

# **Services, Networks, and Competition: Creating Value in a Digital Era**



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# Creating Value in A Digital Era

## Services, Networks, and Competition

- Market context of evolving technology:
  - Situate Information Technology in the story of value creation
- The core questions in this talk:
  - How the evolution of Services and Networks affects the market problem of creating value
  - Place of national developments in international markets
- Three steps to approach an answer
  1. **Production and Competition in the 20th Century**
  2. **The Shifting Levers of Competitive Advantage: The Global and the Digital**
  3. **Services and Networks in the Digital era**
    - The 4th Service Transformation
    - Networks and Innovation
    - National developments and international markets

# Evolution of Competition in the 20th Century

- **American Dominance**
  - Mass Production Developed within One Country Market
- **Japanese Take the Lead**
  - Lean Production: Volume production reorganized and reconceived
  - Trade Conflict: Closed Domestic Market / Open International Markets
- **American Comeback and Entry of Asian Third Tier**
  - New Consumer Electronics: from electro-mechanical to digital
  - Wintelism:
    - Intel and Windows: Component Driven Competition Facilitates Vertical De-integration
    - Modularity Facilitates Outsourcing
    - Cross National Production Networks and Supply Chains
  - Did Japan miss the first digital wave?
- **The Current Era—The Global and The Digital**

# A Global Digital Age: Shifting Levers of Market Advantage

- **The Drivers:**
  - The Global
  - The Digital
- **Combine:**
  - New Applications
  - New Entrants
  - New Strategies
- **Produce:**
  - Constantly Shifting: Levers of Advantage
  - New Mechanisms of Value Creation
  - Raising the Level of the Unexpected/ Increasing the Pace of Change
- **The unexpected, constant disjunctures, are routine**

*How Revolutionary was the Digital Revolution? National Responses, Market Transitions, and Global Technology, a BRIE-ETLA-Helsinki Project (Eds.) (Stanford: Stanford University Press, 2006)*

# From Sectors to Value Domains: The Changing Logic of Value Creation

- **Strategy Logic Circa 1980:**
  - Definable Sectors with clear targets for Advantage and Value.
  
- **The Search for the “Sweet Spot” circa 2005**
  - The Ambiguity of spaces and domains
    - Hardware can be transformed into many different products
    - Is a block of plastic with electronics an MP3 player, a phone, PDA or a television
    - It is about the soft sense of branding and market definition
  - Services make it even messier

# The First Driver: The Global

- **The Classic American Vantage on Globalization**
  - Reduced transaction costs and accelerated trade
  - The world converges to a single norm and set of rules

But is the world really flat?
  
- **National Innovations on a Global Stage: An Alternate View**
  - **A sequence of national stories on larger markets**
    - Japan
    - Finland (Nokia)
    - China
  - **A Sequence of New Competitive Issues**
    - New Competitors
    - New Products
    - New Processes
    - New Places of Production and Innovation
  
- **Tension between the “Global” and the “National”**

# The Second Driver: The Digital

- IT as a Leading Sector: The Conventional Conversation
  - Demand for IT Products drives growth
  - Transformation of other products and services by Digital Tools:
    - » Markets are segmented
    - » Products versions for segmented markets
  - Intellectual Property Becomes Critical
  - Branding and Design Continue to matter
  
- The New Conversation has many aspects
  - **Is open the word of the era:**
    - Closed, open (or at least sort of open) but owned, and open technology
    - The struggle over standards
      - Can closed standards survive?
      - Who controls standard making?
  - **Services: The Pillar of the Digital Era**
    - What is a service and what is a product?
    - Do the requirements for innovation change?
    - The Dynamic of Services and the Networks on which they run is critical

# Service Economy or Service Transformation?

- Services: From Sink Hole to Productivity Driver
  - Expanding services thought to dampen growth
  - Now, services and service tools seen as sources of productivity
- Reframing the Service Debate
  - The issue is Not
    - the growth in the quantity or the value of the activities we label as services.
    - Nor a shift from agriculture to industry to service
  - Rather, the crucial issue Is
    - The application of rule-based Information Technology tools to service activities.
    - Caveat: Services are embedded in social structure and regulation

# The Four Service Transformations: The place of services in the digital era

- The Accounting Error: Outsourcing
- Changes in Consumption Patterns
- Outsourcing Household Work
- The Algorithmic transformation

- Zysman, John. "The 4th Service Transformation: The Algorithmic Revolution," BRIE Working Paper #171 (Berkeley: BRIE, 2006) A version of this article will appear in the CACM Special Issue on Services Sciences, July 2006

# The 4<sup>th</sup> Transformation: The Algorithmic Revolution

- Some service activities can be converted into:
  - Formalizable, codifiable, processes
  - Often with clearly defined rules for their execution
- IT tools can then be applied to services
  - Business processes
  - Sensor networks.
  - Consumer goods and roles
- Skill Requirements change as the routine is automated
  - Worker skills emphasize discovery and pattern recognition
  - Management mentality has to shift from the hardware vantage
- Business Models altered as: Services and Products blur
  - IBM
  - Accounting
  - Pharma
- Nature of Innovation Changes

