Trends in Digital Government

CENTER FOR DIGITAL GOVERNMENT

Cathilea Robinett

Exec. Vice President

Law and **Order**

None of Which Have Been Repealed … Yet.

- ✓ **Moore's Law**
- ✓ **Metcalf's Law**
- ✓ **McLuhan's Law**
- ✓ **Murphy's Law**

Moore's Law

Ever since the invention of the microprocessor, the performance of a microprocessor has been doubling every eighteen months.

Advances in basic physics and engineering have kept this law accurate for over five decades. The industry is trying to postpone the day of reckoning for at least 15 more years – perhaps to be replaced by nanotechnology, quantum dots or spintronics.

The experts look ahead

Cramming more components onto integrated circuits

With unit cost falling as the number of components per circuit rises, by 1975 economics may dictate squeezing as many as 65,000 components on a single silicon chip

By Gordon E. Moore

Director, Research and Development Laboratories, Fairchild Semiconductor division of Fairchild Camera and Instrument Corp.

The future of integrated electronics is the future of electronics itself. The advantages of integration will bring about a proliferation of electronics, pushing this science into many new areas.

Integrated circuits will lead to such wonders as home computers—or at least terminals connected to a central computer—automatic controls for automobiles, and personal portable communications equipment. The electronic wristwatch needs only a display to be feasible today.

But the biggest potential lies in the production of large systems. In telephone communications, integrated circuits in digital filters will separate channels on multiplex equipment. Integrated circuits will also switch telephone circuits and perform data processing.

Computers will be more powerful, and will be organized in completely different ways. For example, memories built of integrated electronics may be distributed throughout the machine instead of being concentrated in a central unit. In addition, the improved reliability made possible by integrated circuits will allow the construction of larger processing units. Machines similar to those in existence today will be built at lower costs and with faster turn-around.

Present and future

By integrated electronics, I mean all the various technologies which are referred to as microelectronics today as well as any additional ones that result in electronics functions supplied to the user as irreducible units. These technologies were first investigated in the late 1950's. The object was to miniaturize electronics equipment to include increasingly complex electronic functions in limited space with minimum weight. Several approaches evolved, including microassembly techniques for individual components, thin-film structures and semiconductor integrated circuits.

Each approach evolved rapidly and converged so that each borrowed techniques from another. Many researchers believe the way of the future to be a combination of the various approaches.

The author

Dr. Gordon E. Moore is one of the new breed of electronic engineers, educated in the physical sciences rather than in electronics. He earned a B.S. degree in chemistry from the University of California and a Ph.D. degree in physical chemistry from the California Institute of Technology. He was one of the founders of Fairchild Semiconductor and has been director of the research and development laboratories since 1959.

The advocates of semiconductor integrated circuitry are already using the improved characteristics of thin-film resistors by applying such films directly to an active semiconductor substrate. Those advocating a technology based upon film are developing sophisticated techniques for the attachment of active semiconductor devices to the passive film arrays.

Both approaches have worked well and are being used in equipment today.

Electronics, Volume 38, Number 8, April 19, 1965

(Paper: 1965)
(Phenomenon: 1955)

"It became an almost religious faith in human ingenuity and a belief in the future. It spoiled everyone into thinking that this would go on forever."

- Carver Mead, CIT, who coined the term Moore's Law

"The fact that materials are made of atoms will be a fundamental limit. We can't go smaller than that."

- Gordon Moore, Intel co-founder

Metcalf's **Law**

Metcalf's Law illustrates the power of networking. The value of a network scales as 2n, where n is the number of persons connected.

IN GOOD COMPANY

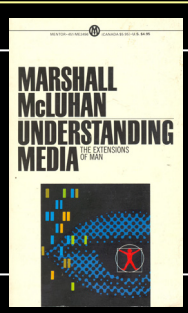
States are increasingly making deliberate policy and investment decisions to align service delivery with a converged future into which they intend to grow.

