLICIES

CHAPTER 2: COUNTRY PROFILES AND POLICIES

This chapter covers the country profiles and key policies in East Asia that have enabled the development of digital tools and technologies that facilitate the improvement of quality of life in China, Japan and the Republic of Korea, in the context of rapid population ageing.

2.1 China

In recent years, the rapid application of new technologies as represented by artificial intelligence, big data and the Internet of Things, has had a dramatic impact on China's traditional care model for older adults. Supported by digital innovations, smart care for older persons has provided new solutions to improve coverage and care for the vast aged population in China, although there remain many urgent issues that need to be addressed. Faced with a significant continuous growth of an ageing population compared to the gradual increase in capacity of care needs, multiple measures were needed to promote the development of high-quality smart care for older persons.

2.1.1 China's Population Ageing and Development of New Technology

In China, the closest definition to the concept of smart care for older persons comes from the two versions of the Action Plan for the Development of the Smart Health Elderly Care Industry[14]. Based on the relevant statements in these two action plans, the definition of smart care for older persons can be understood as: using digital products and information system platforms as carriers, achieving effective integration and optimization of personal, family, community, institutional and care resources, promoting the intelligent upgrading of care services, and meeting various care needs through various practices and related activities.

The rapid development of smart care for older persons in recent years fundamentally stems from the emergence of social demand, whilst also benefiting from the continuous consolidation of technological advancements. The rapid onset of population ageing and the continuous increase in the size of the aged population are the demand foundations for the emergence of smart care. The popularization of intelligent terminal kiosk products in China has also led to the continuous consolidation of the foundation of the Internet of Things, providing a material foundation for the development of smart care.

China entered an ageing society in 2000 its speed of ageing is unprecedented. At the end of 2023, the population aged 60 and above in China reached 297 million, accounting for 21.1

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14 Action Plan Policy Document. Available Online in Chinese: https://www.gov.cn/zhengce/zhengceku/2021-10/23/5644434/files/e7f3 3c3721144446aece8dfc2141d3bb.pdf .

percent of the total population.[15] In absolute numbers, China has become the country with the largest aged population in the world.

Since the establishment of the People's Republic of China, there have been three baby booms in China seen in Figure 6 below. As the children born during the second and third baby boom periods enter the aged stage, China's aged population will grow rapidly in the next 20 years. Based on the current situation, it is estimated that the population aged 60 and above in China will reach around 490 million by the middle of this century, doubling the proportion among the total population today and reaching around 40 percent.[16]
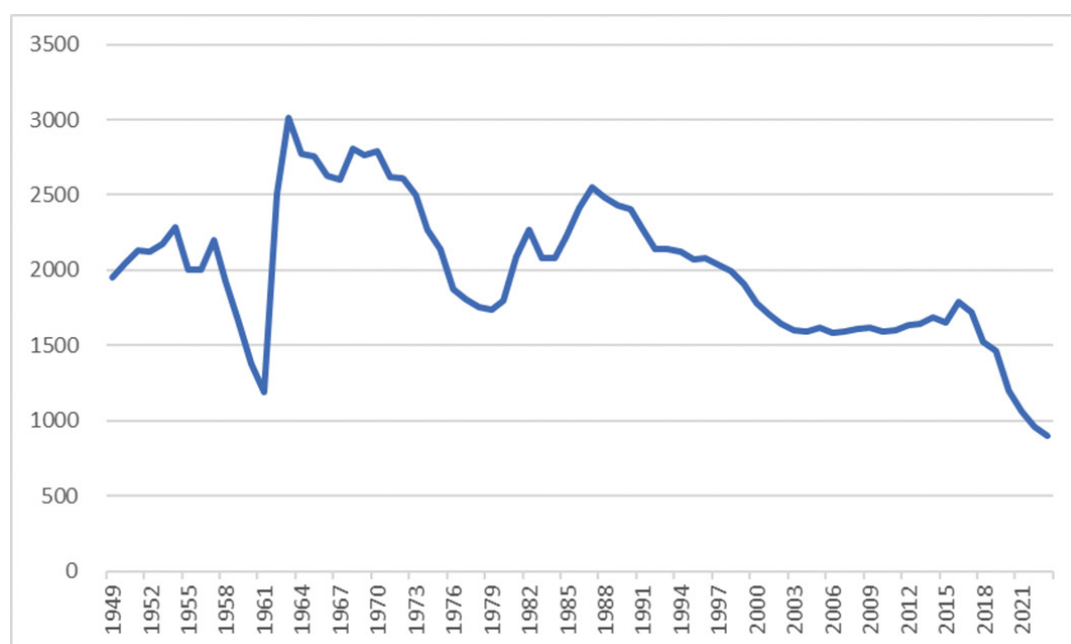
Figure 5: China's Yearly Births: 1949-2023 (10s of Thousands)

Thanks to the continuous improvement of living standards and the continuous advancement of medical technology, the average life expectancy in China is expected to increase. Individuals are living longer, and this trend will lead to a doubling in the size and proportion of aged people aged 80 and above amongst the population. The projection shows that the population of people aged 80 years old and over, will gradually increase from 31.37 million in 2019, to 69.05 million in 2035, and 126 million in 2050, an increase from 12.6 percent to 25.3 percent of the total population.[17] China's fertility rate has been continuously declining,

15 China Statistics. Available Online: https://www.stats.gov.cn/sj/zxfb/202402/t20240228_1947915.html .
16 Healthy Aging: Driven By Policy and Industry, China Development Publishing House, 2019.09.
17 Healthy Aging: Driven By Policy and Industry, China Development Publishing House, 2019.09.

with the yearly births falling below 10 million in 2022 and 2023, reaching 9.56 million and 9.02 million respectively. As a result of multiple factors, including improved education, urbanization, the increasing availability of social services such as family planning, and changing values, current fertility rates are projected to remain around the current level and lead to a reduction in the working age population and labour shortages in certain sectors.

Furthermore, the physical functions of people gradually weaken with age, increasing the likelihood of living with some form of impairment. In China, the number of older persons with at least one impairment, is projected to increase to over 100 million from over 40 million by 2050. This increase, is expected to increase demand for social care services, rendering the traditional care model unsustainable, and necessitating smart care systems.

Compared with most countries in the world, the penetration rate of intelligent terminals and the Internet in China has been rapid. By December 2023, the number of Internet users in China reached 1.092 billion, and the Internet penetration rate has reached 77.5 percent.[18] Three telecom enterprises developed 2.123 billion end users of the Cellular Internet of Things by June 2023, accounting for 55.4 percent of the number of mobile network terminal connections. By December 2023, China has built a total of 3.377 million 5G base stations, covering all prefecture level city/county/district, and developing 2.332 billion cellular IoT terminal users, accounting for 57.5 percent of the mobile network terminal connections. The rapid popularization of intelligent terminals has strengthened the foundation for the Internet of Things, and the application scenarios of smart technology and digital innovation, including care services, have also developed more rapidly in practice.

2.1.2 Policy Framework to Promote the Development of Smart Care for Older Adults

Judging from the existing policy frameworks, smart care for older persons mainly follows two paths: first, gradually incorporating "smart" elements in the construction of care service systems; second, expanding the application of smart technology and gradually increasing its application to care services.

With the increase of actual demand and the support brought by technological progress, some regions in China have gradually improved Internet based and telephone-call based service platforms for older persons. The application of new generation technologies in old age care is increasing. In December 2011, the General Office of the State Council issued the

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18 China Academy of Information and Communications Technology.

"Construction Plan for the Social Elderly Care Service System (2011-2015)" [19], which clearly stated i "strengthen the informatization construction of elderly care services, rely on modern technological means, provide efficient and convenient services for older adults, standardize industry management, and continuously improve the level of elderly care services.".

In September 2013, the State Council issued the document of Several Opinions on Accelerating the Development of the Elderly Care Service Industry, ushering in a new era of rapid development in China's care industry.[20] The second main objective of this document is to "vigorously develop the home-based elderly care service network", which clearly proposes the task of "developing home-based network information services", specifically including that "local governments should support enterprises and institutions to use the Internet, the Internet of Things and other technical means to innovate home-based elderly care service models, develop e-commerce for older persons, build a home-based service network platform, and provide emergency calls, housekeeping appointments, health consulting, goods purchasing, service payment and other services suitable for older adults". This means that in the planning to promote the rapid development of the care service industry, full attention has been paid to actively exploring the role of new technologies.

In January 2014, the National Development and Reform Commission and 12 other departments jointly issued a notice on Accelerating the Implementation of the Information Benefiting the People Project. Among the key tasks proposed, the "Action Plan for Information Benefiting the People in Elderly Care Services"[21] was proposed, which clarified the establishment of a service mechanism for network interconnection and information sharing in care service institutions and medical care institutions. The focus was on promoting the digitalization of care service institutions, promoting remote health monitoring, expanding the coverage of professional services in care institutions, and promoting the integrated development of assisted care, health care, and medical services. Pilot projects were first launched in 200 care service institutions, significantly improving the level of care information services. In the "Community Service Information Benefiting the People Action Plan", it is proposed to "pilot projects in 450 communities in advance, significantly enhancing the capacity of community elderly care services.".

19 Construction plan for the social elderly care service system policy document. Available Online in Chinese https://www.gov.cn/zwgk/2011-12/27/content_2030503.htm

20 Opinions on accelerating the development of the elderly care service industry. Available Online in Chinese https://www.gov.cn/gongbao/content/2013/content_2496392.htm

21 Action plan for information benefitting the people in elderly care services document. Available Online in Chinese https://www.gov.cn/gzdt/2014-01/15/content_2567048.htm

In July 2015, the Guiding Opinions of the State Council on Actively Promoting the "Internet plus" Action[22] was released, which listed the "Internet plus" service for the benefit of the people as the sixth key action, clearly proposed "accelerating the development of Internet based medical, health, elderly care, education, tourism, social security and other emerging services", and took "promoting the development of smart healthcare and social care industry" as a specific task, clearly proposed "relying on existing Internet resources and information power, based on the community, to build an elderly care information service network platform, provide nursing care, health management, rehabilitation care and other home-based care services. Encourage care service institutions to use mobile Internet based portable physical examination, emergency call monitoring and other equipment to improve the level of care services".

In February 2017, the Ministry of Industry and Information Technology, the Ministry of Civil Affairs, and the National Health and Family Planning Commission jointly released the Action Plan for the Development of the Smart Health and Elderly Care Industry (2017-2020),[23] which launched an action plan to integrate intelligence, health, and assisted care to promote industrial development. In July of the same year, three ministries issued a notice on conducting pilot demonstrations of smart health and assisted care applications, marking the beginning of the demonstration development stage for smart care for older persons.

In December 2021, the General Office of the National Health Commission issued a notice on Determining the Second Batch of Pilot Institutions for Remote Collaborative Services of Elderly Health and Medical Care Integration,[24] aiming to further improve the intelligence level of medical care integration services. 346 medical care integration institutions, including the Exhibition Road Guotou Health and Elderly Care Reference Centre (Medical Room) in Xicheng District, Beijing, were selected as the second batch of pilot institutions for remote collaborative services of health and medical care integration.

As the special plans continue to advance, smart care for older persons has also been incorporated into the overall national plan. In 2021, the "14th Five Year Plan for National Economic and Social Development and the Long-Range Objectives for 2035"[25] was released,

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22 Guiding opinions of the state council on promoting the internet. Available Online in Chinese https://www.gov.cn/zhengce/content/2015-07/04/content_10002.htm

23 Action plan for development of the smart health and elderly care industry. Available Online in Chinese https://www.gov.cn/xinwen/2017-02/20/content_5169385.htm#1

24 Second pilot batch of institutions for remote integrated care and medical services. Available Online in Chinese http://www.nhc.gov.cn/lljks/zcwj2/202201/3c6363f290ba4126b0e06921e261c005.shtml

25 China's 14th five year plan for 2035. Available Online in Chinese https://www.gov.cn/xinwen/2021-03/13/content_5592681.htm

with the fifth article titled "Accelerating Digital Development and Building a Digital China". For the first time, digital development was included as an independent part in the national five-year plan for national economic and social development. In Chapter 16, "Accelerating the pace of digital society construction," it is clear that "focusing on key areas such as education, healthcare, and elderly care, promoting the inclusive application of digital services, and continuously improving the sense of gain for the public. Promoting the digitization of resources in public service institutions such as schools, hospitals, and nursing homes, increasing openness, sharing, and application efforts. Promoting the common development and deep integration of online and offline public services.".

In addition to improving policies for implementation, relevant departments are also gradually enhancing the curated catalogue of corresponding products and services based on practical implementations. In June 2023, the Ministry of Industry and Information Technology, the Ministry of Civil Affairs, and the National Health Commission issued a notice announcing the "Catalogue of Smart Health and Elderly Care Products and Services Promotion (2022 Edition)",[26] which listed a total of 54 product-oriented enterprises and 25 service-oriented enterprises.

After several years of efforts, smart care for older persons has become an important component in addressing China's population ageing, improving the care service system, and promoting industrial development. On January 15, 2024, the General Office of the State Council issued the "Opinions on Developing the Silver Economy and Enhancing the Welfare of the Elderly",[27] which introduced 26 specific measures to promote the development of the Silver Economy from four aspects. Article 15 of it is to "create a new business model for smart health and elderly care", proposing to "improve the promotion catalogue of smart health and elderly care products and services, promote the integration and application of new generation information technology, mobile terminals, wearable devices, service robots and other intelligent devices in home, community, institution and other elderly care scenarios, develop intelligent products for health management, elderly care monitoring, and psychological comfort, promote the application of intelligent nursing robots, home service robots, intelligent locating terminals and other intelligent devices. Encourage the use of virtual reality and other technologies to carry out display and experience of elderly products and services.".

26 Catalogue of smart health care products and services as maintained by the ministries as at June 2023 https://wap.miit.gov.cn/zwgk/zcwj/wjfb/tg/art/2023/art_df4850371fdd412bbb81f03a30d82e8d.html

27 Opinions for the development of the silver economy. Available Online in Chinese https://www.gov.cn/zhengce/content/202401/content_6926087.htm

It is not difficult to see from the above policy changes, that both technologies and its attendant policies are improving simultaneously in its application to care services and products. In addition to the active integration of new technologies, eliminating barriers for older adults' adoption of these have also become another important issue for policy improvement.

In November 2020, the General Office of the State Council issued the Implementation Plan for Effectively Solving the Difficulties of Elderly People in Utilizing Intelligent Technology,[28] which established a long-term mechanism to address the inconvenience faced by older people who do not know how to access the internet or use smartphones, and the increasingly prominent problem of the "digital gap" in daily life such as travel, medical treatment, and consumption. Twenty key activities have been proposed in seven sectors, including service guarantees for older persons, transportation, medical treatment, consumption, cultural and sports activities, administrative services, and the use of intelligent products and services, in response to emergencies.

In June 2022, the National Health Commission and the National Office for Ageing issued a notice on Deepening the "Smart Elderly Assistance" Campaign in 2022. Building on the work of 2021, the "Smart Elderly Assistance" public welfare campaign continued to be conducted, expanding its scope to 14 cities such as Shijiazhuang. Training activities have been conducted through recruiting older volunteers and forming volunteer service teams. The National Office for Ageing guides the China Population Welfare Foundation and other units to conduct the "Blue Vest Public Welfare Action" nationwide. Through 2000 offline "Smart Elderly Assistance" classes and 20000 volunteer on-site services, combined with various forms such as online lectures on smartphone use and anti-fraud, it helps older people improve their smartphone operating skills and enhance their awareness of anti-fraud. The core content of these activities is aimed at addressing the difficulties that they encounter in the application of intelligent technology in daily consumption, transportation, medical treatment, and business scenarios. The focus is on using smartphones for inquiry and other aspects, and various methods such as organizing face-to-face lectures are used to help older people improve their ability to use intelligent technology and resolve the practical difficulties encountered in their lives.

28 State council implementation plan to resolve challenges for older people in using smart technology. Available Online in Chinese https://www.gov.cn/zhengce/content/2020-11/24/content_5563804.htm

2.2 Japan

2.2.1. Japan's Population Demographics and Need for Digital Transformation

The population of Japan is already an aged population with a proportion of the population aged 65 at 29.8 percent in 2024. Japan already surpassed the "ageing" population definition back in 1994.[29]

In terms of the working-age population, the population aged 15 to 64 peaked at 87.16 million in 1995, then began to decline, reaching 74.21 million in 2022, which is 59.4 percent of the total population. Currently, the pattern of ageing in Japanese society has shifted from a phase in which the actual number of senior citizens was growing rapidly to a phase in which the number is not increasing much, but the relative proportion of those seniors to the overall population is rising as the working-age population is decreasing as shown in Figure 7. Because of the decline in working-age population, there is a need to improve work productivity and continue active participation in the labour force. Facing this phenomenon, there is a need to implement comprehensive strategies involving technological innovation, policy reforms, and changes in workplace practices to improve productivity.

