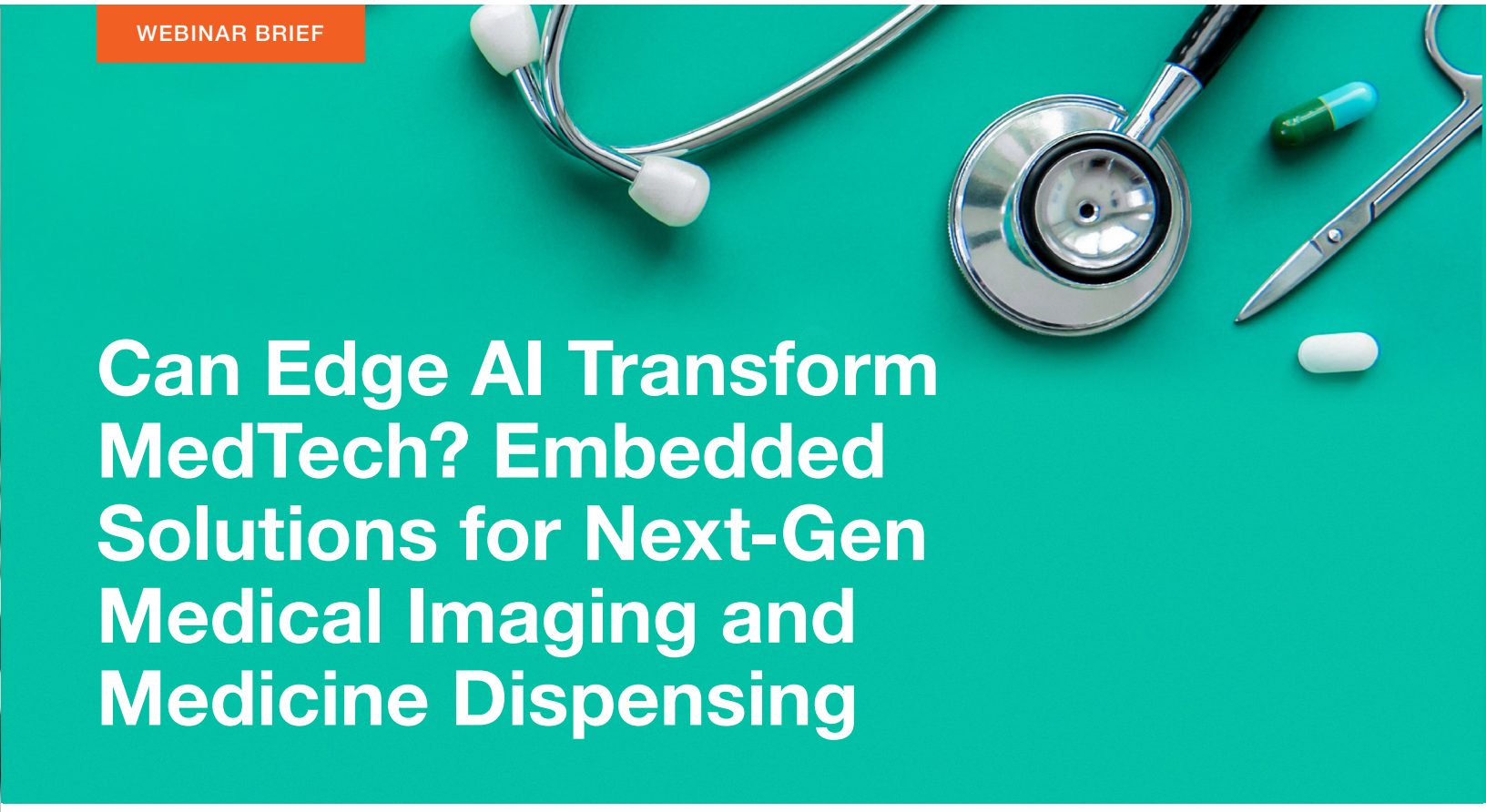
Medical Design & OUTSOURCING

WEBINAR BRIEF



Can Edge AI Transform MedTech? Embedded Solutions for Next-Gen Medical Imaging and Medicine Dispensing

Presenters:

Scott Thomas, AI Systems Architect, Intel

Jason Waldman, Associate Director of Embedded Business Development, Advantech

Charlie Wu, Associate Director of Product Management, Advantech

Moderator: **Jim Hammerand,** Managing Editor, Medical Design & Outsourcing

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OVERVIEW

Advantech, in collaboration with Intel, is revolutionizing the MedTech industry by providing edge AI platforms that boost operational efficiency, ensure exceptional reliability, and foster innovation. In areas such as medical imaging and medicine dispensing, Advantech and Intel solutions offer long lifecycle support, solid revision control, and FDA-compliant designs tailored for these critical applications.

