Philippines Trip Report  
01-Dec.-2014 – 05-Dec.-2014  
Dr. Shaun Grannis

From 01/12/2014 to 05/12/2014 Dr. Shaun Grannis, Biomedical Informatics Research Scientist from Regenstrief Institute, conducted formal meetings and discussions with PhilHealth and other Philippines Health Information Exchange (PHIE) stakeholders to provide consultation on the Philippines work to implement a Health Information Exchange. At the conclusion of the trip, Dr. Grannis provided an exit presentation summarizing key recommendations for moving forward. This report is a summary of key interactions and the high-level recommendations that resulted from the trip.

Key Interactions:

Formal and informal meetings included:

- **Monday afternoon, December 1st** – Met with the PhiHealth and UP Diliman to discuss the proof of concept that will be developed by UP Diliman. Attendees included Jovita Aragona, Angelito Abando and Philip Zuniga (representing the UP Diliman proof of concept team).
- **Wednesday, December 3rd** – Met with EMR Committee, Architecture Committee, IT Working Group. Topics discussed included; the PHIE architecture, network constraints, workflow design, validation/certification and project funding and sustainability.
- **Thursday, December 4th** - Working lunch with Mr. Angelito Abando, PhilHealth.

Summary of Recommendations:

This is a summary of Dr. Grannis’s recommendations after meeting with key stakeholders to discuss progress to date:

1. Component-based HIE Proof-of-Concept

The University of Philippines Diliman is creating a work plan to evaluate a component-based (also known as a “best of breed”) HIE architecture, including an enterprise service bus (interoperability layer - IL), client registry (CR), facility registry (FR), health worker registry (HWR), terminology service (TS), and shared health record (SHR). This preliminary work plan was presented at PhilHealth on Monday, December 1.

Recommendations:

- **Ensure that the HIE proof-of-concept scope of work is clarified.** The preliminary work plan as presented focused primarily on the enterprise service bus (interoperability layer). Other functional components of the HIE (including CR, FR, HWR, TS, SHR) must be evaluated as well, and the work plan should include those components.
- **In addition to clarifying the components to be evaluated in the proof of concept, the scope should also specify the information exchange standards to be evaluated.** Information exchange standards generally fall into two classes: syntactic and semantic. “Syntactic” standards describe the transport or messaging mechanism by which collections of data are
transmitted; they can be thought of as the “envelope” or “container” carrying information within. Examples of “syntactic” health data standards include HL7 (health level 7) versions 2 and 3. (www.hl7.org) “Semantic” standards describe the actual content to be contained in the message or “envelope”; they standardize common clinical and administrative concepts, as well as other healthcare metadata. Examples of common “semantic” standards include ICD-10 (www.who.int/classifications/icd/), LOINC (www.loinc.org), RxNorm (http://www.nlm.nih.gov/research/umls/rxnorm/), and SNOMED (ihtsdo.org/snomed-ct/), among others. With several health information exchange standards available to choose from, and different approaches for implementing these standards, many health standards and informatics organizations have noted that without consensus-based guidance specifying how to implement standards, systems may not be truly interoperable despite using interoperability standards. To maximize interoperability, organizations such as HL7 and IHE (integrating the healthcare enterprise - www.ihe.net) create interoperability specifications that stipulate clear instructions for implementing semantic and syntactic standards. To ensure that the Philippines HIE maximally benefits from the products and experiences of international standards bodies, Table 1 highlights IHE interoperability profiles that the Philippines HIE stakeholders should familiarize themselves with.

Table 1: Recommended IHE profiles for review by the PHIE technical working group (source:www.ihe.net)

