

Customer story

OneSight AI-powered ultrasound

AI-guided ultrasounds powered by Raspberry Pi Compute Module 5 make advanced imaging affordable and accessible

Aiming to mitigate delays in the diagnosis and treatment of sick animals, Fast Medical Devices designed OneSight, a portable, AI-powered ultrasound machine that guides veterinarians, analyses images, and generates diagnostic reports.

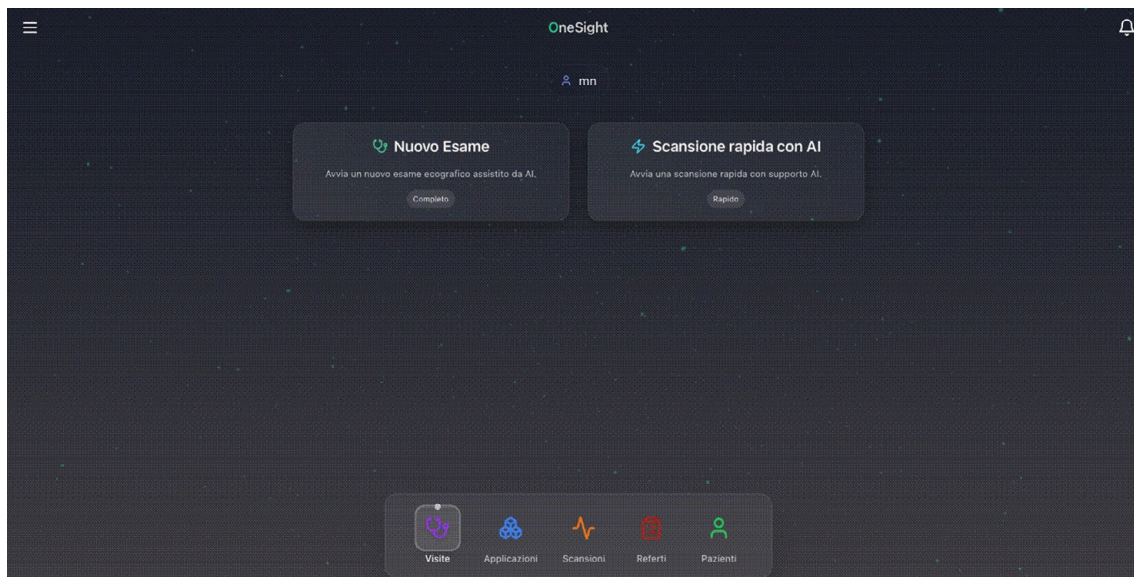
Raspberry Pi solution	Raspberry Pi Compute Module 5 Raspberry Pi Compute Module 5 IO Board RP2040
Size of business	SME
Industry	Healthcare, medical technology, AI



Raspberry Pi offers a clear path towards compliance and scalability

In emergency veterinary medicine, ultrasounds can mean the difference between life and death. Yet in most veterinary clinics – especially small practices or 24/7 hospitals – a trained sonographer is not always available. This creates uncertainty for veterinarians, delays in diagnosis, and fatal outcomes for patients in critical condition.

Fast Medical Devices, an Italian startup specialising in artificial intelligence-based medical technologies, set out to close this gap with OneSight, a portable, AI-powered ultrasound machine that guides veterinarians through exams, analyses images in real time, and generates diagnostic reports.



The Raspberry Pi 5 generation integrates seamlessly with low-power AI accelerators and specialised peripherals



Oliver, the beta tester

The challenge

In order to meet the requirements of most veterinary hospitals, the company's solution needed to be cost effective and able to operate reliably in a variety of clinical environments – from crowded emergency rooms to rural practices – with low power consumption, low electromagnetic interference, and minimal maintenance requirements.

The device also needed to have a compact form factor, one portable enough to move between rooms while supporting multiple I/O connections for probes, displays, and external devices. Security was equally important – as a medical device, OneSight needed to guarantee data integrity, support secure updates, and isolate system processes to protect sensitive clinical information.

The main technical challenge was acquiring and processing high-resolution ultrasound video in real time – the foundation for AI-driven image recognition and diagnostic support. Another challenge was the short time frame Fast Medical Devices had to deliver: to validate the product with pilot clinics, the company needed to build a robust minimum viable product (MVP) quickly without sacrificing reliability.

The solution

Fast Medical Devices used Raspberry Pi Compute Module 5, the Raspberry Pi Compute Module 5 IO Board, and RP2040 silicon to build the MVP of OneSight. The team chose Compute Module 5 because it provided the right balance of high performance, scalability, and affordability needed to power an AI-guided medical device.

