Chapter 2

Study 4: Business Start-up Survey for the Healthcare Industry in Thailand

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Chapter 2

Study 4: Business Start-up Survey for the Healthcare Industry in Thailand

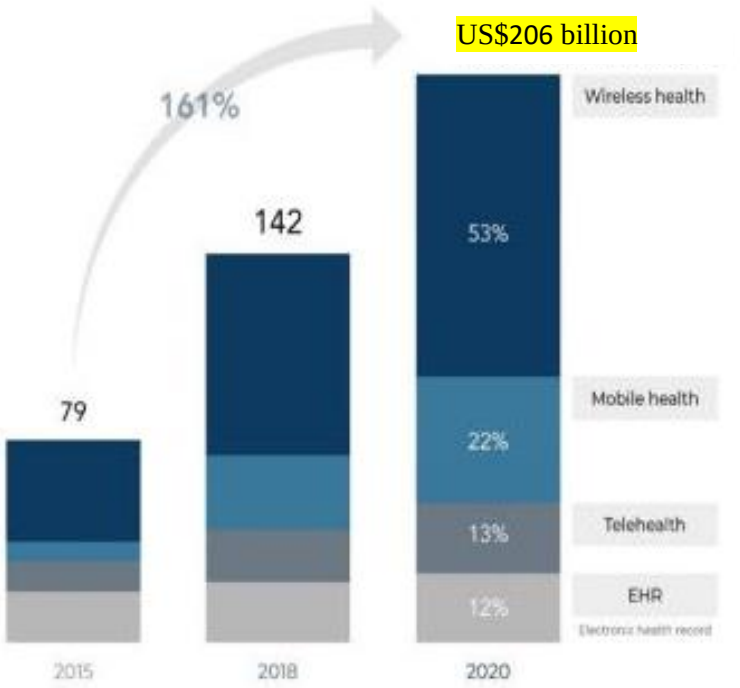
Nopadol Rompho, Sakun Boon-Itt, and Sukrit Vinayavekhin

1. Introduction

It is estimated that the ratio of the world's working-age population aged over 50 years will increase from 20% to 30% by 2050 (Irving et al., 2018). The rapid ageing of Thailand's population will pose a challenge for the economy, forcing government, businesses, and individuals to adapt. Yet, the greying of society will also bring about business opportunities (SCB EIC, 2015). The ageing population was estimated to increase faster than other age groups. The ageing population – those 60 years and older – was estimated to be as high as 13 million or 19% of the total population in 2020 (United Nations, 2019) and more than 20% in 2025. In 2014, 300,000 caretakers were needed to look after 10 million senior citizens (Itthiphanuwat, 2019 [2562 BE]). The key policy of the current government is the Thailand 4.0 economic development model (Government Public Relations Department, 2016), which aims to transform the economy from one based on agricultural, light, and heavy industry into one based on value-based industry driven by innovation. The policy focuses on building up existing and potential industries [First S-Curve] related to the ageing population, such as health tourism, and the future digital technology industrial complex [New S-Curve], including the integrated medical care industry. To boost the value of these business sectors, the government has implemented policies to promote the development of advanced technologies and innovations related to public health. The policies encourage start-up businesses to be involved in healthcare technology (health tech), medical information technology (medi-tech), innovative industries, cultural capital, and high-value services highlighting start-up products for lifestyle businesses and enhanced healthcare services.

Private health tech and medi-tech start-ups are enjoying robust growth. Based on the data from Statista, a leading news agency in Thailand, the market value of global digital healthcare will reach US$206 billion by 2020 (Figure 1).

