



Biometrics Tutorial - Part II

Biometrics Market Development: Opportunities, Applications & Deployments

SpeechTek
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Agenda

- ☞ **Who am I? Acuity Market Intelligence**
- ☞ **Emerging-Tech Market Development Model**
- ☞ **State of The Market**
- ☞ **Opportunities & Applications**
- ☞ **Vertical Industry Analysis: Financial Services**
- ☞ **Deployments Review**
- ☞ **Adoption and Deployment Issues**
- ☞ **Where Does Voice Fit?**
- ☞ **Biometrics Today and Tomorrow**



bridges the gap between information & insight

Acuity Market Intelligence cuts through the clutter of information overload to provide *technology-neutral* and *vendor-independent* insight, analysis and solutions assessment for emerging technology markets.

Markets **Biometrics, ID Management, Authentication**

Clients **Vendors, Integrators, End Users**

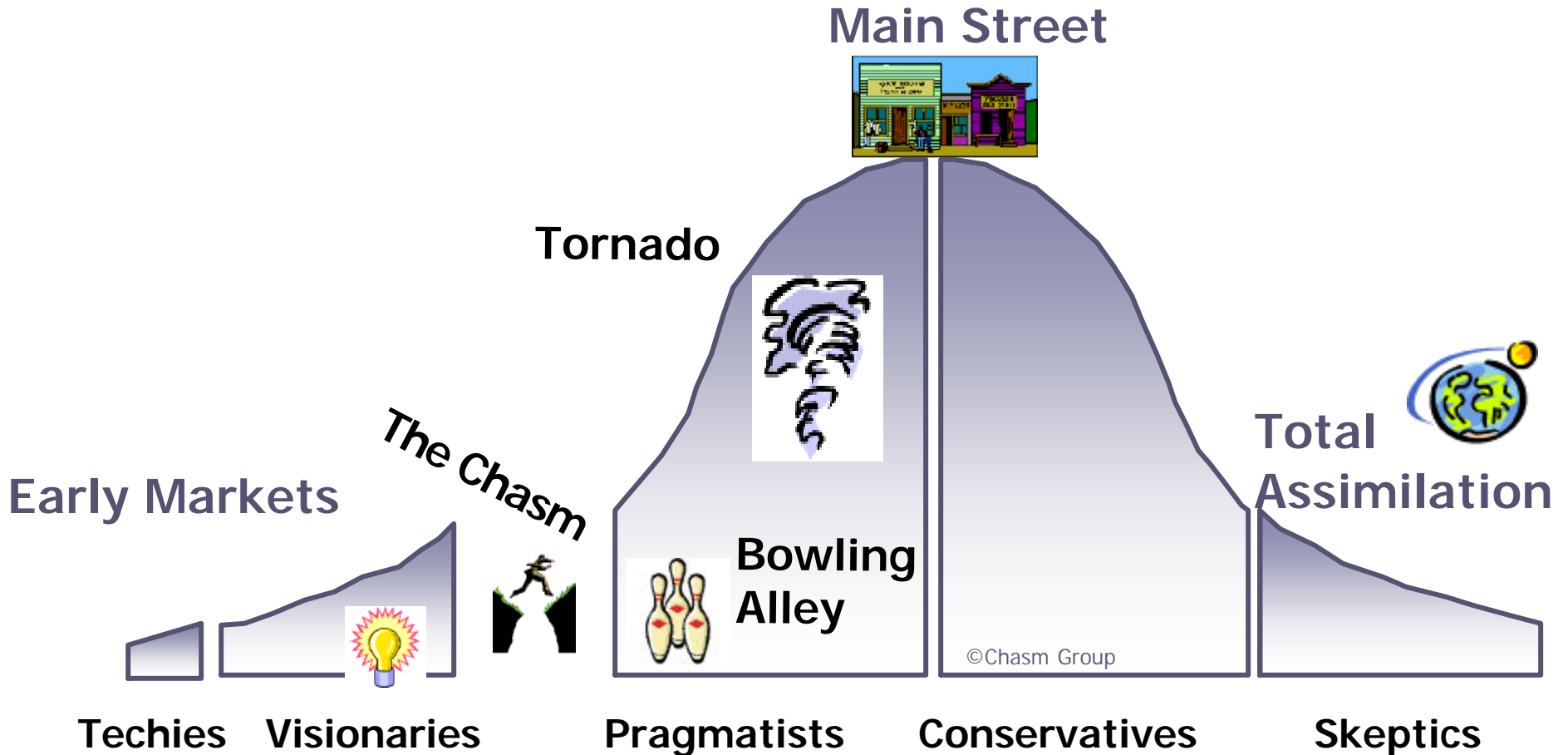
Authentec, Ball Aerospace, Biocom, Booz Allen Hamilton ,
CIA, CIC, Datastrip, DOD, Digital Persona, Digimarc , ETRI,
IBM GS, Imagis, Identix, Morpheus, , NIST, TASC, On Guard
Plus, PingID, SAFLINK, SAGEM, SoftPro, TI, Ultra-Scan

Services **Executive Briefings, Consulting, Segment
Tracking, Reports, Research, Workshops**

Expertise **Opportunity Identification & Sizing
Targeted Vertical Solutions Analysis
Technology Adoption & Deployment Evaluations
Sustainable Market Dominance Strategies**