Advantech and Intel's expertise in edge AI solutions support next-generation medical advancements, helping customers get in front of emerging AI trends and innovations shaping the future of MedTech. From standard offerings to advanced manufacturing services, such as custom prototyping and scalable production, Advantech's flexible business models enable medical device manufacturers to address specific design and production challenges.

CONTEXT

The presenters discussed the role of AI in MedTech applications and explained how Advantech and Intel work together to deliver edge AI solutions that solve medical market challenges.

KEY TAKEAWAYS

Advantech's partnerships enable advanced edge AI solutions for the medical market.

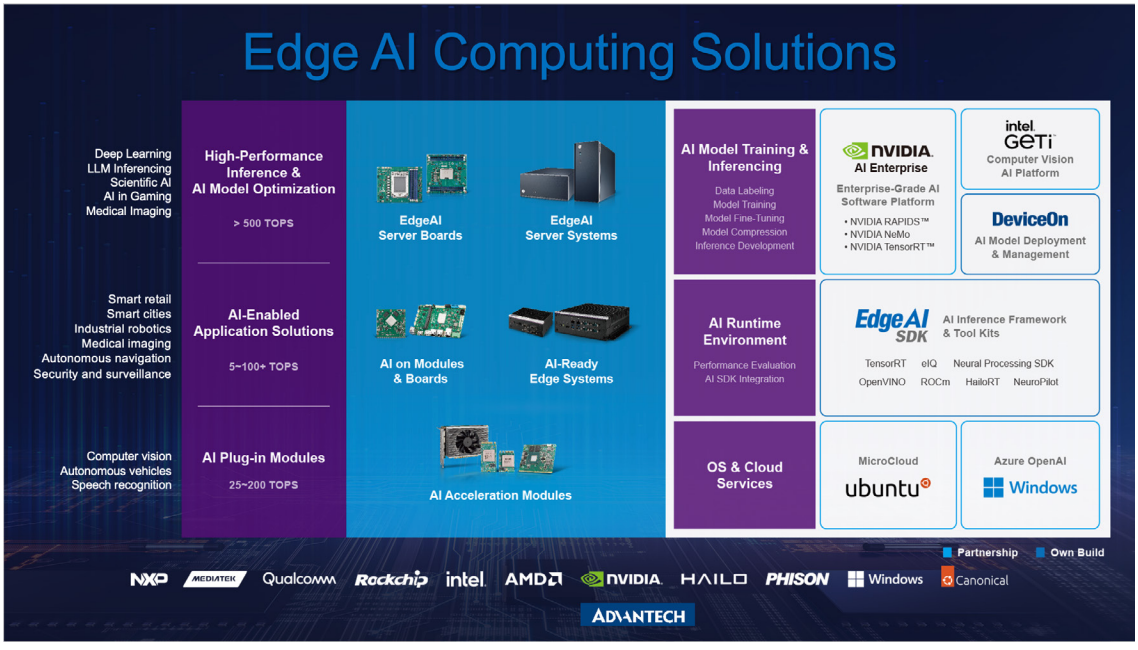
Advantech, an industrial computing solution company, serves the medical market through four main verticals: healthcare IT, medical technology platforms, medical imaging, and medical supply.

In recent years, there has been a significant shift to AI-enabled computing platforms in the medical market. To meet increasing demand and provide solutions for key use cases, Advantech has expanded its capabilities to better assist customers with AI solution integrations.

With data security a critical concern, many companies are moving away from cloud to edge processing—an area where Advantech specializes. With edge AI, data stays on premise, and stays secure. Working closely with technology partners, Advantech enables its customers to rapidly develop the right edge AI application for their specific medical applications.

