MARKET NOTE

NEC Biometrics: No Cards, No Keys, No Problem

Jay Bretzmann

EXECUTIVE SNAPSHOT

FIGURE 1

Executive Snapshot: Acceptance Is Driven by Desire; Trust Is Built Over Time

Information technology (IT) resources have historically been difficult (and expensive) to use for many applications — excepting ballistics trajectories and financial ledger reconciliations where it got its start. Math is nonsubjective and performing it faster through computerization is completely accepted. User authentication applications as with biometric identity solutions have declined in cost to a point where they're widely applicable; yet unfortunately less provable — at least at this point in time. It's easier to trust something when one understands it. Most of us have generally learned when things seem too good to be true, they usually are.

Key Takeaways

- Multimodal authentication using some combination of face, iris, fingerprint, voice, and ear acoustics recognition technologies is available, delivering a false recognition rate of less than 1 in 10 billion.
- The key acceptance driver for these advanced biometric capabilities is the power of convenience — easier is better.
- In almost all cases, users can opt out if they have trust issues with these systems, and the "fear" is most likely driven by a lack of understanding and assurances.
- Fingerprint identification and facial recognition are the leading methods for authenticating people, but the former is admissible as evidence in court and the latter is not.

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IN THIS MARKET NOTE

On September 4–5, 2024, NEC held an analyst briefing at its Tokyo, Japan, headquarters to share the progress it made developing Bio-IDiom facial, retina, fingerprint, voice, and even ear acoustic, multimodal identity security authentication technology. The event also included visits with three NEC customers using Bio-IDiom technology to conduct banking transactions, provide convenience and monitoring for resident activities at a senior care facility, and implement a forthcoming cashless experience for attendees at Expo 2025 in Osaka next year.

IDC'S POINT OF VIEW

Biometric identity security technology has come a long way in the past 50 years, starting at NEC with fingerprint research activities in 1971. The company itself was founded in 1899 working with the United States–based Edison Company as the first foreign-owned entity in Japan. Originally focused on telecommunications and related technologies, the company pivoted to a new focus on computers and communications in 1977 and then switched to its current focus of "social value creation" beginning in 2013.

Continued research and development investments have won widespread praise from U.S. National Institute of Standards and Technology (NIST), ranking first in Face Recognition Verification Test (FRVT) and Face in Video Evaluation (FIVE) tests — to name just two. Fingerprint and iris recognition technologies have also placed first within their respective evaluation groups. IDC witnessed firsthand how well the technology works and pondered its application in a future GenAI-driven world that might become scary placed within the wrong hands.

A primary focus for NEC is opportunities within public sector organizations. Anyone recently traveling through more than 40 U.S. airports — especially international ports of entry — now enjoy the convenience of NEC facial recognition technology as they no longer must stand in long lines and produce boarding tickets, passports, and customs forms thanks to investment by U.S. Customs and Border Protection (CBP) agency's agreement with NEC to provide services at no charge to any airport making the investment in detection hardware. (Now there's even a CBP website where passengers can look up historical wait times at many U.S. airports attempting to further serve the traveling public.) The new Gateless Access Control System was launched in September 2024 and is capable of quickly authenticating large number of people (as many as 100 per minute) even as they are in motion or looking down at a mobile device.

Admission to theme parks, stadiums, and event venues provides a growing market opportunity for NEC.

This is driven by organizations looking to improve convenience and the user experience while benefiting from smoother operations. In the United States, a major national sports association has digitalized its ticket experience, allowing fans to use a mobile application to quickly register and gain entry to participating stadiums. Registered fans can access dedicated, shorter security lines where they are verified using facial recognition technology at strategically placed camera kiosks at the stadium entrances. Furthermore, leading theme park operators have started testing facial recognition technology at the entrance gates of their U.S. parks, resulting in improved operational efficiencies and ROI.

Another promising application of NEC technology is providing keyless access to buildings and housing units for recognized employees and residents. As an employer, NEC Group is on a path to provide all its 100,000+ employees with digital and verifiable credentials within the next year. No one will need to badge-in and the company is even working on a "hot seat" capability that will assist employees with locating colleagues within certain facilities when text messaging isn't possible. The benefits are even greater for housing unit residents as were demonstrated at Park Wellstate Nishiazabu, a senior living facility opening this month (October 2024). Elderly residents never need to remember any keys. The staff can monitor their movements and send someone to check on customers if, for example, they stay unusually long (more than 90 minutes) at the pool/gym or other residence facility.

A future experiment or proof of concept involves creating an exposition venue in Osaka Bay, Kansai, Japan. Called Expo 2025 Osaka, Kansai, Japan, the event will run from April to October 2025. Organizers expect approximately 28 million visitors from an estimated 160 countries. The hope is that the event can permanently raise the future acceptance and level of cashless payments in Japan, which are currently said to be only 40%. Expo attendees can use the Expo's own electronic money — "MYAKU-PE!" — which can be charged from credit cards or bank accounts. MYAKU-PE! will be offered as a face recognition payment service at Expo site stores. MYAKU-PE! will participate in Visa's contactless payment program, it can be used at any payment-enabled merchant in Japan, both inside and outside the venue. In addition, users can also earn rewards within the Expo site by using MYAKU-PE!.

Overall, the more biometric elements applied to a use case, the better the accuracy becomes. NEC claims that some combination of face, iris, fingerprint, voice, and ear acoustics recognition technologies can deliver a false positive (recognition) rate of less than 1 in 10 billion. Yet as with everything in identity, no universal solution exists. Fingerprint identification is the oldest and most accepted of all the capabilities and is even admissible in court as evidence of a crime given:

- Fingerprints were found at the crime scene, or on an object related to the crime.

- The collected prints match the defendant's prints.
- The prints were made at the time of the crime.

Facial recognition technology is both touchless and more convenient, but it's inadmissible in court because, "it is not accepted as scientifically reliable." Faces can be read at distances of 50ft, with an error rate of 0.4% across 12 million registered images (during NIST tests). Combining it with iris recognition improves accuracy and offers an age-resistant solution since the iris is protected by the cornea, but irises can only be read from less than 2ft and require a direct stare.

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Synopsis

This IDC Market Note looks at NEC's analyst briefing held September 4–5, 2024, at the company's Tokyo, Japan, headquarters to share the progress it made developing Bio-IDiom facial, retina, fingerprint, voice, and even ear acoustic, multimodal identity security authentication technology. IDC believes biometrics and digital payment programs will simplify our lives in the not too distant future. The chief benefit that will drive these adoptions is convenience. New IT or digital experiences (DX) can be scary — most of us will remember when no one dared buy anything over the internet in the 1990s. Education, experience, and continued development can eliminate these fears helping consumers and citizens lead more productive lives by not standing in unnecessary queues, running to ATMs, and carrying around documentation to prove who they are and what rights or tickets they've previously purchased.

The part of that public acceptance effort will be establishing a "Digital Ethics Compass," which NEC purports is based on four principles:

- Avoid manipulating
- Make your technology understandable
- Avoid creating inequality
- Give users control

It's pretty much about establishing trust because we're talking about personally identifiable information (PII) and money — not something for which any of us want to lose control. Several of the facial recognition uses mentioned here say that such data will only be retained for a short period of time (hours, days, or weeks), but these data stores will be valuable targets for cybercriminals. IDC suggests that a necessary step in this journey is proving to participants that their identities will be safe when retained, and then deleted after use as promised.

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Global Headquarters

140 Kendrick Street
Building B
Needham, MA 02494
USA
508.872.8200
Twitter: @IDC
blogs.idc.com
www.idc.com

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