Design and Development of Patient centric systems

Proposal Status: In Review

Concept note on

Design and Development of Patient centric systems for

Primary Health Care

Developed by- HISP India

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This proposal is in context of the the ongoing collaborative project between University of Oslo (UiO), Postgraduate Institute of Medical Education and Research(PGIEMR) and Society for Health Information Management Systems (HISP India) towards the design and development of a patient centric system for primary health care.

Background

DHIS2 and OpenMRS are both open source software solutions that cater to the information needs in the public health domain. While DHIS2 is tailored to look after the health indicators en masse , OpenMRS is aimed at collecting and managing Electronic Medical Records (EMR).

DHIS2 in brief:

DHIS2 is a tool for collection, validation, analysis, and presentation of aggregate and patient-based statistical data, tailored (but not limited) to integrated health information management activities. It is a generic tool rather than a pre-configured database application, with an open meta-data model and a flexible user interface that allows the user to design the contents of a specific information system without the need for programming. DHIS2 is a modular web-based software package built with free and open source Java frameworks.

The DHIS2 software is used in more than 40 countries in Africa, Asia, and Latin America, and countries that have adopted DHIS2 as their nation-wide HIS software include Kenya, Tanzania, Uganda, Rwanda, Ghana, Liberia, and Bangladesh. A rapidly increasing number of countries and organisations are starting up new deployments.

OpenMRS in brief:

OpenMRS is a free, open source electronic medical record system (EMR) designed for use in the developing world. It supports health care delivery and research on resource-constrained environments.

OpenMRS is now in use in clinics in Argentina, Botswana, Cambodia, Congo, Ethiopia, Gabon, Ghana, Haiti, Honduras, India, Indonesia, Kenya, Lesotho, Malawi, Malaysia, Mali, Mozambique, Nepal, Nicaragua, Nigeria, Pakistan, Peru, Philippines, Rwanda, Senegal, South Africa,

Sri Lanka, Tanzania, The Gambia, Uganda, United States, Zanzibar, Zimbabwe, and many other places. It is supported by individuals, organizations, government aid groups, NGOs, and for-profit and non-profit corporations.

Information Need

The state in which this project is currently operational has multiple health information needs comprising of

- EMR information from hospitals and
- Health programmes such as health programmes such as RCH (Reproductive Child Health), NCD (Non Communicable Disease) and TB (Tuberculosis)

While the EMRs are collected from the hospitals where patients come from treatment , the other health programmes are based on outreach where community health workers go to the homes of people and engage them in awareness activities and wherever needed provide them with services as such they are trained to do in the form of providing preliminary disagnosis, taking patient history and refererring to respective sites where treatment can be sought.

Information needs from carrying out such an activity are huge and in need of an information system which can help the health workforce to perform better without spending much of their time on information collection and dissemination.

An efficient system with regard to this problem is what this project aims to address in a standardised and reusable way with adherence to certain normative design principles such as

- The system should be integrated with existing systems and work processes, seeking to rationalize, and not becoming yet another system.
- The system should aim to reduce the work burden of the health workers.
- The system should strengthen the use of information for local action.
- The system should be user friendly and easy to use even for level of community health service workforce.
- The system should be scalable, and present a model which could potentially be taken up at the state level and more.
- The system should be such that it can be primarily managed and evolved by the state system, and not be reliant on external consultants.

Approach & Current Situation

We have used both DHIS2 and OpenMRS as solutions in their respective domains wherein, DHIS2 is used as a system for outreach services while OpenMRS is used as an EMR system.

Reproting formats of the outreach programmes have been customized in DHIS2 with the provision of reporting both online and offline through android application. It is running on a central server which the users can access through internet in their web browsers.

The health workers collect the information in their registers while they are in field. They also collect patient level data including demographic details and medical history. This information which is stored in paper format is then put in electronic format at the base station (which could be a small hospital, dispensary etc). DHIS2 is the system which captures these details.

For EMR the reporting happens directly in the system through data entry operators stationed in hospital as and when the patient comes for services. These patients could be the ones which community health workers have referred to the site or new cases who have come on their own.

This model has been piloted in one urban site(dispensary) catering to a population of 30,000. This site has basic IT infrastructure with computer and internet connection which enables it to have OpenMRS running within the premises and accesses DHIS2 through internet. This way this site caters to the information needs of both EMR and outreach programmes.

Challenges

While running multiple independent systems provide the best of both worlds but this approach also brings with it challenges relating to

- Infrastructure
- Inter-Communication between systems
- Scaling

While the challenge of infrastructure is a logistic one which could be solved through providing more resources but the challenge pertaining to communications between systems & scaling is not something with a ready solution at hand.

Why inter communication is a problem?

Both these systems collect patient level demographic data to identify and build a case/medical history apart from the domain specific information that is captured. This demographic data alhough is common to both systems but yet it is bound to be duplicated in both systems. This is a major drawback burdening the data entry operator with entering one information twice leading to waste of time and resoruces.

 Although the target population has an identifiable information for the 30,000 people in the form of a "Ration Card" but still there is no way for the two system to communicate this information to each other. As to why this communication is a challenge is because

- These systems have differing representation of storing this data with their own specific terminology.
- There is no seamless solution to transfer the data of one system to the other.
- Even if we were to develop a communication channel between them then which system's terminology should we take as base?

Our running model cannot be considered efficient unless this problem is addressed in a standardized and scalable manner.

"Client Registry" as a common link between DHIS2 and OpenMRS?

A client registry is basically a database containing a certain set of information in a standardised manner with provision to access this information through standard protocols. This serves as the common ground for multiple independent systems to communicate with each other. Some benefits which this kind of solution offers are:

- Single source of base information thus avoiding duplication between independent systems
- Independent systems do not have to change their base terminologies thus reducing need to change every system in order to communicate.
- It enforces systems to build towards data accessing practised adhering to a base terminlogy.
- Data Quality is higher since only one copy of the base information is to be maintained.

Way Forward

We propose to implement this model to our project by integrating both our systems with an open source solution to client registry – OHIE-CR. Brief overview

The OHIE Client Registry Community (OHIE-CR) is a free and open initiative built and supported by individuals, implementing bodies, and funders with an interest in developing and deploying client registry standards and software. The Client Registry is designed to assist in uniquely identifying individuals who receive healthcare services seeking to leverage client registries to improve health outcomes in resource limited settings.

We envisage a system where the patient demographic data is stored in OHIE-CR system which then serves as a single point of reference for both our systems DHIS2 and OpenMRS. We see the following benefits in doing so :

- Increased effeciency of the system as a whole since needs no longer be duplicated.
- Easier to maintain the base information even especially in absence of a unique identifier for the population.
- Compliance to global standards benefits both DHIS2 and OpenMRS as a whole.
- Standardized model also helps with scaling as the same solution can be reused in a different site.

6. Consortium team:

Prof Sundeep Sahay(UiO)(sundeeps@ifi.uio.no   ) will be the single point of contact for the proposal and workplan.