A longtime technology partner of Advantech, Intel provides the silicon and solutions that enable Advantech to meet longevity requirements for medical applications. This close partnership means that Advantech is one of the first partners to know about Intel roadmap updates, allowing Advantech to get a head start on product development for new silicon within a short window of its release.

Figure 1: Advantech's ecosystem of strong partnerships helps medical market customers integrate AI



With the long development cycles characteristic of the MedTech market, this early access to next-generation-enabled hardware enables Advantech customers to go to market more quickly with the latest technology to assist patients and providers in a constantly changing environment.

Advantech and Intel MedTech solutions have an average longevity of 7-10 years through their embedded long-life program, with options that enable an even longer product lifecycle (10-15 years). These solutions come with tight revision control throughout the life of the product, so that customers will receive the same equipment, shipment after shipment, throughout the product's lifetime. Tight revision control also allows customers to be notified of any changes due to regulatory requirements to ensure the highest consistency possible.

> "Advantech and Intel work together to help advance medical technology, make things easier for our customers [and] healthcare providers—and at the end of the day, make patient care even better for the public at large."
>
> Jason Waldman, Associate Director of Embedded Business Development, Advantech

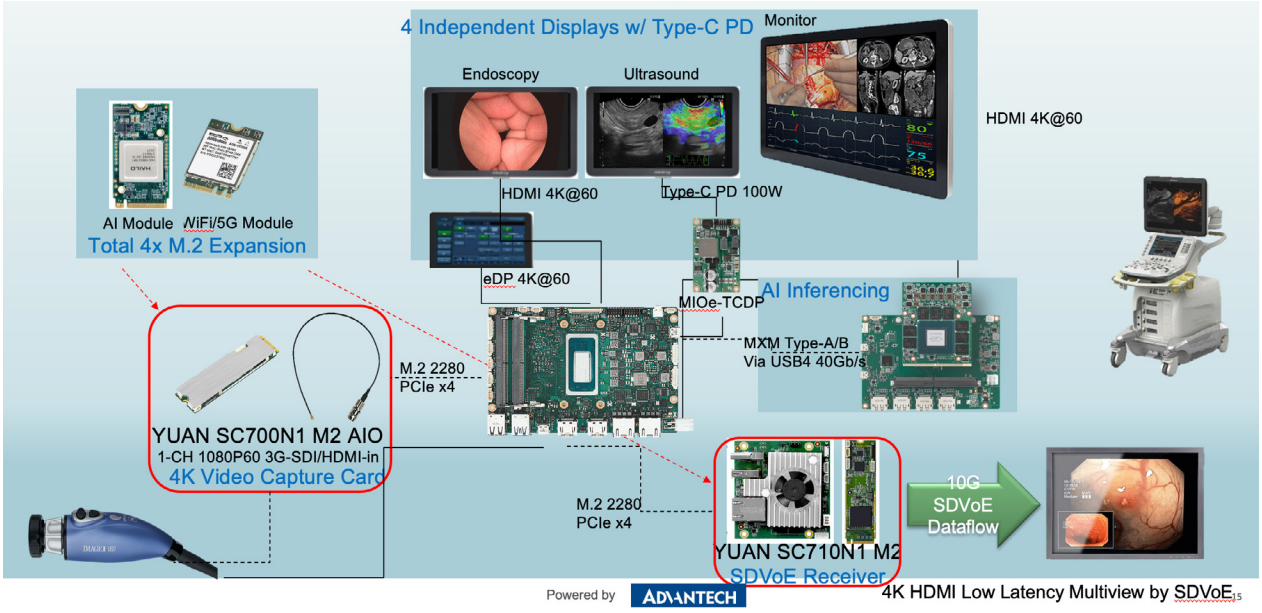
Intel and Advantech developed AI-powered imaging solutions to solve MedTech challenges.

Most recently, Intel and Advantech leveraged AI technology to develop edge AI solutions that address one of today's most pressing medical market challenges: personnel shortages. AI can be a personnel multiplier by helping machines work faster and technicians achieve better and more consistent results.

