

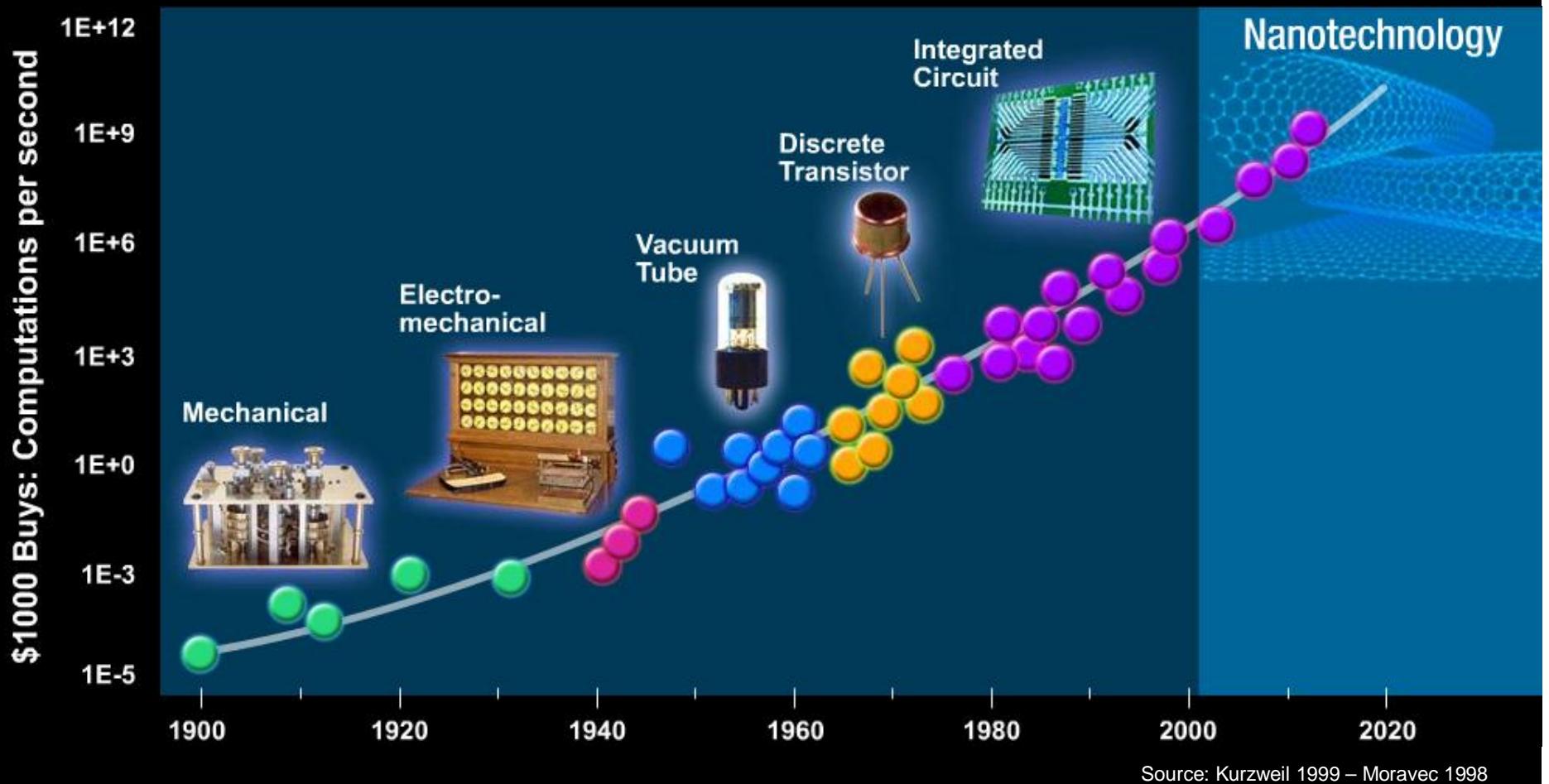


# On the Transition from the Industrial to the Knowledge Economy

*A point of view inspired by Adam Smith*

Irving Wladawsky-Berger

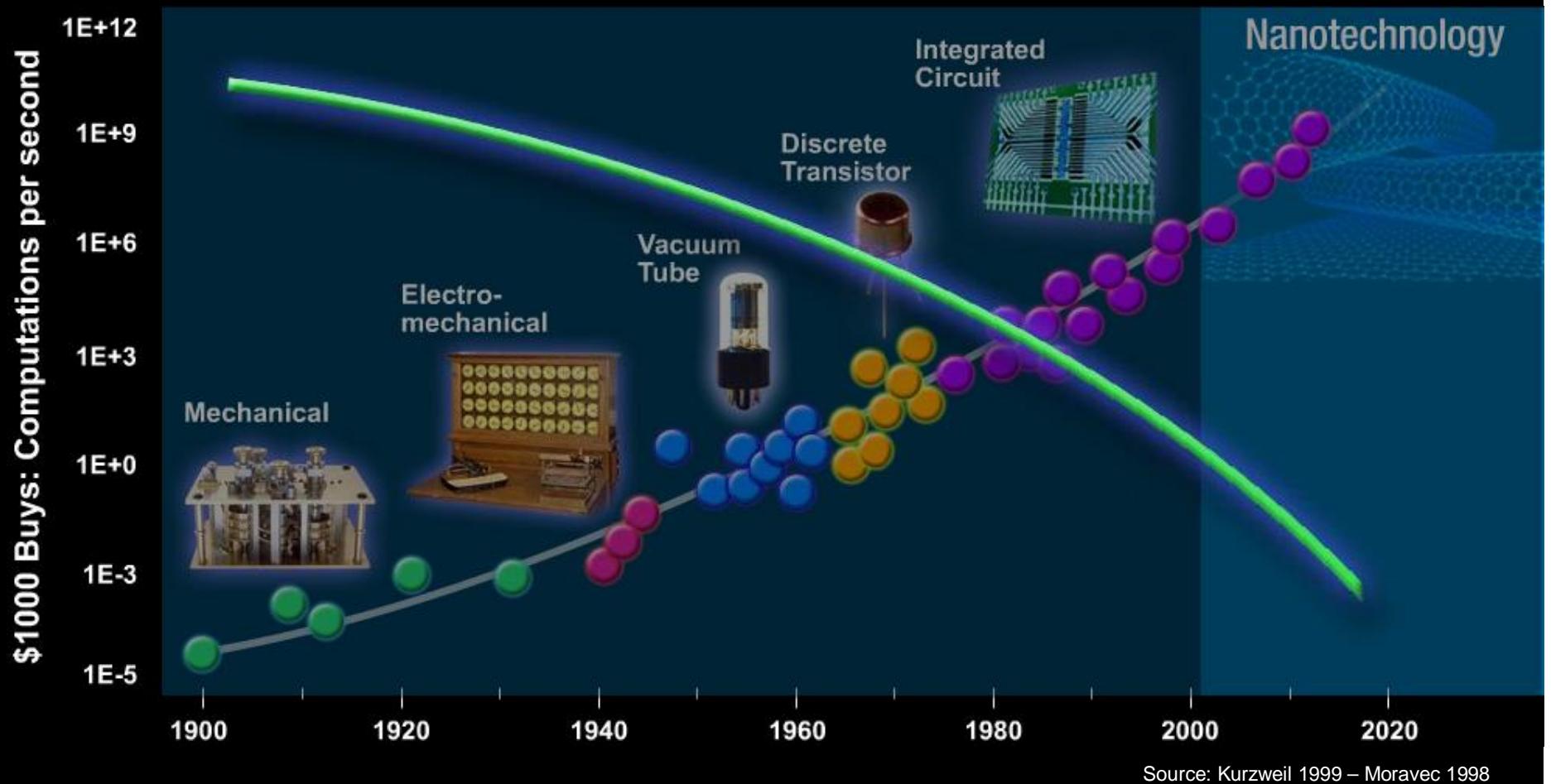
# Accelerating Advances in Technology



Source: Kurzweil 1999 – Moravec 1998

# Accelerating Advances in Technology

## *Driving Costs Steadily Downward*



The Internet: Industrial  Knowledge Economy



