Bangladesh Pediatric Association e-shishu Framework

A proposal for the development of an integrated service

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Abstract

To keep pace with the increasingly technological advent around the world Bangladesh needs to develop technologies that support the care of children addressing issues related to growth and development, children's changing physiology, and the unique diseases of children and interventions of pediatric care. Connectivity and data integration are particular concerns for child health care workers. Consumer health information needs for this population extend beyond the needs of one individual to the needs of the family.

In this proposal we chalked out a complete IT-enabled framework incorporating parents, pediatricians and general viewers to meet the healthcare needs. This proposed framework will be centralized, database driven service. It will include a core website, desktop and mobile application for the parents and also for the pediatrician. The main benefit is the centralized storage of huge data. Parents will be benefited by storing their children's anthropometric data, as well as prescription. Pediatricians will also be able to create and transmit prescription virtually as well as have the opportunity to use this data for research and planning. Last of all the pediatric association will have the complete data regarding the pediatricians, the children, disease particulars as well.

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Introduction

With the advent of modern science and information technology, Health Information Technology (HIT) has prominently been adopted worldwide for overall patient management. Different countries are using HIT in different ways to suit their purposes to meet the patients' need. In Bangladesh it has remained quite a virgin arena.

Technologies that support the care of children must address issues related to growth and development, children's changing physiology, and the unique diseases of children and interventions of pediatric care. Connectivity and data integration are particular concerns for child health care workers. Consumer health information needs for this population extend beyond the needs of one individual to the needs of the family.[1]

HIT has been widely promoted—globally and nationally—for its potential to improve health quality, patient safety, and cost-effectiveness within the healthcare system. The field of medical (health) informatics broadly addresses the cognitive, information processing, and communication tasks of medical practice, education, and research by focusing on the development of computer-based patient records, decision support systems, information standards, data aggregation systems, communication systems, and educational programs for patients and health providers.[2] This expanding field is facing challenges to develop, technology solutions for special populations, that acknowledge the unique needs of these groups.[1] An important way in which the entire medical community is evolving is in the use of electronic information in place of paper medical records. Pediatricians are increasingly using various information technology systems in order to quickly retrieve and store patient medical records. Pediatricians can utilize these types of technologies to also increase efficiency in their practice. By having a patient's entire medical record at their fingertips, they can avoid potential complications that may come from prescribing medicines or treatments that might be detrimental to the patient because of a

preexisting condition.[3] The potential of technology to facilitate the organization, retrieval, and communication of information holds promise for freeing physicians from overdependence on memory and for fostering the development of newly needed skills, knowledge, and attitudes. Information technology already affects the ways that patient data are collected and analyzed, that communication with one's colleagues takes place, and that the biomedical literature is accessed to support clinical decision making. There is a growing ability to access other databases, medical knowledge bases, and decision support tools.[2] The potential of digital health initiatives, such as electronic health record systems, mobile health apps, and virtual care platforms, to have a positive impact on aspects of health care delivery, including in effectiveness and patient safety, is well documented in the literature.

Aims of this project

The main objective of this project is to create an IT-enabled integrated digital platform for the pediatricians as well as for the parents.

Core concepts and Specifications

This project will include a core website, prescription and chamber management software, app for parents.

Modules

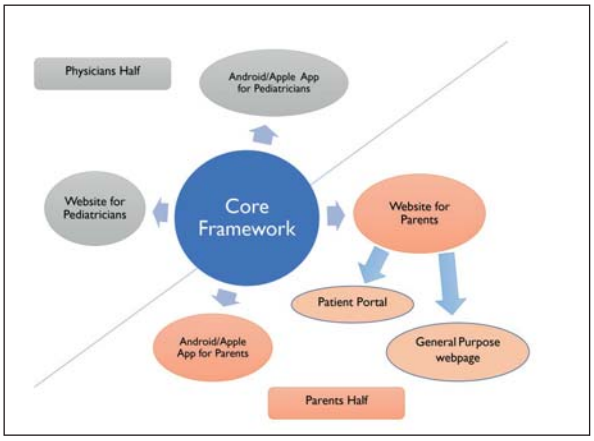

Fig. 1 Schematic representation of the proposed framework

Front end

This proposed framework will consist of the following components:

1. A website
2. Desktop and Android/Apple Application for Pediatrician
3. Android/Apple app for parents

Website

A single domain website should be registered by the Bangladesh Pediatric Association (BPA). The proposed name might be. This domain may be registered as www.eshishu.org. There may be two subdomain for pediatrician (somewhat like http://www.eshishu.org/pediatrician) and parents (somewhat like http://www.eshishu.org/parents) focusing the needs for this two groups.

Website for Parents

This website will focus on the recent news and activities related to newborn, child health, Appointment management, Patient Portal, Electronic Health Record A forum or peer group.

1. Appointment management: Parents can search and create appointments for pediatricians listed as BPA members. There also should be a provision for telemedicine, online payment.