- ✓ State of Indiana
- ✓ Commonwealth of Kentucky
- ✓ State of Colorado
- ✓ Digital Dakota Network
- ✓ State of Maryland

That which comes through wires will go through the air….
That which comes through the air will go through wires.

- Nicholas Negroponte
Being Digital, 1995

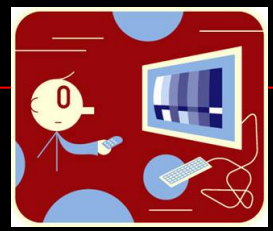
McLuhan's **Law**



In 1964, Marshall McLuhan declared networks were "the extensions of man." In 2004, wireless emerged as the obvious and inevitable extension of the network.

Newsweek

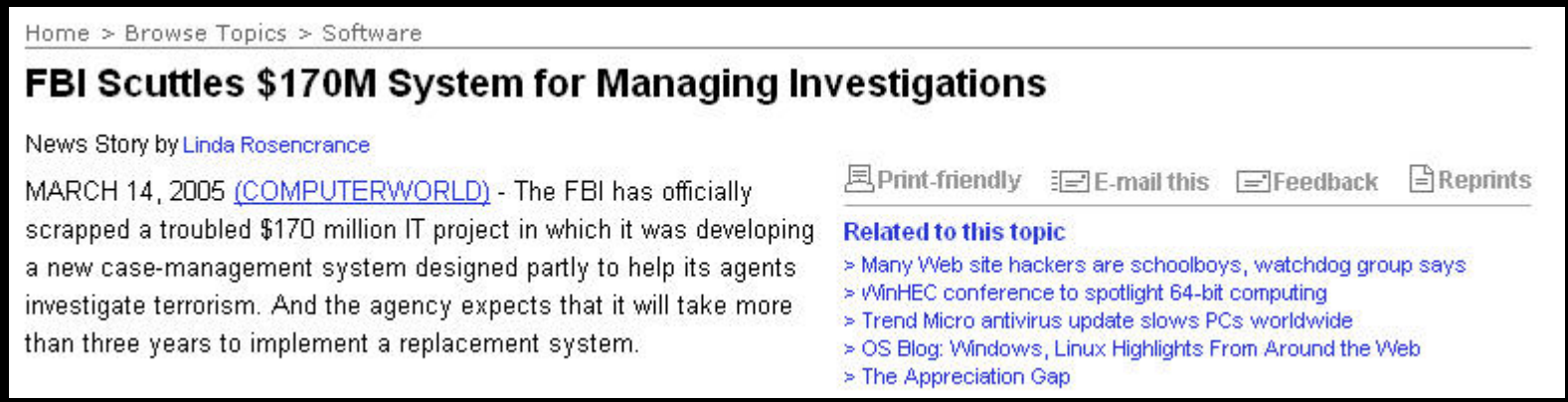
Only a few years ago people breathlessly uttered "convergence" as sort of a catchall mantra. It embodied the elusive idea that different media, including every variety of sound, image and data, could be served up together and consumed like a giant main-course salad, with fantastic benefits in the process. Now you rarely hear it, because the concept is so here and now that it would be like commenting on air.



Stephen Levy, Getting the Whole World in Your Hand, Jan 17, 05

Murphy's **Law**

If anything can go wrong, it will



Home > Browse Topics > Software

FBI Scuttles $170M System for Managing Investigations

News Story by Linda Rosencrance

MARCH 14, 2005 (COMPUTERWORLD) - The FBI has officially scrapped a troubled $170 million IT project in which it was developing a new case-management system designed partly to help its agents investigate terrorism. And the agency expects that it will take more than three years to implement a replacement system.

