Biometrics

Is that really you?
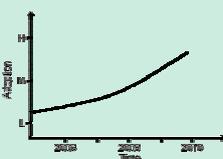

Innovation rating:	25	
Predicted revenues:	5	★★★★★☆☆☆☆☆
Industry relevance:	2	★★☆☆☆☆☆☆☆☆
Commercial interest:	4	★★★★☆☆☆☆☆☆
Supplier capability:	6	★★★★★★☆☆☆☆
Potential impact:	8	★★★★★★★★☆☆

At a glance

Personal-Enterprise-Government
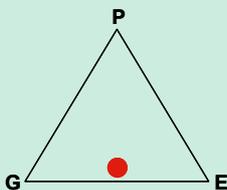
Commercial adoption

Top relevant industries
Government
Security
Automotive

Top investing organizations
Home Office
US Department of Immigration
Toshiba

Top suppliers
Biometri Systemer
OmniPerception
Veritouch

What it is

The term biometrics is used to describe a collection of technologies concerned with establishing the identity of individuals based upon their fixed and unique physical characteristics. Biometrics in use today include fingerprint, iris, hand geometry, voice and face scanning and recognition technologies.

The field of biometrics has been gaining prominence over the last 10 years and has now reached a level of maturity where the technology can be applied with acceptable levels of success and at a reasonable price.
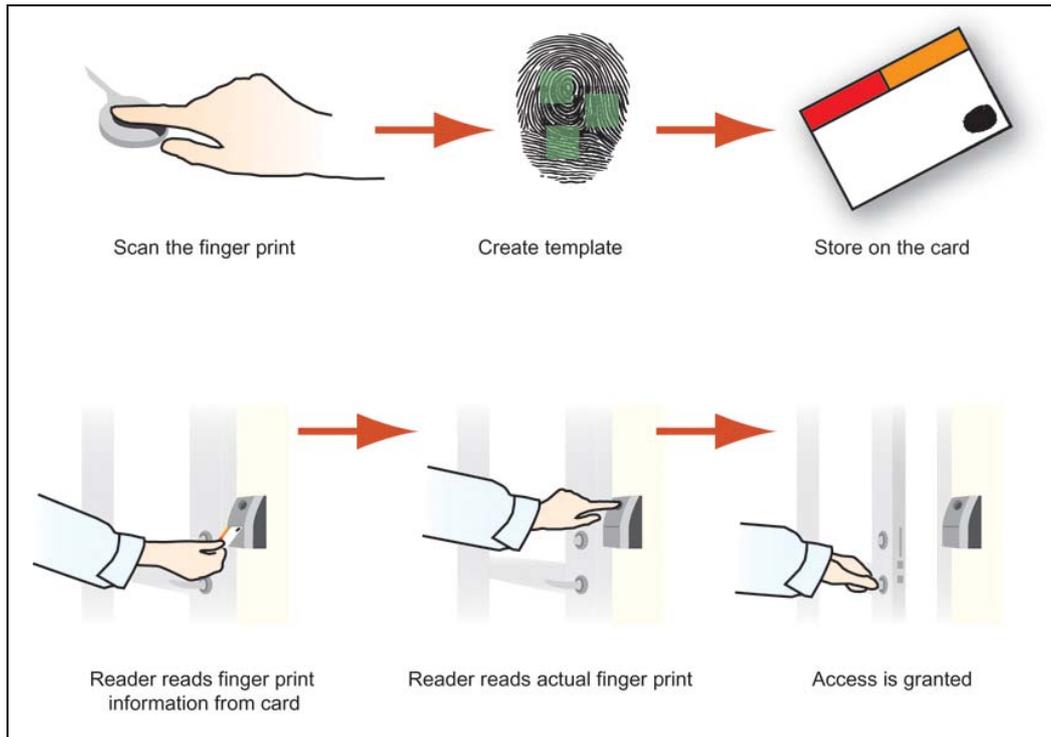
No single biometric technology is infallible and different technologies have strengths and weaknesses that make them more or less suitable for certain applications. Increasingly biometrics are used together to provide a stronger authentication and reduce the risk of error.

