

Technology & the Healthcare Systems in Uzbekistan & Japan: a New Platform to Make a Sustainable Society with E-Healthcare by 2030



Author
Urmonbekov Mukhammad Diyor

By Urmonbekov Mukhammad Diyor

This second article on my research project follows on from the one published in the *Japan SPOTLIGHT* May-June 2020 issue (https://www.jef.or.jp/journal/pdf/231st_Student_View_02.pdf) and focuses on the proposals I received from the GESL program research project in Finland, Estonia and Uzbekistan (Andijan city). Why I did research in Uzbekistan was because I wanted to implement what I have learned from experiments and seminars in Finland and Estonia.

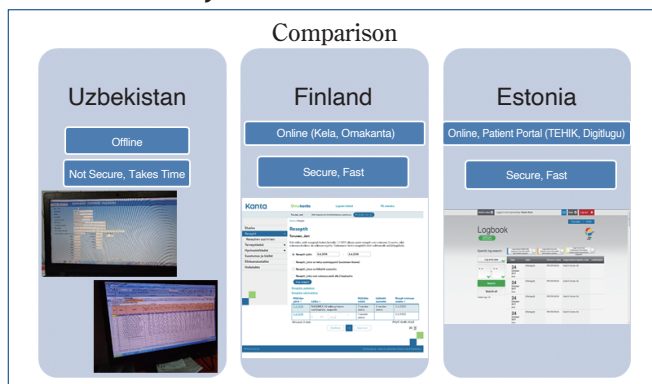
As I have mentioned, the reason why I chose Uzbekistan is because I got some comments from LINE, Takeda Pharmaceutical Co. Ltd and staff from the Ministry of Education, Culture, Sports, Science and Technology (MEXT) on my research when I participated in the Leading Program 3rd Business Concept Competition in Tokyo in January 2018. They suggested I conduct some experiments in my own country to see whether people would accept and use a new system called the “e-healthcare smart card”. I worked with my lab members to record health records in a chip, and doctors will work on R&D in Uzbekistan. I was planning to do some experiments in Japan but they said it was kind of risky, so I decided to focus my research in Uzbekistan where I can understand the situation and the regulations of the Ministry of Health. *Chart 1* shows how I compare the three nations to understand how Japan can implement my proposed system based on these cases.

In Uzbekistan

One of the clinics I visited uses an Excel document to save patients’

CHART 1

Experimental research results in Uzbekistan, Finland & Estonia



Source: *Finland, Estonia and Uzbekistan research report by Keio University, Tallinn University and Tampere University*

health records. A doctor said it is better than a paper-based system and faster and safer because it is connected to the Google Drive and they will not lose the data if something happens to their PC. But it is still a manual process in which they type the data by themselves. Two other clinics use a local database for sharing internal data among doctors and store it in their small databases which are not so secure if a network crash occurs.

In Finland

Kela, the Social Insurance Institution (SII), is a Finnish government agency in charge of settling benefits under national social security programs. Kela was founded in 1937 to handle retirement pay. In the 1980s and 1990s, its role expanded to handle other fields like child benefits, unemployment benefits, sickness benefits, health insurance and student financial aid.

Kela is funded by compulsory payments into some of the administered schemes and by taxation. Coverage under the schemes is given to all permanent residents of Finland. Its proper name Kansaneläkelaitos (Folkpensionsanstalten in Swedish) literally means “People’s Pension Institute”, reflecting its original function as the national provider of retirement benefits.

Under Kela is the Omakanta service – a platform on the Internet with various functions to manage a patient’s health profile and allowing patients in Finland to access “prescription services”, “pharmaceutical database”, “patient data repository”, “patient data archives”, “client data archives for social welfare services”, and “medical certificates”, and even allowing them to donate organs as well.

In Estonia

The Estonian nationwide Electronic Health Record system (EHR) was launched in December 2008. Built on a comprehensive state-developed IT infrastructure, EHR is a central electronic database that registers residents’ medical history from birth to death. In terms of technology, EHR utilizes the same state infrastructure solutions (ID card, X-Road, etc.) that most Estonians already use to a great extent.

EHR has been successfully fused with other public IT services in Estonia and is therefore convenient for all types of users. Citizens and healthcare professionals can use EHR to enter or view a patient’s health-related data, make enquiries, book appointments, and so on. As EHR forms part of the state information system, the content of the centrally stored information was decided upon and fixed in statutory

law.

The Estonian government initiated the development process of a comprehensive nationwide health information system in 2002. In designing such a multifaceted system, not only the technological but also the legal, organizational and ethical aspects of the healthcare service process needed to be taken into account.

Professor Peeter Ross of Tallinn Technical University helped me to understand Estonia's digital healthcare system. He permitted me to access his personal health record and it is very impressive as he can see about 10 years of data, and can manage his children's page too. The uniqueness of Estonia's case is that people can manage their pages from doctors and patients can give permission to doctors to access their health record data for a maximum of 10 minutes and a minimum of one minute.