Website for Pediatrician

This part of the website should include pediatricians personal page (as subdomain), discussion forum, Knowledge base, Online prescription and chamber management functionalities.

Desktop/Android/Apple Application for Parents

The functionalities of app will include creating an appointment, reminder for follow up, medication reminder, payment, recording health related data entry, Electronic Health record, Growth Monitoring, and push notification regarding a national program like mass vaccination, advisory programs etc. Parents will have every right to share clinical info of their child (ren) between the pediatricians for referral if necessary.

Desktop/Android/Apple App for Pediatricians

A desktop or android/apple app for the members of BPA should comprise of a prescription management software, instant messaging among the peers regarding shared decision making.

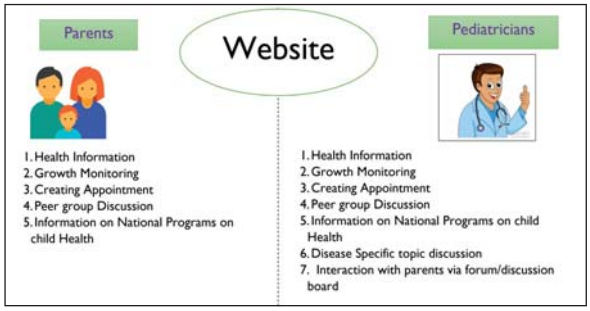

Fig. 2 Features of Website

Backend

There will be a database, SMS gateway, payment gateway (bKash/Nagad/Rocket/Visa etc.) on the backend of this project. All patients' data will be stored centrally. SMS gateway will

provide bulk SMS during a national campaign or awareness or advocacy program. Personalized SMS feature will be employed to notify an appointment creation, follow-up visit, vaccination or drug reminder.

Benefits

1. **For parents**
   a. Monitoring of child's growth parameters
   b. Notification about vaccination
   c. Reminder of next consultation visit
   d. Input anthropometric data
   e. Drug charting
   f. Drug reminder
   g. Health related articles for knowledge enrichment
   h. Peer discussion with other parents
   i. Telemedicine
   j. Easy referral
2. **For Pediatrician**
   a. Prescribing online, on premises or institutional
   b. Health Information Exchange
   c. Telemedicine
   d. Growth monitoring
   e. Chamber and practice management
   f. Inter-communication between pediatrician
   g. Referral for shared decision making
   h. Electronic transfer of health data, health record
   i. Providing handouts/ information leaflet
   j. Research
3. **For the Pediatric association**
   a. Unified prescribing
   b. Huge number of anthropometric data, drug prescribing pattern, immunization coverage, disease pattern, follow up pattern and much more like this
   c. Inter-communication / instant messaging among the pediatricians
   d. Transfer of Electronic Health Record between the pediatrician for shared decision making with prior permission from the parents
   e. Huge data gathered by the pediatricians and also by the parents will help the society to formulate demand-based policies.

Development Cost

This might be a huge and costly project. The approximate cost is about Taka 20,00,000-30,00,000. To minimize the deployment cost Open-Source software may be used wherever possible. A major expenditure will be employed for development and integration. Other costs include domain registration, hosting, application development, technical support (like maintenance), testing etc.

Source of Funding

BPA should sponsor the lion share. Every registered BPA may provide an annual subscription to continue the project. Alternatively, we can request fund from the A2I (Access to Information) project of Government of Bangladesh.

Conclusion

In the USA, the percent of pediatricians, who are using EHRs, increased significantly from 58% in the 2009 survey to 79% in 2012.[4] This proposed system includes not only an EMR, but also a complete care framework including prescription software facilities, parent communication system, appropriate referral system and availability of huge data for research.

Clarification of Technical Terms

1. **A domain name** is an identification string that defines a realm of administrative autonomy, authority or control within the Internet. Domain names are used in various networking contexts and for application-specific naming and addressing purposes.[5]
2. **Shared Decision Making**- Shared decision making (SDM) ensures that individuals are supported to make decisions that are right for them. It is a collaborative process through which a clinician supports a patient to reach a decision about their treatment.[6]
3. **SaaS** - Software as a service is a software licensing and delivery model in which software is licensed on a subscription basis and is centrally hosted.[1,2] It is sometimes referred to as "on-demand software", and was formerly referred to as "software plus services" by Microsoft.[3] SaaS applications are also known as on-demand software and Web-based/Web-hosted software.[7]
4. **Open-source software (OSS)** is computer software that is released under a license in which the copyright holder grants users the rights to use, study, change, and distribute the software and its source code to anyone and for any purpose.[10,11]
5. **Electronic medical records (EMRs)** are a digital version of the paper charts in the clinician's office. An EMR contains the medical and treatment history of the patients in one practice. EMRs have advantages over paper records.[12]
6. Electronic health records (EHRs) do all those things EMR

do—and more. EHRs focus on the total health of the patient—going beyond standard clinical data collected in the provider's office and inclusive of a broader view on a patient's care. EHRs are designed to reach out beyond the health organization that originally collects and compiles the information.[12]

Conflict of Interest: None

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