# Evolution of Systems

Business



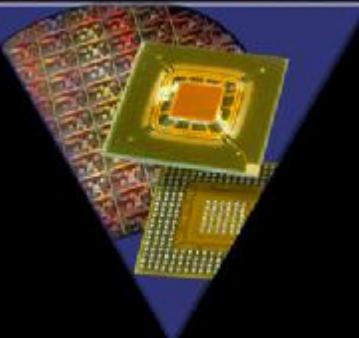
Applications



Products



Technology



# Market Facing Systems



# Back Office Systems

# People and Services



# Machines and Products

# Intangible Assets



# Tangible Assets

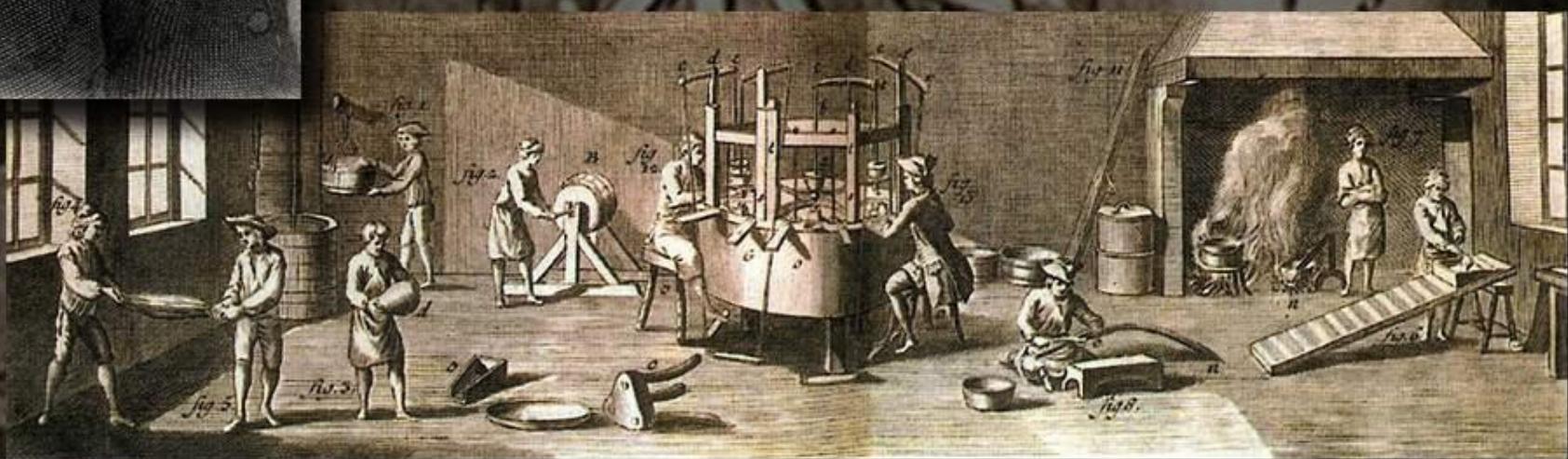


How can you think of something as “cosmic” as the industrial and knowledge economies?