Japan: Population by Age Group, 1950–2050

Suggested citation: AHWIN, "Data on Aging," www.ahwin.org/data-on-aging; compiled based on United Nations, Department of Economic and Social Affairs, Population Division, World Population Prospects: The 2022 Revision, Key Findings and Advance Tables (2022).
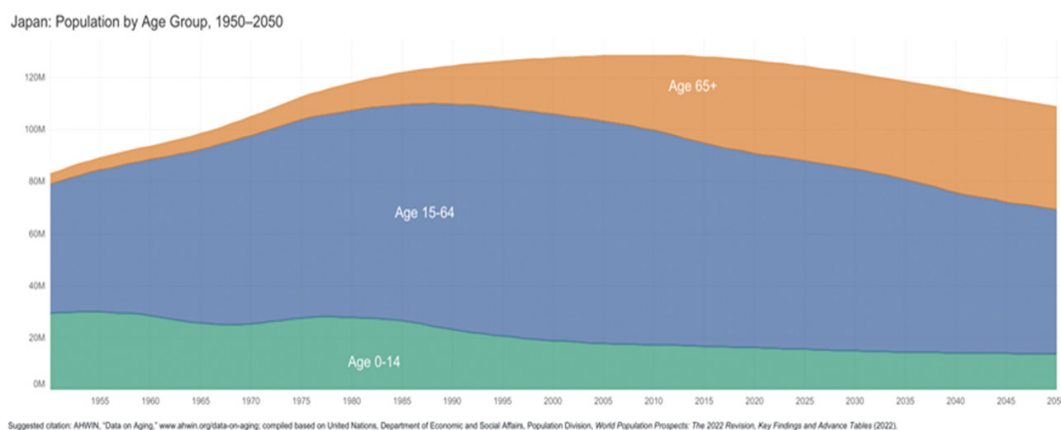
Figure 6: Japan Population by Age Group, 1950−205030

Furthermore, in Japan, the number of individuals aged 65 and over living alone has been increasing for both men and women. In 1980, the proportion of men and women aged 65 and over living alone was 4.3 percent and 11.2 percent, respectively. By 2020,

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29 Cabinet Office, Annual Report on the Ageing Society FY2023, Koureika no joukyou https://www8.cao.go.jp/kourei/whitepaper/w-2023/html/zenbun/s1_1_1.html

30 Source: AHWIN, "Data on Ageing," www.ahwin.org/data-on-ageing; compiled based on United Nations, Department of Economic and Social Affairs, Population Division, World Population Prospects: The 2022 Revision, Key Findings and Advance Tables (2022).

these proportions had risen to 15.0 percent for men and 22.1 percent for women.[31]

The National Institute of Population and Social Security Research projects that 60 percent of older men living alone in 2050 would be unmarried, and there will be a rapid increase in older individuals living alone without close relatives.[32] This gradual change in living arrangements and the significant increase in older individuals, particularly men, living alone and unmarried could lead to a range of social, economic and health-related problems such as:

- Living alone without close relatives can lead to intense feelings of loneliness and social isolation, which are closely linked to mental health issues such as depression, anxiety and cognitive decline.
- With fewer close relatives, older persons may lack caregivers to assist with daily activities or medial needs. Living alone may also lead to delay in seeking medical help, which can result in worse health outcomes, and one might have to resort to more specialized medical interventions that are usually costly.
- Unmarried individuals without close relatives may have fewer financial resources or lack dual-income support, increasing the risk of financial insecurity.

Addressing these issues requires comprehensive policies and programmes that focus on improving social support, healthcare access, economic security and community engagement for the older population. Facing the country's decline in population and workforce shortage, digital technology through AI monitoring, smart apps and online platforms could play a crucial role in providing a holistic solution to the above issues.

In terms of the actions taken by the public sector, two major government agencies in Japan are acting in this context. The Digital Agency is taking the lead in leveraging digital technologies to accelerate regional revitalization efforts under the concept of a Digital Garden City Nation Vision, which is focused on creating communities where citizens, including older people, can use digital services to live comfortably and happily. The Ministry of Health, Labour and Welfare is implementing initiatives aiming to improve care quality and efficiency, and to reduce caregiver burden using data and evidence-based care. The following shares some initiatives taken by the government aimed at transforming society with regards to digital innovation.

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31 Cabinet Office, Annual Report on the Ageing Society FY2023, Kazoku to setai https://www8.cao.go.jp/kourei/whitepaper/w-2023/html/zenbun/s1_1_3.html

32 National Institute of Population and Social Security Research, Household Projections for Japan (2024), https://www.ipss.go.jp/pp-ajsetai/j/HPRJ2024/hprj2024_gaiyo_20240412.pdf

2.2.2 The "Digital Garden City Nation Vision" of Digital Agency, Japan[33]

The Digital Agency was established in September 2021 to address urgent challenges in Japan, including its aged population, low birth rate, and a decline in productivity and global competitiveness in industries. Guided by the Basic Act on the Formation of a Digital Society, the agency is responsible for planning and coordinating policies for a digital society. It aims to create a future where citizens can choose services that contribute to their preferred forms of happiness using digital technology.

The Digital Garden City Nation Vision has a particular focus on the challenges faced by rural areas in Japan, addressing issues such as population decline, ageing population, depopulation, and the concentration of population in the Tokyo metropolitan area, as well as the hollowing out of regional industries. To address these challenges, the government is seeking to leverage regional revitalization efforts and actively promote the revitalization of rural areas. Amid the rapid development of digital technology, digital solutions are seen as the key to solving social issues in rural areas, enhancing the attractiveness of regions, and creating new sources of value.

The government's basic policy outlines the medium- to long-term direction that the vision aims to achieve and supports local initiatives. Local communities are encouraged to envision the society they aspire to, proactively engage in initiatives toward realizing the vision, and strive for a society where "everyone, anywhere in the country, can live conveniently and comfortably."

A Comprehensive Strategy for the Digital Garden City Nation Vision

Japan has been grappling with a declining population and the related issues such as depopulation in rural areas and the decline of regional industries have become significant challenges. In recent years, however, there has been a notable shift in social trends, with increased interest in telecommuting and younger generations relocating to rural areas, particularly in the aftermath of the COVID-19 pandemic. Furthermore, digital technology is rapidly advancing and becoming increasingly integrated in people's lives.

The government's strategy requires that the national and local governments play complementary roles, working to rectify excessive concentration in the Tokyo metropolitan area and promote diversification. They aim to position the resolution of social issues in

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33 Digital Agency, Digital Garden City Nation Vision, https://www.cas.go.jp/jp/seisaku/digitaldenen/about/index.html

rural areas as a driving force for growth and establish a bottom-up connection from local to national levels.

The Comprehensive Strategy for the Digital Garden City Nation Vision is designed to realize the vision by enhancing and strengthening the policies of each government ministry and agency. It outlines Key Performance Indicators (KPIs) and roadmaps for each policy from fiscal year (FY) 2023 to 2027. Local governments will strive to formulate Regional Comprehensive Strategies by considering the social issues unique to each region and promoting a regional vision that leverages local characteristics and attractions. The national government, as a unified entity, will comprehensively and effectively support local initiatives aimed at realizing these regional visions.

Main KPIs under this strategy:
a. Household coverage rate of optical fibre: 99.9 percent (FY2027)
b. Population coverage rate of 5G: 95 percent (FY2023), 97 percent (FY2025), 99 percent (FY2030)
c. Local public entities with established satellite offices, etc.: 1,000 entities (by FY2024), 1,200 entities (by FY2027)
d. Municipalities establishing Children and Family Centres utilizing digital technology for consultation and support: Aiming for nationwide deployment (1,741 municipalities)
e. Percentage of schools utilizing one device per student in classes almost every day: 100 percent (18,805 elementary schools, 9,437 middle schools) (FY2025)
f. Local public entities implementing initiatives related to new mobility services: 70 percent (approx. 35,000 operators) (FY2025)
g. Percentage of logistics companies achieving Logistics DX through the automation, mechanization, and digitization of logistics operations: 70 percent (FY2025)

2.2.3 The Promotion of "LIFE", Scientifically Based Care for Older Adults[34]

The Ministry of Health, Labour and Welfare (MHLW) is taking initiatives aimed at enhancing care quality, streamlining caregiving operations, and reducing caregiver burden using data and evidence-based care. This is expected to improve the quality of life for older persons and achieve a sustainable caregiving system. The promotion of scientifically based care and ICT utilization are such examples.

"LIFE," promoted by the MHLW in Japan, is part of an initiative aimed at supporting the

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34 Ministry of Health, Labour and Welfare, 科学的介護情報システム（LIFE）について, https://www.mhlw.go.jp/stf/shingi2/0000198094_00037.html

improvement of living functions and health maintenance for older people. LIFE stands for "Long - term care Information system For Evidence" and "Living Independently for Elders" emphasizing the goal of promoting independent living in the community.

Key features include the following:
a.Scientific Approach: LIFE is a scientifically based caregiving programme that utilizes advanced medical and caregiving technologies. It incorporates the latest research findings and technological advancements to support the health management and daily living of older people.
b.Functional Training: Emphasis is placed on functional training for older people, providing tailored training programmes based on individual capabilities and needs. This approach aims to enhance activities of daily living and maintain cognitive functions.
c.Utilization of Health Information: Collection and analysis of health information and lifestyle data of older people allow for the provision of personalized support and advice. This enables preventive measures and early detection.
d.Community Collaboration: LIFE prioritizes collaboration with the local community, leveraging community resources and networks for service provision. The programme aims to support older people throughout the community, contributing to the realization of independent living.

The LIFE programme focuses on improving the Quality of Life (QOL) for older people, emphasizing a scientific approach to health and wellbeing, with the goal of supporting independent living.

2.2.4 The Promotion of ICT Utilization in the Field of Care for Older Adults[35]
The promotion of ICT (Information and Communication Technology) utilization in the field of elder care has various advantages, such as improving efficiency and enhancing the quality of services. The following are some general approaches and considerations for promoting the use of ICT in elder care:
a.Introduction of Electronic Health Records (EHR)
Consolidating patient or user information into electronic health records allows for easy access, facilitating smooth healthcare and caregiving services. This enhances information sharing and coordination.

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35 Ministry of Health, Labour and Welfare, 介護現場におけるICTの利用促進,
https://www.mhlw.go.jp/stf/kaigo-ict.html

b. Utilization of Mobile Applications

The use of mobile applications enables staff and care managers to access patient or user information even when on the go, facilitating real-time updates to care plans and communication.

c. Health Monitoring Systems

Implementing systems for real-time monitoring of patient or user health contributes to early issue detection and preventive care. The use of sensors and wearable technology is a consideration.

d. Communication Tools

Enhancing communication among staff and stakeholders through safe and effective communication tools or platforms facilitates smooth information sharing.

e. Training and Education

Training and education on the appropriate use of ICT for staff are crucial. This ensures effective utilization of systems and the ability to provide appropriate care to patients or users.

f. Privacy and Security Measures:

Adequate measures to protect patient or user personal information and minimize security risks are essential. Reliable ICT systems and initiatives that prioritize privacy protection are required. Combining these approaches ensures that the promotion of ICT utilization in elder care is effective and safe, addressing the unique needs of patients or users in this field.

The introduction of science-based elder care and the promotion of ICT utilization are crucial for improving the quality and efficiency of caregiving in Japan's ageing society. By collecting and analysing data, developing evidence-based caregiving methods, advancing caregiver education, and utilizing ICT, it is expected to provide high-quality caregiving services and build a sustainable caregiving system.

2.3 Republic of Korea

2.3.1 The Republic of Korea's Population Ageing and Social Transformation

The Republic of Korea faces a rapidly ageing population, mirroring a global trend of sustained reductions in fertility rates but at an accelerated pace. By 2050, the Republic of Korea is projected to become the have the world's oldest population, with older persons aged 65 years of older accounting for approximately 40.1 percent of the population.[36] This demographic shift stems from a combination of factors, including a significant decline in fertility rates and increased life expectancy. The Republic of Korea's fertility rate hit a new global low in 2023, with the number of babies expected per woman in a lifetime falling to a mere 0.72, down from 0.78 in 2022.[37],[38] Additionally, life expectancy at birth in the Republic of Korea reached 84 years in 2021, a significant increase from 54 years in 1960.[39] This rise in life expectancy can be attributed to advancements in healthcare as well as improved living standards.

This accelerated population ageing, has been raising concerns about the medical system, social welfare provision, and economic growth. These demographic transitions carry profound implications for societies worldwide, necessitating policymakers to adapt public programmes and services accordingly. Notably, the pace of population ageing, in addition to the proportion of older individuals, is of critical importance. While Western nations have had decades to accommodate demographic changes, the Republic of Korea experienced a transition from 7 percent to 14 percent of its older population proportion in merely 17 years, a sharp contrast to France's century-long trajectory to achieve a similar demographic milestone.36

Demographic shifts carry multifaceted social, economic, and political implications, yet they also offer a platform for reshaping societal perceptions and attitudes towards older individuals. Historically, older persons have often been viewed as lacking in workforce contribution capabilities and dependent on external support. This perspective is exemplified by economists' conventional use of the old-age dependency ratio, computed by dividing the population aged 60 and above by the population aged 15 to 60, to assess the financial implications of pension policies. However, empirical data contradicts this perception, revealing that a significant portion of older persons continue to serve as vital contributors to their families and communities, actively participating in both formal and informal labour

36 Statistics Korea. Demographic structure by gender and age. https://www.index.go.kr/unity/potal/main/EachDtlPageDetail.do?idx_cd=1010

37 Statistics Korea. Birth rates. https://www.index.go.kr/unify/idx-info.do?pop=1&idxCd=5061

38 Kim, A. (2024) Republic of Korea's-lowest fertility rate drops to new record, again. Time.

39 The World Bank. Life expectancy at birth, total (years) – Korea, Rep. https://data.worldbank.org/indicator/SP.DYN.LE00.IN?locations=KR

markets.[40] The rapid pace of demographic transitions and ensuing policy adjustments present an opportunity to establish a fresh paradigm that acknowledges older individuals as active and indispensable members of society.

Challenges and Opportunities Presented by Demographic Change and Digital Innovation
The Republic of Korea faces a unique challenge: a rapidly ageing population coinciding with a booming digital landscape. This demographic shift presents both hurdles and opportunities. On one hand, a shrinking workforce could strain social security systems and hinder economic growth.[41] Additionally, the digital divide – the gap in access and use of technology – could exacerbate social isolation among older persons, who may struggle to navigate online services.[42]

However, digital innovation also offers solutions. Telehealth platforms can connect older persons with healthcare providers remotely, while AI-powered assistants can offer companionship and assistance with daily tasks. Furthermore, retraining programmes can equip older workers with the digital skills needed to remain competitive in the job market. By embracing digital tools and fostering digital literacy among its ageing population, the Republic of Korea can navigate the challenges of demographic change and unlock new avenues for growth and well-being.

2.3.2 Economic Growth and Digitalization in the Republic of Korea
The Republic of Korea has undergone a phenomenal economic and social transformation over the last century. The Korean War (1950-1953) inflicted devastating damage, leaving most of the Korean peninsula's infrastructure in ruins. In 1953, the Republic of Korea's GDP stood at a mere US$67 per capita.[43, 44] However, in a remarkable turnaround, the Republic of Korea has achieved rapid economic growth through a combination of factors. These included a strong focus on exports, government-directed industrial policies, and a highly educated workforce.[45] This success story is evident in its accession to the OECD in 1996. Furthermore, the Republic of Korea became the 24th member of the OECD Development

40 Statistic Korea. 2023 Statistics on older adults. https://kostat.go.kr/board.es?mid=a10301010000&bid=10820&act=view&list_no=427252

41 OECD. Demographic trends in the OECD and Korea. https://www.oecd-ilibrary.org/sites/c62449d6-en/index.html?itemId=/content/component/c62449d6-en

42 Kang H, Baek J, Chu SH, Choi J. Digital literacy among Korean older adults: A scoping review of quantitative studies. Digit Health. 2023 Aug 29. doi: 10.1177/20552076231197334..

