Metropolitan Portland Health Information Exchange
Solution Differentiation & Technology Strategy

Results and Reports Retrieval System

Last Updated: 6/5/2007 3:38 PM

Contacts:

Densie Honzel, Oregon Business Council Consultant, honzelde@aol.com

Nancy Clarke, Oregon Health Care Quality Corporation Executive Director, nancy.clarke@Q-Corp.org

TABLE OF CONTENTS

Solution Differentiation

Introduction & Sources

The purpose of this section is to assess at a high level the types of solutions available, in relation to the key requirements identified by the Metropolitan Portland Health Information Exchange (MPHIE) study team. This analysis is intended to guide the selection of one or more types of technologies to be used in the exchange.

The sources of inputs to this document are first, the summary of the Solution Differentiators exercise conducted with the study team in January 2007. The second input is the description of technology options provided in the original "Tiger Team" report provided to the OBC in May 2006. Third, the document was reviewed with the MPHIE mobilization study team in April 2007.

Summary of Solution vs. Requirements

The Solutions vs. Requirements matrix is shown in Table 1. The table lists the key differentiators on the left hand column, as identified in the study team exercise. The four rightmost columns contain a rating of the main solution types identified in the May 2006 report to the OBC: 1) a Record locator service ("federated model", 2) a centralized database, 3) Point-to point interfaces or secure provider to provider messaging, and 4) a "smart card" or similar hand-carried personal health record (other examples would include USB keys).

For each of the four solution types, a qualitative rating was provided. The ratings are as follows:

++   Solution strongly supports the requirement relative to other solutions.
+   Solution supports the requirement relative to other solutions.
-     Solution is less capable of supporting the requirement relative to other solutions.
--   Solution is much less capable of supporting the requirement relative to other solutions.

A glance at Table 1 shows that **either the record locator or the database solution architectures are relatively stronger solutions** for the identified key requirements for MPHIE. In contrast, point-to-point interfaces or messaging, and smart cards are relatively weak solutions.

The information in table 1 has the several limitations:
- Though it has inputs from requirements gathered from the community and a consensus process with the study team, this analysis represents an expert assessment of the solution types available, not a consensus process of rating the solutions.

- It utilizes a point-in-time assessment of the key differentiators for MPHIE; if that assessment were to change, there might be a different set of requirements listed on the left side of Table 1.
- It does not take into account "hybrid" solutions (e.g. federated databases) or other types of solutions such as health record banks (a variant on the database model).

Conclusion

The results of this exercise suggest that the MPHIE could be based on an architecture that uses either a federated record locator model, or a centralized database. The community may have other requirements, such as the need to house data at the source systems, that have bearing on the choice between utilizing a database or a federated approach.

Note that this is just one type of analysis to take into account when deciding on a solution approach. Factors such as cost, complexity, and availability of vendors with the needed products and expertise may influence the selection of technology for the MPHIE.

Table 1. Solutions vs. Requirements Matrix

Item #	Name	Description	Record Locator	Database	Point-to-point	Smart Card
8	Data access	Must allow an authorized provider to access data when needed.	+	++	-	-
16	Auditing	Ability to audit user access to specific data elements for an individual.	+	++	-	-
19	Scalable	Scalable to entire Portland Metro area.	+	+	-	-
5	Data availability	Availability of patient data to non-ordering or non-referring providers (community providers). Permit the result to be available to new (unknown) providers who the patient may authorize in the future.	+	++	-	+
18	Compatible	Forward compatible, capable of supporting national HIE standards.	+	+	+	-
1	Patient record	Physical or virtual aggregation of data for a patient. Non-redundant longitudinal health record.	+	+	-	+
4	Patient Control	Ability for a patient to opt in to participation. Granular patient control of information availability (eg. To the individual result level).	+	++	+	-
14	Domain Authentication	User authentication based on data users local privileges (domain authentication).	+	+	+	-
20	Extensible	Extensible to other functions & data	+	+	+	+
11	EMR Integration	Data integration into electronic medical record	+	+	+	+
9	Viewing	Allow the provider to view the result.	+	+	+	+
17	Lightweight	Limit the impact on existing IT resources, business processes, or operations for stakeholders.	+	+	-	-
21	Decision support	Capable of enabling clinical decision support in the long run.	+	++	-	-
3	Distributed or Hybrid Approach	Political or social requirement to locate data inside the data providers premises, available on demand. Flexible placement of data location, hybrid approach.	++	--	-	-