Market Development Model

Transitions Are Not Smooth



Adoption Groups

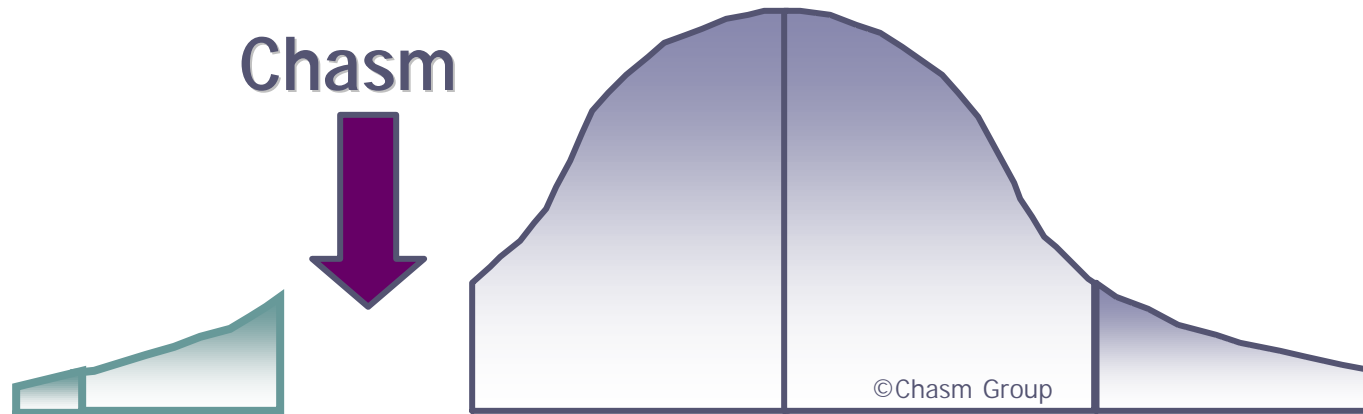
	Motivation	Characteristics	Challenges
Technology Enthusiasts	Enamored of Technology	Alpha Testers Ignore What's Missing	Access to Techies No-Profit Pricing
Visionaries	Competitive Advantage via Revolution	Strategic Imaginations High-risk/High Reward Not Price Sensitive	Rapid Time-To-Market Customization
Pragmatists	Productivity Improvement via Evolution	Understand Tradeoffs Proven Applications Market Leaders	Trusted References Production Solution
Conservatives	Avoid Competitive Disadvantage	Risk Averse Price Sensitive Prefer Single Advisor	Complete Solution
Skeptics	Maintain Status Quo	Debunk Market Hype Contrarian Block New Technology	Not A Customer Opposition to Early Adoption

Early Market Success

- Breakthrough technology product that enables a new and compelling application.
- Technology enthusiast who can evaluate and appreciate the superiority of the product over current alternatives.
- Well-healed visionary who can foresee an order-of-magnitude improvement from implementing the new applications.

- Geoffrey Moore

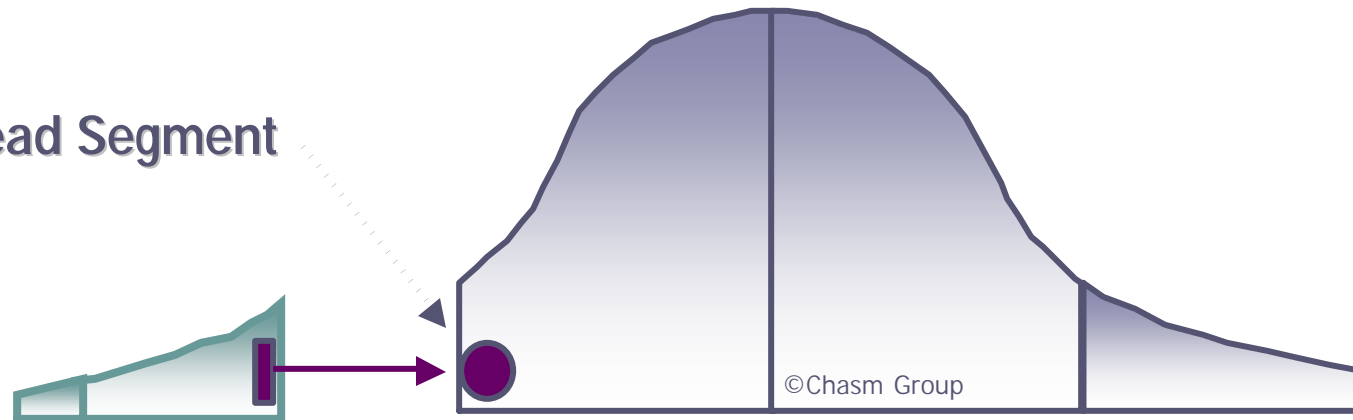
In The Chasm



- ❏ Visionaries Abandon Category
 - ❏ Too Late to Be First
 - ❏ Too Easy For Followers To Catch Up
- ❏ Pragmatist No Reason To Start
 - ❏ *The GATEKEEPERS*
 - ❏ Too Early For Anything To Be In Production
 - ❏ NO Trusted References
- ❏ Growth Recedes
- ❏ Funding In Wait and See Lull

