Beyond Standards:

Business and Social Implications of Telecommunications Standards

(Systems Engineering the New Wireless for the New Economy)

Title: Beyond Standards: Business and Social Implications of Telecommunications Standards (Systems Engineering the New Wireless for the New Economy

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Abstract:

There are both technological and economic changes in the communications infrastructure. These changes make standards setting difficult in a post-monopoly world. The macroeconomic implications of communications infrastructure are critical to developing nations, and to developed economies. At microeconomic level, we see these same forces at work in the build out of new competitive carriers, and in startup companies with new ideas. Standards setting issues carry with them challenges to both the micro and macro capital formation necessary to build out the new infrastructure, and to define and develop the new infrastructure. This presentation considers how standards can help or hinder economic progress. The author explores how chaotic growth makes the engineering and systems implications of standards setting for economic growth largely unknowable, but we can know some basic network needs, and trends, AND we can position both ourselves and our networks for agility.

Beyond Standards: *Business and Social Implications of Telecommunications Standards (Systems Engineering the New Wireless for the New Economy)*

Topics

- What Could Go Wrong?
- What's at Stake?
- What's Changed?
- What Should We Do?

What Could Go Wrong?

- Standards bodies struggle with difficult questions:
  - What can technology deliver in a reasonable time frame?
  - What will support the highest data rate over a link?
  - What are the implications for network performance?
  - What services will be enhanced or degraded?
  - What systems will be interoperable?
  - What nations are maneuvering for advantage?
  - What companies will benefit?

- The wrong choices can have significant impact
  - To the entire equipment value chain
  - To network builders
  - To service providers
  - To telecom customers
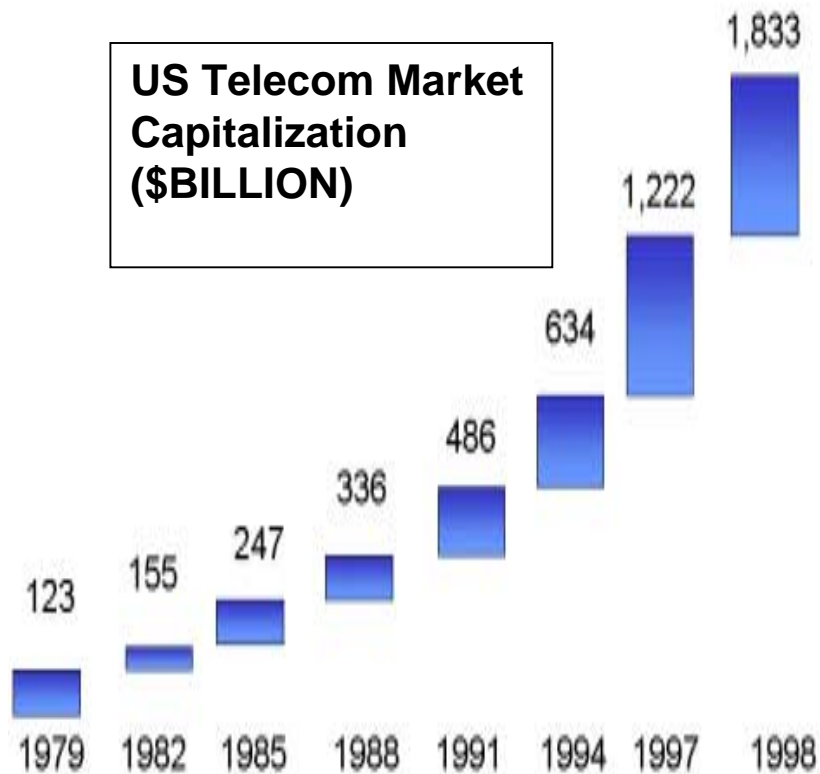 - To National and International Economic Well Being

Telecommunications Service is NOT just selling another product

- World Bank research shows that teledensity is the best predictor of economic growth
- More Important than
  - Education
  - Other social issues
  - Hard Infrastructure

Telecom Growth Fuels First World New Economy

US Telecom Market Capitalization ($BILLION)

