Internet (Smart) Healthcare System

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This research is mainly concentrated on the development of Smart IC Card and IC card reader connected to the Internet, which maintains electronic (digital) medical records of the patient through a systematized collection of electronically-stored health information in a digital format. When necessary, these records can be shared across different healthcare organizations, including hospitals, clinics, and pharmacies. Smart IC Card may include a range of data, including demographics, medical history, national insurance, medication and allergies, immunization status, laboratory test results, radiology images (x-ray), vital signs, personal statistics like age and weight (combining with "My Number" system), and billing information.

Smart IC Card will be designed to store data accurately and to capture the state of a patient across time. It will eliminate the need to track down a patient's previous medical records and assist in ensuring data is accurate and legible. It can also reduce the risk of data replication as there will be only one modifiable file, which means the file will be more likely up to date, and that will decrease the risk of lost paperwork.

Due to the digital information being recorded to this Smart IC Card, it will be significantly effective when extracting medical data for the examination of possible trends and long-term changes in a patient. As future research and further development of this project, the data of medical records in this card can then be efficiently and anonymously used for epidemiological analysis at the national level or population-based studies when this Smart IC Card data is securely connected to an internet cloud system and widely adopted by the Uzbek government in the future.

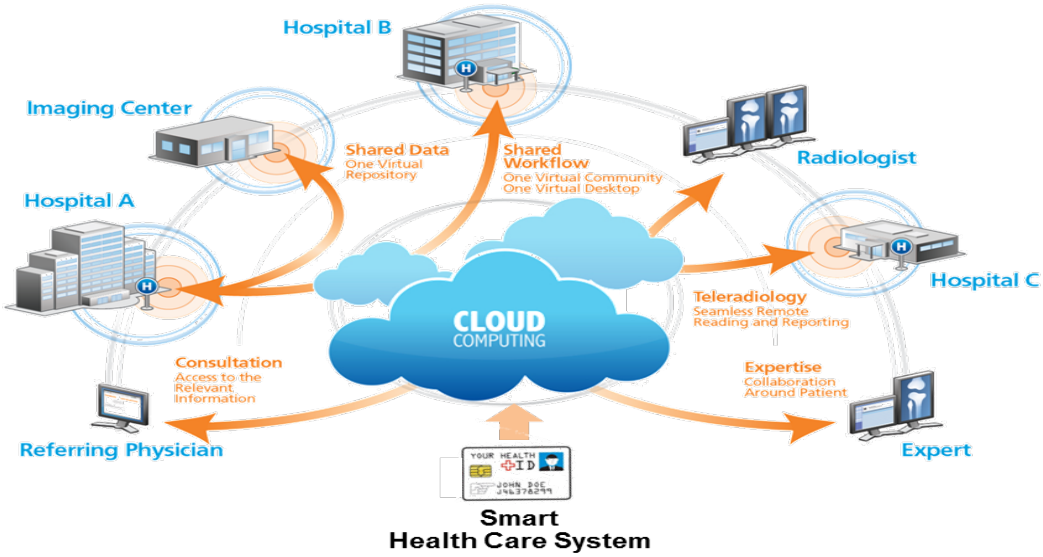
In Uzbekistan and Japan, most hospitals and clinics still use a paper-based system for the reception desk which means it takes time, and paperwork is not suitable for the patient when he or she feels not good. It reduces time-consuming, no paperwork, and the most important one is no guarantee if a fire accident or a strong earthquake happens in their office or storehouse. They can't find patients' health history records once some accident happens. But for the IC card, we can install it local set which not connected to the internet then later we can improve it if a ministry of health in Uzbekistan and Japan permits to use it in local clinics. Why in Japan is because I went to several clinics in Japan, and I filled out a sheet for my health diagnose then doctor will write it on his PC, but If I don't go to his clinic after some year I can't see and find my health history record for my next health diagnose in different clinic. I think it is imperative for our society to save our time and avoiding paperwork. I can not always provide sufficiently accurate information such as my height, weight, past medical conditions or specific medical conditions of my family members, etc. I thought hospitals in Uzbekistan have a similar issue. Once, when I went to a doctor in the capital city, the doctor asked me to bring all my past medical records from local GP because it was necessary for him to put the correct diagnosis, so I had to go back to my hometown to get all my records such as immunization record, previous blood test results, etc.

Here is one good example to support my idea. When the patient is 45 years old, Smart IC Card can contain 45 years information about patient`s health condition. For further examination of a patient`s health condition, past data will be incredibly useful for doctors. Besides, by implementing this kind of Smart IC Card, doctors at any hospital will be able to access patient`s past medical records where those records would be critical components for better examination of health conditions and will help to identify the illness background and this Smart IC Card will be usable in any hospital where card reader is installed and securely protected where patients can have options to access via using PIN core, finger scan or facial recognition.

Doctors could analyse patient data from an electronic health record to predict, detect, and potentially prevent adverse events. This can include discharge and transfer orders, pharmacy orders, radiology results, laboratory results, and any other data from ancillary services or provider notes. This Smart IC Card could also alert doctors when a patient with HIV or any potential illnesses, who did not receive care in over a specified period. Therefore, Smart IC Card could also potentially reduce the number of missed critical opportunities and regular check-ups.

Through this Smart IC Card, doctors will be able to view the patient's full chart, which will cut down on guessing histories, seeing multiple specialists and may even allow better care in emergencies. It will also provide better access to test results and offer evidence-based recommendations for better medical services in Japan and Uzbekistan.

A Smart Healthcare System can be combined and works with Cloud Computing in the future for academic purposes.



How does it relate to CCRC's research themes?

I think my research is relatively connected to all themes within various sectors such as security risks natural disaster, cyber and physical infra in connected age as well as how to govern both the technology and society in next decades.

Theme 1 - The society and self-connected through the cyberspace and physical space as well and the emergence of "thinking" machines collectively network on a network. The century where we live is an age for a "Digital Age," which we work on digitalization rather than manual and systematic principles of the working flow which means that E-Healthcare system should be implemented in every single state within 10 years to reduce of the disease which can spread fast and easy nation to nation, person to self. On the other hand, the project is a part of social security system which is about insurance and the next generation of social principles to govern technology and society under the secure and trustworthy umbrella in terms of improving the healthcare system.

Theme 2 - virtual and physical infrastructural society under connected age, which is a high risk of the treats by cyberspace rather than physical, means that a Smart IC card needs a high-security data protection platform and maintenance in terms of keeping people' trust and make them convinced that the system is still safe even after 10 years or later. My project is based on IoT, AI, and Cyber Civil which needs to work on security issues, such as privacy, technical and understanding of cyber civilization concept in our society in terms of making better people' life and healthcare system in the nations. I think only the government of Japan can handle and combine with a "My Number" system, which is more secure and reliable for the people in Japan. In Uzbekistan, I think high tech and modern devices for the data collection and share with other clinics and hospitals via IC card at the first step, and next step will be based on a network called a "Cyber Space."

Theme 3 - Cyber Civilization Risks and Resilience which the most critical point and more relatively on my project is because of the risk management on data protection and prevention of natural disasters such as earthquake, flood, typhoons, tsunamis, etc. In Uzbekistan and other developing countries, we see many natural disasters which lead to loss of patients' health record documents and can be the primary cause of spreading viruses, infections after the treatment and medication. My notion is that the system can be a sole cure and solved by the E-Healthcare System which will make people happy with no harsh illness in local areas and prevention of the future dangerous diseases such as Ebola, Zika, etc.