Crossing The Chasm

Beachhead Segment

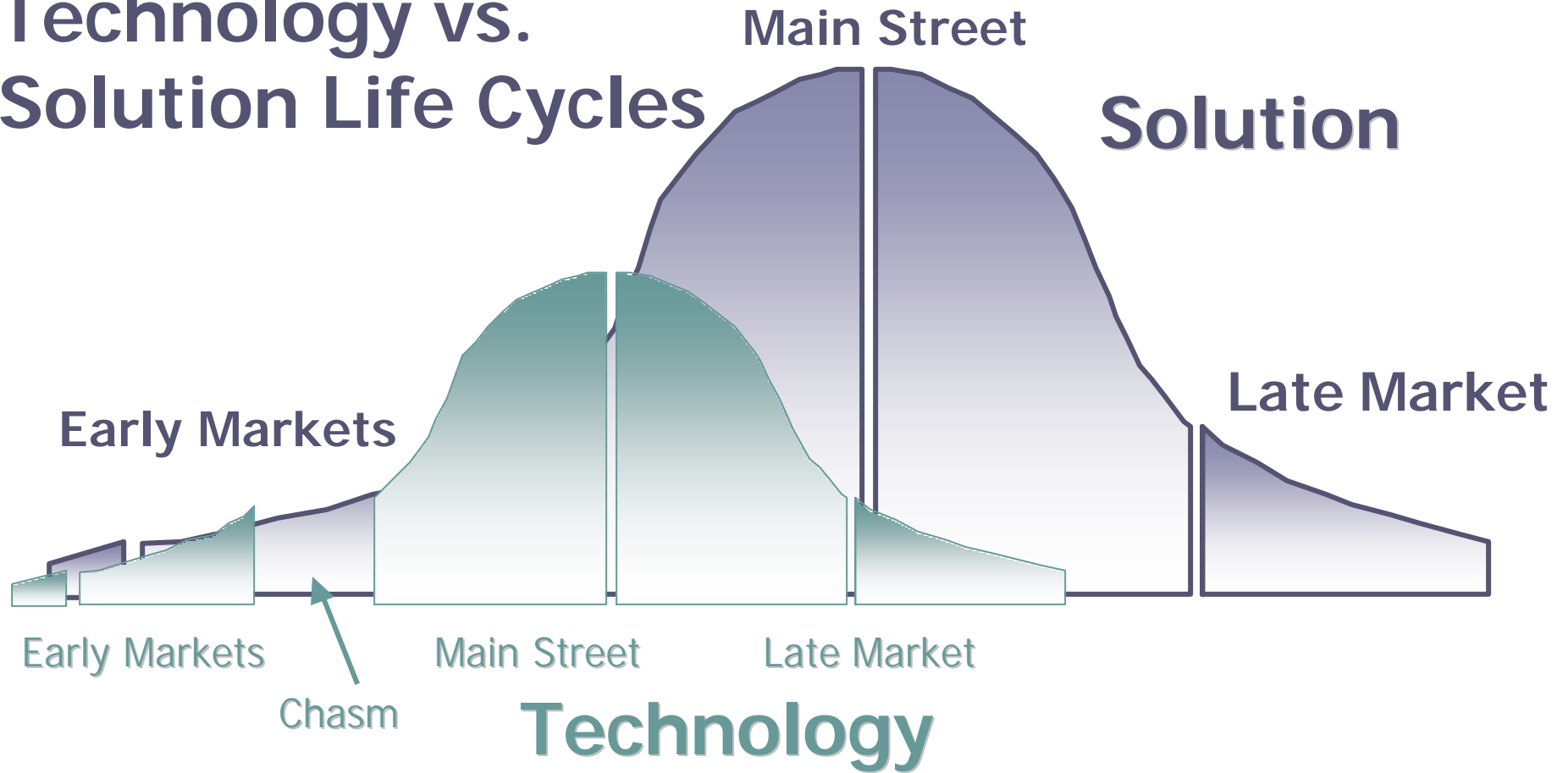


- 80% of many Solutions & 100% of None: Pragmatists Don't Buy 80%
- Pragmatists Adopt Because of Sever Pain, Broken Process
- Conventional Approach is Fatal
 - Commit to Most Common Enhancements
- Counterintuitive Approach Leads To Success
 - Focus on a Single Customer Segment
- Shift From Technology/Product to Market/Solution
- Solve Niche Market Problem
 - Unique to Segment
 - Difficult to Solve
 - Significant Economic Impact

Solution Adoption Life Cycle

For enabling technologies like biometrics, the Solution Adoption Lifecycle hits the Tornado as the Technology Adoption Lifecycle peaks in the Mainstream Markets.

Technology vs. Solution Life Cycles



Markets Are Self Selecting

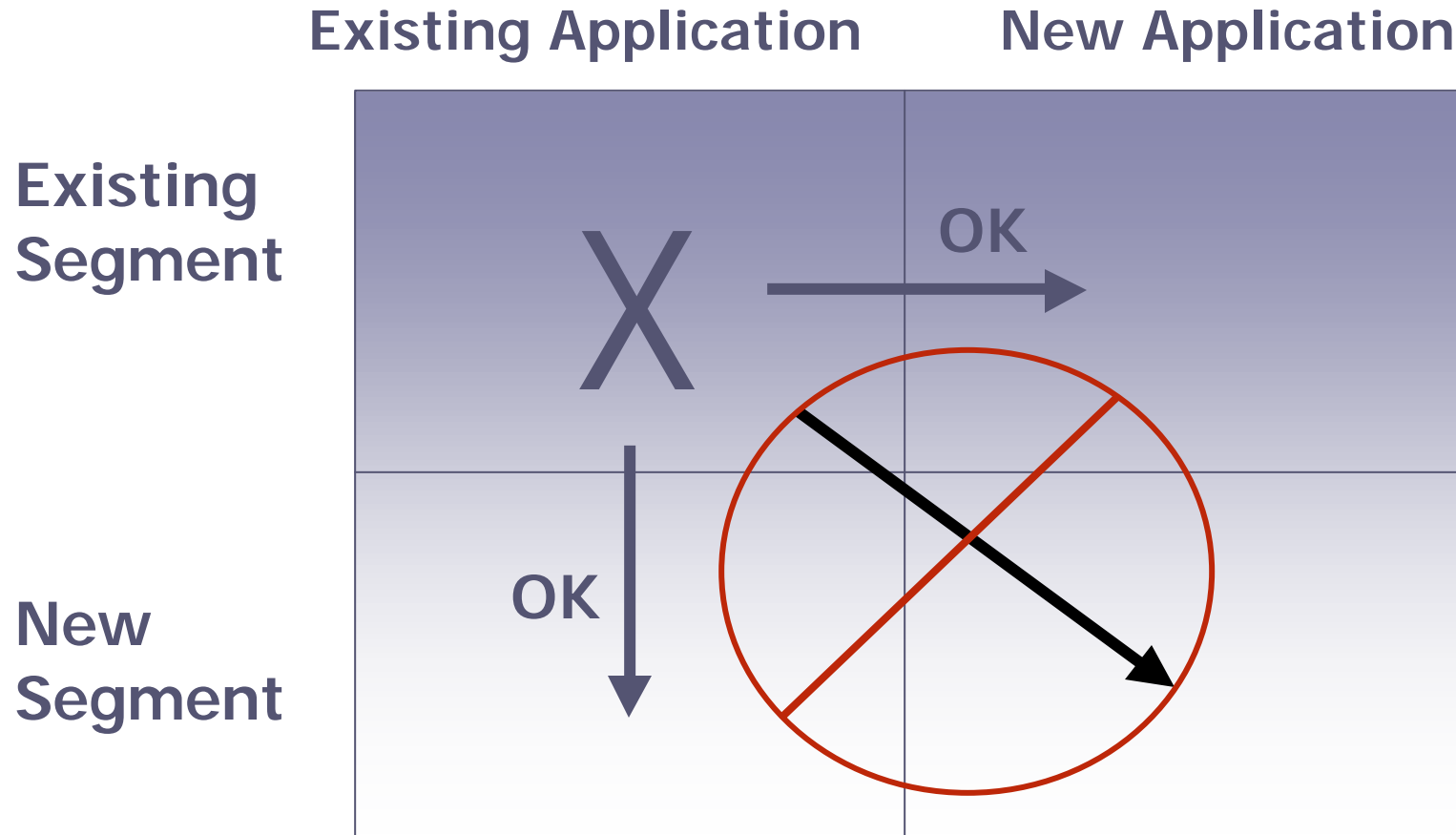
Market:

- a set of actual or potential customers
- for a given set of products or services
- who have a common set of needs or wants, and
- who reference each other when making buying decisions

Two individuals/organizations buying the same product for the same reason that have no way to reference each other are not part of the same market.