6	Transaction model	Availability of patient data only as required by a specific transaction and/or workflow (point-in-time availability of information.)	+	-	++	-
10	Pulling data	Allow the provider to pull the result from a location	+	+	--	-
12	Rendering/Viewing	Data accessible by integrated viewer OR portal	+	+	+	-
15	Population Reporting	Ability to aggregate & analyze population data for quality measurement, population health, research or other secondary uses.	-	++	--	--
2	Shared Database	Political or social requirement to place a copy of data outside the data provider's control/premises, in a data store or repository.	-	++	-	--
7	Information flow	Must be able to send report to a specific location.	-	-	+	--

Technology Strategy

The purpose of this section is to describe at a high level a recommended technology & architecture approach to the Metro Portland Health Information Exchange (MPHIE). The approach described below is based on the following inputs:

- An understanding of the community's needs and constraints outlined in Requirements Definition 2.0
- Privacy & Security Plan 2.0
- The business needs and value-based services required as outlined in Financing Plan 1.0.
- An ongoing assessment and review of national trends and other regions of the US obtained from NHIN Forums and HIMSS07 convention.
- Demonstrations and discussions with vendors about their current capabilities, costs and feasibility of various technical approaches.

The recommended strategy is to proceed in phases, beginning with a minimum set of functionality that provides a base for expanded services to meet the community requirements, financial plan, and privacy needs. Briefly, the financing stages supported by the technology plan are as follows:

- Stage 1: Start up – Community-wide benefit focus, years 1 to 3-4.
- Stage 2: Transition – Developing value-based services, years 2 to 4.
- Stage 3: Sustainable Financing – target year 5.

The corresponding technology phases are:

- Stage 1: Provide thin basic infrastructure and information to support a community-wide benefit, years 1 to 3-4.
- Stage 2: Initial interoperability, additional data types, semantic tools, persistent data to support initial value-based services, years 2 to 4.
- Stage 3: Full interoperability, secondary uses, and complete persistent patient record services to achieve additional value based services and fully-sustainable financing – target year 5.

The design to support the above plan is outlined in Figures 1 through 3. In general, the recommended architecture uses a federated or distributed model, in which the clinical data resides with the health systems or providers. The centralized services include security management, patient identity, and a pointer system used to locate the clinical data for a patient. A discussion of the particulars of each phase is provided with the figures.