In the imaging field, especially, AI's real-time inferencing shifts much of the imaging workload away from technicians in various medical specialties:

- Device-level AI can speed exams by helping technicians correctly capture X-ray images more quickly through pose detection, patient dimensions, and image objectives (soft tissue or bone).
- Interventional imaging with real-time AI augmentation (some offline) makes procedures more effective the first time, helping personnel be more efficient.
- AI inferencing is already commonly used in endoscopy for detecting polyps, and additional uses are rapidly becoming mainstream.

Figure 2: The Intel-powered Advantech MIO-5379 for Endoscopic Ultrasound with AI solution



Rapid imaging not only increases efficiency, but also helps physicians detect problems earlier, enables decision support and treatment planning, and reduces diagnostic errors.

To achieve these significant advancements using edge AI, Intel's newest processors add a neural processing unit—an extra compute module specifically designed for low-power AI inferencing—and integrated GPU.

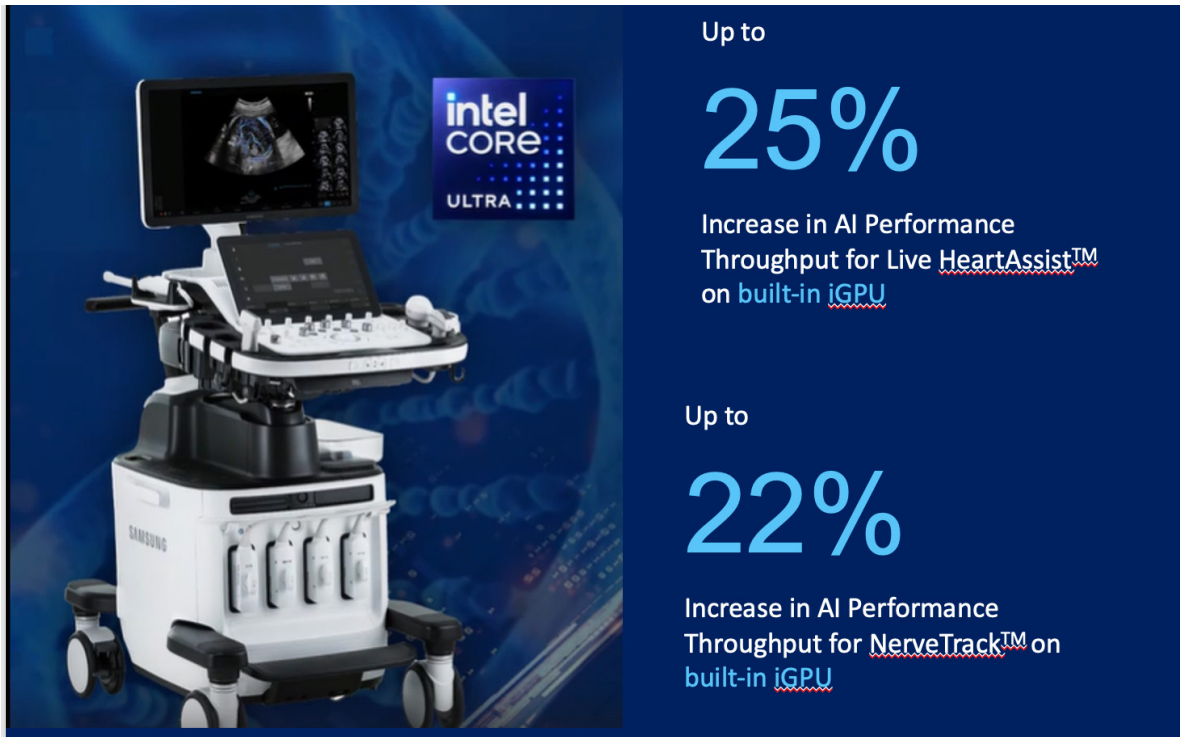
This means that simply changing the processor can add an enormous amount of AI compute power, allowing multiple and real-time models to run at scale, without having to reengineer the entire device.

For example, Samsung Medison replaced the dGPU in its existing product line with the Intel iGPU, to take advantage of AI capabilities in ultrasound applications without having to design new machines. The replacement required no extra power nor thermal envelope changes, and minimal peripheral change, which simplifies the bill of materials, lowers power, and reduces cost.

