INTEGRATION STRATEGIES FOR HEALTHCARE IT VENDORS

COST-EFFECTIVE INTEROPERABILITY SOLUTIONS

Orion Health – White Paper
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1 INTRODUCTION

Healthcare IT organisations rely on information systems from many different vendors to support activities related to patient care, because no single system can do it all. In today's healthcare environment, however, keeping each system's data in a separate silo is not feasible, because data needs to move freely among the various systems in order to match the complex workflows of modern healthcare systems. Interoperability is not optional.

2 PROBLEM

Most healthcare IT software vendors are not in business primarily to interoperate with other software; they have developed unique intellectual property around specific aspects of healthcare, and have implemented it in their software. As a consequence, vendors often prefer to focus on the clinical and business functionality at the core of their product, and features related to data interchange are added as an afterthought.

Unfortunately, failing to treat interoperability as an important, first-tier feature can result in expensive problems down the road for these vendors. Home-built integration components are seldom easy to configure, which leads to unnecessarily lengthy implementation times, or, even worse, an inflexible interface specification that requires the customer to handle customisations on their end. Monitoring can present similar difficulties; troubleshooting often amounts to reading through cryptic log files, which is an unwelcome chore for the vendor's operational team. Furthermore, vendors assuming the responsibility for their own interoperability means, they must take on the burden of fully implementing existing interchange specifications and keeping ahead of emerging standards.

Implementing an interoperability solution is a much bigger commitment than it initially seems, and vendors that choose this path are often surprised by the overall cost.

This whitepaper is aimed at three categories of software vendors:

1. Vendors who are embarking on solving the interoperability problem for the first time and face a "build versus buy" decision.
2. Those who have undertaken the task of creating their own interoperability module and are experiencing a poor return on effort or struggling to implement new, required functionality.
3. Software vendors who have attempted to use a free or open source integration package and are running into limitations, either from the software or the services and support offered by the software's creators.

3 SOLUTION

An alternative to taking on the interoperability challenge is for vendors to offload this work to a standalone, healthcare-focused integration engine, such as Orion Health™ Rhapsody™ Integration Engine. The vendor's software is loosely coupled to the Rhapsody Integration Engine, and both components are delivered to the customer as a composite application. In this model, Rhapsody becomes the vendor's data sharing and acquisition solution.

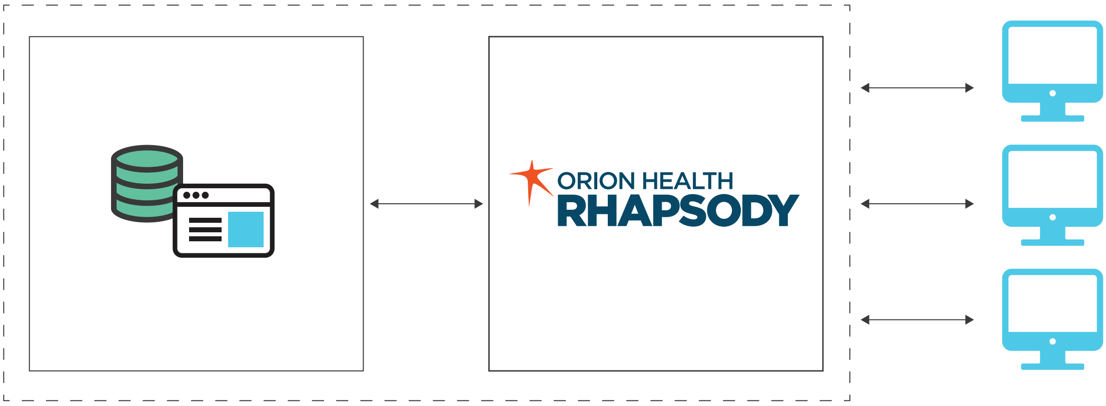

Figure 1: Rhapsody handling all interface to external systems

Rhapsody is responsible for handling all interfaces to external systems; for example: EMR/EHR systems, Lab Information Systems, patient registration/HIS systems, and order entry systems. Each of these interfaces will be different. Protocols, messaging standards, data formats, and acknowledgement schemes differ from one vendor to the next. Rhapsody also communicates with the vendor's software using a standardised interface that fits into the vendor's architecture. For example, the vendor may prefer to communicate between internal components using REST-based interfaces, so Rhapsody could translate an HL7 feed from a customer's lab system to XML and send it to the vendor's application over a REST interface.

By including a commercial-quality integration engine in their solution, vendors avoid dedicating resources to solving the interoperability problem of their software solutions. The vendor's team can stay focused on developing and improving the clinical and business features that differentiate their software from competitors. Furthermore, the vendor is able to deliver a fully featured integration component that is easy to configure, customise, and monitor. Performance, scalability, reliability, guaranteed message delivery, and standards compliance – all which can be very expensive to fully implement – are no longer a concern or a source of cost to the vendor.