# 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?

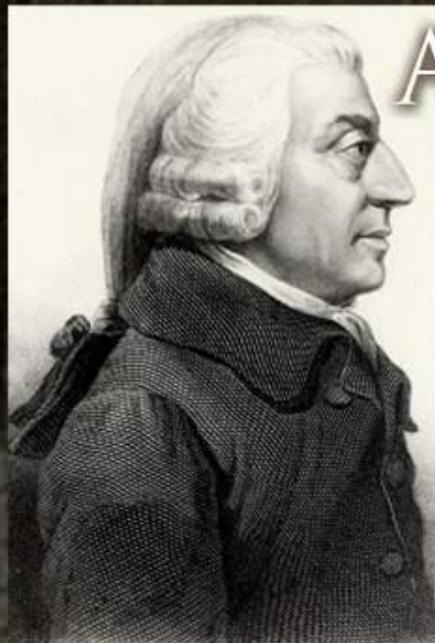
*A Framework inspired by Adam Smith*

§ Division of Labor

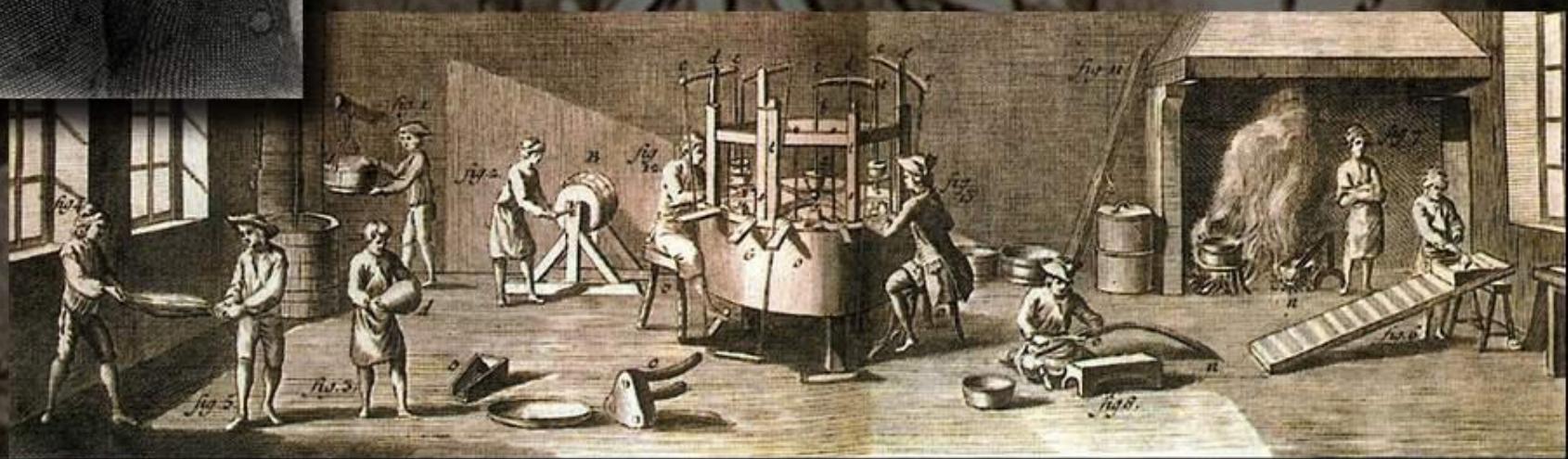
§ The Invisible Hand

§ Moral Sentiments

# Division of Labor



ADAM SMITH



## Division of Labor

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

- à the labourer's dexterity - due to specializing, year-round, in a specific task
- à 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
- à 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

