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Startup Of The Week: Duality Technologies



By Jennifer L. Schenker

[Duality Technologies](#), a World Economic Forum Technology Pioneer, has developed Privacy Enhancing Technologies (PETs) to help corporates with the challenge of sharing their data while at the same time securing it. One of the PETs the company develops is called homomorphic encryption, which allows organizations to collaborate with their business ecosystem on sensitive data, run queries and train AI while controlling the data and safeguarding privacy. Customers include financial institutions, healthcare providers and governments.

Homomorphic encryption allows computations to be performed on encrypted data without first having to decrypt it. This means that data processing can be outsourced without the need to

trust the third party to properly secure the data, says co-founder and board chairperson Rina Shainski. Without the proper decryption key, the original data can't be accessed.

"Today companies use trusted third parties to orchestrate data sharing within ecosystems," says Shainski. "The third party sees everything about your business just for helping your company to collaborate. Companies will still use a third party to orchestrate but with our technology the third parties will not need to access your data to perform their role."

The ability to perform processing on encrypted data will increase trusted data collaboration and has the potential to solve major business challenges faced by companies, says CEO Alon Kaufman.

Duality, which is headquartered in the U.S., recently completed a case study with the UK government's Information Commissioner's Office that illustrates how it works. The case study focuses on a group of law enforcement agencies and financial services organizations that have formed a consortium to conduct investigations to detect and prevent financial crimes and related harms such as fraud, money laundering, and cyber crimes, while protecting the privacy of the subjects of investigations. For these purposes, the members operate as independent data controllers. A "hub", which acts independently to the other parties, acts as an intermediary. It receives and forwards queries to the other members, and then collects, aggregates, and forwards responses, without being exposed to private information.

When a member of the consortium (controller A) conducts a financial crime investigation, it can submit a homomorphically encrypted query about a person to other members within the consortium. The query will ask other members if they hold information for a particular person that is linked to financial crime activity, without disclosing the identity of that person. The query is then sent to members via the hub. These controllers send their homomorphically encrypted responses back to the hub. The hub aggregates them, before sharing the response with controller A, who is the only party to see the final response. All of this is performed without disclosing the private information.

Kaufman, who has a PhD in computational neuroscience, has spent his career using data to solve hard problems for companies in various sectors. The key is not quantity but the quality of data and the more diverse the sources, the higher quality the insights he says.

ChatGPT and other Generative AI models gained their intelligence by training on data on the Internet. To get smarter they will need to train on sensitive quality data. "That is where we are going and why it is so important to offer the ability to control the data and the ability to maintain privacy," says Kaufman. It's Duality's raison d'être, he says. The name of the company refers to its ability to protect data while enabling its use.

The company, which has raised a total of \$49 million, was created in 2016 by Kaufman, Shainski, a veteran venture capitalist with a background in cryptography, Shafi Goldwasser, an

American-Israeli computer scientist and winner of the Turing Award in 2012, Kurt Rohloff and MIT Professor Vinod Vaikuntanathan (pictured here). Named one of Fast Company's 2020 Most Innovative Companies, Duality became a Forum Tech Pioneer in 2021. It is a Gartner Cool Vendor, was a finalist in Fast Company's 2023 World Changing Ideas awards and is listed as one of the CyberTech100, an award given to "the most innovative CyberTech companies that every financial institution should know about in 2023." The company was included in the 2022 CB Insights' AI 100, the 2022 RegTech 100 and the AIFinTech100 2022.

Competitors include [Inpher](#) and [Enveil](#). Inpher was named a Gartner Cool Vendor in 2019 and won first place in IDash's 2020 Genomics Privacy and Security competition. Enveil is recognized in three Gartner Hype Cycle reports (Privacy, Data Security, Digital Banking Transformation) for Homomorphic Encryption and recognized as a Representative Provider in the Gartner Innovation Insight for Federated Machine Learning report.

Kaufman says Duality's differentiator is that it is the only company offering all PET technologies, including federated learning.

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