



Axiomtek, Imedtac Create 4K Operating Room Video Solution

Companies have developed a versatile turnkey, surgery recording system running on Intel® architecture-based medical grade systems that enhances surgical quality, improves patient outcomes, and collects references for teaching and reviewing purposes.

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The operating room (OR) is a complex, challenging, and expensive place for hospitals. Daily, doctors and nurses perform miracles on this front line in the healthcare battle. However, providers are under pressure to do more: service more patients, improve care, streamline processes, and reduce costs. The Axiomtek iMOR-SDB, developed by Axiomtek and Imedtac using Intel® architecture-based medical grade systems does just that – and more.

The iMOR-SDB provides video routing and data integration, allowing OR staff to provide the best possible care for patients by aggregating surgical systems and simplifying their settings. In addition to patient safety, the iMOR-SDB recording system supports the hospital in registering the surgery progress and helps clinical staff to manage surgical videos and data more efficiently creating a smart operating room.

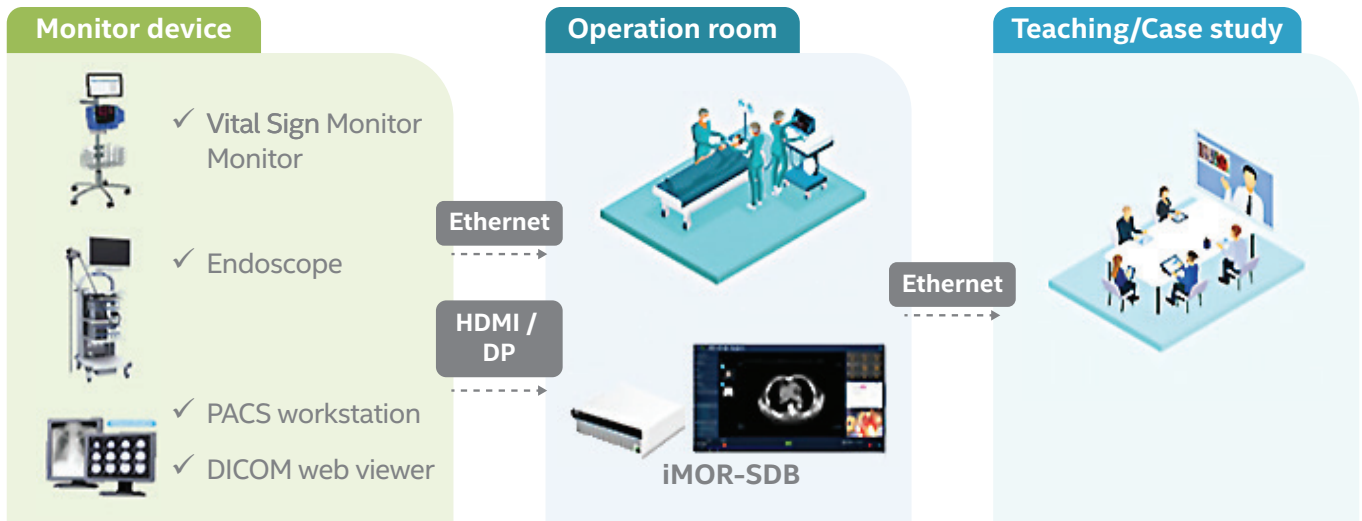


Figure 1. Key functions of a smart OR device and two applications

Creating the Smart OR

The operating room is a high stress/high reward environment for many reasons, starting with the teams' often harrowing life and death responsibilities. Consequently, health care providers try to provide their staff with the tools to treat patients effectively. The equipment and applications used are unique to the industry, so developing such products takes time and effort, resulting in expensive solutions. Once purchased, health care providers try to maximize the return on their investment. As a result, many have legacy OR systems designed years and sometimes decades ago.

The surgery team depends heavily on information to treat patients. Doctors and nurses collect data about a patient's condition, their medical history, and the treatments available. Traditionally, accessing that information has been challenging with legacy systems because their underlying design is built on closed systems that silo the information – not sharing it with other systems.

