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

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**CFR Roundtable on Technology, Innovation, and American Primacy**

**New York, May 17**

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# **Creating Value in A Digital Era**

## **Services, Networks, and National Competition**

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### **Core questions in this talk**

- How does the evolution of Services and Networks affect the market problem of creating value?
- Do national developments matter in an era of global markets?
- How will innovation in an era of digital services influence American choices?

# **Creating Value in A Digital Era**

## **Services, Networks, and Competition**

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### **Three steps to an answer**

#### **1. Production and Competition in the 20th Century**

- Situate Information Technology and Services in the evolving story of value creation

#### **2. The Shifting Levers of Competitive Advantage**

- The Interplay of “Global” and the “Digital” changes the game

#### **3. Services and Networks in the Digital Era**

- The 4th Service Transformation
- Networks and Service Innovation
- National developments and international markets

# Evolution of Competition in the 20th Century

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- **Mass Production and American Dominance**
  - Mass Production, developed within one country market, became a foundation of American Power
- **Lean Production and Trade Conflict with Japanese**
  - Lean Production: Volume production reorganized and reconceived
  - Trade Conflict: Closed Domestic Market / Open International Markets
- **U.S. Comeback: Wintelism and the Emergence of Cross National Supply Chains**
  - New Consumer Electronics: from electro-mechanical to digital
  - Wintelism:
    - Intel and Windows: Component Driven Competition Facilitates Vertical De-integration
    - Modularity Facilitates Outsourcing
    - The beginnings of Open Innovation (an old story with a new label)
  - Cross National Production Networks and Supply Chains
    - IT tools facilitate the new global production system
- **The Current Era – The Global and The Digital**

# The Digital Global Era: The Changing Logic of Value Creation

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## From Sectors to Value Domains

- 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?
  - Services make it even messier

# A Global Digital Age: Shifting Levers of Market Advantage

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- **The Global and the Digital Combine:**
  - New Products and Services
  - New Entrants
  - New Strategies
- **Fundamental Features**
  - Constantly shifting levers of advantage
  - The unexpected, constant disjuncture, become routine
  - New mechanisms of Value Creation

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

# The Global: National Stories on a Larger Stage

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- **The Classic 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, entangled with a European story
    - 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 Digital: A Tale of Tools and Services

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- The Conventional Story
  - IT as a Leading Sector as demand for IT products drives growth
  - IT Transforms of other products and services by Digital Tools
    - Markets are more finely segmented
    - Product versioning to fine market segments
    - Digital products and services
      - Traditional good and services refashioned
      - Border between goods and services blurs
- Services as A Pillar of the Digital Era
  - Is there a Service Economy?
  - The blurred border between Goods and Services
  - Do the requirements for innovation change?
  - The Dynamic of Services and the Networks on which they run is critical

# Service Economy or Service Transformation?

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- **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

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- 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

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- **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**

# Service Innovation in The Algorithmic Revolution

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- **Innovation In Business Models:**
  - 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 tools embed knowledge and can be purchased as tools
  - Application to reorganization of business and social processes
    - Requires mastery of the social processes
    - Flexibility to reorganize the processes
  - Network characteristics influence experimentation with Services
    - Networks host the services: Services are not stand alone tools
    - Will Services structure demand for Networks?

# Can we learn about Services Innovation from the tale of Network Innovation and Experimentation

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- **The Emerging Digital Era:**
  - Analogue networks to Data networks
  - Data networks to the Internet
  
- **Re-labeling the Telecom Stack**
  - Application Layer (implementation of real uses of data)
  - 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.

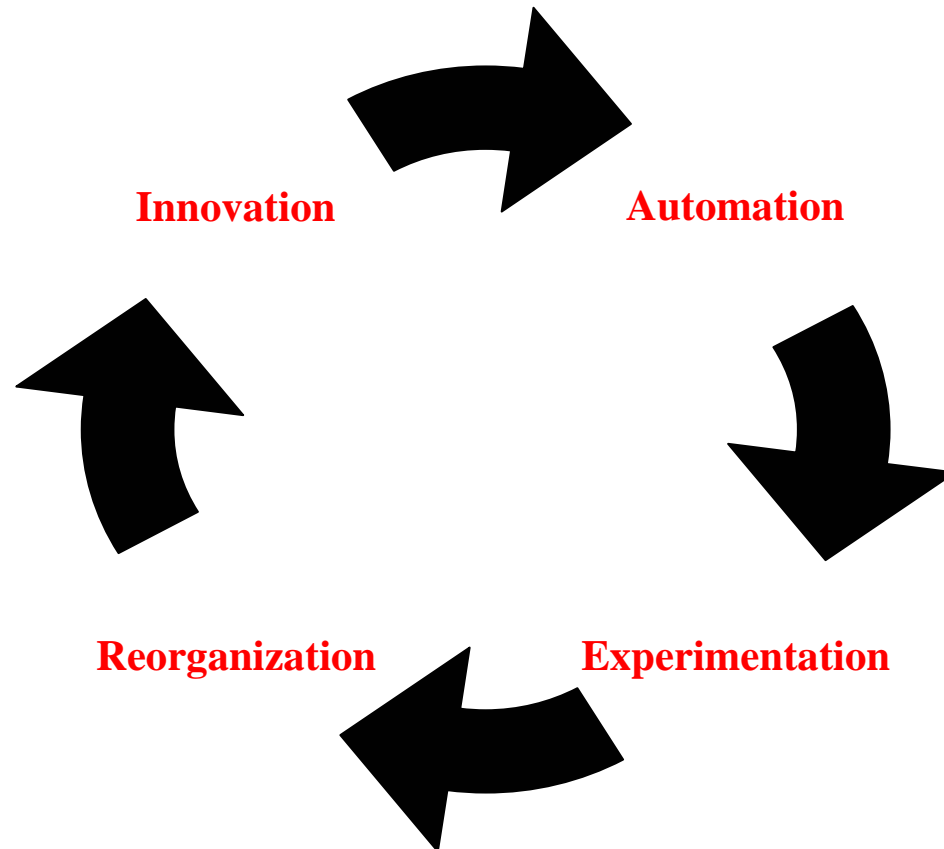
# Three Layer Model of Data Networks: The Issues

