Paradigms of the Knowledge Economy

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The Knowledge Economy

- What do we mean by the "Knowledge Economy"?

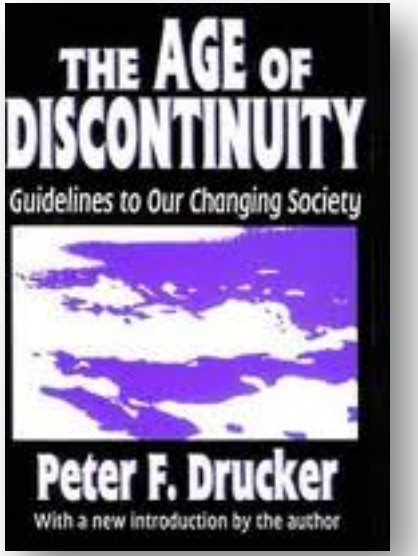
The Knowledge Economy

- In addition to land, labor and capital, knowledge is now viewed as a key factor of production.

The History of KE

- When attempting to develop a genealogy of the Knowledge Economy (KE), most scholars begin with Peter Drucker's (1969) *The Age of Discontinuity*.

- The truth is that the discourse on KE is interwoven with much older intellectual threads that evolve across a range of disciplines, including sociology, economics, and management studies.



Tracing the KE Discourse

- In reality, the discussion on KE "sits within a complex and interconnected set of discourses that rapidly succeed, replace and overlap one another"
- (Peters, 2009).

A Range of Discourses

- Fritz Machlup (1962) on measuring the production and distribution of knowledge.
- Gary Becker (1964; 1993) on human capital as an accelerator of economic development.
- Peter Drucker (1959) on the knowledge worker (his term) and on 'knowledge management'.
- Yoneji Masuda (1968) and Mark Porat (1977) on the "information society".
- Daniel Bell (1973) on the "postindustrial society" and the importance of new science-based industries (including a shift from manufacturing to services).
- Alvin Toffler (1980) on prosumer production and the 'Third Wave'.
- Paul Romer (1990) on economic transformation arising from investment in technology as an input (Endogenous Growth Theory).
- The OECD (1996) on endogenous growth theory and public policy formation in support of the 'knowledge-based economy'.

Defining the Knowledge Economy

- Put in simple terms, the discourse on KE suggests that the industrial economy is being transformed by accelerating innovation linked to rising investments in science and technology.

Paradigms of the Knowledge Economy

- Beyond any single definition of the Knowledge Economy, however, there are in fact several different forms of KE.
- Paradigms of the Knowledge Economy :
  - (1) The Innovation Economy *(Peter Drucker)*
  - (2) the Network Economy *(Yochai Benkler)*
  - (3) the Creative Economy *(Richard Florida)*
  - (4) the Green Economy *(Jeremy Rifkin)*
- In this presentation, I examine four contemporary *paradigms* of KE and consider their implications for shaping education.

Paradigm One: The Innovation Economy

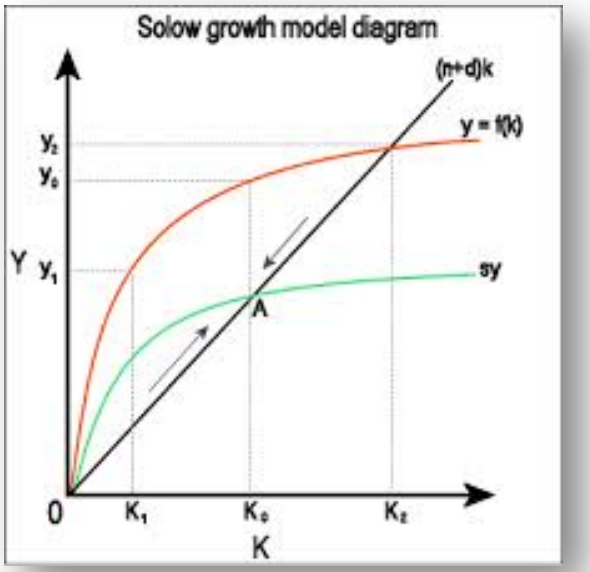
- Conventional readings of KE view it as the next stage in the evolution of capitalism.
- Building on Burton-Jones (1999), for example, KE is often defined simply as "knowledge capitalism":
  - *The knowledge economy is a contemporary and dominant manifestation of capitalism. It is driven by the production, distribution and consumption of knowledge. (Kenway et al., 2006, pp. 4-5)*

KE as Policy Discourse

- At the global level, KE discourse is rooted in major reports like the OECD's *The Knowledge-based Economy* (1996).

