



Leading the way in real-time integration and display



LiveData in the OR

Operating room teams are under increasing pressure to ensure patient safety as well as improve productivity—in an increasingly complex environment. Sophisticated medical devices and hospital information systems produce a staggering amount of data; yet systems to organize, synchronize, and display the information have been notably absent.

LiveData has stepped in to fill the gap, bringing an entirely new category of technology to the operating room: real-time visual integration. Our systems are designed to facilitate the flow of information between devices and departments and among caregivers. They equip OR teams to see all relevant information about the patient and operation—precisely when needed.

LiveData captures, synchronizes, and integrates data from any medical device or system, and transforms it into readable information on rich displays. With LiveData OR-Dashboard™ as its cornerstone, a visually integrated OR (VIOR™) provides a complete picture of the surgical case as it progresses; PACS images, lab reports, videos of the surgical field, physiological readings, HIS data, and other information come

together in real time, in step with perioperative workflow.

LiveData understands that successful visual integration involves more than installing technology. Implementing an effective solution requires understanding how an OR team functions as a unit, when various pieces of information are pertinent, and how this information can best be presented within the context of team workflow.

Vendor-neutral, LiveData assumes a collaborative role with hospitals, ensuring development of cost-effective, needs-oriented solutions. Today, leading medical

institutions such as Massachusetts General Hospital, Memorial Sloan-Kettering Cancer Center, and NewYork-Presbyterian Hospital rely on LiveData to meet many of their most pressing challenges.

With over fifteen years of experience in the manufacturing and utility industries, LiveData offers hospitals technology with a successful track record. Our real-time visual integration systems have a reputation for functioning impeccably, with unprecedented accuracy, and with a flexibility that renders them capable of adapting to whatever the future may bring.



Creating Safer, More Efficient Operating Rooms

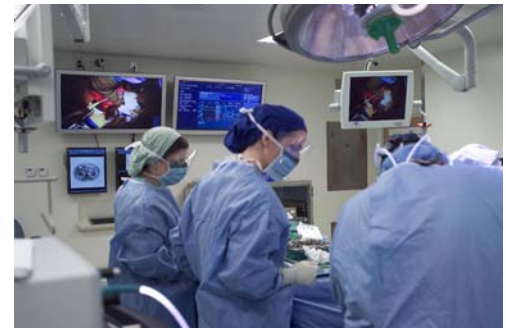
LiveData's real-time visual integration systems for the operating room are based on the premise that efficiency and safety go hand in hand.

Because breakdowns in communication from one device to another, among people, between people and equipment are the leading cause of accidents, industries like aviation and utilities are now highly standardized. They are prepared for efficient and effective transfer of information at all times.

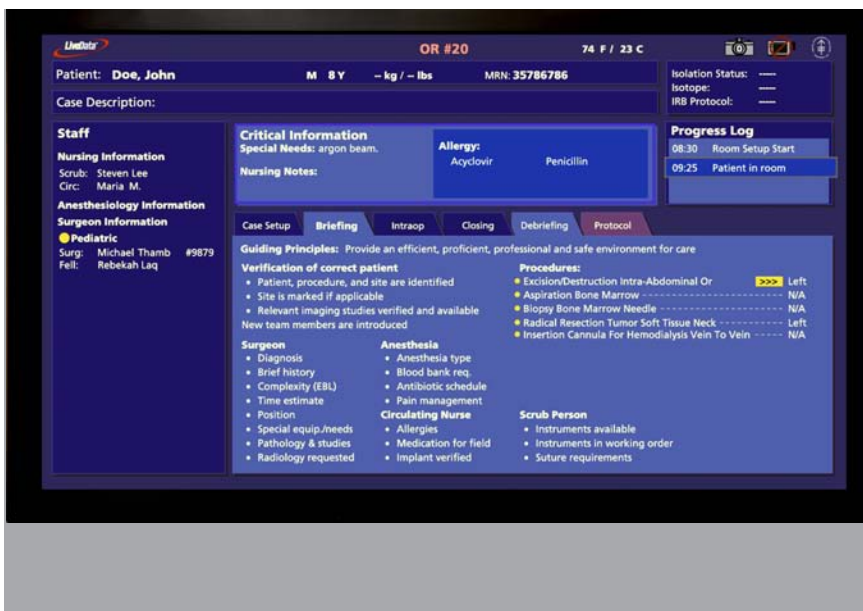
Such standardization is not the case in today's hospitals, where sophisticated medical devices