The MVP integrates a custom acquisition board developed in-house by Fast Medical Devices, capturing high-resolution video from an ultrasound probe and converting it into a USB-UVC stream. This makes the feed immediately compatible with Compute Module 5, enabling reliable real-time processing and display. The device also includes a high-resolution touchscreen, giving veterinarians an intuitive, step-by-step interface designed for use under time pressure.

Form factor and usability were central design considerations. Compute Module 5 is housed inside a compact, fanless, and waterproof medical-grade enclosure that is easy to sanitise and robust enough for continuous operation in busy clinical settings. The power efficiency of the module ensures that the device can run unattended with minimal maintenance, while its multiple I/O ports allow for integration with probes, monitors, storage devices, and future wearable accessories.

The software architecture was developed with security and scalability in mind. The module runs a custom operating system that is optimised to remove unused components and maximise resources for medical workloads. The team also integrated the device into a CI/CD pipeline, allowing for rapid programming of operating system images across multiple units. This reduces manual setup, ensures consistency across deployments, and allows clinics to receive secure over-the-air updates.

Why Raspberry Pi?

When evaluating hardware platforms for OneSight, Fast Medical Devices considered several options, but none offered the combination of performance, affordability, versatility, and ecosystem support that Raspberry Pi provided. “There were no solutions that combined the flexibility, compactness, and speed required for an MVP,” the team added. “One option was to use a full PC equipped with a high-end GPU, but that approach proved completely impractical: too large, too expensive, and far too power-hungry for a portable medical device.”

A turning point was the release of the Raspberry Pi 5 generation, which introduced PCIe support to the flagship Raspberry Pi platform. This opened the door to seamless integration with low-power AI accelerators and specialised peripherals, while still keeping the system compact and energy efficient. For Fast Medical Devices, this meant that what once required a desktop-class PC

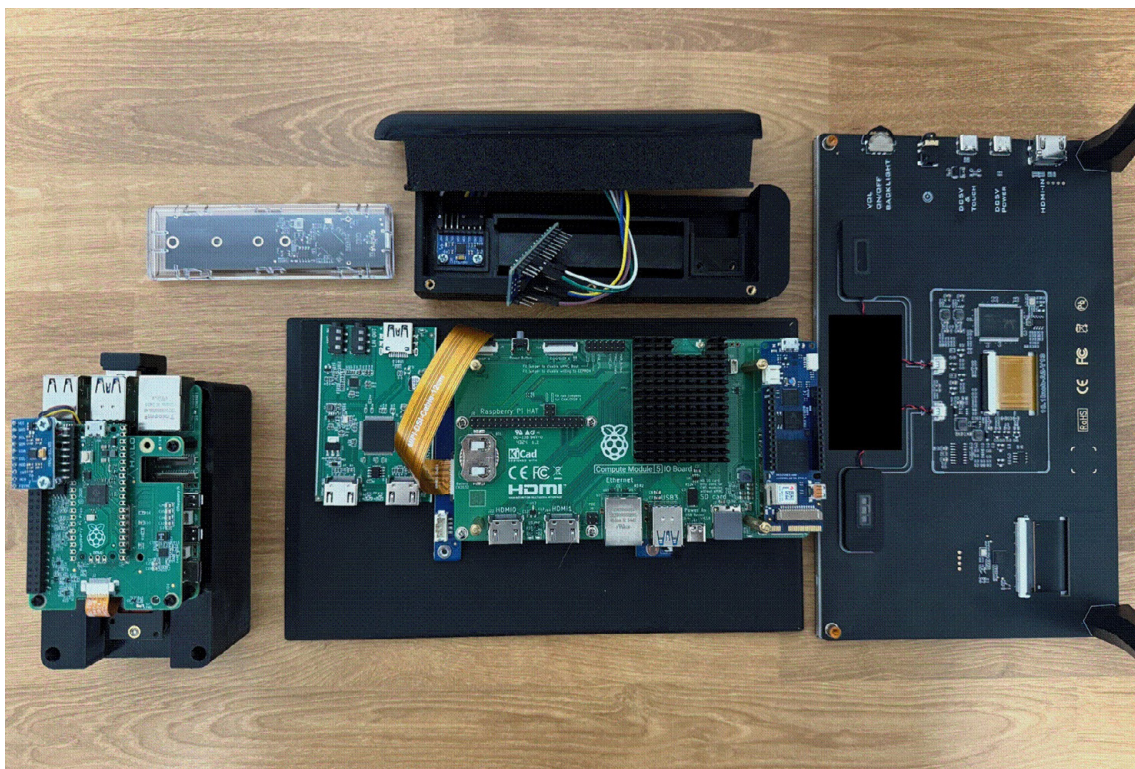
could now be achieved on an embedded platform suitable for clinical environments.

