

The Future of Biometrics

Market Analysis, Segmentation & Forecasts

Insight into the Trends, Drivers & Opportunities
that will Shape the Industry through 2020



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ACUITY
MARKET INTELLIGENCE

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About Acuity Market Intelligence

Acuity Market Intelligence is an emerging technology strategy and research consultancy with a proven record of accurately anticipating biometrics market trends. Acuity cuts through the clutter of information overload to provide technology neutral and vendor independent industry insight and analysis for the biometrics industry and other emerging technology markets. The core of Acuity's knowledge base is fundamental understanding of technology market development, technology evolution in emerging markets, and how technology is adopted and deployed most effectively in targeted vertical markets. This knowledge is applied through proven tools and techniques to help vendors, integrators, investors, and end-users:

- Identify, prioritize & size lucrative markets.
- Define & analyze targeted vertical solutions.
- Create & evaluate market development and adoption strategies.
- Achieve sustainable market dominance.
- Evaluate deployment plans within the context of generating *real* ROI.

Market Development Expertise

Acuity's singular focus is on the development of emerging technology markets providing expertise in the following areas:

Market Analysis – Identification and evaluation of key technological developments, market trends, industry players and deployment effectiveness.

Opportunity Analysis – Highly granulated vertical market segmentation and identification, prioritization and sizing of the most lucrative opportunities for a given product or service

Solutions Analysis – Requirements and functional specifications for applications of emerging technology.

Due Diligence – Evaluation of market players to ensure:

- Opportunities have been adequately and accurately assessed
- Financial, operational and strategic plans are in place to create sustained market viability
- Product and service quality can be demonstrated

Strategic Planning – Creation of highly leveragability plans to develop, evaluate and deploy emerging technology based solutions with the objective of achieving the highest degree of customer satisfaction and sustained market dominance.

Client Services

Clients leverage Acuity's knowledge and expertise through a range of off-the-shelf, semi-custom and fully custom product and service offerings. These include:

Executive Briefings & Strategy Sessions – Interactive sessions provide targeted insight to Client Executives.

Consulting – Custom projects designed to support specific Client objectives

Segment Tracking – On-going coverage of technologies, players and market drivers and dynamics of a particular industry sector or technology marketplace.

Reports – Periodic and one-off targeted analyses focused on a range of topics including: technology evolution, application development, vertical market adoption and competitive analysis.

Research – Standard and semi-custom research projects designed to address specific industry knowledge gaps.

Workshops – One to two day intensives presenting Acuity's proprietary methodology for applying proven tools and techniques to identify, prioritize and size market opportunities.

**Please contact Acuity Market Intelligence for additional information
on services, availability and fee structures.**

Online	www.acuity-mi.com
Phone	+1 303 449 1897
Email	info@acuity-mi.com



Report Overview

- SCOPE:** This report presents unique insight into how the market for biometrics will evolve through 2020, what will drive and shape this market evolution, and where the most lucrative biometric market opportunities will be. This report is not a biometric primer. It is an advanced market analysis that requires a basic understanding of the biometrics industry and associated technologies. The report is presented in two parts. Part One contains the in-depth analysis and Part Two provides detailed market segmentation and forecasts.
- OBJECTIVE:** This report provides a basis for short, mid-range and long term strategic planning for technology and solution development, market investment, and phased adoption of biometrics for both Public Sector and Commercial applications.
- AUDIENCE:** Individuals responsible for strategic planning and business and market development within the biometrics community including: vendors, integrators, investors, consultants, distributors, solution providers, and Public Sector and Commercial end-users.
- METHODOLOGY:** Analysis is drawn from on-going market coverage of industry milestones, developments, announcements, presentations, tests, pilots and deployments as well as public domain and private data sources, research and reports, surveys, and interviews with vendors, integrators, intermediaries, customers, privacy and civil liberties advocates, and other relevant technology and vertical market industry experts. Forecasts are derived from modeling total potential market opportunities based on enhancement or replacement of existing technology and non-technology based processes and solutions and the introduction of new processes and solutions based on the unique capabilities of evolving technology. Conservative adoption rates are then applied for given market sectors and applications to determine market value. .
- KEY CONCLUSION:** Over the next 10 years the infrastructure to enable mainstream, ubiquitous biometric authentication will be developed. Biometrics will be a critical embedded component of the digital world, as it becomes a key enabler of trusted transaction control – data access and flow - for both personal and commercial use. This secure transaction capability will ultimately define the genuine opportunity for revenue associated with deployment of biometric technologies. The technology itself will, in many respects, become inconsequential as the applications it delivers become essential components of 21st century life.
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- AUTHOR:** C. Maxine Most, Principal, Acuity Market Intelligence



