HIR
Healthcare Informatics Research

Health Innovation for Aging Society

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The trend of increasing population of the elderly is occurring not only in Japan and other developed countries but also in nations across the globe. While this trend speaks well for ongoing improvements in health, welfare, diet and other factors, the attendant demographics will also result in many challenges with regard to managing the societal impact, including management of increasing costs of care required as a population ages. In order to adapt to aged societies, and to support a greater desire of people to live independently as well as to enable younger generation to maintain their health and active participation in the society when they become aged in the future, we need a significant change in the behaviors and thought processes of healthcare providers, the public, and elderly people's friends and families. This will relate to all aspects of a person's life, including planning, decision-making, and day to day living. To make super-aged societies sustainable, drastic innovations related to the social system are necessary to enhance people's happiness and reduce social costs at the same time [1].

DIN, the German Institute for Standardization, asserts that 'Standards ensure innovation'. I believe DIN's contention is true. Then, it is critical for all nations to understand the definitions of health and standardization in the area of Health Informatics. The definition of health is well described in one World Health Organization document [2] that suggests requirements for Electronic Health Records [3]. World Health Organization claims that the ideal vision of health (and consequently of health information) is "A state of complete physical, mental and social well-being and not merely the absence of disease or infirmity".

For a definition of standardization in the area of Health Informatics, ISO/TC215 (Health Informatics), the most pivotal and influential health-informatics international standard organization, elucidates its scope as follows: standardization in the field of health informatics, to facilitate the coherent and consistent interchange and use of health-related data, information, and knowledge to support and enable all aspects of the health system [4].

Moreover, as DIN insists, it is imperative to change our mindset and perceive the importance of international standards in the health industry, which has a worldwide reach. Even though it is critical to take notice of the gravity of the current situation, for many people it is difficult to fully embrace the phenomenon of an aging society. I believe the reason for this struggle is that, still, most people have very little awareness of the internationalization, globalism, and transnationalism of health informatics and the health industry.

In this editorial, I will address the issue of "How can we make an ideal environment in which experts, making efforts to improve the welfare of humanity, can work with enthusiasm and without interruption?" I will also consider how the solution to this question lies in a project termed 'MyTh' (Figure 1), a project that is within the scope of Health Informatics Standards.

Every person wants to live long and to be in healthy condition. My research team and I also long for the same healthy life, which seems like a myth that cannot be achieved. However, my team and I believe that such a goal can be accomplished and, to make a step toward realizing this dream, we have named our project MyTh.

Most health records are in the hands of providers and an environment in which people can manage their own health records has not been established yet. However, there has been some progress toward creating such an environment.
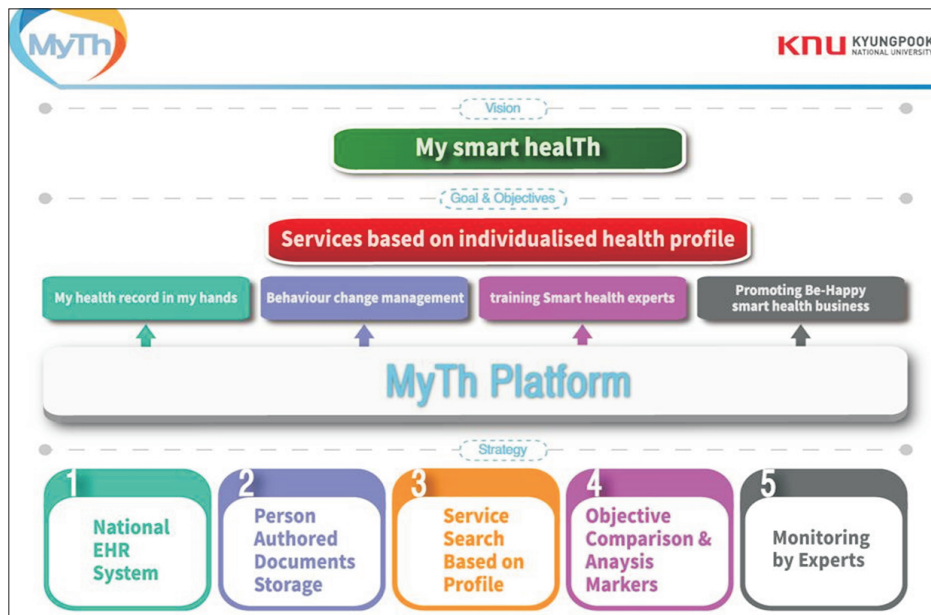
Among those efforts, one good example is Hesel [5]. Hesel is a picture archiving and communication system (PACS) for patients. It uses a standard called Digital Imaging Communications in Medicine (DICOM) and is made by experts who have accumulated experience in making PACS for doctors. As Hesel is a combined effort including standards, technologies, and field knowledge, it represents a kind of fusion of innovations.