“Compute Module 5 was selected primarily because of its low power consumption, compact form factor, and rich I/O options,” the team explained. “Ultrasound video acquisition and processing require robust data throughput, and Compute Module 5’s interfaces allow for seamless integration with custom acquisition boards, high-resolution displays, and external peripherals.”

Compute Module 5 provides rich I/O options in a compact form factor

Another decisive factor was ease of development and deployment. Raspberry Pi’s extensive documentation, strong community support, and availability of software tools significantly accelerated prototyping. Moreover, the ability to integrate the platform into a CI/CD workflow was critical: the team could quickly build, test, and flash custom OS images across many devices, cutting down engineering time and reducing errors during deployment.

In addition, Raspberry Pi offered a clear path towards compliance and scalability. The reliability of the platform and the long-term availability of components provided confidence that the MVP could become a certified



medical device without requiring a complete hardware redesign. Support for security features such as secure boot and signed updates further aligned with the project's regulatory needs.

Affordability also played a key role. As a startup building products for a cost-sensitive market, Fast Medical Devices needed to design a platform that would be accessible to veterinary clinics worldwide. Raspberry Pi's industry-leading price-performance ratio enabled the team to make a device that was both technologically advanced and economically viable.

The results

By combining Raspberry Pi Compute Module 5 with custom acquisition hardware, modern display support, and a tailored software stack, Fast Medical Devices delivered a flexible and cost-effective MVP that demonstrates the future of AI-guided veterinary ultrasounds.

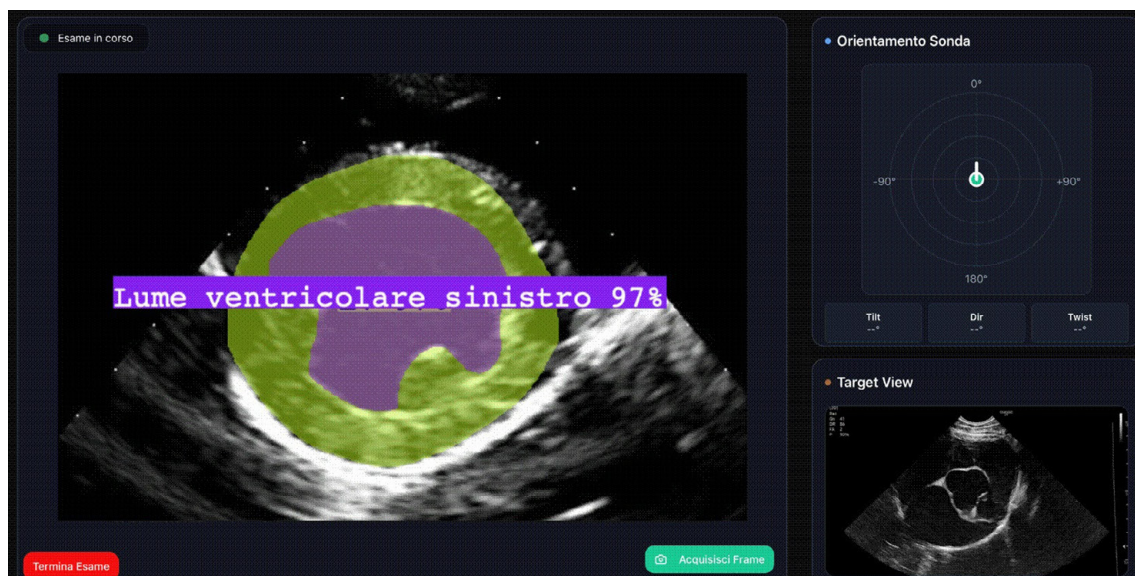
The device is now being tested with pilot clinics and has already proven its ability to reduce time to diagnosis and expand access to advanced imaging, even in clinics without a specialist. Veterinarians can now perform more ultrasounds per day — in some cases, double or triple

their previous capacity — while generating structured reports in real time. This improves patient outcomes, increases clinical efficiency, and allows for better use of specialist resources.

From a business perspective, Raspberry Pi enabled Fast Medical Devices to reduce development time and bring a robust prototype to market on a tight schedule. The company has since advanced to the finals in major innovation competitions, attracted interest from veterinary networks, and gained visibility in the wider medtech ecosystem.

The Compute Module 5-based MVP has also provided a scalable foundation for future growth; the current architecture will evolve into a custom medical-grade hardware platform, incorporating additional features such as wearable accessories for patients and clinicians, enhanced AI workflows, and integrations with cloud-based diagnostic services.

Reliability has been a standout result: OneSight units have run continuously in clinical settings with minimal maintenance requirements, validating Raspberry Pi as a robust core. With clinics already expressing strong demand, Fast Medical Devices is now preparing for broader deployment, CE certification, and expansion into international markets.



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