



Update on the Biometrics Market

presented by



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Acuity Market Intelligence is an emerging technology strategy and research consultancy with a *proven record of accurately anticipating biometric and associated identification solutions market trends.*

Markets	Identification Solutions, Biometrics, Authentication
Services	Market Research, Analysis & Strategic Planning Opportunity Assessment & Analysis Technology Adoption & Deployment Evaluations
Clients	Vendors, Solution Providers, Integrators, Investors, End Users



Context

“Biometrics has been considered *on the verge* of a significant market development breakthrough for more than 10 years.

In spite of relatively uninspiring industry results, recent developments -- larger and wider scale adoption, significant capability and performance advancements, standards development, and consumer acceptance -- indicate looming and substantial market expansion.

How will this market expansion occur and what will the road towards biometric ubiquity look like?”

“Biometrics: Roadmap to Ubiquity” - Acuity Market Intelligence, Nov 2008

Premise

The market for biometric is in a strange state and will most likely not follow the typical path of disruptive technology adoption.

Biometrics is *no longer* behaving like a “typical” emerging technology market

Today's Discussion

Market Landscape

Market Dynamics
Technology Evolution
Atypical Market Development

Technology Adoption Lifecycle Redux

Classic TAL Model
Historical Adoption Rates
Adoption

Perspective

Market Growth
Market Evolution
The Future: Personal Identity Ownership
Phased Market Development Path

Moving Forward

Biometrics Inevitability
Strategic Opportunity
The Bottom Line

Market Landscape

Market Dynamics

- ☞ Post 9/11 rapid market acceleration never materialized
- ☞ Government sector driving requirements for large scale identification solution infrastructure
 - ☐ Slow progress, on-going delays, programs unrealized:
 - ☐ Enrollment and credential issuance services deployed independently of authentication capability
 - TWIC, Registered Traveler, REAL ID, US-VISIT
 - E.g. PIV Cards issued as of 12/1/08 32% enrolled, NO Readers
 - E.g. TWIC originally scoped at 9 – 12M enrolled has been scaled back to 1M Maritime only, NO Readers
 - 1M now enrolled with 14/4/09 deadline for remaining 200K
 - 18 months, 150 fixed and 450 mobile enrollment stations – 56K /month
- ☞ Consolidation Continues
 - ☐ L-1's buying spree has slowed down – for now
 - ☐ AFIS market consolidates with Sagem's purchase of Printrack
 - ☐ CrossMatch – once thought to be positioned as third BIG player along with Sagem and L-1, now appears to be for sale

Market Dynamics

- ☞ Industry has not taken market development initiative *crucial for emerging technology markets*
 - ☐ Defining marketplace
 - ☐ Positioning as key *identification solutions enabler* delivering reliable, trusted, privacy enhancing authentication of individuals
- ☞ Industry lacks thought leaderships and vision for both technology and solution development
- ☞ Impact of Global Economic Meltdown
 - ☐ Public offerings halted
 - ☐ Some private equity investments continue
 - ☐ Stock prices suffering
 - ☐ Time and Attendance will be the big winner
 - Clear business case
 - Short-term ROI

