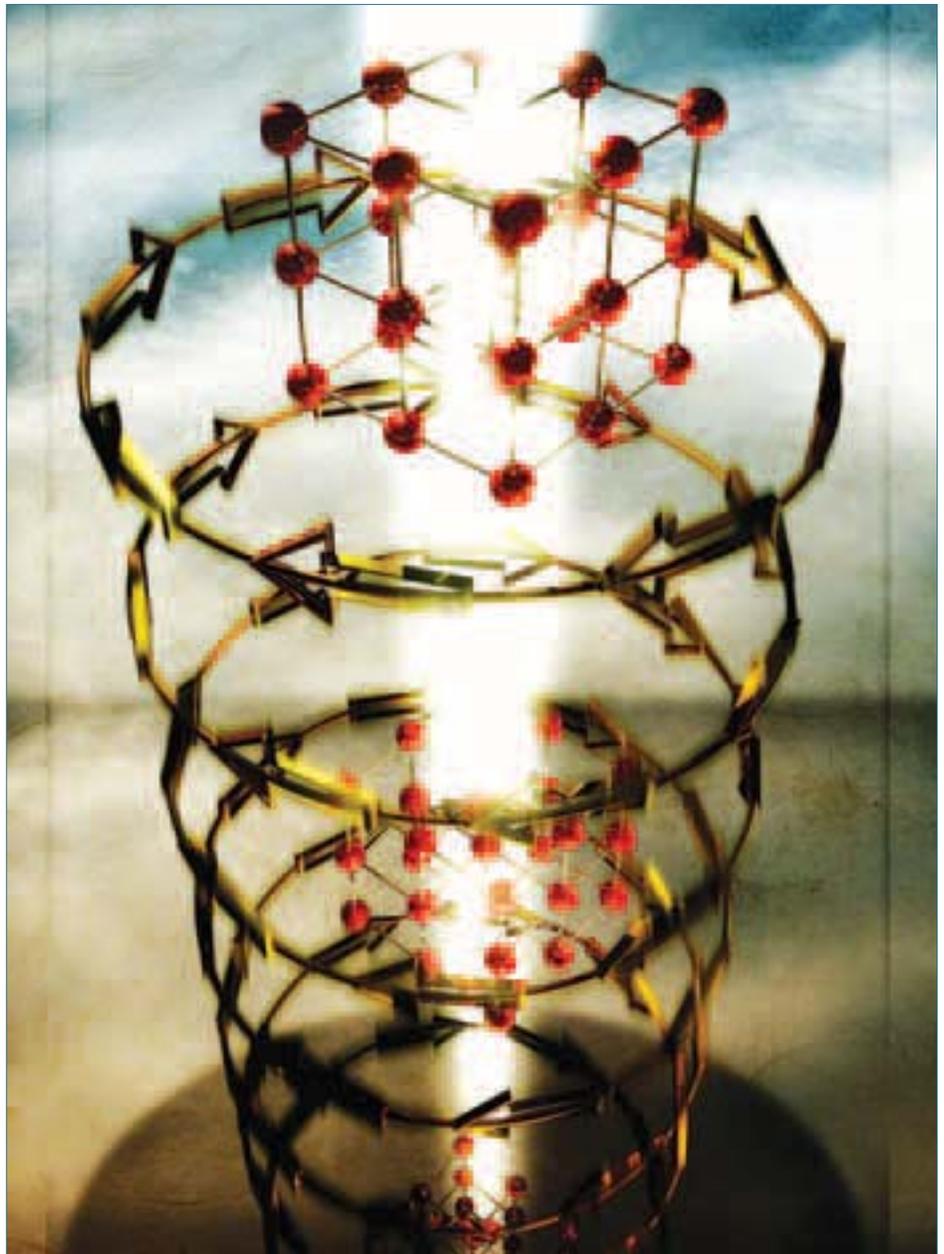


# Biometrics Comes of Age – From Core Technology to Identification Solutions

A subtle yet significant shift in the market focus of the fledgling biometrics industry has begun. This once impenetrable domain of technology elites – experts hawking product to experts and debating the finer points of equal error rates – is transitioning into a more customer focused solution environment. A small, but critical mass of vendors are redefining the competitive landscape to one where positioning is based on the ability to provide solutions rather than on hardware and software specifications and performance.

**T**his shift is evident in the language of press releases, the content of conference presentations, and the sales rhetoric on trade show floors. Even more importantly, it is becoming evident in the communication of strategic intent, and the allocation of R&D and market development resources. It is evident too in the emphasis of recent partnership and acquisition deals such as



# Identification Solution Map

## Components of a Biometrically Enabled Identification Solution



Source: Acuity Market Intelligence

Viisage's acquisition of Imaging Automation to expand their identity solutions portfolio, or Safink's partnership with Forward Advantage to deliver health-care solutions.