123 — 1979
155 — 1982
247 — 1985
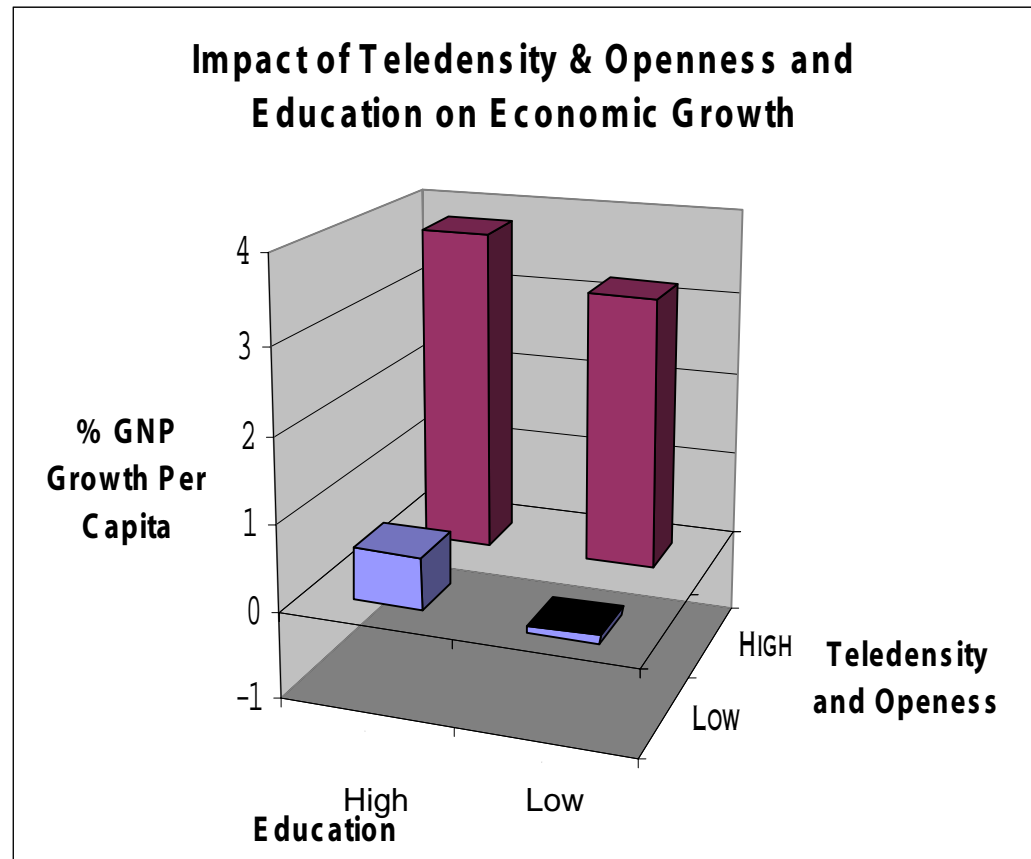336 — 1988
486 — 1991
634 — 1994
1,222 — 1997
1,833 — 1998

Nearly all the productivity increases attributed to the New Economy are dependent on rapid deployment of communications and digital interaction *AND Stock Prices Reflect it.*

What's at Stake?
Third World Economic Growth Is Fueled by Telecom

Worldwide communications *levels the playing field* for emerging economies, and provides access to the world economy faster than any other form of infrastructure **And poor nations are counting on it!**