New systems that rely on data analytics, artificial intelligence, and the Internet of Things (IoT) are emerging. These digital operating room solutions (see Figure 1) break down traditional barriers between systems to allow more access to data. The products connect different systems; integrate data from multiple sources; offload mundane, routine processes; and empower surgical teams.

Therefore, they are gaining market traction. The global integrated operating room market is anticipated to grow at a CAGR of 11.04% from \$936.4 million in 2020 to \$2.2 billion in revenue by 2028.

However, hospitals are under pressure to improve procedures but not break the bank, a balancing act that is difficult to maintain because OR costs are very high. So, the new products need to be integrated in a cost-effective way.

Meeting the Challenge

The Axiomtek – Imedtac iMOR-SDB OR video solution meets these criteria. It integrates streaming video sources, patient information, and surgical data. With it, OR nurses manage the surgical process and query postoperative data records more efficiently.

The system provides

- High performance system hardware delivering video in real time
- Flexible display options for switching between videos and data
- Options to take screenshots and record surgical procedures at any time during surgery
- A surgical safety checklist time tag to indicate the phases of the operation, which include sign-in, time-out and, sign-out
- Sharing live video with other surgeons, staff, and students during conferences and classes
- The solution is built specifically for emerging smart operating rooms and has been successfully implemented in hospitals worldwide. This OR integrated product improves workflow, enabling staff to focus more on patient care rather than inputting, collecting, and tracking information.

iMOR-SDB Provides a Complete OR Solution

Given the health care requirements, system performance demands are high, but deployments need to be fast and simple. The iMOR-SDB combines the Axiomtek mBOX600 server with powerful Intel® architecture microprocessors and surgery software from Imedtac in a turnkey system.

Axiomtek's medical computing systems are fully customizable to suit the needs of a wide range of medical industry applications, with high-performance CPUs, extensive storage capabilities, rich I/O expandability, and various form factors from board level to system integration, plus multiple safety and medical certifications.

The fanless embedded mBOX600 Medical Grade System family of specialized Medical Grade Systems meets IEC60601-1 medical product safety standards and is designed with the compute power for medical imaging applications, such as computer-aided diagnosis, outpatient terminal and surgical video streaming, and biometric analysis.

The medical grade systems are designed for longevity, which ensures a long life cycle for the hospital. The system is based on COM Express a modular circuit board form factor that allows the system to be easily upgraded and repaired.

The mBOX600 features a sleek and clean chassis that fits in with other hospital equipment. The flat design also puts the heat sink under the unit which makes cleaning easier and avoids the chassis being covered by dust.

Both the serial data COM ports and the LAN ports on the mBOX600 are isolated which ensures data signal stability and avoids interference with other medical equipment.

Axiomtek worked with Intel and Imedtac to base the mBOX600 on Intel® or Intel® Core™ i7/i5/i3 processors. Certain high performance mBOX600 Medical Grade Systems utilize Intel. The processors are optimized for many workload types and performance levels, all with the consistent, open, Intel architecture. The processors benefit from decades of innovation to enable high performance across a wide range of workload requirements. Other medical grade systems

in the mBOX600 family use the Intel® Core™ Series, the company's highest performing family of CPUs for laptop and desktop PCs. From the top-end Intel® Core™ i7 processors to the value-packed Intel® Core™ i3 processors, Intel® Core™ processors lets compute platforms do more. The mBOX600 features a PCIe x16 slot for graphic processing unit (GPU) or frame grabber.

Imedtac has AIoT for Medical System Expertise

Imedtac focuses on the development and application of the latest in artificial intelligence Internet of Things (AIoT) technology and systems. The company builds next-generation integrated care platforms, allowing doctors, nurses, and patients to provide high-quality, comprehensive care and by providing instant communication with multiple parties. They have an experienced, cross-disciplinary professional team of both medical and AIoT technology experts.

The iMOR-SDB is based on software that Imedtac developed for operation room use. The program, which runs on Windows OS, integrates OR streaming video sources, patient information, and surgical information sources into one easy to follow dashboard. With it, OR personnel manage the surgical process and query postoperative data records more efficiently, speeding up surgical processes, reducing costs, and increasing profitability.