A variety of advantages exists when using Hesel. When a person uses the Hesel app in a mobile device, he/she can keep his/her medical images in it. Anytime and anywhere, doctors can compare the results of a new examination to those of prior ones for better diagnosis. Moreover, Hesel ensures patients that their personal information is being kept safely because their records are in their own hands, in the hands of the person who cares about them most. Also, providers can support smart health-record management services, integrating medical records from multiple medical facilities. Lastly, Hesel is very useful when it comes to cases of emergency and when a second opinion is called for in teleradiology.

There are international standards in personal health record (PHR) definitions and the PHR Functional Model; these standards were made to manage patient-oriented health records. However, another international standard, person-owned repository (PoR) [6], is in the process of standardization. This system will enable patients to have the upper hand in controlling their own health records. A PoR is a repository created, owned, and managed by a patient to store his/her health documents. It is an abstraction and can

be implemented on mobile devices or regular PCs; it can even be stored on cloud services. This system is particularly useful for PHR applications and can also be used for exchanging of health information. It is substantially different from provider-owned repositories such as IHE XDS.b, in which a repository is owned by a provider and information is exchanged between providers. In contrast, with a patient-owned document repository, the patient has total control over every aspect of his or her information, including when and how a particular piece of information will be exchanged and with whom. PoR includes 1) the definition of a patient-owned health document repository; 2) abstract structures of the repository and associated shared directories; 3) functional requirements; 4) feasibility analysis; and 5) representative use case scenarios.

Providers should be able to provide a service that creates records that a patient has asked for and make those records portable for the patient. Among several of these services, the leading service is Blue Button, supported by the Veterans Affairs (VA) hospital in the United States. The Blue Button [7] system lets patient go online and download their health records so that they can use them to improve their health and have more control over their personal health information and their family's healthcare. Blue Button+ [8] is a blueprint for the structured and secure transmission of personal health data on behalf of individual consumers. It meets and builds on the view, download, and transmit requirements in Meaningful Use Stage 2 for certified EHR technology. Simply put, 'meaningful use' means providers need to show that they are using certified EHR technology in ways that can be

measured significantly in quality and in quantity [9]. The VA hospital accepts Meaningful Use, recognizing it as an innovation in the area of policy that has created an environment in which patients can manage and possess their own health records.

Even when people possess their own health records, it is very important to acknowledge what kinds of services and benefits people can obtain. I am looking forward to the development of a certain service and an organization (or a platform) that can be implemented in near future: a service called Behaviour Change Management and an organization that can provide smart healthcare services that are based on each individual's health profile.

An environment that can employ Life-Long service, using Internet of Things (IoT) technology and Vital Sign Measurement services, will be realized soon. A number of projects that are encouraging people to use a set of wearable devices with their smartphones are being launched, including an IoT healthcare demonstration project for Daily Life Care and smart projects to provide follow-up management to patients with serious illnesses. In these innovative services, it is critical to adopt international health informatics standards because the service area of these programs can be expanded to every country in the world if the services meet international standards. Thus, every nation should make its full effort toward registering patents with this outstanding technology. Also, efforts to standardize these innovative technologies are being made. However, the technologies are a collaboration among multiple areas: hardware, communications, contents, and software. Therefore, cooperation among experts in various areas is the key to success in the standardization and registration of in the standardization of systems and the registration of patients.

It is essential to establish an innovative health service platform in which a person can develop his/her own individualized health service system based on his/her own health profile. For the establishment of such a system, there are two things that are needed: health profiling services provided by experts and clear definitions of risk management services. On the other hand, the reliability of the results of the risk management service is another problem that will have to be looked at from a new perspective. To analyze and compare results, a considerable amount of clinical research data will be required. Thus, it is inevitable that a large amount of time will need to be invested in order to obtain meaningful results. At this point, I believe that the value of sharing data, information, and knowledge is being recognized.

Although people can benefit from a number of good healthcare services, it is in their own hands whether they will be healthy or not. It is their will and action that make the difference. Therefore, I believe that the ultimate solution to the healthcare problem should rely on people's mindsets, especially on how willing people are to start adopting healthy habits. I want to encourage each and every one of you to start this process, right now.

If you read the standards and innovative ideas/thoughts that I have written out and described in this editorial, I expect that you will achieve brief insight into and answers for the question of "What should be done to improve the quality of health services and reduce costs in utilizing those services?"

In the field of healthcare, in which a number of interests collide and complex human relationship reside, the time when innovation, led by talented people around the globe, finds its place will come. At that time, the construction of a utopia, in which welfare for all mankind has been met, will take its first step. Finally, I want to express my deepest gratitude to the experts, organizations, and government officials who have dedicated their time and effort toward making progress in developing, adopting, and spreading Health Informatics Standards.

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