Ethics, social media and e-health in Thailand

Suttisak Jantavongso

College of Information and Communication Technology, Rangsit University, Pathum Thani, Thailand

Abstract

This paper represents the intersection of ethics, social media, and electronic health (e-health) research domains. Following the papers titled "Ethics and E-Health in Thailand" and "Ethics and Social Media" published in 2013; this paper is one of the research working papers on ethics in Thailand by the researcher. This study introduced the roles of e-health and discussed certain ethical related issues aiming at those who were not familiar with e-health and the roles of Information Communications Technology (ICT) in healthcare. The research method was based on the Information Systems (IS) research approach, which employed a positivist research framework. The framework proposed a research cycle consisting of three stages. This paper presented the results of the theory building stage. The influence of ICT and the Internet including social media was an important factor in how healthcare services in Thailand are being offered and practiced. Whereas e-health relies on digital technologies to improve the efficiency of services, enhance service and product quality, empower patients and healthcare consumers, foster relationships between healthcare providers and patients, and promote education; the impact of e-health on patients and issues relating to the online practice of health services, privacy, informed consent, and health equity must be examined. These posed issues for greater attention on "e-health ethics".

Keywords: e-health, healthcare, ethics, morals, social media.

Received 3 April 2015; Accepted 7 May 2015

INTRODUCTION

The role of health and wellbeing of the people is vital to the economic development and performance of Thailand. A high quality healthcare system is a foundation of Thailand's social and economic wealth. The Thai government has a priority of maintaining equal access to safe and effective healthcare. Accordingly, Thailand has been moving towards improving quality healthcare system since 1975.[1] For example, a Thai national policy on providing free healthcare targeting low income earners, followed by the universal access to healthcare system. Thailand has achieved universal access to healthcare system since 2001.[2] In turn, this has had a significant impact on Thais in their reduction of the direct household payments for healthcare; and promoted an equitable quality healthcare system.[3]

Furthermore, Information and Communications Technology (ICT) is a key influence in improving quality, equity, and reducing cost in a healthcare system. Whereas differences among countries do exist, common factors related to successfully implementation of ICT in healthcare can be identified. Implementation of health related ICT and Electronic Health Records (EHRs) is considered among the highest priorities of modern healthcare systems.[4] Furthermore, e-health also has a

Correspondence: Suttisak Jantavongso, College of Information and Communication Technology, Rangsit University, PathumThani, Thailand (Tel.: +668-3461-6111; E-mail address: suttisak.j@rsu.ac.th).

significant role in enhancing the quality of healthcare services.[5] For Thailand, the growth of ICT, social media and use of the Internet have influenced daily lifestyle of Thai people. In 2015, 23.9 millions are active Internet users in Thailand, a 37 percent penetration of the total population, compared with 42 percent globally. Thais spend nearly 5.5 hours on average daily use of the Internet, compared to 4.4 hours globally. Thailand is ranked number two behind Philippines of 6.3 hours. Added to these figures, 32 millions are active social media accounts in Thailand, a nearly 50 percent of the population. As at January 2015, Thais spend 3.8 hours on average daily use of social media, compared with 2.4 hours globally. Thailand is in the fourth place behind Argentina, Philippines, and Mexico. Thus, there is a 33 percent annual growth in the social media accounts in Thailand since January 2014 compared with a 12 percent globally.[6]

These days, information including sensitive health information are available via the Internet and social media platforms.[7-9] Health and medical records, health advices, personal health records or databases are easily accessible. With the right tools and equipment, anyone is able to simply search someone's information and vital data via e-health systems and the Internet.[10]

In contrast, e-health is not a new phenomenon, and has been introduced in most of special medical areas. Hence, in many developing countries, the technology of e-health is not considered as the mainstream of healthcare process.[11] Accordingly, the concept of e-health is also not new in Thailand. For example, "e-health" was the most searched term in 2007.[12] News about the control of tobacco and alcohol consumption, physical activities promotion, health risk factors were available for Thai e-health users. E-health facilitates the development of social movement and the healthcare systems in increasing the Thais' wellbeing. The suggested three principle strategies as recommended by Charmonman[12] are (i) social mobilization, (ii) system development, and (iii) healthy communities development. In particular, a developing country like Thailand is facing with many healthcare and medical service issues. For example, financial, resources, proficiency, and lack of healthcare professionals.

Whereas, the value of e-health has never been more important in Thailand, ethical and privacy concerns keep Thai consumers from obtaining the full benefit of online e-health systems.[13] Hence, to fully understand Thailand's e-health systems, it is critical to understand the extent of e-health's social, ethical and legal barriers. E-health's privacy has become increasingly difficult to manage. Patients expect their health information to be confidential, and only accessible to authorized personnel. Health and medical records contain personal and sensitive information. This information should be protected due to its impact on employment opportunities, ability to obtain health insurance, and exploitation.[14]

Purpose

This paper describes the roles of ICT in health, also known as e-health, social media and discusses certain ethical issues related to e-health. The paper is an introductory article for those who are interested, but not familiar with e-health and the roles of health Information Technology (health IT) in healthcare. The roles of ethics in social media in e-health will also be presented.

Research methodology

The research method adopted was the Information Systems (IS) research approach introduced by Shanks et al.[15] which employs a positivist research framework. The research framework proposes a research cycle consisting of three stages: (i) theory building, (ii) theory testing and (iii) theory refinement.

