



15732 Los Gatos, Blvd, pmb 525,  
Los Gatos, Ca. 95032. United States  
(office)408-916-1480 (mobile)408-888-0892  
(fax)408-317-1717

Atumi-Bldg, 5F  
2-43-10, Minami-Otsuka  
Toshima-ku, Tokyo, 170-0005, Japan  
(office)81(50)5534-7533

[www.aim8.com](http://www.aim8.com)

## Biometrics and Japan

Stephen Miller

[email: smiller@aim8.com](mailto:smiller@aim8.com)

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### **Abstract**

Although it is difficult to quantify, it is generally assumed that biometric technologies within Japan have been more widely accepted in commercial and government applications in contrast to the United States. This is evident by the explosive growth rate in biometric sales.

The increased popularity is often attributed to cultural reasons. In part this may be true; however there is a constant exposure to biometrics and the benefits of biometrics in the daily life of Japanese which is making the transition to secured technologies easier.

This paper addresses the biometric explosion within Japan as well as examining the driving forces behind it.

### **Introduction**

Biometric sales in Japan are rapidly increasing. Most technologies are seeing 100% growth rates in the last few years and some are seeing greater than 200%. This trend is expected to continue into the future.

Biometric technologies developed in Japan are becoming increasingly visible outside of the country and more commonplace in the West. Many large Japanese corporations are considered the leaders in the industry.

In general users have similar complaints as those in the West. "Fingerprinting is for criminals." However, criminals have introduced identify thief in Japan. Japan is a country known for its low crime rate, where credit cards are still new to many. A single crime can be televised at night. Identify thief and fraud are occupying more air time.

Moreover, Japanese corporations, with a consensus versus a decision making philosophy, are typically slower to adopt and develop new technologies. However, once accepted, the decisions on how to best adopt new technologies are planned very well, avoiding many problem associated with the Western decision-making philosophy.

### ***Crime Statistics***

Despite Japan's status as a modern, industrialized nation—a condition linked by many criminologists to growing rates of crime—the nation does not suffer from steadily rising levels of physical criminal activity. [1]

However, the number of credit or cash card forgery crimes in Japan rose nearly 6 percent in the first half of 2005 from the same period last year, according to government data. Internet-related crimes including "phishing"—scams that trick people into providing personal and financial information—and illegal access to computer networks have more than doubled in Japan in the past five years, police data showed. [1]

Demand for the technology has been spurred by the introduction in April of the Personal Information Protection Law, which calls for companies and organizations to establish and manage company-wide information security. [2]

### ***Consensus building***

The importance in Japan of group identity, the Japanese approach to decision making, and the way in which the Japanese avoid conflict and build consensus when making a decision are characteristics of Japanese interactions that are critical for Americans to understand in order to communicate successfully with the Japanese. [3]

In project planning consensus building tends to be a longer process. However, many issues are considered in detail, hence avoiding later problems. The process may be considered proactive rather than reactive.

In developing biometric technologies the consensus approach to product development often addresses the issues of user acceptability and what needs to be done for a more commercially viable technology.

### ***Japanese Biometrics Overview***

Within Japan biometrics has long been promoted by hometown favorites such as NEC, Fujitsu, and Hitachi.

Vein technologies are very popular in Japan and enjoy high sales growth rates. The technologies have proven themselves in high profile installations within Japan. There are now 60,000 ATMs with vein technologies installed. Initially the biometrics was an option for users; however it is gradually becoming a requirement.

Vein technology is a type of system that uses veins in a person's body to establish identity. Vein ID systems use infrared light to scan the user's hand and look for a pattern

of veins in order to make an identification match. Both Hitachi and Fujitsu have developed commercial Vein ID systems.

### Fujitsu Palm Vein Technology



### Hitachi Finger Vein Technology



Although Fujitsu has been a long time player in the fingerprint market, their efforts with Palm Vein technologies have been widely publicized and marketed. Within the two large Japan security shows each year, Fujitsu has a strong presence. Moreover, through subways and train stations one can easily find a Palm Vein advertisement.

Hitachi dominates the Finger Vein technology and holds significant market share over Fujitsu. Moreover, Hitachi hosts a weekly TV series on travel to foreign countries that is widely popular and is one of the longest running TV series in Japan. On a weekly basis the Hitachi Finger Vein technology is featured prominently in commercials. The importance and benefits of biometrics is constantly being reinforced to a large part of the population.



There is no escaping the advertisements and promotion of Panasonic and Oki for Iris Recognition. Many luxury apartments in Japan are sold with Iris access control for entry and exit. The companies continue to improve the ergonomics of their technologies for rapid recognition.

NEC remains the number one leader in all biometrics in Japan with AFIS and fingerprint technologies. The company is the supplier to the Narita Airport visitor program (similar to the US-VISIT Program).



Little known in the West is DDS, a fingerprint algorithm company who have bundled their fingerprint algorithm technologies with a variety of swipe sensors. Their non-minutia technology is based upon Spectrum Analysis. This algorithm of the spectrum analysis regards the cross sections of a sliced fingerprint pattern as a wave. The company had done very well and is almost tied with NEC in the fingerprint sector.

In Facial Recognition, there are numerous companies in the market place. Toshiba, NEC, Panasonic, Omron, Sony, etc are all competing. Moreover, there are numerous small companies focused upon specific vertical markets.

### ***The Sales Explosion***

The Biometric market in Japan is approximately 90 million dollars. The growth rate is over 100% per year. [4]

Fingerprint technologies are the leading with about 60 million dollars sold last year and an approximate growth rate of over 100 percent. Sylex Technology Inc., which sells fingerprint authentication for PC access, expects its sales to double next business year and again the following year.

Vein technologies come in #2 with 9 million dollars and an excellent growth rate over 200% in the next years. Hitachi has three quarters of the market and Fujitsu has a little less than 25%.

Facial recognition is around 5 million dollars with a growth rate of 150%.

Iris technologies sales growth rates are still small but have strong hopes in the West.

In the overall biometric market, NEC has 25% market share (AFIS, finger, etc), DDS (fingerprint) has 20% and Fujitsu has 11%.

Sector activity, as measured by patent filing, indicates that fingerprint technology is by far the largest area of interest with approximately 43% of total patent activity. The activities for other biometrics are approximately: bodies (in general) 12%; face 10%; signature 8%; iris 7%; composite (multi-modal) 7%; and voice 5%. [1]

### ***Conclusion***

The Japanese biometric market is enjoying an incredible sales growth rate. Japanese biometric companies are becoming more recognized within the West. New technologies such as vein are expected to be competitors of more traditional technologies such as fingerprints.

In addressing issues of user acceptance of biometrics, technologies brought to market in most cases have gone through a long process of study and careful consideration. Moreover, the need for biometrics is constantly demonstrated with the emergence of new crimes and security issues, and the safety and solutions that biometrics offer and conveyed through many mediums.

### ***References***

[1] Ziff Davis Media Inc.

[2] Webopedia.com

[3] The Japanese: Conflict and Consensus Building

[4] Akcess Market Analysis