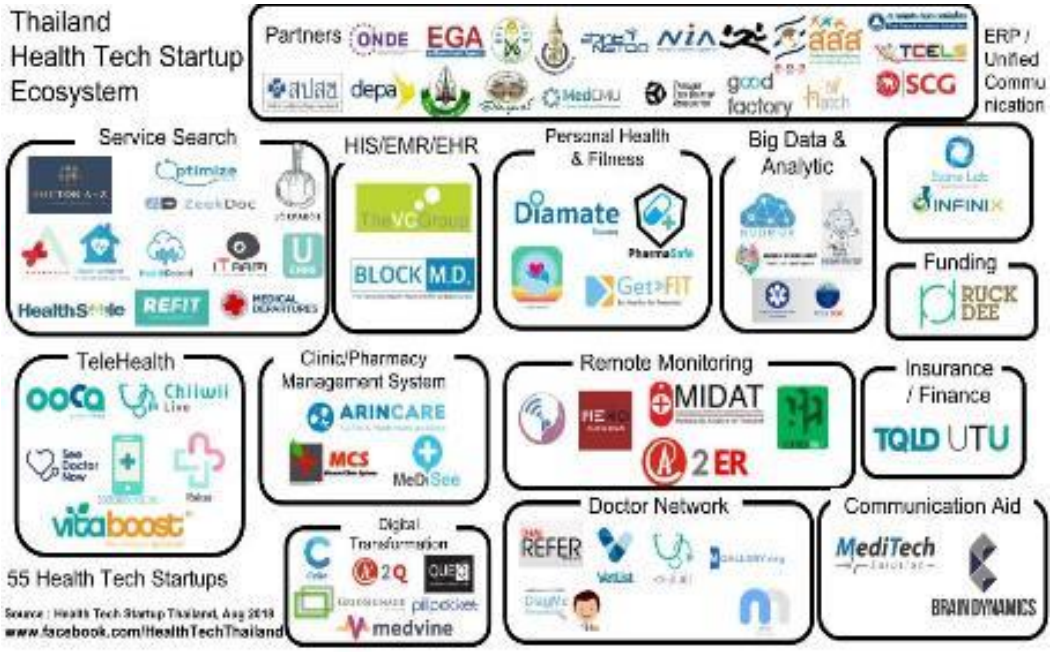
Figure 2.1. Global Digital Health Market



EHR = electronic health record.
Note: Mobile health refers to healthcare services provided using mobile devices. Telehealth refers to delivery of healthcare services via remote technologies.
Source: Statista (2019).

Health tech and medi-tech start-ups have been increasing rapidly and are cooperating to form a health start-up network. In August 2018, there were 55 health tech start-ups categorised into 14 groups (Figure 2.2).

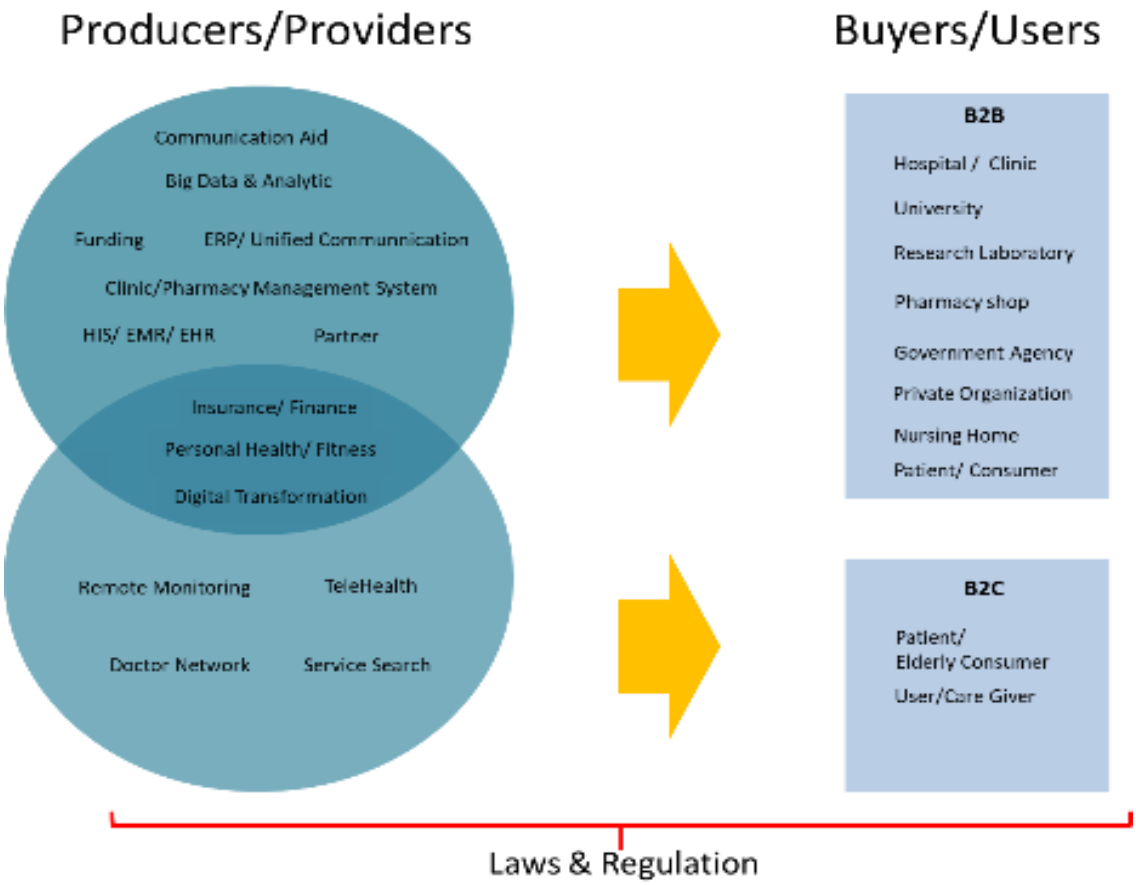
Figure 2.2. Ecosystem of Health Tech Start-ups in Thailand



