



Trends of Thailand Healthcare Services System

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Abstract

Currently, Thai government is supporting Thailand to be an international medical hub. Thailand healthcare services are expanding to the CLMV nations, China, Russia and Africa. Subsequently, the numbers of foreign patients that come to Thailand for treatment will trend to be increased. Healthcare becomes one of the fast-growing sectors in Thailand. Thailand is recognized as the highest level of preparedness to cope with epidemics in Asia, based on the Global Health Security (GHS) Index 2019. Thailand has received 92.58 for the infrastructures, 96.22 for the cost, 89.91 for government readiness, 67.51 for medicine availability, and 17.37 for the professional competence. These enhance Thailand healthcare services system to be developed for facing more intense competition both domestically and internationally. It is interesting to understand Thailand healthcare services situation for enhancing Thailand's competitiveness and potential to be a center of the regional economy in the future. This article emphasizes on the trends of healthcare services systems in Thailand. Encouragement for Thai people to increase their longevity is described in the first section. Data warehousing for healthcare is then explained. Later, technology for healthcare industry transformation is mentioned as the third issues. The leveraging business intelligence for healthcare management is then proposed. Lastly, trend of wellness tourism in Thailand is discussed in the last section.

Keywords : Thailand, healthcare, technology, digital, medical tourism

Introduction

Healthcare services are trends affecting all people's lives including in high, middle, and low-income countries. Thailand healthcare systems are strongly influenced by culture,



political systems, and economies. Now, health trends technologies in Thailand become very interesting issue. People become more health conscious because they can use technologies for monitoring their health without contacting to the hospital or clinics. Benefits of health services and healthcare technologies are used in various dimensions. The details of technologies were used in Thailand healthcare industry such as encouragement for people to live longer, public health data warehouse, healthcare technological trend and its change, pervasive business intelligence and competitiveness, and medical/health tourism in Thailand are mentioned.

The aims of this article are to understand Thailand's healthcare services systems circumstances and trends, and to prepare for the responding to the changes to enhance Thailand's competitiveness and potential to be a center of the regional economy in the future.

Encouragement for people to live longer

Rapid population aging across Southeast Asia has dramatically increased during this decade. According to the National Economic and Social Development Board (NESDB) population projection, Thailand will enter the aging society in 2021 as depicted in Figure 1.

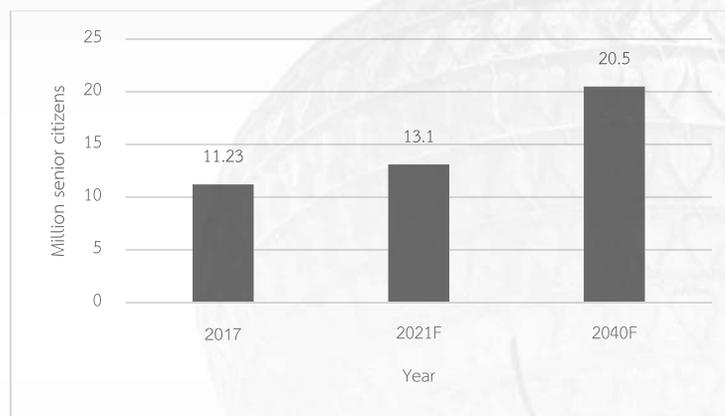


Figure 1 Proportion of Aging Population

Source : Thai Gerontology Research and Development institute (2017). Situation of the Thai Elderly 2017. Retrieved July 29, 2019, from Situation of the Thai Elderly Website: http://www.dop.go.th/download/knowledge/th1552463947-147_1.pdf : 35



Thailand must face with the challenge of providing adequate elderly healthcare. Most of elderly people must stay alone in their house because their child must go out for work. Online system technology would be another good choice for supporting the well-being of the physical and mental health of elderly. Technology can help for monitoring, prevention, providing consultation services, making appointment reminders, etc.

Public health data warehouse

Healthcare big data is the healthcare data collected from various sources such as electronic medical records (EHRs), medical device data and patient behavior and sentiment data (Adibuzzaman et al., 2017). Healthcare data can be electronic medical records, imaging data, patient data, sensor data, internet-connected devices. Data warehouse is used as a central hub of patient data. It extracts information from database to analyze and diagnose patients' symptoms efficiently. Applications of data warehouse in healthcare can be summarized as follows (Fatt and Ramadas, 2018):

1. Descriptive analytics: It describes the historical data of patients which helps to present number of patients who visit the clinic/hospital in the past including the medical record of each patient. This can make the medical staff work easier more efficient. It can also track the amount of money was spent for medical treatment within a given period.
2. Predictive analytics: This phase can be considered as analyzing phase. The historical data is used as the guidelines to forecast the future.
3. Prescriptive analytics: Data warehouse is assisted to make the best decision and to comply with the medical treatment for the doctor.