Introduction

What is *The Future of Biometrics*? Strong consensus amidst well-founded trepidation indicates biometrics will become mainstream, ubiquitous technology. Opportunities abound and to date there has been significant market penetration in the areas of identify confirmation and credentialing, physical and logical access, and surveillance. From passports and ATMS to corporate networks access and mobile phones, from White Castle and Pictet & Cie Banquiers, a renowned Swiss bank, to the Denver RTD (Rapid Transit Department) Treasury, biometric technologies are used by hundreds of thousands of individuals across the globe for personal, commercial, and civil applications every day. The most interesting and relevant questions about biometrics' future is then not so much about if biometrics will prevail or even how quickly, but rather what is the path from today's limited – though effective and relatively obscure - use to what most industry experts agree and most privacy advocates and civil libertarians dread is biometrics ultimate destiny? Ubiquity.

***The Future of Biometrics* addresses these questions by providing insight into how the biometrics industry will evolve through 2020, what will drive this evolution, and where the most lucrative market opportunities will be. It is intended to provide a basis for short and long term strategic planning for technology and solution development and deployment for both Public Sector and Commercial applications. The report is presented in two parts. Part One contains the in-depth analysis and Part Two provides detailed market segmentation and forecasts.**

Part One: Analysis

The first half of the report addresses fundamental questions that provide the context for developing a comprehensive view of the likely evolution of the biometrics marketplace.

- What are the Mega and Meta dynamics and forces shaping the evolution of the market?
- In which industries and for which applications will biometrics be most widely deployed?
- How will market demand shape the evolution of the technology and the development of biometrically enabled solutions?
- What role will technology convergence play and how will it impact overall technology and market development?
- How will the most substantial opportunities for industry players evolve?

Context

The Future of Biometrics begins with a fictional scenario representing what may prove to be a very real world experience in the year 2020. This provides context for understanding the far-reaching implications of biometrics as an integral component of daily life.

Mega Drivers

The six *Mega Drivers* for biometrics are global trends that will profoundly impact all IT development through 2020 and have important, specific implications for biometrics.

- Globalization and the Development of the Third World
- Borderless Economies
- Population Mobility
- Proliferation of Mobile Devices and the rise of Access Anywhere
- Central Role of Digital Identity
- Inevitability of eGovernment

Meta Drivers

Application Solution and Technology Evolution *Meta Drivers* shape both opportunities for widespread deployment of biometrics as well as determining the likely winners from a field that is simultaneously consolidation and expanding.

The three key Public Sector *Application Solution Meta Drivers* are: eBorders, eID, and eGovernment.

The three key Commercial *Application Solution Meta Drivers* are: Enterprise Security, Information Transactions, Financial Transactions.

The four key *Technology Evolution Meta Drivers* are: Secure Mobility, Secure Credentials, Secure Transactions, and Digital Identity/Content Ownership.



Obstacles/Opportunities

Biometrics technology has to the potential to enhance or threaten consumer and citizen rights, privacy and opportunities for identity theft and fraud. Centralized databases, reliance on a single view of identity, and the development of a *whole system* approach to security are assessed relative to these inherent conflicts that may constrain market development. These are discussed relative to key obstacles to market expansion and adoption. Central to this component of the analysis is the notion that these obstacles pose challenges that can be harnessed and transformed to provide significant opportunities for market leadership and dominance.

- Enrollment
- Human Factors
- Privacy/Civil Liberties
- Extensible Security
- Solutions Perspective

Future for Key Technologies

Technology evolution is inevitable and evolving capabilities and limitations will impact the relative success/ubiquity of each biometric modality. Technology convergence is also inevitable as is the emergence of multimodal biometrics as a major factor in the development of practical, ubiquitous biometric solutions.