# Innovation and The Algorithmic Revolution

- Innovation IN Business Models: Services and Products Blur
  - The blurred boundary between product and service is a source of innovation
  - Is an mp3 player a product or a service—the iPod story and Sony’s woes
- Innovation in Service Products and Service Process
  - IT embeds knowledge: technology can be purchased as tools
  - Mastery of social process for their service application is critical

# The New Innovation Dynamics of Services and Data Networks:

- Network characteristics influence experimentation with Services
  - Networks host the services; Services are not stand-alone tools
    - Interlinked tools provide services
    - Logic of Location Changes
- Services structure demand for Networks
- The Questions:
  - How will network policies and build-outs influence service development?
  - How will service offerings influence network requirements and success?

# **Can we learn about services from the story of Network Innovation and Experimentation**

- **The Emerging Digital Era:**
    - **Analogue networks to Data networks**
    - **Data networks to the Internet**
  - **Re-labeling the Telecom Stack**
    - **Application Layer**
    - **Control Layer**
    - **Infrastructure Layer**
- Bar, François and Michael Borrus. "The Future of Networking." A Berkeley Roundtable on the International Economy (BRIE) Research Paper. University of California, Berkeley, 1993.

# Three Layer Model of Data Networks: The Issues

## ■ The Three Telecom Layers

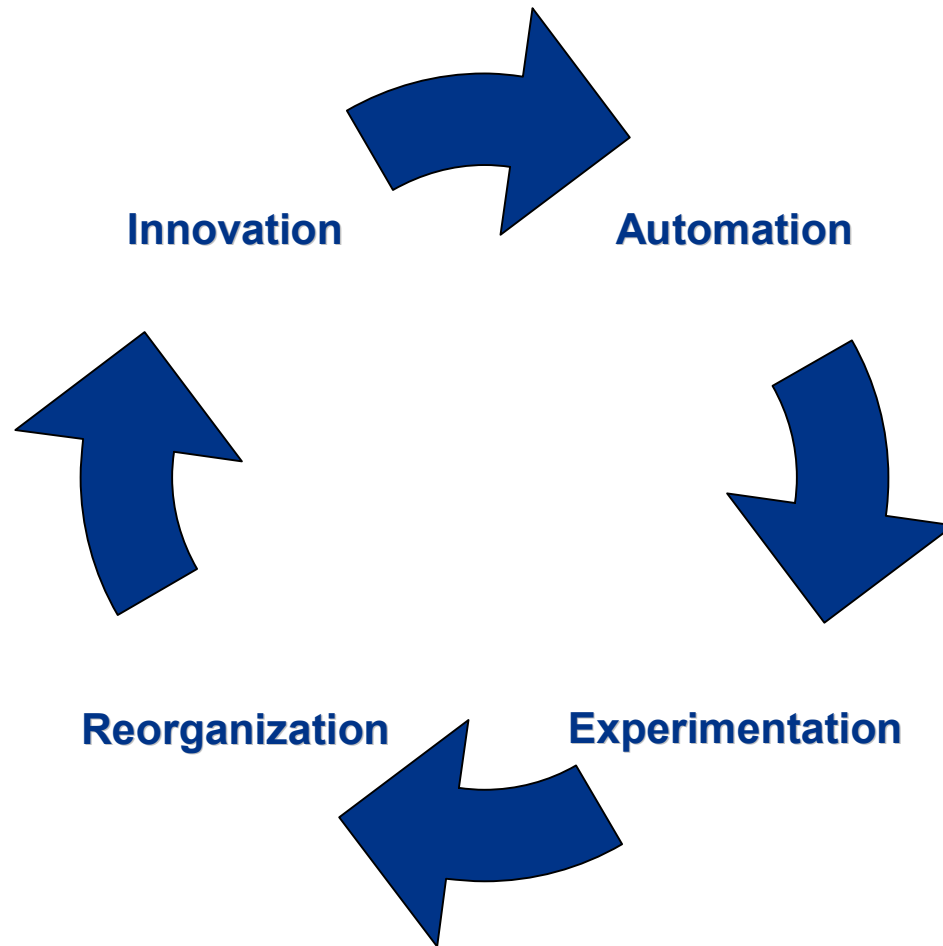
- Application layer
- Control layer
- Infrastructure layer

## ■ The Issues

- The Emerging Independence of the Control Layer
- Growing Competition throughout the layers
- Automation and Experimentation

- Bar, François and Michael Borrus. "The Future of Networking." A Berkeley Roundtable on the International Economy (BRIE) Research Paper. University of California, Berkeley, 1993.