Data elements and national standards have been vital issues in Thailand over last five years. Some of national standards that Thailand try to follow are population data identification, hospital identification, medical service data, and financing and claim data (Ingun et al., 2015). Population data identification are the data which are related to the information of newborn, death, immigrated or emigrated. This would be the personal data of each patient for receiving the healthcare services in hospital. Hospital identification is assigned by the Bureau of Policy and Strategy. This number will be given to the hospital that legally registers healthcare facilities. Next is medical service data. The medical service data can be divided into two type of dataset. The first type of dataset contains transaction of individual patient from hospital while another system contains individual outpatient's transaction data, health data



such as referral and accident data. Lastly, financing and claim data that would help to reduce false claim for each patient and improve data quality data.

Healthcare technological trend and its change

Online service has an important role in daily life. People can receive the product or service any place, anytime in a shorter time. In case of healthcare services patient can check their symptoms online. Patients can consult their own physician or doctor team and get advice, treatment plans and prescriptions if needed from specialists on managing their health and condition online. Further, medical online system helps to create doctor's schedules and manage the waiting queue for access to physicians, especially in Thailand Government hospitals. Online system provides various benefits both for the healthcare services providers and users such as reducing staff labor, improving satisfaction, improving efficiency, reducing waiting time, increasing revenue, increasing popularity, reducing cost, balancing patient load and reducing wrong appointment type.

It was found that 76 percent of Thai people who are living in the cities plan to have a better work-life balance by having the healthy food and doing some exercises (Mintel Press Team, 2018). Apart from the hospital and clinics, Thailand also has gym, fitness, yoga, Pilates, spas and wellness centers for both deep relaxation and /or recovery purposes. People can book such service online before they go to use the services in such centers. Now the advancement in technology is shaping and influencing most of Thais, and Thailand government plan to apply Thailand to the direction of the development of health in Thailand to Health 4.0 as explained in Figure 2. Mintel research (2018) reported that 63 percent of Thai people are searching their nutritional or dietary information online and 54 percent of them getting such information from social media or blogs. These reflect that digital channels are the top of mind of Thai people, especially during this decade where more consumers are moving online.

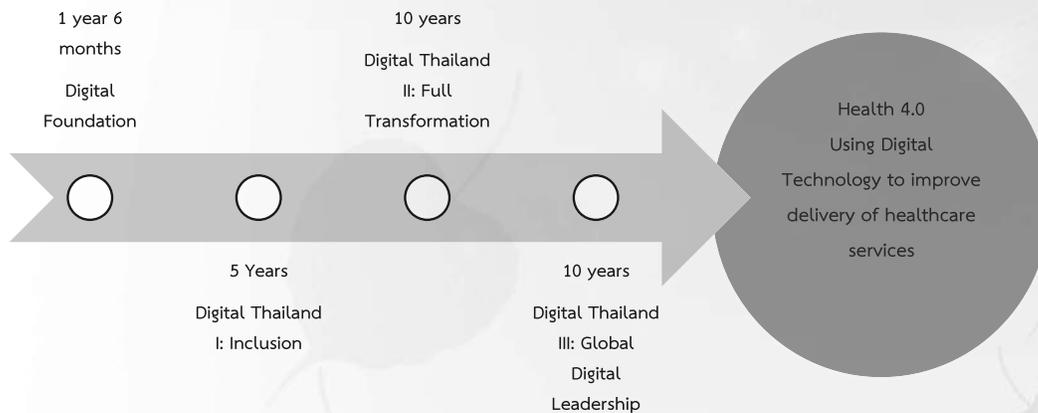


Figure 2 Thailand Digital Landscape to Health 4.0

Source : Ministry of Information and Communication Technology (2016). eHealth Strategy Ministry of Public Health (2017-2026). Retrieved July 29, 2019, from eHealth Strategy Website: https://ict.moph.go.th/upload_file/files/eHealth_Strategy_ENG_141117.pdf : 27

However, a big change of healthcare businesses over the world has been prevailed, including in Thailand. In 2018, because of a quick jump of 'Health Tech', this made the interest of health popular not only patients, but also among health institutes. An extending the healthcare environment to patients' comfortability goal has been set for a decade, however, the barriers of making this process happened involved a large scale in development (Schaffer, Rasmussen, and Faiman, 2018) such as design, technology platforms, payment strategies, reimbursement, securities, devices, workflow, related knowledge of health, etc. While health services providers, doctors, nurses, insurance dealers, the government leaders, and others attempted to get rid of technological barriers, patients demand continued searching for the technologies facilitating their lives.