There is a convergence of forces at work here. These include government mandates – particularly in the realm of travel documents, core technology maturity and associated price/performance improvements, consumer product – laptop, mobile phone, PDA – integration by major consumer electronics players like IBM, Fujitsu, HP, Casio, and LG Electronics, and enterprise and consumer market readiness – as evidenced by a spate of recent market surveys in the US, Europe, the Middle East and Asia indicating high levels of acceptance and anticipated adoption.

While it is not clear whether this recent biometrics industry “enlightenment” is more cause or effect in regards to these forces, it is clear that an important industry shift is taking place. It might even be said that biometrics is “growing up”. Perhaps, moving into late adolescence where near obsessive navel gazing has expanded into a broader view – customers do not really want to buy biometrics (even if they sometimes think they do); what they really want is to solve their identification problems.

## Making the Solutions Transition

So how does the biometrics industry make this transition from its technology

entrenched past to its identification solutions future? How can an industry worldview based on error rates and proprietary intellectual property move towards one that embraces interoperability and human factors design? It certainly takes more than slick marketing, a well-managed PR campaign, and handshakes and smiles following clever acquisition or partnerships plays.

In order for biometrics to enable broad-based identification solutions, the technology must be developed and integrated within a larger solutions context. Understandably, biometrics vendors have been focused on enhancing the price/performance of their technology. This has been vital to elevating biometric technology to a level of being truly useful (i.e. reliable, accurate, affordable.) Now that the technology has reached a level of reasonable usefulness, it must be considered within a broader context that addresses a range of issues outside of the purview of developing technology .

The Identification Solution Map provides a model for defining this context by identifying the essential elements of a total identification solution. These include engineering (i.e. technology development,) as well as industrial design, human factors, the information infrastructure and the legal and regulatory framework in which these solutions reside. While the identification of these five elements, or key solution components, may seem relatively self evident,

## Components of a Biometrically Enabled Identification Solution

**Engineering** covers all aspects of the development and integration of biometrics and associated technologies—i.e. databases, secure encryption, smart cards. These include functional specifications, technical & system performance requirements, process flow and system design, standards compliance, data management, interoperability, scalability, legacy and future integration and deployment and testing methodologies.

**Industrial design** includes the look and feel of biometrics devices as well as any interfaces systems, software or kiosks. Industrial design must address visual elements, environmental concerns, disability compliance and functional conflicts.

**Human factors** deals with the human to machine interface for all constituent groups that may come in contact with the technology. These include end-users, design, support and maintenance staff and operators. Human factors include ease of use, intuitiveness, acceptability, convenience, ergonomics, and social acceptability.

**Information infrastructure** is a rather broad bucket that encompasses everything from business process management, content management—interactive menus, instructions, information kits, communications – internal and external, integration with existing data management services, integration with other programs, projects or departments, security, privacy and data protection policies as well as roles and responsibilities for all constituents.

**Legal and regulatory** includes local and international compliance for all constituent groups, with all applicable laws related to privacy, data protection and civil liberties.

this broader perspective on constructing identification solutions has been almost completely absent from the biometrics industry.

## Bridging the Human-Machine Identity Gap

One area, in particular, where this lack of solutions focus has been most pronounced is in regards to human factors considerations. The true complexity of developing

and implementing biometrically enabled solutions rests in the nature of the technology itself. That is, biometrics is the science and technology of human/machine interaction.

Human factors considerations are therefore not a luxury but rather a necessity for any biometrically enabled system intended for widespread use. This includes more than just the design of the human interface but the overall experience a user has while interacting with one or more biometric devices. Human factors dynamics may be different for each facet of the biometric authentication process. Enrollment and verification may vary. Differences across biometric modes are likely to be significant. In addition, variations within and across multi-modal applications may pose

more complex issues as the order of biometric readings may have implications for overall human factors analysis and associated system design.