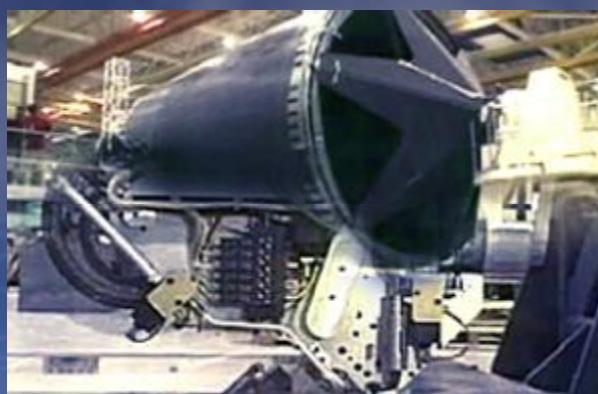
Strategy  
Collaboration



Design /  
Simulation

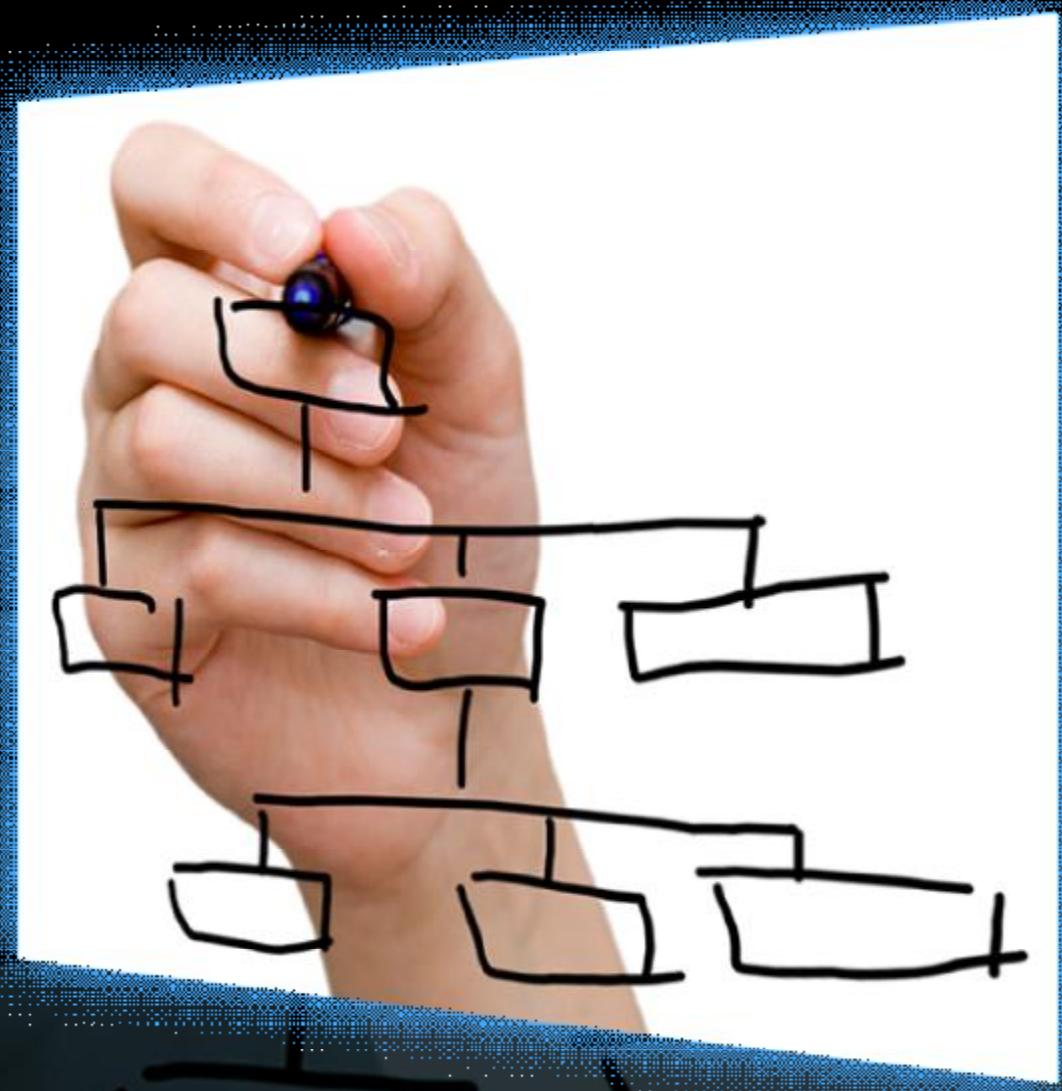


Operation /  
Maintenance



Manufacturing

## Division of Labor

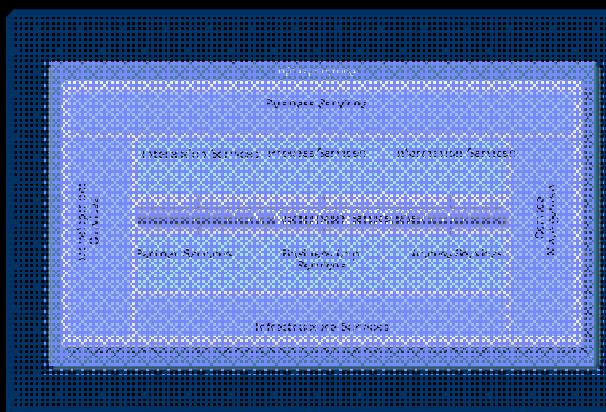


# Computer Assisted Business and Organizational Systems

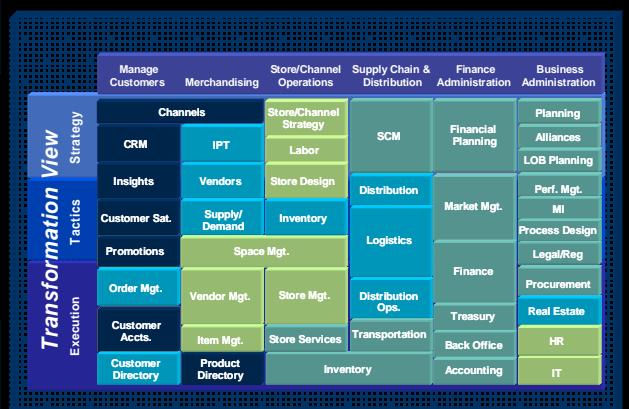