Source: Health Tech Startup Thailand (2018).

An analysis of health tech start-ups' value chain reveals that buyers or end users of their products and services can be categorised into business-to-business (B2B) and business-to-consumer (B2C). Start-ups provide products and services for organisations or individuals or both (Figure 2.3).

Figure 2.3. Health Tech Start-up Value Chain



B2B = business to business, B2C =business to consumer, EMR = electronic medical record, ERP = enterprise resource planning, HIS = hospital information systems.
Source: Author.

2. Objectives

This study surveyed health tech start-ups with the following objectives:

1. Examine the market size of health tech start-ups, specifically in areas related to the ageing population and determine the different types of health tech start-ups with potential to grow in response to population ageing.
2. Explore innovations and health tech start-ups that help older people maintain their physical and mental functions so they can continue to participate in society and contribute to the nation.
3. Investigate the gap between the needs of older people and what existing health tech start-ups can provide.
4. Explore rules, regulations, laws, and practice guidelines for health tech start-ups to develop a knowledge base that supports their operations and efficient response to the needs of the ageing population.

3. Methodology

The study relied on a qualitative research instrument, i.e. semi-structured interview, to collect data from health tech start-ups and employed the multi-case study technique. The technique helps researchers understand more deeply phenomena or cases in real-life situations (Yin, 2013). The study focused on the ageing population in terms of its market sizes, types of start-ups with potential to grow, and trends in innovations and health tech start-ups that develop the potential of older people and fill the gap between their needs and what health tech start-ups can provide. We designed the study to explore rules, regulations, laws, and practice guidelines for health tech start-ups. Our interview guide had 10 questions:

1. Describe your start-up (general information, value proposition, customer segments, channels to access customers, revenue model, etc.).
2. How does your company affect the ageing population?
3. What are some possible development trends for technologies and services in Thailand's healthcare industry?
4. What services and technological support does your start-up provide to the elderly and which are still lacking?
5. About how many customers do you have and what are their income levels?
6. Who are your target customers? Do you focus on the ageing population?
7. Do you plan to expand to support and respond to the needs of the ageing population? How?
8. What are the trends in innovations and health tech start-ups that can develop the potential of older people so that they can maintain their physical and mental functions and continue contributing to the nation?
9. What are the discrepancies between the needs of the ageing population and what existing health tech start-ups can provide?
10. Should any laws and regulations be adjusted? How?

The researchers selected 15 health tech start-ups representing 13 out of a total of 14 sectors. The founder, co-founder, or executive of each start-up was interviewed about the company's overall management, whether management is concerned about population ageing, and health tech start-up trends.

Appointments to meet with the interviewees were made in advance so they could prepare. Interview questions were sent to the interviewees if they asked for them. Each interview lasted 45–60 minutes and at least two interviewers were present during each interview. Before the interviews started, the interviewers introduced themselves, described the objectives of the research study, and asked if they could make an audio recording of the interview. The interviewers repeated their questions as necessary and allowed the interviewee to ask for clarification. Follow-up questions were used to ensure that the information provided by the interviewees was complete. Occasionally, the

interviewee's answers were repeated to allow him or her to confirm them. At the end of each interview, the interviewer told the participant that the interview had come to an end and that he or she could ask questions and/or provide any additional relevant information. Lastly, before ending the interview, the interviewers assured the interviewee that his or her information would be confidential.