With the iGPU, sonographers can capture 10 images of a fetal heartbeat at the exact moment needed, and anesthesiologists use the AI-enhanced ultrasound system for nerve tracking, enabling them to quickly locate and block a nerve.

> "All of these great AI models can be deployed, working with Advantech. Get it done, get it certified correctly, do it right the first time."
>
> Scott Thomas, AI Systems Architect, Intel

Figure 3: The Samsung Medison AI Ultrasound system with Intel iGPU



Using Edge AI in Pharma Dispensing

Edge AI solutions are a natural fit for automating the medicine dispensing process, given the repetitive nature of pharma dispensing tasks (e.g., counting, identifying objects, and reading labels).

One Advantech and Intel customer uses the Advantech industrial motherboard for pharma dispensing technology. The 9th Gen Core-I, which balances performance, cost, and industrial quality, is currently being upgraded to the 14th Gen Core-I solution to support enhanced AI capabilities.

Advantech provides a software development kit to aid the development of the AI model, as well as its DeviceOn/Edge+ platform for AIoT device management and edge orchestration, which enables remote management, monitoring, and updating.

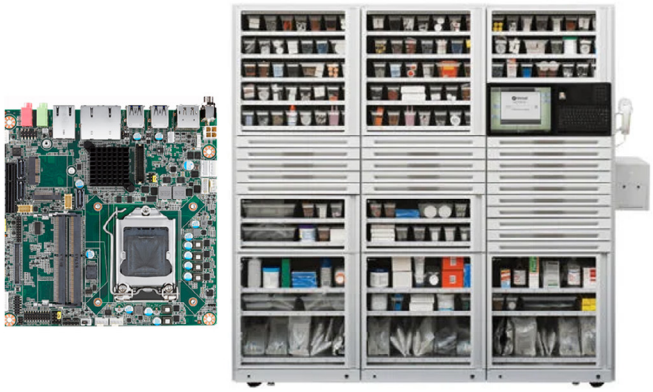


Figure 4: Advantech industrial motherboard with Intel 9th-generation Core-I & dispensing cabinet

The built-in graphic core or PCIe expansion for GPU/VPU provides scalable AI performance to identify medicine/supply type and quantity. With an off-the-shelf industrial I/O for machine interface from Advantech, the cabinet is connected to the display, camera, bar-code scanner, drawer/door access, keypad, and printer—all components necessary to the dispensing system.

Four key factors drive successful edge AI implementation in MedTech.

Intel strives to be an industry leader, working closely with early adopters to continuously evolve and adapt. Through significant real-world experience, Intel has defined four key factors for a successful edge AI implementation:

Ease of use	Edge AI solutions should require almost no personnel training—and any training should be simple, without a lot of extra steps or time investment (e.g., interaction or typing) required.
Functionality	The solution must work well from the start, providing great results, quickly—or it will be pushed aside.
Integration with existing infrastructure	This includes integration with information security tools. Security is paramount. Advantech is not only good at integrating within the box but doing so in a secure way.
Manageability	Updates and lifecycle management must be done regularly and efficiently without causing disruption to operations.

Advantech is a one-stop shop for medical computing solution design.

Advantech offers a wide variety of off-the-shelf hardware and peripherals, memory solutions, wireless solutions, and AI acceleration modules for faster time-to-market, a wide selection of I/O interfaces to meet the unique needs of different applications, powerful processing capabilities for scalable edge AI applications, and remote management tools for ongoing development.

With significant experience designing IEC 60601-1-compliant computers for patient safety, Advantech has the proven technical knowledge to help customers design their next-generation medical solutions.