<table>
<thead>
<tr>
<th>IHE Profile Name</th>
<th>Label</th>
<th>Description</th>
<th>Web URL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Infrastructure Profiles</strong></td>
<td></td>
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<tr>
<td>Patient Demographics Query</td>
<td>PDQ</td>
<td>Enables applications to query a central patient information server to retrieve a patient’s demographic and visit information.</td>
<td><a href="http://bit.ly/1wG6pn9">http://bit.ly/1wG6pn9</a></td>
</tr>
<tr>
<td>Patient Identifier</td>
<td>PIX</td>
<td>Supports the cross-referring of patient identifier lists from multiple different data sources.</td>
<td><a href="http://bit.ly/1shUGcN">http://bit.ly/1shUGcN</a></td>
</tr>
<tr>
<td>Cross Reference</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Care Services Discovery</td>
<td>CSD</td>
<td>Supports queries across related directories containing data about: organizations, facilities, services and providers.</td>
<td><a href="http://bit.ly/1HxaALg">http://bit.ly/1HxaALg</a></td>
</tr>
<tr>
<td>Audit Trail and Node Authentication</td>
<td>ATNA</td>
<td>Establishes security measures that, combined with appropriate security policies and procedures, provide patient information confidentiality, data integrity and user accountability.</td>
<td><a href="http://bit.ly/16dgSut">http://bit.ly/16dgSut</a></td>
</tr>
<tr>
<td>Consistent Time</td>
<td>CT</td>
<td>Ensures that system clocks and time stamps of computers in a network are well synchronized.</td>
<td><a href="http://bit.ly/1yG4Dm9">http://bit.ly/1yG4Dm9</a></td>
</tr>
<tr>
<td><strong>Content Profiles</strong></td>
<td></td>
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<tr>
<td>Cross-Enterprise Sharing of Medical Summaries</td>
<td>XDS-MS</td>
<td>Defines the content sections for discharge summaries and referral notes.</td>
<td><a href="http://bit.ly/1qCXgZV">http://bit.ly/1qCXgZV</a></td>
</tr>
</tbody>
</table>
• Ensure that the UP Diliman team is well-connected to stakeholders at DOST and the EMR working group, as well as other stakeholders that can meaningfully inform the proof-of-concept work. The DOST team currently maintains a Mule ESB enterprise license that expires in February, 2015. UP Diliman will need to evaluate Mule ESB as a part of the HIE proof of concept work, and retaining the software license will be necessary. The EMR working group will likely evolve requirements that inform the architecture of the HIE proof-of-concept.

• Ensure that the objective(s) of the HIE proof-of-concept work are clear among the PHIE stakeholders. Some expressed the view that the proof-of-concept would primarily stimulate a list of requirements that would inform a terms of reference (TOR) that would be submitted to vendors, presuming that vendors would support a “best of breed” component-based HIE system (as exemplified by OpenHIE - www.openhie.org), in addition to their more typical “best of class” systems. The TWG should validate that vendors are willing and able to support a “best of breed” HIE approach. Additionally, believing that the proof-of-concept could reveal limitations in a best of breed component design, an additional perspective expressed was that the proof-of-concept would aid in making a “go/no-go” decision regarding the “best of breed” approach. Both outcomes (informing future TOR requirements and validating a best of breed design) can meaningfully advance the PHIE and should be stated clearly.

2. EMR Certification Process

EMR/EHR vendors, DOH stakeholders, and PhilHealth stakeholders met on December 3 to review various aspects of the PHIE architecture and the “primary care benefit” (PCB1) use case. The strategy of beginning with a lightweight HIE use-case that supports the PhilHealth PCB-1 electronic reporting from clinics to PhilHealth was reviewed. In the context of discussing this use case, and in the context of discussing the an incremental strategy for deploying HIE, the issue of EMR certification was discussed.

Recommendations:

• The EMR/EHR certification process and scope should be reviewed and clarified. The PHIE stakeholders should establish common expectations/objectives for a certification or validation process. Certification can be used both to improve the effectiveness and efficiency of deployment, and also can be used to formally document and verify compliance with mandated regulations, such as PCB1 reporting. During December 1 conversations the term certification was perceived as a more rigorous, formal process, while validation was viewed as a less formal, more collaborative process to establish mechanisms for testing information exchange. It was noted that more rigorous and formal certification processes will require greater resource support, while collaborative validation approaches may reduce resource requirements. The TWG should review their strategy for certification and/or validation to address various strategic certification issues, including: the need for an independent certifying body, the scope of certification (e.g., compliance with syntactic, semantic, and security requirements, etc.), and the breadth of testing to be performed in each area of the scope. Additional nonexhaustive exemplar resources can be found at the testing and certification sections of various health IT organizations, including Integrating the Healthcare Enterprise -
3. HIE sustainability model

In addition to EMR certification/validation processes, incentive and sustainability models were reviewed, building upon a previously described theoretical framework (Figure 1).

Recommendations:

- **Ensure that potential strategies for incentivizing electronic information exchange are reviewed, and the results of such evaluations are communicated to the appropriate stakeholders.** If PHIE stakeholders conclude that incentive strategies are needed, actions should be taken to develop a framework for such incentives. The EMR providers involved in the December 3 meeting suggested that the incentives for implementing electronic health data exchange were ambiguous and under current rules would likely be variable due to the need to negotiate financial terms with each local health executive. Further guidance clarifying whether and how EMR vendors are to be incentivized is encouraged.