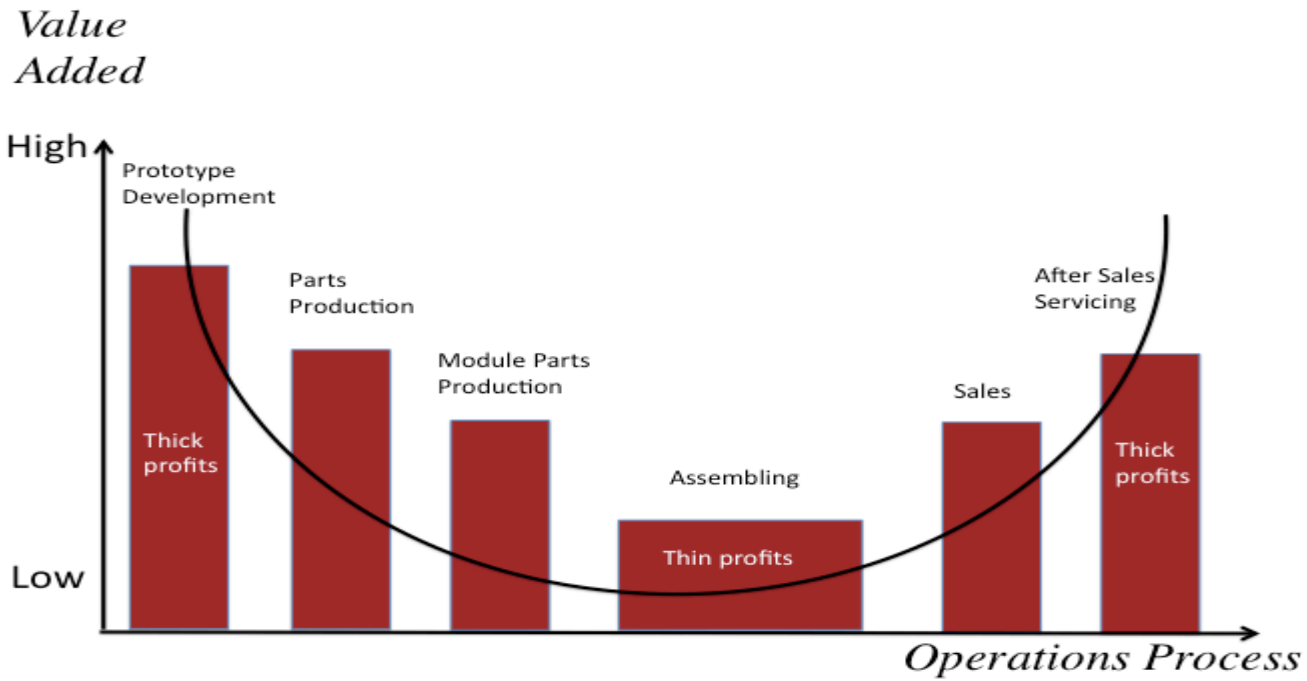
Endogenous Growth Theory

- Based on *Endogenous Growth Theory*, contemporary thinking on the knowledge economy explicitly connects investments in knowledge and education to economic expansion.



The Smiling Curve

- As the so-called "Smiling Curve" of value production illustrates, "thick profits" are now increasingly concentrated in industries that require higher value-added knowledge.