As a platform aimed at helping healthcare IT vendors achieve their interoperability goals, Rhapsody includes a number of developer-centric features, including:

- Unattended installation of the engine and configuration loading
- Configuration version control
- Various methods of connecting to vendor software: SOAP and REST web services, JMS queuing, MSMQ, database access, and many more
- Engine API for remote monitoring and management
- Rhapsody Development Kit (RDK) for custom component development

3.1. SOLUTION BENEFITS

A healthcare IT vendor can realise many benefits across the organisation by incorporating Rhapsody as a part of their platform.

Development	• Remain focused on core application features without worrying about integration features and standards
Support	• Simplified interface monitoring and error management • More rapid resolution of interface issues
Field deployment team	• Easier configuration, customisation, and debugging of interfaces at the customer site
	• Easily connect to a variety of EMR/EHR, LIS, HIS, and other types of software • Quicker customer deployments
Sales	• Eliminate customer objections that interfacing may be an obstacle to deployment

Because Rhapsody is offered as a solution rather than a product, customers have access to a wide range of support and services, including:

- Orion Health consulting services
- Online and in-person training courses
- 24x7x365 customer support
- Online reference manuals and examples
- Online customer community
- Yearly user groups

4 MIGRATION TO AN EMBEDDED-ENGINE SOLUTION

The conversion from a self-developed interoperability solution need not be a complex or risky process. Generally, the following steps will provide a clear path.

1. Analysis of the current interoperability components
2. Separation of interfacing code (e.g., receive and map an HL7 message) from business logic (e.g., update a patient's demographic information)
3. Re-implementation of interfacing code within Rhapsody Integration Engine as interface configuration
4. Testing and validation
5. Documentation of standard interface specifications and a "playbook" for the field team to build customer configurations
6. Convert existing implementations from the legacy code to the new, Rhapsody-based solution (where required)

The software vendor's development team typically conducts steps 1-3. Step 4, is undertaken by the vendor's QA department. Step 5, may be completed by a technical writer, developer, or other resource. Step 6 is handled by the professional services or field team.

Training on the Rhapsody Integration Engine should be provided to the development and QA teams prior to step 3, and the field team will need to be trained on the tool before step 6.

For vendors that are implementing an interoperability solution for the first time, the process is limited to steps 3 through 5.

4.1 ANALYSIS

The migration process begins by understanding the existing interoperability code base. In many cases, this code will be decoupled from the main body of the application code. In other cases, it will be co-mingled, which can make analysis more difficult. The output of this stage should be a complete understanding of the interoperability code base, ideally with written documentation.

4.2 SEPARATION OF CODE

In this step, an analyst or architect determines which portions of the code are responsible for the transport and manipulation of interface messages and which parts are related to business rules. An example of transport and manipulation might be the code that accepts an HL7 message over a TCP connection and that finds the patient identifier. An example of a business rule might be the code that updates patient demographic information.

It is important in this step to pay attention to the various configurable parameters, as they may turn into configurable parts of the Rhapsody interfaces later.

In cases where an application does not have an existing code base, the system architects have the opportunity to define an interface from the Rhapsody Integration Engine to the existing code base.

4.3 RE-IMPLEMENTATION

At this stage, the development team re-implements the transport and manipulation code that was previously identified within Rhapsody. Special care should be taken to create generic, reusable interfaces. Many customers seek assistance from Orion Health's consulting services team at this stage to recommend best practices and optimise their implementations.

The endpoints of the Rhapsody interfaces should make calls to the code that implements business rules within the application. This can be done using a variety of technologies that are available within Rhapsody, including: REST or SOAP-based web services, reading/writing a database table, JMS or MSMQ queuing, a plain TCP/IP connection, etc.

Initially, the legacy code may be left in place until the re-implemented interfaces are tested and validated, but eventually, the code should be retired in order to reduce the overall complexity of the code base.

4.4 TESTING

Ideally, the legacy code base would have a rich set of unit tests whose data can be repurposed to validate the newly developed Rhapsody interfaces. In cases where such tests are not available, it is possible to send test messages to both the old and new implementations and compare them to ensure they are the same. The Rhapsody product contains a variety of testing facilities to assist in this process.

4.5 DOCUMENTATION

Using Rhapsody's built-in documentation features, it is possible to produce standard interface specifications with little effort. This will provide a documented way for trading partners to communicate with the vendor's application.

In the majority of implementations, the trading partners will not be able to fully implement the vendor's specification. In those cases, it will be necessary for the vendor's field team to build a "last mile" interface to the customer's systems. These interfaces are intended to bridge the gap from customer systems to the vendor's standard configuration.

A best practice is to deliver a common, "near side" configuration to each customer that is responsible for taking a standard, well-formatted message and sending it to the vendor application's business rules. Then, each customer will also receive a "customer configuration" that maps the customer's particular messaging variation to the vendor's standard. In this way, the common configuration can be versioned separately from the individual customer configurations.