and information systems play an increasingly important role. In an effort to address this issue, CIMIT, a nonprofit consortium of leading academic and research institutions dedicated to technological innovation in healthcare, invited LiveData to share our expertise in real-time data integration.

The first major outcome of this collaboration is LiveData OR-Dashboard, developed for Massachusetts General Hospital. Today, more and more hospitals rely on the dashboard in order to create LiveData's comprehensive visual integration solution for the OR.



LiveData OR-Dashboard™

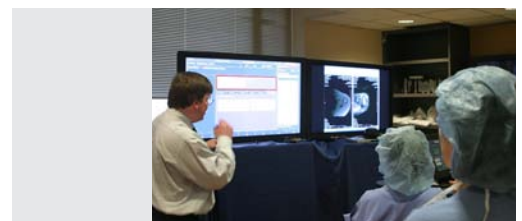


LiveData OR-Dashboard is designed to increase situational awareness, promote team communication, and streamline the perioperative process. Providing the entire OR team with the right information at the right time, the dashboard serves as a tool for promoting decisions that directly reinforce patient safety and workflow efficiency.

LiveData OR-Dashboard monitors, captures, synchronizes, and automatically displays essential patient information on a large flat-panel screen—unobtrusive but highly visible. The system is capable of integrating all device data in an OR, as well as information from administrative, patient care, and hospital information systems.

Functioning in real-time, LiveData OR-Dashboard synchronizes information display to fall in step with OR workflow. LiveData OR-Dashboard automatically follows the patient's transition through the perioperative process, displaying information relevant to the work at hand. For example, a Timeout panel appears just prior to surgery, displaying information that assists the team with their own safety pause procedure; it remains visible until the procedure is completed according to hospital protocol.

With connections to the sterile supply department, an OR team is able to track the status of equipment trays when most needed—during case setup, on the dashboard's Case Setup panel.



LiveData Services: Building the Right Solution

LiveData is dedicated to providing creative and cost-effective solutions, tailored to meet the unique needs of each hospital.

We work in partnership with hospitals, offering vendor-neutral expertise throughout the process of implementing new technology.

Long in the business of integrating diverse proprietary systems, LiveData is well poised to act as a liaison between hospitals and third party vendors, to develop partnerships with vendors the hospital has already chosen to work with, and to establish new ones.

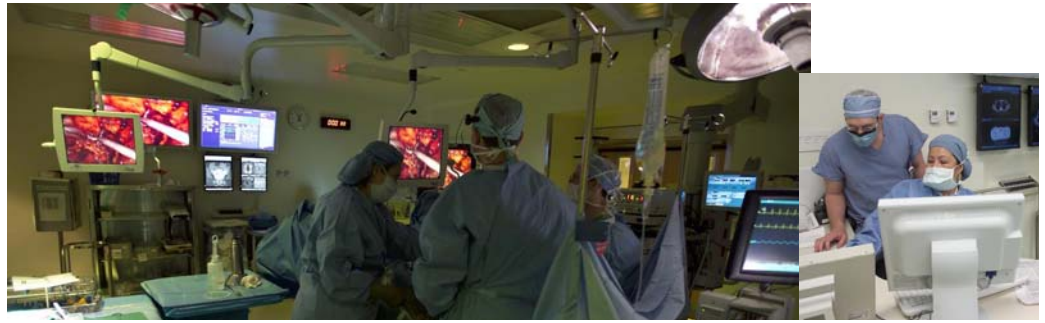
Flexible and responsive, LiveData will completely oversee a project or work with a hospital's existing vendors to ensure delivery of a comprehensive solution for the operating room.