## Strategy Collaboration



## Operation / Feedback-loop



## Business Designs and Architectures

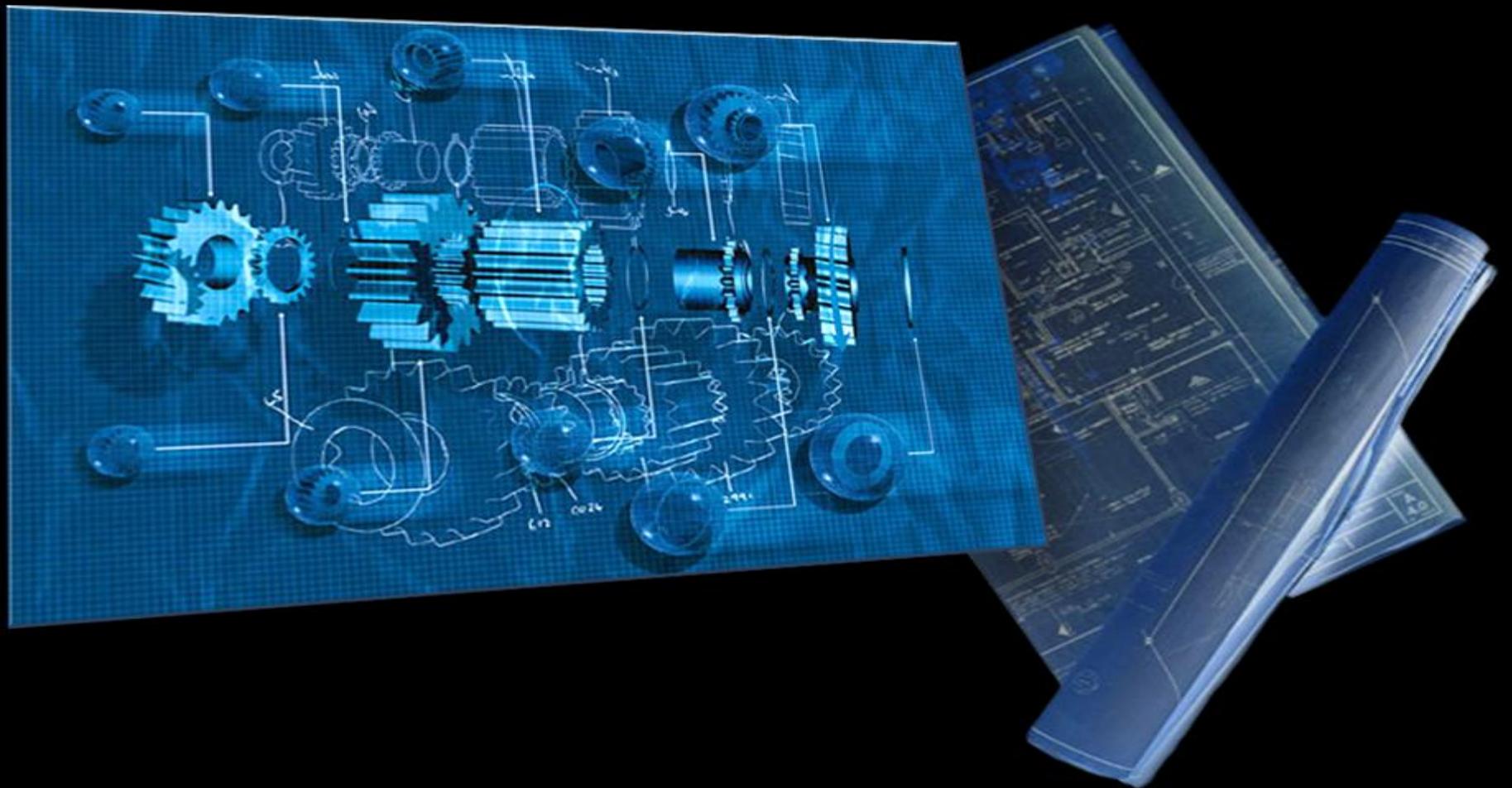


## Implementation (SOA)

# 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)*

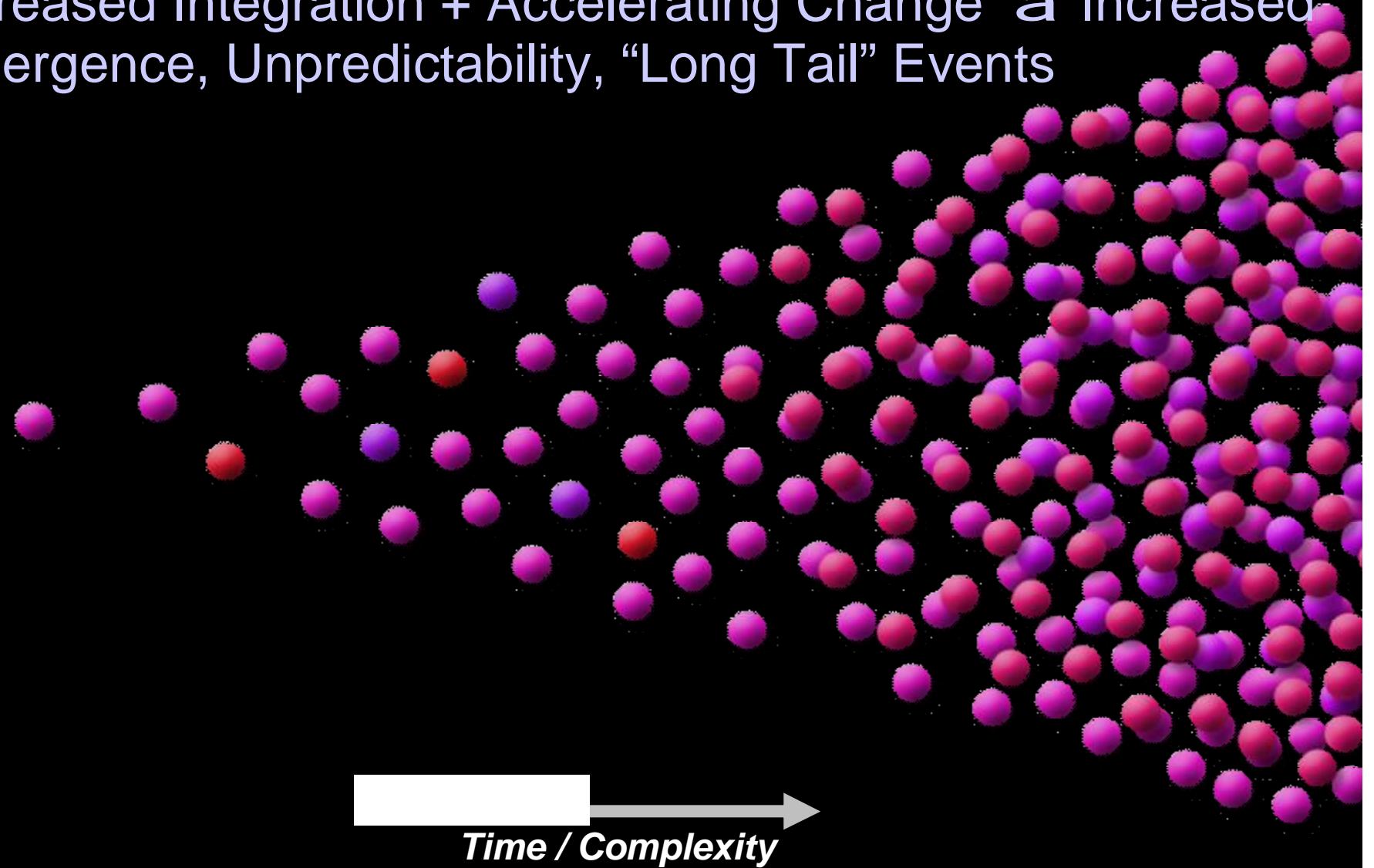