Growth from Innovation

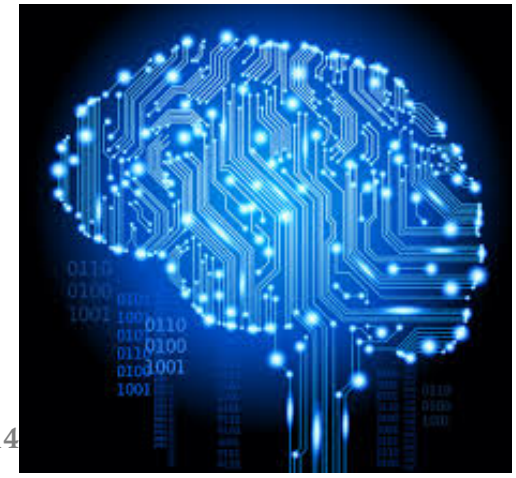
- Endogenous Growth Theory is distinct from neoclassical theory, in that growth is seen as the "endogenous outcome of an economic system, not the result of forces that impinge from outside" (Romer, 1994: 4).
- "Economic growth occurs whenever people take resources and rearrange them in ways that are more valuable."

Human Capital Theory

- According to the economist Paul Romer (1988), "the stock of human capital determines the rate of [economic] growth".

Human Capital Theory

- Evolving out of the work of Mincer (1958), Becker (1964) and Schultz (1961, 1964, 1971), human capital theory proposes the idea that capitalist organizations can advance worker performance and improve economic productivity by investing in high-skills and training.



Human Capital Theory

- Principles underlying human capital theory include:
  - techno-scientific innovation
  - the codification of knowledge through information and communication technologies (ICTs)
  - the production and circulation of knowledge by and through knowledge networks.
  - the commodification of knowledge through intellectual property regimes

KE as Innovation

- Where neoclassical economic theory views knowledge as exogenous (or external) to growth, theories on endogenous growth locate knowledge and innovation at the center.

Innovation and Intellectual Property

- Underlying public policy discussions on KE is a sharp focus on intellectual property and the global regulation of creativity and innovation through organizations like the World Intellectual Property Organization (WIPO) and the World Trade Organization (WTO).
- IP rights (copyrights, patents and trademarks) are viewed as fundamental to protecting "knowledge-based capital" (KBC).
- This reflects an increasing relative share of GDP attributable to "intangible" capital in OECD countries (Powell and Snellman, 2004: 201).

Paradigm Two: The Network Economy

- In addition to this formal notion of the Knowledge Economy (Paradigm One), there other competing and overlapping paradigms of KE.
- Each paradigm reflects a separate but contingent dimension of an evolving discourse on KE, and each paradigm represents a unique intellectual strand in an ongoing discussion on postindustrial society.

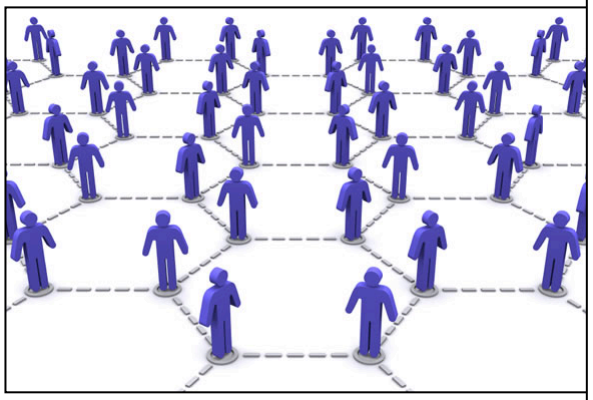
The Network Economy

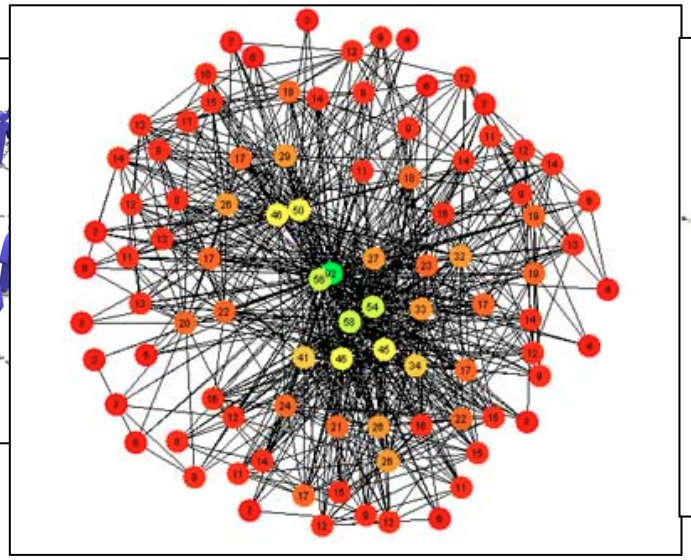
Borrowing language and discourse from the Open Source Movement, Yochai Benkler (2006) suggests that the rise of networked environments make possible a new modality of organizing production.

