

# Interface Engine in Healthcare

Our expertise on Mirth



In today's connected healthcare environment, the role of an interface engine should be to enable faster deployment cycle times of high quality interfaces using people who have analyst-level, workflow-based skill sets. With healthcare data flowing through it, an interface engine should ease connections to remote care facilities (e.g., physician practices, labs, radiology centers, etc.) and leverage the data to improve operations and workflows.

In these two sentences, the role of an interface engine is clearly defined.

Exploring each facet of this definition is essential to gaining the most value from your [healthcare integration](#) infrastructure and ensuring your infrastructure has the right fit for the demands upon us today, and those we will be facing in the years ahead.

The key elements of the interface engine role defined above include:

- **People** - Utilizing people skills that are more readily available with the right cost-benefit ratio
- **Cycle Time** - Delivering tested, ready-to-deploy interfaces in hours rather than days, weeks or months
- **Community Exchanges** - Enabling efficient, secure exchanges with a larger, external health care community
- **Workflow** - Orchestrating healthcare workflows in a logical manner while alerting the right people when potential bottlenecks arise
- **Operational Views** - Leveraging the data flow into meaningful information for managers and directors with operational responsibility

Each of these interface engine roles is explored within this white paper.

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## People

In previous generations of interface engines, extensive programming was required. Building interfaces required a person who had deep skills in Java, TCL, Python, or other programming languages. There were at least three disadvantages to this approach. First, these skill sets are sometimes difficult to locate and afford. Second, the skill set is focused on a development language, not on healthcare workflow. Third, the cycle time to build interfaces were long, with development queues quickly building for new interfaces.

Today's healthcare environment has expanded outside the four walls of a healthcare organization. Understanding healthcare workflow is more essential in building the interface, since greater logic is required in the routing and mapping of patient data. Equally important is that the demand for new healthcare interfaces has increased

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exponentially as IT departments strive to deliver more with less in today's cost-sensitive environment.

The role of an interface engine in modern healthcare is to address these changes in a productive and proactive manner. How interfaces are built should be intuitive so that analyst-level skills can be utilized. Included in this skill set should be a greater understanding of healthcare workflow so that the interfaces can better match operational or system requirements.

Utilization of people skills should be greater with today's interface engine technology to not only match new cost structures but also better meet new interfacing demands.

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## Cycle Time

Waiting days, weeks, or months for a new interface is quickly becoming unacceptable. This affects critical workflows and the ability to deliver efficient, high quality care in a timely manner.

An interface engine's role is to streamline the process of building, testing, and deploying new patient data exchanges. The interface engine is the catalyst, not a hurdle to overcome, in implementing new healthcare interfaces.

Related to the skill sets, cycle time is reduced significantly with a different approach. Rather than developing interfaces in a programming language – part or whole – the approach should be menu-driven. It comes down to not only the skills required, but also the time it takes to implement a quality interface. The role of an effective interface engine is to reduce the cycle time to deploy a robust, well-tested interface.

Another relation to cycle time and interface engines is leverage. An interface engine's role is to create leverage within your interfacing environment. For example, one Admit-Discharge-Transfer (ADT) interface should be leveraged to more than one application. The interface engine serves as middleware to leverage one application interface to multiple applications as needed. This directly impacts cycle time in a positive manner, and can dramatically decrease the interfacing costs for a healthcare organization. Both are vital attributes.

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## Community Exchanges

What happens within the four walls does not stay within the four walls any longer. Physician practices want to receive patient, lab or report results electronically. Hospitals want to receive patient demographic information electronically. Radiology practices need to send patient reports to referring physicians electronically. Although there is a strong need for internal application integration, the boundaries have expanded and will continue to expand as new Federal and State guidelines and incentives coming into reality.

The role of an interface engine is to facilitate productively and securely the expanding exchange of patient data. TCP/IP connections through VPNs cannot be the only means of communication today. Secure web services through a remotely -deployed software agent provides more manageable exchanges. An interface engine needs to be a platform in which new integration requirements can be met effectively while providing the intended results.