The data from the semi-structured interviews were analysed by means of content analysis. The interview recordings were transcribed and checked for accuracy. The information was coded manually by the researchers to obtain the gist of the interviewees' answers to each question (Schreier, 2012). Then the coded information of all participants was combined to form an overall picture of their answers to each question. Finally, we reviewed the codes for accuracy, collaborated to create guidelines and types of information or themes and categories (Kurasaki, 2000) for each interview question, and wrote a report on the findings. We summarised and presented the research outcomes based on the interviews.

Table 2.1 shows the details of the samples of the study.

Table 2.1. Detailed Descriptions of Samples

Start-up	Sector	Business Focus	Size (# Employees)	Service (Years)	Informants	Interview Date
A	Service search	Home care	Small (16)	3	Founder	21 Dec 2018
B	Personal health and fitness	Personal life medication platform	Small (7)	4	Founder	13 Nov 2018
C	ERP and unified communication	Resource management system	Small (14)	2	Founder	14 Nov 2018
D	Telehealth	Psychological consultancy	Small (5)	2	Founder	19 Nov 2018
E	Digital transformation	Improve well-being	Small (35)	1	Head of customer living solution business	24 Jan 2019
F	Doctor network	Health consultancy	Small (7-8)	3	Founder	19 Mar 2019
G	Clinic and pharmacy management system	Drug store system	Small (12)	3	Founder	18 Mar 2019
H	Insurance and Finance	Insurance	Small (15)	3	Founder	18 Mar 2019
I	Funding	Matching and consulting	Small (5)	3	Marketing	15 Mar 2019

Start-up	Sector	Business Focus	Size (# Employees)	Service (Years)	Informants	Interview Date
					manager	
J	Remote monitoring	Medical monitoring and data warehouse	Small (10)	2.5	Founder	15 Mar 2019
K	Communication aid	Digital health	Small (8)	5	Founder	14 Mar 2019
L	Digital transformation	Elder community	Small (10)	2	Founder	15 Mar 2019
M	Digital transformation	Queuing solution	Large (100)	4	Founder	29 May 2019
N	Partner	Support (funding and consulting)	Medium N/A	N/A	Manager	1 Apr 2019
O	HIS, EMR, EHR	Research and development, software provider	Small (15-20)	N/A	Founder	18 Jun 2019

EHR = electronic health record, EMR = electronic medical record, ERP= enterprise resource planning, HIS = hospital information systems.
Source: Author.

4. Research Outcomes and Discussion

Data from the interviews can be summarised as follows:

4.1. Target Customers, Market Size, Value Proposition, Major Source of Income

The market size of health tech start-ups related to the ageing population can be measured by (1) the size of the ageing population and (2) the size of the industry in relation to the target customers of a specific start-up. The health tech start-ups provide the following services:

1. equipment and facility management;
2. platform to offer mental health counselling services;
3. websites and applications for the use of medication;
4. platform to search for caregivers for healthcare at homes or in hospitals;
5. extension of a retail business to provide products and services involved with housing, with an emphasis on comprehensively serving older people;
6. products that provide insurance for older people and retirees;
7. service to match start-ups with sources of funding;
8. system to organise activities for older people;
9. suggested solutions to patients about receiving medical services in the network of hospitals that serve as information centres;
10. provision of knowledge and funding for start-ups; and
11. research on and development of blockchain products to manage health information.

The direct buyers of these start-ups' products might not necessarily be the end users, i.e. the elderly or their caregivers, but may include corporate clients. We classified their business models into B2C and B2B.

4.1.1. Older People in General and Older People Who Recently Left the Hospital (B2C Model)

The target customers are the end users, who can be all older people throughout the country (as measured by the size of the ageing population). Thailand has 11 million people aged 60 or over, who comprise 20% of the total population; 20% of the population aged 60, or about 2 million, will need to be cared for. By 2031, the number of older people is estimated to rise to 19 million or about 28% of the population (*Matichon Online*, 2018 [2561 BE]). The products and services available are, for example, caregiving, medical and health counselling, management of residential places to fulfil the needs of older people or patients, procurement of devices for collecting and monitoring personal information of older people, and preparation of activities to promote good physical and mental health of older people, amongst others.

B2C start-ups approach their target clients through direct sales, and exhibitions. Alternatively, clients contact the start-ups after having searched the internet, e.g. using Google or other search engines and visiting online stores or receiving suggestions from doctors or nurses who have visited the start-up websites.