This paper reports the results from the first stage of theory building and in this study involved a review of the literature on relevant research domains. A literature survey was conducted first, which focused on the domain of e-health, social media, e-health ethics, and social media ethics. The key factors are discussed in the later section.

Literature review

Healthcare

Health is one of the most essential elements of all human goods. Health refers to happiness, wellbeing, healthy thinking, and sanity. In turn, happiness promotes wellbeing. Furthermore, health is a state of complete physical, mental, and social wellbeing. Health also relates to social and political life. Thus, happiness are closely associated with physical and mental functioning. Assuring the health of its people is an important priority on any nation's agenda. For that reason, health needs are defined as the need to treat life threatening physical properties, physical disability, or disease.

Additionally, "Maslow's Hierarchy of Needs" is a valuable assessment tool that is used in the field of healthcare. Maslow's hierarchy addresses the needs of patients and where they are in their life from a psychological perspective because it identifies and addresses the needs of those particular patients. Likewise, Maslow's hierarchy is a motivational theory in psychology. It argues that while people aim to meet basic needs, they seek to meet successively higher needs in the form of a hierarchy.

Figure 1: Maslow's Hierarchy of Needs[16]

Maslow's hierarchy is illustrated as a pyramid with five levels of needs, see Figure 1. Health is under the "safety" level that includes security of environment, employment, resources, health, and property.[16] Relieving any anxiety or fear will help in putting more emphasis on social development, and with this will come a healthier self-esteem of the patients.

Therefore, healthcare is defined as that set of goods and services that patients or consumers use partially or entirely because of their anticipated favorable impact on health status. It consists of treatment that is curative, meliorative, and rehabilative.[17]

E-health

Electronic healthcare or e-health in the broadest perspective is not a revolution, nor did it suddenly appear. E-health is rather an evolution of traditional healthcare service providers which emerged early in the 21st century.[18] E-health is the combined use of electronic ICT in the healthcare services. E-health covers technologies used for medical, clinical, educational, research, and administrative purposes, at locally and regionally. The application of e-health is expected to enhance networking, facilitate global thinking, and improve healthcare on local, regional, and national levels. The objectives of e-health can be grouped into: (i) increase healthcare's efficiency, (ii) better care quality, (iii) increase obligation to evidence-based medicine, (iv) empowerment of patients and consumers, and (v) develop relationships between patients and healthcare practitioners.

E-health can be defined as the use of ICT for healthcare services.[19] Thus, it is envisaged that e-health is able to facilitate inequities in health systems and services in Thailand. Applications of e-health spans across a wide range of services such as: (i) store, process, and transmit patient information; (ii) manage the various clinical, administrative, and financial information; (iii) improve quality of patient care and patient safety; (iv) provide tools for diagnostics and treatment by distance; (v) develop capacity by offering

online health training and education courses to students and health professionals; (vi) offer innovative methods for healthcare using mobile devices, and (vii) make highly sophisticate biomedical research reachable. Accordingly, there are both commercial and open-source e-health products available. These products are able to integrate information from existing healthcare ICT systems.[20]

E-health in this study is defined as *"the use of emerging ICT, especially the Internet and social media platforms to improve and enable healthcare services".* The Internet is not only a source of information, but a mean of advancing e-health via communication. E-health systems complement traditional approaches for healthcare delivery. E-health systems are able to provide non-urgent consultations, obtaining routine laboratory test results, ordering repeat prescriptions and making appointments.[21]

Social Media and E-Health

Many social media tools are available for healthcare services including blogs, social networking sites, collaborative projects, content communities, virtual social worlds and virtual game world. These social media tools can be used to enhance professional networking and education, patient care, patient education, organizational promotion, and public health programs.[8] Nearly 40 percent of the online health information users used social media.[9] These users posted comments on their own health related matters, obtained health information, joined a health related group, followed their contacts' health experiences or updates. Twitter was used for health oriented questions and answers. Disease specific exchanges on social media sites provide sources of knowledge, encouragement, and support for patients with chronic illness.

For many people, well-known Facebook and Twitter are considered as social media. Despite this assertion, "SixDegrees.com" launched in 1997 was the first recognizable social media site.[22] Even though "SixDegrees.com" had attracted millions of users, it failed to become a sustainable and closed in 2000. The site allowed its users to create their profiles and list their friends. The site had promoted itself as a tool to assist people connect with and send messages to others.

Whereas social media has a very board meaning, no single, universally applied definition;[23] Cambridge[24] and Oxford[25] dictionaries provide a working term as follows: *"Websites and computer programs that allow people to communicate and share information on the Internet using a computer or mobile phone."* [24] and *"Websites and applications used for social networking."* [25] Thus, social networking is defined as *"The use of dedicated websites and applications to communicate with other users, or to find people with similar interests to one's own."*.

Furthermore, an increase in social media users in recently and an advancement in technologies of social media have been noticed by both academic and practitioner communities. Hence, social media embraces new media, digitalizing, and social networking technologies.[26] *"Internet medicine"* is another term for e-health which refers to health services and information delivered through the Internet.[27] Social media provides a cost effective method for patients to receive information and social support for their illness. Whereas, EHRs are primarily made to support mainly a one-to-one communication between a patient, a healthcare professional, and an organization; e-health via social media can provide many-to-many, many-to-one, and one-to-many communications. Thus, this is essentially extending the patients participation in their own decisions and health management, at the same time providing tools for medication assistance and research on treatment.