The system features:

- Dual 4K video signal input recording
- Step-by-step record of the event's safety check
- The number of sterile supplies counted
- A reminder to use antibiotics intraoperatively
- Record video and snapshots
- Other reminders

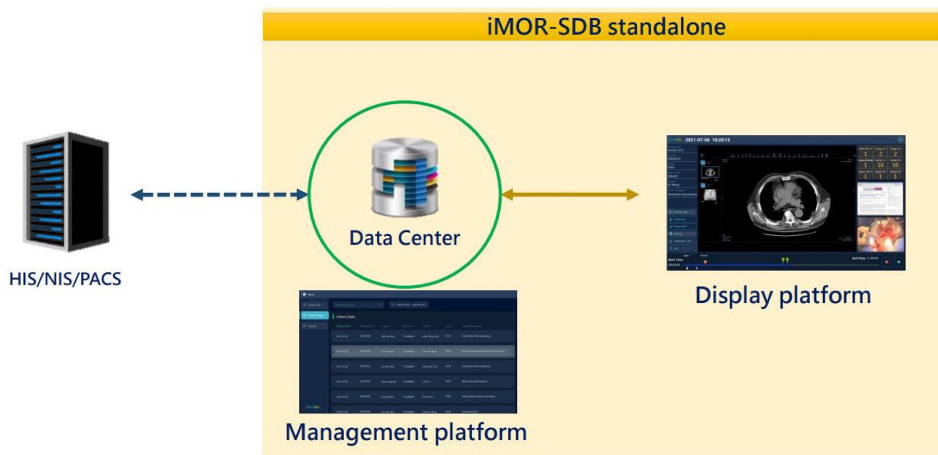


Figure 2. Key functions of the iMOR-SDB include a display platform for video and other data and a management platform that ensures security among other functions