In Process

A Japanese Ministry of Health, Labour and Welfare "Vision" entitled "Japan 2035: Leading the World through Health" says "Utilize the data network to develop a policy evaluation process on prevention, diagnosis, treatment, disease management, care services, and long-term care." I think Japan has the capacity to implement this kind of new platform for its healthcare system in the near future.

At the same time, the president of Uzbekistan announced in January 2020 a policy on E-government, Digital Economy Transparency, IT Parks for young people and the Digital Uzbekistan 2030 program. But there are still some obstacles the government and private sector need to overcome, such as slow Internet speeds and power outages. The education system is also still struggling to shift to modern technology in rural areas. This should have been done in the early 2000s, but this policy has not been working because of corruption in some areas. I think it is time to change the state policy and structure to make a sustainable society by using high technologies and investing in its young generation.

Effectiveness of Research

The Smart IC Card is a system of hardware, software, people, policy, and processes that will work together to collect data from multiple resources, thus providing information and decision-making support to multiple healthcare providers irrespective of time and place. The following are some key functions.

Health Information and Data – The system will be able to store and provide access to a patient's health information, such as history, allergies, laboratory reports, diagnoses, current medications, and so on, to healthcare providers to make appropriate clinical decisions for better care. It will integrate data from various sources and make it available to the people involved in the care of a patient.

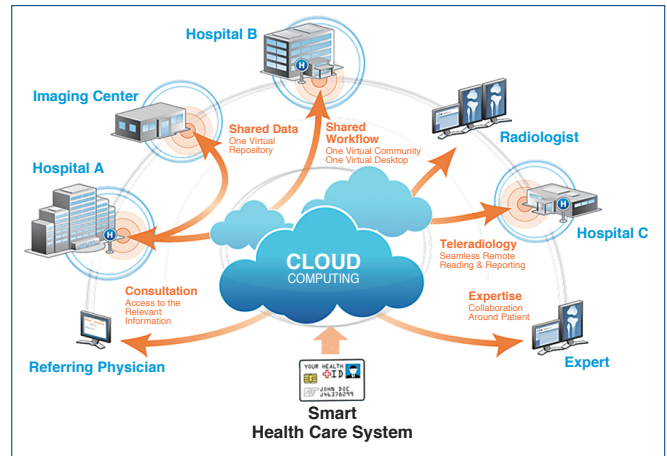
Replicate the Workflow – It will be able to work in sync with the original workflow of the healthcare organization.

Efficient Interaction – The system will also save time for care providers by keeping things concise.

Clinical Decision Support – It will also support provision of reminders, prompts, and alerts. Such features help in improving clinical and preventive practices and reducing the frequency of adverse events.

CHART 2

Future e-healthcare combined with cloud computing



Source: GESL research report submitted to MEXT

Patient Support – It will empower patients to access their health information, enabling them to be involved in their own healthcare and manage it via smartphone and PC.

Messaging and Data Processing Capability – It will also enable exchange of data in known/standard formats for interoperability of healthcare applications. Additionally, it should enable processing of incoming data in known/standard formats.

Chart 2 is a photo showing that a Smart Healthcare System can be combined and work with Cloud Computing in the future for academic purposes to prevent harmful diseases.

Access Rights

Since all e-health projects involve a significant amount of sensitive personal data, ensuring the safety of this information is an extremely important issue. Therefore, great effort has been put into designing the most appropriate and comprehensive security solutions to prevent any adverse events. To correctly identify a specific health record user, it is necessary to apply complex authentication methods. A good example of this is the ID card and its coding system, which enables local citizens to provide electronic signatures and to identify a patient's health issues in the past. There are significant rules on accessing patient data and how patients can protect themselves from doctors and government officials when they do not want to share their data with them for R&D or illness prevention purposes.

- All healthcare providers must send mutually agreed data to a Ministry of Health database (as set out in legislation).
- All access rights and data use are regulated by law.
- Access is only granted to licensed medical professionals.
- A patient's data can only be viewed by their attending physician – i.e. the person currently associated with the patient's treatment, who is a healthcare employee registered with the Ministry of Health under the Ministry of Social Affairs.
- ID cards are used to authenticate and provide digital signatures.
- Citizens can access their own data through the Patient's Portal, where it is also possible to declare their intentions and preferences

regarding certain subjects. More specifically, patients have the right to set access restrictions on single documents, cases of illness and all personal information in the database.

Action Plan by Stages

Chart 3 shows the project progress by timeline and stages for future work. I have three further suggestions which could lead to applicable research with a secure and trustable platform.

1) In Japan, the “My Number” system gives people a unique number, which they can use anonymously. Even if hackers manage to access a medical database and health records, the identity of the patients will not be revealed because only the doctors know their identity, based on their ID number. The E-Healthcare Smart Card can be combined with the My Number system to enhance security, especially for elderly people and employees who are concerned about their privacy.

