63.135 Information Technology and Society

Topic 8: The informational economy and globalization: Centralized and decentralized structures

Outline

1. Informationalism and the networked society
2. The network enteprise
3. Changes in space and time concepts
4. Decentralized structures and processes

1. The global networked economy

- *Key new element:* In a self-feeding spiral, progress in management, knowledge, and technology is applied to these same three things
- (*Note:* key element in individual human learning is *self-reflection*)

Productivity, competitiveness and the informational economy

- Productivity means raising output yield per unit of input
- Productivity drives economic progress
- Around 1970s a *downward* trend in productivity growth occurred; note the time-lag factor
- The most productive IT users synergistically combined customer-focused business strategy with decentralized organizational structure

Informationalism and productivity

- *Informationalism:* _____
- Capitalist firms are driven by profitability, not necessarily productivity
- 1980-2000, a main strategy was to broaden markets and fight for market share
- World trade accelerated, enabled by IT support for capital mobility and greater communication capability
- It was globalization of the market and IT that enabled this acceleration

Mass customization

- IT enables combination of quality of high-end custom design with efficiency of mass production
- A product of the customer-centric enterprise resulting from global economy

Historical specificity of informationalism

- Informational-global economy has same profit-driven logic as industrial economy
- Industrial economy became informational-global to avoid collapse
- One factor: a profit squeeze
- Alternative case: collapse of USSR due to failure to shift to new paradigm

Global economy

- *Definition:* "an economy with the capability to work as a unit in real time ... on a planetary scale"
- Not the same as world economy, which has existed since 16th century
- Core of most national economies is global
- Examples of global aspects: financial markets, international trade, transnational production

Selective globalization

- Global R & D: 1993, 10 countries did 84% of research and development
- R&D is skewed toward the concerns of these countries
- Telephones: late 90s, 20% of global population in high-income countries had
  - 74% of phone lines
  - 93% of Internet users
- Most non-public R&D is by multinational corporations

Global labor market

- The market for exceptionally-high-demand labor is globalized
- The market for unskilled labor is not
- There also exists a global networking of labor, interlinked by family and business connections
- Developed societies are increasingly multi-ethnic

Geometry of the global economy

- OECD countries () and four Asian tigers () had 73% of all manufacturing, 1988
- G-7 countries () had 90% of high-technology manufacturing, 80% of all computing power
- Wealth, resources, and dynamism are concentrated in a few countries "a fundamental asymmetry between countries" in integration, competitive capacity, and benefits from growth
- *Result:* Segmentation of the world population, exclusionary and unstable at boundaries

Political economy of globalization

- Global economy was result of
  - markets
  - governments
  - international financial institutions
- Three policies (Reagan-Thatcher-neoliberals)
  - deregulation of domestic economies
  - liberalization of international trade
  - privatization of state-owned firms

Globalization

- *Goal:* Unify all economies under rules of market
- IMF enforced rules, operating in more than 80 countries
- Those countries that declined were ostracized via loss of emergency IMF credit
- "The triumph of markets over governments", a victory wanted by the governments
- There is no easy or political way back out of globalization

The new economy

- Internet industry grew 68%/year, 1998-1999, to $500B
- Internet and IT became the core of the U.S. economy
- Electronic stock trading
  - twice as efficient, raises amount of value traded
  - but increases volatility exponentially
- *Value* of a business is the *expectation* of its *future* value
- A new kind of capitalism unlike laissez-faire or Keynesian capitalism
- Organizational form: *network*, not *hierarchy*

U.S. role in new economy

- *Technical:* California was birthplace of many IT developments
- *Economic:* size of U.S. economy, dominance
- *Cultural:* entrepreneurialism, individualism, flexibility, multi-ethnicity
- *Institutional:* deregulation and liberalization

2. The network enterprise

- *Thesis*: Informational-global economy is associated with "a new organizational logic" that converges and interacts with new technological paradigm
- Mass production is converted to flexible production
- Crisis, not of the large corporation, but of its traditional form of hierarchical, vertical integration and functional management

Toyotism

- Management-worker cooperation
- Multifunctional labor
- Total quality control
- Reduction of uncertainty
- Flat management hierarchy
- Just-in-time delivery of resources to production process

