



# Interoperability Solutions for Healthcare



OBJECT MANAGEMENT GROUP

# The Solution for Interoperability in Healthcare

## Business Environment

*In the early 1990s, there were over 6,000 independent hospitals in the United States. By 1996, the number had shrunk by over 50%. Some beds were lost, but most of the reduction was due to consolidation. This trend continues.*

*The advent of managed care as the new model for healthcare delivery in the United States mandates that healthcare providers find a way of reducing costs while maintaining or improving the quality of care. The healthcare industry is responding to this challenge by forming Integrated Delivery Networks, converting the traditional fee-for-service health care system into an enterprise care model. By some accounts, there will be less than 600 Integrated Delivery Networks in the US by the year 2005.*

## The Problem

The Integrated Delivery Network (IDN) model is expected to greatly enhance efficiency and cost effectiveness of healthcare delivery by consolidating resources and moving patients to the lowest cost point of care within the network. It is possible that up to 20 different caregivers throughout an IDN will need simultaneous access to a patient's clinical records. Obviously, traditional paper-based records are unsuitable in this setting. They cannot be readily

available as a patient moves, nor can they be conveniently shared among clinicians for consultation and collaboration. The industry needs an information system solution that will allow collective data to be shared. Computer-based Patient Records (CPR) address these information-sharing problems.

## The Shift to Enterprise Information Integration

A recent survey revealed that the major areas of concern to healthcare CIOs were all related to the integration of enterprise information. This trend reflects a change in viewpoint away from departmentally centered roles (admissions, lab, radiology, etc.) and towards enterprise-wide roles that are common to business in general. But a major problem exists in creating computer-based records. Many of the existing legacy information systems which contain the raw patient data were created over 20 years ago and implemented in the mainframe

terminal technology of those times. Many of these systems are just now making the transition to the client-server technologies brought about by the advent of personal computers and local area networks in the 1980s. However, the computerized records needed to make the IDN business model successful requires a network centered, distributed view of clinical information.

## The Solution: CORBA

The Common Object Request Broker Architecture (CORBA) is an open standard that allows the proliferating number of hardware and software applications to communicate with one another no matter what language they are written in, what platform(s) they run on, no matter who designed or built them, or where they are located on the network. CORBA is not a healthcare-specific standard. It is a complete, distributed object computing framework that extends applications across networks, languages, component boundaries and operating systems. CORBA was designed with the enterprise in mind and can be used in all aspects of a business. Distributed object computing systems based on CORBA are scalable to thousands of clients and servers across all computing platforms. CORBA is available today. It is providing

### A Computer Based Patient Record

A CPR is a virtual record; an aggregation of clinical information about a particular patient, drawn from anywhere within the IDN and made available to any caregiver who is authorized to see the information. In this context, a CPR is a multi-media presentation of information drawn from all clinical departments within an IDN and displayed as views of the most relevant information to caregivers in the hospital, in the office, at home, or any other location where it is needed.



the foundation for hundreds of mission-critical applications in dozens of industries from banking to manufacturing, retail to utilities, transportation to healthcare. CORBA-conformant products are offered by dozens of vendors including IBM, Oracle, Netscape, Sun, Hitachi, Hewlett-Packard, Fujitsu, Silicon Graphics, and Computer Associates. With such significant deployments and a constantly growing array of available products, CORBA is "The Middleware that's Everywhere."



## The Use of CORBA in Healthcare (CORBAmed)

CORBA is created and maintained by the Object Management Group (OMG), an international, non-profit software organization driven and supported by information system vendors, software developers and technology users. The OMG is supported by more about 800 members. All of them see information as one of their most valuable resources.

To address the needs of the rapidly changing healthcare industry, the OMG established a Healthcare Task Force, known as CORBAmed. This dynamic task force is the fastest growing organization providing specifications to healthcare organizations. CORBAmed is improving healthcare delivery by:

- Promoting interoperability among healthcare information systems, devices, and instruments, using CORBA technology.
- Expanding the awareness and use of CORBA technology by healthcare organizations to ensure industry interoperability.
- Improving the quality of care and reducing costs through the use of CORBA.
- Supporting the reliable and secure sharing of medical information among healthcare organizations.
- Using the OMG technology adoption process to standardize interfaces for healthcare objects and components.
- Working with international standards organizations to develop and promote interoperability in the healthcare industry.