2) Some security companies in Japan like Secom Co. Ltd. and ALSOK have contracts with financial institutions such as banks and insurance companies, and are also responsible for cyber security as well as physical security. They could develop a new internal platform for the healthcare system in Japan. Almost all Japanese people know of these security companies and would soon come to trust the new system.

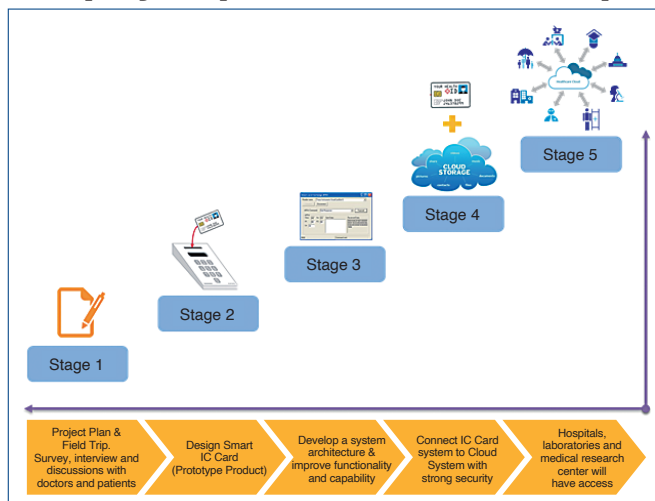
3) In Uzbekistan, as in Japan, the healthcare system involves a lot of paperwork and often patients cannot find their health history records after some years. Some are lost or destroyed in fires. The Uzbekistan healthcare system needs a smart card which can keep all patient data for life.

In my opinion, implementing new technologies such as patient health diagnoses, recording IC cards and cloud computing systems in the hospitals of Uzbekistan and Japan would be a significant improvement in people’s lives. At the same time, by creating applications for tablets, doctors will be able to check regularly on a patient’s history and condition.

Initially the Smart IC Card will be applicable only for internal use, at

CHART 3

The project process & various steps



Sources: GESL program pamphlet, author

this point domestic use, because many medical types of equipment and conditions are not yet standardized around the world. I think many hospitals need to adopt similar standards. Hospitals will need to register for the system to obtain information about medical research projects and diagnoses for many illnesses. An “Online Cure” system could contribute to international society by sharing many research project results and diagnoses. Services on the system could be provided in several major languages such as English, Chinese, Spanish, Russian and Japanese. By using the Internet and wireless equipment, even if a patient is at home or somewhere else, a doctor can check his or her health condition.

But the implementation of such new technologies in healthcare is a particular struggle. If you were to ask, “How is the healthcare industry keeping up with the pace of powerful tools being developed?” I would reply, “Essentially, we are not.” With the Internet, we have entered a new era of medicine in which every patient can have access to the full medical encyclopedia on his or her iPhone. As patients have become more informed, we have moved away from the paternalistic relationship doctors once had with their patients.

Uzbek-Japanese Collaboration

Uzbekistan and Japan have, to my knowledge, almost the same administrative system for healthcare which is based on paper and manual tasks for elderly people. In Uzbekistan most people rely on Japanese technology and security systems, and it is also a big market for Japanese IT companies that work with systems management and healthcare equipment. One of the main reasons for my research at Keio University is to promote Japanese IT companies and enable suitable and secure digital healthcare platforms in Uzbekistan. After I have conducted some further experiments in Uzbekistan, I hope the Japanese Ministry of Health, Labour and Welfare and Japanese IT companies will seek to create a market in Uzbekistan and a stable network there with patients and security companies. It would be a good opportunity for them to act as a bridge between Central Asia and East Asia.

In Uzbekistan, I have already talked with officials at the Ministry of Health and they said they are ready to work with Japanese companies to implement such a Smart IC Card system. In the meantime, Japan and Uzbekistan need to promote IT in their hospitals for the interest of elderly people in particular. In the case of Japan, the key issue is not hardware but people’s readiness to accept IT and a new platform that will be quite new for them. In the midst of the current pandemic, for example, people still prefer going to the office and having a face-to-face meeting. This is a question of Japanese culture. But in Uzbekistan, the problem would be a lack of hardware and software for a new system and secure digital platform. So Uzbekistan could be the beneficiary of Japanese IT hardware, the quality of which is fine but which is not used on a greater scale in Japan due to cultural factors.

In the future I hope I can serve as a bridge between Japan and Uzbekistan with a view to improving Uzbekistan people’s health through the use of Japanese high tech to help prevent the occurrence and spread of diseases and infections.

JS

Urmonbekov Mukhammad Diyor is a graduate of the School of Media and Governance and is studying for a Masters’ degree at Keio University in Japan.