43 Bank of Korea. National Account. https://www.bok.or.kr/portal/bbs/P0000598/list.do?menuNo=200454

44 World Bank. GDP (current US$) – Korea, Rep.. https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=KR

45 Asia Society. Population Change and Development in Korea. https://asiasociety.org/education/population-change-and-development-korea

Assistance Committee (DAC) in 2010, marking a historic shift – the first country to transition from being an aid recipient to a donor itself.[46] Mr. Oh Joon, a former Korean Deputy Minister of Foreign Affairs, stated as follow when the Republic of Korea joined the OECD DAC:

"We worked hard to overcome poverty and achieve development. For many Koreans, including myself, it happened in our own lifetime. As a child, I went to an elementary school where we drank milk and ate corn bread that came in containers marked 'United Nations' or 'US Government'. A few months ago, I visited a kindergarten in Mongolia where children were studying with textbooks marked as gifts from the Republic of Korea."

From being one of the poorest countries in the world, Republic of Korea has become a economic powerhouse. Today, it boasts the world's 13th largest economy with a GDP per capita exceeding US$ 32,000.[47] The Republic of Korea is now an export giant, ranking as one of top ten exporters globally.[48] Exports made in the Republic of Korea, including semiconductors, automobiles, ships, smartphones, and rechargeable batteries, have garnered a reputation for high quality and innovation in the global marketplace.

The Republic of Korea has strategically leveraged digital transformation to fuel its economic engine. Government-led initiatives have prioritized high-speed internet infrastructure, resulting in one of the world's fastest broadband penetration rates.[49] This commitment extends beyond mere connectivity, fostering a culture of technological innovation that aligns with Republic of Korea's position as a leader in research and development (R&D) expenditure relative to GDP.[50] This robust digital ecosystem positions Republic of Korea as a frontrunner in the digital age. Conspicuously, the Republic of Korea boasts one of the world's highest smartphone ownership rates, with approximately 98 percent of Republic of Korean adults reported owning a smartphone in 2022.[51] This widespread adoption can be attributed to several factors. Government policies promoting digital infrastructure development played a crucial role. Additionally, the dominance of domestic mobile phone manufacturers like Samsung further fuelled smartphone accessibility and digital culture.[52] Furthermore, the

46 OCED. OCED Development Assistance Committee (DAC) welcomes Korean membership. https://www.oecd.org/fr/cad/oecddevelopmentassistancecommitteedacwelcomeskoreanmembership.htm

47 World Bank. GDP per capita (current US$) – Korea, Rep. https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?locations=KR

48 World Trade Organization (2023). Trade Profiles. ISBN 978-92-870-7393-8. https://www.wto.org/english/res_e/publications_e/trade_profiles23_e.htm

49 Ookla, Speedtest Global Index 2023. https://www.speedtest.net/global-index#mobile

50 World Bank. Research and development expenditure (% of GDP). https://data.worldbank.org/indicator/GB.XPD.RSDV.GD.ZS?most_recent_value_desc=true

51 Wike et al. (2022) Social media seen as mostly good for democracy across many nations, but U.S. is a major outlier. Pew Research Center.

52 Muff, Philippe. (2018). How Republic of Korea Joined the Forefront of the Global Smartphone Market Through Innovation. 10.13140/RG.2.2.26321.45922.

Republic of Korea's digital economy has boomed in recent years, alongside the rise of new big tech companies like Naver, Kakao, and Coupang. Naver, originally a search engine, blossomed into a multifaceted platform, while Kakao's messaging app evolved beyond communication to encompass mobile payments, transportation, and entertainment. Meanwhile, Coupang emerged as a major e-commerce player, expanding further into logistics and delivery. The new digital ecosystem, weaving together mobile payments, transportation, entertainment, and more, shapes the daily lives of Koreans.

Additionally, the Republic of Korea recognizes the transformative potential of Artificial Intelligence (AI) and has established national strategies on AI. In 2019, the Ministry of Science and ICT announced the "AI National Strategy" followed by "Strategy to Realize Trustworthy AI for Everyone" in 2020. This strategy outlines three pillars for ethical and responsible AI development, which are technology, system, and ethics, emphasizing investment in core AI research and development alongside establishing AI safety standards and regulations.[53]

Most recently, the "Digital Bill of Rights" was announced in September 2023. This Bill outlines five key principles: a) Ensuring freedom and rights in the digital environment, b) Promoting fair access to and opportunities in the digital, c) Establishing a safe and trustworthy digital society, d) Fostering digital innovation based on autonomy and creativity, and e) Enhancing well-being for all humans.[54]

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53 The Republic of Korea Ministry of Science and ICT. Strategy to realize trustworthy artificial intelligence. https://www.msit.go.kr/eng/bbs/view.do?sCode=eng&mId=4&mPid=2&pageIndex=&bbsSeqNo=42&nttSeqNo=509&searchOpt=ALL&searchTxt

54 The Republic of Korea Ministry of Science and ICT. A new order for a new era of deepening digitalization presented. https://www.msit.go.kr/eng/bbs/view.do?sCode=eng&mId=4&mPid=2&pageIndex=2&bbsSeqNo=42&nttSeqNo=873&searchOpt=ALL&searchTxt=principle

DIGITAL TECHNOLOGY CASE STUDIES

CHAPTER 3: DIGITAL TECHNOLOGY CASE STUDIES

Healthy ageing is underpinned by the whole lifecycle of a person starting from young, digital literacy and the attendant innovations in the use of digital tools, applications and devices are important not only for the individual but also for governments and organizations in improving productivity and the quality of life for older persons.

3.1 China
3.1.1: 5G Enabled Healthcare – Improving Healthcare Capacity of Communities

Figure 7: Data-linked health measurement systems and databases

City/Country: Hainan Province, China
Project Cost: more than 200 million RMB
Funding Sources: Government Funding
Key Stakeholders: government agencies, healthcare institutions, Tech company, rural older residents
Website: https://mp.weixin.qq.com/s/FmXb68dz7MnApZ2iEG3zig

Background:

Older people's health often deteriorates as they age. Healthcare has become the biggest problem faced by older persons in their lives, and they are also an important target group in current healthcare services. Compared with urban areas, the older persons in rural areas not only have lower health literacy, but also face a "digital gap", unable to enjoy convenient medical services, and face problems such as high transportation and medical costs, due to a

long distance to seek medical treatment in their daily life.

To provide convenient medical treatment for older persons in rural areas, Hainan Province has made full use of new technologies such as 5G, artificial intelligence, and digitalization to empower grassroots medical institutions through 5G medical equipment, build a 5G telemedicine service network, and build a joint prevention and treatment system for special diseases. As a result, older persons can receive sufficient medical treatment in their villages' medical stations with the support of 5G digital technology.

Project Implementation:
In 2020, Hainan Province launched the "5G Internet of Things-based Primary Medical Service Capacity Improvement Project" and promoted the "2+3" healthcare service package to promote the effective linking of high-quality medical resources, focus on the management of common diseases and key chronic diseases, and improve the capacity of primary health services.

Focusing on chronic diseases with high incidence, mortality and disability rates in Hainan, standardized prevention and treatment plans for each disease were formulated. With the full support of 5G telemedicine service networks and general practitioner workstations, rural clinics conduct preliminary screening of residents, mainly older persons, and improve the ability of the general practice to "treat minor diseases, major diseases, acute diseases, and chronic diseases".

The province promotes the "2+3" (hypertension, diabetes, hepatitis, tuberculosis, mental illness) chronic disease management service package, and carries out the integrated service of "prevention, screening, diagnosis, treatment and rehabilitation". Transforming primary medical institutions from "treatment-centered" to "health-management-centered" and improving the capacity of health services.

The project covers 2,700 village clinics, more than 340 township health centres, and 19 city and county hospitals (including 38 county people's hospitals, county maternal and child health hospitals and county traditional Chinese medicine hospitals). Through the construction of seven diagnostic centres for imaging, pathology, ultrasound, foetal heart, ophthalmology, electrocardiogram, and incurable diseases, combined with AI-assisted diagnosis, the diagnosis capabilities of primary medical institutions in the province are augmented, and the ability of grassroots health services to accurately respond with

treatment has been improved. Thereby, realizing the vision of "not entering the city for minor diseases, and not leaving the county for common and frequent diseases".

Results and Impacts:

Result 1: Improvement of Medical Service Delivery and Diagnosis

Older residents can be diagnosed and treated by higher-level experts through 5G telemedicine services in the village clinic, without having to travel to hospitals that are further away. The digital equipment of the clinic meets the daily needs of the grassroots level, and the older residents receive better targeted medical services and care. The cost of transportation and medical treatment for residents has not only decreased, but there has also been an improvement of the medical experience via medical services available at their doorstep, with common chronic diseases of older persons being detected and effectively managed in a timely manner. Since the implementation of the project, the total diagnosis and treatment volume of primary medical and health institutions in Hainan Province has continued to increase, with an increase of 8.29 percent in 2023 compared with 2022.

Result 2: Medical Resource Coordination and Rural Support

The use of 5G telemedicine service network and digital equipment has rapidly improved the diagnosis capabilities of grassroots doctors and expanded the supply of medical services. Through the establishment of a system of medical treatment and integrated prevention and control, the orderly coordination of regional multi-level medical institutions has been realized. Prior issues, such as the uneven allocation of medical resources and the insufficient capacity of primary medical services have been alleviated. Since the implementation of the project, by the end of January 2024, the 5G telemedicine system in Hainan Province has been utilized a total of 2,145,800 times. Among them, 2,011,700 general practitioner workstations were served, 60,900 handheld ultrasound services, fundus cameras 16,900 times, wearable 12-lead dynamic remote ECG diagnosis services 8,200 times, and Doppler foetal heart rate monitoring services were utilized 48,100 times.

Result 3: Improving Healthcare Monitoring and Supervision

Through the Internet, big data, artificial intelligence and other information technology, the province has become capable of real-time dynamic monitoring of medical treatment improving the efficiency of supervision.

Lessons Learned and Potential Improvements:

Lesson 1: Through digital technology, multiple levels of medical data can be interconnected, making it easier for older persons to access medical services in the community. In this process, there will be many information systems, and it is necessary to consider the standardization of data formats, data synchronization mechanisms, data encryption and privacy protection measures, and the reduction of coupling system architecture to avoid the increase of project risks caused by data docking.

Lesson 2: Relying on digital technology can better help grassroots medical institutions realize the transformation from "treatment-centered" to "health-management-centered", and better serve the health management. While implementing digital technology, it is also necessary to fully consider the training and guidance for the transformation of practitioners in primary medical institutions with the help of digital technology.

Future Improvement:

Based on the concept of integrating "medical care, medicine, insurance, nursing and health", digital technology could link older residents and primary medical services, introduce resources such as commercial insurance, personalized service packages, and third-party medical and health services, empower grassroots medical institutions, and gradually establish a personalized service ecology in primary healthcare, further activating the ability of primary medical institutions and doctors to serve the older persons, thus driving the development of local healthcare services for older residents.

3.1.2: Beihang Elderly Care Alliance - A Smart Community-based Care Service Model

City/Country: Beijing, China
Key Stakeholders: government agencies, university agencies, non-profit organization, operation agencies, community residents, care service institutions
Website: https://news.sina.com.cn/o/2023-10-13/doc-imzqxiir6792980.shtml

Background:

Beihang Community is located at No. 37 Xueyuan Road, Haidian District, covering an area of 0.5 square kilometres, with a total of 46 residential buildings, and a total of nearly 4,000 households. There are about 15,000 permanent residents in this community, of which nearly 3,200 permanent residents are aged, accounting for 20.81 percent of the permanent

population. In 2021, the following problems were found in Beihang community's elderly care:

a. The community is old, empty-nested, and impaired.
b. The community has not yet grasped the disability situation of the older persons in the community and their needs.
c. The awareness rate of older persons and their families about Beijing's elderly care policy is not high.
d. The community's care service system is not complete, the connection between supply and demand is not smooth, and the docking is fragmented.

To solve the problem of community elder care provision, in 2022, under the guidance of the Civil Affairs Bureau of Beijing Municipality and Haidian District, under the leadership of Huayuan Road Street, and with the support of Beihang University, Taikang Yicai Foundation, China Philanthropy Research Institute of Beijing Normal University, and Beihang Community Neighbourhood Committee initiated the creation of a unit community smart care for older persons' service alliance.

Led by the Beihang Community Neighbourhood Committee, the Beihang Smart Elderly Care Alliance is guided by the needs of older persons, takes information management as the platform, coordinates and links the resources of the government, society and the market, and coordinates the forces of university, foundations, think tanks, community, care service providers, medical and health institutions and other parties to create all-round, full-time, high-quality services. This initiative explores the sustainable development of "public welfare + business" service model for older persons.

Project Implementation:
Focusing on the needs of aged within the community and based on an intelligent platform, Beihang Smart Elderly Care Alliance builds a community service platform, formulated on a "1+N" smart care for service model that connects the supply and demand of community care services, effectively combining "online + offline" and "hard equipment + soft services".

"1": Build a comprehensive community service ecology for older persons
With "linkage" as the core, the dispatching centre serves as the basic platform, and intelligent technology as the tool, the alliance gives full play to the guiding and coordinating role of streets, units, and community neighbourhood committees, and mobilizes and aggregates NGOs, think tanks, markets, society and other resources to participate in the construction of the community service system for residents. On the basis of ensuring basic old-age care

services for the impaired, empty-nested and older people, this initiative provides a diversified, personalized and high-quality services for all in the community, and establishes a multi-level service ecology for older persons.

"N": Mobilize multi-party smart care resources to create a "hard equipment + soft service" experience

Focusing on daily life, healthcare, safety and other needs of older persons, the Nursing Alliance links multiple non-profit organization smart care resources, and introduces smart platforms, smart devices and smart applications into the community. Using AI, the Internet of Things, big data, mobile Internet and other technological means, this alliance aims at creating a comprehensive service system from life assistance, health management to safety protection, while improving service efficiency and quality.

Results and Impact:

Result 1: Digital Centralization and Service Dispatch Model

With the support of the community, Beihang has built a service dispatch centre, providing online and offline integrated services through hotlines, care service information platforms, smart large screens, mobile phone WeChat applets and on-duty personnel. The centre has opened a special line for older persons, and they only need to dial the 5977 extension number to reach the service centre, and the staff on duty will provide them with advice and service scheduling, so as to realize the accurate docking of supply and demand. As of the beginning of June 2024, more than 2,400 person-times of supply and demand for care services have been completed, helping the community to answer care policy consultations, solve daily life problems, and introduce and dispatch service resources. The centre has built a smart care information platform, which archives basic information of nearly 5,000 older persons and about 30 service providers, records the needs of older persons, service dispatch, and activity development, and can track and manage the whole process of door-to-door service. Furthermore, through the integration and extraction of big data, the characteristics of the community's service needs are analysed, and the work and care in the community are analysed. The centre set up a smart large screen to display the panorama of the care service operation, realize operation digitalization, digital visualization, and real-time monitoring as seen in Figure 9.

Figure 8: Beihang elderly care alliance digital applications for tracking activities and records.

According to the list of ten categories of care services, the Beihang Elderly Care Alliance has launched a WeChat mini-programme picture in Figure 10 below, introducing service items and service prices, and attaching the introduction and contact information of the service provider, so as to facilitate locating the services and supply resources they need, and realize the accurate docking of supply and demand for older adults.

Figure 9: WeChat applications for older adults to facilitate service provisions and information sharing.

Result 2: Convenient Transportation Access

To facilitate taxi transportation, in March 2023, the Beihang Care Alliance and Gaode Taxi launched a travel plan for older adults, installing 4 stations to help the community of Beihang University as seen in Figure 11 below. This is in addition to the provision of travel subsidies for medical treatment, and organizing training in the community. App users can scan the QR code on the station, and the mobile phone can directly jump to the Gaode taxi WeChat applet. The starting point is automatically located to the location of the station. Without entering the terminal station, the user can tell the driver the destination after getting on the bus, to realize convenient scanning code and one-click taxi calling. Fare payment can be

made through online methods such as Gaode Taxi APP, WeChat, Alipay, etc., or offline cash payment. Gaode Warm-hearted Station has been put into use, reducing the difficulty of using mobile phones to take taxis.

Figure 10:Digital taxi hailing platform via QR Code scan.

Result 3: Cloud-based Health Management

Beihang Care Alliance has introduced smart health check equipment and remote health services. Based on big data and artificial intelligence, the alliance combines offline health check with remote family doctor services, online health course education, and online expert consultation. This opens the "last mile" of home health management, creating a full-process medical experience from assistance to registration to drug purchase.

a. Smart health check. To promote early detection and prevention of diseases, portable and high-precision health monitoring equipment has been introduced, including eagle pupil health detectors with a test device shown in Figure 12 below, cell energy detectors, etc., which can carry out rapid, non-invasive, accurate and comprehensive physical examination, help identify health risks, provide auxiliary diagnosis, and simultaneously establish health records. Up to May 2024, nearly 600 older adults in the community have been served.

