USING SWASTHYA SLATE TECHNOLOGY TO IMPROVE HEALTHCARE INFRASTRUCTURE AND PATIENT CARE

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Abstract –
Aim- The purpose of this research is to display the need for diagnostic and data collecting healthcare technology through the use of technology such as the Swasthya Slate.
Conclusion- The Swasthya Slate technology though designed for developing countries with a lack of health care infrastructure can also be used in developed countries to increase the quality of patient care and digitize patient specific documentation.

I. INTRODUCTION

The growth of healthcare systems around the world is prompting the need for revolutionizing the way diagnostics data is collected and shared [1]. The Swasthya Slate (SS) health tablet is a promising diagnostic tool created by the Public Health Foundation of India [2]. This healthcare technology integrates diagnostic data collection, electronic patient records (EMRs) and data sharing via cloud computing to improve health care infrastructure and patient care in developing countries [2,3,4].

II. SWASTHYA SLATE

Swasthya Slate utilizes a Bluetooth enabled diagnostic device linked to android-based mobile systems to perform a variety of diagnostic tests portably and efficiently [2,3,4,]. This mobile health technology is able to perform 33 diagnostic tests through various mobile applications, record patient medical history, and offer computerized diagnosis support (CDS) [2,3].

A. Altering the Infrastructure of Health Care

The increased demand and adoption of health information technology, the need for digitization of health records, data collection and health screening is vast [4]. The SS implements digitization of patient medical records by integrating both EMRs and cloud computing technologies [2,3,4]. During the patient's interaction with the front line healthcare worker, the data collected through both questionnaires and diagnostic tests is compiled into a standardized EMR for the patient, which is then stored in the data cloud [2,3]. Cloud computing makes it possible for users on different devices to access the EMRs of patients over the Internet using the host server [5]. Combining EMRs and the data cloud, SS makes it possible for the EMRs of patients to be readily accessed by clinics, hospitals and policy makers [2,3,4].

One of the aims of the SS is to provide real time data to policy makers through the use of the their data cloud. Using the data collected through the SS data cloud allows policy creation and alteration to be driven by up to date health data [2]. One issue seen in the healthcare infrastructure of the developing world is the lack of efficiency in the communication between the front line healthcare worker and policy makers. In Peru and Nicaragua it was noted that the current method of collecting epidemiological data through paper documentation and transportation of these documents is both inefficient and expensive. The epidemiological data arrives late, contains errors and thus is not conducive to implementing and altering healthcare policies in a timely manner [6]. SS has the potential for epidemiological data collection to become both inexpensive and efficient [3,4]. While the SS are being used for diagnostic testing, the EMRs created can be accessed by policy makers through the data cloud, providing policy makers with data that is standardized, current and accessible [2,3,4].

B. Improving Patient Care

Healthcare technology and IT in developing countries is concentrated within cities and privately funded health institutions, providing innovative and novel care to a limited number of patients [7]. In The World Health Report of 2013, WHO emphasizes the need for affordable and accessible universal health coverage [8]. With the aim to provide health care globally, it is necessary to implement health care technology in the developing world as a whole and not simply in the regions with a financial advantage [7].

SS usage in the developing world would provide low cost healthcare in rural areas by allowing for quick and effective diagnostic screenings [2]. Based on the results of the diagnostic screenings, the integrated CDS within the device will provide the frontline health care worker directly in contact with the patient guidelines and regulations from government health agencies in order to provide appropriate care immediately [2,4]. If the CDS advises the front line worker to refer the patent to a clinic or hospital, the referral process is simple, since the patient's EMR is available in the data cloud. Additionally, a

personal health care official will verify the data and refer the patient to an appropriate doctor [2]. Using CDS as an aid increases the adherence of healthcare workers and doctors to guidelines and protocol, which they may otherwise overlook. Furthermore, based on the patient's diagnostic results, the dosing of prescribed medication will be more accurate, reducing medication dosing errors and thus increasing patient safety [1].

C. Related Devices

With the growth of technology, the potential for using smart phones as mobile diagnostic devices is great and many mobile applications and devices similar to the SS have been created. The Colorimetrix mobile application is a diagnostic tool that utilizes the camera of the smartphone to decipher and analyse only colorimetric tests compared to the 33 diagnostics tests the SS mobile applications offer [9,10]. The AgPlus diagnostics technology is also similar to the SS as it too is a handheld diagnostic device that uses Bluetooth capabilities and the Wifi; however, the AgPlus does not have the capability to generate EMRs as SS does [11]. Based on the devices compared, it is apparent that the SS is a more suitable diagnostic device to use when wanting to offer a wide array or diagnostic tests while generating EMRs and digitizing diagnostics in developing countries.

III. CONCLUSION

Though the Swasthya Slate is a promising form of mobile health technology that is revolutionizing data collection and patient diagnosis, limitations of this technology are still present. India has a remarkable mobile network that provides mobile data connection to most of the country, allowing for mobile health technologies to be used even in rural areas [12]. In rural areas beyond India the availability Internet connection and mobile networks is a limitation for the SS technology. In many developing countries where mobile networks have yet to be established the uploading and syncing of EMRs to the data cloud would not be instantaneous and therefore creating a lag between the collection of data and access [3]. Still, using the SS as a diagnostic tool alone has the potential to greatly increase patient care in developing countries.

A prominent limitation in regards to healthcare technology is the monetary cost factors associated with implementation and maintenance of the new technology. Therefore, it is assumed that the implementation of SS may be limited by the potential cost of purchasing the diagnostic kit once it is mass-produced . Overcoming this limitation will require funding for the purchasing of the SS diagnostic kits and more cost-effective solutions

during production. Therefore, acquiring the technology would be based upon the available resources of a given organization or consumer [13].

The potential that Swasthya Slate offers in the way diagnostic data is collected and shared is remarkable. This technology has the potential to be implemented all around the world. In Canada specifically this technology could be used in doctor offices and clinics. The SS if implemented would eliminate the wait time that is required for many diagnostic tests and digitize patient specific health care documentation, ultimately leading to increased quality of patient care [2,3,4]. Further research should aim to address the socio-cultural needs of consumers, as well as available resources, including the limitations of these resources within a specified region, to be able to effectively manage health care.

IV. REFERENCES

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