4.1.2. Hospitals, Nursing Homes, Medical Clinics, Drugstores, and Organisations (B2B)

B2B represents corporate clients. Buyers are not the end users. Potential buyers are more than 1,200 hospitals and nursing homes, about 24,800 medical clinics (Ninkitsaranont, 2019 [2562 BE]), and more than 20,000 drug stores throughout the country. The country has about 50,000 doctors. Interview data reveal that such potential clients have a firm intention to buy innovative products and services that include systems and applications to serve the needs of older people, e.g. an application that allows doctors to track how their patients take their medicine. Clients are mostly hospitals, whilst the individual older person or caregiver is the end user.

These start-ups approach their clients through public relations via various online and offline media, sales teams, personal networking, and word of mouth from hospitals. The informants said most customers get information through word of mouth, social media, or online media before deciding to contact the start-ups.

4.2. Trends and Opportunities that Will Facilitate the Growth of Health Tech Start-Ups that Support and Respond to the Ageing Population's Needs

The global digital health market has grown and will expand significantly. Its global market size was forecast to increase by 161% in 2020 compared with 2015, with wireless health technology taking the highest share (53%), followed by mobile health (22%), telehealth (13%), and electronic health records (12%). Mobile health refers to healthcare services provided using mobile devices. Telehealth refers to the delivery of healthcare services via remote technologies. Trends in the global digital health market will focus on providing health services remotely. Patients and other older people no longer need to travel to hospitals or clinics and will be able to receive medical care through various types of devices in the comfort of their own homes or other locations outside hospitals. Remote healthcare services will reduce travel expenses and time and the physical burden of queuing to receive healthcare. Such services are expected to provide enormous benefit to patients and other older people who have difficulty traveling because of their health.

The key to develop health tech start-ups that support and respond to the ageing population's needs includes changes in consumer behaviours and development of technology:

4.2.1. Familiarity with Technology

In the future, elderly consumers will be more familiar with information and communication technology because they are young consumers now, who have easy access to technology and make good use of it. This generation accepts technology easily, which will facilitate the spread of new technology.

4.2.2. Advanced Information Technology and Artificial Intelligence

Because the percentage of the younger population will decrease, the workforce of the future will be smaller. The development of information technology, however, will reduce demand for human labour. Information technology (IT) and artificial intelligence (AI) will play an important role in developing various kinds of products and services. Population ageing will create a shortage of caregivers, and IT and AI are expected to be utilised in elderly care.

4.2.3. Integration of Data

Almost all informants agreed that the Internet of Things has great potential for the development of health tech. For example, sensor systems that have internet connection can improve the efficiency of elderly care. The effective use of the Internet of Things requires a system to track, organise, and integrate information. For health tech start-ups to develop, a database of comprehensive client information is necessary; therefore, an efficient storage system is required. Most information has been kept locally. For example, once a patient's pulse is taken, the data are stored only where the activity took place. Without a link with other related data, locally stored data do not help create a complete picture of clients' health status and cannot be used efficiently. Comprehensive information on individual wellness, e.g. heart rate, metabolic rate (basal and exercise), blood sugar level, and blood pressure, should be collected and integrated.

4.2.4. Job Creation

The informants from the doctor network and telehealth sectors mentioned that IT has the potential to provide comfortable working environments for older people in their own homes. It can create jobs for older people, who will then feel they are contributing to society. Many older people remain capable and resourceful because of their extensive work experience. Older people have been discouraged from working for several reasons. Staying in an office for 8 or 9 hours per day is not easy for them. Traveling to work might not be an option because of their health. Innovations and technology, e.g. video calls and online tools, will provide opportunities for them to work from home. Older people can use their experience and give valuable advice through video calls and e-mail. In Thailand, using IT is new for most older people.

4.3. Innovation and Start-up Trends that Will Encourage Older People to Keep Contributing to Society

4.3.1. Innovation for an Active Ageing Population

The informant from the digital transformation sector focusing on the senior community mentioned that older people have fewer opportunities to engage in activities because of their health. Innovations and start-ups will play an important part in offering activities suitable for older people and in allowing them to engage in activities that they were able to do previously. For example, older people who enjoy socialising can join a virtual community to share their lives and experience and to maintain their physical health.

