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Amazon Wants to Replace Your Wallet With Your Hand. Eventually, You'll Probably Let It

Tech like Amazon One makes 'Don't leave home without it' a very dated construct

By Lisa Lacy | October 7, 2021



Palm vein scans are emerging as a biometric with a lot of potential.

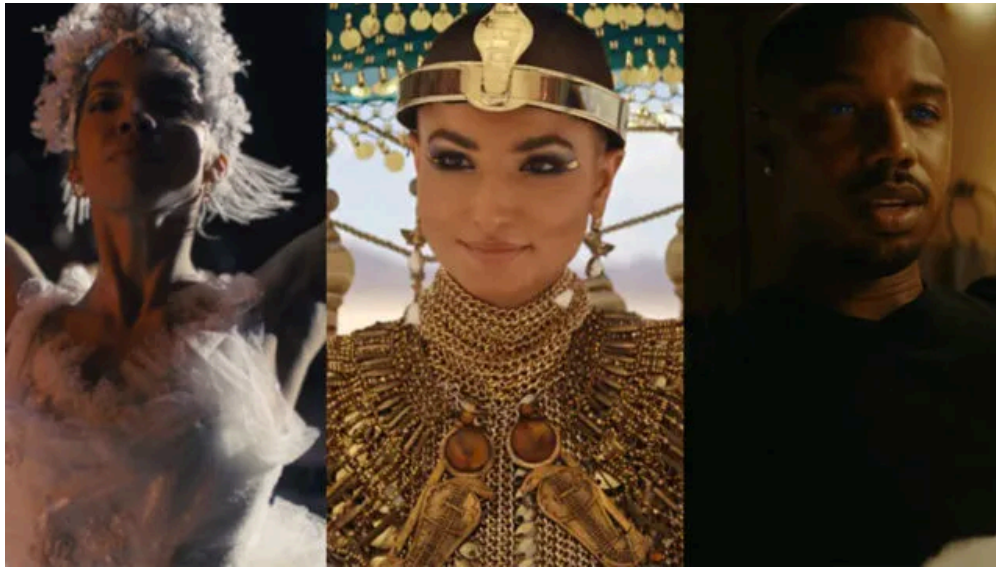
Credit: Amazon

When fans arrived to see Australian DJ Alison Wonderland at Red Rocks Amphitheatre in Denver on Sept. 14, they encountered a new means of entry: their hands.

The source? Amazon.

In partnership with digital ticketing company AXS, the ecommerce platform installed "ticketing pedestals" that use a pay-by-palm technology called Amazon One at the 80-year-old venue. However, instead of facilitating payments, Amazon is enabling entry for ticketed guests who opt to use their palms (and are among the "tens of thousands of customers" enrolled in the program).

In a blog post, Amazon said this was the first time Amazon One was available outside of retail. The technology debuted at two Amazon Go locations in September 2020 and is now in 70 U.S. locations and counting.



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Now, the ecommerce giant plans to add more AXS venues—the list of possible candidates includes the T-Mobile Center in Kansas City and the Target Center in Minneapolis—as Amazon remains “excited about the potential for expansion to other locations where entry lines can be long and time consuming.”

Unlike a wallet, it’s unlikely consumers will forget to bring their hands to a store, concert or beyond, so technology like Amazon One promises truly never-before-seen convenience. Indeed, experts point to a not-so-distant future when parts of our physical selves—likely our palm veins—replace credit and identification cards.

An internal John Hancock

Amazon says its palm technology is designed to read the “tiny, distinct features on and below the surface” of users’ hands.

When customers enroll in the program, “imaging and computer vision algorithms capture and encrypt your palm image” to create a palm signature that the system analyzes whenever enrollees place their hands over readers. This signature includes “surface-area details like lines and ridges as well as subcutaneous features such as vein patterns.”

That means Amazon isn’t capturing palm prints, but rather conducting palm vein scans, explained Matt Fitz-Henry, CEO of experiential agency Genome Digital.

“Because the size of the palm is significantly larger than the tip of your finger, for instance, it is something where you can get considerably more data points that are referenceable,” he added. “So it’s a much higher level of scrutiny to ensure that it, in fact, is the person.”