Stage 1 Architecture.
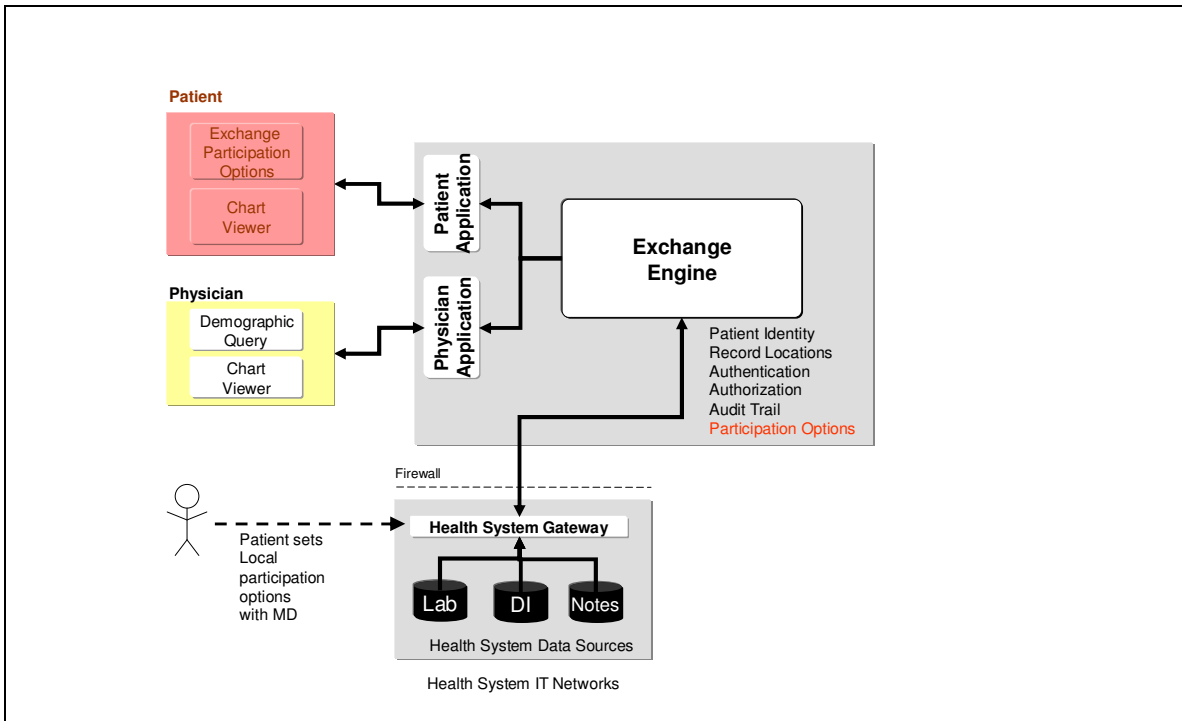
Figure 1. Thin centralized HIE services. In stage 1, the central services consist of patient identity management, record location services/document registry, security services to include authentication, authorization, and audit trail, and the ability for patients to control their participation options in the exchange. The exchange should also provide patients with the capability to view their own data (red box, upper left). Physicians would query data from the exchange with a standalone web portal. There is no central storage of clinical data. Lightweight edge servers or "Gateways" would reside at the health systems, receive and convert data from source systems/interfaces, and register patients and records with the HIE. Note that the first level of patient control over participation is at the health system, where the patient decides whether to participate in the exchange. The second level of patient control is within the exchange itself; the patient sets global preferences via a patient portal. Primary users are the physician and the patient.