# Network Innovation and Experimentation



# The Services Stack and Network Development

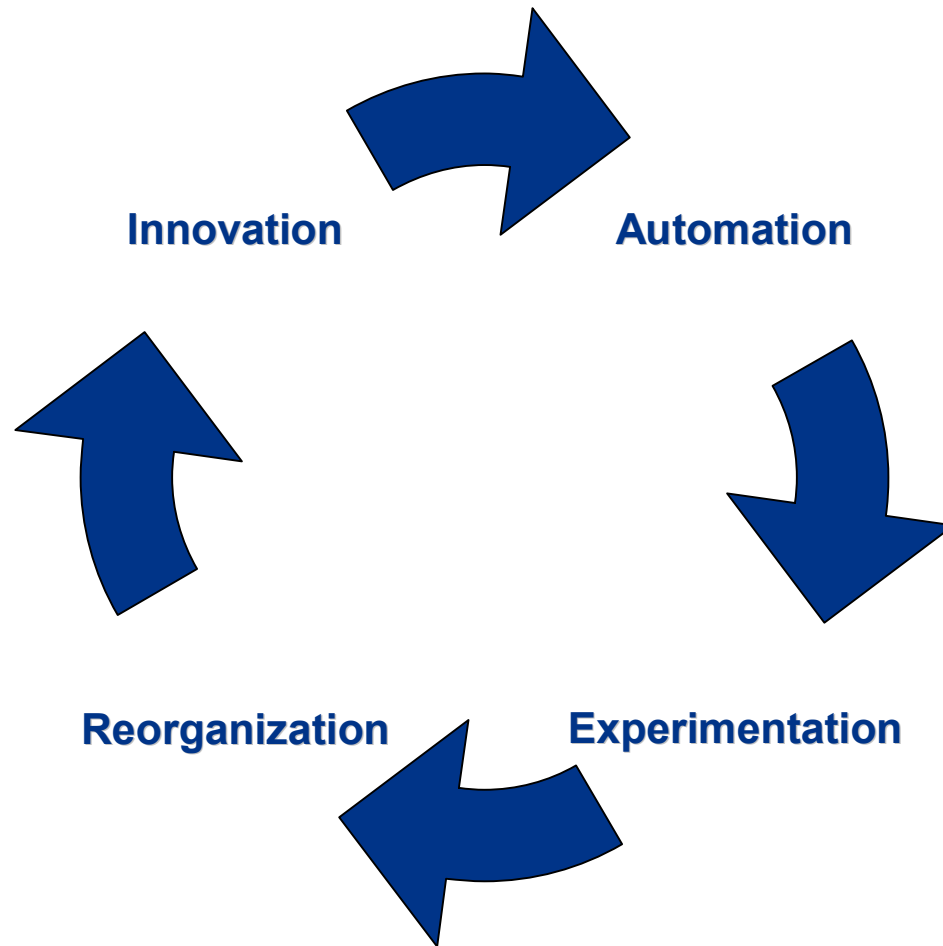
Can we formulate a conceptual services stack that will allow us to understand

- **Control**
- **Competition**
- **Innovation**

# Several Versions of the Services “stack”

- **One view from IBM**
  1. Business and Social Processes
  2. Management and Control
  3. Implementation and execution
- **One view from Microsoft**
  1. Business Processes
  2. Applications
  3. MiddleWare
  4. Operating system
- **Who Controls Value In Each Layer?**
- **Other conceptions of where control and value lies**
  - In the database? Oracle
  - In the processing of the data? SAP
  - In the middleware and the clue? IBM

# Again, Innovation and Experimentation: This time in Services



# National Innovation in Global Markets

- Domestic Markets and International Competition
  - CAN provide environment for innovation and experimentation that creates the basis for advantage in global markets
    - Production innovation: Toyota and autos production—production innovation
    - Product Innovation: Sony Walkman, product innovation and standards fight within Japan
  - But domestic markets can be a trap (some would point to NTT Docomo and Japanese cell phone technology)
- The National Market in the Digital Era
  - Networks shaped by national policy
    - Leadership on the network facilitates experimentation and user led growth
  - Services always have a national element to the story
    - Services are always embedded in social structure and regulation
    - Understanding organizational and social dynamics is central in this era
- How will global competition be shaped in the next cycles.
  - Will National Network Build-out create advantage in services?
  - Will national environment create advantage and innovation

# The Algorithmic Revolution: Lessons for the Era of Computational Services

- The algorithmic revolution: Application of IT tools to processes that can be formally defined in codified computable form
- Computable services Change the Dynamic of Innovation
  - Business Model Innovation at the Blurred line between services and product
  - Social process and the mastery to express formalizable steps for application of tools is critical
  - Interplay between network development and service automation and experimentation is critical
- National network strategy and market regulations influence leadership in application of IT tools to services
- Domestic market can be:
  - Launching pad to global markets
  - Dead-end trap