Social Media and E-Health in Thailand

Social media and e-health in Thailand is slightly different. Use of social media for Thai healthcare professionals is emphasized on Facebook and LINE Chat applications. For example, the Deputy Minister of Public Health in 2013, encouraged patients who live in Northern Thailand to use "LINE Consultation" with their doctors. The reasons given by the Minister was that advice via LINE messages offered quick and accurate

responses. The LINE application was able to provide a right direction to the patients who live in a rural area in a timely manner.[28]

Moreover, LINE, Facebook, Twitter, and WhatsApp are the main social media applications in Thailand which allow patients in seeking for a second opinion. Image scans and reports from a hospital can be quickly uploaded and viewed by remote specialists. Specialist's opinions can be discussed online in real time.[29]

Thai healthcare professionals already use social media to connect with others and patients. The social media platforms are selected based on the applications' familiarity. Non-payment for applications from the healthcare providers is one of the main reasons behind the popular use of social media. In addition, there are many active social media users, ability to send and receive pictures, notifications, easy to use, and ability to participate in group discussions. While there are many benefits of social network for a Thai healthcare system, discussing the details of patients should be done with the patient's consents.[29] Discussing cases in a real-time environment and in a public space, Thai healthcare professionals must take into consideration whether the patients would be able to recognize themselves even if no one else can. Without the patient's explicit consents, this in itself possibly will reduce trust in the healthcare professionals.

Privacy and Confidentiality of Healthcare Information in Thailand

Regulations relating to healthcare information, privacy and confidentiality are considered as barriers to Thailand's e-health systems. This is because of the restriction on sharing of patient data among healthcare service providers.[4] Whereas Thailand has enacted a legislation to ensure privacy of personally identifiable data of individuals irrespective of whether it is in analog or digital format, Thailand does not have a specific legislation to protect privacy of individuals' health-related data held in digitized format. Moreover, Thailand does not have legislation which provides for the sharing of health-related data.[19]

Despite this, patient's privacy and confidentiality of healthcare information in Thailand are related by a number of legislations as follows (i) declaration of patient's rights B.E.2541 (A.D.1998), (ii) National Health Act B.E.2550 (A.D.2007), (iii) Section 323 of the Criminal Code B.E.2499 (A.D.1956), and (iv) Computer Crime Act B.E.2550 (A.D.2007).

Firstly, declaration of patient's rights B.E.2541 issued in 1998 contains ten crucial issues of patient's rights following the principles of human rights and the 1997 Thai Constitution.[30] Equitable access to and utilization of health services, and an equitable chance to obtain complete information about patient's health and illness, were recognized as the right of patients and the public. In particularly, Issue 7 states that *"The patient has the rights to expect that their personal information are kept confidential by the medical practitioner, the only exception being in cases with the consent of the patient or due to legal obligation."* [31]

Following this, Section 7 of the National Health Act B.E.2550 issued in 2007 states that *"Personal health information shall be kept confidential. No person shall disclose it in such a manner as to cause damage to him or her, unless it is done according to his or her will, or is required by a specific law to do so. Provided that, in any case whatsoever, no person shall have the power or right under the law on official information or other laws to request for a document related to personal health information of any person other than himself or herself."* [32]

In addition, Section 323 of the Criminal Code B.E.2499 concerning disclosures of private secrets states enacted in 1956 states that *"Whoever, knows or acquires a private secret of another person by reason of his functions as a competent official or his profession as a medical practitioner, pharmacist, druggist, midwife, nursing attendant, priest, advocate, lawyer or auditor, or by reason of being an assistant in such profession, and then discloses such private secret in a manner likely to cause injury to any person, shall be punished with imprisonment."* Added to this paragraph, *"A person undergoing training and*

instruction in the profession mentioned in the first paragraph has known or acquired the private secret of another person in the training and instruction in such profession, and discloses such private secret in a manner likely to cause injury to any person, shall be liable to the same punishment." [33]

Furthermore, Thailand Computer Crime Act B.E.2550 was enacted in 2007 to enforce Thailand's law on the Internet, and safeguarding electronic data within Thailand. The details of Sections 5, 6, 7, 14, 15, and 16 is presented as follows. Section 5 deals with illegally accessing a computer system for which a specific access prevention measure that is not intended for their own use. Section 6 is about disclosure of security procedure. Section 7 looks into illegal access to computer data that has specific security measures intended to deny access to unauthorized persons. Section 14 involves importing into a computer system: (14i) wholly or partially forged or false computer data that is possible to cause damage to another person or the public; (14ii) false computer data in a manner that is possible to undermine national security or to cause public panic; (14iii) computer data that is an offence against national security or terrorism according to the Criminal Code; (14iv) pornographic computer data that is accessible to the public; and (14v) publishing or forwarding any computer data with the full knowledge that such computer data is under paragraph (14i), (14ii), (14iii), and (14iv). Next, Section 15 deals with any service provider intentionally supporting or consenting to an offence under Section 14 within a computer system under their control. Finally, Section 16 involves a computer system that is available to the public photographs of another person that are developed, edited, enhanced, or altered by electronic or any other means in a manner that is likely to damage the reputation of that other person, exposing that other person to hatred, contempt, or humiliation.[34]

E-Health in Thailand

Thailand is one of the leading countries among developing nations, that the use of ICT applications including e-health services is pervasive. Thailand has achieved an elevated level of access to e-health services, use of ICT and ICT skills. Despite this, Thailand is still lagging behind in laying down the e-health foundations. The study by Kijsanayotin et al. [19] identified three levels of e-health development. The first of these is the foundation policies and strategies. This includes the creation of an appropriate governing body involving a multi-stakeholder and at the national level. The second level is e-health development models. The final level is e-health applications.

