

The digital transformation and 'dematerialization' of ultrasound

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Healthcare Business News caught up with Claude Cohen-Bacrie, founder, president and CEO of E-Scopics to discuss the company's advanced ultrasound system which aims to dematerialize and democratize the modality. He describes the value of this digital transformation of ultrasound from traditional ultrasound hardware systems to a software-based solutions, and the implications.

HCB News: Can you explain the concept of "dematerialization" as it applies to this ultrasound system?

Claude Cohen-Bacrie: Dematerialization, in the context of this ultrasound system, refers to the transformation of traditional ultrasound hardware, which typically involves specialized and dedicated components, into a software-based solution running on off the shelf computers, tablets or smartphones or, in some cases the cloud.

Dematerialization has already revolutionized other technologies such as the photo industry, where the processing running on smartphones today allows photo qualities to almost equal hardware professional cameras. This has driven the democratization of the technology and a real explosion of the number of photos produced. In dematerialized ultrasound, the intelligence and processing power required for ultrasound imaging are shifted from the hardware components to software running on consumer electronic devices. The only remaining Hardware component of the service is the probe, but unlike traditional ultra-portable ultrasound devices, this hardware serves primarily to send and receive ultrasound signals without extensive built-in processing or image reconstruction capabilities. The critical aspects of generating high-quality ultrasound images and quantifying tissue properties are managed by the software, making it a highly flexible and versatile solution.

HCB News: What motivated the company to pursue dematerialization in the development of its ultrasound system?

CCB: The motivation behind pursuing dematerialization for this ultrasound system was to overcome limitations associated with traditional hardware-based ultrasound systems, particularly those related to

miniaturization. Miniaturization often involves trade-offs, such as reduced energy efficiency and processing power, due to the compact size of the hardware components. By transitioning to a software-based platform, the image reconstruction is softwareized and put out of the probe and performances can be kept on handheld ultrasound. The system can provide advanced features and high-quality imaging these limitations. The company has invented and conceptualized a path similar to the one taken by other industries, such as photography and music, which shifted from specialized hardware to software capabilities, could be applied to ultrasound to provide more accessible and feature-rich imaging solutions.

HCB News: How did system developers leverage its experience from the previous company, Supersonic Imagine, in developing this dematerialized ultrasound system?

CCB: The company has leveraged the expertise and experience gained from my previous company, Supersonic Imagine, where I was a co-founder, and which was acquired by Hologic. Supersonic Imagine was a pioneer in the development of advanced software for ultrasound image reconstruction and quantification. The knowledge and experience gained in this domain laid the foundation for transitioning from traditional hardware-based systems to a software-based approach. It was at Supersonic Imagine that we recognized the potential of dematerializing ultrasound and shifting the intelligence from hardware to software, but we did not have the technology to implement it. This experience served as a crucial steppingstone in the development of their current dematerialized ultrasound system, but the company developed specific IP to enable a complete "softwareization" of Ultrasound.

HCB News: How does the company's platform allows the development of clinical applications, and what are these potential applications?

CCB: The company's Software platform is designed to be modular and agile, allowing E-Scopics for the development of applications, alone or through collaboration with third-party Medtech players. This platform architecture makes it possible to



create specialized applications that can leverage the software-based ultrasound system's capabilities. Third-party developers can build applications targeting a wide range of clinical areas. The applications can spread along the patient care management from screening to therapy and can be categorized into two main groups:

One: Upstream Applications: These applications leverage the system's ability to quantify tissue properties and generate quantitative measurements. This quantification is foreseen as an enabler for healthcare professionals to adopt Ultrasound technology without having to interpret images. Measurements are used to assess and monitor patients' health status. Potential applications include monitoring liver stiffness for hepatologists, assessing patients at risk of liver diseases, monitoring vascular diseases, evaluating rheumatoid arthritis, assessing gynecological conditions for fertility treatments, and many more.

Two: Downstream Applications: These applications are focused on interventional procedures while providing imaging guidance. They use the system to guide minimally invasive treatments. Examples include liver endoscopic surgery, vascular interventions, and many more.

The range of applications is vast, spanning different medical specialties, and the system's modularity allows it to adapt to various clinical needs.

HCB News: So you are getting ultrasound into the hands of a wide range of specialties, and essentially democratizing the modality. Is that a reasonable conclusion?

CCB: It's our primary mission. We really want to leverage this ubiquitous platform to develop products easily adoptable by clinical specialties that are not expert at all in ultrasound imaging. We want to give them ultrasound-based quantification tools that help them assess their patient at the point of care during a consultation. So, these need to be very simple, easy-to-use

Healthcare Business News Q&A; Claude Cohen-Bacrie, Founder, President and CEO, E-Scopics (continued)

and specific in the clinical need they address. The first product which we have developed is Hepatoscope, which is a Liver-stethoscope targeting chronic liver disease and which can assess both liver stiffness which is recognized as an indicator of fibrosis and Ultrasound propagation characteristics which are related to Liver tissue properties and especially fat content. The tool will allow to screen patients and target those who are receiving therapies to be followed. We also anticipate the tool to be able to monitor patients under treatment. Other applications could similarly take advantage of the system's quantification tools giving clinicians something that is measurable and does not necessarily require expert interpretation.

HCB News: How does the company's approach to "ultrasound-as-a-service" make ultrasound more affordable and accessible?

CCB: The company's "ultrasound as a service" approach is designed to enhance the accessibility and affordability of ultrasound imaging and remove barriers to adoption of Ultrasound by specialty clinicians. It transforms the traditional model of purchasing expensive ultrasound hardware capital equipment into a more cost-effective and flexible subscription-based service. This approach offers several benefits including affordability and accessibility. Instead of making a significant upfront investment in purchasing ultrasound equipment, users can subscribe to the service on a pay-as-you-go basis, spreading the cost of the equipment over time. This makes high-quality ultrasound imaging more

financially accessible. More importantly, the subscription model that we have created ensures that users have access to the latest features and updates of the software, keeping their ultrasound systems up to date at all times. It really is a software with all the benefits of the apps as we know them. This accessibility allows healthcare providers to offer advanced ultrasound capabilities to a broader range of patients. It is also scalable in that users can adjust the level of service according to their needs, whether it's primary care physicians, specialized clinicians, or healthcare facilities. This scalability offers flexibility in tailoring the service to specific clinical applications. The "ultrasound-as-a-service" model ensures that users have access to a state-of-the-art ultrasound system without the need for significant capital investment, making high-quality imaging more widely available.