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Related to this topic

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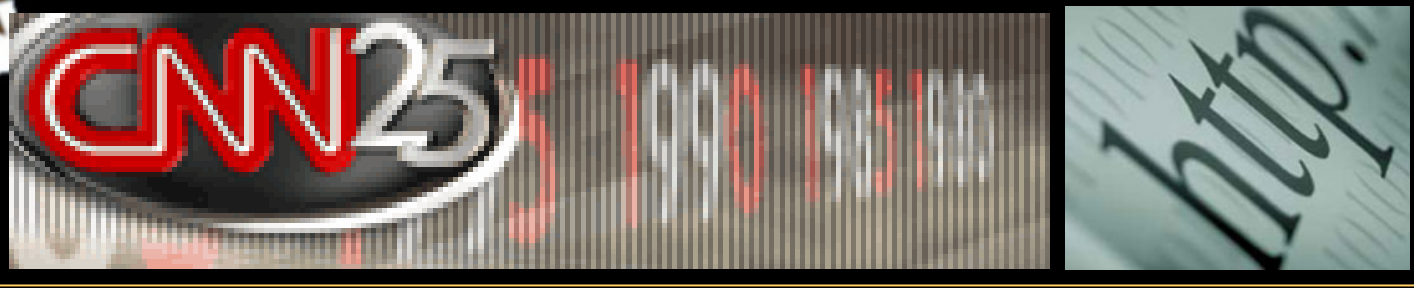
- ✓ Federal government is just larger, not unique
- ✓ States, and major universities, colleges, cities and counties, are spending tens of millions of taxpayer dollars without delivering value.
- ✓ Project Management Offices, ITIL and other initiatives are worthy pursuits but no substitute for Pre-Qualifying System Owners.

In The Last **Quarter Century**

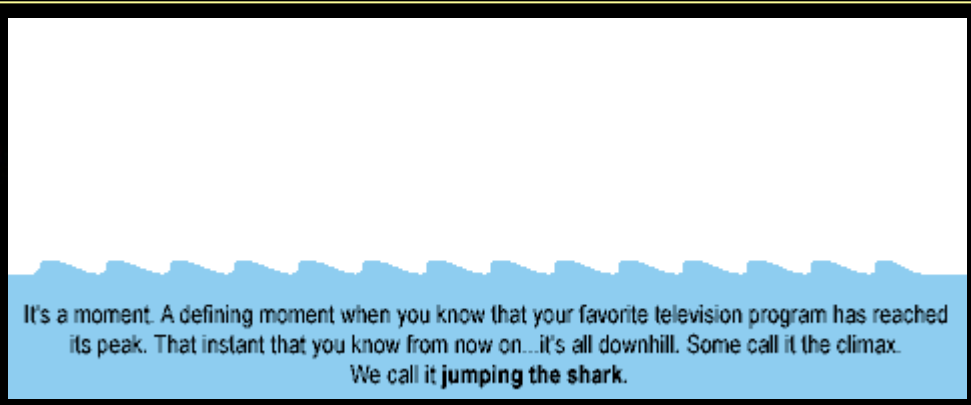


1. The Internet
2. Cell phone
3. Personal computers
4. Fiber optics
5. E-mail
6. Commercialized GPS
7. Portable computers
8. Memory storage discs
9. Consumer Digital Camera
10. Radio frequency ID tags
11. MEMS
12. DNA fingerprinting
13. Air bags
14. ATM
15. Advanced batteries
16. Hybrid car
17. Organic light-emitting diodes
18. Display panels
19. HDTV
20. Space shuttle
21. Nanotechnology
22. Flash memory
23. Voice mail
24. Modern hearing aids
25. Short Range, Hi-Freq Radio

*** Microelectromechanical system**

Criteria: "25 non-medically related technological innovations that have become widely used since 1980, are readily recognizable by most Americans, have had a direct and perceptible impact on our everyday lives, and/or could dramatically affect our lives in the future." identified by a panel of technology leaders assembled by the Lemelson-MIT Program (Source: CNN, January 18, 2005)

Plus Some **Shark Jumping...**



Five Near Misses in the History of Digital Government

1. Stand Alone Kiosks
2. Portal personalization
3. Attempts to re-architect the Internet by Legislative committee
4. Early data centers with glass walls to show off the big iron
5. Any and all projects over budget and past due