The beginning of health technology started at the same time of the change of financial technology, until recently, people became rapidly interested in it. However, healthcare technology has isolated from mobile technology revolution. The benefits of using digital health technology in facilitating healthcare services were categorized in various types of uses. For example, people were getting used to wearing technological devices when doing exercise, but not wearable devices for health were produced more features for health services also



such as added system for measuring sugar level in one's blood, measuring oxygen in blood, some features to track one's health information and share that information to the doctor who was taking care of that patient. To understand a digital health technology in healthcare services, current digital landscapes in healthcare were explained as following:

The use of digital health technology as diagnostic tools, disease management and supporting tools

Health Information Technology involved broad range of technologies used in a healthcare services such as patient engagement tools, laboratory and medical imaging information systems, health information exchanges, clinical decision support, medical devices, and etc. (Singh, and Graber, 2015). Health Information Technology played a very important role, for example, capturing patients' information in many aspects of diagnostic methods, including clinical historical interviews, physical exam or testing (Balogh, Miller and Ball, 2015). The potential of health Information Technology could assist in the measurement for diagnostic errors. Currently, an increasing of the complexity of healthcare services needed a huge amount of information in contributing to challenges in diagnostic process, Health Information Technology can address and relieve those human limitations.

The use of digital health technology to develop medical research and clinical study

Due to a rapid change of clinical research landscape, digital health technologies have been designed and used to implement clinical trials, for example, health information technology, mobile health (mHealth), telehealth for patient-reported outcome measures (Crotti, 2018). To illustrate, data collection from the patients by using the application to call patients and collect their data for a convenience can help a researcher study patients' progress for treatment study. Benefits of digital health in medical research conduct were explained into various viewpoints. Developing medical study design by using artificial intelligence (AI) can enhance research study and open more platforms to engagement more participants. As a tool assisting medical research conduct could give an immediate feedback, so the data were immediately collected at a specific site (Augenstein, Enders, & Cetin, 2019).



Pervasive business intelligence and competitiveness

A rapid growth with high intense of competition in healthcare industry impacted many hospitals and healthcare service centers to develop new patterns of their services. One of the most developed medical services is an innovation for self-wellness, which drives and attracts more people getting involved in. This could bring a long-term competitive advantage for hospitals and healthcare service centers.

Health and beauty service industries have been growing and expanding every year. The biggest product trends that people are interested in are mass beauty markets which serve to wide-range age and genders. Kestenbaum (2018) suggested the unique characteristics of beauty industry are customers' enjoying moments of new products and finding new brands, and young and independent brands in the beauty market.

Thailand can be counted at the first era of elderly society, therefore demands of elderly products and services exceed supplies in the market. Nowadays nursing home and day-care services for elderly people are organized and managed by small and medium enterprises. Rather there were a few of large-size organizations that run through this business (AEC+ Business Advisory, 2018).

The opportunities for health care-related businesses were suggested for investors who are seeking for creating and adding more values by emphasizing on medical services. Thai government was attempting to enhance levels of competitiveness by increasing healthcare services and focusing on medical services as a basis, and supplementary food and products as supporting business. Moreover, there should be an integration of healthcare and tourism services in light of medical holiday or vacation package, for example, an annual health check-up together with travelling package and recreational services such as Thai massage, spa, long-term healthcare services, and etc.

Medical/health tourism in Thailand

'Medical tourism' is known as a vacation including travel at international regions to gain medical services. Generally, those involve fun, leisure, relaxing activities, health care services, as well as wellness services. There has been increasing numbers of countries which marketed themselves for medical tourism destinations (Connell, 2013). Region of Asia has been certified and ranked as a high potential of health tourism and brought a huge amount of revenue coming to this area. Tourism Authority of Thailand (2017) reported the revenue



gaining in Asia according to health tourism has reached 3.4 billion dollars, which has taken 12.70 percent of world market that was 26.77 billion dollars. The estimation of growth was approximately 17.6 percent between 2007 and 2012.

Thailand was reported as the third biggest medical tourism destination market in the world (thethaiger.com, 2018). Thailand has invested heavily on medical services longer than 2 decades. By now, there were more than 60-plus gold standards facilitators and a-more-than hundreds of well-established clinics in this fields spreading around Thailand, particularly in Bangkok. Plenty of surgeries and surgeons were available and trained from international regions with many experiences. Regarding the government's strategic development plan in health services and tourism. The beneficiary from government policy could stretch promoting Thailand as a medical hub (back to 2003). The key service sector was private hospitals that play a very important role in the market. In the current, there were 256 enterprises and organizations. By those, more than 100 potential private hospital can support the health service needs from foreigners.

