Production, Clouds, and the Transformation of the Global Economy

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Purpose Today

Put Three Themes On the Table

Three Themes: Future Technologies

- *Revisiting Manufacturing Matters*
- Clouds and Services
- Clouds and Energy

Theme One:
Manufacturing Matters

The Original Argument Revisited

Manufacturing Matters: The Myth of the Post-Industrial Economy,
S. Cohen and J. Zysman. 1987. (New York: Basic Books).

The Original Argument

- Services and Manufacturing Intertwine
  - Linked
  - Counting: When is a service a Service
- Can you *control* what you cannot *produce*?

Can you *Control* what you cannot *Produce*?

- The original issue in the era of US-Japan Competition
  - –Semi Conductors and Sematech
  - –Walkman through Autos
- Is there a current relevance

Have the Changes In Production Altered the Crucial Question?

- **Decomposition**: controlling costs/accelerating innovation
  - Offshoring
  - Outsourcing
  - Wintelism and Open Innovation
  - Supply Chains and Supply Networks
- **Recomposition**: How do you put the pieces together

Pattern of Decomposition Was not Inevitable

- Corporate Choices: Often mistaken or the result of limited capacities

- Policy Decisions: Trade policy facilitated corporate choices.

Analysis Moves from Sectors to Phases of Production

- Silicon Valley: New Industry Innovation
- China: Rapid Scaling and product implementation

Manufacturing:
The "New" Crucial Question

Strategic Asset ?

or

Vulnerable Commodity ?

"Strategic Asset or Vulnerable Commodity? Manufacturing in a Digital Era." BRIE Working Paper #147A (Berkeley: BRIE, May 2003) http://brie.berkeley.edu/publications/WP147A.pdf

Manufacturing:
The "New" Crucial Question

Strategic Asset **Facilitates *Control ?***

or

Vulnerable Commodity ***Best to Buy?***

Theme Two:

Clouds and Services

Services with Everything: The ICT-Enabled Digital Transformation of Services.
Zysman, Feldman, Murray, Nielsen and Kushida. BRIE Working Paper #187A (BRIE: Berkeley, April 2010)
http://brie.berkeley.edu/publications/WP_187a%20Services...%20revised%206.16.11.pdf

"Cloud Computing: Policy Challenges for a Globally Integrated Innovation Production and Market Platform," Jonathan Murray and John Zysman. TPN Transatlantic Week. (Washington, D.C. July 2011)
http://brie.berkeley.edu/publications/working_papers.html http://www.springerlink.com/content/0102m443m6522v1u/fulltext.pdf

Theme Two: Part A

Services with Everything:

The Ict Enabled Transformation

Services with Everything: The ICT-Enabled Digital Transformation of Services.
Zysman, Feldman, Murray, Nielsen and Kushida. BRIE Working Paper #187A (BRIE: Berkeley, April 2010)
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The New Value Logic:
The Services Transformation

- The issue is <u>not</u> the service economy
  - What the numbers hide
  - The illusion and delusion of services

- The issue *is* the algorithmic revolution:
  - The algorithmic revolution: a services transformation driven by the application of rule-based information technology tools
  - The new importance of ICT

- Services are about the use and deployment of information

Services with Everything:
The (ICT Enabled) Services Transformation

- Services: Economic Black Hole To Productivity Driver
  - The Black hole: Limits to productivity in services?
  - The Baumol Dilemma and why it matters

- ICT enabled Services: Moore's Law or Baumol's Dilemma
  - Why Moore's Law resolves Baumol's dilemma.
  - Capacity to develop and deploy innovative (ICT enabled) services throughout the economy is central to growth
  - Critical source of value in global competition in the effort to escape price based commodity competition

New Service-Based Business Models

- Decomposition = Commodification of products and processes
- A Central Challenge: Escaping "The Commodity Trap":
  - Bold innovative strategy
  - What can make a unique offering.
- New Business Models throughout the economy
  - Transformation of existing offerings (Finance and Media)
  - Creation of new businesses (Google)
  - Blurring of the service/product line: Products morph into services
    - The automobile from product to transportation service
    - Design your own apparel
    - From Cranes to port services