Among other services, LiveData provides:

A thorough assessment of how information from diverse medical devices and hospital information systems can be used to streamline the perioperative process and improve patient safety.

Evaluation of how audio-visual resources and communication connections can be integrated with LiveData OR-Dashboard for seamless transfer of perioperative information.

An in-depth analysis of OR workflow for timely acquisition of all relevant information.



Richard DeWitt, Courtesy of Memorial Sloan-Kettering Cancer Center

The Visually Integrated OR (VIOR™)

A visually integrated OR (called a “Wall of Knowledge” by some hospitals) is LiveData’s comprehensive solution for gathering and presenting all relevant perioperative information precisely when needed by the team. At any time, anyone in the operating room can look up and see a complete picture of the surgical case in progress.

LiveData OR-Dashboard delivers a continuously updated view of all essential information on the patient and operation while adjacent monitors display surgical images, as well as PACS and pathology reports. Video, still images, data from any computerized or endoscopic system in the OR and other departmental systems—all are captured and time-synchronized.

A video of the surgical view runs in perfect synch with physiological readings and all other information displayed on LiveData OR-Dashboard. Hospitals have the option of archiving these displays to support subsequent analysis of data elements or entire operations.

LiveData sets up everything in a VIOR to move in step with perioperative workflow, including voice and video connections to other areas of the hospital. OR teams are able to track equipment and consult with specialists in remote locations without interrupting the flow of surgery.

Advanced communication capabilities permit on-the-fly and scheduled video-conferencing to other departments, conference rooms, and auditoriums. With a touch of a button, the OR team is able to present endoscopic images or field camera and room images to a cardiologist or other consulting specialist, while conversing naturally.

Connections with pathology enable clinicians to engage in analysis of specimens as they are produced. All communication occurs in real-time, allowing surgery to flow smoothly. Pathologists send full-resolution video images of the specimen back to the surgical team while continuing discussion; questions and concerns are immediately addressed.

Adding Components to a Visually Integrated OR

LiveData will provide not only all services, but also all tools required to implement a comprehensive visual integration solution for the OR. Where hospitals have established sophisticated audio-visual and remote communication capabilities, LiveData collaborates with existing vendors to ensure delivery of a fully functional VIOR.

Web Access for Remote Sites

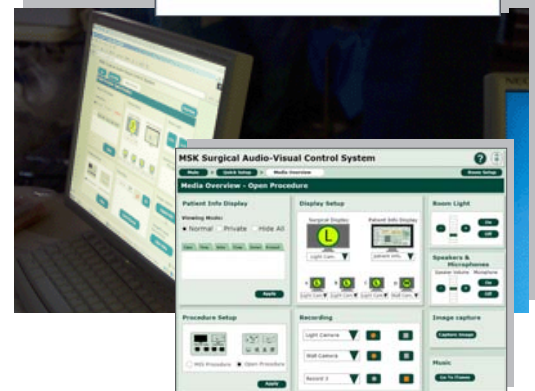
A visually integrated OR provides access to its information displays via the web to any authorized user within the hospital’s intranet. Hospitals with a visually integrated OR are well-positioned for telementoring and telemonitoring. Operating rooms are equipped to transmit videos of surgery with LiveData OR-Dashboard physiological displays to authorized sites anywhere in the world.

Real-Time Archiving

LiveData Historian™ captures time-synchronized data about an operation—with the option of including video—for future playback and analysis. It records at a resolution suitable for capturing waveforms, in milliseconds. Surgeons and other clinicians are assured of an exceptional degree of playback accuracy.

One-Touch Room Control

LiveData VIOR Control System is an intuitive program for handling all elements of a visually integrated OR—cameras, monitors, physiological information display systems, lighting as well as environmental effects like music and temperature. Staff carries out commands with computer keyboards, touchpads, or voice commands. Moving from OR to OR requires no additional training; all are equipped with the same user interface.



Building a Foundation for the Future

LiveData RTI™ Technology

Robust, flexible, and scalable, LiveData RTI Technology underlies all LiveData's visual integration systems. The same platform used in healthcare is used by over one hundred electric power utilities and manufacturers to deliver real-time information for mission-critical applications.