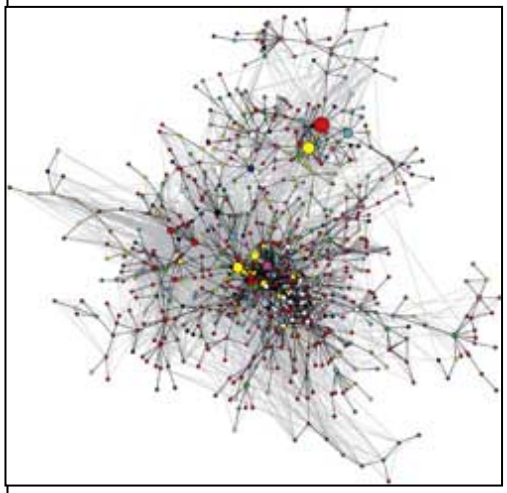
In his book, The Wealth of Networks: How Social Production Transforms Markets and Freedom, Benkler suggests that networked production is transforming market-based economies.

Networks are peer-driven

In ideal social networks, information is driven peer-to-peer rather than hierarchically.







Networked Production

- Similarly, **Adler & Heckscher** (2005) argue that networks fundamentally change how we produce and consume:

Structures of Social Organization

- They outline 3 broad **modes** of social organization:

1. **Hierarchy**

2. Market

3. Network

Networked Community

- All three forms can be present simultaneously, but generally one is dominant.
- In premodern/traditional societies, hierarchy is dominant
- In modern/industrial societies, competitive markets are dominant
- In postmodern/postindustrial societies, networked community is becoming dominant

Cultural Typologies

- In hierarchical (pre-modern) societies, relationships are defined by honor and status. Cultures are highly ordered but closed and conformist.
- In market (modern) societies, relationships are defined by rational self-interest. Cultures are open to innovation, but individualistic and competitive.
- In network (post-modern) societies relationships are defined by 'collective intelligence'. Cultures are complex and adaptive but dependent on shared construction and constant negotiation.

Forms of Organization

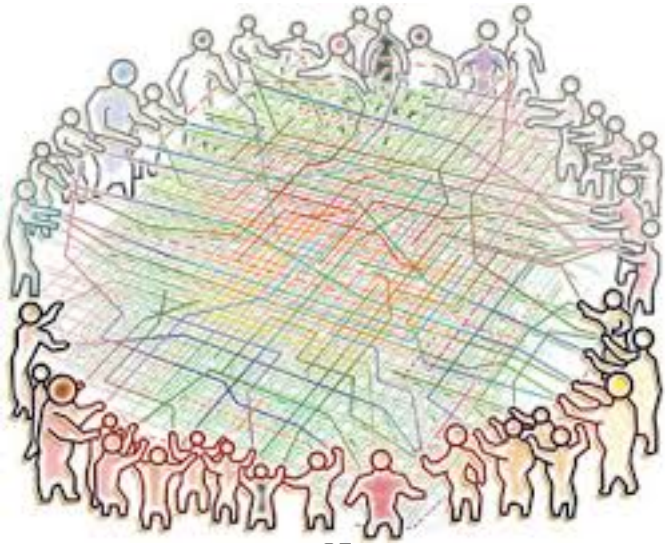
	Hierarchy	Market	Network
Organization	Mechanical division of labor coordinated by common norms	Organic division of labor coordinated by price and/or authority	Organic division of labor coordinated by conscious collaboration
	Organization through vertical dependence	Organization through horizontal independence	Enabling (horizontal and vertical interdependence)
	The structure is local, closed	Global, open	'Glocalization'
Identities	Status-dependent	independent	Interdependent, self-construal interactive social character