Figure 11: Example of portable measurement equipment for checking eye health.

b.Smart chronic disease management. In view of hypertension, one of the common chronic diseases in older adults, the Care Alliance has allowed some to try out the Taikang Hypertension Chronic Disease Management Programme, including smart blood pressure monitors and health management services. The smart blood pressure monitor can be interconnected with the mobile phone, the blood pressure data is synchronized with WeChat, and uploaded to the chronic disease management system. Blood pressure is managed and analysed by the health housekeeper, and the family doctor provides health management services such as telephone follow-up, blood pressure monitoring and early warning, and health education. On the other hand, in August 2023, the Care Alliance cooperated with the China Ageing Development Foundation to carry out the "Geriatric Rehabilitation Project" arteriosclerosis screening project. The community received portable arteriosclerosis screening equipment, which can provide automatic measurement of blood pressure and pulse, detection of cardiovascular and cerebrovascular arterial hardness index within 90 seconds, and has served nearly 300 people in total.

c. Online family doctor. In response to the risks associated with going outside for medical treatment during the epidemic in 2022, the Care Alliance promoted the Taikang family doctor service in the community, and could sign an exclusive family doctor online after registering on their mobile phones, and the doctor would provide "one-to-one" exclusive services for 4 family members. The online family doctor service adopts two methods: appointment system and instant system, and supports three forms: online graphic consultation, video consultation and telephone consultation, which can allow older persons and their families to achieve 24/7 hours of convenient medical treatment anytime, anywhere, and can assist in registration in public hospitals. From December 2022 to January 2023, the Care Alliance helped nearly 100 people sign contracts and use family doctors in Beihang University, with an average age of more than 80 years old. At the same time, there are many persons under 70 years old, middle-aged family members and older adults sharing family doctor accounts.

Figure 12: Family doctor services for 1 to 1 consultation.

d. Through 24/7 intelligent monitoring, build a community security net. The home safety of older persons who live alone has always been a key concern for the community. With

the support of Huayuan Road Street, Beijing Taikang Yicai Foundation, and smart equipment service providers, the Beihang community has installed more than 500 AI voice interactive robots, non-contact monitors, more than 160 wearable smart positioning watches, and 10 sets of smart home alarm devices, including smoke detectors, gas, floor drains and other alarms and are shown as examples in Figure 14.

These monitoring devices are linked to a 24-hour monitoring and command platform. Once an emergency or accident occurs, the monitoring equipment will send an alarm signal after receiving the voice of the person or sensing it through millimetre-wave radar. When the monitoring centre receives the signal, it will notify the emergency contact person of the person as soon as possible, or dispatch professional rescuers to the scene nearby, and provide corresponding solutions according to the on-site situation and the needs of the person in distress. In this way, it effectively avoids major problems caused by delays and built a safety net for older adults who live alone. In November 2023, the China Ageing Development Foundation donated 50 AI smart surveillance cameras to the community. They are installed in the homes of older persons, and their family member can grasp the home situation of through video and voice on the mobile APP.

Figure 13: Smart robots(Upper left), cameras (Upper Right) and devices (Lower Left and Right) for family members and workers to assist in monitoring older persons at home.

Lessons Learned and Potential Improvements:

Lesson 1: By building a community digital service platform for older persons and establishing online and offline dual channels to meet the needs of care services, it can effectively solve the three major pain points in the process of finding care services: (1) older persons cannot go out, (2) service providers cannot enter, (3) older persons lack the ability to screen service providers. By solving the problem of information asymmetry of care services, the supply and demand of care services can be accurately and efficiently matched, and the response mechanism of community care needs will be built to improve the experience of home care life in the ageing community.

Lesson 2: Through the introduction of smart devices such as smart health check equipment, home safety monitoring equipment, and online family doctors, or Internet platforms, the early screening and diagnosis of major diseases and chronic diseases of older persons can be effectively promoted. In this way, it can provide convenience and support for the diagnosis and treatment, thereby improving health management awareness and the ability of community health management. Thus, the community builds up a smart home safety protection network.

Lesson 3: Relying on the operation platform of the care alliance, a comprehensive information management system for community care services has been established, which can accurately grasp the needs of the older persons, volunteers, and enhance professional service capabilities, service orders, intelligent equipment and alarm ledger information. These can provide reference for the work of older persons in the community and provide guidance and basis for the operation of the service of the care alliance.

Future Improvement:

After nearly two years of development, the community smart care service model of Beihang community has taken shape and is currently being upgraded and iterated. The next step is to link more high-quality resources, introduce diversified, high-quality, and more advanced health management, home monitoring smart products, smart health services, to enrich the platform's smart service system, upgrade the platform's service capabilities, and optimize the smart care life and service experience for older persons. At the same time, relying on the integration of local operation resources by university and community, two further developments are expected. On the one hand, they will build community smart care products and service centres, so that older persons can easily experience a variety of advanced care equipment and diversified care services. On the other hand, they will build a community security protection system composed of intelligent terminal equipment, central monitoring platform, mobile

server, and local operation personnel to further build a solid community security net.

3.1.3: Yunlin Life Apartments - Comprehensive Smart Home Care System

Figure 14: Management monitoring dashboard for Jiangsu Yunlin

City/Country: Wuxi, China
Key Stakeholders: Jiangsu Yunlin Elderly Care Group
Website: http://www.yunlingroup.com/html/index.html

Background:

Jiangsu Yunlin Elderly Care Group was established in 2014, the group absorbs the related concepts and experience of the Netherlands, engages in care service, and built the first life apartment in China in 2016. At present, 11 Yunlin life apartments have been built up, serving more than 5,000 people. Yunlin Group is committed to becoming the disseminator of the concept of "Happy Care" model in China and a provider of operation, management and service, with the primary goal of providing good service and management. On the basis of the existing projects as a model, Yunlin Group continues to introduce various concepts and practices from abroad, optimize and improve them in combination with the situation in China, and finally become a provider of a systematic, differentiated and standardized happy care service system.

Yunlin Group takes digital technology as an important starting point to promote the care

industry, accelerates the deep integration of the Internet and care services, accurately connects the needs of older persons and the supply of services, and continues to develop digital and intelligent care applications.

Enjoy Yunlin (Yunlin Elderly Care Integrated Cloud Platform) is a digital care service intelligent platform created by Yunlin Group based on home-based care. With the strategy of service + technology, digitalization and intelligence as the engine, this platform forms a comprehensive care service intelligent platform integrating basic information and care service resource information for older persons. The platform takes the lead in exploring the new model for home-based care, and first provides one-stop high-quality care services with "peace of mind, health, happiness and convenience" in Yunlin Life Apartment. This model demonstrates a new vision of home-based happy care and builds a new paradigm of smart care for older persons in the new scenarios.

Under the framework of Enjoy Yunlin, there are six digital applications: the Lehuo preferred retail platform, the adjacent property system, the Yunlin health care one-stop service platform, the Yunlin Lelao volunteer platform, the Yunlin canteen meal service platform, and the Yunlin Hui rights and interests' system. By optimizing the three dimensions of "safety, health, and entertainment", Yunlin uses "digital technology" to empower "elderly life" and promote the high-quality development of the community care industry.

Project Implementation:
The platform has gradually expanded its target audience to families and formed a three-in-one comprehensive service structure and system of institutions, merchants and older persons. For institutions, communities, and projects, it provides IoT, interconnected, and intelligent care smart solutions. For merchants, it provides smart devices and platforms, meeting commercial operations, providing construction, consulting, operation and maintenance, and operation services. For the older demographic, it provides a one-stop smart comprehensive service platform for local service retail and silver retail.

a. Digitally Integrated Medical and Care Services
   Through the three-in-one model of "platform + hardware + operation", home medical care and care services involving safety and health management are provided both physically and virtually, through a combination of applications and care service providers. Combining "offline + online" service supply, community care and home care are more closely integrated and can be provided on a 24/7 basis.

The "Life Apartment" is equipped with intelligent terminal products such as smart assistive devices, smart home, health monitoring, and care. These smart devices include emergency call buttons, smoke detectors, water sprinklers, gas alarms, infrared detectors, smart bracelets, wireless door sensors and other products designed to call for help and alarm devices to alert the service centre. The system locates the position of the person. If there is a call for help, it will give an alarm promptly, and notify the person's family, property service centre, and rehabilitation physiotherapy centre with one click, and the service personnel will respond shortly.

b.Digital Local Life Services

The platform service also the following services: smart caring property through which facility management is carried out, entertainment such as videos, online recharge of credits, payment services, catering, membership clubs, volunteer registration and other local life modules.

The platform also directly publishes community activities and volunteer activities online. Residents of the community can accumulate "points" for participating in the activity and deposit them in the "Time Bank", and then they or their parents can withdraw the "points" to redeem them for care services, supplies or household necessities. This is intended to encourage young people and older persons to participate in volunteer services, support a "time bank", a mutual aid caring model, and use digitalization to realize mutual assistance for older persons.

Through a one-stop new retail platform seen in Figure 16 below, it prioritizes users and allows for flexibility between online orders and deliveries as well as offline shopping and collection. Digital recommendations provide a personalized and scenario-based shopping experience, improving the shopping experience and satisfaction of families.

Figure 15: One-stop digital life experience, including services and shopping.

Results and Impact:

Result 1: Digitalization of Medical Care and Assisted Care

Through the three-in-one model of "platform + hardware + operation", home-based medical care and care services involving safety, care and health management are provided by the community facilities and personnel 24/7 through a combination of diversified and multi-level care services "online + offline". They can thus enjoy more professional medical care and care services in the community and at home. Some of the services are depicted in Figure 17.

Figure 16: Use of digital technologies for monitoring in assisted and medical care.

Result 2: Expediting Dining Services

Through the meal assistance applet section shown in Figure 18, a cloud ordering + food delivery service is paired with online consultation and customization of exclusive nutritious meals and made remotely. Offline at a cafeteria dine-in service, scanning code ordering can perform automatic dish identification, expediting checkout at the counter.

Figure 17: Digital order of food and dining services.

Result 3: Enriching Local Life

Through various functional modules such as property management, health care to home, entertainment appointment registration, online supermarket, and old-age membership, it comprehensively meets the needs of families in all aspects of services. These include all kinds of online payment, reporting for repair, registration for cultural and entertainment activities, space reservation, all-in-one card recharge, membership rights, point exchange, customized services for age-appropriate transformation, donation of aged items, work display, etc. By posting community activities and volunteer service activities online, as well as the corresponding scoring mechanism, more people can participate in volunteer activities more conveniently.

Result 5: Extensions of Financial Services

Yunlin worked with the bank to jointly launch the silver financial co-branded card. Yunlin has customized exclusive co-branded card rights and interests for families, covering benefits for preferential activities such as water and electricity, property, meals, and nursing. In line with the promotion of the bank's digital currency and the expansion of local life service products, the card application and the scope of services are intended to be expanded further in the future.

Figure 18: Co-branded bank cards for seniors, with targeted reward systems.

Lessons Learned and Potential Improvements:

Lesson 1: Through the introduction of informatization, intelligence, digitalization and other technologies, the operational efficiency and service quality of Life Apartment has been improved, by enabling an increased scope of service, timely care and greater community activity provisions to residents while reducing operating costs.

Lesson 2: Digitalization enabled Yunlin Group and partners to achieve better cooperation with partners through the use of smart equipment and a digital platform for commercial activities, allowing for greater personalization of the needs of older residents, families while expanding the scope of offerings.

3.1.4: UBTECH Smart Care Solution for the Elderly

City/Country: Beijing, China
Key Stakeholders: UBTECH ROBOTICS CORP LTD, YUECHENG GROUP
Website: https://www.ubtrobot.com/ , https://www.yuechenggroup.com/#/index

Background:

Founded in March 2012, UBTECH ROBOTICS CORP LTD is a humanoid robots and smart service robots company dedicated to the mission of 'bringing intelligent robots into every family, and making everyday life more convenient and intelligent'. Based on these full-stack of in-house technologies, the company has established smart robotic solutions with hardware, software, service and content all integrated together, covering various industries such as AI education, smart logistics, smart elderly care, and business service.

In the current environment of rapidly ageing demographics and the explosive growth of technology, technology has played an important role in the operation of care service process and the improvement of the quality-of-care service. Based on the consensus in various

aspects, UBTECH and Yuecheng Group, a professional social care service provider in China, have established a bilateral cooperation framework, to jointly build a high-end smart health care community. UBTECH undertakes the responsibility of providing a complete set of smart health care solutions, and applies solutions such as barrier-free travel, smart food delivery, smart housekeeper, smart cleaning, anti-lost early warning, fall early warning, health monitoring, and smart community care operation to the care community of Yuecheng Group to improve its intelligent service capabilities.

Project Implementation:

UBTECH's Smart Elderly Care Solution offers an enriched portfolio of intelligent robots to enhance the quality of life for seniors. In addition to using cutting-edge robotics technologies, the solution also leverages advanced artificial intelligence. And through UBTECH's Smart Healthcare Cloud Platform, the Smart Elderly Care Solution creates a network that enables seamless integration of a variety of devices. This interconnect between hardware, network and people supports the seven key scenarios of smart elderly care: operational management, safety and security, health management, daily care, rehabilitation, mental and physical activities, and nutrition and diet.

Within the past years, UBTECH has released five elderly service robots shown in Figure 20 below: Wassi, an intelligent walking assistance robot; VerCari, a containerized delivery robot; PathFynder, a smart wheelchair; AuCari, an open delivery robot; and Welli, a companion robot.

Figure 19: UBTECH Smart Elderly Care Robots

Designed for accessibility, UBTECH's Smart Elderly Care Solution portfolio accepts a multitude of inputs. Its smart sensors, working in parallel with its data platform, transform care from passive to proactive in assisting with daily tasks. And with rich interactive features, the solution can support seniors' physical and mental well-being.

In this case, UBTECH provides a complete set of smart elderly care solutions, with companion robots such as seen in Figure 21, food delivery robots, cleaning robots, and intelligent transportation robots to provide services for seniors.
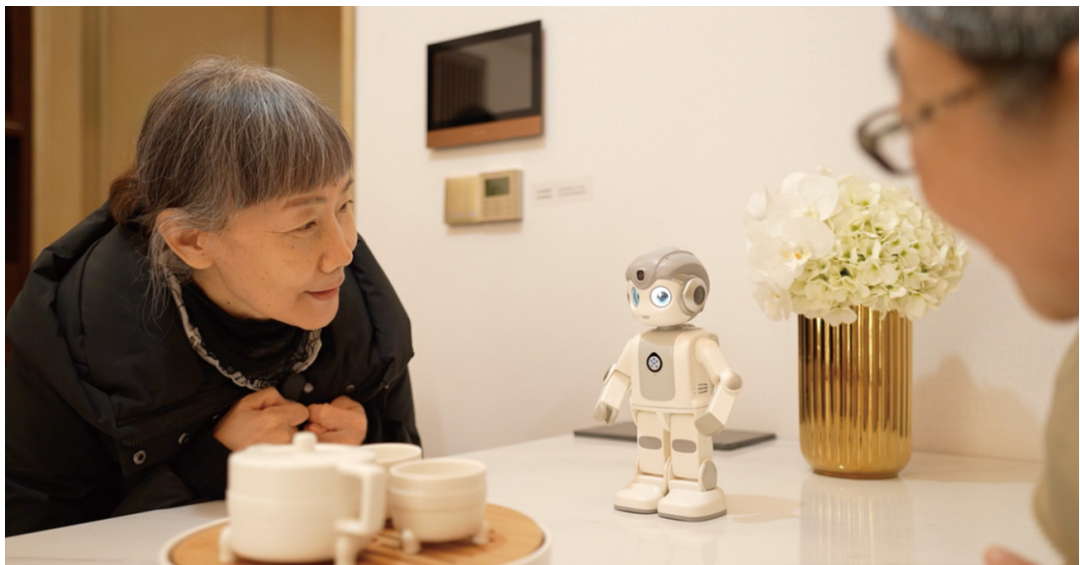
Figure 20: Seniors interact with UBTECH Companion Robot

The whole solution provides assistance to the seniors in both physical and psychological ways. The seniors could be transported autonomously using PathFynder, the smart wheelchair depicted in Figure 22, assisted for walking and the physical rehabilitation using Wassi. They also get reminded of their agenda and could communicate naturally with Welli. The caregivers could send items, without walking, to people using Aucari and sensitive items using Vercari. All the robotic functions are automated and coordinated using the cloud service platform. This solution creates 24/7 service for the nursing homes and apply advanced AI technology for precise and continuous service.