Technology Evolution

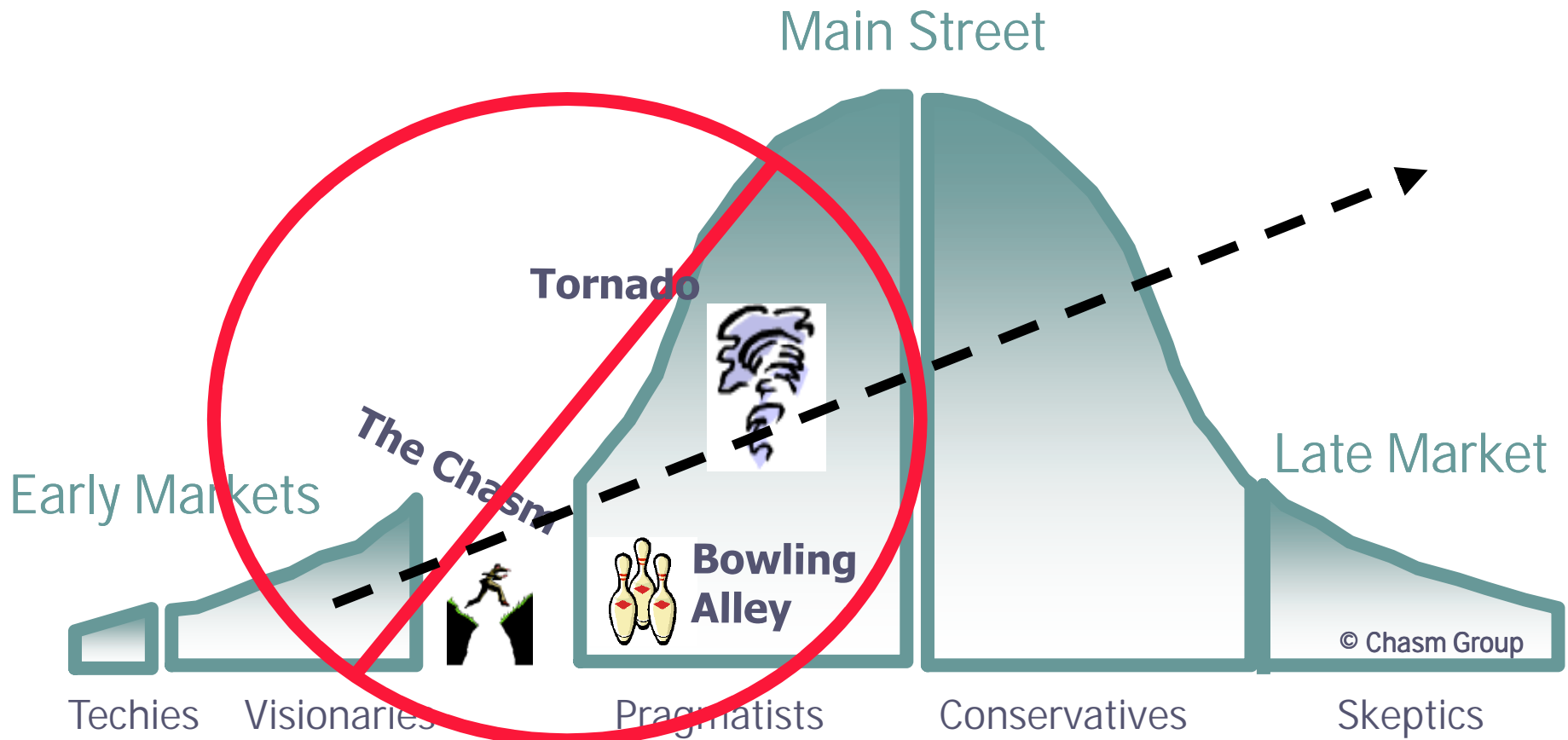
- ☛ Iris has finally come into its own
 - ☐ Patent expiration opened up market
 - ☐ Though considered “futuristic” for mainstream, it is inevitable
- ☛ Distance based capture is almost there: Iris and Face
- ☛ Vein Recognition is a three way race: Hitachi, Fujitsu and Sony
- ☛ “Knuckle” Recognition, Gait Recognition, Smell Recognition, Brain Scans
- ☛ The Fingerprint Debate has Begun in Earnest
 - ☐ How reliable is fingerprint matching?
- ☛ Genuine Fusion
- ☛ Revocable Biometrics are here
 - ☐ Game changing
 - ☐ Infrastructure issues
- ☛ “Do Nothing” Biometrics Win

