Improving Awareness in Message Exchanging Platform  
- A Knowledge Driven Approach

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Abstract: One of the key functionalities in the Enterprise Application Integration (EAI) engines is a dashboard to provide awareness on the message traffic, performance and throughput. Current dashboards present a rich data set but often lacks context to interpret these data. This poster presents a knowledge driven approach in improving the dashboard by presenting contextualized information. The new dashboard will be evaluated by measuring user awareness, as measured by applying a quantitative analysis technique called SAGAT (Situational Awareness Global Assessment Technique) [1] and the results will be presented.

Introduction: In recent years, Public Health has advanced its capacity to adopt current trends in information science and technology in collecting, analyzing and disseminating public health information [2]. National initiatives like the NEDSS (National Electronic Disease Surveillance System) and Biosense programs have turned towards EAI systems as a solution to mitigate the challenges in disparity and structure of the messages they receive from participating public health partners. Information exchange between public health trading partners requires EAI systems that can support beyond mapping heterogeneous messages. One such effort at CDC is the NEDSS Message Subscription Service (MSS) [3], an EAI based software application that can map incoming messages of multiple formats into a standard representation, then archive, validate, translate, map and route the message based on the content of the message [3].

MSS has a dashboard that provides an overview of the status of MSS and its components (Figure 1). This dashboard provides the status of the Rhapsody engine (the core EAI component), statistics on the message traffic and message processing, a list of subscribers and the subscriptions applied to the messages, available message mappings and their usage. Though the dashboard presents a comprehensive list of variables, the representation is the same regardless of the role of the user and the tasks. It does not provide any context to explain the behavior of message traffic or the processing of the messages. For example, if the message traffic for a Tuberculosis subscriber from a particular data source in the last 2 days is significantly less than the normal message traffic, how does the data provisioning manager interpret and react to this? Is it because for the last 2 days the submitting labs were closed, or did the data transmission or message validation fail?

Method: To better explain these data, we propose a knowledge driven approach for which the information representation will be driven by context generated by a list of domain ontologies. An ontology driven approach will allow us to classify the messages to one of the domain events and allow us to bring in associated information that may better explain these data. The improved dashboard will present contextualized information and will be evaluated by applying SAGAT. The evaluation process involves conducting a task analysis to identify the list of tasks and goals for the end user. The task analysis will dictate how SAGAT will be customized to measure the users’ understanding and interpretation of the representation by probing the cognitive constructs such as perception of information, task related interpretation, forecasting or explaining the near future or immediate past.

A better understanding of the contextualized information representation will provide a model for design and evaluation of information representation in any health information system.

Reference:
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