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## Workflow

The process orientation of healthcare is crucial. Six Sigma and Total Quality Management approaches within healthcare are showing great results in achieving efficiency and enhancing quality of care. Data flow plays a fundamental role in this new process view within healthcare. It is no longer “good enough” to just re-work a date format and send it on to the next application. Logic needs to be applied to the data not only in the transformation but also in where it needs to be routed. Likewise, alerts need to be fired out to the correct people when certain triggers occur, such as missing data elements or a particular event occurring. Data flow is not flat or uneventful. It is robust, ever-changing, and an interface engine needs to adapt to these changes.

The role of an interface engine is to ease the workflow while providing the flexibility to change direction based on configurable events and deliver alerts when an abnormal condition arises. Streamlined healthcare workflows and interface engines are intertwined together, each supporting one another in order to support the productive, timely delivery of care to patients.

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## Operational Views

Think about it. What part of your data flow goes through an interface engine? The answer is probably “most of it.” If the interface engine is the conductor of the data flow, then wouldn't it be beneficial to gain a view into the data from an operational perspective?

Another role for an interface engine is to capture the data, store it, and, with an

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added layer, present it graphically to decision makers. The information is timely, and operational decision makers require this type of insight in order to make changes to address current trends. Access to current information will facilitate more decisions that are informed with the added ability to address potentially adverse issues in a timely manner before they have negative effects. It has been many decades since the Information Age was proclaimed. Isn't now the time to leverage the information age with better access to key operational data?

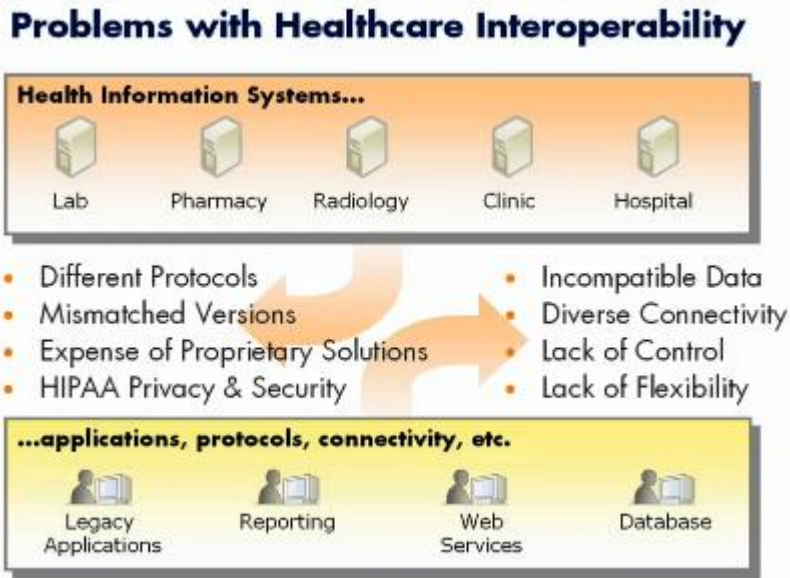
An interface engine's role is clear – Provide the data, which can be organized and presented in a way to facilitate timelier, more effective workflow and healthcare operational decisions.

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## Mirth An Integration Engine

Mirth Solutions power the flow of patient and administrative data across healthcare systems in less time and at lower cost than traditional solutions....providing safer healthcare with greater convenience for patients and providers.