Impact of Teledensity & Openness and Education on Economic Growth

% GNP Growth Per Capita
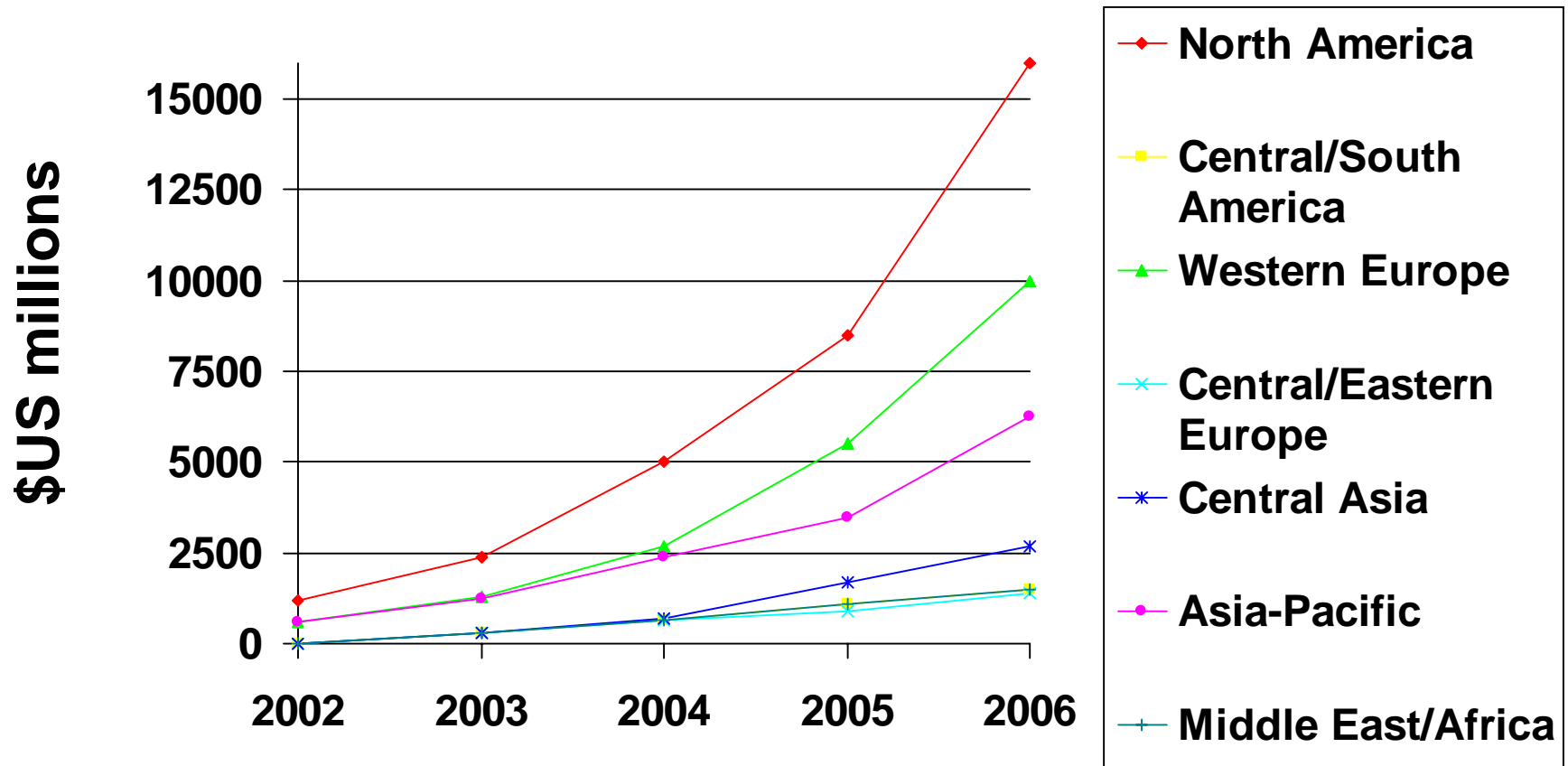
Teledensity and Openess

HIGH

Low

High Education

Low

Wireless Telecom Growth Promises to Deliver to Consumers what the WWW has NOT done yet

- Delivery of services and economic interaction to a PERSON not just to a PLACE
- Terminal is PERSONAL
- Presence is PERSISTENT
- Can serve needs REAL TIME
- Serves wants; IMPULSIVE

- Can make use of LOCATION
- Can compare WHILE SHOPPING
- Can Leverage COMMUTE TIME
- Carrier adds capacity AS NEEDED for delivery of services and connections to remote locations

Next Generation Wireless Projections for Service Revenue (Mobile Only)

Legend:
- North America
- Central/South America
- Western Europe
- Central/Eastern Europe
- Central Asia
- Asia-Pacific
- Middle East/Africa

Y-axis: $US millions (0, 2500, 5000, 7500, 10000, 12500, 15000)

X-axis: 2002, 2003, 2004, 2005, 2006

What's at Stake? **A MORAL RESPONSIBILITY**

- Economic Well Being of hundreds of millions of people (billions??)
- Commercial Viability of the companies who serve them
- Economic Development of entire nations
- Ending the "Digital Divide" which is really a "Connectedness Disconnect"

What's Changed?
Why is this so HARD?