- | | | |
|-----------------|-------------|-------------|
| ◦ AFIS 10 Print | ◦ Finger | ◦ Face |
| ◦ Iris | ◦ Hand | ◦ Vein |
| ◦ Voice | ◦ Signature | ◦ Keystroke |

Part Two: Market Segmentation and Forecasts

The second half of the report includes market segmentation and forecasts through 2015.

The two key Application Solution domains and their associated subsectors - Public Sector (eBorders, eID, and eGovernment) and Commercial (Enterprise Security, Information Transactions, Financial Transactions) - are mapped against four key application areas— Physical Access, Logical Access, Identity Confirmation and Surveillance - to create comprehensive market segmentation matrices. The resulting target markets are ranked in terms of development priority and timeframe. Each target market is also assessed in terms of the technologies (biometrics modalities) most likely to be deployed. Forecasts for the Commercial and Public Sector Application Solution domains, their subsectors, and select target markets are presented globally and by region (See Table of Contents—PART TWO, Page vii).

A quantitative approach is applied to market forecasts. This approach is based on the development of modeling tools designed to project total market potential for biometrically enabled solutions within select market sectors. These tools determine total market value based on an analysis of how these solutions can augment or replace existing manual and/or automated processes or introduce new processes based on unique technological capabilities.

The models rely on public domain and private primary data sources and are flexibly structured to account for known and predictive factors. Primary sources determine known model data - such as the number of port facilities or annual passports issued. Conservative assumptions for predictive factors - such as technology pricing and anticipated adoption rates - are then introduced to determine forecasts. Final Forecasts represent the predicted penetration of the total market value over the forecast range, which in this case is 2007 through 2015.



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Mega Trends

- Globalization the Development of the Third World
- Borderless Economies
 - Workforce Decentralization and Mobility
- Population Mobility: Immigration & Emigration
 - Proliferation of Mobile Devices and the rise of Access Anywhere
 - Ubiquity of Mobile Personal Devices : Phones, PDAs. Thumb Drives, Computer on a Stick, etc.
- Free Broadband Wireless Everywhere
- Central Role of Digital Identity
 - Data Ownership/Management/Control: *Personal, Commercial, Government*
 - Decoupling Content form Media
- Inevitability of eGovernment
 - Cost of Providing Government Services
 - Consumer Demand for Improved Service, Security, Privacy
 - Citizen Demand for Improved Government

Meta Drivers

- Public Sector *Application Solution Meta Drivers*
 - eBorders, eID, and eGovernment.
- Commercial *Application Solution Meta Drivers*
 - Enterprise Security, Information Transactions, Financial Transactions.
- Technology Evolution Meta Drivers*
 - Secure Mobility, Secure Credentials, Secure Transactions, & Digital Identity/Content Ownership.

Obstacles/Opportunities

- Countervailing Forces
 - Opportunity Threat Dichotomy: Enhancing or Threatening Consumers/Citizens
 - Privacy, Centralized Databases, Single View of Identity, *Whole System Security*
- Core Issues
 - Bridging the Human-Machine Identity Gap: *Enrollment, Human Factors, Privacy/Civil Liberties*
 - Solutions Development: *Extensible Security, Transaction Specific Identity, Performance*

Future for Key Technologies

- Capabilities and Limitations Impacting Ubiquity of Biometric Modalities
 - AFIS/10 Print
 - Finger
 - Face
 - Iris
 - Hand
 - Vein
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- Development Priority
- Deployment Timeframe
- Technology Deployment

Commercial: Enterprise Security, Information Transactions, Financial Transactions

- Target Markets
- Development Priority
- Deployment Timeframe
- Technology Deployment

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- Key eBorders Target Markets - Global, US, EU
- eID - Global and Regional, US, EU
- Key eID Target Markets - Global, US, EU
- eGovernment - Global and Regional, US, EU
- Key eGovernment Target Markets - Global, US, EU

Commercial by Solution

- Enterprise Security - Global and Regional, US, EU
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- Information Transactions - Global and Regional, US, EU
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- *Regions: North America: US, CA, Mexico
 EMEA: Europe, Middle East & Africa
 Latin America: The Caribbean, Central & South America
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Charts, Tables & Graphs—Part One

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Key Information Transactions Target Market Forecast - Global
Key Information Transactions Target Market Forecast - US
Key Information Transactions Target Market Forecast - EU
Financial Transactions Market Forecast - Global
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