Chapter 2.12
Design and Development of Standards (HL7 V3) Based Enterprise Architecture for Public Health Programs Integration at the County of Los Angeles

Abdul-Malik Shakir
CAL2CAL Corporation, USA

David Cardenas
L.A. County Department of Public Health, USA

Gora Datta
CAL2CAL Corporation, USA

Debashish Mittra
CAL2CAL Corporation, USA

Arindam Basu
CAL2CAL Corporation, USA

Rini Verma
CAL2CAL Corporation, USA

ABSTRACT

Public Health (PH) applications in County of Los Angeles (LAC), Department of PH have been developed to meet individual PH program's goals. This resulted in lack of county-wide PH data integration, efficiency, and usefulness. LAC encouraged the development of web-based applications utilizing standards-based PH Information Network interoperable service-oriented architecture (SOA). The goal was to stop the evolution of fragmented health data systems which place limitations on the PH mission of safeguarding and improving the health of the community as well as responding to large-scale threats to PH. PH Nursing case management is one example of LAC's initiative for promotion of web-based tools which will be utilized within this SOA. This PH architecture is capable of supporting electronic data exchange from PH partners using a HL7 integration hub. It promotes the development of management tools and applications to assist PH response and recovery activities while providing resources to support departmental integration.

INTRODUCTION

Public health applications in the County of Los Angeles, Department of Public Health have been traditionally developed to assist public health programs in meeting individual program's goals and objectives. This led to the development of systems that collect data only for a specific program area leading to a lack of county-wide public health data integration, efficiency, and usefulness. The existing Program Area Modules (PAMs) do not conform to the National Electronic Disease Surveillance System (NEDSS) nor Public Health Information Network (PHIN) standards recommended by the Centers for Disease Control and Prevention's (CDC, US Govt.) for an interoperable information systems in organizations that participate in public health (Public Health Information Network, 2004; National Electronic Disease Surveillance System, 2004).

The PAMs use a variety of user interfaces, business logic, directory structures, workflow, and data storage systems and are not accessible outside public health firewall. The user and electronic interface for these modules have been implemented differently and do not present a common user or electronic interface for these modules, thereby significantly increasing the cost of data collection and analysis. These modules exist as stand-alone entities each with functionality for disease reporting, incident management, and data storage for specific program areas, and in most cases do not communicate at all with each other or external healthcare partners. A limited number of modules have ad-hoc implementation for electronic data exchange with laboratories as well as some other capabilities needed by the application users.

It was determined that under the standards based architecture, PAMs only handle specialized functionality for each specific area of health care or resource management. All common functionality like user authentication, directory serices, data storage, and so on should be handled by Common Area Modules (CAMs), modules common to all PAMs. An internal message and data broker module will be used for electronic data transfer with partner systems. This initiative will also require that existing investments in legacy systems be leveraged and merged with standards-based Web enabled systems to provide a synchronized view of public health data and resources across all program areas.

The nursing practice management system (NPMS) case management PAM is an example of the Los Angeles County's initiative in promotion of Web-based tools which is to be utilized within the interoperable standards based architecture. This PAM has won several awards since it was implemented including the Los Angeles County Public Health Innovation Award in 2003 and the National Association of Counties Nursing Achievement Award in 2004 (see Figure 1).

The public health nursing unit of Los Angeles County promotes the well being of the community at large and prevents disease, disability, and premature death. Public health nurses (PHNs) make home visits to families with communicable diseases; emphasize nutrition, disease prevention, and health; and improve the quality of neighborhood life by working in partnership with the community. This system tracks multiple interventions given over a period of time by index case, family, and household. It provides a powerful and secure departmental work-flow, assignment/task management and reporting tool with an intuitive interface design that minimizes training and transition costs. The "open" architecture allows the system to communicate with other Public Health programs. This system involves epidemiological data entry during assessments of cases by Public Health Nurses and serves as an efficient tracking system for nurses and supervisors, ensuring that members of the community are assessed and that interventions are made in a timely manner.

The investment into the approach for an enterprise architecture within an existing infrastructure was done with the view that investment of pre-

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