Currently CORBAmed is working on several technologies. Some are purely healthcare related, some are related to the enterprise as a whole. The members of CORBAmed

CORBAmed leverages CORBA technology to create standards promoting distributed, object-based healthcare applications:

- **Object Request Broker (ORB):** standard "middleware" of CORBA. Available from many vendors.
- **CORBA services:** Naming, Trading, Transaction Processing, and Security are but a sample of the services available to all applications that use CORBA.
- **Business Computing Support:** Work-in-progress to define an environment where development flows smoothly from analysis and design, through development, to deployment and maintenance, thus supporting the paradigm shift in healthcare.
- **Healthcare Specific Common Services:** Via CORBAmed (or in cooperation with other OMG Task Forces):
  - Person Identification Service (PIDS)
  - Clinical Observation Access Service (COAS)
  - Terminology Query Service (TQS)
  - Resource Access Decision (RAD)
  - Clinical Image Access Service (CIAS)
  - Summary List Management Service (SlMS)
  - Medical Transcription Service (MTM)
  - Health Information Locator Service (HILS)
  - Order Entry/Management Service (OE/MS)
  - Many more to come.

work in concert with other healthcare standards groups to eliminate redundancies, to take advantage of the best technologies, and incorporate the best standards available.

## Help Drive the Technology

You are invited to join this dedicated group in their mission of bringing true interoperability to the healthcare industry. Help solve critical problems facing Healthcare IT professionals. You can drive the changes that will allow your organization to stay competitive in an increasingly complex market. CORBAmed meetings are held around the world in conjunction with regularly scheduled OMG Technical Committee meetings (five times a year) to discuss a range of topics in an open and productive forum.

A CPR Architect at Baptist Health Systems of South Florida said, "OMG and CORBAmed membership have become an invaluable asset. Even within an organization of about 800 members, my input and vote carry significant weight. The process is quick because it incorporates existing, useable technology, creating standards in sync with the needs of users. The organization works continuously to improve and upgrade existing specifications to ensure that users get the best technologies available. The OMG process works."

**For more information on OMG, and to find out more about CORBAmed, its activities and its successes, see <http://www.omg.org>, or call +1-781-444 0404.**



## CORBA In Action — A Case Study

The large-scale Government Computer-based Patient Record (GCPR) Framework project is achieving interoperability among diverse automated healthcare systems via CORBAmed interface standards. GCPR Framework project participants are the United States

Department of Veterans' Affairs, Indian Health Service, and Department of Defense.

The GCPR Framework is a CORBA-based infrastructure that will allow the participating agencies to "hook up" their systems to a single, common, open, international standard interface and inter-operate. According to Peter Groen, Department of Veterans' Affairs, Acting GCPR Framework Project Manager, "You can think of the framework and its interoperating agency systems like a component stereo system. Each system can 'plug in' to the middleware by a standard interface, like the RCA plug and jack

on the back of the amplifier. You can even think of amplification as a common service like PIDS or COAS. By standardizing on the interface, we can allow each participating agency to continue



### Global Context

The changes in healthcare today are not limited to the United States. Although the U.S. leads the world in the application of managed care, most other nations have experienced a prolonged and dangerous escalation in healthcare costs. Countries in Latin America, Europe, and Asia are looking towards some variant of the IDN model to help them contain costs while maintaining a high standard in the quality of care. Whatever the healthcare delivery model, whether based on private insurance or government-managed systems, a solution to the rising costs is mandatory. Regardless of the national payment model, a network-based solution based on distributed object computing is an essential part of the healthcare delivery infrastructure. Due to its international scope, the OMG offers a real solution to healthcare computing problems on a global scale.

using its own business practices and heterogeneous legacy systems. We realized that we could not affordably achieve or maintain interoperability by standardizing platforms, operating systems, graphical user interfaces, languages, or even data across such large-scale diversity. We knew we needed a non-proprietary, interface standard solution. CORBA and CORBAmed Common Services are proving to be that solution during our current prototype phase."



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*For information on how you can join the OMG and help build the "Architecture for a Connected World", contact the OMG's Vice President of Business Development at +1-781-444 0404, by fax at +1-781-444 0320 or by email at [info@omg.org](mailto:info@omg.org).*

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