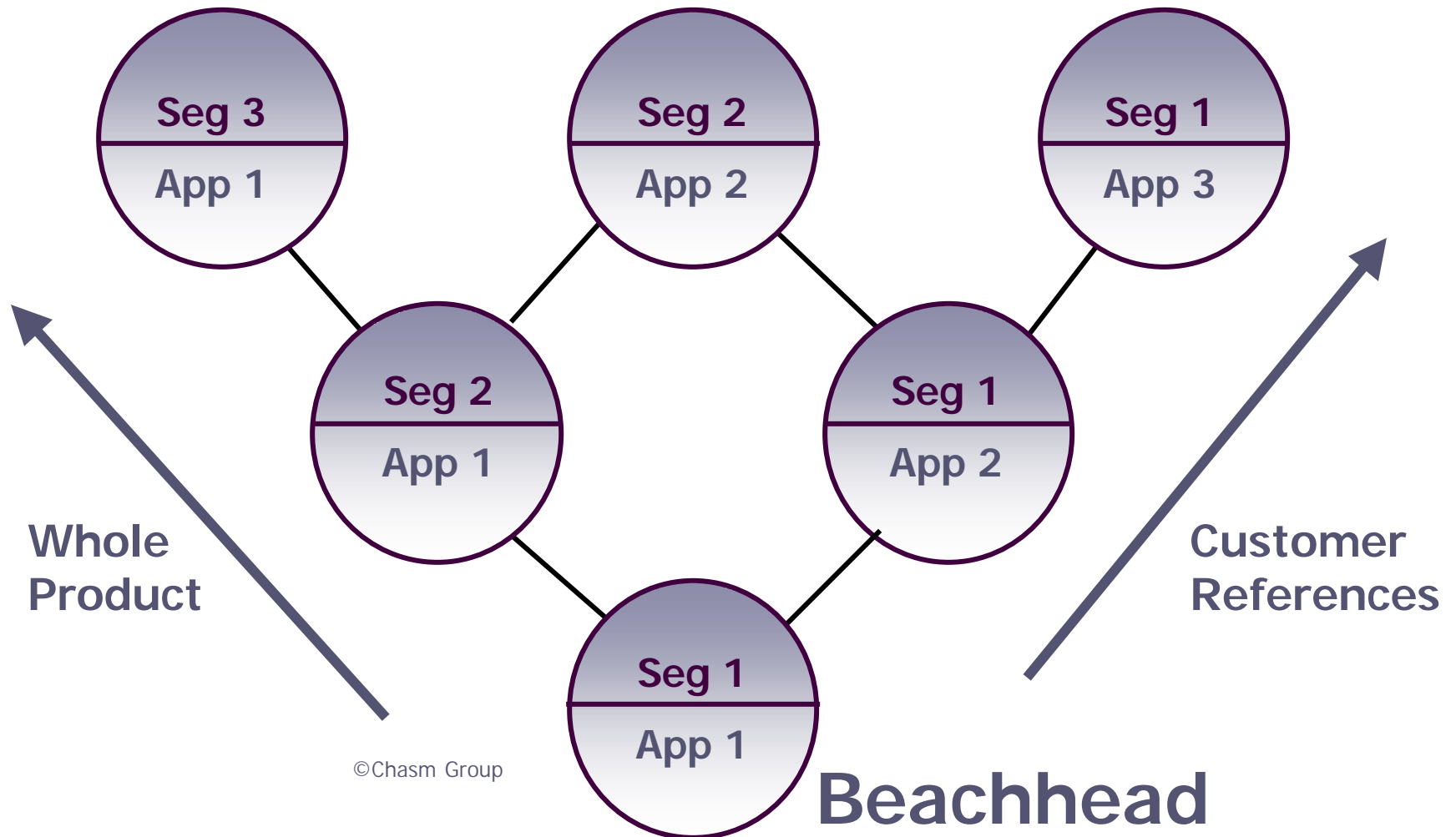
Chasm Group©

Niche Market Penetration



Bowling Alley

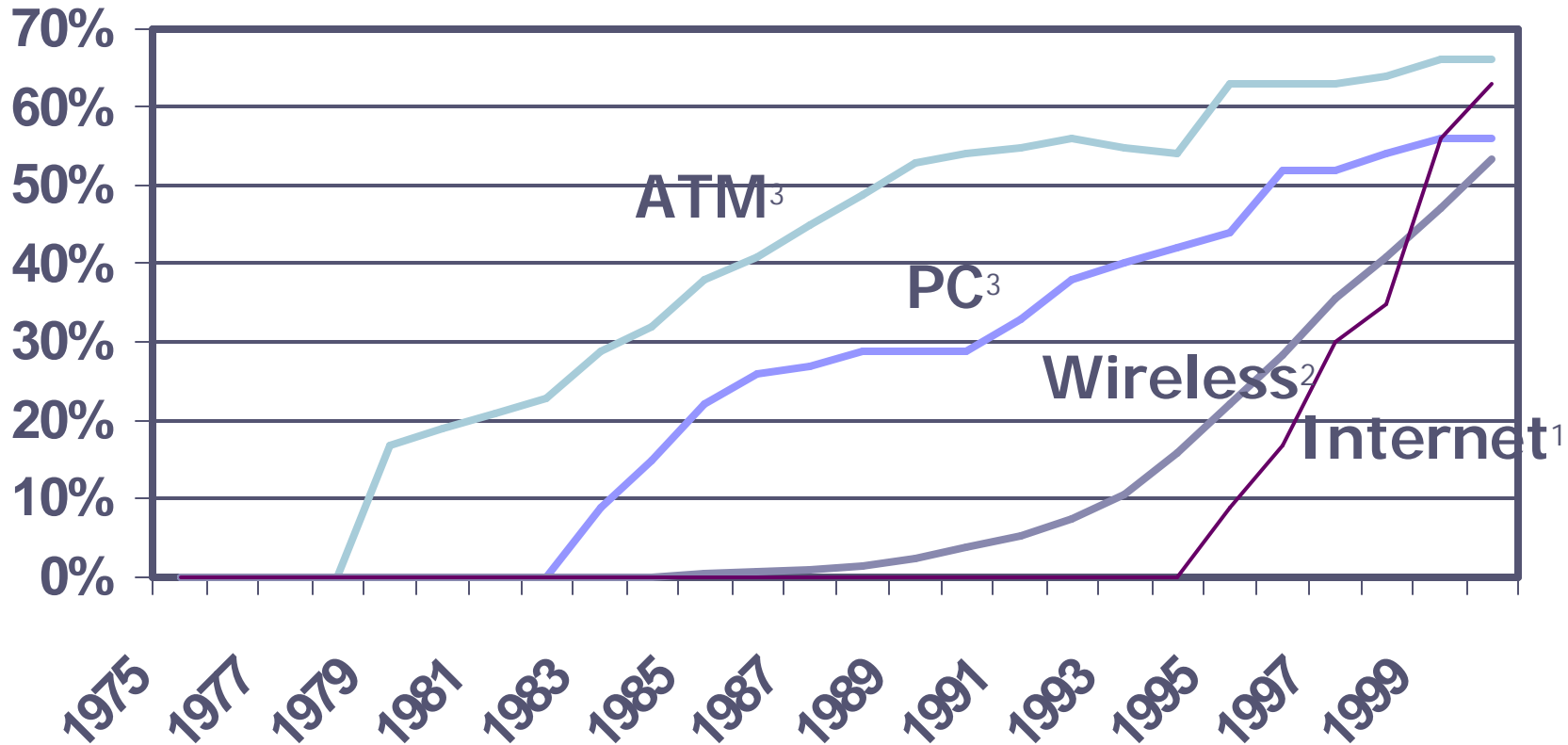
Leveraged Market Development



Biometrics: State of the Market

- ☞ World Economics/Geopolitics
- ☞ Post-Dot Com IT Paralysis
- ☞ Emerging From Realm of "Technology Jocks"
- ☞ Post 9/11 *Slow Security Industry Growth*
- ☞ Market Creation Development Phase
- ☞ Adoption Demands ROI
- ☞ Solutions NOT Technology
- ☞ Price/Performance Curves Dropping
- ☞ Reliability Improving
- ☞ Innovation From The Private Sector
- ☞ Small Scale Successes Build Credibility & Momentum
- ☞ Partnerships/Relationships are Fluid
- ☞ No Market Leaders

Historical Adoption Rates*



1 US Adults online - Harris Interactive, 11/01

2 % Penetration - Frost & Sullivan 9/99

3 penetration of US households - 15K+ income Synergistics 10/0

*US DATA

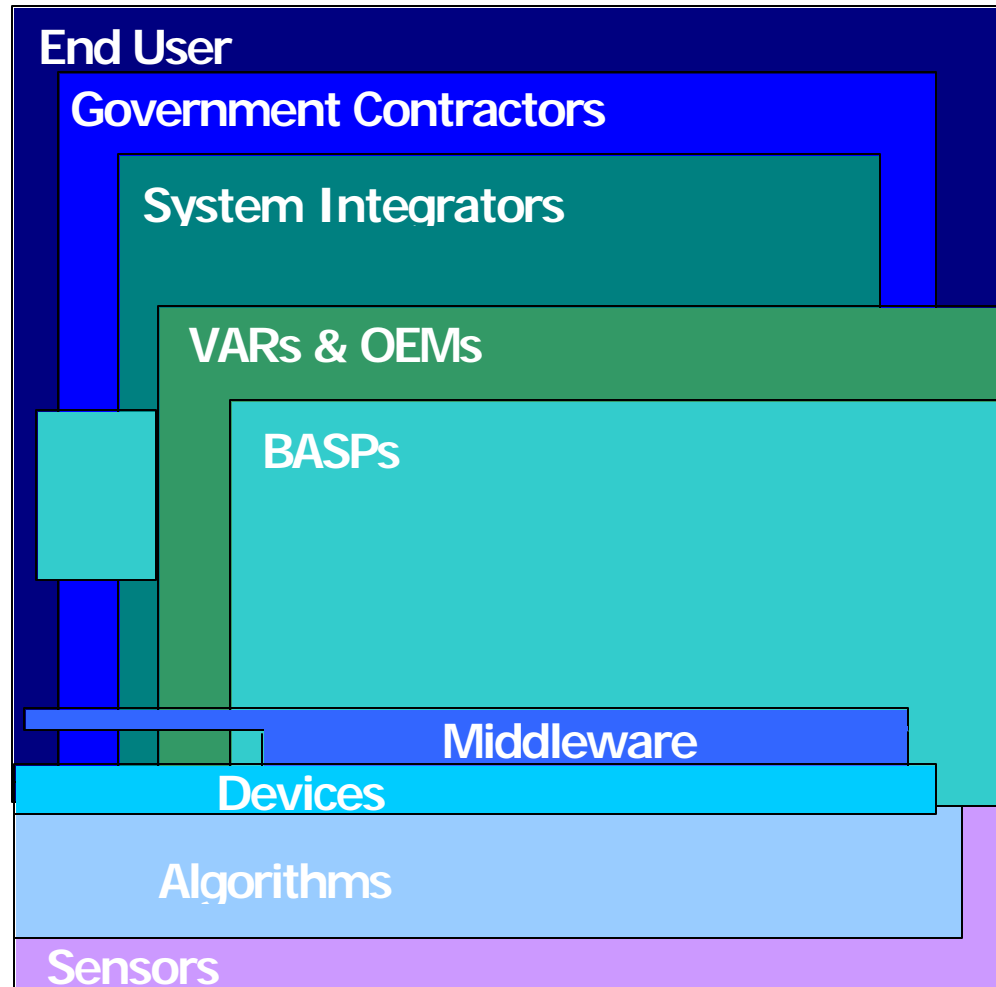
Emerging Market Evolution

Success Depends on Shifting Approach



- ☞ Solving Problems to Significant *Points of Pain*