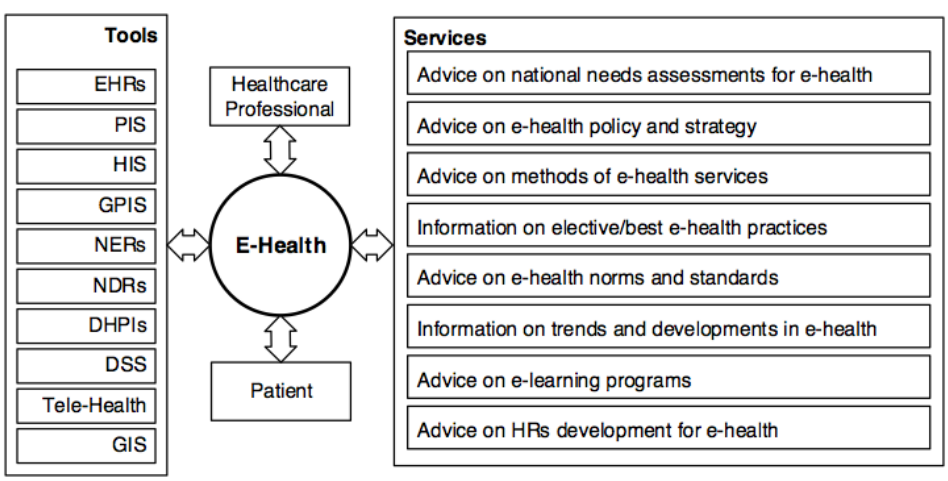

Figure 2: E-Health's Tools and Services[35]

Thailand has highlighted the use of ICT in developing e-health tools and e-health services. Examples of these tools are: (i) Geographical Information Systems (GIS), (ii) Tele-health, (iii) Decision Support Systems (DSS), (iv) Directories of Healthcare Professionals and Institution (DHPI), (v) National Drug Registries (NDRs), (vi) National Electronic Registries (NER), (vii) General Practitioner Information Systems (GPIS), (viii) Hospital Information Systems (HIS), (ix) Patient Information Systems (PIS), and (x) EHRs.[35] Added to these tools, the followings are the preferred services: (xi) advice on Human Resources (HR) development for e-health, (xii) advice on electronic learning (e-learning) programs, (xiii) information on trends and developments in e-health, (xiv) advice on e-health norms and standards, (xv) information on effective and best e-health practices, (xvi) advice on methods of e-health services, (xvii) advice on e-health policy and strategy, and (xviii) advice on national needs assessments for e-health, respectively, see **Figure 2.**

A critical requirement to develop Information Systems (IS) can lead to more effective decision making and more efficient action by the healthcare professionals. There is a demand for professionals who can improve how patient information is gathered, managed, and used effectively due to the enormous expansion in health data and ICT in Thailand. Therefore, interdisciplinary collaboration of scholar in the fields of management, information, computer, and the cognitive sciences with intelligent practitioners is needed.[36] Hence, there is a need for the degrees combine computer science and medical training to develop graduates who can organize electronic record systems, create information management software for medical facilities, and help develop efficient and secure databases in which to store and manage all the collected data.

Accordingly, ICT skill courses have been offered as part of university curriculums in Thailand, and ICT skills programs were introduced in the ongoing training of healthcare professionals since 1992.[35] To date, a number of undergraduate and postgraduate programs in Health Informatics are offered by Thai universities. For example, Bachelor of Science Program in Medical Informatics, Bachelor of Science Programme in Medical Technology, Master Programme in Health Informatics, and Master of Pharmacy Program in Health Informatics respectively.[37-39]

Thai hospitals had successfully implement e-health systems since 2009.[40] A number of hospitals had digitized as many processes of its hospital works. E-health systems provide twice over the number of patients a hospital can manage daily, increase safety and reduce its patients' invoices. Invoice payment, HRs, record keeping and inventory can be done electronically, allowing the staff to concentrate on their duty. In terms of safety, an electronic prescription (e-prescription) system allows the hospital to eliminate errors from illegible handwriting, and allergy alerts against medications unsuitable for patients. E-health systems are able to recommend alternatives based on the symptoms observed. It is evident that e-health systems and electronic medical (e-medical) software solutions can improve and simplify the business processes within hospitals and medical centers. For example, using a fully integrated hospital IS via the HIS, record keeping can be improved, thereby ensuring thorough and accurate documentation and reporting to provide care for patients. HIS includes registration, clinical systems, patient and bed management, laboratory management, and HR systems. A common database allows departments throughout the hospital to work together, and improve both efficiency and quality. HIS can be developed by the hospital, outsourcing, or a strategic partner to assist the hospital ongoing developing and improving the system.[41]