- No one wants to be a bad person, but…..
- The Industry is re-inventing itself :Five Intractable Forces of Change
- Any single force would make planning and standards setting very difficult
- The combination of these forces make standards and planning VERY HARD
- Easy to choose standards that benefit only one part of the value chain, make networks too expensive, too inflexible; when we do this, we make wrong choices

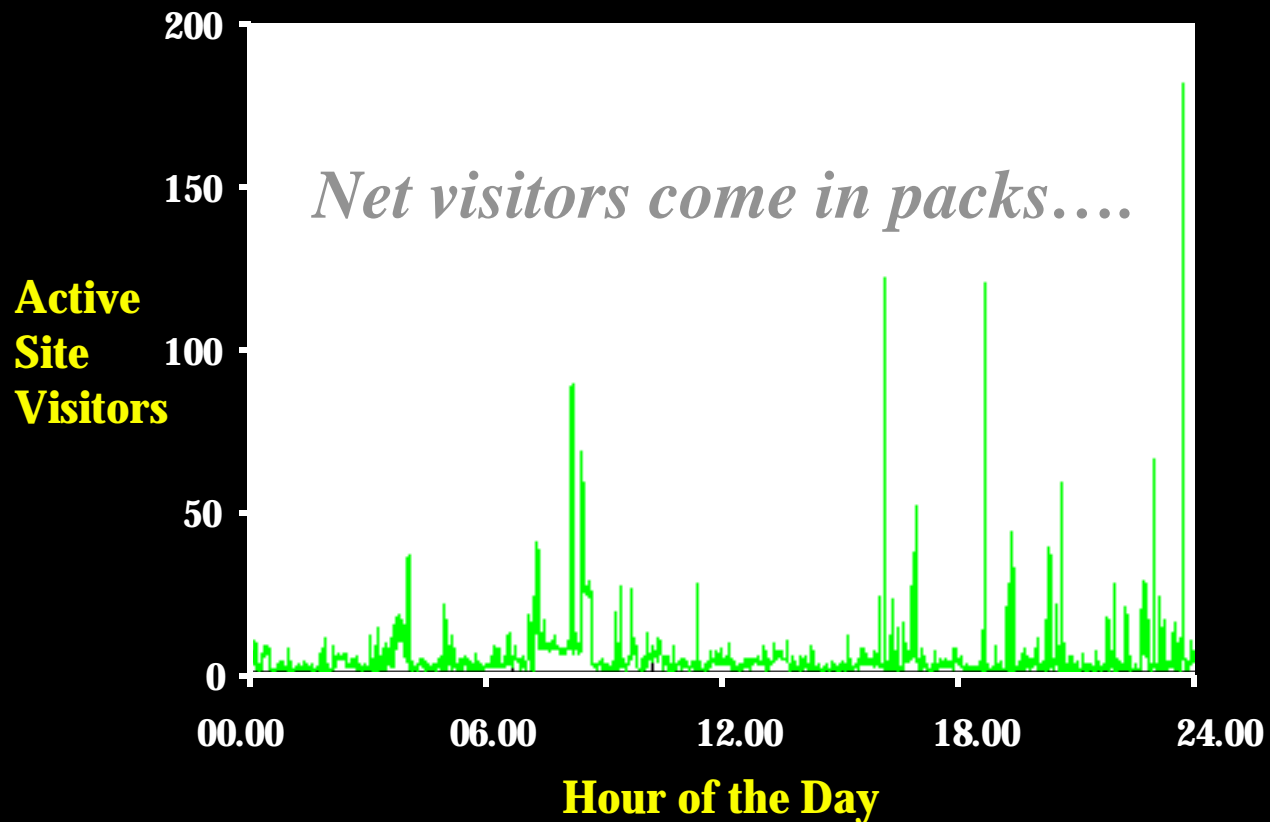*What's Changed?*

FIVE INTRACTABLE FORCES OF CHANGE

FROM	TO
• Monopolies	• Regulated Competition (and unregulated chaotic competition
• Voice Services	• Data Networks
• Vertical Integration of the network value chain	• Horizontal Aggregation
• Competition Only in Poor Nations who used standards from the first world monopolies	• Global Competition everywhere and standards chaos
• Communications and Information were two markets	• InfoCom is becoming one market (some say it IS one market)

Old Network Planning Won't Work

A connected world is chaotic….