- ☞ Solutions Focus Drives Market Penetration
- ☞ Demonstrable ROI is REQUIRED
- ☞ Proactive Market Development – *Market Making*
 - Targeted Nice Markets
 - *Whole Product Solutions*
 - Leveraged Penetration Strategies

Biometrics Market Map



Identifying Opportunities Alternative Views

Mainstream

Acuity

	Mainstream	Acuity
Revenue Drivers	Security, Compliance	ROI/Business Process Improvement
Market Forecasts	Core Technology: Sensors, HW, Algorithms	Solutions Potential: Targeted Core Technology & Integration. Support & Maintenance
Top Players	Established Technology Vendors	Emerging Solutions Providers
Leading Verticals	Government: Borders, Military Transportation: Airports Financial Services: Largest Banks & Credit Card Companies Healthcare: Large Facilities	Financial Services: <i>Aggressive</i> Technology Adopter Banks and Credit Card companies Transportation: Maritime Cargo Government: Admin eGov

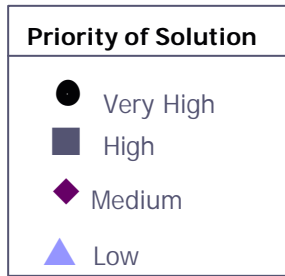
Identifying Opportunities Alternative Views