The major private hospitals for medical tourism attracting tourists in Thailand were 4 hospitals in Bangkok, Bumrungrad Hospital, Bangkok Hospital, Samitivej Hospital, and BNH Hospital. The provided medical or health services as world-class medically services in Thailand presented professionalism with using high technology of medical facilitators with reasonable and affordable prices for both domestic and international clients. In a present, 66 Thai medical institutes were accredited by the Joint Commission International (JCI) as meeting the international standards, compared to other neighboring countries as shown in Figure 3. While, the comparison medical service costs were illustrated in Table 1.

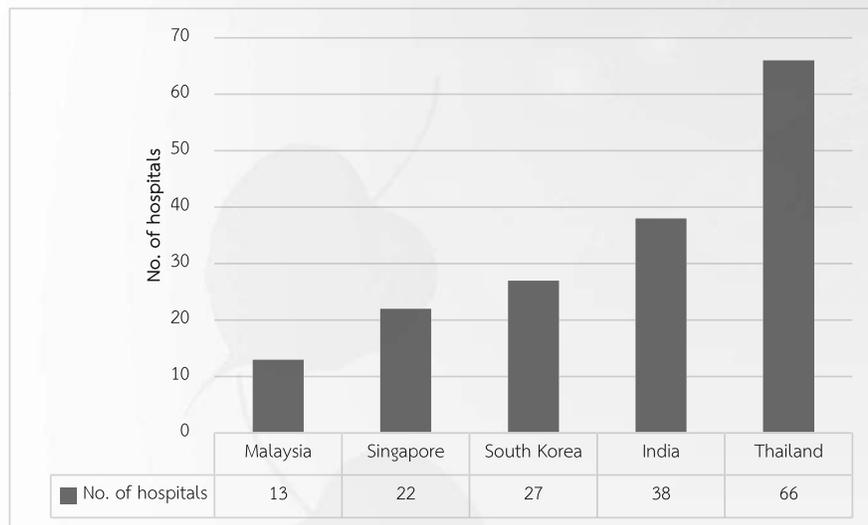


Figure 3 the Joint Commission International (JCI) accredited hospitals from 5 countries (2019)

Source : Joint Commission International (2019). JCI-accredited organizations. Retrieved July 6, 2019, from Joint Commission International Website:

<https://www.jointcommissioninternational.org/about-jci/jci-accredited-organizations/>

Table 1 Comparison of medical service costs among 4 countries with 8 selected types of treatments

Procedure	Thailand	USA	Singapore	India
Coronary angioplasty	\$4,200	\$28,200	\$13,400	\$5,400
Heart bypass	\$15,000	\$123,000	\$17,200	\$7,900
Hip replacement	\$17,000	\$40,364	\$13,900	\$7,200
Gastric bypass	\$16,800	\$25,000	\$13,700	\$7,000
Hysterectomy	\$3,650	\$15,400	\$10,400	\$3,200
LASIK (2 eyes)	\$2,310	\$4,000	\$3,800	\$1,000
Dental implant	\$1,720	\$2,500	\$2,700	\$900
Breast implant	\$3,500	\$6,400	\$8,400	\$3,000



The most popular treatment which gained a high amount of income for Thailand tourism industry was ‘Cosmetic surgery’ (Cohen, 2008). The treatments of medical service categories have been categorized by Thailand Med Tourism (2015) as in Table 2.

Table 2 Medical services in Thailand

Cosmetic / Plastic surgery	Breast augmentation / Breast lifting Eyelid surgery Tommy tuck
Dentistry	Laser teeth whitening Dental implant
Cardiology	Heart transplant Cardiac catheterization Carotid artery scan
Orthopedic surgery	Hip replacement / resurfacing Knee replacement Shoulder arthroscopy Ankle fusion
Holistic / Anti-aging	Acupuncture Detoxification Stem cell treatment rejuvenation
Dermatology	Birthmark removal Mole removal Cellulite treatment
Other services	LASIK eye surgery Medical checkup Sex reassignment surgery

The medical tourists’ perspective of Thailand medical tourism

According to the study of Sonpiam (2015), samplings were from international medical tourists who came to have treatments by accessing at hospitals and clinics in Thailand. Survey was distributed by using questionnaires. The findings presented 6 most popular treatments that tourists were received the services were as follows: cosmetic procedures (42.90 percent),



surgical procedures (32.90 percent), medical treatment (20.80 percent), dental treatment (15.50 percent), medical check-up (12.90 percent), and other (2.60 percent).