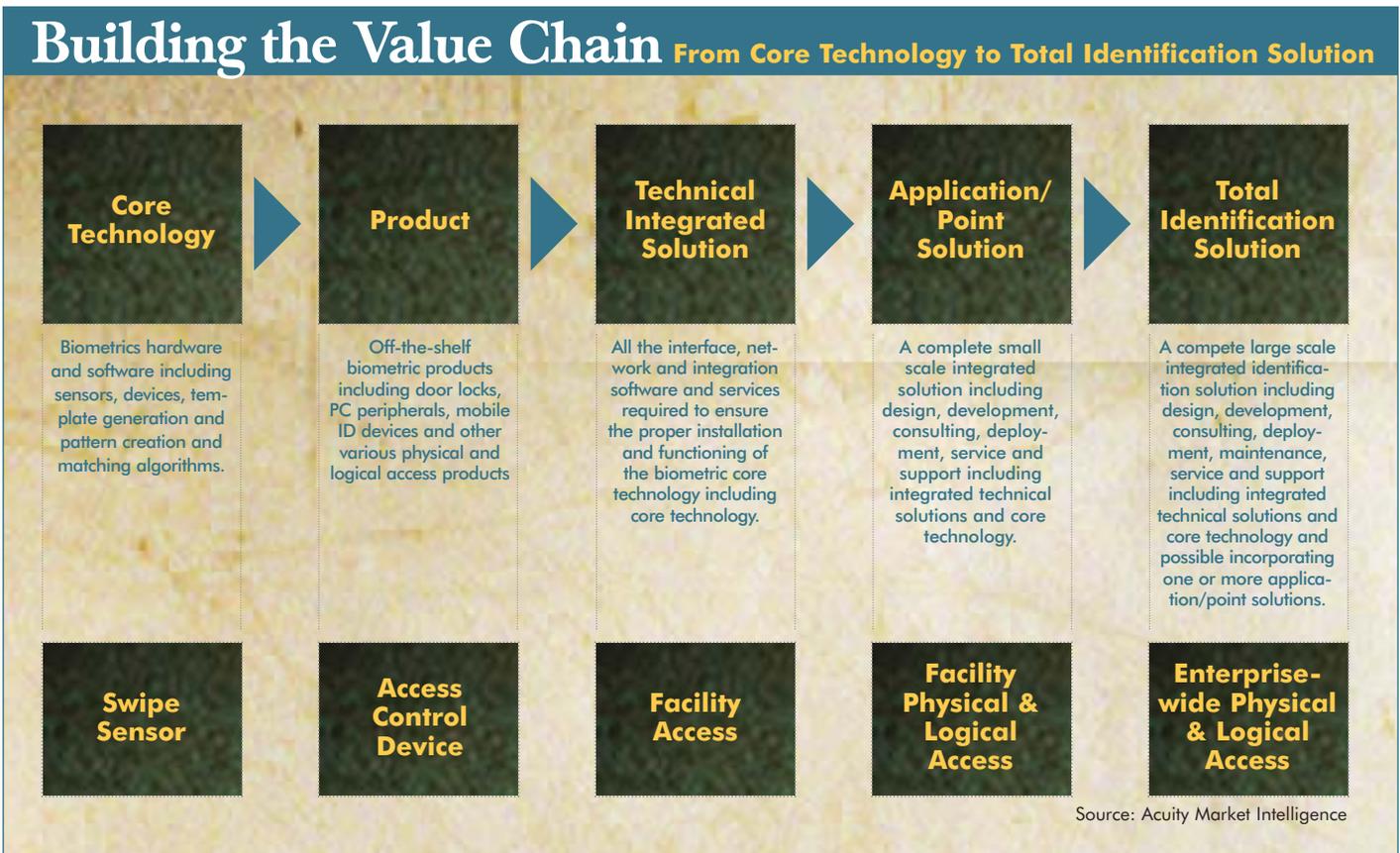
## The Need for Human Factors Engineering