Mainstream

Acuity

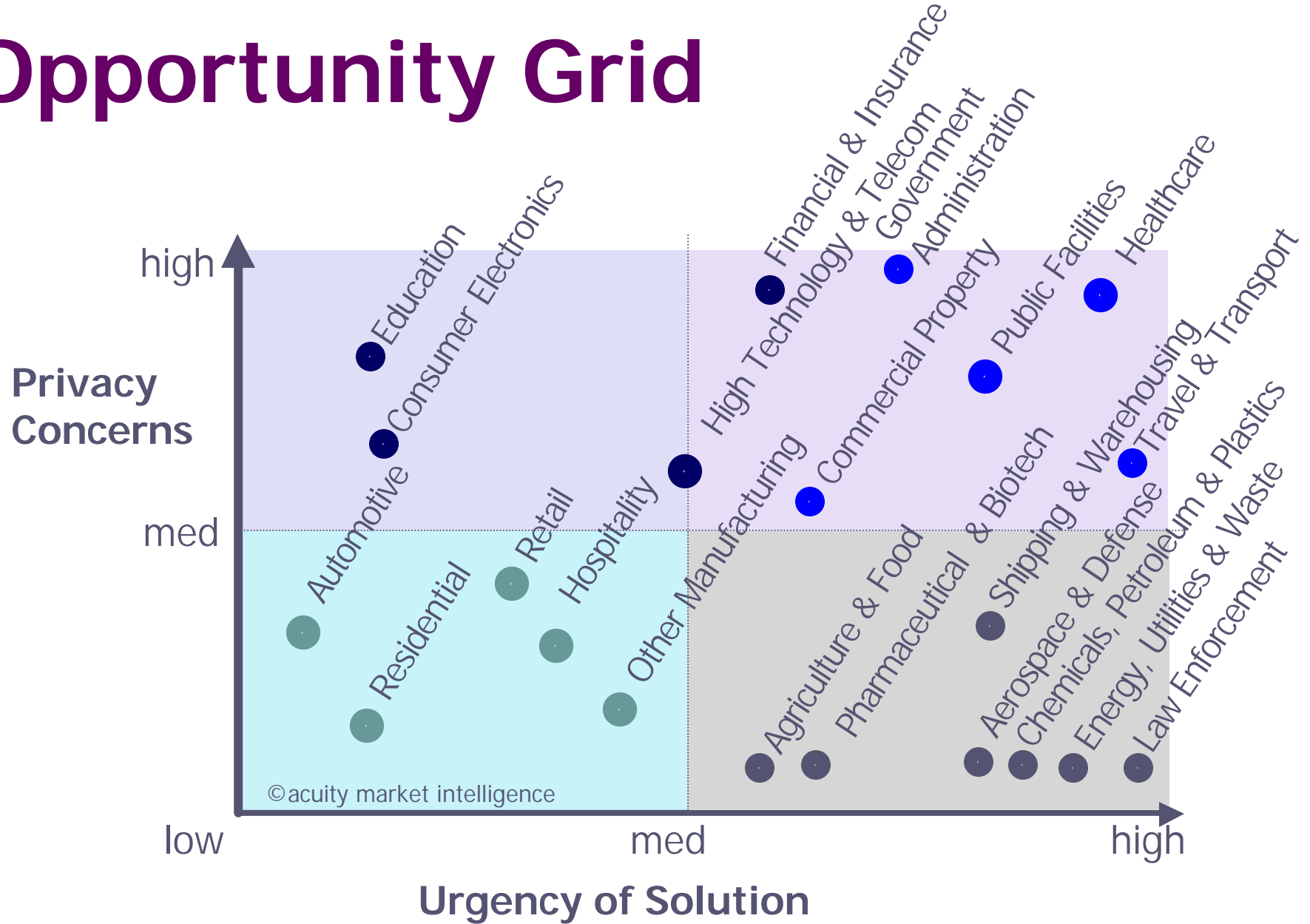
	Mainstream	Acuity
Problems to Solve	Security, Security, Security	Visibility: ID Management, ID Fraud, Supply Chain Biz Process: Paperwork Reduction, Process Efficiency, Disaster Recovery
Key Applications	Physical Access: Facilities Logical Access: Networks	Logical Access: SSO, Federated ID, Transactions – Information & Financial, fixed and wireless
Leading Technologies	Finger, Face, Iris	Voice, Signature, Emerging

Vertical Segmentation



	Government Administration	Law Enforcement	Aerospace & Defense	Financial & Defense	Healthcare	Hospitality	Public Facilities	Travel & Transportation	Shipping & Warehousing	Energy, Utilities & Waste	Chemicals, Petroleum & Plastics	Pharmaceutical & Biotech	Agriculture & Food	Education	High Technology & Telecom	Other Manufacturing	Commercial Property	Retail	Automotive	Consumer Electronics	Residential
Physical Access	●	●	●	●	■	■	●	●	●	●	●	●	■	■	■	■	◆	▲	▲	▲	
Logical Access																					
Secure Data personal, corporate, public	●	●	●	●	●	■	■	●	●	●	●	●	■	●	■	■	◆	◆	◆	◆	
Financial Transactions POS, ATM, e-commerce, gov't disbursements	■	◆	◆	■	●	◆	◆	■	■	■	●	■	■	◆	◆	■	●	■	▲	■	◆
ID Confirmation Voter, Benefits, DMV, Drivers License background check	●	●	●	■	■	■	■	●	■	■	■	■	■	◆	◆	◆	■	▲	▲	▲	-
Time & Attendance	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	▲	◆	◆	▲	◆	▲	▲	-
Surveillance public & private	●	●	■	■	■	◆	●	●	■	●	●	●	●	■	◆	◆	■	■	▲	▲	▲

Opportunity Grid



FS Industry Sectors

Market Sector Matrix

by interaction mode

Priority of Solution	
●	Very High
■	High
◆	Medium
▲	Low

		Bank	Savings & Loans	Credit Union	Securities	Credit Card	Transaction Processing	Insurance	Mortgage
Branch/Office	Customer	■	■	■	◆	-	-	■	■
	Employee	●	●	●	●	●	●	●	●
ATM/Kiosk	Customer	■	■	■	◆	◆	-	-	-
	Employee	■	■	■	-	-	-	-	-
POS Terminal	Customer	-	-	-	-	●	●	-	-
	Employee	-	-	-	-	-	-	-	-
Electronic/Online	Customer	●	●	●	●	●	●	●	●
	Employee	●	●	●	●	●	●	●	●
Phone	Customer	●	■	●	●	■	-	■	◆
	Employee	◆	◆	◆	◆	■	▲	▲	◆