Modes of Social Organization

- Hierarchy uses authority to create and coordinate a division of labor (bureaucracy)
- Markets use price signals to coordinate competing and anonymous suppliers and buyers
- Networks use shared values and norms to produce and improve a common object or common resources

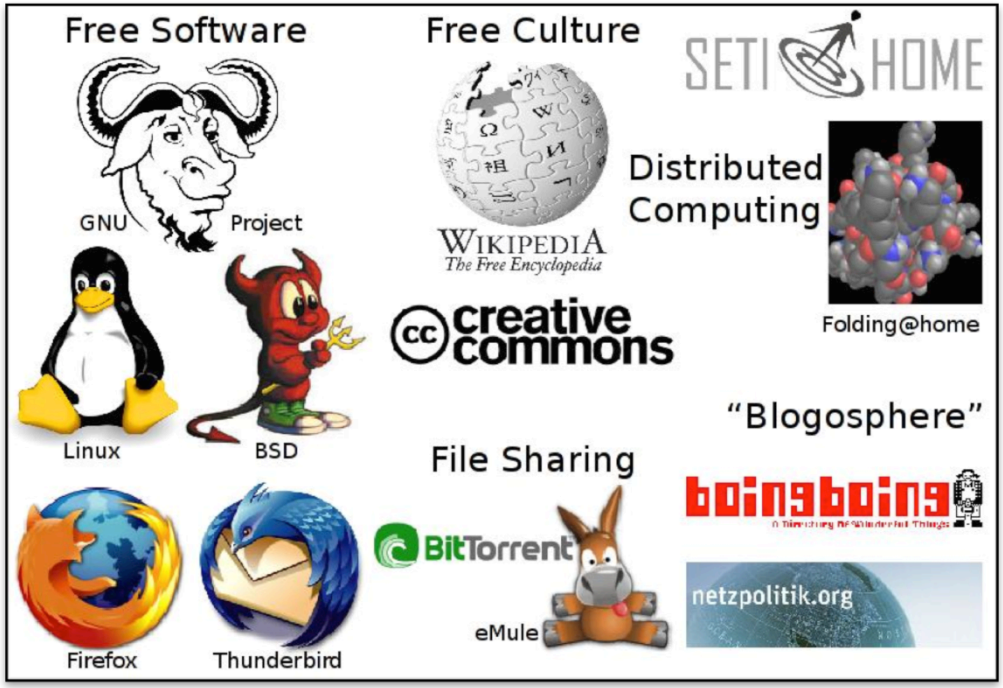
Beyond Public Goods

- Where as **public goods** can be overused (the tragedy of the commons) **collaborative goods** are dependent upon continuous improvement (ie., they **cannot** be overused)



Collaborative Production

- A collaborative community emerges when a collective group engages in cooperative, interdependent activity towards a common object.



Defining Collaborative Community

- "**Collaborative community** forms when people work together to create shared value. This increasingly characterizes societies in which the generation of knowledge, often involving many specialists, has become central to economic production… In the **traditional**, where values are assumed to be eternally embodied in the existing community, without the need for shared work to achieve them; and the **modern**, where values are removed from the public realm and left to individuals, with community being merely a place where individuals can pursue their own ends by participating in a shared game. In a collaborative community, values are not individual beliefs, but the **object of shared activity**; they have to be discussed and understood in similar ways by everyone. The basis of trust is the degree to which members of the community believe that others have contributions to make towards this shared creation..."

Self Production

- Bound together in productive social and economic **relationships,** user networks can self-produce, self-supply, and self-distribute **common** goods and services

Organization in a Knowledge Age

- Under bureaucracy, knowledge was a scarce resource, concentrated (along with decision-making) at the **higher** levels of an organization
- Organizations competing on the basis of innovation, however, require **continuous** creativity and the collaboration of the whole organization
- The question the authors ultimately ask, is whether capitalism itself (ie, commodification and private property) can survive the shift to a **knowledge** age

Managing Scarcity

- **Capitalism** is based on the allocation of scarce goods through the use of markets.