Regarding this study, friends/relatives and the Internet search were the most important factors of information sources before making the decision to come and get services in Thailand. This implies that the most important until least important influencing factors which affected tourists' decision making. The very high important impacting factors were 'professionalism (doctors, physicians), quality of care, accreditation of medical service providers, affordability/costing, and alternative/innovative treatments. This study showed post-purchased attitude toward medical/health treatments by tourists that they would recommend the services to their friends/relatives and consider coming back to have further treatments as well.

Another study from Kanittinsuttitong (2015), the study concerned about the motivation and decision on medical tourism services in Thailand. The study clarified that in Thailand, there was not enough medical tourism agencies that facilitated and provided information for tourists. Gaps of provided services for facilitating medical tourism such as interpreters, transportation and food service provider which were required in medical tourism chain.

Medical tourists in Thailand were not formed by homogeneous group. The tourists were mixed up of patients who traveled and sought for serious health treatments and who were seeking for minor treatments while taking a vacation. Both groups brought a net contribution to domestic economy revenue not only medical expenses but also travelling activities. The numbers of tourists have been overestimated every year in the past. Therefore, medical stakeholders involving hospitals, medical/health institutes, medical tourism agencies, transportation, food service providers, and even the government should consider arranging the medical/health system related to all stakeholders to be beneficial to Thailand.

Discussion

The medical and healthcare worlds are continually changing, and the technology is currently playing the important role in the medical domain. The preparation of high-quality and affordable healthcare services systems is more challenging due to the complexities of healthcare services and systems. However, the goals for healthcare services are to protect and develop the individuals' health. From this article, the encouragement for people to live longer, public health data warehouse, healthcare technological trend and its change, pervasive



business intelligence and competitiveness and medical/health tourism in Thailand were discussed about the trends of healthcare services system in Thailand that there are more gaps for developing their quality and competitiveness in the medical industry. The encouragement for people to live longer is focusing on the patient safety which was defined as the reduction of risks of adverse events relating to the medical care across a range of diagnose (Shojania, Duncan, McDonald, Wachter & Markowitz, 2001). Consequently, the quality care of both public and private services, not only how the services were used to treat the patients, but also how the healthcare services systems were applied, is essential to establish the fundamental elements of healthcare services system in Thailand. The strategic issues of Thailand healthcare services development have been strengthened in terms of health information system inputs and more concrete feedbacks for the fundamental health information system management. The healthcare services system development in Thailand in the coming era might be considered to develop the medical technology systems for people to living longer; to develop the decision supporting systems of the health technologies, healthcare research development, and the new innovations; to make strong processes and mechanisms in healthcare data management; and to improve the medical or health tourism in the near future.

Therefore, there are no longer to say that the healthcare industry is essentially dependent on the skilled medical professions and/or staff, however, they are the guardians of the health organization's reputation and brand. It can be said that the healthcare industry is counted not only the relating-medical products and services or patients, but also the supporting for the lifelong life. It would encompass both therapeutic services and social support mechanisms as well as welfare to our society. Consequently, there are efforts and benefits toward achieving a societal goal of inclusion extending beyond the discussion of healthcare as it is undeniable that the pragmatic approach of healthcare services will have to include the healthcare systems.

Recommendations

It can be recognized to the rise of trends and the increasingly rapid pace of healthcare services in this technology era which could affect a new normal within the healthcare industry. From the past, the healthcare was rooted in natural sciences such as basic clinical tools and equipment. In the present, the technology capabilities and practice mindsets have been developing and changing the healthcare demands. In the future, the digital network, software



or the new media will experience a fast-forward effect in the form of sudden affluence as well as the changes in people's lifestyles, health and diets.

Conclusions

The Board of Investment of Thailand or BOI announced the plan to drive Thailand to become the Hub of Wellness and Medical Services by 2025. Thailand has been introduced the affordable system for the country to develop healthcare services systems. Various systems and technologies such as smart equipment i.e. wearable blood pressure monitors, wearable fitness trackers, and wearable ECG monitors and data warehouse system i.e. health information technology, mobile health (mHealth), telehealth for patient-reported outcome measures have been adopted and used for enhancing medical system in Thailand. Another interesting trend for Thailand healthcare system is the medical tourism. The researchers found that the most popular treatments that tourists were received the services are cosmetic procedures, surgical procedures, medical treatment, dental treatment and medical check-up. The reasons why Thailand becomes popular for medical tourism are Thailand has the government support, excellence services, multiple tourist attraction, JCI accreditation in various healthcare services centers, and low treatment cost when compare to other countries.

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