Net visitors come in packs….

Active Site Visitors (y-axis): 0, 50, 100, 150, 200

Hour of the Day (x-axis): 00.00, 06.00, 12.00, 18.00, 24.00

Peter Cochrane

Beyond Standards

What Should WE DO?

- We should use the principles of Systems Engineering: Determine user and market requirements to the extent possible and keep true to these priorities

- We conducted a series of about fifty interviews across the telecom value chain (end users, carriers/service providers, networking companies, OEMs, component makers, software vendors……..**To Revisit Value Propositions**

- **FIFTEEN VALUE PROPOSITIONS THAT SEEM STABLE**

What Should we DO?

Nine Basic Value Propositions to Telecommunications End Customers

WHAT THEY WANT TO HEAR

- Installation cost and timing
- Reliability of Service
- Quality of Service
- Delivered Bandwidth
- CPE ease of use (including the applications presented by the CPE)

- Integration of connection, content, services, mobile and premise distribution

- Billing Plan
- Billing Accuracy
- Total Cost

WHY THEY CARE

- Want it when they want it
- Is it OK of 911 doesn't work?
- Varies with user
- Varies with user
- Don't want hassles when moving, changing configuration, adopting new services and practices
- Want to get data, content, connections, and other services from without a big hassle NOT THE SAME AS INTEGRATED BILLING
- Want some choices that fit
- Don't want to audit every bill
- Want predictable, affordable value

What Should we DO?
Six Value Propositions of Service Providers & Networking Integrators (and one bone of contention)

WHAT THEY WANT TO HEAR	WHY THEY CARE
• Low Marginal Cost of Capacity	• Cost of each new connection drives total cash need
• Fast Time To Service Delivery	• Customers care about how fast they can get on line, investors care how fast payback begins
• Discontinuity in Service Level	• Allows offering services at premium prices, higher margins, lower churn, higher customer satisfaction
• Flexibility of Network	• Lets the network adapt to new services
• Market Acceptance/Easy Use	• Drives timing, marketing costs
• Regulatory Hurdles	• Determines who provides service, who is kept out
• Other (THE BONE)	• Service Providers want open standards, Network Integrators want proprietary hooks