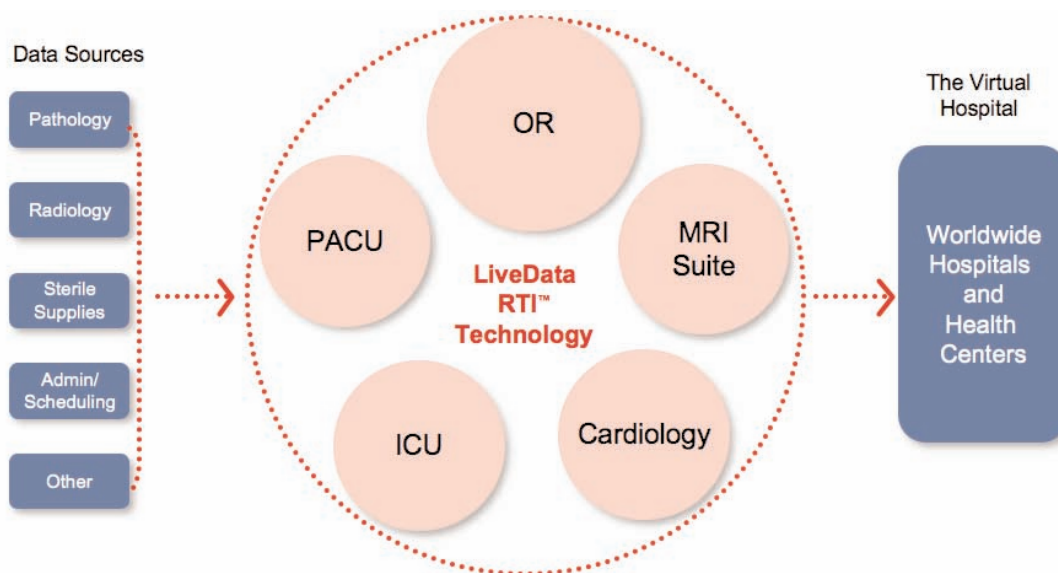
Implementing one LiveData system provides hospitals with a foundation for future expansion without compromising their initial investment. Installation of LiveData OR-Dashboard equips hospitals to integrate multiple devices and systems from any area of the hospital. LiveData RTI Technology also enables hospitals to build a broad range of visual applications for any department. A visual application like Radianse Patient Flow

Manager, which LiveData developed in collaboration with Radianse, Inc., tracks the progression of patient care and manages bed capacity throughout the hospital.

A hospital with LiveData OR-Dashboard thus has a solid platform for expanding into a visually integrated OR as well as extending visual integration into other departments—to encompass an entire hospital.

Visually integrated hospitals are well positioned for the future, where transmission of real-time information beyond the hospital walls will play a greater role. Telementoring, telemonitoring, and computerized or remote medical supervision are already underway in many institutions.

The Visually Integrated Hospital



Promoting Standards for Medical Devices and Systems

LiveData is active in CIMIT's Medical Device "Plug-and-Play" Interoperability Program (MD PnP), which leads the evaluation and adoption of open standards and technology for medical device interoperability. Until this goal is met, LiveData remains committed to providing intermediary solutions and promoting non-proprietary standards.

When possible, LiveData healthcare solutions use existing standards—such as HL7 message protocol, IEEE 11073, XML,

SOAP, and SOA. Otherwise, LiveData works directly with vendors of proprietary systems to fulfill a hospital's full set of requirements.

LiveData has developed an extensive library of medical device and hospital information system interfaces—McKesson HSM, Picis OR management systems, Philips, GE, Draeger, and HP anesthesia information systems, Philips physiological monitors, Applied Logic tray tracking system, to name a few.

The library also includes interfaces to supply chain management systems, authentication systems, audio-visual systems—to all systems commonly found in hospitals today.

LiveData provides hospital IT departments with a solution for secure, transparent access to key information systems. LiveData RTI technology alleviates the need for additional interface adaptors and does not disrupt the integrity of such other systems as Epic OpTime, McKesson, Eclipsys, and Picis.