Atypical Market Development

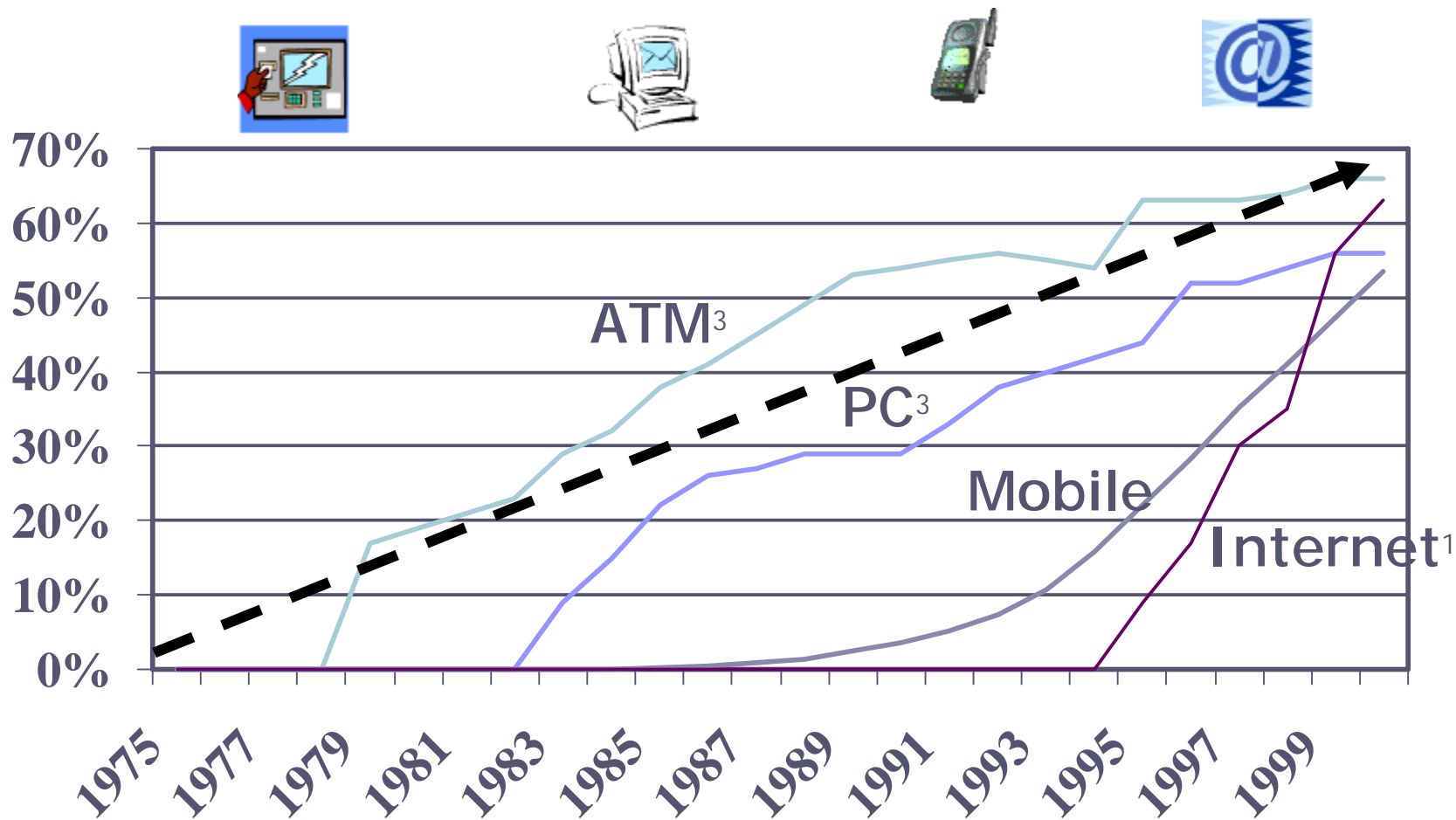
- ☛ Biometrics market not following typical path of disruptive technology adoption
 - ☐ Biometrics have been considered a disruptive innovation on the verge of breakthrough for an extended period of time
 - ☐ Breakthrough has not happened for several reasons.
 - Industry focus on incremental technology performance improvements while technology has not delivered on its promise in terms of capabilities
 - Solutions context has not been developed to leverage the capabilities that have been available
- ☛ Created new/atypical market development environment
 - ☐ *“Market Making” window passed; Market has been externally defined*
 - ☐ Biometrics as a class of disruptive or discontinuous technology has not moved completely through its revolutionary market development cycle and yet is now undergoing significant evolutionary or continuous innovation