Figure 21: Seniors is reading on Smart Wheel-chair

At the same time, through the upgrading and transformation of equipment and systems, the development of a community home service system, the improvement of SOS and intelligent upgrading of the positioning system, it helps the community to build a technology-based operation process, to provide care services, all managed through a central interface as seen in Figure 23.
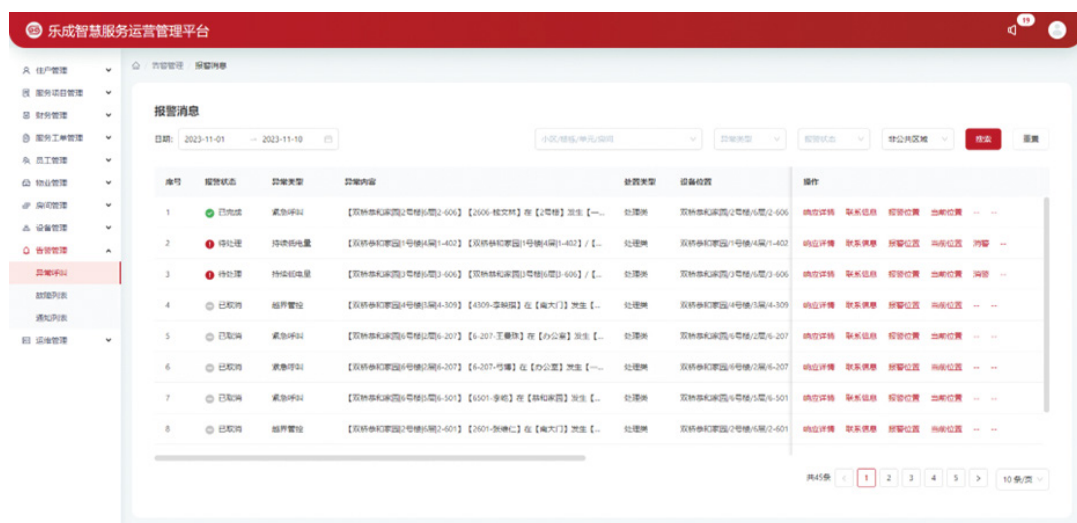
Figure 22: Yuecheng Smart Care platform interface

a. Intelligent services are friendly for seniors, making it more convenient for them to enjoy the robotics services.

The "Smart Elderly Care Cloud Platform" is an important management unit for building a community care service system. Through the Internet of Things, intelligent hardware and community based programmes, it connects community home-based care institutions with seniors, children, businesses and door-to-door personnel, providing multi-level diversified and multi-functional social care and medical care services for the aged in the community.
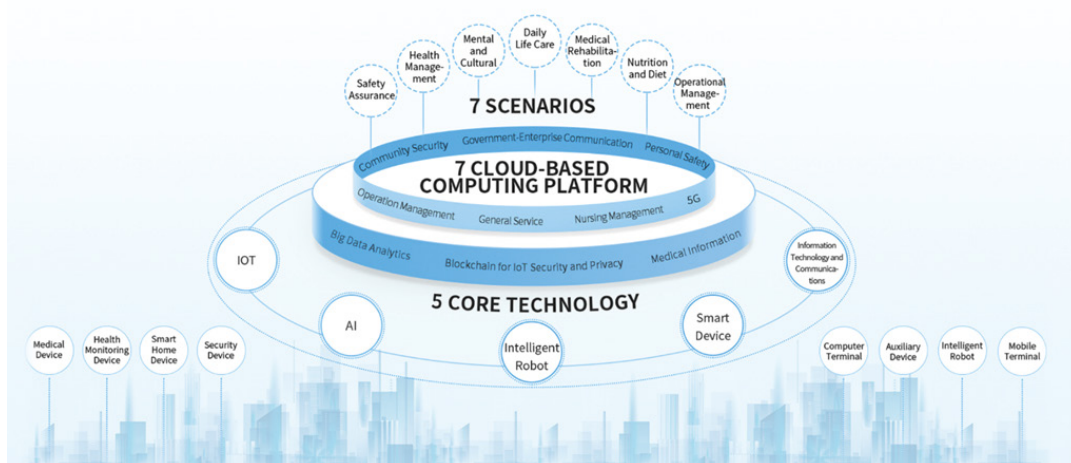
Figure 23: UBTECH Smart Elderly Care Cloud Platform structure

b. Establish the dual channels of intelligent care services by combining both online service and offline service.

Online Channel: The development of the mobile application provides a more convenient way for seniors in the community, through instant messaging software to scan the QR code or search for "beautiful Gonghe" to enter the application, people can apply for various needs such as repair, home cleaning, accompanying medical treatment, haircuts and community activity notifications on demand.

Offline Channel: The care service centre sends personnel to conduct home visits, clarifying needs and providing services while also engaging in training of smart devices and completing the promotion of smart equipment use.

c. Demand-oriented scenario applications make seniors feel more at ease in their home care life.

In the public service area, UBTECH provides smart food delivery, smart cleaning, smart transportation and smart reception scenarios through Yucheng's digital Apps; In the intelligent home-based care model room, it provides customized scene services such as safety guarantee, health management, spiritual and cultural scenes, and home environment system for seniors, so as to continuously enhance the happiness and sense of security.

Figure 24: Smart Reception

Result 1: Professional and intelligent care services

Through the smart health care cloud platform, remote guardianship and care is realized, and service quality improved, primarily through the use of location monitoring and SOS rope alarms,, the location and safety of the care residents can be monitored 24/7, and abnormal conditions can be dealt with in a timely manner.

Result 2: Provide personalized and convenient services

Through digital and networked tools, the smart care for older persons community provides convenient and personalized services, enhancing the connection and sense of belonging between older persons and the community, thus improving the satisfaction and happiness of residents.

Result 3: Smart operations processes with technology

By introducing intelligent equipment and systems to achieve intelligent service and management, this project optimizes resource allocation, quickly responds to demand, improves the efficiency of community resource utilization, and provides strong support for the subsequent development of community.

Lessons Learned and Potential Improvements:

The increasing aging population becomes a significant social and economic challenge for human society. Through the integrated application of digital technology in the care scenario, this project effectively solves the problem of meeting the core needs utilizing artificial intelligence and technology to improve the quality-of-care services and reduce service pressure. The intelligent upgrade of equipment and the overall operation system, helps the community to create a new internal operation process with technology as the core and provide new services. UBTECH expects to generate more value and provide high quality services for the seniors. With the aid of robotics and AI technologies, the in-depth integration of robotics and care services, the ability of seniors to use smart care service tools is enhanced, and the personalized, multi-level and diversified care needs in their later years are met.

3.1.5: Bili Smart TV – Digital Smart TV Applications for Older Adults

City/Country: Beijing, China
Key Stakeholders: Beijing Bili Information Technology LTD
Website: https://mp.weixin.qq.com/s/YXiOB5OgP6ILXkAPLTluJA

Background:

Television is a medium that is often used in home life. Based on the development needs of long-term care, seeking new applications on TV has become one of the new trends in digital innovation to address the increasing needs of older persons. Older persons typically have less responsive hearing, eyesight, and understanding and acceptance of high-tech consumer products that gradually decline with age. When coupled with TV usage habits, the TV is a suitable comprehensive information platform for them to receive information, experience entertainment and carry out service interaction.

Project Implementation:

Bili Information adopts its self-developed old-age care Internet of Things (IoT) operating

system to empower enterprise customers to build a platform-level smart care IoT platform, solve the problem of fragmentation of the smart terminal operating system, and support more flexible customization of the required application services.

a. Old-age Caring IoT Operating System

Bili Information's health care TV service system can be regarded as the road surface connecting the upper and lower levels of the silver technology highway, which can be compatible with a variety of smart TVs and set-top box hardware devices downward and can undertake the integration of various silver technology applications with a unified interface protocol upward. Through intelligent hardware or OS to carry out efficient Internet of Things linkages, it has successfully upgraded the large TV screen that every family has, and provides applications for them in "clothing, food, housing, transportation, health, medical care, entertainment, and education". Thus, enabling care technology and services to enter the last 100 meters of home care.

b. Old-age Health Care Application Shopping System

Bili Information has designed the BHS/Bili Old-age Health Care Service App store, which is similar to Apple's APP store and Huawei's Mobile Service (HMS). It has built a unified application mall for specific care goods and services with design rules, technology and safety rules, operation rules, and charging rules.

c. Technology Service Committee

To solve the problem of the digital gap facing older persons in using technology products, Bili Information tries to transform the technology products from "technology training" to "technology accompaniment". Through sustainable technology accompaniment, the technology products in life can easily help to obtain the life services older persons need.

Applied Scenarios:

Smart Accompaniment: Make full use of the information transmission and interactive window of the TV screen in the home environment or the bedroom scene of the nursing facilities, provide adults with warm and sustainable technological companionship, liberating them from the lonely scene of "no one to be accompanied, nothing to talk about, and nothing to do". This can be seen in the activities list of the smart TV information screen in Figure 22 below.

Figure 25: TV welcome screen to access available services.

Large Screen Relative Video Call: Considering the objective constraints such as the decline of their eyesight and inconvenient mobility, with the empowerment of the smart TV operating software system, video calls are made on the large TV screen equipped with cameras, so that they can communicate with their children, family members, agency housekeepers, community service personnel or chronic disease management medical staff, with a quick dial system as shown in Figure 23.

Figure 26: Video call system to family members and for assistance.

Safety Monitoring and Privacy Protection: With the help of the smart TV system, it can realize the safety of the older persons without induction into a care home or facility. This not only solves the safety problems of the persons who are living alone, impaired or have dementia, but also respects and protects their privacy.

Active Social Participation: On the premise of meeting the basic safety requirements, active older persons have a high demand for spiritual and recreational life. Under the organization of care institutions and service stations, as well as the personal initiative of individuals, there are often a variety of community activities. With the help of the smart TV software operating system, the socialization of community life can be realized on the large TV screen through online booking, display of activity works.

Old-age University: There are now a wide variety of university courses for older persons with excellent content in the market. With the help of smart TV operating software, offline courses can be made accessible online, so that they can easily sign up, learn happily, watch repeatedly, and discuss together. with information readily available as seen in Figure 24.

按"上下左右"键选择作品，"❤"键进行点赞

Figure 27: Learning and community activities of neighbourhood.

Online Clinic: As they age, older people tend to have a variety of chronic diseases. Whether it is disease monitoring, medication management, or video consultation, they can use the large TV screen to realize home care and protect their health.

Home Visit Caring Service: In general, older persons prefer to enjoy their old age in a familiar home setting. This requires more refined and accurate door-to-door service. Through the smart TV software operating system, it is easy to make appointments, service monitoring and evaluation,, etc.

Results and Impacts:

In the past few years, Bili Information has done the following work: 1 year of user demand research, 4 years of actual customer service, 30,000 terminal service cases, 113 versions of optimization and upgrading iterations, 23 industry exhibitions and learning exchanges, 34 city visits and research, and 67 enterprise exchanges and learning visits. Based on these efforts, Bili Information has accumulated a lot of front-line work experience and data precipitation, and finally launched the care TV butler system in 2023. This system can provide multi-functional and whole-process services including housekeeping, door-to-door service, life care, health care, university education, style display, social activity and entertainment, and health management under the scenario of centrally managed care institutions and CCRC. At present, the total number of terminals deployed online in China's large-scale care institutions are about 49,000.

Lessons Learned and Potential Improvements:

Lesson 1: Through the digital management platform, it can be applied to all business and service scenarios, improve work efficiency and reliability, and reduce management costs and management risks.

Lesson 2: The collection and statistics of data can set a clear direction for complex work and at the same time increase the replicability of the project.

Future Improvement: It is estimated that the scale of TV sets in the home is 10 times that of the number of slots in caring institutions. Expanding the application from institutions to the home will be the main task. In this process, Bili Information plans to complete 30 percent of the installed capacity of TV programmes and implement the pilot home care TV services in the next two years. This will provide a foundation for the smart TV system to gradually cover more families.

3.1.6: QIANCHI – Learning Platform for Older Adults

Figure 28: Lifelong learning platform interface

City/Country: China

Funding Source: Self-funded by the Company

Key Stakeholders: Government Agencies, Middle-aged and Senior Citizen Users, Senior Citizen Universities, QuantaSing Group Limited

Website: QIANCHI (https://www.qianchixuetang.com/) and QIANCHI APP

Background:

With the increase of China's ageing population and the transformation of educational services and consumption behaviours, there is a growing demand for "learning in old age and finding pleasure in learning" among people, which has driven the emergence of China's middle-aged and senior citizen interest-based learning market and has presented a thriving trend.

QuantaSing Group Limited launched the leading domestic middle-aged and senior citizen interest-based learning platform - QIANCHI, to build a new online lifestyle, providing online interest-based learning services for middle-aged and senior citizen groups, comprehensively enhancing the learning atmosphere and learning experience, so that interest-based learning could become an important path for middle-aged and senior citizens to embrace their later years of life and start their "second life".

Project Implementation:

QIANCHI leverages its expertise and content to integrate traditional Chinese art and culture courses with digital technology, offering a diverse range of courses such as online calligraphy classes, piano classes, and standing meditation classes to meet users' needs for learning interest skills and enhancing their capabilities.

It also helps older adults to achieve a learning-based and cultural-based retirement by building the CTA model, including Courses (courses), Tools (tools), and AI (artificial intelligence technology), through which course content, intelligent learning tools, and vivid and interactive experiences are provided to help students apply what they have learned and create an exclusive online platform for middle-aged and older people's interest-based learning.

QIANCHI has developed an intelligent course research system based on artificial intelligence and big data, which can analyse students' learning data in real time, collect user learning feedback intelligently, identify the weaknesses in teaching, iterate and optimize the course content to improve users' learning effect and satisfaction.

Offline, QIANCHI has set up more application scenarios, such as the Yaji Garden and Zhan Zhu Study Tour, as well as the Piano Study Tour. It has also integrated education resources from various channels, including state-owned enterprises, higher education institutions and enterprise institutions, and partnered with universities to deepen the professional strength of the instructor team. At the same time, it has introduced courses into the local streets, thus breaking through the "last mile" of residents' interest-based learning. QIANCHI opens

a new "study and travel" era for the older adult group with its "cultural and tourism + study tours" approach, providing a closed-loop experience of online learning and offline practice for middle-aged and older users, and exploring a new path of learning and traveling for the interest group through leisure and pleasure.

This allows more middle-aged and older people to build new lifestyles and achieve "learning in old age and finding pleasure in old age".

Results and Impacts:

Result 1: Technology-driven Creating an Age-Friendly Course System

QIANCHI has opened up online learning scenarios for middle-aged and older people based on their interests and cognitive characteristics, providing professional teaching guidance through online live streaming, videos, and communities so that middle-aged and older users can enjoy it without leaving their homes. The course content is simple and easy to understand, making it easy to get started. It also uses interactive and gamified learning methods to enhance the fun and interactivity of learning.

Result 2: Older adult oriented services to enhance the sense of achievement

To meet the learning needs of the aged population, QIANCHI adopted a companion-style teaching service model. The core idea of this model is "companion-style learning," which means that through live lectures by professional instructors and full-time companion services by teaching assistants, people can feel warmth and care while learning.

Result 3: People-friendly design makes it easy for middle-aged and older people to enjoy online learning

QIANCHI considers the characteristics and needs of older persons in its product design, adopting large font, high contrast, easy-to-identify colour schemes, and a simple and intuitive interface layout to ensure that users can easily read and operate. It also optimizes and improves various aspects of the product based on the usage habits and preferences. For example, it simplifies the registration process to enable users to quickly complete registration and start learning; it provides voice search function, allowing users to search for courses by inputting keywords verbally; it also provides a thoughtful reminder function to prevent users from missing important courses and learning tasks. These friendly design details not only enhance user experience and learning effect but also make them feel the convenience and warmth brought by technology.

Lessons Learned and Potential Improvements:

Lesson 1: The market for interest-based learning among the older and middle-aged is still relatively nascentThe consumption habits of older and young users are very different. Older persons have a low dependence on brands, and they are more inclined to trust people and products themselves. Companies must have a deep understanding of older users and need to have enough resilience and patience.

Lesson 2: Continuously enhance the older persons' sense of identity and understanding in the digital society

Although digital technology and artificial intelligence are widely used in social life today, many older persons still have misconceptions and discomfort with these technologies. Improving their digital literacy and increasing their sense of identity and understanding of digital transformation will enable them to enjoy the convenience of digital life.

Future Improvement: Strengthen the combination of online and offline scenarios, and continuously improve user service capabilities

Continuously improve user service capabilities, provide personalized learning paths, and better meet the unique needs of each student, while providing targeted learning resources and guidance. Meanwhile, it is also important to strengthen the integration of online and offline scenarios, effectively develop and provide learning resources through an interesting and valuable learning platform.