FS Market Segments

Application Matrix

Generalized Across Market Sectors

Priority of Solution	
●	Very High
■	High
◆	Medium
▲	Low

	Branch/ Office		ATM/Kiosk		POS Terminal		Electronic /Online		Phone	
	C*	E**	C	E	C	E	C	E	C	E
Physical Access	◆	■	-	●	-		-	-	-	-
Logical Access										
Secure Data personal, corporate, public	■	●	■	●	-	-	●	●	■	◆
Financial Transactions POS, ATM, e-commerce	■	●	■	●	●	-	●	●	■	◆
Identity Confirmation background check	■	●	-	-	-	-	-	-	-	-
Time & Attendance	-	◆	-	-	-	-	-	-	-	-
Surveillance public & private	■	■	■	■	-	-	-	-	■	■

*C = Customer, **E = Employee

FS Market Niches

Logical Access Applications

Generalized Across Market Sectors

Priority of Solution	
●	Very High
■	High
◆	Medium
▲	Low

	Branch/ Office		ATM/Kiosk		POS Terminal		Electronic /Online		Phone	
	C*	E**	C	E	C	E	C	E	C	E
Call Center	-	■	-	-	-	-	-	-	●	●
Pin/Password Reset	-	●	■	-	-	-	●	●	●	●
SSO	-	●	■	-	●	-	●	●	■	●
Transactions Order, Payment, Transfer, Deposit	●	●	●	-	●	-	●	●	●	●
Account Management Open, Close, Inquiries	●	■	◆	-	-	-	●	●	●	●
Records/Data Access Secure, Sensitive	●	■	■	●	-	-	●	●	●	●
Secure Device Access Laptops, Phones, PDAs,	-	■	-	●	-	-	●	●	-	-
Card Activation Credit, Phone	-	■	▲	-	◆	-	■	■	■	-

*C = Customer, **E = Employee

FS Technology/Application Grid

Select Logical Access Applications

Generalized Across Market Sectors

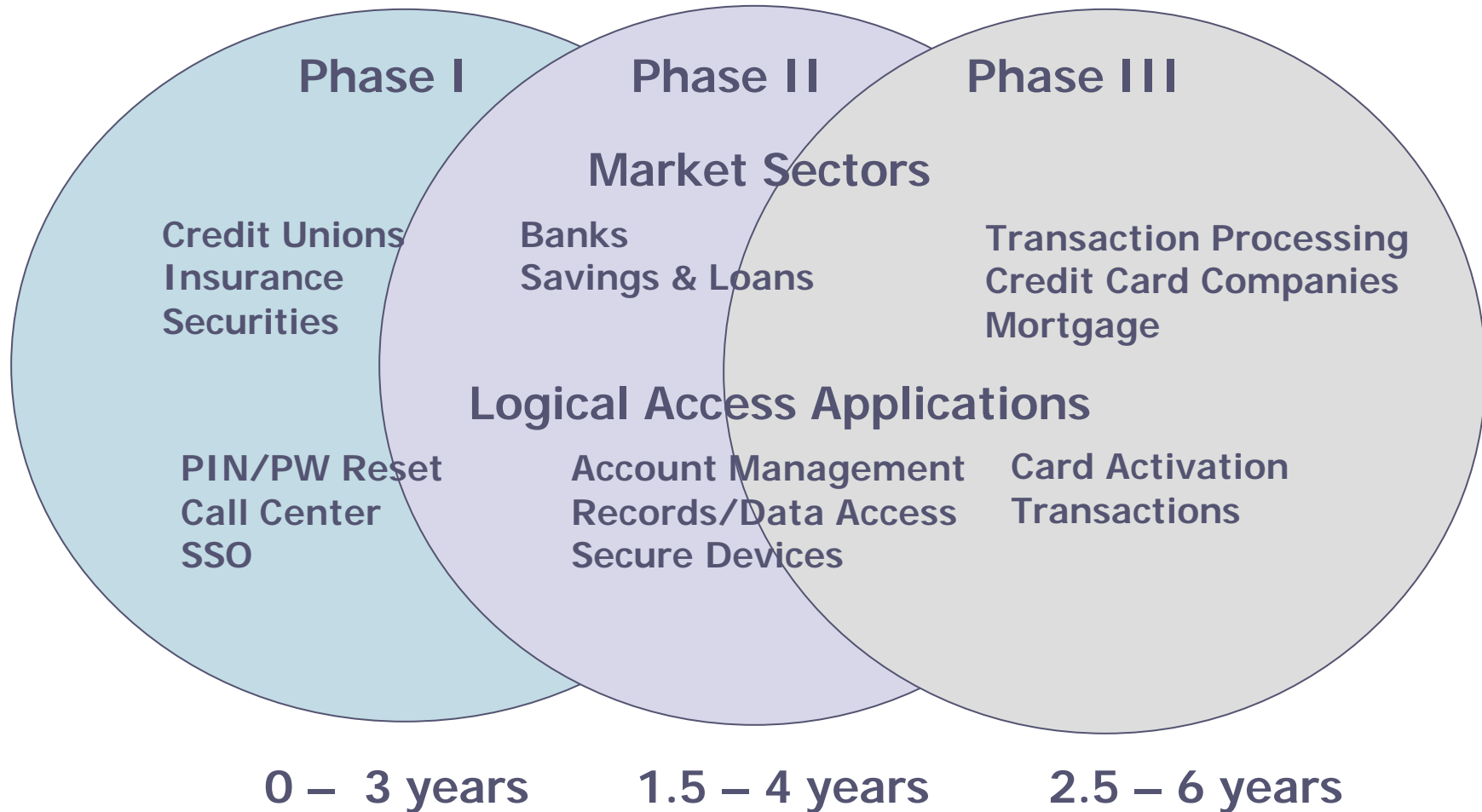
	Branch/ Office		ATM/Kiosk		POS Terminal		Electronic /Online		Phone	
	C*	E**	C	E	C	E	C	E	C	E
Data/Information										
Account Open/Close	F, I, S		F, I, FA				F, FA, I, S	F, FA, I	V, F, FA, I	
Applications	FI, I, S		F, I, FA				F, FA, I, S	F, FA, I	V, F, FA, I	
Records Access	FI, I, S	F, I	F, I, FA				F, FA, I, S	F, FA, I	V, F, FA, I	V, F, FA, I
Transactions										
Payments/Withdraw	F, I, S	F, I	F, I, FA		F, S		F, FA, I		V, F, FA, I	V, F, FA, I
Accounts	F, I, S		F, I, FA				F, FA, I		V, F, FA, I	
Securities Buy/Sell	F, I, S		F, I, FA				F, FA, I		V, F, FA, I	
Securities Mngmt	F, I, S	F, I	F, I, FA				F, FA, I	F, FA, I	V, F, FA, I	V, F, FA, I
Inter-bank Transfer	F, I, S	F, I	F, I, FA				F, FA, I	F, FA, I	V, F, FA, I	V, F, FA, I

