

Fingerprint Biometrics 101

This brief paper identifies essential differences between fingerprint scanning technologies and other aspects of operation and physical construction that impact user success in enrolling and using fingerprint scanners. Ways to leverage strengths while minimizing the impact of weaknesses are highlighted.

Before getting started, let's put things in prospective. The term biometrics itself tends to evoke fear, uncertainty and doubt in many people. But is that really any different than playing golf for the first time? Obviously, it is not something that anyone would want to do with the boss if it were the first time, but with the right equipment, a few lessons and lots and lots of practice; anyone should be good to go with the basics.

Once we hit the course, what we have learned comes into play. What did the pro say about keeping your "eye on the ball?" There are parallels with biometrics. Here "getting the ball into the hole" after passing all of the sand traps, tall grass, ponds and trees and successfully navigating the green represents all of the benefits that will be realized by using biometrics.

Replacing outdated technologies that were designed for a different set of requirements and conditions than those currently being encountered is certainly of importance. However, why not look at biometrics from a total value perspective? Why not justify the investment based on cost savings and the generation of added revenues plus intangibles such as convenience, ease of use and improved regulatory compliance? You will think of many others.

Keep in mind that at any point along the way, outsourcing is always an option. Consultant advisors like us are always a safety net. This is especially true with biometrics where benefits will bring positive value to the bottom line rather than only added costs that seem to grow, grow, grow. So let's get started and build a knowledge base of background information that will be needed later on.

First, there are different chip (the active element that reads the finger) technologies each with its own advantages and disadvantages.

Here is a sample.

CHIP TECHNOLOGIES	ADVANTAGES & DISADVANTAGES
<ul style="list-style-type: none">• Optical• Electro-Optical• Laser-Luminescent• Radio Frequency• Capacitive (semiconductor)• Thermal• Pressure Sensitive• Acoustic• Signature (dynamic)	<ul style="list-style-type: none">• Some work well with more difficult skin textures.• Sensor surface is sometimes protected from damage.• Results can be impacted by variations in ambient lighting conditions - surroundings that are too bright or too dim should be avoided• Fingers sometimes directly touch active element.

Besides chip type, what other factors in chip construction and use impact scanability?

- Size of sensor's active area
- Stationary vs. swipe sensors
- Skin texture
 - Rough and irregular – Conditions such as Psoriasis make scanning difficult

- Fine Asian skin – Similarly, if there are insufficient variations, it is difficult to “see” contrasting differences
- Proprietary vs. interoperable solutions
 - Proprietary – Limits flexibility to one manufacturer’s products
 - Interoperability – Allows variety and choice within a multi-user environment or for a single user who will experience different operating conditions and prefer to be able to use more than one scanner. Interoperability requires common matching software that will work with varied scanners without software changes.

What is the bottom line to all this?

Just like shoes, where not every one will fit correctly, the best possible or even fit at all, fingerprint scanners have similar limitations that must be considered. Providing choices to each and every individual is an important benefit.

Having an experienced person present to help users with scanner selection and use can make a big difference in getting off on the right foot and having a pleasant rather than a frustrating experience.

What is the process for enrollment and use?

Start by considering operating conditions and user differences and select a small group of likely scanner candidates. Then through trial and error find the one scanner that is the optimum for each individual. This represents the one that at a minimum should be used for enrollment, assuming that the scanning architecture is one that permits interoperability of scanners, namely plug and play, mix and match using any vendors’ products interchangeably.

Once fingers have been enrolled with the system, then other less sensitive scanners can be tested to enable choices under varying operating conditions.

What is the role of the software?

The primary role of biometric software is to store and manage templates that are based upon scanned images of fingers. Templates are created during the original enrollment and are used in subsequent user authentications. Original scanned images are discarded to placate those who fear that someone could use them to steal identities even though countermeasures have been developed to eliminate that possibility.

Basic enrollment and matching can be integrated into custom applications by software developers or can be purchased as a part of a Biometric Suite that includes other biometric controlled features including file and folder encryption and network and application logon.

What does the future look like?

Ultimately, we expect access to buildings, machinery and a long list of other private and intellectual property will be controlled by biometrics. Fingerprints and other body parts are competitors. Different ones can be layered to add greater levels of protection or can be used individually based upon a selection that is most appropriate for a specific need or task.

Isn’t it time to experience the benefits of biometrics? Contact us for help.

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