Based on the latest development of digital innovation and the changing demand in the older persons needs, it could be anticipated that digital innovation will play an even bigger role in addressing China's population ageing. Over the past decades, population ageing has become a common challenge for China, Japan and the Republic of Korea and other Asian countries. Facing with the increasing proportion of older persons in the society, it is extremely meaningful to carry out international cooperations in finding out new solutions to address the challenges posted by population ageing and improve their life quality further. The following are not only China's key priority areas but also the highly expected collaborative areas in the coming years.

a. To find more solutions for home-based older persons' care.
   The world has witnessed an obvious shift in addressing population ageing from facility-based to home-based for the development of care. Facing with the rapidly increasing aged people, no country could build enough nursing facilities to provide sufficient care.

For most countries including China, an ideal model is to spend the old-age life in home. Thus, exploring new possibilities provided by digital innovation, home will be main scenario to develop digital innovations.

b. To find new support for the integration of healthcare and social care
For older persons, health is key concern in their daily life. An analysis regarding disease burden has shown that chronic disease has become the main influencing factor for most countries' old-age people. Thus, how to provide sufficient support to the person's health and establish effective health management models has become one of the key factors in improving their life quality. Cases have shown great progresses in this field and more efforts are still needed to address this area's challenge. In this field, international cooperations could play an active role.

c. To establish new platforms enabling the older persons social participation
With improved health conditions, more and more people have begun to pursue an "active ageing" life in their old age. The rapid development of old-age universities has demonstrated the strong demand to spend a more meaningful life after their retirement. In the future, it could be expected that more and more old-age people would turn to new technology to enrich their life. In this field, international collaboration could bring new breakthroughs.

3.2 Japan

3.2.1: "Smile Miyakonjo" – Exclusive Digital Services for Local Residents via My Number Card

Figure 29: Campaign for "Smile Miyakanojo" (Main picture from https://portal.smilemiyakonjo.jp/informations/
news/portal-information)

City / Country: Miyazaki / Japan

Project Cost: Maintenance cost is 60 million JPY/year.

Funding Sources: 'Digital Garden City Nation Vision' government subsidies

Key Stakeholders: Local residents

Website: https://www.city.miyakonojo.miyazaki.jp/

Background:

Miyakonojo city is located in Miyazaki Prefecture, on the southern island of Kyushu, Japan with a population of approximately 160,000. Among the city population, it is estimated that roughly 5 percent, about 8,000 people, have dementia. With the declining working-age population, it is crucial for each individual to maintain their health, including cognitive functions, to balance work and life effectively. This balance is seen as essential for sustaining the overall functioning of society. Dementia not only affects the individual but also imposes significant economic and psychological burdens on families due to caregiving responsibilities. Consequently, how to address dementia prevention has become a critical issue for Miyakonojo city.

Having the goal of realizing a sustainable society where citizens can live healthily and with

good well-being, Miyakonojo city has established a new digital service called "Smile Miyakonjo" as a citizen portal. This portal offers personalized health promotion solutions and learning opportunities, aiming to provide innovative and effective strategies to tackle the rising incidence of dementia. By catering to individual needs and fostering engagement, these activities seek to enhance cognitive health and support preventive measures against dementia.

Project Implementation:

In October 2022, the Miyakonojo Smart City Promotion Council was established to address regional challenges by bringing together representatives from local industry, government, and academia. By February 2023, the council applied for the "Dementia Prevention Service Using the My Number Card" project in Miyakonojo city, aligning with the Japanese government's Digital Garden City Nation Vision. This project aims to develop a variety of dementia prevention services on a scalable digital platform, leveraging a smart city data integration framework. The proposal was accepted as a target for the subsidy programme in April 2023. By the end of February 2024, Miyakonojo city launched the dementia prevention service under the name "Smile Miyakonjo." This citizen portal incorporates six different services, all accessible through the My Number Card, reflecting a significant step towards improving community health and digital integration.

Accessible exclusively to Miyakonojo residents through authentication with the My Number Card, this service aims to sustain and enhance the long-term well-being of the citizens. To simplify access, a digital ID called "Miyakonojo ID" linked to the My Number Card is issued, allowing residents to use the service directly via their smartphones.

"Smile Miyakonjo" offers online brain training and reskilling courses, incorporates cutting-edge technologies like generative AI, and collaborates with local activities such as English conversation, pottery, and piano classes. These initiatives encourage older residents to engage more actively in the community, promoting their social participation.

都城IDはxIDにもとに発行されます

Figure 30: Miyakonojo ID is issued based on registration linked to My Number Card

Results and Impacts:

Result 1: Digital ID for Human Development

Notably, Miyakonojo city stands out as a leading region in the adoption of the My Number Card, with a 90 percent penetration rate, providing a robust foundation for conceptualizing this dementia prevention initiative. The city has been recognized as a successful example of solving fundamental issues through digital solutions and lauded by major corporations. It has also been highlighted, as a leading example of human resource development, in the private sector.

Result 2: Widespread Adoption of Services Amongst Age Groups

The service was implemented in April 2024 and within one month, more than 200 people registered and utilized the services, ranging from classes to health promotion activities. Users include not only the older age groups but range widely from residents in their 20s to 60s, so it has gained traction across generations.

Lessons Learned and Potential Improvements:

This initiative was considered unprecedented in Japan, as it involved acquiring personal information via the My Number Portal and using a data integration framework to provide personalized recommendations. Addressing security concerns was crucial; however, through thorough and multifaceted examination, robust measures aligned with national guidelines were implemented to ensure security.

Looking forward, efforts will focus on launching new initiatives linked to dementia prevention, promoting the shared use of the data integration platform across different regions, and expanding the reach of dementia prevention services. Additionally, the provision of reskilling courses is expected to contribute significantly to the development of local talent.

Furthermore, since "Smile Miyakonjo" is a service operating on a data linkage platform developed based on the standard architecture defined by the Digital Agency, it is a model that can be deployed nationwide, so it is hoped that similar initiatives would be implemented in other parts of Japan.

3.2.2: DS Selrea Oral AI Assessment Application

City / Country: Chiba / Japan
Project Cost: N/A
Funding Sources: Private company
Key Stakeholders: Care service operators, Long term care beneficiaries
Website: https://selrea.co.jp/

Background:

DS Selrea is a service operator specializing in day care services, home-based nursing and fitness rehabilitation within the long-term care insurance framework for individuals who require prolonged rehabilitation. Being part of the DS Healthcare Group, the largest dental healthcare provider in Japan, DS Selrea incorporates oral care as one of the services provided at the day care facilities. In addition to the regular rehabilitation programmes such as aerobic exercises, programmes to improve oral functions like swallowing training are also conducted to maintain and restore physical functions.

In Japan, aspiration pneumonia is one of the common causes of death among older people and is often due to the decline in oral functions, such as swallowing. Recognizing the importance of oral health in achieving healthy ageing, DS Selrea has been incorporating oral and rehabilitation services since its inception, aiming to offer a one-stop service for dental, medical, and long-term care with equipment shown in Figure 28 below.

Day care facility of DS Selrea with equipment for fitness rehabilitation

A corner of the facility used for brushing of teeth and conducting oral check

Sink used for maintain oral cleanliness and health as part of rehabilitation program

Figure 31: Rehabilitation fitness facilities (Left) Oral check stations (Middle) Oral cleanliness and rehabilitation program (Right)55

55 Photos used in this report was taken in Total Reha Center Takanedai, with the kind support from Mr. Naoya Kitamura, CEO of DS Serlea . About Toruto: https://toruto.carewiz.ai/oral-care

Project Implementation:

DS Selrea make use of an Oral AI assessment app called 'Toruto' which evaluates and score oral functions as part of their oral health programmes in the rehabilitation facilities, using smartphone photo. This service was developed and released by Exawizards, an AI-service development company, in collaboration with DS Selrea, with the aim of visualizing the risk of aspiration pneumonia and supporting its prevention.

'Toruto' performs risk assessments of oral dysfunction using the Pataka speech test depicted in Figure 29, which scores the number of times 'PA-TA-KA' is clearly repeated within a given interval. Installable on any smartphone or tablet, data is taken easily by recording a video of the speech test and the app instantly displays the results based on its scoring system, allowing patients to view their outcomes on the spot. The AI evaluates and analyses the speech based on indicators such as "speed" and "pronunciation," and displays the results in a communication sheet. Additionally, depending on the evaluation results, the service will propose oral function improvement training and recommend consulting a specialist if there is a high risk of oral function decline.

Dental hygienist using the tablet to conduct speech test   The score of the speech test could be viewed on the spot

Figure 32: Dental hygienist conducting a speech test with the aid of a tablet.

Results and Impacts:

Result 1: AI Driven Oral Care Benefits

Not many facilities could conduct appropriate dental care, oral hygiene services in day care centres as it requires skilled workforce and additional staff effort. The introduction of 'Toruto' represents a significant advancement in using AI to enhance elder care, providing a practical tool for maintaining and improving oral health, which is integral to overall health and quality of life.

By incorporating oral function analysis into the broader elder care service, the system promotes a more comprehensive approach to health management for the older people. Oral health is closely linked to overall health and improving it can have positive effects on general well-being and quality of life. The service provides personalized feedback and training recommendations based on the evaluation results and this targeted approach helps users improve their oral functions through specific trainings. According to a dental hygienist working at DS Selrea, the training includes encouraging older people to smile or make cheerful expressions by lifting the corners of their mouths, which has seemed to boost their self-esteem and contributed to a positive atmosphere within the facility.

Furthermore, the service not only benefits older persons but also supports caregivers by providing clear and actionable data. This data can inform treatment plans and interventions, making the caregiving process more effective and efficient. The ability to visualize and score oral functions helps in the early detection of potential issues, such as the risk of aspiration pneumonia. This early detection is crucial for preventing more serious health complications.

Lessons Learned and Potential Improvements:

Since its launch in April 2023, 'Toruto' has only been used in selected day care facilities for pilot studies. The app developers aim for a widespread adoption of the app. To emphasise the importance of oral care not only in elder care facilities but also in local community activities which engage older people. This service also aims to promote a mind change within older persons to be capable of conducting self-care of their teeth and oral hygiene, to prevent negative health conditions such as aspiration pneumonia, diabetes and dementia, which are causally linked to poor oral health.

Further improvements to the app are also planned, such as adding functions to assess tongue cleanliness and making use of visual information to evaluate overall oral health.

3.2.3: QR Code Jell Nail Stickers for People with Dementia

City / Country: Saitama / Japan
Project Cost: Provided to end users for free from the local city offices. Manufacturing cost is approx. JPY 1000 per sheet (8-10 jell sticker available on one sheet)
Funding Sources: Private company expenses
Key Stakeholders: Local city council, long term care beneficiaries
Website: https://orangelinks.co.jp/en/

Background:

As the population ages, the number of people living with dementia has rapidly grown. According to the 2020 statistics of the Tokyo Metropolitan Police Department, the number of people with dementia who have been reported missing due to wandering that year was over 17,000, and that number has been increasing steadily over the past decade. This issue of wandering was among the concerns addressed in Japan's Comprehensive Strategy to Accelerate Dementia Measures, also known as the "New Orange Plan," which was announced in early 2015. The Plan emphasizes incorporating the perspectives of people with dementia and their families, respecting the dignity of those with dementia, and working toward a society where older persons could age in place.

ORANGE LINKS, established in August 2015, launched a system called "NailQ" that facilitates verification of the identity of older persons with dementia who might have become lost. The innovation entails attaching a jell sticker to a person's fingernail and toenail that features a QR code. If the police locate an older person who seems to be disoriented, they can read the QR code using a smartphone to obtain the information of authority which should be contacted and provide rescue accordingly. The Nail Jell Sticker has been adopted by the eldercare department in city offices and has contributed to locating older persons with dementia to get back home safely even after being lost.

"NailQ" sticker attached to fingernail.   Users can obtain information by reading the QR code using a smartphone

Figure 33: Example of NailQ stickers (Left) Scanning QR code for information from NailQ stickers (Right)

Project Implementation:

ORANGE LINKS initiated and developed the NailQ system, based on opinions and feedback from care facilities, hospitals, and care managers from the local community. NailQ had two unique requirements: First, there was a need to develop a sticker as small as 1cm x 1cm in order to fit on the thumb. This was made possible by collaborating with a manufacturer to create a QR code sticker of the ideal size. Second, there was a need for the QR code to be readable even if it was in bad condition, so together with the manufacturer, they managed to develop a system that could read the QR code accurately even if 15 percent of the code is worn out. The stickers last roughly two weeks.

This innovation is currently being implemented in the local administration in Saitama Prefecture, where more than 300 older persons with dementia have this QR code sticker. The local government offices or the social welfare councils distribute the stickers to local at-risk residents for free. Iruma city in Saitama prefecture has developed an SOS support project using the NailQ system to provide custody to residents who are located through Figure 31. The support project involves the cooperation of the police office and the local residents, so it takes a whole community approach and by creating an environment where people can live without the fear of getting lost, it contributes to the older persons' sense of security living in the community.
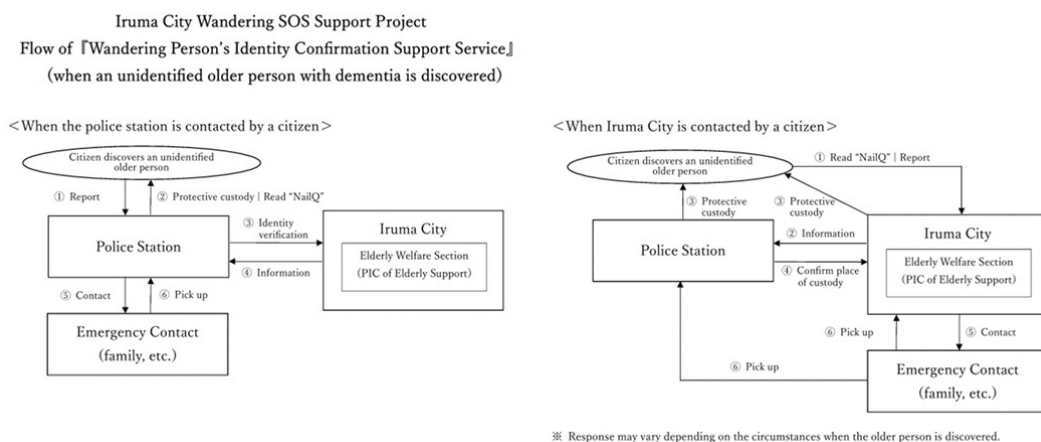
Figure 34: Process flow for alert systems using the NailQ systems for dementia support of older persons.

Results and Impacts:

Result 1: Low-Cost Dementia Assistance

Despite the high number of wandering cases, distributing GPS devices to residents with dementia was not seen as an effective solution due to the high initial investment and maintenance costs. In addition, there were cases where older persons forgot to carry the

devices with them or the devices ran out of battery, so they were not widely used. Compared to conventional monitoring devices, NailQ is available at a low cost and uses readily accessible technology, so it is easy to implement. Since the QR codes are affixed to the nail, there is no worry of forgetting or removing it, and its waterproof nature makes it resistant to wearing out.

Lessons Learned and Potential Improvements:
The QR code jell sticker lasts on the nail for roughly two weeks so regular replacement is necessary. Also, due to privacy reasons, real-time location information could not be provided from the QR code, so it requires the cooperation of neighbourhood and local police authority to ensure early protection.

The current system could be scaled up further by raising awareness and enhancing support for dementia. In light of this issue, ORANGE LINKS has implemented several collaborative projects to disseminate their work at a larger scale. In 2019, they collaborated with a local railway company and the local police to conduct a drill to review the required actions when a wandering older person is located at a train station.

In 2020, the organization worked together with the local broadcast station and an insurance company, to develop a package including insurance in case an older person gets injured while wandering. Future improvements include expanding this SOS support system to other local administrations in Japan, and given the global impact of dementia and social issues related to it, ORANGE LINKS aspires this NailQ system would be adopted and utilized in countries outside Japan.