4.3.2. Financial Management Service

According to the informant from the insurance and financial sector, most people are not well prepared financially for ageing. Thailand is one of many countries in South-East Asia facing rapid population ageing (Hsu et al., 2015). But a significant number of people will become senior citizens without having enough financial resources to support themselves (Jongudomkarn, and Camfield, 2006), and social welfare provided by the government will not be sufficient (Ruanto, Leucharusmee, and Chinnakam, 2017). Without financial security, older people will not have good quality of life and will unlikely live happily or engage in activities that promote good quality of life.

The same informant stated that retirement planning services will improve older people's quality of life in the long term. There should be financial services related to products or services for older people such as patients' beds or necessary but costly medical devices. Start-ups can help improve older people's quality of life by offering services for financial planning for retirement and health insurance. Start-ups may offer services after the elderly have passed away to relieve the burden of their children, e.g. expenses for cremation, transport to their hometowns, and inheritance management. However, to make these services readily available to the public, the government must fund start-ups.

4.3.3. Cost of Technology

The cost of health tech and innovation is anticipated to go down. Innovative products and services will become cheaper. Lower costs will give everybody, including the ageing population, access to these products and services and encourage older people to continue contributing as high-quality workers.

4.3.4. Preventive and Mobile Healthcare

Healthcare innovations, products, and services aim to help older people prolong their lives, e.g. through telehealth, service search, and doctor networks. Informants from the remote monitoring business, however, said that prevention of risks and diseases has not been sufficiently emphasised. The following are needed: (1) a storage system for health information to enable sharing of clients' information with caregivers, nurses, rehabilitation therapists, doctors, amongst others; (2) a warning system such as a medical wristband to prevent foreseeable dangers; (3) home delivery of essential medicines in response to clients' health information collected remotely, such as mobile blood tests collected by certified professionals; and (4) monitoring systems that can send alerts to hospitals if falls are detected, so that an ambulance can pick up the client.

4.3.5. Augmented Reality and Virtual Reality

The development of augmented reality (AR) and virtual reality (VR) is expected to create a boom in remote medical consultation services. AR and VR will particularly benefit patients who need psychiatric or psychological consultations because mutual recognition of facial expressions is crucial for counselling and diagnosis. AR and VR could open a new world of healthcare and medical services and, it is hoped, improve access to medical consultation services and, therefore, the quality of life of older people.

4.4. Discrepancies between the Needs of the Ageing Population and Health Tech Start-Ups Available for Older People

4.4.1. Mobile Service

Mobile medical services such as remote area or off-site medical services are still insufficient, whilst demand for mobile services is enormous from people with mobility problems, particularly older people. Alternative services such as visiting clinics or nursing homes are insufficient. Health tech start-ups are expected to fill the gap between demand and supply of mobile medical services.

4.4.2. Barriers to Adoption

Health tech start-ups have focused on advanced technologies that require advanced skills and knowledge to use rather than end-user–friendly products. To meet growing demand, health tech start-ups are expected to listen to older people to understand what products and services they need to ensure social inclusion. Some older people do not have the knowledge or skills to adopt cutting-edge technologies. If they want to target older people and expand their business, health tech start-ups should provide user-friendly products and services that older people can easily enjoy. Two factors should be considered: need and application. Gaps still need to be filled so that health tech start-ups can grow sustainably. This does not mean, however, that older people, who are diverse, are all unfamiliar with advanced technology. The suggestion reflects the opinions of the informants.

4.4.3. Buyer vs. User

Most older people have been cared for by their children or close relatives for generations (Klassen et al., 2018). Who decides what products or services should be purchased for older people? In most cases, the caregivers do: ‘those who bought it don’t use it; those who use it didn’t buy it’. This is true in the case of purchasing high-tech products. As a result, the products and services likely do not meet the needs of those who use them. Start-ups must study the discrepancy of needs between buyers (family caregivers) and consumers (older people) to create products and services that respond to older people’s needs. Start-ups should keep in mind that their customers now, who are children or caregivers of older people, may one day become the end users of their products and services. Start-ups can create products and services that respond to the needs of the elderly and the caregivers on the assumption that buyers and end users have similar preferences. Effective marketing, awareness raising, and brand loyalty are key to the success of start-ups.