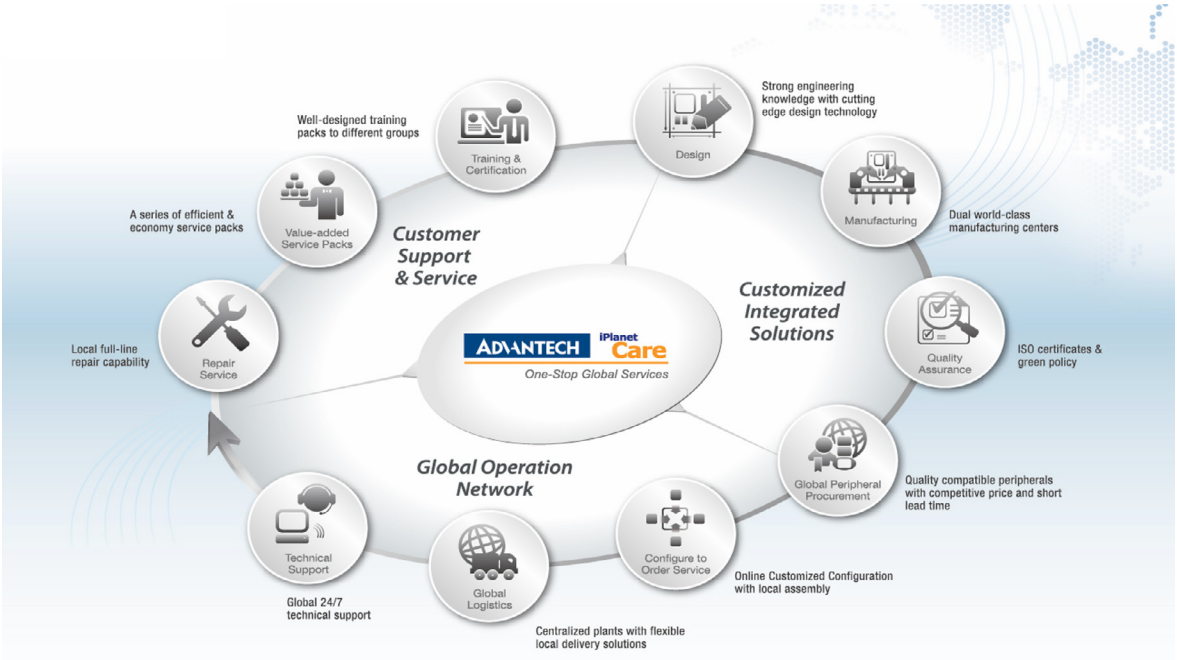
Advantech's ISO 13485-certified factory includes a design team that adheres to traceability certification requirements, offering better service to medical customers.

An Advantech FDA-certified facility in Milpitas, California, enables production of computer solutions for medical market customers. Advantech also offers internal expertise to guide customers through FDA certification (along with other required certifications).

From design to delivery, including a strict QA process and logistics solutions to deliver products worldwide, Advantech offers a one-stop global experience for medical market customers.

> "When it comes to designing medical computing solutions, Advantech is really your one-stop shop."
>
> Charlie Wu, Associate Director of Product Management, Advantech

Figure 5: Advantech's global services



ADDITIONAL INFORMATION

To learn more, visit Advantech and Intel MedTech

BIOGRAPHIES

Scott Thomas
AI Systems Architect,
Intel

Scott Thomas is an AI Systems Architect within Intel's Health and Life Sciences group. With over 30 years of expertise in embedded computing, Scott specializes in advancing medical devices through cutting-edge AI technology. Scott's innovative contributions are highlighted by his six patents in camera and sensor technology. Scott holds a BSE. in Industrial Engineering from Arizona State University. Outside of work, he enjoys building interactive robots and traveling with his wife.

Jason Waldman
Associate Director of Embedded Business Development, Advantech

Jason Waldman has been with Advantech since February 2023, working from Advantech's North American headquarters in Irvine, California. In his role, Jason works with a variety of ecosystem partners to provide solutions to customers, while also working with the various Product teams to develop cutting-edge products. Jason has his MBA from UCLA's Anderson School of Management and his bachelor's from Syracuse University.

Charlie Wu
Associate Director of Product Management,
Advantech

Charlie Wu joined Advantech in July 2000 as application engineer and become part of the product management team in 2003. Charlie has extensive product knowledge on embedded boards and systems, as well as related projects which allow him to gain insights of various vertical markets. Outside of work, Charlie likes outdoor activities like fishing and camping. Charlie holds bachelor's degree in electrical engineering from California State University, Fullerton.

Jim Hammerand (Moderator)
Managing Editor, Medical Design
& Outsourcing

Jim Hammerand is the managing editor of Medical Design & Outsourcing. He has more than two decades of journalism experience spanning newspapers, magazines, websites, live events, radio and TV news. He studied journalism and management at the University of Minnesota. Jim and his family live near Seattle, Washington.