# The Invisible Hand



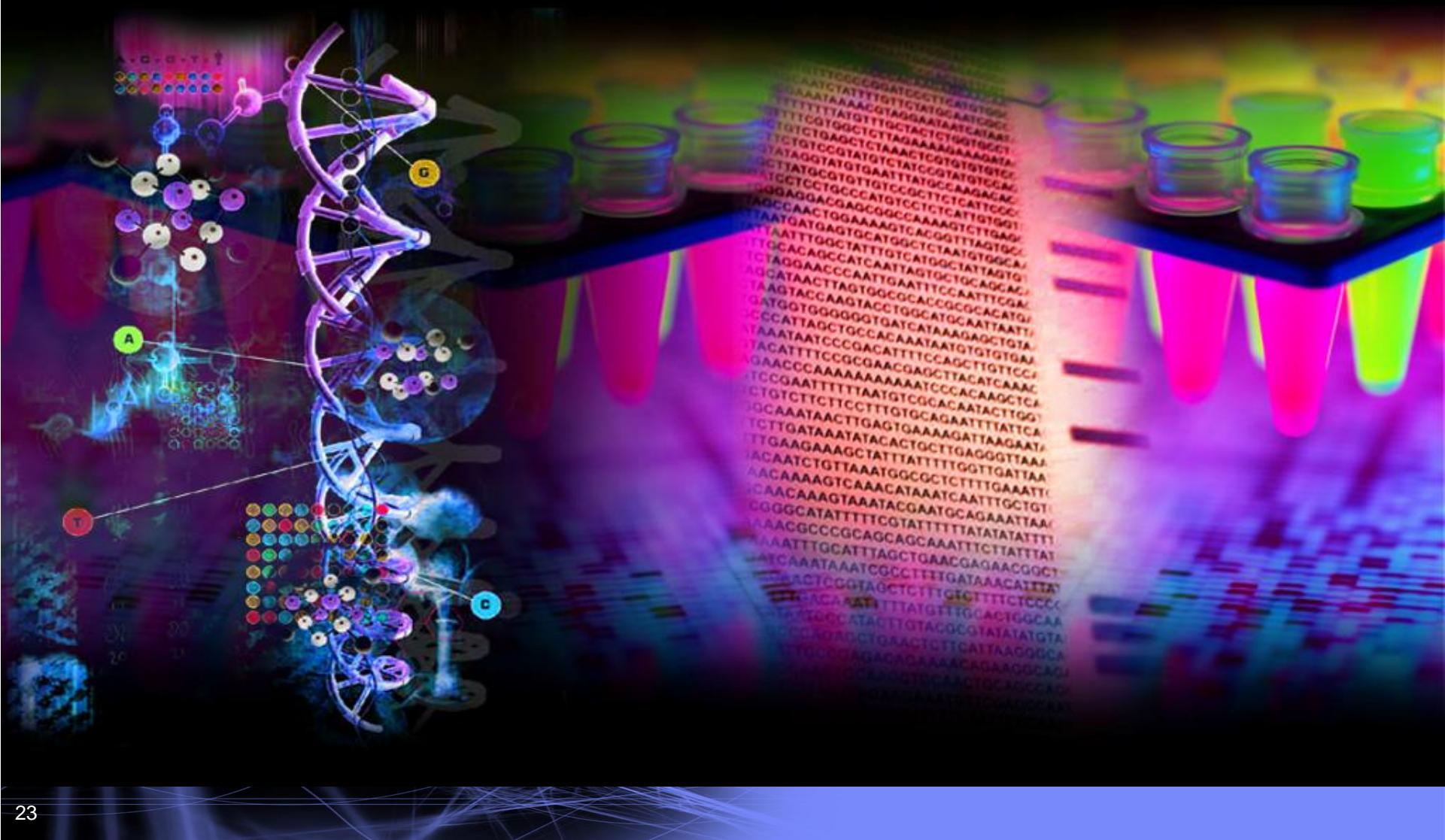
# Globally Integrated Enterprises, Industries and Economies



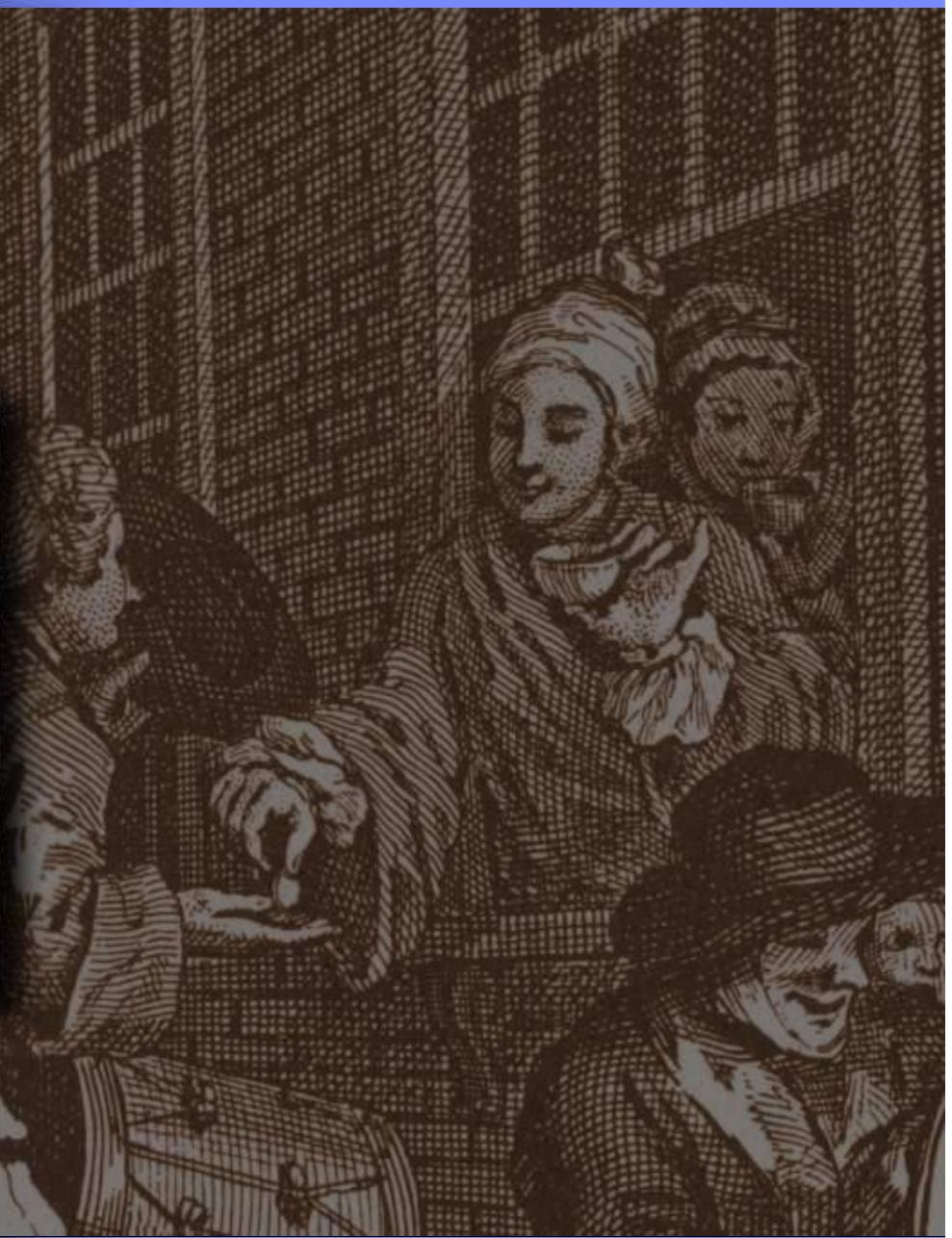
Increased Integration + Accelerating Change  $\rightarrow$  Increased Emergence, Unpredictability, “Long Tail” Events