4.5. Laws and Regulations Should Be Adjusted to Support the Growth of Health Tech Start-Ups for Older People

4.5.1. Telemedicine

Some entrepreneurs said that the government should support telemedicine or technology-enabled medical services, including an online prescription system, to allow patients to have real-time communication with medical personnel. The services have not

been approved officially, so they are not governed by laws and regulations. Introducing laws and regulations to approve the services will benefit start-ups as well as clients, especially those with limited mobility.

4.5.2. Legislative and Process Barriers

We recommend that the government relax legal restrictions on registration, e.g. laws and regulations on fundraising and registration of start-ups. Because of such restrictions, many start-ups registered abroad, where laws are more flexible and/or less complicated, e.g. in Singapore. Some start-ups offered employee stock ownership (Ittipanuvat, 2017 [2560 BE]).

4.5.3. Roles of the Government

We recommend that the government define its roles. For example, the government is expected to be an information centre. Government offices can be the source of information. A problem is that information needed to develop health tech start-ups is dispersed and sometimes information needed for business analysis cannot be found.

The government is expected to establish the standards for health tech start-ups. An informant from the communication aid sector doing business on digital health said that the government should establish clearer ethical standards for human experiments to develop medical devices to accelerate innovation.

The government should encourage new start-ups by providing essential support such as financial initiatives, business coaching, and tax exemption.

4.5.4. Outdated Laws and Policies

Start-ups face outdated laws and regulations, which fail to support the growth of health tech start-ups. In addition, the number of related laws which need to be reformed is huge. Once the first laws are considered and changed, they will affect others. Reform of the laws will be complicated and delayed. Outdated laws prevent the social enterprise from preparing for a time when such laws are not relevant to the needs of the private sector. All related laws and regulations must be reformed so that health tech start-ups do not miss opportunities.

4.6. Recommendations for Policy Development

The study's policy recommendations regarding laws and regulations can be summarised as follows:

1. There should be laws and regulations for telemedicine or medical services that use information and communication technology, including an online prescription system, to allow patients to have real-time communication with medical personnel.
2. Fundraising laws and regulations should be adjusted. Registration of health tech start-ups should be flexible and relevant to management of start-ups. Fringe benefits and incentives should be offered to employees, e.g. stock options.
3. Several related laws are overlapping and should be streamlined or completely overhauled because the business world changes quickly.

4. To help health tech start-ups grow sustainably, emphasis should be placed on preventing foreign start-ups from having an advantage over local ones. The government should foster health tech start-ups that are based in the country, e.g. tax exemption in the first year of business only for Thailand-based start-ups to enhance their ability to compete until they are strong enough to grow sustainably. Other measures should be in place to support start-ups' initial stage of operation and to shield them from difficulties.
5. Standards of various government institutions have different requirements, delaying health tech start-up innovation. The government should set clearer ethical standards for human experiments to develop medical devices and medical technology for hospitals and clinics so that the business sector can design guidelines for good practice.
6. Innovative services provided by health tech start-ups should be favoured in the reimbursement system of healthcare services. Services can include various forms of innovation, e.g. a device for brain analysis, a health monitoring device. Innovation in healthcare technology could ease access to patients' medical records, which must be shared free of charge, which can benefit businesses and patients.
7. The government is expected to be an information centre or data source to promote health tech start-ups. Precise and integrated information is crucial to conduct research, disseminate up-to-date information to stakeholders, and help the public understand new laws on health tech start-ups.

5. Summary

The analysis of the interviews and secondary data reveals that the size of health tech start-ups can be measured by the size of the ageing population and of the industries. Customers are B2C and B2B, which affects how start-ups approach their target customers. The elements that facilitate the growth of health tech start-ups that meet the needs of the ageing population can be categorised as follows: familiarity of the elderly with technology, advances in IT and AI, integration of data, and creation of new jobs and value amongst senior citizens.

Regarding health tech start-ups' innovations that enhance the potential of older people to continue contributing financially, the study found that older people need more activities, financial planning services to be ready for later life, lower-cost technology, measures to prevent health problems, and the use of AR and VR in communications.

Discrepancies between the needs of the ageing population and the ability existing health tech start-ups to meet them can be summarised as follows: insufficient mobile medical services, barriers to older people adopting high technology, and the gap between buyers (mainly family caregivers) and end users (older people).

Lastly, the study recommends that laws and regulations related to health tech start-ups be adjusted to support the industry's growth and to benefit all stakeholders. In this way, the industry will grow efficiently and sustainably and eventually promote the well-being of all senior citizens in Thailand.

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