E-health foundation actions build an enabling environment for the use of ICT and the Internet for healthcare services. These foundations comprise of supportive e-health policy, legal, and ethical frameworks. There is a need for a (i) national e-health policy, (ii) national ICT procurement policy for health sector, (iii) national multiculturalism policy for e-health, and (iv) national telemedicine policy. As mentioned previously, there are legislations on personal and health-related data to ensure privacy of personally identifiable data in place.[42]

In addition, there are government sponsored initiatives about Internet safety and literacy. These are: (i) quality assurance approaches to health-related Internet content, (ii) voluntary compliance by content providers or website owners, (iii) technology through filters and controls, and (iv) educational programs for consumers and professionals. There are e-health expenditures from both public, donor/non-public, and public-private partnerships funding sources. Thailand has capacity building in the areas of ICT education and professional groups offering ICT continuing education. There are ICT trainings for students in health sciences at tertiary institutions, and institutions offer continuing education in ICT health professionals.[42]

E-Health Ethics

This section examines information privacy and confidentiality of e-health. Privacy and confidentiality, personal data, and data protection issues are becoming highly relevant when discussing e-health, especially in a Thai context. Privacy concerns are a barrier hindering implementation of e-health since many e-health systems are web services, many healthcare professionals and patients fear that medical records are not secure.[43] This concern is more significant when medical and personal records are transmitted across multiple locations.

As with traditional healthcare services, effective and efficient service delivery relies on the ability to gather and communicate accurate, complete information while maintaining the appropriate privacy and security levels. Breaches in privacy can weaken patient trust, compromise information, and at the end of the day, patient care. When efficiency and trust are compromised, the costs to the patients, the health service providers, and to the healthcare system as a whole increase. Hence, privacy is not just a required process driven by compliance requirements; privacy is a foundation in achieving cost effective, efficient, and successful healthcare services.[44] Without confidence and trust from the patients that their most sensitive medical information will be secured, patients are unwilling to fully and honestly disclose personal information, and may avoid seeking healthcare services altogether. Data concerning one's health, belief, religion, trade union, race, ethnic background, and judicial information, are amongst the most sensitive. For this reason, data that are capable, by their nature, of infringing fundamental freedoms or privacy of the data subject should usually not be processed.

Ethical compliance is one of the e-health challenges of developing countries.[11] Consequently, e-health need to establish a relationship between healthcare professionals and patients. This defines a new ethical paradigm which must be regarded in e-health systems. This leads to the next barrier. The cultural barriers are perhaps the most significant obstacles for Thailand's e-health systems. From the healthcare professionals' perspectives, the most frequently stated are the healthcare professionals' view of e-health as often too busy to deal with. Thai healthcare professionals may not perceive the full potential of e-health. There is a common concern that e-health may depersonalize healthcare and more specifically, will interfere with their rapports with their patients. Thai healthcare professionals concern about e-health as a threat to their patients' patient privacy and confidentiality.

E-health involves the interaction between patients and healthcare service providers. E-health covers the communications between institution to institution to exchange health information, health records, disease, diagnosis, treatment, health monitoring, and lifestyle management electronically. E-health also covers e-health's products such as wireless monitoring devices (recording blood pressure, picture archiving, and anatomical calculation devices etc.). Therefore, e-health products and services must protect the processing of patient health and sensitive personal information.[45]

The health and medical ethics has been marked by responses to new challenges faced by the medical and healthcare service providers. These challenges have arisen from innovative treatment methods, scientific progress, and advance technologies. In turn, these pose new issues about how e-health may apply healthcare and medical ethics. In this paper, healthcare and medical ethics are referred as *"e-health ethics"*. As mentioned, due to these digital interactions between

healthcare providers and patients, a number of ethical issues that impact healthcare providers and patients arise. This dynamic area of e-health ethics require more attention and coordination among various stakeholders and should continually evolve with changes in this digital environment.[46]

The potential for invasion of e-health systems is on the rise and with information that could potentially harm a person, ethical practices should be the main concern for healthcare service providers. While e-health increases the quality of care and patient satisfaction; patients' privacy must not be violated due to unethical acts. Paper health records must be transported with patients throughout their stay at a hospital, increasing the chances of misplacement, which lead to compromised information. E-health records will reduce chances of duplicate procedures due to lost information as well as patient waiting time. This in turn improve quality and patient satisfaction. In the event of an emergency, e-health must increase the quality of care provided. Treatment would not be delayed and the possibility of prescribing medications that may cause an adverse reaction is reduced. Information Technology (IT) professionals working with e-health have a huge responsibility as protectors of patient information. The Thai government should make every effort to ensure patients' privacy is protected. Healthcare service providers together with the Thai government is to maintain the privacy and confidentiality of patients. An example of an existing e-health ethics framework in the literature is presented in **Figure 3.**

