Development of Integrated Vaccine System (IVS) for Vaccination Database

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ABSTRACT – The conventional manual method of recording vaccination information is less organized and difficult to be retrieved back. IVS is an integrated information technology system that tries to address the weaknesses in the conventional method by preparing a database storage for vaccination information and also mobile application to remind the parents of the next vaccination date. IVS is still in the early development with positive progress.

1. INTRODUCTION

Development of integrated information technology system called Integrated Vaccine System (IVS) incorporates the Hospital/Healthcare Information System (HIS) and Telemedicine aspirations. HIS is an integrated computer system installed throughout the hospital [2]. The objectives of HIS implementation are to ease data reporting and retrieval, reduce errors, increase efficiency, improve healthcare quality as well as better communication between healthcare providers [5]. Telemedicine was meant to provide healthcare and health-related services by using telecommunications, information and multimedia technologies to link the consumers, healthcare providers, suppliers, consumer and other agencies [4].

IVS system is about storing vaccine intake information in a database by the healthcare organization and retrieving the data as a reviewed schedule regarding vaccination dates and information by the parents on an application. The parents would also be notified for next vaccination date through the application. The objective is to have a proper and organized information storage regarding vaccine intake information and also to alert the parents of vaccination dates which is not able to be fulfilled by the conventional manual method.

Albania, Vietnam, Guatemala, Senagal and South Sudan are among the countries that have implemented this integrated information technology system on vaccination. Immunization Information system (IIS) was developed by Albania to support birth and vaccination registration, vaccine stock management, cold chain management and hostile events management following vaccination [6]. More on IIS, it is a confidential computerized database that is population-based, recording all immunization doses residing in certain geopolitical areas. The advantages of IIS include providing the immunization histories that are consolidated to determine appropriate vaccination and also aggregate vaccination data for surveillance and program operations to improve vaccination rates and reduce diseases that can be prevented by vaccine. By having consolidated record, it can provide official immunization records for school, camping and other activities entry requirements. IIS also able to remind immunization due date, ensuring the children to only take the needed vaccination [1].

In Malaysia, this kind of vaccination integrated system has not been developed yet. For this time being, our Malaysia's experts under the programme of Immunise4life have developed an application called MYVaksinBaby. The application can provide information about vaccines and vaccines-preventable diseases. It provides a list of recommended vaccines under Malaysia's National Immunization Programme and also additional optional vaccines that can be obtained in private hospitals and clinics. Issues or questions such as the safety of vaccines and vaccination status in Islam are also addressed by MYVaksinBaby application. Other than that, this app is also able to send auto-reminder for the next vaccination date [3].

In this paper, the integrated vaccine system for vaccination database is developed to address the weaknesses in the conventional method by preparing a storage for vaccination information and also mobile application to remind the parents of the next vaccination date.

2. METHODOLOGY

2.1 Early development of IVS

The registration form was firstly created using Bracket software. The script from the registration form was then sent into phpMyAdmin database (Figure 1) via php and SQLi coding. The form was further edited using Dreamweaver software editor. Other information such as parents' and babies' background information as well as vaccination schedule (appointment date, type of vaccine and baby weight) was also stored using phpMyAdmin database. In the second stage, a second database known as vaccine database (Figure 3) was created using phpMyAdmin to connect php in the registration form with vaccine database that consists of two separate tables: patient information table and

vaccine schedule table (Figure 3). Patient information table is to store all data in the registration form while vaccine schedule table is to record vaccination information of the babies.

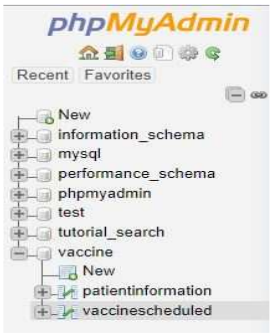

Figure 1 The phpMyAdmin database used to create the registration form and vaccine database.

Figure 2 IVS interface for registration purpose.

Figure 3 Database for patient vaccination schedule.

2.2 Implementation of IVS

As depicted in Figure 4, the implementation starts with the person in charge of the hospitals or clinics signing up the registration form for the parents. The signup interface is presented in Figure 2. All of the compulsory information of the registration form need to be filled up first before the vaccine schedule table can be generated. Upon registration, the parents will obtain their own unique ID. A new appointment date for the next immunization will be immediately set up. The parents will then be guided to install a reminder application (*MyKidVAX*) to remind them of the next vaccination date. The reminder will be triggered one week and one day before the appointment date using the application. During the next vaccination appointments, the parents will go through the same procedure excluding the registration and application installation parts. The data recorded will be further analysed to obtain information regarding vaccination status: on time, delay or refuse for further research.

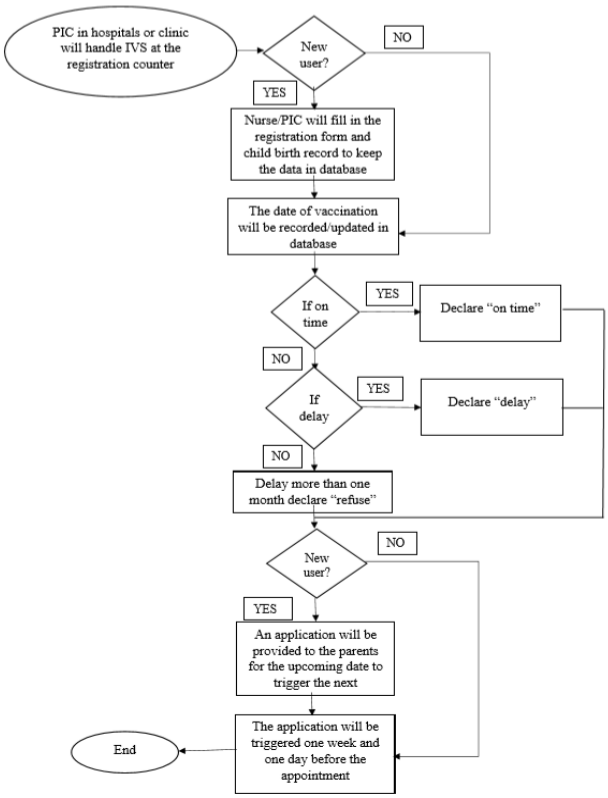

Figure 4 Flowchart of IVS implementation

3. SUMMARY

IVS development is still in the early stage and so far is showing great progress based on the registration form and vaccine database created. For the next progress, the vaccine database will be updated more and the reminder application will be developed.

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