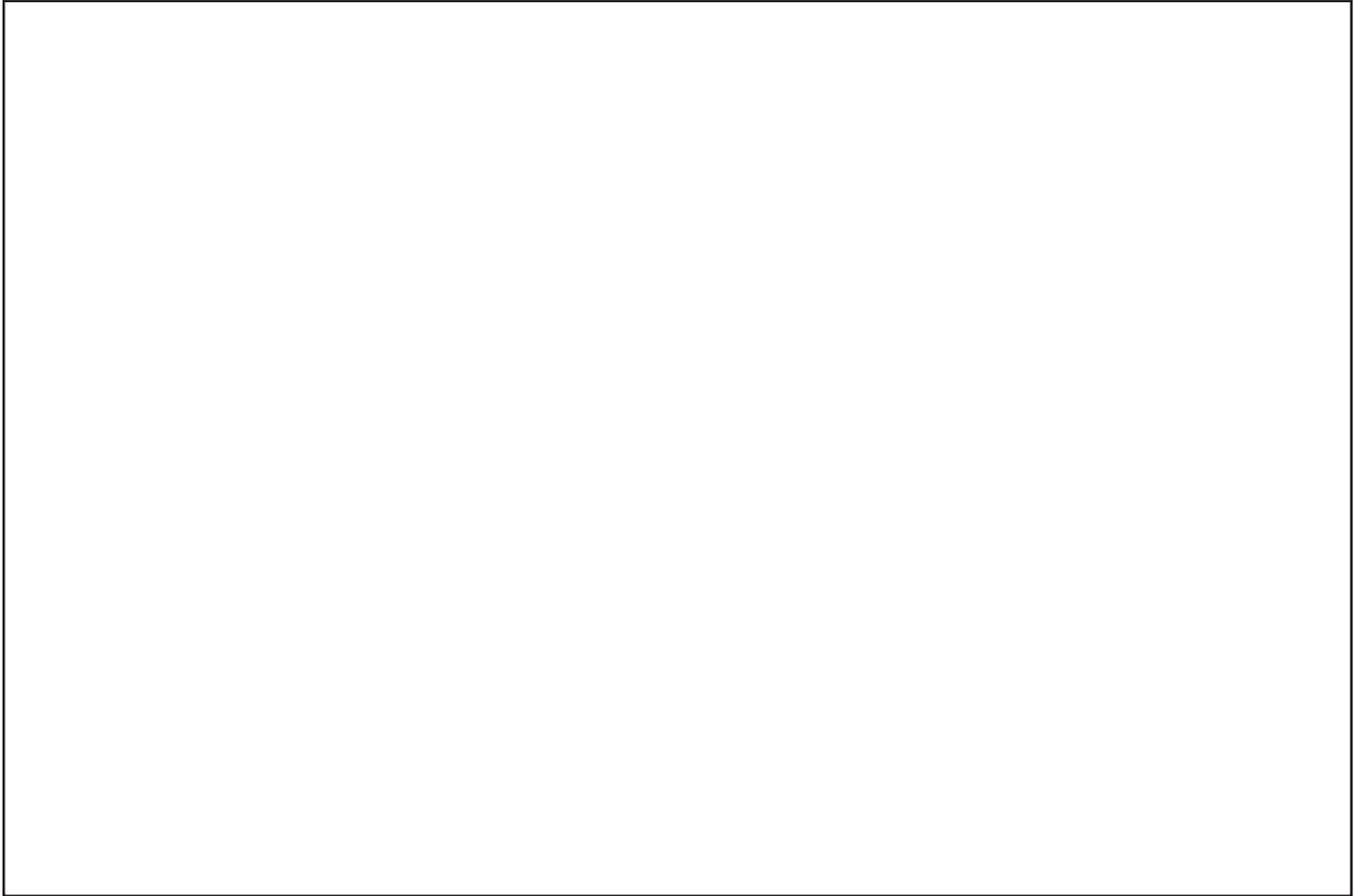
While human factors design has been incorporated into the development of a number of biometrics at the device level, the science has been largely ignored at the solutions level. For example, the UK recently completed a biometric passport enrollment test of nearly 10,000 volunteers. This pilot was not intended to test technology but rather to see how easily participants could enroll and how they would react to biometrics. However, there was no human factors consultation on the project.

This was an important opportunity to design and analyze a thorough human factors study of the interaction with and reaction to a multi-biometric enrollment

environment. Instead, a group of technology vendors developed enrollment stations based on their limited expertise and the UK government gained limited knowledge about how best to enroll large populations of people into biometrics based identification systems. Going forward, the industry must take maximum advantage of these opportunities to gain the human factors knowledge that will be required to develop truly usable, socially acceptable biometrically enabled identification systems.

Much in the same way that new forms of human/machine interfaces were developed in response to the introduction of 3D computer graphics in the late 1980's, human factors faces a significant new challenge in regards to designing truly user friendly biometrically enabled identification solutions. While this may seem like almost too big a play for an industry dominated by small, low or no revenue, marginally funded technology companies, it is





precisely the adoption of this big picture view that will help the industry mature and complete the evolutionarily transition towards true solutions development.

## **Biometric Identification Solutions Value Chain**

Another useful model for examining the transition from core technology to identification solution is the Biometrics Identification Solution Value Chain. This value chain illustrates both the iterative nature of developing identifications solutions and the increasing complexity of implementation as vendors move along the value chain from core technology to total identification solution.

While the conceptual progression across the value chain seems intuitive, its practical application is convoluted at best. Individual vendors and solutions providers often lack a clear sense of how they fit into this progression and subsequently what is required of them to be suc-

cessful. One of the most critical challenges facing industry players today is not only to understand how this value chain operates in regards to providing customers with genuine solutions to their problems but also how to develop a successful market strategy that leverages their position along the chain.

This is not just the case with small core technology vendors but with vertically focused solution providers and large systems integrators as well. With few exceptions, vendors spread themselves across the value chain without clearly articulating what a total or complete identification solution consists of, what the process is to construct one, where they fit in to this process, and how to leverage their organizational capital and that of appropriate partners to achieve genuine success.

## **Completing the Transition**

As the biometrics industry begins to experience true acceleration over the next 18 to

24 months, players that focus on solutions and learn how to leverage the value chain will begin to establish market dominance. These few companies will rise above the market morass – 400 companies and counting – and establish themselves as recognizable brand names in the delivery of identification solutions. They will have the chance to move beyond the trappings of market evolution – glossy brochures, clever PR, calculated acquisitions – and complete the subtle transition that has begun pushing biometrics towards a solutions based market maturity. ■

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