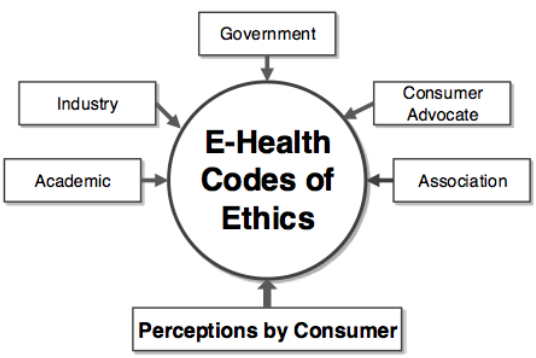

Figure 3: E-Health Codes of Ethics Framework by Bodkin[47]

E-Health ethics factors for Thailand

Morals

Ethics is a set of rules that are universally biding on all people at all times. Ethics are referred to as moral rules that derived from transcendental or higher authority such as "Divinity"[48]. Ethics can also be emphasized on: (i) right and wrong actions, (ii) good and bad consequences, and (iii) virtual or justice. This in turn leads to a moral system. The moral system comprises of: (i) religion, (ii) philosophical ethics, and (iii) law.[48]

Ethics is acting as free moral agents for individuals that use to make decisions to guide their behavior.[49] Since e-health in Thailand is closely associated with ICT and social media, this has raised new ethical questions for both healthcare professionals and patients. E-health creates opportunities for healthcare information revolution. It may also threatened existing distributions of rights, power, money and obligations[49]. Thai healthcare professionals and providers have moral obligations to patients in their care. For example, consent and access rules, responsibility for data quality, liability for negligence, mistakes and accidents as the moral orders governing health records.[50] Whereas morals are the principles on judgments of right and wrong are based, ethics are principles of right conduct.

Confidence and Trust

Trust is fundamental to healthcare.[51] However, trust can be difficult to achieve in the Internet where anyone with minimalist technical skill can offer health information, products, or services, irrespective of their qualifications. Added to this, patients rely on healthcare providers to: (i) keep their personal information confidential, (ii) provide accurate, appropriate information about their conditions and possible treatments, and (iii) recommend the therapy they believe to be in the patient's best interest. Without trust from the patients, e-health would not be possible. Trust becomes more profound under the new generation of e-health systems in Thailand. Confidence and trust is critical in affecting the adoption of e-health and are of particular importance for healthcare

service providers in Thailand, because of the aspects that defines Thai patients. Healthcare service providers are required to gain the confidence and trust of their potential patients. Healthcare providers must ensure that the privacy of their patients will be safeguarded and personal information used only for the purpose of delivering superior value to them. Whereas the relationship between healthcare providers and patients forms the heart of e-health, confidence and trust underpin this.

A number of confidence and trust factors fit within the e-health ethics group. These factors, shown in **Figure 4**, include: (i) confidence in the technology, (ii) data security, (iii) data integrity, (iv) data consistency, (v) privacy and confidentiality, (vi) adequate level of security and trust, (vii) data backup system, and (viii) trust on online transactions.[1,52]

Figure 4: Original E-Health Ethics Factors by the Researcher[1]

Proposed model and work in progress

Proposed e-health ethics factors were obtained through a judgement-based decision process similar to the procedures performed by Lynn[53] and Ngansathil[54] in their studies. The proposed e-health ethics factors keep pace and take full advantage of the new developments in emerging technology including social media on e-health in Thailand. These factors are built upon a foundation derived from the literatures and the previous publications by the researchers.[1,52,55-60] Patients need to be protected from any misconduct actions by the healthcare professionals and providers. Government therefore needs to establish a legal framework to safeguard against this and an independent ombudsman to police the services. Trust is, and will continue to be, important. Trust, together with shared purpose and shared risk, must be embraced by all the stakeholders within the model **(Fig. 5)**. The strengths and weaknesses of each factors will need to be examined. Trust, one of the cultural and social issues, will be discussed in details in the later publications.

In addition, the following stages in the research methodology is theory testing and theory refinement. Theory refinement involves the iterative refinement of the theory formed in stage one (this study), based on the findings from stage two. The results from the second and third stages will also be presented in the future publications.

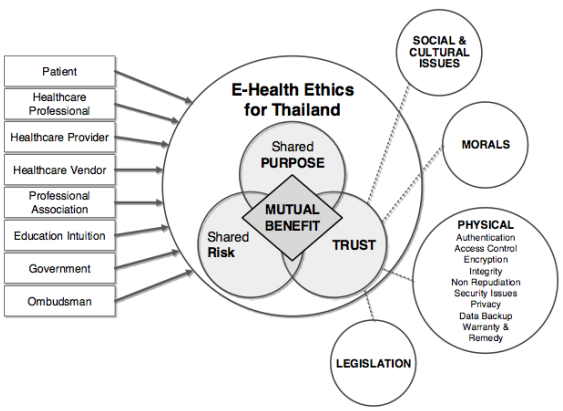

Figure 5: Proposed E-Health Ethics Factors for Thailand

Conclusion

For e-health in Thailand to flourish, maintaining patients' privacy and confidentiality must always be a priority. Thai professionals working in healthcare services must take e-health ethics very seriously. Understanding the impact of e-health ethics with high ethical standards support the successful implementation of e-health technologies. Healthcare providers must adopt e-health ethics' policies and procedures to protect patient information. The Thai government must be proactive in providing the essential training and orientation on ethical principles and practices. Codes of e-health

ethics must be visible and become the fundamental partnership of every Thai's healthcare professional's practice and behavior.