Understanding Property

- Scarce goods are understood as private goods and therefore protected by **property** rights
- A property right is a legally enforceable power to **exclude** others from using a resource
- In the neoclassical paradigm, scarcity is about **rivalry** and property is about **exclusion**

Non-rival Goods

- A private good is rivalrous because consumption by one person reduces the quantity that can be consumed by **another** person
- However, collaborative production depends upon an **extended** understanding of the notion of nonrivalrous **public goods**,
- Nonrivalry occurs when increased consumption of a good **does not** reduce the amount available to others (eg., air and other natural resources)

Anti-Rivalry

- The emergence of **collaborative production** suggests something more and different from public goods and/or common-pool resources (eg., public infrastructure)
- Collaborative goods are *anti-rivalrous* and *inclusive*
- That is, they depend on **sharing**
- an **increase** in consumers of collaborative goods in fact increases the value of the goods

Collaborative Goods

- **Anti-rivalry** occurs when the use and/or sharing of the production of a good *increase* value to others
- **Inclusiveness** occurs when the value of a good *increases* as the number of people using/producing the good *increases*
- So where private goods are diminished by use, and **public** goods are not necessarily diminished by use, **collaborative** goods are actually enhanced by use

Paradigm Three: The Creative Economy

- Richard Florida defines the Knowledge Economy in terms of a *Creativity*
- In his view, the creative class- people whose main economic function is to **create** new ideas, new technology, and new creative content- is the vanguard of a new phase in capitalism.

Rise of the Creative Class

- In Florida's estimation the creative class already constitutes 30% of the U.S. workforce:
- with an **inner core** (of scientists, engineers, architects, designers, musicians, artists, educators and entertainers) representing 12%
- and an **outer layer** of support **professionals** in business, finance, health, law, accounting and related professions representing 18%).

The Creative Economy

Ranging from copyright **industries** like publishing, music, visual/performing arts, film, media, architecture, advertising and design, on the one hand,

to patent **industries** like engineering, biotechnology, information technology, pharmaceuticals, electronics and advanced materials, on the other,

creative industries are linked by their common dependence on human talent and creative innovation.

Education in the Creative Economy

- Florida argues that **education** is critical to developing the human capital that underlies the creative economy
- At the same time, the kind of education that Florida is referring to is not strictly about knowledge acquisition
- But about nurturing creativity

Beyond Factory Schooling

- Education systems today are ill-equipped to tap the **creative** capacities needed for a creative economy

- Ken Robinson, for example, argues that the contemporary factory model of schooling is **killing** creativity

Creative Individualization

- As he suggests, contemporary education systems are essentially **Fordist** factories shaped for the needs of industrial societies

- In Robinson's view, the key to transforming education today is to focus on nurturing individual **talents**

Community and Education

- How do networks change education?

Beyond the Transmission Model

- Education systems designed for industrial societies are ill equipped to effectively harness the creativity and open collaboration needed today because they are too "top down".
- Transmitting a fixed body of knowledge and practices down from experts to amateurs is contradictory to an economy and society increasingly dependent on collaboration and innovation.

Community as Curriculum

- David Cormier (2008) puts it this way:

> *In the rhizomatic model of learning, curriculum is not driven by predefined inputs from experts; it is constructed and negotiated in real time by the contributions of those engaged in the learning process. The community acts as the curriculum, spontaneously shaping, constructing and reconstructing itself and the subject of its learning in the same way that the rhizome responds to changing environmental conditions.*

Theories of Learning

- Definition:

  Sfard (1998) points out that there are two predominant metaphors for thinking about learning: (1) Learning as acquisition and (2) Learning as participation.

- (1) *Learning as acquisition* assumes that the human mind is a container to be filled through knowledge and learning.

- (2) *Learning as participation* assumes that learning is more akin to apprenticeship.

  That is, learning involves enculturation into cultural practices and shared learning activities. Knowledge is situated in social contexts, and is acquired by *doing*.

Peer Learning Communities

- Just as peer-to-peer communities have transformed the production of software, P2P learning communities may transform the practice of learning and education.

P2P Learning Ecologies

- Brown (2005) and others describe this unfolding environment in terms of P2P "learning ecologies".
- Supported by peer networks, learning ecologies enable robust feedback systems that self-organize around a "cultural" commons.
- These commons-based ecologies afford opportunities for learners to share, plan, negotiate and execute projects collaboratively.

Thank You!