TODAY

Serving the **Digital Majority** *and the Field of Dreams*

The Digital Majority

Everybody

All US Households

Any **~75%**

Broadband **51%**

Source: Jupiter Jul 04/Ipsos-Reid Nov 04. Neilson-NetRatings, Nov 04,In-Stat, Apr 20, 2005

Ethnicity

Now/ By 2007

Hispanic American **45/68%**

African American **45/69%**

Source: Jupiter Research/ Knowledge Networks/SRI, July 02 – July 04

- ✓ Nearly 84.3 million U.S. households had computers in 2004, a figure forecast to grow to nearly 95.7 million in 2009.
- ✓ In 2004, there were over 79.1 million Internet households, and by 2009, this figure will grow to over 92.1 million households.
- ✓ U.S. wireless subscribers will grow from 178.0 million in 2004 to 233.5 million in 2009.

Age

18+	61%
18-24	68%
25-34	71%
35-49	69%
50-54	67%
55-64	57%
65-74	36%
75+	16%

The All **Digital Society ?** Apparently Not …

Imagining the Internet

Elon University / Pew Internet & American Life Project

PREDICTION: By 2014, 90% of all Americans will go online from home via high-speed networks that are dramatically faster than today's high-speed networks.

52%
AGREE

"Only if the government subsidizes the great divide between the haves and the have-nots with respect to computers, computer training, and the cost of access."

"It will take longer to reach 90% unless this becomes a public-works project like the Interstate highways."

… Paging Ike, Call Your Service …

Source: Elon University/Pew Internet and American Life Project. January 2005.

Cell Phone **Texters**

Forget MTV, I Want My SMS…

Adult Americans with Cell Phones	**134 M**
Generation Y/ Millennials Who Text Message *Adults Ages 18 to 37*	**63%**
Generation X Who Text Message *Adults Ages 28 to 38*	**31%**
Baby Boomers Who Text Message *(18% among ages 40-49; only 13% among ages 50-58)*	**18%**

Source: Pew Internet & American Life Project, March 05

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Rise of the Natively Wireless

intel. Most Unwired Cities Survey

INAUGRAL - 2004

1) Portland, OR-Vancouver, WA
2) San Francisco-San Jose-Oakland, CA
3) Austin-San Marcos, TX
4) Seattle-Bellevue-Everett-Tacoma, WA
5) Orange County, CA
6) Washington, DC
7) San Diego, CA
8) Denver, CO
9) Ventura, CA
10) Boston, MA

SECOND ANNUAL - 2005

1. San Francisco-San Jose-Oakland, Calif.
2. Orange County, Calif.
3. Washington, D.C.
4. Austin-San Marcos, Texas
5. Portland, Ore Vancouver, Wash.
6. Seattle-Bellevue-Everett-Tacoma, Wash.
7. Bergen-Passaic, N.J.
8. Middlesex-Somerset-Hunterdon, N.J.
9. San Diego
10. Denver
11. Chicago
12. Sacramento, Calif.
13. Honolulu
14. Vallejo-Fairfield-Napa, Calif.
15. Minneapolis-St. Paul, Minn.
16. Atlanta
17. Boston
18. Ventura, Calif.
19. Monmouth-Ocean, N.J.
20. Colorado Springs, Colo.
21. Dallas-Fort Worth-Arlington, Texas
22. New Haven-Meriden, Conn.
23. Los Angeles-Long Beach, Calif.
24. New York City-Nassau-Suffolk, NY Newark, NJ
25. Salt Lake City-Ogden, Utah

State-of-the Digital States

CONSOLIDATION OF IT INFRASTRUCTURE

	PARTIAL	FULL
Service Management *Including provisioning and performance monitoring; maintaining quality of service, ensuring resiliency; data centers & server hosting environment*	65%	7%
Knowledge Resource Management *Including content management, business process automation, directory services, registries and repositories and digital archive*	30%	5%
Transport Management *Including local area network services; wide area network/ backbone service; message queuing, filtering, metering, routing and monitoring*	44%	26%
Security Services *Including identity management, encryption, access control, authentication and single sign-on, security infrastructure and defenses*	51%	7%
Shared Utilities *Including portals, e-mail services, calendaring and scheduling, payment services [bill presentment, i-checks, credit cards, ACH] and help desks*	65%	7%

