Telemedicine Software Development in Sustaining Healthcare in Japan Through a Bioethical Lens: Preventing the Spread of COVID-19

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Introduction

With the emergence of the COVID-19 pandemic, the healthcare industry in Japan has seen big changes as the bioethical issue of preventing the spread of the virus is examined. Solutions utilizing telemedicine have become accepted and standardized, opening opportunities for innovations in the health-tech industry. Telemedicine refers to the remote diagnosis and treatment of patients by means of telecommunications technology. The pandemic causes cluster infections in medical facilities as there are underdeveloped precautions. We approached this issue by developing software for clinics to prepare for the diagnosis of patients before entering facilities and conducted a social-implementation experiment (Society5.0) with the city of Tsukuba to have its benefits tested by clinics.

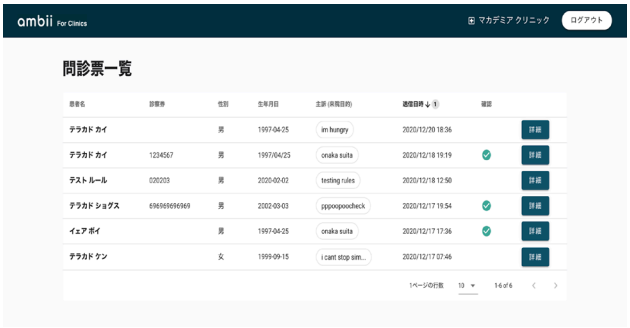

Figure 1: Clinic application for preparing patient diagnosis

Materials and Methods

A sales-first and lean approach was made where we directly made sales calls to approximately 200 clinics to survey their problems so that the correct features could be implemented. We also found several clinic collaborators in order to follow medical guidelines in creating the product. A scalable web application with a JavaScript frontend and Python API backend was developed and deployed on a cloud infrastructure. The application allows patients to fill out symptomatic medical information on the patient-client side and sent to a dashboard application accessed by the clinic-client to view and send the data to their electronic medical record (EMR) system. Due to the EMR system being disconnected to an internet network because of security measures, we developed a method to send the patient data with a QR-code reader by Bluetooth.

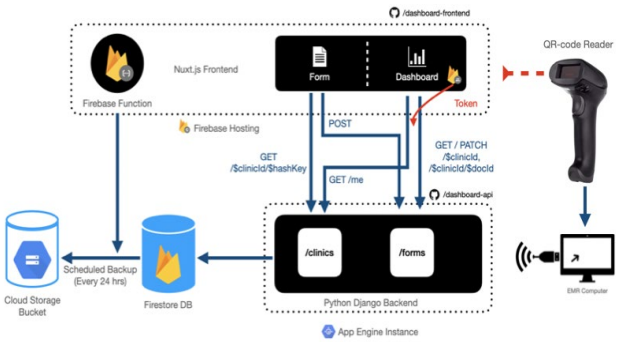

Figure 2: System architecture of Ambii Patient Form application

Results and Discussion

10 clinics tested the telemedicine patient form and saw various use cases in settings including online and drive-through examinations of patients. Results of trial clinics turning over to paying clients of our service showed their reliance towards the system. Preventing overcrowding of waiting rooms inside clinics and filtering patients with corona-like symptoms before visit were the main benefits besides optimization of the examination flow.

Conclusion

Although approaches in telemedicine do not prevent the infection one-hundred percent, it optimizes the diagnosis of patients in a safer manner.

References: Abraham, C., Nishihara, E., & Akiyama, M. (2011). Transforming healthcare with information technology, 157-170.