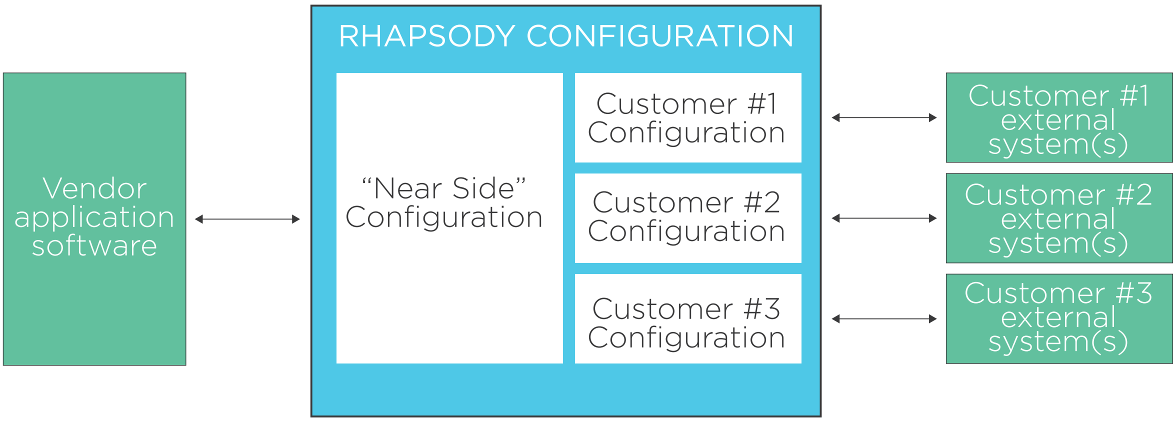
RHAPSODY CONFIGURATION
Vendor application software
"Near Side" Configuration
Customer #1 Configuration
Customer #2 Configuration
Customer #3 Configuration
Customer #1 external system(s)
Customer #2 external system(s)
Customer #3 external system(s)

Figure 2: Rhapsody configuration

4.6 CUSTOMER CONVERSIONS

Obviously, a major architectural upgrade to the vendor's application will impact existing customer deployments. Ideally, there should be no changes required on the customer's side; however, the vendor's field team may need to implement some customer-specific configuration when the installation is upgraded to the Rhapsody-based version of the application.

5 SUMMARY

In today's healthcare IT environment, interoperability among disparate systems has become a must-have feature of any vendor's product offering. By following the process described in this whitepaper, vendors can migrate from their own interoperability code to Rhapsody or add interoperability features to their product for the first time with minimal disruption.

Vendors that embed Rhapsody as their interoperability solution can expect to enjoy a number of benefits:

- **Savings** in terms of code development and maintenance
- **Competitive advantages** related to interoperability
- **Operational efficiency** of deployment, troubleshooting, and monitoring
- **Future-proofing** through compliance with new and emerging standards

Contact Orion Health for more information about how Rhapsody can help your organisation cost-effectively improve its interoperability strategy.

6 ABOUT RHAPSODY

Orion Health Rhapsody Integration Engine is designed for rapid interoperability between healthcare IT systems, regardless of technology or standards. Rhapsody's proven technology works between different systems and across organisations, providing seamless connectivity between legacy and next-generation health systems. Rhapsody provides fast, reliable connectivity and data sharing within and among hospitals, Health Information Exchanges and public health organisations. Orion Health Rhapsody lays the foundation for the delivery of consistent, efficient and high quality patient care.

KEY COMPONENTS:

- **Engine:** The main messaging service that implements communication.
- **Development Environment (IDE):** An easy-to-learn graphical user interface to configure the functionality of Rhapsody.
- **Management Console:** Web-based application that displays system status and performance monitoring.
- **Mobile App:** Convenient monitoring capability of the Management Console on a smartphone.
- **Dashboard:** Displays the notifications and system health of multiple Rhapsody engines in a single monitoring-centric view.

Contact Orion Health for more information about how
Rhapsody can help your organisation cost-effectively
improve its interoperability strategy.
Please visit **www.orionhealth.com/rhapsody-integration-engine**

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Rhapsody™ Integration Engine is intended only for the electronic transfer, storage, or display of medical device data, or the electronic conversion of such data from one format to another in accordance with a preset specification as specified in the product manual and/or related documentation. Rhapsody Integration Engine is not intended to be used for active patient monitoring, controlling or altering the functions or parameters of any medical device, or any other purpose relating to data obtained directly or indirectly from a medical device other than the transfer, storage, and conversion of such data from one format to another in accordance with preset specifications. Rhapsody® is a registered trademark of Orion Health™ Limited, manufactured in New Zealand, by Orion Health Limited. Rhapsody Integration Engine is not intended to be used for diagnostic purposes, or to replace clinical judgment or responsibilities.