On the Transition from the Industrial to the Knowledge Economy

A point of view inspired by Adam Smith

Irving Wladawsky-Berger
Accelerating Advances in Technology

Source: Kurzweil 1999 – Moravec 1998
The Internet: Industrial Knowledge Economy
Evolution of Systems
Market Facing Systems

Back Office Systems
People and Services

Machines and Products
How can you think of something as “cosmic” as the industrial and knowledge economies?
Go Back to the Source: The Father of Economics

Adam Smith 1723-1790
How can you think of something as “cosmic” as the industrial and knowledge economies?

A Framework inspired by Adam Smith

- Division of Labor
- The Invisible Hand
- Moral Sentiments
Division of Labor

Adam Smith
Division of Labor

Smith lists three causes, arising from division, of improved productivity:

- the labourer's dexterity - due to specializing, year-round, in a specific task
- time not wasted passing from one task to the next - as in agriculture - as well as the more consistent and focused effort when working in just one area
- the machines and tools that have evolved in conjunction with increasingly specialised labour

It is the size of the market that determines to what degree the division of labour will take place. In a small economy, a person would not see the benefits of specialising in just one employment since he could not reap the benefits through trade for other goods and services with others.

Wikipedia – Adam Smith
Computer Assisted Engineering Systems

- Strategy
- Collaboration
- Design / Simulation
- Operation / Maintenance
- Manufacturing
Division of Labor
Services Sciences, Management and Engineering (SSME)

Computer Assisted Business and Organizational Systems
Architectures, tools, processes, modeling, simulation, analysis, . . .
The Invisible Hand
The Invisible Hand

As every individual, therefore, endeavors as much he can both to employ his capital in the support of domestic industry, and so to direct that industry that its produce may be of the greatest value; every individual necessarily labors to render the annual revenue of the society as great as he can. He generally, indeed, neither intends to promote the public interest, nor knows how much he is promoting it.

By preferring the support of domestic to that of foreign industry, he intends only his own security; and by directing that industry in such a manner as its produce may be of the greatest value, he intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to promote an end which was no part of his intention. Nor is it always the worse for the society that it was not part of it.

By pursuing his own interest he frequently promotes that of the society more effectually than when he really intends to promote it. I have never known much good done by those who affected to trade for the public good. It is an affectation, indeed, not very common among merchants, and very few words need be employed in dissuading them from it.

The Wealth of Nations – Adam Smith (1776)
The Invisible Hand
Globally Integrated Enterprises, Industries and Economies
Increased Integration + Accelerating Change \rightleftharpoons Increased Emergence, Unpredictability, “Long Tail” Events
Information-based Decision Support and Management
Moral Sentiments
Moral Sentiments

How selfish soever man may be supposed, there are evidently some principles in his nature, which interest him in the fortunes of others, and render their happiness necessary to him, though he derives nothing from it, except the pleasure of seeing it.

Of this kind is pity or compassion, the emotion we feel for the misery of others, when we either see it, or are made to conceive it in a very lively manner.

That we often derive sorrow from the sorrows of others, is a matter of fact too obvious to require any instances to prove it; for this sentiment, like all the other original passions of human nature, is by no means confined to the virtuous or the humane, though they perhaps may feel it with the most exquisite sensibility. The greatest ruffian, the most hardened violator of the laws of society, is not altogether without it.

The Theory of Moral Sentiments – Adam Smith (1759)
Moral Sentiment
Can you have moral sentiments in a global, digital economy?

The (Flat) World

The Region or Nation

The Town or City

The Village or Local Neighborhood

21st Century . . .

20th Century

18th – 19th Century

17th Century and earlier
Evolution of the Web

Early Web
Access and Find

Web 2.0
Share and Collaborate

Visual, Immersive Web
Experience, Participate and Co-Create
Social Networks

People from all over the world self-organizing into communities
Collaborative Innovation

*People from all over the world self-organizing into a commons-based, peer-production system*
Knowledge Economy

Industrial Economy
Information Technology is to the Knowledge Revolution as Steam Power was to the Industrial Revolution
Transition to the Knowledge Economy

Deepening Integration of IT into all aspects of Business and Society

Business, Societal and Lifestyle Innovation

Accelerating Advances in Technology
How can you extend Adam Smith’s framework from the industrial to the knowledge economy?

- **Division of Labor**
  - Services Sciences
  - Complex Engineering Systems

- **The Invisible Hand**
  - Information-based Decision Support and Management
  - Predictive Analysis and Simulation

- **Moral Sentiments**
  - Social Networks
  - Collaborative Innovation
  - Corporate Social Responsibility

† Talent is more important than ever
A Stream of Disruptive Innovations

- Software as a Service
- Services Sciences
- Web 2.0
- Offshoring
- Virtual Worlds
- Mashups
- Flat World
- Game players
- iPods
- SOA
- Petaflop supercomputers
- GIE
- Cloud Computing

Into the Future . . .
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