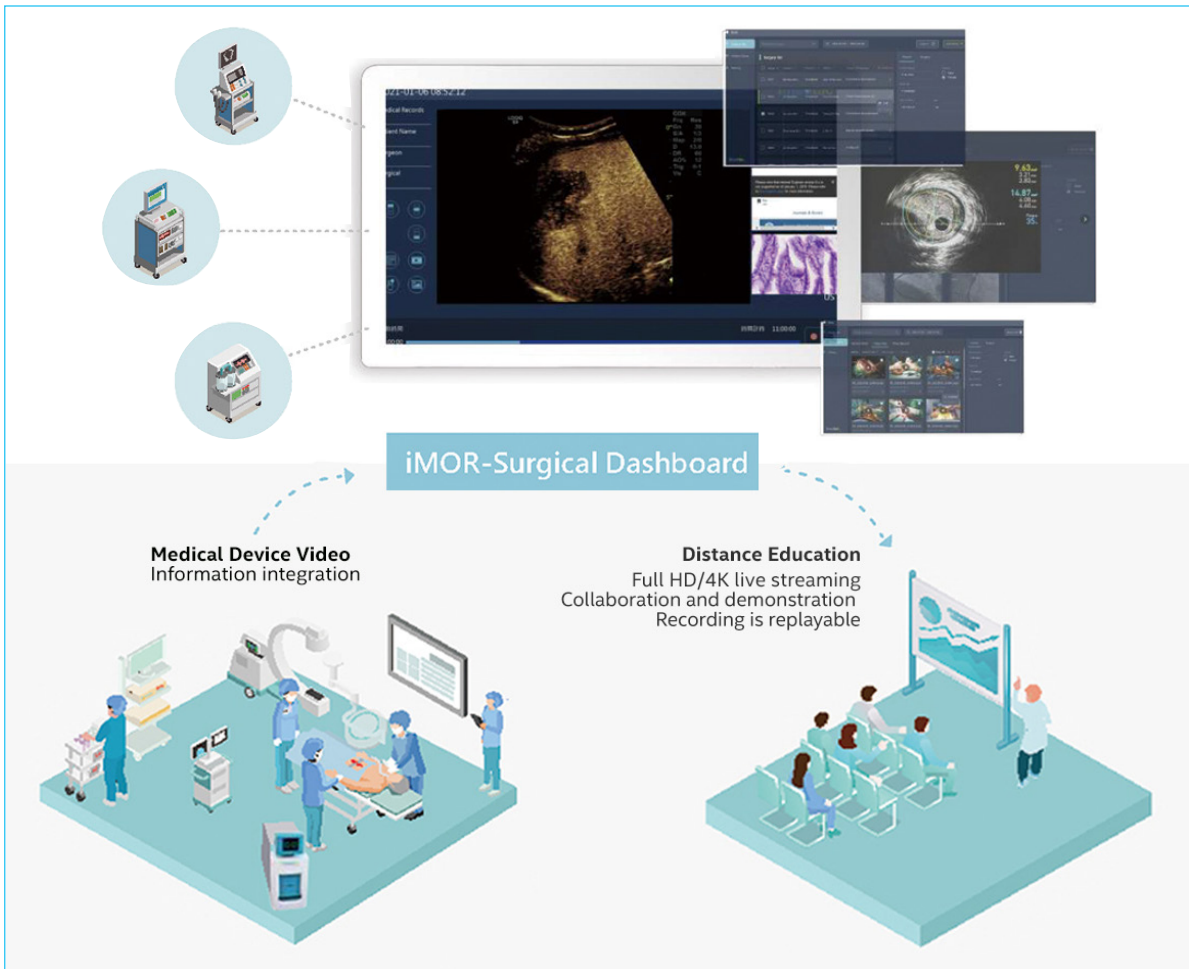


Figure 3. iMOR-surgical dashboard architecture

Solving Customer OR Challenges

Medical Worx is an Axiomtek partner specializing in health care technology services and facilities. The company is evaluating the iMOR-SDB for its hospital customers across the globe as part of its technology integration services that create a custom plan for each healthcare facility to address specific needs.

“We work with a number of health care providers and know that typically, OR video software needs to be integrated with patient data to be most useful. Connecting the two is often a tedious process that takes a long time because of the lack of robust application programming interfaces. We turned to the iMOR-SDB because the software records the surgery and imports the patient information independently. With no need to connect with the hospital information system, our job becomes easier,” said Essam Youssef, the sales director of Medical Worx.

One of the first hospitals to fully evaluate the system is Almoosa Specialist Hospital. Founded in 1996, Almoosa Specialist Hospital is a Saudi Arabian health system that promotes wellness and is the first private hospital in Ahsa. Its team of more than 3,000 caregivers provides health services to patients in more than 380 beds. The health care company’s specialized services include:

- A bone and joint center.
- A comprehensive cancer treatment center.
- A world-class neuroscience center supporting a top stroke program.
- An advanced heart center with all the latest cardiac modalities, such as hybrid operation room and electrophysiology lab.
- The region's largest and most comprehensive maternity and children's program.

Compliance is another challenge. Health care equipment must adhere to industry and government guidelines. For instance, in the US, the Health Insurance Portability and Accountability Act (HIPAA) mandates that organizations put checks in place to keep outsiders away from confidential information, such as patient records. The iMOR-SDB solution creates a visual record of each surgery that can be examined afterwards as hospitals try to improve their procedures and includes security features that ensure only authorized individuals access the information.

Almoosa Hospital is now building a world class OR by incorporating the iMOR-SDB solution .

“iMOR-SDB will enable us to streamline our OR surgery by providing an intuitive interface to our surgical video data. With the solution’s live streaming capabilities, remote specialists take part in operations. In addition, the hospital enhances patient care by quickly and easily capturing data during surgery, so the OR crew focuses on the patient and delivers the best possible care.”

—Almoosa Medical Director

Conclusion

Health care providers have been under tremendous stress in the last few years. Their ORs have been hit particularly hard by high traffic and growing numbers of cases. The iMOR-SDB running on the mBOX600 Medical Grade System streamlines surgery and protects patient information as health care companies continually try to enhance their operations.

Learn More

- [Axiomtek mBOX600](#)
- [Imedac Home Page](#)
- [Intel Core Processor Family](#)



Figure 4 . iMOR-SDB solution in Almoosa Specialist Hospital



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