Strategies for Value in (ICT Enabled) Services:

- Automated services: +++
  - Finance and Communications Networks
  - Search
  - Social Networks

- Hybrid Services ++
  - Health systems
  - Integrated systems of people and machines

- Augmented human services +

(+ = potential for productivity increase)

Capturing Value in (ICT Enabled) Services

- Automating routine business processes and services means only temporary advantage
- Continuous Innovation remains central
  - Enduring Advantage is created by re-conception and re-configuration of services
  - Value captured by:
    - Strategy
    - The organization of the firm

Not Your Grandfather's Services:

Production, Services, and Manufacturing

ICT Services are PRODUCED

Not Your Grandfather's Services:

Production, Services, and Manufacturing

ICT Services are Smart Systems that are:

- Built
- Capital intensive
- Latent capacity acts as inventory

The Story of the Cloud is a Story of Production

Clouds: The Latest ICT Platform?

Expands the Domain Of Ict Enabled Services

Services with Everything: The ICT-Enabled Digital Transformation of Services.
Zysman, Feldman, Murray, Nielsen and Kushida. BRIE Working Paper #187A (BRIE: Berkeley, April 2010)
http://brie.berkeley.edu/publications/WP_187a%20Services...%20revised%206.16.11.pdf

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The Cloud Dilemma

The Cloud Dilemma

Users: Lowers Scale

– An enhanced dynamic utility making intensive computing more accessible

The Cloud Dilemma

Providers: Raises Scale

The Cloud Dilemma

USERS: Diffuses Innovation Potential

PROVIDERS: Scales and Production means Cloud currently controlled by Global Giants as an extension of their activities

The Cloud Dilemma

Traditional Tension Exacerbated Between Local and Global Objectives

Theme Three:

The Climate Debate Hides the Real Technological Issue

"From Religion to Reality: Energy Systems Transformation for Sustainable Prosperity," John Zysman and Mark Huberty. Prepared for Green Growth Leaders. (BRIE: Berkeley, June 2011). http://greengrowthleaders.org/wp-content/uploads/2011/08/From-religion-to-reality_chapter-1.pdf

Climate is About

An **Energy System Transformation:**

A Fundamental Transformation

Why An Energy System Transformation?

Climate and Beyond

- Emissions are Derivative of the Energy System
- Energy security
- The costs of importing energy
- Reconciling broader international objectives

An Energy Systems Transformation

The Old: *Inefficient high-carbon*

The New: *Efficient low-carbon*

The Energy Systems Transformation

The Old: *Inefficient high-carbon*
The New: *Efficient low-carbon*

- More than optimizing the existing system?
  - Higher gas mileage
  - Longer lasting light bulbs

The Energy Systems Transformation

The Old: *Inefficient high-carbon*
The New: *Efficient low-carbon*

- Optimize the existing system?

  OR…

- Create a new system
  - Smart efficient buildings
  - Renewables
- Establish a New Energy Trajectory

Historical Guidance
Not the First Energy Shift

- Wood to Coal*
- Coal to Oil
- Adopting Electricity

*"The Next Last Energy Transition: Energy policy and technological innovation across three centuries", Mark Huberty, CITRIS-BRIE Working Paper, (BRIE: Berkeley, September 2009).

Summary

- Manufacturing Matters:
  - Can you control what you cannot produce?
  - Strategic Asset or Vulnerable Commodity?
- (Ict Enabled) Services with Everything
  - (Ict Enabled) Services are produced raising similar issues as manufacturing
  - The Cloud diffuses Ict based innovation but creates provider user dilemmas for policy and strategy
- Energy is not just about Emissions: There is a basic transformation afoot

Three Themes

- ***Manufacturing Matters* Revisited:**
- **Clouds and Services**
  - **ICT Enabled Transformation of Services**
  - The expanded domain of ICT Enabled Services
- **Clouds: An Energy System Transformation**