Organizational forms

- Inter-firm networking
- Corporate strategic alliances for specific aims, coexisting with competition
- Shift from vertical bureaucracies to the horizontal corporation
  - flat hierarchy
  - organization around process not task
  - team management
  - customer-satisfaction-driven
  - retraining of employees
  - decentralization

The Cisco model

- Cisco Systems' "global networked business model" for production of Internet backbone products
- Relationships with key constituencies
- Manner of sharing information and systems
- Relationships and communication exist in "networked fabric"
- Core of business operations: Cisco web site
- Cisco supplies manufactured product but contracts out the manufacturing

Other users of the Cisco model

- Dell Computer has a similar web-based customization model
- Dell stock rose 9400%, 1995-1999
- John Deere (agricultural machinery)
- Bechtel (warehousing logistics)
- Renault (auto production)
- Cisco model is becoming the predominant one (184)

Information technology and network enterprise

- Network organization requires change of mentality, not just a technical change
- A change in corporate cultures
- Whole layers of managers become unnecessary
- Network enterprise is enabled by wide-area networks (WANs) enabling collaboration between users at remote sites
- Internet is the ultimate WAN

The network enterprise

- *Organization*: "a system of means structured around the purpose of achieving specific goals"
- Goal of
  - *bureaucracy* is to reproduce system of means
  - *enterprise* is to evolve and shape system of means
- *Network enterprise:* "specific form of enterprise whose system of means is constituted by the intersection of segments of autonomous systems of goals"

Culture, institutions, organization: East Asia

- East Asian business systems tend to be based on networks, not on firms or individuals
- Developmental states base legitimacy on ability to promote development (growth, change), promote national identity.
- *Example*: Japan, MITI

Examples

- *Japan:*
  - *zaibatsu*, horizontal conglomerates of mutually owned firms since pre-WWII (Mitsui, Mitsubishi, Sumimoto)
  - *kairetsu*, vertical networks
- *Korea:* Hyundai, Samsung, Lucky Gold Star, Daewoo
  - hierarchical networks (chaebol) of large firms controlled by holding companies
  - authoritarian pattern
- *China:* family based business enterprises are managed in authoritarian and centralized way, but system is overall flexible and decentralized

Multinational enterprises

- Basic organizational form of global informational economy is international networks of firms and their sub-units
- Kinds of networks, based on multinationals:
  - supplier
  - producer
  - customer
  - standard coalition
  - technology cooperation

The logic of networks

- "The logic of the network is more powerful than the powers in the network"
- "The network enterprise ... seems to be flourishing …"
- "The large, multi-unit corporation, hierarchically organized around vertical lines of command seems to be ill-adapted to the informational, global economy"

The spirit of informationalism

- *Max Weber:* Protestantism provided the ethical "spirit of capitalism", i.e., entrepreneurship and profit-seeking
- For first time, the basic unit of organization in the economy is not a *subject* (individual or class or corporation), but a *variety* of subjects, a network
- The ethical foundation for the network enterprise, or spirit of informationalism, is "a multi-faceted, virtual culture" that evolves, the culture of creative destruction running at the speed of light

Networks restructure society

- Power relationships are made susceptible to major change by network organization of society
- Power is held by people at the interfaces between networks
- Global capitalist society is structured around a network of financial flows
- Dominant functions in society are organized in networks, subordinate ones are fragmented

3. Changes in space and time concepts

The space of flows

- "Space organizes time in the network society"
- The traditional space of *places* is replaced by a space of *flows*
- Example of a flow: A stream of symbols, images, transactions, messages, as between a computer and its environment

Advanced services, information flows, global city

- Networks are in a spatial hierarchy, concentrated in certain metropolitan areas
- Regional and local centers reflect differences of intensity and scale
- The whole system becomes globally interconnected
- The hierarchy is not permanent or stable

The new industrial space

- "Milieus of innovation" benefit from synergy of interaction (not composition) of elements present
- These may include industrial technopolises, Tokyo, Paris-Sud, London-M4, Milan...
- Milieus of innovation have global networks of production and distribution
- The new space is organized around flows of information

The end of cities?