Current activity

A combination of factors has increase government and commercial interest in biometrics. These include:

- A global concern about national security, especially to counter terrorism

- Increases in identity and other types of fraud

- Improved public acceptance of the technology

- Improved accuracy of biometric solutions

- Combating illegal immigration

A number of high profile political decisions; for example, the US Government implementation of the fingerprinting of all persons entering the country, and the British Government's decision to launch a national biometric ID card by 2007 have greatly raised the public profile of biometrics.

FORESIGHT

Scan the finger print   Create template   Store on the card

Reader reads finger print information from card   Reader reads actual finger print   Access is granted

In addition, the International Civil Aviation Organization is pushing for biometrics to be included on all passports as soon as possible. The UK Passport Service is currently undertaking a biometrics pilot scheme.

Many successful commercial trials of biometrics in the private sector have also contributed to the rise of the technology. One of them is the fingerprint recognition technology being built into consumer products such as laptops and cars to ensure they only be used by their rightful owner.

Important considerations
Fingerprint recognition can be fooled by calluses, residual prints on the reader, and even hand cream! Face recognition struggles in certain lighting conditions and can by fooled by disguises; and iris recognition can be confused by contact lenses and watery eyes.

Biometric identification also faces stringent opposition from civil liberties groups who believe that it represents a breach of privacy. There is great concern about the storage of the biometric data and who has access to it. The possibility of storage of personal data on a centralized government database causes greatest concern. There is concern that this data may be misused and even that it may be possible for a person's stored data, or 'biometric reference template', to fall into the wrong hands. Even schemes in which data is stored on the card itself have not been immune from criticism.

PA's assessment
Biometrics technology is already well enough supported to permit its widespread adoption in a variety of applications. Gradually we will become accustomed to being identified by our physical traits in situations where previously we would need to provide an official document, such as a passport or driving license, enter a code or PIN number, or provide a signature.

As biometrics matures, many objections to the technology will be overcome. The use of multi-modal biometrics will increase reliability by using mathematical algorithms to reduce error.

In multimodal biometric applications a probability score is taken from each biometric measurement with the scores then combined to provide authentication which is more flexible, accurate and fool proof than a system which uses a single physical trait.

Overcoming public objection to biometrics will take time and good PR. Technologies to overcome controversial issues such as centralized storage of personal data are underway.