# 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.*

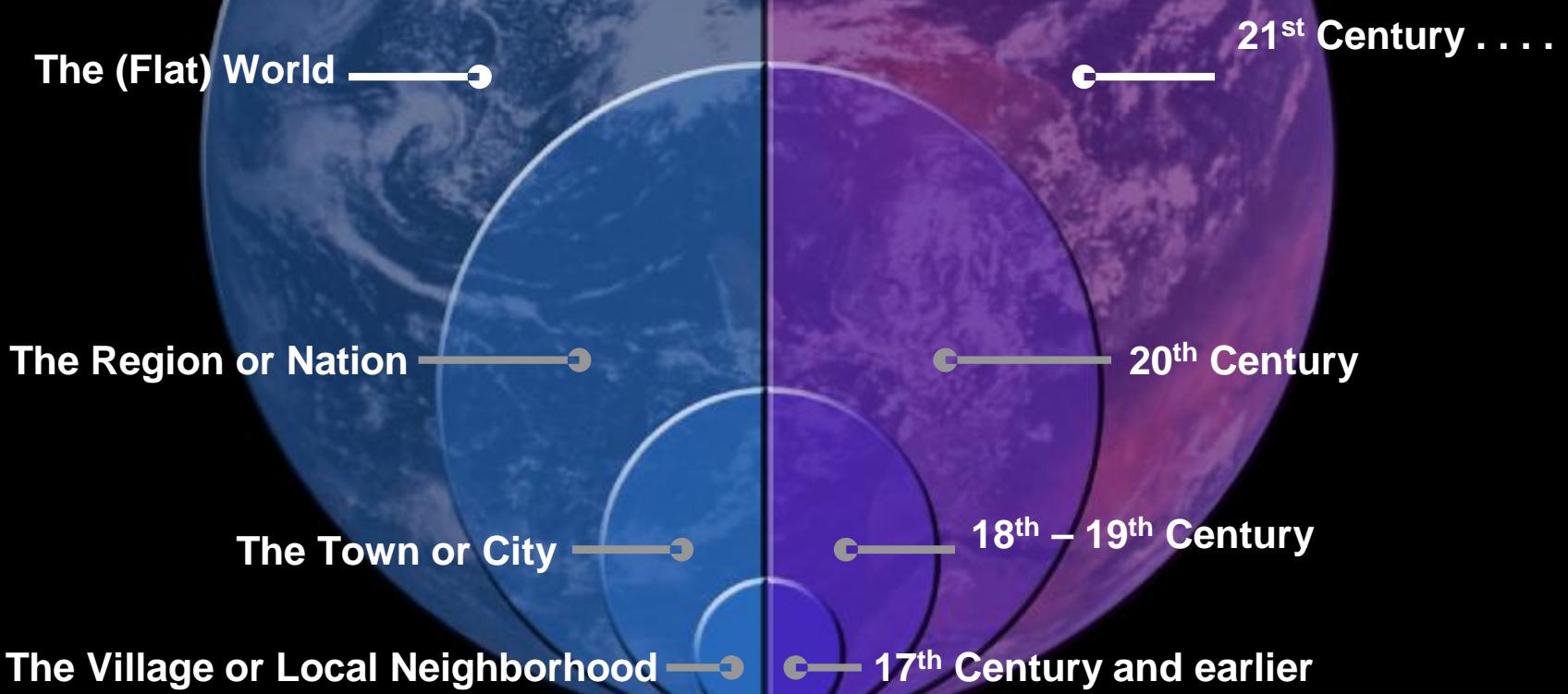
*That we often derive sorrow from the sorrows of others, is a matter of fact too obvious to require any instances to prove it; for this sentiment, like all the other original passions of human nature, is by no means confined to the virtuous or the humane, though they perhaps may feel it with the most 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)*