Stage 2 Architecture
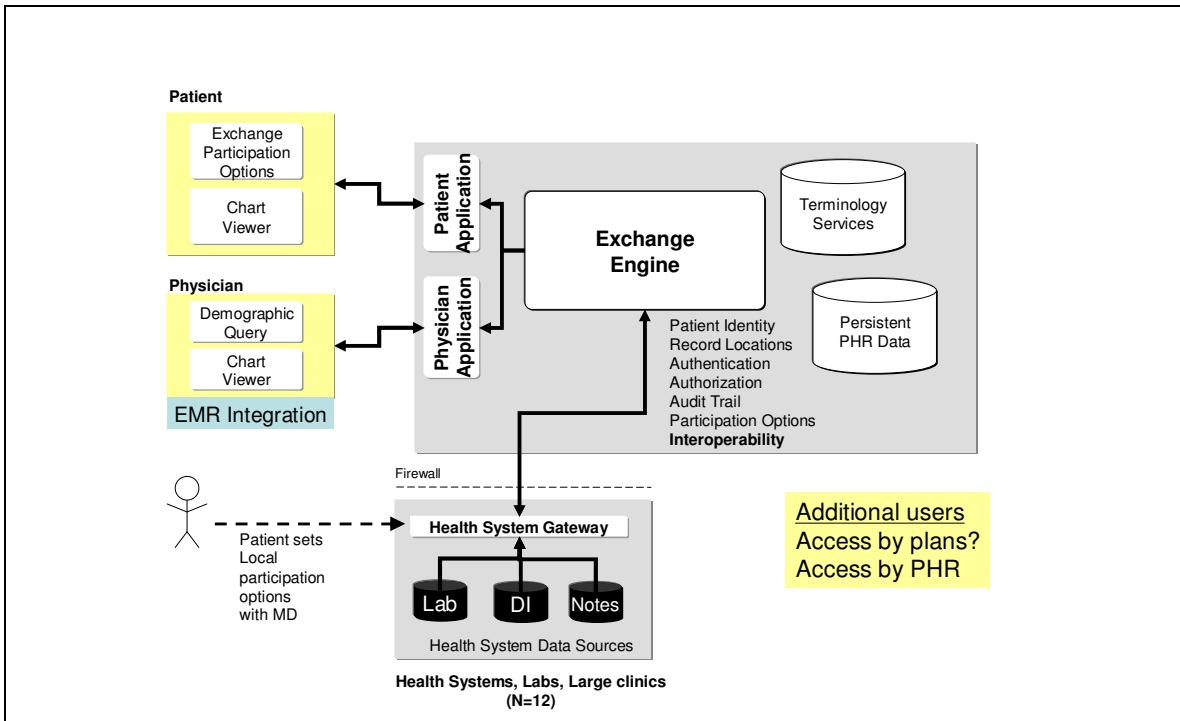
Figure 2. Initial Value-Based Services. In stage 2, the exchange must be able to support services that require increased interoperability, such as direct integration with provider EMRs, Personal Health Records, and other data types (e.g. medications). The exchange will provide terminology services, which are intended to provide semantic interoperability across the HIE. For example, providers should have the ability to automatically import structured and coded data from the HIE into the clinical lists of the EMR (problem, medication, allergy, procedures, etc). The structured and coded data imported from the exchange would be usable by the EMR system functions exactly the same way as if it were native to the EMR, for example for decision support alerts/triggers/reminder. Additionally, the exchange will support structured chart summary documents in line with national standards such as HL7 Continuity of Care Document (CCD) or XDS-Medical Summary (XDS-MS). Persistent data storage will enable establishment of PHR databases. Additional users could include health plans and other PHR services.

Stage 3 Architecture
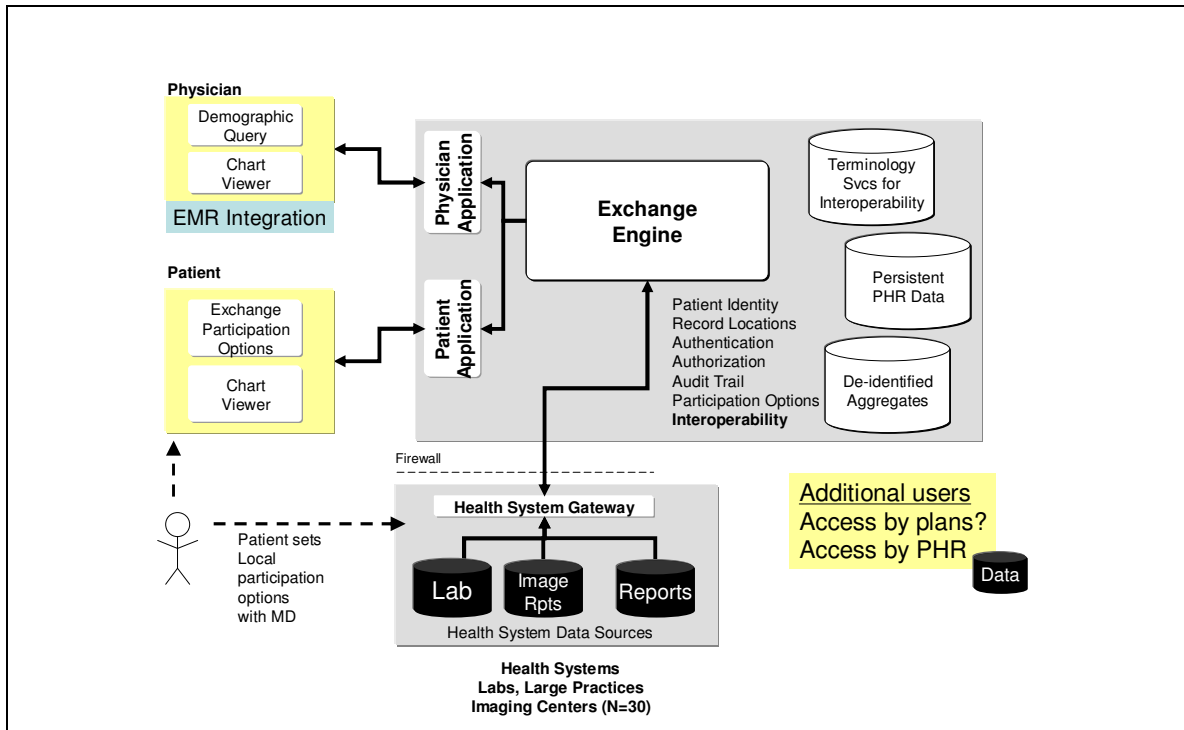
Figure 3. Full services. Stage 3 services would include patient record aggregation for PHR support, full interoperability services, aggregate databases suitable for secondary uses, and infrastructure to generate sustaining revenue such as lab result delivery, claims attachments, disease management, medication lists and so on.