References

1. Jantavongso S. Ethics and e-health in Thailand. Proceedings of the Thai Medical Informatics Association Annual Conference and The National Conference on Medical Informatics 2013; 2013; Bangkok.
2. Tangcharoensathien V, Limwattananon S, Prakongsai P. Improving health-related information systems to monitor equity in health: lessons from Thailand. The Economics of Health Equity. Cambridge: Cambridge University Press; 2007. p. 222-46.
3. Limwattananon S, Tangcharoensathien V, Prakongsai P. Equity in financing healthcare: impact of universal access to healthcare in Thailand Nonthaburi: Ministry of Public Health; 2005 [cited 2013 17 September]. Available from: http://www.equitap.org/publications/docs/EquitapWP16.pdf.
4. Kaye R, Kokia E, Shalev V, Idar D, Chinitz D. Barriers and success factors in health information technology: A practitioner's perspective. Journal of Management & Marketing in Healthcare. 2010;3(2):163-75.
5. Moghadasi H, Asadi F, Hosseini A, Hossein ZE. A model for measuring e-health status around the world. Pajoohandeh Journal. 2012;16(7): 347-57.
6. Kemp S. Digital, social & mobile in 2015: we are social's compedium of global digital statistics 2015 [cited 2015 19 March]. Available from: http://wearesocial.net/blog/2015/01/digital-social-mobile-worldwide-2015/.
7. Nantiruj T, Maneerat N, Varakulsiripunth R, Izumi S, Shiratori N, Kato T, et al. An e-health advice system with Thai herb and an ontology. Proceedings of the 3rd International Symposium on Niomedical Engineering; 2008.
8. Ventola CL. Social media and health care professionals: benefits, risks, and best practices. Pharmacy and Therapeutics. 2014;39(7):491.
9. De Choudhury M, Morris MR, White RW. Seeking and sharing health information online: comparing search engines and social media. Proceedings of the 32nd annual ACM conference on Human factors in computing systems; 2014; New York: ACM.
10. Kahn S, Sheshadri V. Medical record privacy and security in a digital environment. IT professional. 2008;10(2):46-52.
11. Khalifehsoltani SN, Gerami MR. E-Health challenges, opportunities and experiences of developing countries. Proceedings of the IC4E'10 e-Education, e-Business, e-Management, and e-Learning; 2010: IEEE.
12. Charmonman S. Country Report 2007 on eEverything from Thailand. Proceedings of the 24th South East Asia Regional Computer Conference; 2007; Bangkok.
13. Goldman J, Hudson Z. Virtually exposed: privacy and e-health. Health Affairs. 2000;19(6):140-8.
14. Norton L, Al-Assaf A. Ethics of E-Health. American Academy of Medical Administrators. 2006; Summer:3.
15. Shanks G, Arnott D, Rouse A. A review of approaches to research and scholarship in information systems. Proceedings of the 4th Australian Conference on Information Systems; 1993; Brisbane.
16. Poston B. Maslow's hierarchy of needs. The Surgical Technologist. 2009 (August):347-53.
17. Rhodes RP. Health care politics, policy, and distributive justice: the ironic triumph. Albany: State University of New York Press; 1992.
18. Harrison JP, Lee A. The role of e-health in the changing health care environment. Nursing Economics. 2006;24(6):283-8.
19. Kijsanayotin B, Kasitipradith N, Pannarunothai S. eHealth in Thailand: the current status. Studies in health technology and informatics. 2010;160(1): 376-80.
20. General Electric Company [Internet]. GE healthcare's eHealth solutions 2013 [cited 2013 18 June]. Available from: http://ehealth.gehealthcare.com/ehealth-products/.