At the cutting edge of the field, several biometrics companies using statistical techniques to counteract the variability in results caused by differing conditions (eg lighting) at the point of scanning. This statistical 'offset data' can be combined with the data stored on the card to create a digital signature. By irreversibly encrypting this signature it is possible to ensure the biometric data is unrecoverable and not open to misuse.
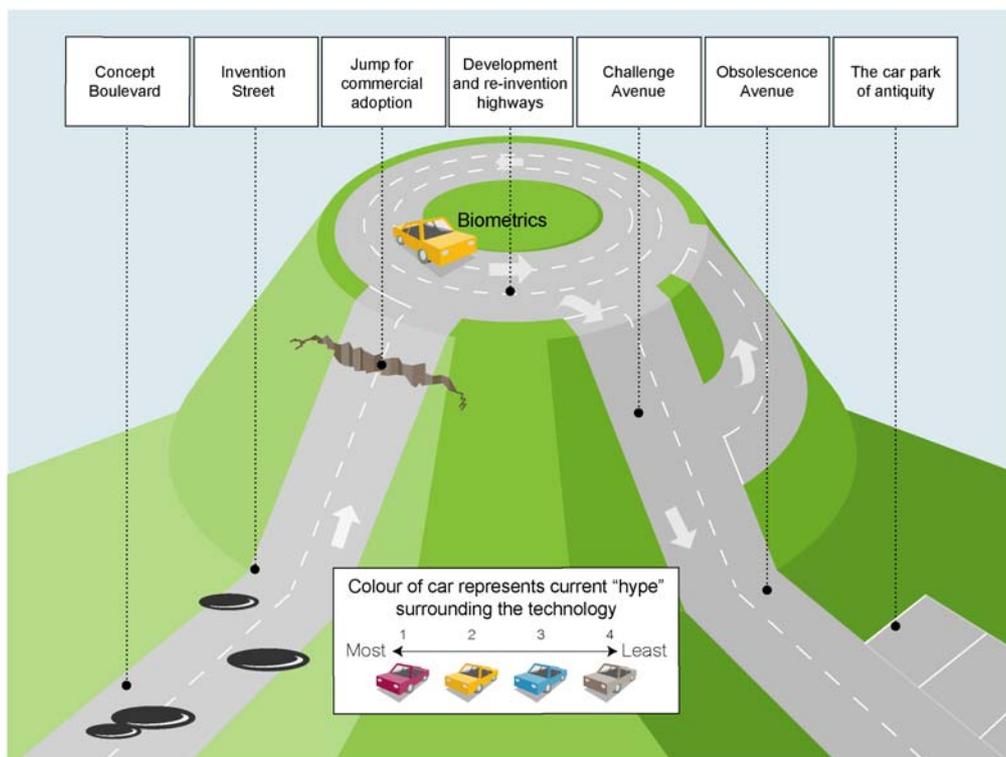
When a scan is made the offset data is combined with the scan generating a template that should match that stored on the card regardless of variations in conditions at the point of scanning.

The first major wave of biometric applications will be centered on border security as more governments insist on biometric authentication of all visitors. This will be followed by many governments issuing biometric Identity cards to their citizens.

Already biometric scanners are being built into assets and this is a trend we will see continue. Biometrics will authorize us to use our laptops, drive our cars, and open our front doors. Some software companies are starting to use biometrics to authenticate users to applications, eg signing in to an ASP.

Despite the problems and objections to biometrics today we will see the technology become increasingly pervasive. Public opinion will ultimately be swayed by the benefits of biometrics and over the next 10 years we will see biometrics used as standard in many situations where authentication is required in our everyday lives.

The Innovation Highway

| Concept Boulevard | Invention Street | Jump for commercial adoption | Development and re-invention highways | Challenge Avenue | Obsolescence Avenue | The car park of antiquity |

Biometrics

Colour of car represents current "hype" surrounding the technology

Most ← 1 2 3 4 → Least

The Innovation Highway explained

The Innovation Highway model is intended to provide a graphical representation of the lifecycle of a technology from its initial conception through to obsolescence and antiquity. Additionally the model also conveys the level of current 'hype' around the technology (represented by the colour of the car).

Concept Boulevard: The technology exists as a concept with some or all of its enabling factors in place, and with leading thinkers able to describe its operation and overall goals. It does not yet exist however in a tangible form.

Invention Street: Brings the technology concept into reality in the form of a working prototype. Technologies in this stage seek to generate sufficient resources to bring them to the mass market.

Jump for Commercial Adoption: In order to successfully reach its target market, a technology must prove its worth and robustness and generate sufficient marketing hype and momentum to achieve market acceptance.

Development and Reinvention Highways: Once a technology has achieved mass-market acceptance, it enters a cycle of incremental development and reinvention.

Challenge Avenue: This stage represents established technologies coming under pressure from new alternatives that threaten to capture their market share. For example, VHS video is currently being challenged and supplanted by DVD and other video formats.

Obsolescence Avenue: Here technologies enjoy limited support from a diehard user base, but eventually even these users will migrate to newer better technologies or due to a lack of support.

Car Park of Antiquity: The final resting place of technologies that are no longer manufactured or actively supported. They are of interest only to collectors and historians.

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