

Case Study

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Equideum Health: Revolutionizing Healthcare with Decentralized Data

Intel® Software Guard Extensions are a key component of a groundbreaking Intel® Xeon® processor-based solution at the intersection of AI and blockchain technology.



Executive Summary

Equideum Health's groundbreaking solutions, Elevated Compute™ and FHIR® BlocksSM, are part of a technology framework and health data marketplace at the intersection of blockchain, AI, and advanced privacy-enhancing technologies. They build on cutting-edge technologies from industry leaders like ConsenSys, Microsoft, and Intel, while relying on Intel® Xeon® processors and enhanced Intel® Software Guard Extensions (Intel® SGX) to support their Data Integrity and Learning Networks™ (DILNs).

Challenge: Decentralized Health Data

In the modern healthcare landscape, individuals' health data has become dispersed across a wide and expanding array of data silos. Information is compartmentalized among stakeholders such as health insurance companies, pharmacies, provider offices, health systems, and laboratories.

The lack of a verifiable, uniform identity, and a unified comprehensive health record connected to that identity, make effective data analysis very challenging. To perform high-quality, trusted analytics, stakeholders must engage in multi-party data sharing, which introduces, privacy, security, and bioethical risks. This not only hampers research and innovation but also results in a limited, disjointed perspective of individual patient health. Furthermore, ethical and compliant secondary use of health data requires a much more robust approach than is available today.

"Our industry goes to an enormous amount of unfortunate and wasteful spend trying to derive accurate information around individuals when all of the data is fractionally sharded across an endless number of data silos," says Heather Leigh Flannery, Founder and CEO of Equideum Health.

Solution: Data Integrity and Learning Networks

Elevated Compute and FHIRBlocks build on advanced solutions from Intel, Microsoft, and ConsenSys. Part of a technology framework and health data marketplace at the intersection of blockchain, AI, and privacy-enhancing technologies, they enable Equideum's DILNs. Elevated Compute represents the first commercially available integration of these three families of emerging technologies, focused exclusively on the challenges of the healthcare and life sciences industries. DILNs and FHIRBlocks together address deep-rooted challenges in reconciling the prioritization of data security and compliance with individual control over protected health information and personal data.

The integration of verifiable identity and consent, public-private hybrid blockchain, and decentralized next-gen AI helps ensure secure automation across



Equideum Health's Elevated Compute and FHIRBlocks are part of a framework at the intersection of blockchain, AI, and privacy-enhancing technologies.

organizational boundaries. It also provides an immutable audit trail to deter tampering and increase data integrity. By avoiding data centralization and bringing AI models to data sources, this approach helps ensure safer and more secure access to health data, with strong potential to address public health challenges and mitigate health disparities.

“The only party that should centralize that much information about an individual is the individual themselves, and the only way to have total control over information about you is to take custody of that information.”

— Heather Leigh Flannery, Founder and CEO
of Equideum Health

Person-centric features of the Elevated Compute platform will include a private, self-sovereign, cloud-based storage vault for comprehensive individual data. “The only party that should centralize that much information about an individual is the individual themselves,” Flannery says. “And the only way to have total control over information about you is to take custody of that information.”

Protected health information sourced from FHIR/HL7 (Fast Healthcare Interoperability Resources/Health Level 7) feeds and other endpoints are consolidated, consented, and shared by the individual. A user-friendly mobile application with a digital wallet interface will allow users to interact with their personal data locker and control access and usage through APIs.

Elevated Compute will enable a new kind of health data marketplace that is highly secure and economically inclusive of the data subject. This exchange will be a platform for data discovery, monetization, and AI algorithm training. Real-time discovery will occur via secure multi-party computation.

“You couldn’t get very far in healthcare and life sciences without dealing with truly big data like full sequence human genomes.”

— Heather Leigh Flannery

Equideum Health has closely aligned with the Intel Xeon architecture, that has a unique approach to confidential computing that offers higher levels of assurance than encrypted

virtual machines. These processors feature enhanced Intel Software Guard Extensions, which can partition applications into processor-hardened enclaves, to enhance protection of selected applications or data from disclosure or modification. “We were some of the very first users and adopters of Intel SGX technology in a blockchain integrated model for healthcare and life sciences,” Flannery says.

The latest generation of Intel Xeon processors offer up to one terabyte per socket of memory throughput, which makes it possible to compute large volumes of sensitive biometric data. “You couldn’t get very far in healthcare and life sciences without dealing with truly big data like full-sequence human genomes,” Flannery says.

Equideum Health’s journey towards a new healthcare paradigm is being made possible through new kinds of public-private partnerships. “It’s an ambitious agenda,” Flannery says, “so it’s wonderful having partners as supportive and collaborative as Intel.”

What’s Next: Equideum Health, Real World Impact

Equideum Health is driven by a commitment to the vision of individuals being able to aggregate, curate, govern, and even monetize their protected health information and other personal data while preserving and enforcing differential privacy. One soon-to-be-activated use of Equideum Health’s technology is in support of veterans, their families, and caregivers, allowing for veteran-centric coordination across public and private payers and care delivery organizations in the Veterans Incentivized Coordination and Integration initiative.

Another area where Equideum Health’s solution promises to have real-world impact very soon is in clinical trial matching. Many clinical trials fail before they ever start because of the challenges in recruiting enough participants to meet statistical end-points and satisfy diversity and inclusion targets. DILNs and FHIRBlocks will streamline the process of matching patients to the inclusion and exclusion criteria of clinical trials aligned to their conditions, without having to expose or directly share their protected health information.

Health data is the most sensitive kind of data there is, and thus demands the highest standards of computing practices. By granting individuals greater control over the information about them, Equideum Health is paving the way for AI-personalized wellbeing without compromising freedom and privacy. With strong partnerships and proven technological innovations, the journey towards a person-centered, more secure, and equitable healthcare system is well underway.

For More Information

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