Source: Center for Digital Government, 2005

State-of-the Digital Counties

CONSOLIDATION OF IT INFRASTRUCTURE

	PARTIAL	FULL
Service Management *Including provisioning and performance monitoring; maintaining quality of service, ensuring resiliency; data centers & server hosting environment*	18%	27%
Knowledge Resource Management *Including content management, business process automation, directory services, registries and repositories and digital archive*	20%	15%
Transport Management *Including local area network services; wide area network/ backbone service; message queuing, filtering, metering, routing and monitoring*	17%	37%
Security Services *Including identity management, encryption, access control, authentication and single sign-on, security infrastructure and defenses*	19%	28%
Shared Utilities *Including portals, e-mail services, calendaring and scheduling, payment services [bill presentment, i-checks, credit cards, ACH] and help desks*	21%	28%

Source: Center for Digital Government, 2005

State-of-the Digital Cities

CONSOLIDATION OF IT INFRASTRUCTURE

	PARTIAL	FULL
Service Management *Including provisioning and performance monitoring; maintaining quality of service, ensuring resiliency; data centers & server hosting environment*	20%	35%
Knowledge Resource Management *Including content management, business process automation, directory services, registries and repositories and digital archive*	22%	22%
Transport Management *Including local area network services; wide area network/ backbone service; message queuing, filtering, metering, routing and monitoring*	13%	48%
Security Services *Including identity management, encryption, access control, authentication and single sign-on, security infrastructure and defenses*	19%	32%
Shared Utilities *Including portals, e-mail services, calendaring and scheduling, payment services [bill presentment, i-checks, credit cards, ACH] and help desks*	16%	17%

Source: Center for Digital Government, 2005

Implementation & **Adoption**

The *Field of Dreams* Test

HIGHEST IMPLEMENTATION RATES

1.	Job Searches	98%
2.	Fishing and Hunting Licenses	88%
3.	Credential Status Lookup (Doctors, Dentists, Nurses)	72%
4.	Unemployment Insurance Application	72%
5.	Business Tax Filing and Payment	70%

HIGHEST ADOPTION RATES

NATIONAL AVERAGE

1.	VIN Validation	97%
2.	Credential Status Lookup (Doctors, Dentists, Nurses)	85%
3.	Criminal History Background Check	85%
4.	UCC Searches	77%
5.	UCC Filings	62%

DIGITAL STATES SURVEY

CENTER FOR DIGITAL GOVERNMENT

Are we there **Yet?**

Everything Government Does Starts and Ends with a Form

	PRINT & FILL	SUBMIT ONLINE	PAYMENT
Property assessment/ Tax payment	67%	34%	--
Procurement docs	64%	21%	--
Voter registration renewal	60%	39%	--
Building Permits	58%	14%	--
Vital Statistics	56%	19%	9%
Parks and recreation services	55%	20%	--
County records request	50%	20%	--
Court services (jury duty, court date)	49%	32%	--
Library card or materials renewal	40%	28%	n/a
Animal services	36%	9%	4%
Child support or child care	32%	9%	7%
Occupational license renewal	26%	6%	--
Utility bills	16%	11%	11%

Got Your Number Now

While 95% of 911 public safety answering points (PSAP) have e911 for wireline phones, fewer than 40 percent of 911 PSAPs have e911 for wireless phones – that despite that 32 percent of calls to 911 are from wireless phones.

Often combined with CRM-driven call centers, 311 is now the "one call to city hall" for non-emergency calls in a growing number of American cities, including Austin, Akron, Baltimore, Bethel, Charlotte, Chattanooga, Chicago, Columbia, Dallas, Detroit, Hampton, Houston, Los Angeles, Louisville, Miami-Dade, New York City, Orange County, FL, San Antonio and Winston-Salem.