Technology Adoption Lifecycle Redux

Classic Technology Adoption Lifecycle



Historical Adoption Rates

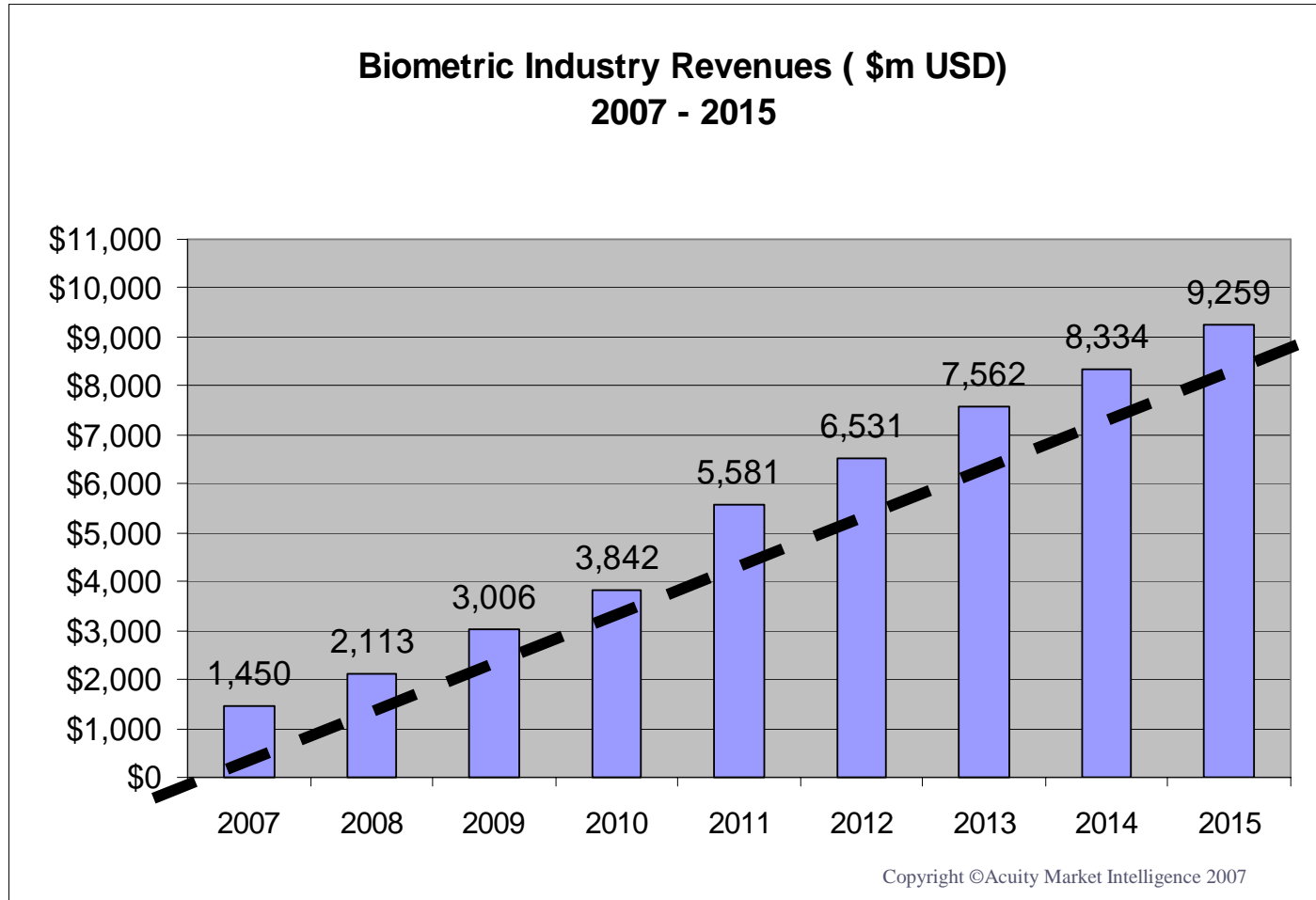


Adoption

- ☛ Clear momentum BUT market growth will be linear not the exponential growth most readily associated with disruptive innovation
- ☛ Steady and Sustained Adoption Through 2020
 - ☐ NO Explosive Growth – No “Tornado”
 - ☐ Biometrics adoption will mimic the growth curve of ATMS, which achieved nearly 70% adoption through linear growth over 20 years NOT typical “hockey stick” growth curve of innovations such as mobile phones or the Internet
- ☛ System Integrators **WAIT** for Demand Creation
 - ☐ Vendors **MUST take responsibility** for creating “Whole Product Solutions”
- ☛ Biometric Selection Criteria
 - ☐ No One Is Looking for Biometrics Per Se
 - ☐ Requires **Solutions** to “**Business Killers**”