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- **The Three Telecom Layers**
  - Application layer, or (implementation of real uses of data)
  - Control layer
  - Infrastructure layer
- **The Issues**
  - The Emerging Independence of the Control Layer
  - Growing Competition throughout the layers
  - Networks interconnected via TCP/IP and WWWeb
  - User driven, principally corporate users, exploration of how to use data and data networks

# Network Innovation and Experimentation

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# The Services Stack and Network Development

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- **For the technologists the stack has many layers.**
- **Can we formulate a simplified conceptual services stack that will allow us to understand competition and innovation?**
- **Service Stack sits on top of, or next to data network “layer”**

# Several Versions of the Services “Stack”

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- **One View from Microsoft**
  1. Business Processes
  2. Applications
  3. MiddleWare
  4. Operating System
- **One View from IBM**
  1. Business and Social Processes
  2. Management and Control
  3. Implementation and execution (including applications, middleware, and operating system)
- **Other Conceptions of Where Control and Value Lies**
  - In the database? Oracle
  - In the processing of the data? SAP
  - In the middleware? IBM
- **Who Controls or Captures Value In Each Layer?**

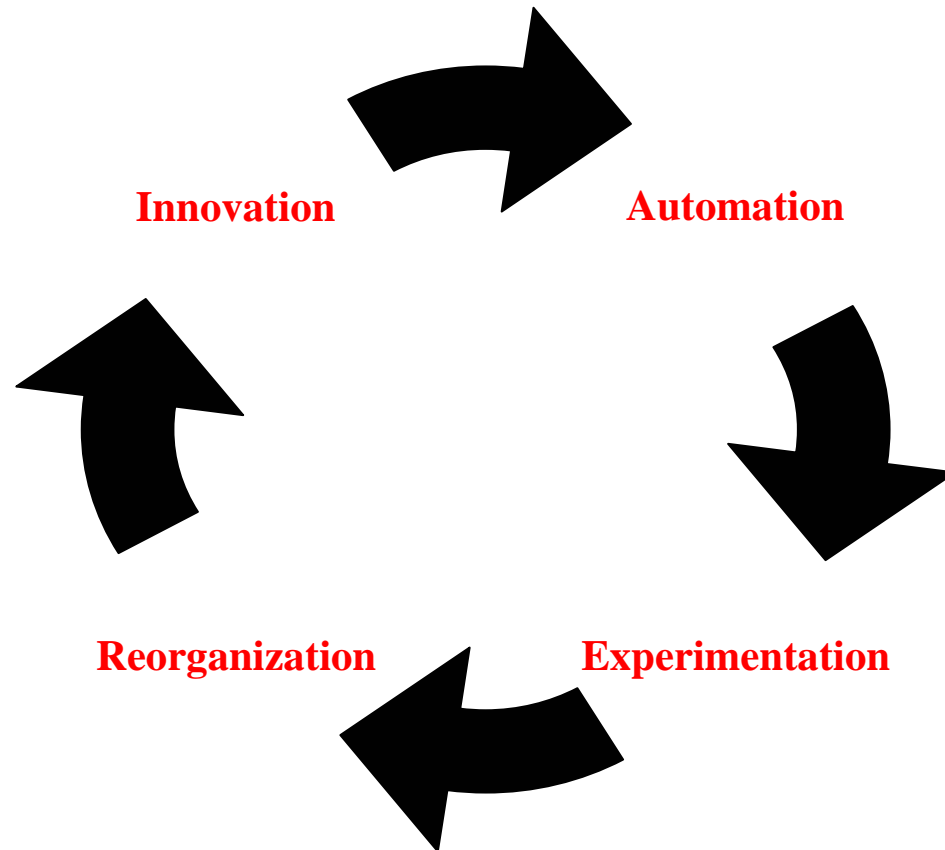
# The Evolving Services Stack

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- Speculate:
  - Two core processes in evolution of the Service Stack
  - Decomposition of tasks – modularization of tools
  - Recombination of these modular tasks
    - Application interfaces,
    - Service oriented architectures
- Resulting in
  - Services on the fly?
  - User interfaces diffusing possibility of generating services a la carte? User initiative moves beyond the large corporation
- With Consequences for the Dynamics of Competition
  - When does power in the market dominate?
  - When will clever algorithms or data sets prevail?

# Innovation and Experimentation in Services: Same Logic? Or A More Complicated Story

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# **The Algorithmic Revolution and Service Innovation: National Markets and Global Competition**

- **Networks shaped by national policy**
  - Will leadership in broadband deployment elsewhere facilitate experimentation and user led growth in services
  - Will, similarly, national network buildouts create advantages in equipment and standards as well
  - Will innovation in services drive innovation in networks and equipment
- **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
    - The ability to reorganize depends on social rules and regulations
  - Will distinctive national market needs create the basis for global innovation
    - Distinctive national markets are both platform and trap
    - Compare Toyota (Process) and Sony (product) of yesteryear with DoCoMo
- **Wide availability of IT tools permit rapid emergence of service new comers**

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

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- **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
- **Rival sources of initiative for standards, innovation, & leadership**