511 services are active in 14 states and have been funded in 48.

211 has grown to serve approximately 101 million Americans -- over 34% of the US population – through 140 active 2-1-1 systems in 28 states plus Washington, DC.

TOMORROW

Dare to **Do Over**

What Have We **Learned?**

1. Digital technologies have been doing the heavy lifting of government for a half century
2. Closed systems are secure and inflexible. Open systems are infinitely adaptable but hard to secure
3. Digital majority has expectation of self service on their terms.
4. Government does not always do everything, forever.
5. Modernization is never done: iterative and continuous. Data center disciplines have something to offer server environments.
6. Value proposition of the transactions to the user drives adoption of applications
7. Public Sector IT community too often relies on the cost and benefit estimates of third parties – surest way to lose control of project and the related expectations.
8. Transparency and privacy may not be IT 's issues, but they are IT's problem
9. 5 Critical Cs: Convergence, consolidation, collaboration, contract management and cost
10. Invest in changing the cost structure when the money is there so the doors can stay open when its not

Taylor's **Big Sleeper**

If its Good Enough for Football Coaches …

MANAGING CONTRACTS

Federal Government

- ✓ 1999-2002: Federal Contractors outnumber Federal Employees by > 2:1
- ✓ Spends $100 Billion per year more on Contracts than Employee Salaries

  Brookings Institution

State Government

- ✓ 1996-2001: Contracts with Private Companies rose 65%, worth $400B
- ✓ Contracts consume 19% of state operating budgets, excluding Medicaid

  Government Contracting Institute

Public Sector Contracting Attorneys and Officials

- ✓ **Serve Well and Proudly**
- ✓ **The JFK Discount May Not Be Enough**
- ✓ **Their cars may cost less than the suits worn people on the side of the table**

The Internet Now & Next

Imagining the Internet

Elon University / Pew Internet & American Life Project

SUMMARY: Experts are both in awe and in frustration about the state of the Internet. They celebrate search technology, peer-to-peer networks, and blogs; they bemoan institutions that have been slow to change.

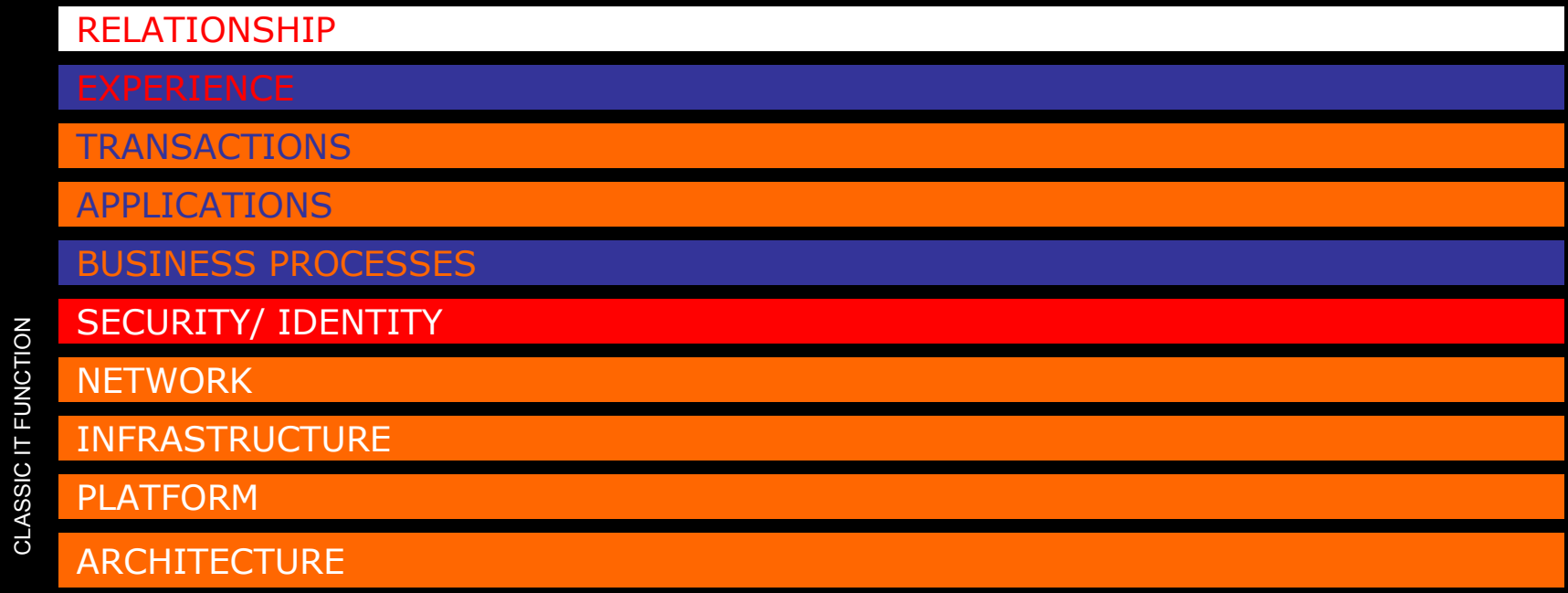
"Government will be forced to become increasingly transparent, accessible over the Net, and almost impenetrable if you're not on the Net."

