

## **Behavioral Organizations Resource Gateway (BORG)**

### **Solving the problem of HIPPA Compliant Electronic Medical Record sharing and validation between collaborating organizations using open technology.**

By Craig E. Caesar

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If you are frustrated by attempts to implement cross-organizational computer systems, you are certainly not alone. Mandated proprietary systems are often designed to fit a very narrow interpretation of underlying data. Implementations typically require data conversion, duplicate data entry, inadequate support, and security administration. Open technology standards reduce this overhead when paired with a collaborative framework providing data definition, transmission, and secure access protocols.

The main problem facing organizations that share data is not purely technical. Proprietary systems can be configured to communicate across networks or via batch updates. Connections between these kinds of systems are expensive to develop and expensive to maintain. Emerging open data description and transmission protocols eliminate the cost of establishing secure communication between systems, increase the quality of technical solutions, increase security, and decrease the cost of implementation.

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Humans need a common interpretation of data to make it useful between organizations. They must agree on validation protocols to insure HIPAA compliance and consistency of shared data. The Dallas Area Northstar Authority (DANSA) will use open data access protocols to define a common XML Schema bringing consistency to data shared among Northstar Service Providers. 3DES Virtual Private Network (VPN) and Secure Sockets Layer (SSL) encryption will protect data transfer. This approach will provide a secure, common, and useful interpretation of shared clinical data.

*DANSA will work with each organization to resolve conflicts and insure consistent information*

*data will be de-identified to support HIPAA compliance. This will provide system wide outcome measures without compromising client confidentiality or organizational privacy*

*Using open technology protects the long-term viability of this solution, and minimizes efforts required to participate in the system*

**How will the BORG solve interpretation problems?**

DANSA will provide data storage and transmission technology via the Behavioral Organizations Resource Gateway (BORG). They will assign security rights to insure appropriate access at the organizational and user role level. All server-to-server communication will occur over VPN connection, and all user access will be granted via Lightweight Third Party Authentication (LTPA) token using single sign on over an SSL connection.

DANSA will work with each organization to resolve conflicts that arise as a result of BORG transactions. This will insure that consistent information is available to all participating organizations in real time. This will also allow single entry of client information within each organization's existing system. Client history and demographic information will be available in each organization's system upon valid intake of a client known to the BORG.

In addition to collecting and cleaning data, DANSA will publish reports and interfaces for accessing aggregated data. This data will be de-identified to support HIPAA compliance. This will provide system wide outcome measures without compromising client confidentiality or organizational privacy.

**What technologies will the BORG support?**

HarrisLogic, an IBM Business partner, will build BORG interfaces using open technologies developed by industry leaders such as IBM, Microsoft, and Sun Microsystems. These technologies conform to transmission and security protocols published by the World Wide Web Consortium (W3C), publishers of the URI/URL, HTML and HTTP specifications available in an Internet browser near you.

Using open technology protects the long-term viability of this solution, and minimizes efforts required to participate in the system. While no technology is future proof, the technologies chosen enjoy broad industry support, cross-platform compatibility, and the full momentum of open system trends.

*Client data will flow directly to and from CompTMAP and will be fully integrated within the BORG interfaces.*

*Vendor solutions improve as open protocols become more mature and full featured*

*EMR vendors may be eager to work with agencies within the pilot to gain access to the broader market the BORG potentially provides*

Organizations that have implemented Extensible Markup Language (XML) and Simple Object Access Protocol (SOAP) capable technologies will only need to define transactions that comply with the XML data schema published by DANSA.

The BORG data schema is designed to support the University Of Texas Southwestern CompTMAP system developed by Dr. Kenneth Altshuler. Client data will flow to and from CompTMAP and will be fully integrated within the BORG interfaces. Access to the TMAP algorithms will be possible by launching CompTMAP through the BORG in a terminal services session.

#### **Why use open technology?**

Open technology standards benefit software vendors and their customers by opening broader markets for interface software that is increasingly more flexible and stable. Vendor solutions improve as open protocols become more mature. Software implementations become easier and more robust due to increased data stability and quality.

We anticipate that, as the BORG's XML Schema gains wider acceptance, vendors will code solutions that are compatible with it. Some EMR vendors may be eager to work with agencies within the pilot to gain access to the broader market the BORG potentially provides. This creates healthy competition and focuses vendors on creating better interface design instead of defining proprietary database schemas.

#### **Why use XML and SOAP?**

XML encoded data created by systems built in Java, C++, Visual Basic and many other development environments can be interpreted by any other system that understands XML. Interpretation of that encoded data is based on a published XML data schema that is centrally managed and widely distributed.

*An XML Schema provides information that allows systems to agree on how to interpret and translate text data*

*The BORG XML Schema is designed to integrate directly with CompTMAP*

*SOAP will be used to create web services published through the BORG making direct data lookups fast and available on mobile devices*

XML Schemas are defined by a W3C standard for describing XML data. XML data is defined as characters between XML tags, so it is transmitted only as string text. An XML Schema provides information that allows systems to agree on how to interpret and translate text data. The data tag structure makes it fairly easy for humans to interpret the schema and make sense out of encoded data.

The BORG XML Schema is designed to integrate with CompTMAP software. This means that data from any BORG compliant EMR solution will provide background data needed to support the groundbreaking medication algorithms expressed in CompTMAP. This also means that visit and medication information from CompTMAP will flow into BORG compliant EMR solutions. As CompTMAP matures, the BORG XML Schema will become more robust and valuable.

XML parsing solutions are free and available for download at <http://xml.apache.org>. The BORG will implement the Xerces library using Java servlets hosted on Websphere Application Server.

SOAP is a lightweight protocol intended for exchanging structured information in a decentralized, distributed environment. SOAP makes it possible to transmit XML data payloads between different systems, such as between an EMR and a Human Resources application.

SOAP will be used to create web services published through the BORG making direct data lookups fast and available on mobile devices. As new devices are developed, the BORG will be positioned to format useful data made securely available through them.

While SSL encryption will protect SOAP and XML data transmission initially, proposed open standards such as Security Assertion Markup Language (SAML) and XML Key Management Specification (XKMS) will offer additional security measures.

*The TOP grant will help support implementation of interfaces*

*HarrisLogic will maintain and provide knowledge about systems that are known to the BORG*

### **How much will it cost to participate?**

The cost to participate depends on each organization's current technology landscape and capability. Many of these costs will be covered by the TOP grant for organizations participating in the BORG pilot.

The TOP grant will help support implementation of interfaces or solutions that are XML and SOAP capable. HarrisLogic is available through matching funds under the TOP grant for assistance in evaluating each organization's needs.

HarrisLogic will be available to assist on a contract basis beyond the scope of the TOP grant, but many organizations should be able to implement BORG interfaces with minimal additional investment.

HarrisLogic will maintain and provide knowledge about systems that are known to the BORG. This shared knowledge will jump-start each organization's implementation and lower implementation costs as that knowledge base matures.

### **Additional Resources**

W3C's definitions for XML and SOAP:

<http://www.w3.org/XML> <http://www.w3.org/TR/SOAP>

To access the BORG and CompTMAP pilot you will need a username and password for <http://edapt.us>. Contact HarrisLogic at 1.800.539.4258 to obtain a user id, or use the username "testdrive" with password "agile".

Visit <http://www.harrislogic.com> for information about HarrisLogic's services and philosophy.

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