21. Wongkaew T, Thammakoranonta N. Factors effecting consumers' attitudes toward using of e-Healthcare. Proceedings of the International DSI / Asia and Pacific DSI 2007; Bangkok.
22. Boyd D, Ellison N. Social network sites: definition, history, and scholarship. Journal of Computer-Mediated Communication. 2007;13(1):210-30.
23. Paireepairit I. Free space of expression: new media and Thailand's politics. Berlin: Friedrich-Ebert-Stiftung, 2012.
24. Cambridge University Press [Internet]. The Cambridge dictionary 2014 [cited 2014 March 3]. Available from: http://dictionary.cambridge.org/.
25. Oxford University Press [Internet]. The Oxford dictionary 2014 [cited 2014 March 3]. Available from: http://www.oxforddictionaries.com.
26. Eid M, Ward SJ. Ethics, new media, and social networks. Global Media Journal-Canadian Edition. 2009;2(1):1-4.
27. Jacobs DJ. E-health diabetes self management system. Rondebosch: University of Cape Town; 2011.
28. Thairathonline [Internet]. Minister of public health advises patient who live in the high area to consult their doctors with LINE application 2013 [cited 2015 15 February]. Available from: http://www.thairath.co.th/content/378540.
29. Lokapattana P. Social media: the critical risk in medical informatics. Pathumthani: Rangsit University; 2014.
30. Prakongsai P. The impact of the universal coverage policy on equity of the Thai health care system. London: University of London; 2008.
31. Mahidol University [Internet]. Declaration of patient's rights 2015 [cited 2015 20 March]. Available from: http://med.mahidol.ac.th/qsmc/th/content/12122014-1351-th.
32. Office of the Prime Minister. National health act B.E. 2550. Royal Thai Government Gazette. 2007;124:3.
33. United Nations Office on Drugs and Crime (UNODC) [Internet]. Thailand criminal code 2015 [cited 2015 20 March]. Available from: http://www.unodc.org/res/cld/document/tha/criminal-code-as-of-2008_html/Thailand_ Criminal_Code.pdf.
34. Ministry of Information and Communication Technology. Computer Crime Act B.E. 2550. Bangkok: Ministry of Information and Communication Technology; 2015.
35. World Health Organization. Building Foundations for eHealth Geneva: World Health Organization, 2006.
36. Mahidol University [Internet]. What is health informatics? 2013 [cited 2013 19 September]. Available from: http://bios.ph.mahidol.ac.th/MSHI/what_is_health_ informatics.htm.
37. Rangsit University [Internet]. Bachelor of science program in medical informatics 2013 [cited 2013 19 September]. Available from: http://it.rsu.ac.th/MEI/Pages/Syllabus.aspx.
38. Mahidol University [Internet]. Master of science in health informatics (international programme) 2013 [cited 2013 19 September]. Available from: http://bios.ph.mahidol.ac.th/MUPHBSweb/degrees/index.html.
39. Silpakorn University [Internet]. Master of pharmacy program in health informatics 2013 [cited 2013 19 September]. Available from: http://www.pharm.su.ac.th/en/about/programs.
40. Kok A. Thailand: successful e-health system lauded. FutureGov. 2009.
41. Bumrungrad International Hospital [Internet]. Advanced Technologies: Bumrungrad International Hospital; 2013 [cited 2013 18 June]. Available from: http://www.bumrungrad.com/en/about-us/advanced-technologies#2-microsoft.
42. World Health Organization. Atlas eHealth country profiles. Geneva: World Health Organization, 2011.
43. Anderson JG. Social, ethical and legal barriers to e-health. International journal of medical informatics. 2007;76(5):480-3.
44. Simkevitz H. The business of privacy in healthcare delivery. Bell, 2010.
45. Kelly B. E-health: ethical and data privacy challenges in the EU. London,: Clinica Medtech Intelligence, 2011.
46. Liang BA, Mackey TK, Lovett KM. eHealth ethics: the online medical marketplace and emerging ethical issues. Ethics in Biology, Engineering and Medicine. 2011;2(3):253-65.

47. Bodkin C, Miaoulis G. eHealth information quality and ethics issues: an exploratory study of consumer perceptions. International Journal of Pharmaceutical and Healthcare Marketing. 2007;1(1):27-42.
48. Himma KE, Tavani HT. The handbook of information and computer ethics. Hoboken: John Wiley & Sons; 2008.
49. Johnson DG. Computer ethics. Upper Saddle River: Prentice Hall; 2009.
50. Garrety K, McLoughlin I, Wilson R, Zelle G, Martin M. National electronic health records and the digital disruption of moral orders. Social Science & Medicine. 2014;101:70-7.
51. Mack J. Beyond HIPAA: ethics in the e-health arena. Healthcare executive. 2004;19(5):32-3.
52. Jantavongso S, Li R. A new age e-business model for SME. Proceedings of the AusWeb03: the 9th Australian World Wide Web Conference; 2003; Gold Coast.
53. Lynn MR. Determination and quantification of content validity. Nursing research. 1986;35(6): 382-6.
54. Ngansathil W. Market orientation and business performance: empirical evidence from Thailand. Melbourne: The University of Melbourne. ; 2001.
55. Jantavongso S. Ethics and social media. Rangsit Journal of Information Technology. 2013;1(2): 42-6.
56. Jantavongso S, Kasemsan K. Assessing e-business deployment framework for Thai SMEs: the case of Thai restaurants in Melbourne, Australia. Proceedings of the 2nd Asian Conference on Information Systems (ACIS 2013); 2013; Phuket.
57. Jantavongso S, Li R, Tootell B. Culture and e-business in Thailand. In: Kamel S, editor. Managing globally with information technology. Hershey: IRM Press; 2003.
58. Jantavongso S, Napasorn P. The adoption of e-business among small and medium enterprises in northern Thailand. Proceedings of the Knowledge Management International Conference (KMICe 2014); 2014; Langkawi.
59. Jantavongso S, Sugianto L-F, Syaub Y-R. E-business deployment framework for Thai SMEs. Proceedings of the 2007 International joint Conference of e-CASE, e-Commerce, e-Administration, e-Society, and e-Education; 2007; Hong Kong.
60. Oh H, Jantavongso S, Li R. A critique: factors contributed to the dotcom failures. Proceedings of the 2004 Information Resources Management Association International Conference; 2004; New Orleans.

Ante eo et vilia nosunti popubli cesenat, nem rei fentemum num qua non venato etebulabus inati, nondeate, utemus rei ima, novehebat pribus sentior uratidestia iam ciis, unintentrit omaximur. Ocavent nonsum publintrit? Quidereors entem taritus sensuntem opubliisulto in vemover urnulto noximus est det ina mena, furbi ta, P. Evici consuli isquod con anu comnoste, vendam tum pera vide conos iaequam tericep erbissimus, die menius,