### Why Mirth



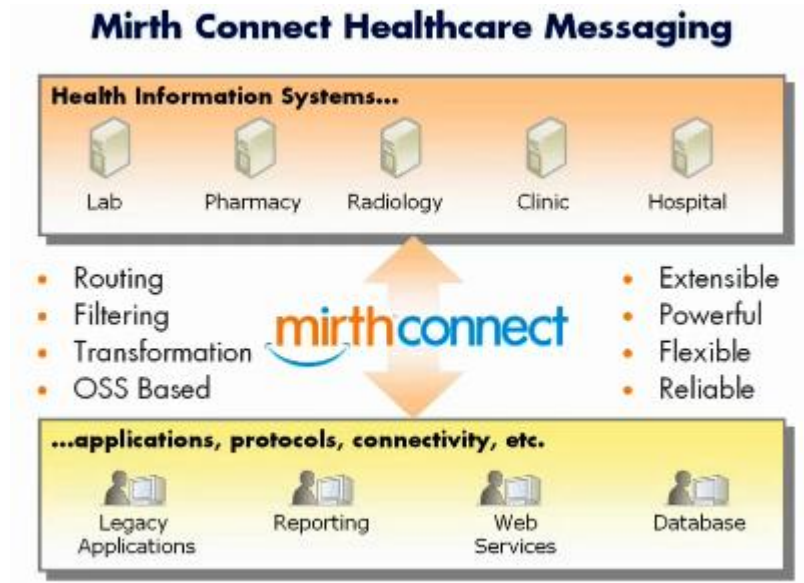
## The Mirth Connect Solution

Mirth allows messages to be filtered, transformed, and routed based on user-defined rules. A web-based interface and channel creation wizard associates applications with Mirth engine components.

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Mirth uses a channel-based architecture to connect systems with other HL7 systems. Channels consist of endpoints (both inbound and outbound), filters, and transformers. Multiple filters and a chain of transformers can be associated with a channel. The Mirth web interface allows for reuse of filters and transformers on multiple channels.

Endpoints are used to configure connections and their protocol details. Inbound endpoints are used to designate the type of listener to use for incoming messages, such as TCP/IP or a web service. Outbound endpoints are used to designate the destination of outgoing messages, such as an application server, a JMS queue, or a database.



## Mirth Connect Overview

- **Ease of Use**
  - Graphical Administrative tool
  - Simple Channel Based Interface
  
- **Powerful**
  - Filters
  - Transforms
  - Routes
  
- **Flexible**
  - Multiple routes and transformations
  - Extensible via JavaScript
  - Plug-in architecture
  
- **Cost Effective**
  - Open source engine
  - No licence fees
  
- **Standard based messaging**
  - HL7 v2 and v3
  - NCPDP
  - X12/EDI
  - XML
  - DICOM
  - Delimited Text
  
- **Supported Connectors**
  - File System
  - FTP/SFTP
  - Email
  - TCP
  - SOAP
  - HTTP
  - Database
  - JMS
  - LLP/MLLP
  - PDF/RTF

## Summary

The time has come to change. An interface engine is not just an interface engine any longer; it is a healthcare integration platform that supports the operations of a care delivery organization. From interfaces to workflow to operational decisions, interface engines have transformed to integration platforms, which assist the renovation of healthcare into being more productive, connected, and efficient. Times have changed. Mind-sets are changing. New roles for an interface engine are essential to meet today's requirements and shifts in healthcare.

### Key points:

- **Resource utilization** is a key consideration in determining the value of your interface engine and future healthcare integration initiatives.
- It needs to be both **faster and higher quality**. Cycle times coupled with quality are key attributes for an interface engine. If you are evaluating new integration platforms, use a stop watch test for an interface and then test the quality of what was built. Using a stopwatch provides an interesting, useful wrinkle in evaluating a proof of concept.
- It's the **community of care**. Integration requirements have expanded outside the four walls of a healthcare organization. The interface engine needs to support a larger initiative and extend into the community in a productive, secure manner.
- **The process matters**. Facilitating workflow is a critical role for interface engines today. Think logic, think alerts. Support processes and act on process flow information.
- Better access to critical data will set you free to make **more informed, timely decisions**. Capturing data, storing it, and presenting it is a new role for interface engines – one that enables key healthcare decision makers to make complex decisions faster and better. It's not only IT anymore; it is IT enabling the operations with insights.

### **About Perennial Systems**

Integrating information technology to deliver safer healthcare has been a major challenge owing to the fact that much of the subsequent response to that challenge has focused on increasing the capabilities of enterprise hospital and clinical information systems—for example, implementing order-entry systems to check for drug allergies when writing prescriptions. But IT and patient care also come together at the bedside in the medical equipment and instrumentation systems used to deliver direct patient care—for example, smart infusion pumps that help ensure that the right dose of the right drug is administered to the right patient.

Perennials skills and capability can touch on both types of systems, while focusing primarily on the application of software and systems engineering to software based medical devices and device systems used at the bedside.

### **Perennial Systems**

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