- **Begin to clarify HIE sustainability strategies.** Our previous report described a framework for evaluating various sustainability models that varied across combinations of public/private and non-profit/for profit (Figure 1). Because healthcare in the Philippines is delivered via both public (government) and private organizations, the Philippines HIE likely will need to deliver value to both public and private stakeholders to maximize its opportunity for sustainability. This suggests that the TWG should evaluate the feasibility of implementing a public-private partnering strategy to support ongoing HIE activities.
Additionally, the PHIE TWG should evaluate the need for regional interconnected HIE’s, versus a single centralized HIE infrastructure. A publicly managed and funded HIE could serve as an information exchange foundation that both enables government mandated information exchange and reporting, while also supporting the development of regional HIE initiatives by supplying basic infrastructure. A greater portion of early investments, stakeholder engagement, and management of the PHIE may depend on public resources to initiate and grow the process; longer-term growth of HIE may benefit from private resources as the value of a highly-leveraged and interconnected infrastructure becomes increasingly apparent to larger numbers of stakeholders. Independent of the form of the business model (public/private; non-profit/for profit) a critical success factor for the long-term success of any HIE is clear: maximal value must be demonstrated to a broad set of stakeholders. Widespread adoption of HIE is most often achieved by continuously expanding the menu of health information exchange use cases that deliver value to a diverse and growing group of stakeholders. A nonexhaustive list of exemplar HIE use-case patterns include:

○ Results delivery. By leveraging an HIE’s common data sharing infrastructure to exchange routine clinical results (e.g., patient care summaries, consultant reports, ancillary tests, etc.) the overall cost of data delivery can be reduced.

○ Transitions of care. Information can be lost when patients transition from care settings (outpatient-to-inpatient, inpatient to long term care facility, etc.), resulting in less-informed and more costly care. Providing more comprehensive and integrated information during these transitions can improve care outcomes while reducing adverse events and care costs.

○ Population health support. Population level disease patterns can be derived from HIE data. Such information can support various public health processes, including aggregate data reporting, communicable disease management (notifiable disease reporting), emergency preparedness (syndromic surveillance and biosurveillance), and healthcare worker alerting.

○ Resource utilization. HIE information can support optimizing care utilization patterns. Analytic models predicting usage patterns can be derived from routine data sources and may support care interventions that optimize use of health care resources.

4. Architecture Documentation
As a part of the discussion on December 3rd, the architecture was discussed.

Recommendation:

• Ensure that the documentation of the PHIE architecture is clarified. Ensure that architecture diagram accurately reflect architecture and not simply information flows. We discussed the model that begins with the architecture description, workflows leveraging that architecture then described, and subsequently individual transactions comprising an entire workflow are
that expressed in greater detail. Using this documentation methodology, EMR vendors may be more confident about the process for testing, validation, and/or certification.

References:
- OHIE Workflow Documentation

The following are workflows defined in OHIE V1.0. Each workflow contains the standardized message specifications and a diagram outlining the interaction between the HIE components and point-of-care applications. Additional workflows may need to be developed to support your individual implementation.

- Register patient workflow, https://wiki.ohie.org/display/documents/Register+patient+workflow - This transaction allows a point-of-care system to store a patient's demographics in the Client Registry.
- Get patient workflow, https://wiki.ohie.org/display/documents/Get+patient+workflow - This transaction allows patient demographics to be fetched from the Client Registry using an identifier.
- Query patients workflow, https://wiki.ohie.org/display/documents/Query+patients+workflow - This transaction allows a PoC systems to query for patients that match supplied demographics.
- Save encounter workflow, https://wiki.ohie.org/display/documents/Save+encounter+workflow - This transaction allows a PoC system to save encounter to the SHR. The transaction is verified and validated against the other registries before it is saved in the SHR.
- CSD Query for services, https://wiki.ohie.org/display/documents/CSD+Query+for+services - This transaction allows a point-of care application to point to query for health workers, facilities and/or the services provided.

5. Data Specification Transparency
At the time of the December 3rd, 2014 PhilHealth meeting, final versions of the data dictionary and JSON format to be used for the PCB1 use case reportedly had not been distributed to all EMR vendors and other HIE stakeholders.

Recommendation:
- To ensure robust design, as well as optimize stakeholder buy-in, the data dictionary and messaging specification(s) should continue to be collaboratively developed and shared openly. Further, the technical working group should evaluate the value and feasibility of continued
engagement with clinical vocabulary subject matter experts to ensure a robust data model and data dictionary for the PCB1 use case, as well as future use cases.