3.2.4: VR Dementia – Dementia Experience through VR to Improve Care

Figure 35: Promotional of VR Dementia Experience (Main picture from https://angleshift.jp/1534/)

City / Country: Tokyo-Chiba / Japan
Project Cost: VR rentals start from 15,000 JPY per unit (excluding tax), training sessions starts from 150,000 JPY per class with approx. 30 people (excluding tax)
Funding Sources: Private company expenses
Key Stakeholders: Local government, Nursing homes, hospitals, educational institution
Website: https://angleshift.jp/1534/

Background:

As our societies age rapidly, the prevalence of dementia is increasing, making it essential for everyone to have proper knowledge and understanding of this medical condition. This awareness is crucial for ensuring that individuals with dementia and their families can live with peace of mind. Creating a supportive and comforting environment can significantly improve the behavioural and psychological symptoms of dementia, even in advanced stages. However, dementia manifests in a wide variety of symptoms, and even experienced professionals may struggle to create ideal environments for those affected. This complexity contributes to the perception that communicating with people with dementia is challenging. Consequently, there remains a prevalent negative image in society regarding both interacting with individuals who have dementia and the prospect of developing the condition.

"VR Dementia" developed and run by SILVER WOOD Co.,Ltd, is a 90-minute hands-on training programme that immerses participants in the virtual reality experience of living with dementia. This simulation provides insights into the multiple symptoms of dementia from the perspective of someone affected by the condition. After the immersive experience, participants engage in discussions moderated by a facilitator about their feelings and reflections on the session, such as "What did you feel?" and "How would you want to be treated in this situation?" The goal is to encourage participants to consider how modifying the environment, with a focus on how they could understand and interact appropriately, could create a safer and more comforting space for those living with dementia.

Project Implementation:

The innovation behind this VR project originated from the experiences gained while operating Ginmokusei, a nursing home facility operated by SILVER WOOD Co., Ltd, where approximately 90 percent of the residents have some form of dementia. The VR content was entirely developed in-house, from planning and scripting to filming and editing, and was based on extensive interviews with people living with dementia. The initial stages were experimental, but as the content was created and refined, hands-on experience sessions were organized.

Feedback from these sessions was continuously integrated into subsequent versions, enhancing the overall effectiveness of the programme. Initially, the service was offered for free upon inquiry, leading to overwhelmingly positive responses from participants. This success attracted increasing media attention and opportunities to collaborate with local governments and ministries. The growing demand from across the country eventually enabled the introduction of a fee for the service. Even during the pandemic, when gathering in person became challenging, the initiative continued through online events, maintaining its national reach.

Emphasizing the quality of the experience has been crucial to the programme's success. Beyond merely developing VR content, a key component has been the involvement of facilitators who are trained in-house to conduct the sessions effectively. This ensures that the programme not only delivers an immersive experience but also fosters a deeper understanding among participants.

Figure 36: Training sessions held in community gatherings for residents (left) and as an educational programme (right) to have better understanding of dementia

Results and Impacts:

Result 1: Allowing Caregivers and the Public to Experience Dementia for Awareness and Training.

Traditional methods for deepening the understanding of dementia have predominantly relied on literature, audiovisual materials such as DVDs, and role-playing exercises. While these approaches allow for the learning of dementia symptoms, they often fall short in conveying the psychological dimensions experienced by those affected. Consequently, these methods provide limited guidance on how to effectively interact with individuals living with dementia.

The VR Dementia experience revolutionizes this understanding by immersing participants in the symptoms of dementia from a first-person perspective. This immersive technology

enables users to directly experience the emotions and psychological responses elicited by dementia symptoms and interactions with others, as if these experiences were their own. This deep level of engagement fosters a profound comprehension of the psychological challenges faced by individuals with dementia. Moreover, it presents a critical opportunity to contemplate and develop specific approaches to interaction that can provide comfort and a sense of security to those living with the condition.

As of April 2024, more than 140,000 participants experienced the VR Dementia programme and locations implemented included Japan nationwide, China, Republic of Korea, Vietnam, Taiwan, Malaysia, Singapore, USA and so on.

Lessons Learned and Potential Improvements:
Currently, the VR contents are mainly created in Japanese, while several contents have been translated and are available in English, Chinese and Taiwanese. Spreading further to other languages could potentially improve the international outreach of the programme.

Through the VR Dementia sessions, SILVER WOOD Co.,Ltd emphasizes not only understanding the perspective of a person with dementia but also advocate against unnecessarily restricting their abilities under the guise of "nursing care." This philosophy is integral to the elder housing facilities they operate, where approximately 90 percent of the residents have some form of dementia, including mild cognitive impairment.

Their approach is to minimize constraints on their behaviour and preserve their independence as much as possible, striving towards an environment that encourages individuals with dementia to engage in activities and continue having a role as a member of the community. This approach fosters a sense of autonomy and motivation among their residents and as a result, many demonstrate a growing desire and capability to manage their own tasks and exhibit increased vitality and enthusiasm. SILVER WOOD Co.,Ltd aspires to advocate for such positive environment by helping people understand dementia better through their programme.

3.2.5: Shakai Sanka no Susume Application by Hitachi

City / Country: Japan

Project Cost: N/A

Funding Sources: Private company

Key Stakeholders: End users, business clients (i.e. insurance company)

Website: https://www.hitachi.co.jp/products/it/finance/ShakaiSanka-no-SUSUME/index.html

Figure 37: User interface of the app (Images from Hitachi)

Background:

As the population continues to age rapidly, the increasing costs of health and nursing care has become a significant challenge in Japan. Various gerontological studies have shown that in addition to physical exercise and a healthy diet, active social participation—such as working, participating in local activities, and engaging with the community—plays an important role in reducing the risk of older persons requiring long-term care. According to a study conducted by the Japan Agency for Gerontological Evaluation Study (JAGES), a community health promotion programme focused on increasing social interactions among older persons was found to be effective in preventing the onset of disability. In this study, community salons were introduced to provide opportunities for social interactions among older residents and its impact was evaluated prospectively for several years. Five years after the salons were launched, participants showed a 6.3 percent lower incidence of functional disability compared to non-participants.

While there are a variety of services available that can support exercise and a healthy diet,

services or mechanisms which can support social participation are very limited. It was against this background, that Hitachi launched a free smartphone app called Shakai Sanka no Susume (Encouraging Social Participation) in June 2022, designed to measure and further encourage social participation among older people. Based on previous findings from the collaborative research with the JAGES project, Hitachi believes that the data collected through this app is important in performing risk assessment to provide better solutions in addressing issues related to care, as well as to improve the quality of life of the older people.

Project Implementation:

Users of the Shakai Sanka no Susume app can have information on their daily activities collected automatically simply by carrying a smartphone with the app installed. This information includes their step count and details of when they leave their home, such as the route travelled and the places where they spend time.

With regards to measuring social participation, the app utilizes standard features available in a smartphone such as the GPS, motion sensors and step sensors to analyse the places the user has been to, the distance walked, and the amount of time spent there. The actual evaluation items used in this app are: 1. average number of steps (steps/month), 2. number of different locations visited (locations/month), and 3. number of days going out (days/month). Using this information, the app then ranks the user's social participation into four categories, which are Kakedashi (Beginner), Jozu (Skilled), Shisho (Master), and Tatsujin (Expert), with the wider range of places visited, variation of activities and longer amount of time spent outside corresponding to a higher level of social activity.

The app is coupled with other functions like one of the initial features of the app was providing readable articles to users about the importance of social participation that was learned from past research projects of JAGES research group. Such feature was aimed to contribute to users' awareness and motivation, of which they could make a linkage that engaging in social participation can play a crucial role in preventing the need for nursing care. * To date, the column distribution feature has been excluded from the app.

Results and Impacts:

Result 1: Improved Social Participation and Activities

From November 2020 to March 2021, Hitachi conducted a proof-of-concept testing for its app in collaboration with JAGES. During this period, approximately 90 older persons used the app for about four months. The app monitored and evaluated their activity levels while also

delivering articles that promoted social engagement. As a result, Hitachi observed a notable increase in social participation among a significant portion of the participants. Likewise, in a randomized-controlled trial conducted by JAGES research group after the release of the app in 2022, the results showed an increase in the number of social participation events among the group which installed the app.

Result 2: Data for Personalized Care and Services

One of Hitachi's goals is to utilize anonymized data on social participation to assist industries such as insurance companies, in developing products and services targeted at the older people. Based on the knowledge that the more socially active an older person is, the lower the risk of them being certified as in need of care in the future, insurance company could potentially design a product which caters for active older persons, such as offering nursing care coverage with discounted premiums or advantageous policies to those who can provide proof of active involvement in social participation. Moreover, Hitachi plans to collaborate with banks, retailers, real estate companies, and other corporations and organizations to develop services tailored for the older people. This initiative not only supports the creation of innovative business opportunities in the senior market but also, as the number of users grows, transforms the app into a platform that connects with them. This creates significant potential for companies and services targeting the seniors.

Hitachi also seeks partnerships with local government authorities to engage better with the local communities and help extend the reach of services. Collaborating with local governments can unlock a wide array of resources, support and opportunities which could further develop the variety of services the app could provide.

Lessons Learned and Potential Improvements:

Despite the benefits of the app, having older people to voluntarily download the app on their own proves to be a challenge. To address this, Hitachi introduced a new feature called Tsunagaru in Summer 2023. This overwatch function enables children of older people who live separately to gently oversee their safety without intruding on their privacy. This as a result, initiated more downloads by having the children to install the app into their parents' smartphones.

Moving forward, Hitachi plans to develop the app into a white label product, which allows partnering companies to customize it to fit into their own business model. As the senior market presents vast opportunities across various sectors but requires careful navigation

of its unique challenges, success in this market hinges on a deep understanding of seniors' needs and preferences, ethical business practices, and the ability to adapt to changing regulatory and economic landscapes.

Being a leader in IT and digital solutions, Hitachi offers data analytics platforms and solutions to help business leverage data. Through the Shakai Sanka no Susume app, Hitachi aims to develop a robust support system for companies expanding their services to the senior market, while simultaneously contributing to the extension of healthy lifespans.

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3.3 Republic of Korea
3.3.1: CLOVA AI CareCall
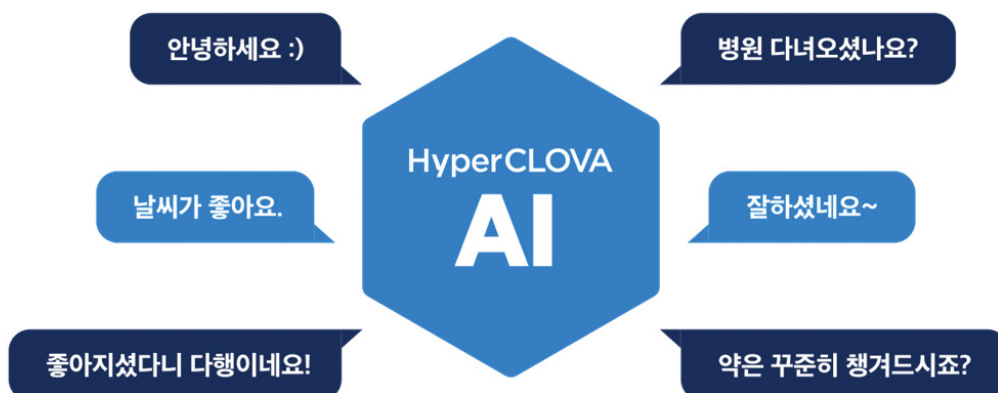
Figure 38: The Conversation Scenario Example of Naver CareCall

City / Country: Multiple Rural and Urban Areas / Republic of Korea
Project Cost: Approximately KRW 4,000 per user per month
Funding Sources: Local governments
Key Stakeholders: Tech company, local social care service providers, government agencies
Website: https://www.ncloud.com/product/aiService/clovaCareCall

Background:

NAVER CareCall is an AI-powered service offered by Naver Cloud Platform, specifically under their CLOVA AiCall umbrella. It's the first and biggest well-being check service in Korea utilizing AI technology. Designed to check in on individuals requiring healthcare support, particularly those with issues like sleep or eating difficulties. It monitors for potential abnormalities through natural conversations conducted by AI.

Project Implementation:

NAVER CareCall utilizes a multi-faceted approach, combining various AI and technological aspects to deliver its services. While initially developed for COVID-19 monitoring, CareCall has been repurposed to cater to a broader range of needs. It now focuses on providing well-being support and emotional care to individuals, particularly those living alone or facing social isolation.

Overall, NAVER CareCall's implementation blends various AI and technological advancements

such as speech recognition and natural language processing (NLP) to provide a comprehensive and personalized service for individuals requiring well-being support and healthcare assistance.

Results and Impacts:
Result 1: Previous IT solutions for older persons often relied on mobile devices, such as tablets or AI speakers. NAVER CareCall, however, utilizes regular telephones. This means anyone with a phone number, including older persons living alone, can easily access the service. Therefore, the key innovation lies in its accessibility.

Result 2: The Korean government has invested in developing technologies to support older persons. However, many of these final products, despite being purchased and distributed by the government, remain expensive. NAVER CareCall's strength lies in its cost-effectiveness. Compared to other gerontechnological services, this AI-powered phone call service is significantly cheaper, allowing a larger number of older persons to access it even with limited government budgets.

Lessons Learned and Potential Improvements:
Lesson 1: CareCall offers remote well-being check-ins, making social services more accessible, especially for individuals in remote areas or those facing mobility limitations.

Lesson 2: Reactions to CareCall among older persons have been diverse. While some initially enjoy the service, others decline to use it after only a few interactions. This highlights the importance of considering the heterogeneity within the ageing population when developing AI-powered social care services.

Future Improvement 1: By monitoring conversations and identifying potential red flags, CareCall can facilitate earlier detection of health issues such as depressive symptoms etc., enabling timely intervention and improved health outcomes.

3.3.2: SKT AI Speaker Cognitive Training <Brain Talk Talk>

Figure 39: SKT AI Speaker Cognitive Training <Brain Talk Talk> featuring a care worker and beneficiary

City / Country: Multiple Rural and Urban Areas / Republic of Korea
Project Cost: N/A
Funding Sources: Private company
Key Stakeholders: Tech company, local social care service providers, government agencies
Website: https://news.sktelecom.com/tag/%EB%91%90%EB%87%8C%ED%86%A1%ED%86%A1

Background:

Brain Talk Talk is an AI speaker-based memory training programme developed by SK Telecom. It was designed to target mild cognitive impairment (MCI) in older persons, aiming to reduce the risk of developing dementia.

Project Implementation:

Brain Talk Talk has been developed by SK Telecom as part of an SIB (Social Performance Compensation) project for older persons. SKT Brain Talk Talk leverages an AI speaker format, making it accessible and user-friendly for older persons, even those with limited technological experience. This programme has multiple partners including university, foundation, and other companies.

Results and Impacts:

Result 1: Early research shows promising results, with a significant decrease in dementia morbidity among participants compared to the expected annual rate. This suggests the programme could offer a valuable tool for reducing dementia risk.

Result 2: Independent research further bolsters the programme's potential, suggesting improvements in long-term memory, working memory, and language fluency. These findings highlight Brain Talk Talk's potential to enhance cognitive health in older persons.

Lessons Learned and Potential Improvements:

Lesson 1: To develop effective AI-powered services for the growing ageing population in the Republic of Korea, collecting data that reflects the diversity of this population is crucial. This data will serve as valuable training datasets in the years to come.

Lesson 2: Compared to Western countries, Republic of Korea offers fewer options for cognitive training programmes for older persons. However, this AI-powered approach presents a potentially innovative and cost-effective solution.

Future Improvement 1: While the development is based on a specific subgroup of older persons in the Republic of Korea, generalizing the findings will require accumulating more evidence through a population-representative sample.

3.3.3: Ever Young Korea

Figure 40: Older persons working for Ever Young as part of its employment programme in reskilling older persons to perform digital work. Photo credit: https://www.chosun.com/national/national_general/2022/02/15/FRKZGHJYIZCAVFDZVRKKKJPAFM/

City / Country: Seoul and Chuncheon / Republic of Korea
Project Cost: N/A
Funding Sources: Private company
Key Stakeholders: Tech companies
Website: https://everyoungkorea.com

Background:

Founded in 2013, EverYoung Korea is a social enterprise established to challenge ageism in the Korean workforce by providing quality IT jobs to senior citizens. With an average employee age of 64.9, EverYoung fosters a unique and inclusive work environment for individuals typically overlooked in the traditional job market.

EverYoung Korea stands as an innovative social enterprise working to dismantle age barriers and empower older persons through meaningful work opportunities.

Project Implementation:

EverYoung Korea embodies a critical mission: combating age discrimination by offering fulfilling IT careers to older persons. Their unique hiring practices prioritize cultural fit, work ethic, and lifelong learning over traditional benchmarks like academic background or age. This approach has fostered a remarkable workforce primarily composed of individuals in their 60s and 70s, boasting high employee retention rates.

The company provides valuable services such as content moderation, data quality assurance, and information organization for esteemed clients like Naver and Hyundai Card. While they acknowledge challenges like age-related biases and potential limitations in physical strength, EverYoung Korea remains dedicated to developing flexible work arrangements that cater to the evolving needs of their ageing workforce.