"Hyperlinks subvert hierarchy. The Net will wear away institutions that have forgotten how to sound human and how to engage in conversation"

Source: Fox, Susannah, Janna Quitney Anderson, and Lee Rainie. *The Future of the Internet.* Washington, DC: Pew Internet & American Life Project, January 9, 2005.

The Layered **Look**

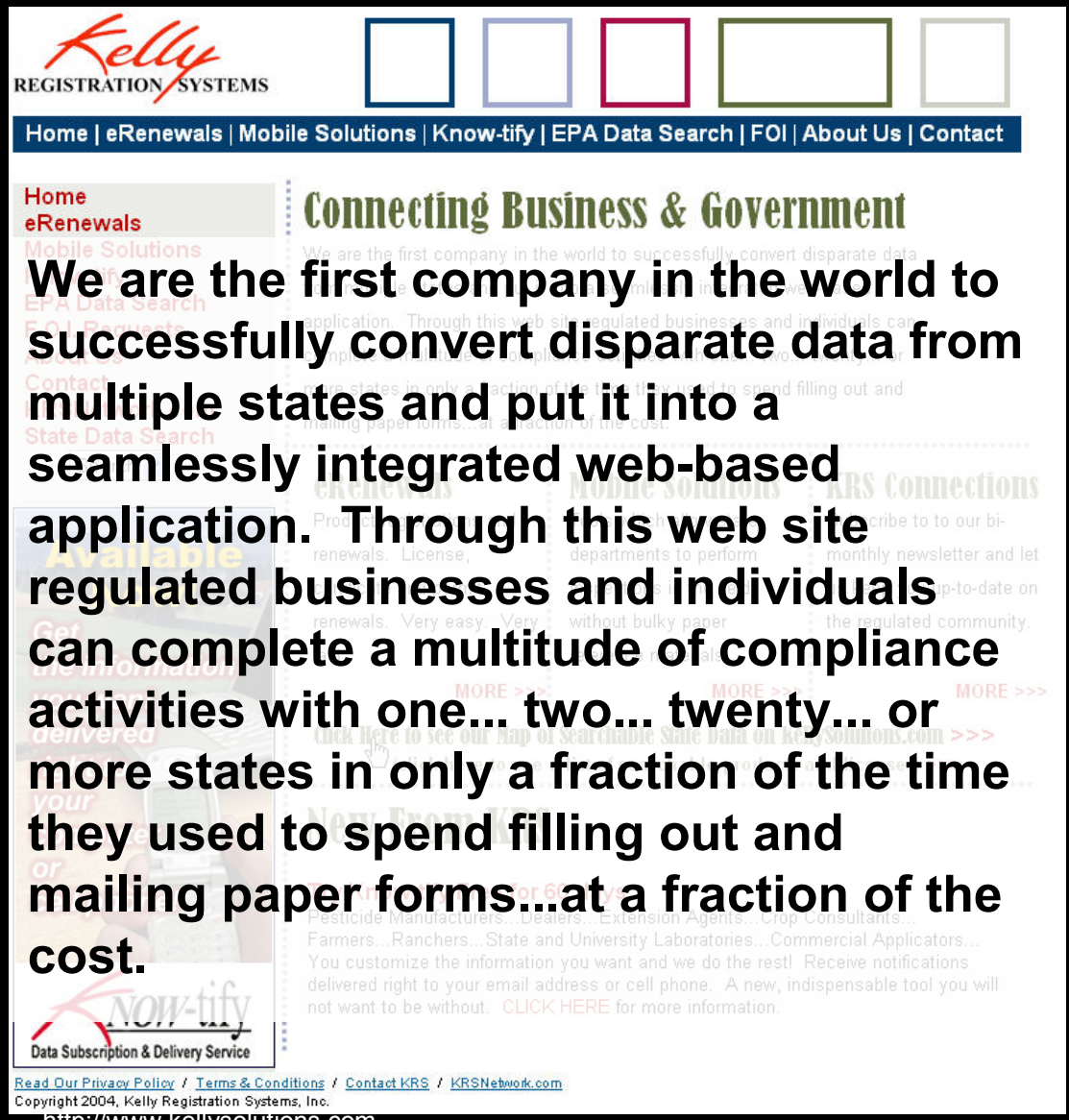
Perfection of means and the confusion of ends – matters most.