Perspective

Biometric Market Growth



Market Evolution

Today



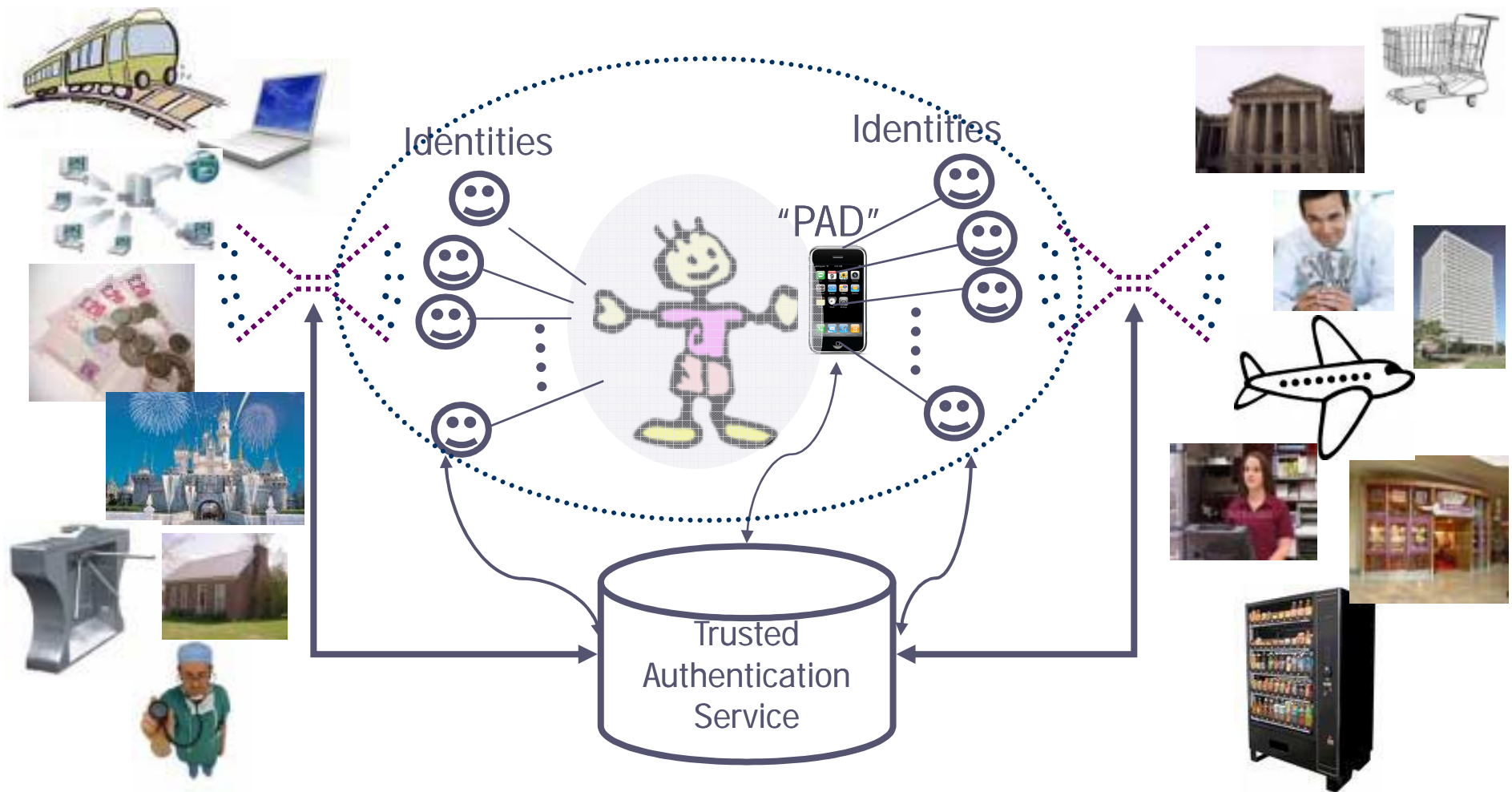
Tomorrow

Limited Deployment
Expensive
Awkward
Bulky Capture Devices
Mediocre User Experience
Algorithm Dependency
Limited Distance
Proactive Subject Positioning
"High End" Applications
Minimal Solutions Capability

Ubiquitous
Low Cost/High Performance
Flexible Form Factors
Embedded Capture Devices
Algorithm Agnostic
Broad Distance Range
Personal Device Integration
Passive Subject Acquiring
Solutions Portfolio
Consumer Control
Citizen vs Consumer Use

The Future: Personal Identity Ownership

Evolution toward transactions - info & financial - inevitable



Phased Market Development Path

- ☛ The Market Development Path can best be understood in terms of distinct market phases defined by solution and infrastructure milestones rather than technology or systems evolution.
 - ☐ Phase I: Biometrics are proven effective in well-defined, single purpose, autonomous applications
 - ☐ Phase II: Biometric Integration: Fused Biometrics, Multidimensional Identification, Linked Systems
 - ☐ Phase III: Anonymous, Privacy Enhancing Biometrics
 - ☐ Phase IV: Biometrically enabled Transaction Infrastructure