*C = Customer **E = Employee

F=Finger F=Face I=Iris V=Voice S=Signature

FS Adoption Timeline

Sectors and Logical Access Applications



FS Sizing Example One

Transaction Processing

Global Payments (non cash) - 2000 & 2010

Volume of Transactions (Billions)				
	2000	2010	10% penetration	25 cents per transaciton
Europe	60.38	107.08	10.71	2.68
Americas	114.08	195.08	19.51	4.88
Asia	38.60	91.50	9.15	2.29
total	213.06	393.66	39.37	9.84

Value of Transactions (Billions)				
	2000	2010	10% penetrtration	.01% on Volume
Europe	383,800	676,700	67,670	6.77
Americas	720,000	1,104,000	110,400	11.04
Asia	372,900	535,300	53,530	5.35
total	1,476,700	2,316,000	231,600	23.16

Transaction Data - Boston Consulting Group, 2003

FS Sizing Example Two

Branch/Office – Employee - PIN/PW Reset

Financial Services Industry Employment (US)						
US (2000)	Total Firms	Total Employees	500+ Firms	500+ Employees	Employee Type	% of Total
Industry	227,034	5,963,426	1,630	4,059,152		
					Tellers	
Banking	7,594	1,492,834	276	1,118,273	326,760	21.89%
Credit Unions	9,417	192,227	37	17,855	57,620	29.97%
					Sales Agent	
Securities	43,665	866,222	599	611,431	161,410	18.63%
Insurance	123,234	800,979	472	203,959	132,180	16.50%

Data - US Census Bureau, US Bureau Labor Statistics

Revenue and ROI Calculation (US)						
Sector	Employee Type	Adoption Rate	Enrolled Employees	80% Success	Revenue \$100 per seat	Total ROI \$200 per seat
Banking	Teller	10%	149,283	119,427	\$14,928,340	\$23,885,344
Credit Unions	Teller	25%	48,050	38,440	\$3,844,000	\$7,688,000
Securities	Sales	15%	129,930	103,944	\$10,394,400	\$20,788,800
Insurance	Sales	20%	160,180	128,144	\$12,814,400	\$25,628,800

Deployments

Application	Customer	Country	Vendor	Biometric
Border Contort	Immigration	Israel	Recognition Systems	Hnad
Account Access	First Direct Bank	Israel	Persay	Voice
Surveillance - Non Coop	Casinos	Las Vegas, Atlantic City	Biometrica (Viisage)	Face
PIN/Password Reset	Banco Bradesco	Brazil	Nuance	Voice
Border Control	Schiphol Airport	Netherlands	Schiphol Group (Dartagnon)	Iris
PIN/Password Reset	Progressive Ins.	US	VoiceVault	Voice
Network, Records Access	St. Vincent's	Indianapolis	Saflink, AuthenTec	Finger
Call Center Processing	Union Pacific	US	SpeechWorks	Voice
POS	Kroegers	Texas	BAC	Finger
Monitoring Parolees	Home Office	UK	Nuance	Voice
Vault Access	First Tennessee Bank	Tennessee	Recognition Systems	Hand
Transactions	InTrust Bank	USA	T-NETIX (Speechworks)	Voice
Facility Access	American Express	NYC	Bioscrypt	Finger
Transactions	Buywayz	Ireland	VoiceVault	Voice
Identity Documents – IDs, Voter, Healthcare	Government Agencies	Worldwide	Sagem, Unisys, BioID, Identix, Digimarc, Datacard,	Finger, Face, Iris
70 total including Account Access, Applications,	Nationwide	UK	CIC, Florentis, Motion Touch	Signature

Adoption Issues

- ☞ Sluggish Economy
- ☞ IT as an Emerging Strategic Imperative
- ☞ Unrealistic Expectations - Infallibility
- ☞ Large Scale Systems Deployment
- ☞ Privacy & Legal Issues
- ☞ User Acceptance
- ☞ Enrollment
- ☞ TAL Model – Dragged into The Chasm
 - Too Late for Visionaries
 - Too Early for Mainstream Market

Deployment Issues

- ☞ Define Problem & *Value Appropriate* Solution
- ☞ Iterative Process - Test, Pilot, Deploy
- ☞ User Base Considerations: Size, Characteristics, Acceptance
- ☞ Enrollment & Education
- ☞ Environmental/Situational
- ☞ User Support
- ☞ Integrated ID Management
- ☞ Interoperability & Scalability
- ☞ Database Management, Control, Storage
- ☞ Privacy Concerns

Where Does Voice Fit?

- ☞ Familiar Voice-based Infrastructure
- ☞ Demonstrable Short-term ROI
 - Lower Costs, Increased Convenience
- ☞ Regulated Industry Compliance
 - Gramm-Leach-Bliley Act, Patriot Act
- ☞ Telecom Security Vulnerabilities
- ☞ Citizen and Consumer Identity Concerns
- ☞ SS & Identity Fraud/Theft Legislation
- ☞ Technology Works
- ☞ Focus on Convenience and Business Process
- ☞ High Levels of Consumer/User Acceptance

Biometrics Today...

- Biometrics Uniquely Offer : Cost, Control, Convenience, Compliance, Trust, Security, Non-repudiation
- Technology Performance is *Good Enough*
- Price/Performance Continues to Drop
- Transition - High Security to Regulated Industry & Commercial Solutions
- Small Closed Loop Applications - <50,000 users
- Government Public Safety Initiatives Slow Going
- Security Perceived Driver BUT Process Improvement & Operational Efficiency DRIVE ADOPTION

... And in the Near Future

- ☞ Networks Drive Business Process Improvement
- ☞ Identity is Central to Networked Infrastructure
- ☞ Interconnected Networks Radically Increase Accessibility and Visibility
- ☞ Ubiquitous Use in Commercial Enterprise
 - Physical & Logical Access, Identity Confirmation, Time & Attendance
- ☞ Large Scale Systems "Public Safety"
 - Transportation, Immigration & Border Control, Citizen Identification
- ☞ Integrated Account Management & Transactions
 - Financial Services, Telecom, Retail
- ☞ Legislative & Regulatory Control to Protect Privacy
- ☞ Morphing of Technologies Towards Generic Pattern Capture and Matching Algorithms



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