CLASSIC IT FUNCTION

Rules-based **Agents**

The gov-dot-com Redux



http://www.kellysolutions.com

Technology 4 the Masses

SMART Dust

Electronic Product Codes with Radio frequency ID chips will replace existing bar code technology

- ✓ When You Need to Know Things about Things
- ✓ First arriving at the container and palate level - Later at the object level
- ✓ Patterned after Internet technology - object name servers, PML & distributed processor language
- ✓ Future of regulatory compliance and security monitoring will be computer to computer for data transfer, management, and use
- ✓ Regulation and security becomes a real time data mining activity, not a forms process
- ✓ Fits on the "D" on a dime - small enough to embed in products (chemicals, medicine and food)

Source: MIT/ RJV Consulting, Aug 03

Adapted from autoidcenter.org, RJV Consulting, WOZ and the Wall Street Journal

Scarcity

4,300,000,000

UNIQUE INTERNET PROTOCAL (IP) ADDRESSES (v. 4)

NOT ENOUGH WHEN EVERYTHING CONNECTED TO THE INTERNET
-- FEWER THAN 1 BILLION LEFT ...

The Promise of IPv6:

340,000,000,000,000,000,000,000,000,000,000,000

UNIQUE INTERNET PROTOCAL (IP) ADDRESSES (v. 6)

Stopped building applications, and started building transactions.
Adopted Functional Architectural Frameworks that accept the fact that systems across government are not integrated and won't be for some time.
LESSON LEARNED: Perhaps software is not meant to be written, modified and maintained as much as it is to be EXERCISED…

Government Transaction Framework®

Navigation

Triage Referral	Signage Portals Search Tools Agent Assist IVR Menu

Selection

Broker Inventory	Catalogue Pay Per View Digital File Publishing Partial Paym't Calendar

Payment

Deposit Rec'able	Credit Card Debit Card Cash EFT On-Account

Fulfillment

Deliver Register	OTC Postal Service Outsource SMPT XML Stream ODBC

Posting

Ledger Reconcile	Oracle Tuxedo CICS TIP

Reporting

Ops. Financial	IM MIS / EIS Statements

Source: CGI Single-Window Government Lab, Fredericton, New Brunswick, Canada

Contact **Data**

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