Market Development Phase I

Biometrics are proven effective in well-defined, single purpose, autonomous applications

- ☞ This is where we are today.
- ☞ From time and attendance and access control to document credentialing – passports, ID cards – and background checks, a range of biometric technologies have been efficiently and cost effectively deployed to solve specific identification and authentication problems.
- ☞ Biometrics are also now being widely deployed in personal devices such as laptop PCs and mobile phone and PDAs.
 - ☐ Though they are not being widely used in these devices – except in the Asian markets – this lays the infrastructure groundwork to support future market expansion.

Market Development Phase II

Biometric Integration: Fused Biometrics, Multidimensional Identification, Linked Systems

- ☛ The next level of breakthrough will be about making biometrics work in broader identification solutions contexts. This includes:
 - ☐ Merging multiple biometrics to produce fused identification results for high security applications.
 - ☐ Effectively incorporating various techniques and methods to produce multidimensional identification profiles based on any combination of biometrics, biographic, body marks, profiled behaviors, events, etc.
 - ☐ Developing integration capabilities that allow two or more biometric based systems to securely and anonymously share identification information including those accessed by personal devices such as PDAs.
- ☛ This is just beginning now and will absorb significant market resources for at least three to six years, perhaps longer given the grim economic outlook.

Market Development Phase III

Anonymous, Privacy Enhancing Biometrics

- ☛ Coincident with, but slightly trailing Phase II development, will be the development of core technology, solutions, and systems based methods for safeguarding the use of biometric information.
- ☛ It is likely that in early Phase II development, serious real and/or potential security breaches will threaten expanded use of biometrics.
- ☛ \Without aggressive, proactive, measures to create built in fail-safes at all levels of deployment – technology, solutions, and integrated systems - fear and public pressure may derail market expansion and even curtail growth of existing biometric based applications.

Market Development Phase IV

Biometrically enabled Transaction Infrastructure

- ☛ Finally, the *Holy Grail* for biometrics: mainstream transaction based capabilities.
- ☛ Biometric authentication will be routinely integrated into daily activities that required access to information or financial resources.
- ☛ From global financial institutions confirming asset transfers, to personal mortgage payments via mobile phones, from emergency requests for medical histories to consumers updating their health profiles, in the next seven to ten years biometrics will become invisibly routine enabling a host of secure, private, and user controlled transaction.

Moving Forward

Biometrics Inevitability

There is no question that as this market evolves, so too will the capabilities and performance of existing and new biometric technologies. However, it is safe to say *that the industry has passed the threshold of having to prove that the technology works* (albeit after a somewhat checkered past). The focus going forward will be on creating the ecosystem that not only allows, but actually requires that biometrics thrive.

"Biometrics: Roadmap to Ubiquity" - Acuity Market Intelligence, Nov 2008

Strategic Opportunity

- ☛ Deliver on the promise of biometrics by providing working solutions to real problems - *Biometrics that actually work*
 - ☐ Industry has legacy of undelivered promises, claiming “revolution” or “paradigm shift” is risky.
 - ☐ Rather than taking the mantle of champion of disruptive innovation, focus on providing the evolution that *delivers on the promise of biometrics* rather than introducing another revolutionary leap from a tenuous technology platform that many believe is unproven.
- ☛ Simultaneously manage progress towards expansion into large looming opportunities while rigorously, systematically addressing immediate market needs
 - ☐ Establish the near-term market penetration platform from which large-scale market development efforts can be launched
 - ☐ Focus on Phased Implementation for Near, Medium and Long range
- ☛ **Evolution NOT Revolution**

The Bottom Line

- ☛ **The Fantasy:** The longed for single, monumental event that will propel biometrics to “Tornado” status is a pipedream
- ☛ **The Reality:** All constituents must make the transition from *survival-mode* based operations to long-term strategic thinking that addresses fundamental issues associated with the development of identity-centric IT
- ☛ **The Challenge:** Develop a strategic framework to assess and prioritize short-term opportunities/requirements within the context of building a highly leveragable strategy that focuses on the long-term capabilities/demands of biometrically enabled IT.

This requires vision, commitment, and strategic flexibility.



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