Results and Impacts:

Result 1: Their success story inspires other companies to re-evaluate their hiring practices and embrace the potential of diverse workforces. This can lead to a more inclusive and age-neutral employment landscape in Korea.

Result 2: By offering fulfilling IT careers to older persons, EverYoung Korea actively challenges age discrimination in the Korean workforce. This provides valuable opportunities for a demographic often overlooked in the traditional job market.

Lessons Learned and Potential Improvements:

Lesson 1: Most current practices using technology for the ageing population often assume that older persons are dependent and in need of services. However, this innovative approach demonstrates the importance of empowering older persons in the digital era through employment in the IT field.

Lesson 2: The strength of Ever Young Korea lies in its understanding of the unique characteristics and needs of older workers. This understanding informs their business and operational model, allowing them to recruit and retain qualified employees, create a supportive work environment, and deliver high-quality services. Therefore, Ever Young Korea's strength lies not just in their understanding, but in actively incorporating it into their business model, leading to a successful and impactful organization.

Future Improvement 1: While Ever Young Korea offers valuable employment opportunities, accessibility remains limited. Currently, only those living in Seoul, the capital city, can access these positions. This highlights the existing geographical inequality issues in Republic of Korea, which require attention and improvement in the future.

3.3.4: Emergency Alarm and Safety Service

Figure 41: Informational poster of the National Alert System in Republic of Korea.

City / Country: Multiple Rural and Urban Areas / Republic of Korea
Project Costs:[56] (a) maintenance fee - approximately KRW 50,000 per user per month; (b) local community center's operation cost – approximately KRW 279,000
Funding Sources: Local governments and the Ministry of Health and Welfare
Key Stakeholders: local social care service providers, government agencies
Website: https://www.bokjiro.go.kr/ssis-tbu/twataa/wlfareInfo/moveTWAT52011M.do?wlfareInfoId=WLF00001093

Background:

The Republic of Korea grapples with a rising phenomenon: a growing number of older persons living alone. A staggering one in five individuals over 65 now resides independently,

56 Welfare Policy in the Republic of Korea. How to apply for emergency alarm and safety service. https://easybokji.com/%EC%9D%91%EA%B8%89%EC%95%88%EC%A0%84%EC%95%88%EC%8B%AC%EC%84%9C%EB%B9%84%EC%8A%A4-%EC%8B%A0%EC%B2%AD%EB%B0%A9%EB%B2%95-%EC%B4%9D%EC%A0%95%EB%A6%AC/

signifying a significant demographic and cultural shift.[57] This trend raises concerns for their well-being. Studies have shown that living alone in later life is linked to an increased risk of delayed medical attention following falls and a higher likelihood of lonely deaths, highlighting the urgency of addressing this challenge.

Project Implementation:
The Republic of Korea's Emergency Safety and Security Service provides a lifeline for vulnerable populations. This programme utilizes a network of sensors and detectors installed in the homes of older persons living alone and people with disabilities. These sensors can detect emergencies like falls, fires, or gas leaks. The system then transmits real-time alerts to trained emergency management personnel, who can dispatch help 24/7 through the network of 119 rescue centers.

The Emergency Safety and Security Service prioritizes those most at risk. Eligibility is focused on older persons living alone, particularly those facing financial hardship, and people with disabilities who are often left alone for extended periods. By August 2020, this service had already reached over 100,000 individuals, offering them invaluable peace of mind and increased safety.

The Ministry of Health and Welfare plays a crucial role by overseeing the programme, providing funding, and offering guidance to local governments. Local authorities then take the reins by selecting service providers, training emergency management personnel, and establishing a collaborative network with key stakeholders. These stakeholders include essential services like the fire department, local community welfare centres, and the Social Security Intelligence Service.

Importantly, local community welfare centres act as the frontline service providers. They hire and manage emergency management personnel who operate the system and ensure its smooth functioning. Data from the system is securely managed by the Social Security Intelligence Service.

Results and Impacts:
Result 1: The system boasts impressive results. Early detection and rapid response through the network of sensors have demonstrably saved lives in fire and gas leak emergencies.

57 Statistics Korea. (2023). The proportion of older adults living alone. https://www.index.go.kr/unify/idx-info.do?idxCd=8039

More importantly, the programme fosters a sense of security and reduces anxiety for both users and their families.

Result 2: Statistics from the Social Security Intelligence Service reveal that the programme has prevented an estimated KRW 360 billion in potential costs over the past decade. This translates to a significant return on investment.

Lessons Learned and Potential Improvements:

Lesson 1: The programme hinges on the dedication of emergency management personnel. These professionals conduct home visits to install the system and ensure its ongoing functionality through regular checks. A critical factor for success lies in well-trained emergency management personnel who monitor the system. This expertise ensures timely responses to emergencies.

Lesson 2: Effective collaboration is crucial from the outset. Determining which government agency (central vs. local) will oversee development, management, and evaluation is essential to ensure smooth cooperation among all stakeholders throughout the process.

Future Improvement 1: The programme installs sensors and cameras in people's homes, and further research and discussions are needed about privacy issues. Individuals have different perceptions about data collection and sharing.[58] In the future, the system needs to be developed considering the diversity in these privacy perceptions, particularly among older persons.

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58 Kim, T. K., & Choi, M. (2019). Older adults' willingness to share their personal and health information when adopting healthcare technology and services. International journal of medical informatics, 126, 86-94.

3.3.5: National Information Society Agency (NIA) Digital Learning Centers

Figure 42: Website of NIA's digital learning centres.

City / Country: All over the country, Republic of Korea
Project Cost: N/A
Funding Sources: The Ministry of Science and ICT
Key Stakeholders: National Information Society Agency, local governments, civil society
Website: https://www.xn--2z1bw8k1pjz5ccumkb.kr/main.do

Background:

Due to the accelerated digital transformation during the COVID 19, digital divide has been recognized as an urgent and serious social problem in the Korean society. Also, available digital skills education systems had several limitations. Firstly, limited accessibility restricts participation as classes are held at few specific locations. Secondly, a low participation rate indicates the programme isn't reaching enough people. Furthermore, a lack of policy attention neglects the needs of the broader population who also require these skills. The curriculum itself is outdated, failing to adapt to changing technologies and user habits. Additionally, the focus on traditional devices ignores the rise of smartphones and AI. Finally, fragmented online learning systems lack integration and offer outdated content, hindering effective remote learning.

Project Implementation:

The National Information Society Agency has established "digital learning centres (디지털 배움터)" all around the country. These centres aim to bridge the digital divide by establishing a seamless on-offline education network. This network will ensure everyone has access to digital education and assistance, regardless of location or ability.

A key initiative is the Digital Learning Platform, which will expand offline educational infrastructure for all citizens. Additionally, a 1:1 programme will bring digital education directly to those with mobility limitations. Furthermore, an online system will allow individuals to assess their digital skills and receive personalized learning plans.

The programme will be expanded to include both on-site and online opportunities to strengthen everyone's digital literacy, with specific focus on software skills for students facing educational disadvantages.

Results and Impacts:

Result 1: This platform has been evolving and provides users with a self-evaluation of their digital skills, which can help them navigate appropriate courses and programmes.

Result 2: According to a report by the NIA, the total number of programme users surpassed 790,000 in 2022. Notably, over half of the users were above 60 years old. Additionally, this initiative deploys digital learning buses to rural areas, allowing residents to visit and learn how to use digital devices.

Lessons Learned and Potential Improvements:

Lesson 1: Government-led interventions to reduce the digital divide can have a significant impact on society.

Future Improvement 1: This initiative is in its early stages. To implement evidence-based policy, it's important to include research and evaluation throughout programme execution.

3.3.6: Seoul 50 Plus Foundation

Figure 43: Seoul 50+ Foundation website

City / Country: Seoul Metropolitan Government / Republic of Korea
Project Cost: N/A
Funding Sources: Seoul Metropolitan Government
Key Stakeholders: Seoul Metropolitan Government
Website: https://50plus.or.kr

Background:

The Republic of Korea faces a rapidly ageing population, with the fastest rate of population ageing globally. Notably, people aged 50 to 64 constitute the largest demographic group in Seoul. Throughout their lives, their contributions to society are crucial for long-term sustainability. Therefore, understanding and addressing their needs is an important issue.

Project Implementation:

Established in 2016, the Seoul 50 Plus Foundation aims to empower the 50+ generation by fostering social participation and easing their transition to later life. It achieves this through

four key initiatives: (1) 50+ campus offering comprehensive services for the transition from middle age to old age, (2) the development of a 50+ work model, (3) the development of 50+ customized policies, and (4) the promotion of a new 50+ culture.

50+ Campuses: These comprehensive centres provide a range of services, including counselling, transition training, and community activities. Here, individuals can receive customized life planning that addresses seven key areas such as career, social contribution, and health.

50+ Work Model: The Foundation tackles career challenges by facilitating partnerships between public and private sectors. This connects the experience and expertise of the 50+ generation with volunteer opportunities, jobs, and even startups. Online and offline support systems, including an online talent database, further enhance job placement. The Foundation also promotes "encore careers," second vocations that allow individuals to pursue personal and societal goals later in life. To support this, they offer office space and internship opportunities.

50+ Website: Their website (htttps://50plus.or.kr/org/eng.do) serves as a central hub, providing members with easy access to programme information and promoting a fresh perspective on life after 50. This includes research on relevant policies that aim to improve the lives of the 50+ generation.

Results and Impacts:
Result 1: Beyond its core services, the Seoul 50 Plus Foundation fosters stronger bonds between generations through campaigns and activities. These intergenerational partnerships involve both young and older persons, as well as young-old and old-old adults.

Result 2: The Seoul 50 Plus Foundation's 2019 annual report highlights strong engagement. In that year, their 50+ campuses saw a significant number of visitors, exceeding 356,915. Additionally, the Foundation provided over 27,685 counselling sessions. Their digital presence is impressive as well, with the website recording more than 1.1 million visits and attracting over 44,592 members to their online portal.

Lessons Learned and Potential Improvements:
Lesson 1: The Seoul 50 Plus Foundation's online portal has become a lifeline, especially during the COVID-19 pandemic. It bridges the gap between the Foundation and its members,

offering essential information and valuable resources to help the 50+ generation navigate the digital world.

Lesson 2: Traditionally, solutions for ageing populations focus solely on the oldest old. However, the Foundation's success highlights a key lesson: empowering future generations of older persons as they approach later life is crucial for a smooth transition.

Future Improvement 1: 50+ programmes offer valuable opportunities for learning and career development for both current and future older persons. However, since this foundation is located in Seoul and restricts services to its residents, it could exacerbate regional disparities. The Korean government should consider expanding similar programmes to underserved areas to ensure equitable access.

RECOMMENDATIONS AND CONCLUSION

CHAPTER 4: RECOMMENDATIONS AND CONCLUSION

Creating equitable and responsive digital societies that facilitate, accommodate and help older persons thrive is an ongoing multisectoral effort by governments, civil society and private sector actors alike. Several key areas exist where countries and key stakeholders can act in concert to ensure that our built environments are age-friendly, in addition to ensuring that societal and digital interface design are user-friendly and interoperable to an enable an easy access to older persons. Many of these recommendations are interlinked and need to be carefully analysed for their application in national or local contexts.

4.1 Building Human Capacities

Digital literacy remains a key challenge in many countries, in both rural and urban areas, even considering the improved access to the internet, due to a reduction in cost of devices, connectivity plans and government programmes. The lack of digital literacy skills is expected to gradually diminish as generational change occurs, with younger generations being increasingly familiar with computing devices and using digital interfaces. Nevertheless, outreach efforts to older persons must continue, minimizing the risks of being isolated and marginalized without the skills to engage in an increasingly digitalized society.

Lifelong learning is equally important to ensure that younger adults and children are exposed to changes in digital technologies, such as potentially disruptive artificial intelligence and augmented reality systems. This will ensure that over the long term, digital literacy skills will play a smaller factor in societal isolation and individuals will be able to benefit from improvements in digital technologies and system designs.

To build awareness and interest in the social care sector, training and exposure of both the public and caregivers to the issues faced by older persons such as dementia and reduced mobility, can improve care provided both at home and at dedicated care facilities. To that end, educational programmes focusing on older age challenges may be important for local governments and charitable foundations to consider achieving more inclusive societies.

4.2 Infrastructure and Support for Development of Products And Services

Engaging youth and entrepreneurs in understanding the challenges faced by older persons, allows better user design as the former enter the workforce and the latter embark in the creation of social-focused enterprises. This allows the private sector to better engage with the needs of a market that may be under-represented and have challenges in voicing its

opinions, especially with regards to the design of products and services.

To that end, partnerships between academia, civil society, venture capitals and even local or national governments are a key in ensuring successful implementation of effective solutions, as each has its own pivotal role to play, which should be defined, understood and communicated. Governments can play a primary role by facilitating common industry standards on physical and digital design together with the private sector, to promote the prevalence of universal design, which can also facilitate ease of use to disadvantaged groups of peoples. In addition, standards on artificial intelligence development, could minimizes digital biases against older persons potentially on areas of training learning algorithms, such as with facial recognition and other biometric ID services. Another sector is cyber security, where government can collaborate with both private sector and civil society ensuring that digital products, are safe to use and online data are protected from malicious users, thus also minimizing potential apprehension by older users in increasing digital usage.

Joint testbed zones between academia, private sector and community centres or areas as defined by local or national government can accelerate product iteration and development, common data sharing standards and improving harmonization of certification between countries, can also accelerate the deployment of important technologies into society that can improve the quality of life for all.

4.3 Inclusive Built Environments and Social Structures

A potentially significant sector where digital technologies and the digital literacy could be key is in the changing demographic and migration structures, typically of youth towards large metropolitan areas, making it difficult to maintain family support structures in rural communities and even in certain urban communities. The use of digital tools appears fundamental to maintain family ties and a need for local community support structures in place to support older persons that are potentially facing social isolation.

Even as we build new digitally smart cities, urban planning and community development also needs to consider persons with disabilities and older persons, that may not be digitally connected or lack significant digital skills to engage with online applications and services. On this issue, we have seen good examples from developing countries and in East Asia, in providing one-stop shop services and backup services, where older persons can be assisted to obtain their services in-person or assisted to obtain it digitally.

In rural areas, where permanent representation by local government offices may be complicated with the shifting demographic trends, forms of outreach such as through government services being offered by trained civil workers, as they check-in on older persons or similar roaming services, could provide a means of reaching those who are most likely to be neglected and at risk of being left behind.

4.4 Coordination of Policies and Standards

National development goals based upon the sustainable development goals are good measures to start ensuring the success of defining an inclusive digital society, as what can be measured, can result in an action to be taken to improve the measurement indicators.

However, what is desired at the national level may be different at a local level. Reviews with residents, businesses and representatives, should be undertaken to best understand key priority needs and capabilities within a community. There is also a limit as to what can be sustainably done by a government without the significant adjustment of income or expenditure, thus prioritizing and planning for programmes should be targeted or where overlapping synergies apply, to combine functional designs together, such as designing transportation for older persons which can also encompass impaired groups of people as an example.

Coordination between national governments on the acceleration of research, development, certification and deployment of new digital technologies, including data sharing and knowledge sharing frameworks, could significantly accelerate the silver economy. Regional coordination and guidelines, similar to emissions policies, could potentially spur significant interest and investment in developing products and services to improve the quality of care, by increasing the involvement of private sector and civil society actors.

4.5 Evolving Nature of Ageing

Resolving the issues of an ageing society, is an ever-evolving goal due to the changes in technology, society and personal factors such as literacy. As human development continues and generational change occurs, the new aged population that have grown up with computers and smartphones will eventually become dominant. However newer technologies, such as virtual / augmented reality, artificial intelligence are likely to be potentially more approachable, making future digital integration into care potentially easier.

This change could see significant increases in the productivity of the care sector in the region, while also potentially improving the mobility and happiness of individuals by enabling greater interconnectedness through the use of smart mobility and virtual reality devices. Several success factors stand out within the presented case studies, which includes the development of a strong benefits case to the impacted persons, designing systems and programmes for ease of use and while also ensuring that the level of technical ability for recipients are matched can be key to successful implementations.

Thus, countries and communities looking to digitalize care systems must also be highly cognizant of the capabilities of the majority of individuals, including the minority groups to tailor programmes for their benefit, knowing that there is no immediate one-size fits all solution. The implementation of different programmes to cater to different groups will therefore allow better allocation of resources while also maximizing the impact and comfort of those that we seek to serve.

Subregional Office
EAST AND NORTH-EAST ASIA

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