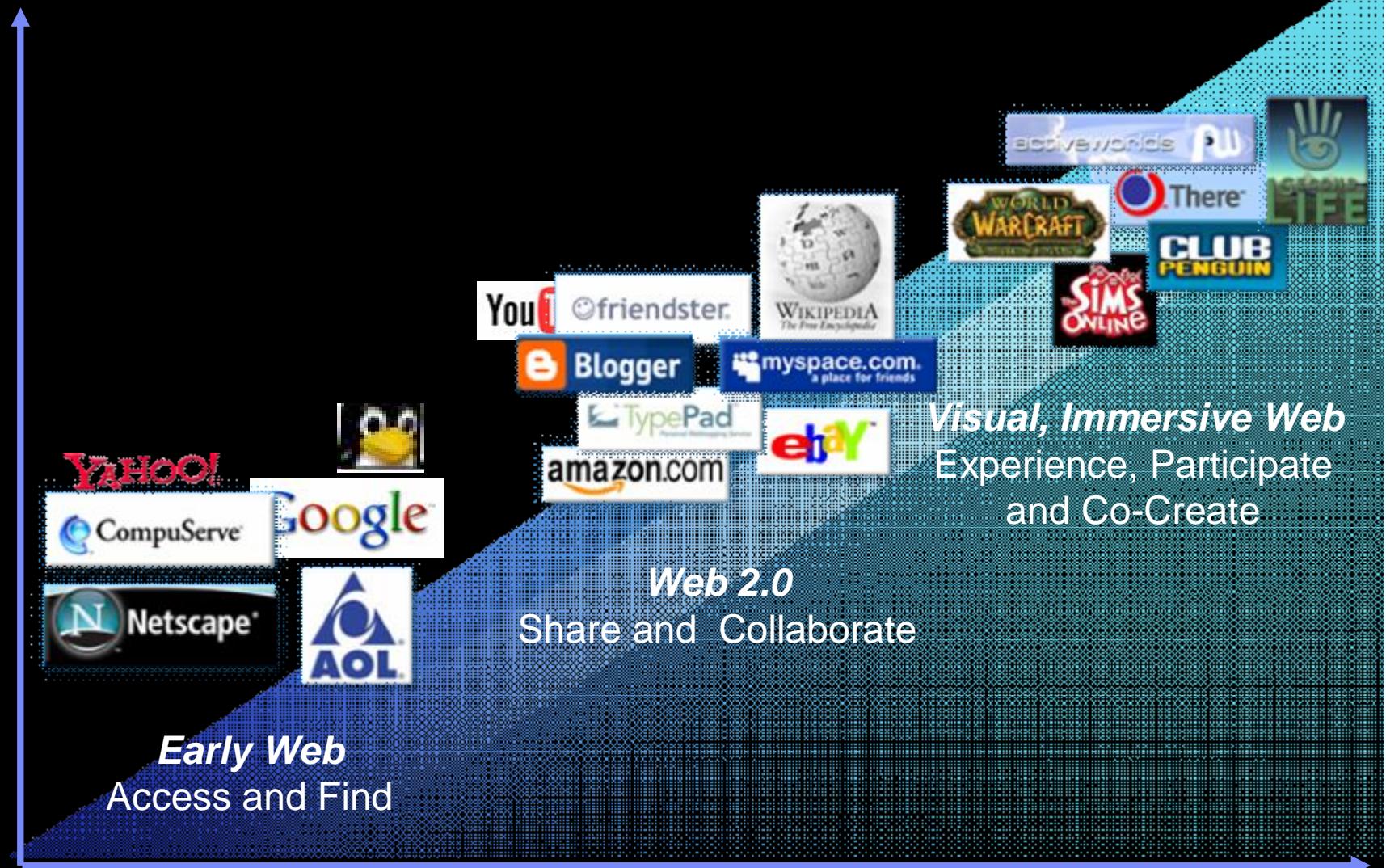
# Moral Sentiment



# Can you have moral sentiments in a global, digital economy?



# Evolution of the Web



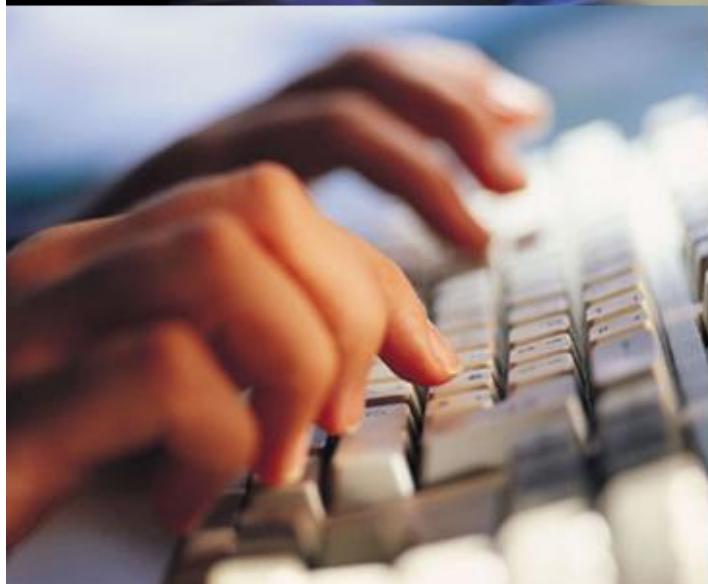
# Social Networks

*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 Revolution

*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**

Ø How can you extend Adam Smith's framework from the industrial to the knowledge economy?

à *Talent is more important than ever*

§ Division of Labor

Ø Services Sciences

Ø Complex Engineering Systems

§ The Invisible Hand

Ø Information-based Decision Support and Management

Ø Predictive Analysis and Simulation

§ Moral Sentiments

Ø Social Networks

Ø Collaborative Innovation

Ø Corporate Social Responsibility

## A Stream of Disruptive Innovations

Software as a Service

Services Sciences

Web 2.0

Game players

SOA

iPods

Offshoring

Petaflop supercomputers

Virtual Worlds

GIE

Mashups

Cloud Computing

Flat World



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