Conclusion and Next Steps

The federated architecture shown if Figures 1-3 would support the clinical and financial goals of the MPHIE. The Stage 1 architecture represents the bare minimum set of functionality capable of meeting the needs of the community while providing a credible foundation for patient privacy and control of their participation. The architecture becomes a hybrid in later stages with the addition of centralized data storage capability for patient records and de-identified data.

As decisions are made in the remainder of the mobilization effort, the technology plan will be updated to correspond with later stage financial and privacy models, and to make more explicit the types of information and services provided in stages 2 and 3.

Appendix A: Background, Sources, Related Documents

The MPHIE Mobilization Planning effort was commissioned and financed by the Oregon Business Council's Health Information Exchange Leadership Group. The project leadership team (Tiger Team) provided oversight and leadership in guiding the development of the planning included:

  Andrew Davidson, Oregon Association of Hospital and Health Systems
  Janice Forrester, PhD, The Regence Group
  Dick Gibson, MD, PhD, MBA Providence Health Systems & Legacy Health
    Systems
  Jody Pettit, MD, Oregon Health Care Quality Corporation & Office for Oregon
    Health Policy and Research

The Mobilization Planning effort was staffed by Oregon Health Care Quality Corporation. Staff and sub-contractors who contributed to various portions of this report include:

  Nancy Clarke
  Jody Pettit, MD
  Tom Ricciardi, PhD
  David Witter, Witter & Associates

For More Information please contact:

Oregon Business Council
1100 SW 6th Avenue, Suite 1508
Portland, OR 97204
Denise Honzel, honzelde@aol.com,
(503) 860-1278

Oregon Healthcare Quality Corporation
619 SW 11th Avenue, Suite 221
Portland, Oregon 97205
Nancy Clarke, nancy.clarke@q-corp.org
(503) 241-3571

The Mobilization Planning effort builds upon the report to the Oregon Business Council (OBC) Data Exchange Group titled "Oregon Health Information Exchange Options" dated May 15, 2006 available at http://www.q-corp.org/q-corp/images/public/pdfs/OR%20HIE%20Options.pdf.

The Mobilization Planning effort report relies on a number of sources of information including published studies, publications and reports of major organizations involved in health information exchange, and information collected from other regional health

information organizations (RHIOs) and health information exchanges (HIEs) and interviews and discussion with clinicians and other stakeholders in the community.

Key Mobilization Planning documents include
- MPHIE Final Report
- Metropolitan Portland Area Health Care Environment.
- MPHIE Technology Plan.
- MPHIE Privacy and Security Assessment.
- MPHIE Governance Plan.
- MPHIE Business Plan.
- MPHIE Operations Plan.