Plan for Chaos
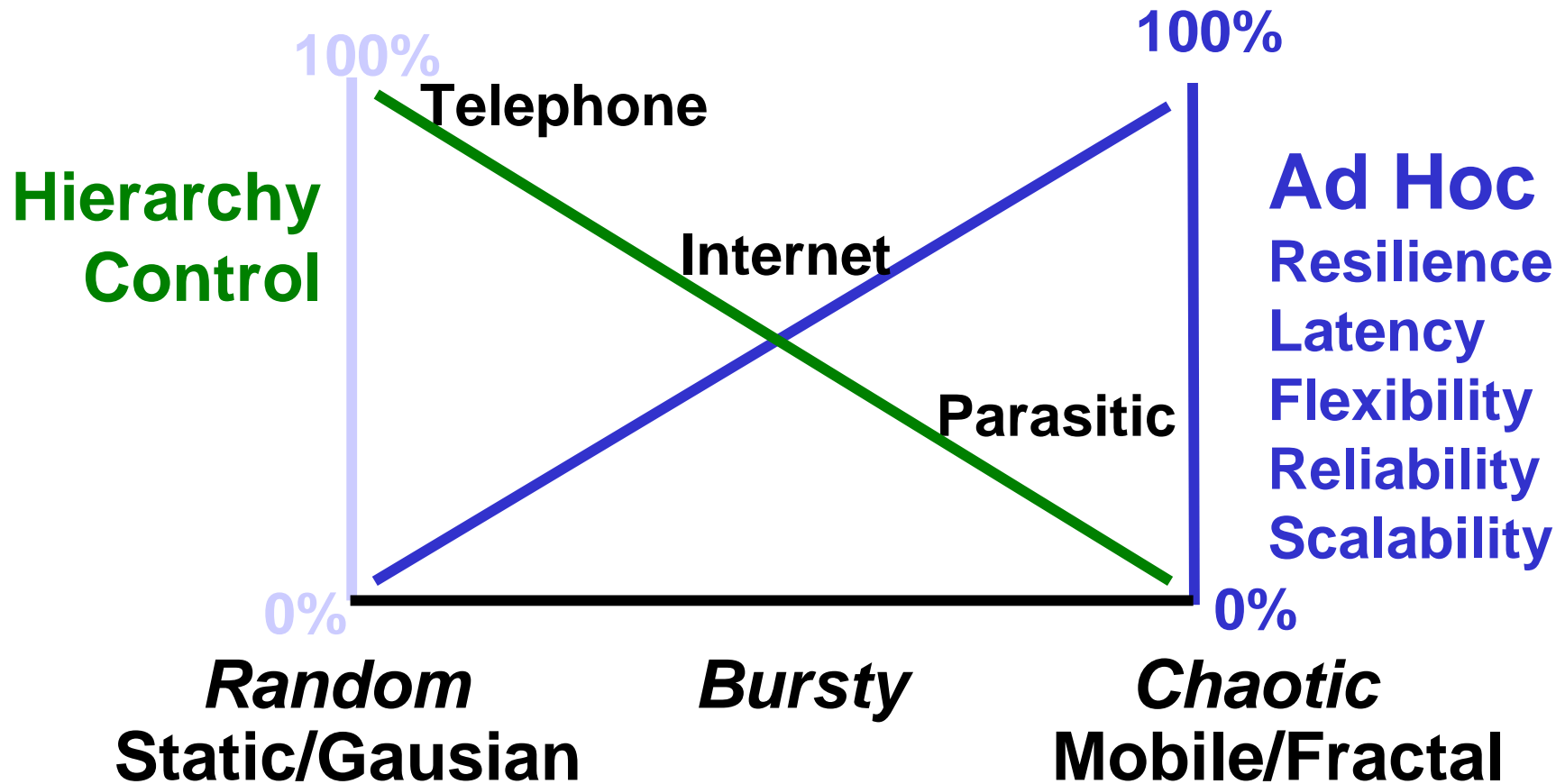
What Should we DO?

- REMEMBER OUR MORAL RESPONSIBILTY TO PEOPLE WHO NEED SERVICE TO IMPROVE THEIR LIVES
- Recognize the day of the vertical monolith is gone
  - AT&T, Bell Labs & Western Electric don't prescribe now
  - Governments can only police a fraction the critical decisions
  - Can't refer to customers as rate payers anymore, they demand value
- We ALL have a distributed responsibility to provide flexible networks: can't predict specifics, but we know the trends.
- Plan for chaos: Chaos can be our ally for agility
  - Networks will change before a standard can be implemented, many times before it goes out of service
- Keep priorities on BALANCING the 15 value propositions that customers, carriers, and network companies need
- Only fight over proprietary things when all of the above have been dealt with

Beyond Standards

The Author

Steve Roemerman is the CEO and founder of Incucomm, a telecommunications development, holding and operating company, focused on supporting the needs of founders and early stage companies in the telecom market. Incucomm operates in Dallas, and currently has several emerging telecommunications companies in development.

Steve is a Senior Member of the IEEE, and recognized by the IEEE for early work in the conversion from analog to digital. Since the early 1970s, he has been involved with a number efforts that changed the state of the art, among them the first 16-bit microprocessor, F-117 stealth fighter, early PC's, and E-Commerce theory. He has been a consultant to major corporations, governments, and to early stage technology companies. He was Vice President for Systems Strategy at Texas Instruments, a Vice President for Raytheon, and CEO of Crosspan, a company that built OEM wireless telecommunications equipment.

Steve Graduated from the University of Missouri at Rolla and attended Graduate School at Southern Methodist University. He has presented papers and lectured on a number of subjects, at symposia, and in university settings. His publications include works on communications, signal processing theory, satellite communications, technology history, and application of technology to new businesses.

References & Sources

- Chart 5 & 7: World Bank (World Development Report
- Chart 6 & 9 McKinsey and Company
- Charts 15 & 16 primary research by the author at Crosspan, and Incucomm

- Charts 13 & 17 "More Machines Than People" (Paper by Peter Cochrane Chief Technologist BT, Collier Chair for The Public Understanding of Science & Technology)