- Not just work-at-home, but "telecommuting from telecenters" seems to be emerging, using suburban facilities
- Not the end of the office, but diversification of work sites
- Online transactions will not eliminate shopping centers, but supplement them
- Emerging higher education forms combine onsite and distance education

Transformation and urban form

- The informational city
- Mega-cities: 10 million plus, where control of media, power politics, symbol production capacity are centered
- In mega-cities there is global connectedness but local disconnection
- Mega-cities are the nodal points and power centers of the global space of flows
- Downside: urban decay, environmental problems

Social theory of space of flows

- Space = society
- “Space is crystallized time”
- “Space is the material support of time-sharing social practices”, having symbolic meaning

Society is constructed around flows

- Flows are endless streams
- Flows express processes that dominate social life
- Interaction flows presuppose simultaneity and space coupling
- *Flows:* "purposeful, repetitive, programmable sequences of exchange and interaction between physically disjointed positions held by social actors"

Flows and their support

- Kinds of flows
  - information
  - technology
  - organizational interaction
  - images, sounds, symbols
- Layers of support for the space of flows
  - circuit of electronic interactions
  - nodes and hubs
  - spatial organization of managerial elites

The edge of forever: Timeless time

- A society is embodied time
- Time is local (specific to a context) and global
- Time, history, and society
  - modernity places clock time in command over space and society
  - network society is leaving behind "linear, irreversible, measurable, predictable time"

Time as the source of value

- New financial products, e.g., futures, derivatives, increase relative value of nominal capital to deposits and assets
- Pensions and insurance are put at risk in financial gambling
- "The annihilation and manipulation of time by electronically managed global capital markets are at the source of new forms of devastating economic crises, looming in the twenty-first century"

Changes in experience of time

- Flex-time and the network enterprise
  - Skilled workers manage their own time
  - Accept flexible schedules: "just-in-time labor"
- Shrinking and twisting of working lifetime
  - Actual working lifetime may reduce to about 30 years

Blurring of the life cycle

- *Hypothesis:* "The network society is characterized by the breaking down of the rhythms, either biological or social, associated with the notion of a life cycle"
- Individuals are choosing different times to procreate and thus determining their own life schedules

Death denied and instant wars

M. Castells:

- We use technology to postpone death to the last possible moment, denying its inevitability, denying death
- "Instant wars" are an attribute of informational societies and of forms of domination in the new system generated by them

These are questionable claims

Virtual time

- Time is transformed into simultaneity and timelessness (e.g., hypertext)
- Time sequence depends on social context
- Time is compressed and then denied, due to fast turnover made possible by communication technologies

Time, space and society

- Timeless time goes with the space of flows
- Time discipline, biological time, and sequenced time go with places
- "We have entered a purely cultural pattern of social interaction and social organization," since culture has superseded nature in dominance
- Hence flows of messages and images are basic thread of social structure
- Information age is "marked by the autonomy of culture vis-a-vis the material basis of our existence"

4. Decentralized structures and processes

Decentralized "design"

- *Example artifacts:*
  - The Internet
  - Natural language
  - Human society and culture
  - Evolution of life
- Are any *centralized* processes capable of producing equally good results as current *decentralized* processes?

"Authorities" that shaped Internet

- DARPA's "design" was as a decentralized (self-organizing) system
- Internet Assigned Number Authority (IANA) – a volunteer group that gave way…
- To government-sponsored "cooperative agreement," 1993
- … followed by government-authorized Internet Corp. for Assigned Names and Numbers (ICANN)

Could the Internet have been designed?

- "There was no one we could have pointed to as charged with 'creating' the set of rules we now know as the Internet"
- "My instinct is that it could not have [been build another way], that only an 'authority-free' process of this kind could have constructed this system…"

Decentralized decisions and their results

- *Example:* A low-price WalMart replaces downtown despite townspeople's preference for having a downtown – "an unexpected or unintended result is not the same as a coerced result"

References

S. Baase. *A Gift of Fire*, 3rd ed. Pearson Prentice Hall, 2008.

M. Castells. *Rise of the Network Society*, 2nd ed. Blackwell, 2000, Chs. 2-3, 6-7.

M. Hammer and J. Champy. Reengineering.

C. Hawken. *The Next Economy*.

M. Resnick. Decentralized thinking.