As a matter of fact, Fitz-Henry said these palm scans read an average of about 5 million reference points. That's part of what makes them so secure and why the palm "seems to be the one at the moment that is certainly pulling out ahead of" other biometrics like fingerprints or iris scans.



Palm vein scans also have an advantage in being internal. That's because external biometrics like the alternatives mentioned above can be more easily replicated or spoofed, he said.

Palm veins also tend to be relatively stable throughout a person's life, unlike other external features.

"As an example, if someone were to burn their finger badly, it could permanently alter their fingerprint," Fitz-Henry said.

Ant Allan, vp analyst at research firm Gartner, noted that palm vein recognition is a "handy" method for authentication because it is contactless and doesn't require consumers to "carry a card or other device or remember any password or PIN." It is also "more acceptable to customers than, say, face or fingerprint, which might have an association with criminality or surveillance or raise concerns about the security of the data and potential abuses," he added.

Palm vein data

Amazon One also gives the ecommerce giant access to even more customer data, although it's unclear what exactly it can infer from these palm vein scans beyond linking the image to a mobile phone number, credit card and/or ticket.

This is something that I think you're going to see more and more, especially as the ability to implement it gets easier.

Matt Fitz-Henry, CEO, Genome Digital

When asked about what customer data it can access with the scans, Amazon repeated its statement about how the scans work—"the technology evaluates multiple aspects of your palm" including surface-area details and subcutaneous features—but did not comment further.

Allan noted the potential to infer medical conditions like circulation problems, but said he's not aware of any "significant objections" in this regard.

Fitz-Henry, too, conceded he does not know the exact process Amazon is using to verify individuals, but said typically a tech company creates a referenceable ID from scans like this, which is "translated into something that's largely a text string that can be pulled up and verified." This doesn't innately contain a ton of personally identifiable information, but depending on the algorithms involved, it could raise questions about privacy. (Amazon says it has "best-in-class technical and physical security controls" and customer information "is not stored on an Amazon One device and is protected at all times, both at rest and in-transit.")

"You could to some extent argue both sides because this is more verifiable and arguably better from the standpoint of ensuring that [ID] is tied to the user," Fitz-Henry added. "But at the same time, the issue is it's directly tied to the user."

The liveness factor

It's also not clear what would happen if, say, a user's palm vein scan were somehow compromised.

Amazon said it "[stores] all highly sensitive biometric data off-device in a highly secure, isolated and purpose-built cloud storage environment, where access controls are enforced and audited on both the data repository and the key management system."

Fitz-Henry, however, pointed out, "Anything digital is potentially vulnerable."

That being said, he pointed to one distinct security advantage of palm vein scans: The authentication method still requires the person from which the scan is generated to be present—and living—in order to generate a match. So even if a bad actor was able to recreate a vein pattern, they would still need to address what he called this "liveness factor."

Allan agreed that liveness testing, which proves the biometric trait is from a living person and not an image or a video, is "the major protection against any compromise of a biometric trait."

Your future wallet

And so it seems palm-based payments, venue entry and more are only a matter of time.

"There's no question there's not going to be a separation between the transaction infrastructure and the physical being," said a technology executive who declined to be named because he is not authorized to speak on the record.

Fitz-Henry agreed. That's in part because palm vein scans are so secure—and because the processing power required for these interactions is decreasing.

"This is something that I think you're going to see more and more, especially as the ability to implement it gets easier," he added.

Similar technology has technically been around for years. NYU Langone Medical Center implemented palm vein scans <https://gcn.com/articles/2011/06/20/nyu-hospital-biometric-palm-scanner-patient-id.aspx>) as a means of patient identification in 2011.

More recently, Genome Digital worked with a telecom client to allow event attendees to access lockers in which they could charge their mobile devices.

And of course, in China, services like Alipay's Smile to Pay have been around since at least 2017 <https://www.alizila.com/alipay-launches-smile-to-pay-commercial-use/>). (Although The Wall Street Journal reports pay-by-face technology has been a tough sell <https://www.wsj.com/articles/in-china-paying-with-your-face-is-hard-sell-11600597240>) so far.)



The David and Goliath Race to Expand Contactless Payments

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