



ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ  
ΠΑΝΕΠΙΣΤΗΜΙΟ ΚΡΗΤΗΣ

# Ψηφιακή Οικονομία

**Διάλεξη 3η: Basics of Network Economics**

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Τμήμα Επιστήμης Υπολογιστών



# Course Outline



- **Part I: Service Science**
  - Introduction
  - **Basics of Network Economics**
    - Supply Chains
    - Service Value Networks
  - Tools
    - Vensim



# Network Economy



- An enterprise-based system of developing, producing and marketing goods and services, in which a substantial amount of business activity is conducted in alliances between multiple firms
- Markets
  - A special kind of markets: those where **network goods and services** are traded
  - Telephone, email, Internet, computer hardware, computer software, banking services, airline services, ...

*Source: Ard-Pieter de Man, "The Network Economy : Strategy, Structure and Management, 2004"*



# The Faces of the New Economy



10pm Friday Evening:

- Sunil in India, just received e-mail from Inge in Germany, who runs a micro-enterprise from home, with details on some programming she has just subcontracted
- Nikos is at a taverna celebrating a 1million euros investment of venture capital in his company
- Ivan has just begun the night shift in a call center
- Katerina just left her cleaning job – she is also a part-time office administrator and runs a small enterprise designing and selling cushions

*Source: Graham Dawson et al, "Economics and Economic Change Microeconomics, 2006"*



# Living and Working in the New Economy



- Shift from manufacturing to services in industrialized economies
- Information and communication technologies
- Globalization

*Source: Graham Dawson et al, "Economics and Economic Change Microeconomics, 2006"*<sup>4</sup>



# Shift from manufacturing to services in industrialized economies



- ◆ Several reasons for the restructuring:
  - ◆ Old industrialized countries (Germany, USA, Japan, UK) face competition from new industrialized countries
  - ◆ Productivity (output per worker) has increased in manufacturing allowing same output with less workers
  - ◆ People in richer countries already possess many consumer goods, but are short of time – growth of personal consumer services such as leisure, fitness training, etc.
- ◆ But service sector more diverse than manufacturing:
  - ◆ Highly skilled and paid jobs (IS, marketing, design, finance) and low skilled and paid jobs (cleaning, catering, security, leisure, personal care). Unions lose influence, wide wage disparities
- ◆ Restructuring rarely takes place smoothly – factories don't become call centers overnight!



# Globalization



- Interdependence and integration of economic activity in different countries
  - Interdependence: production of goods in one country is affected by the production of goods in another
  - Integration: production processes in different countries are coordinated
- Facilitated by ICT: for example leading companies in clothing and footwear, do not manufacture them –they do branding and marketing



# Information and communication technologies



- New ways of disseminating goods and services
- Speed-up in communications
  - events in one part of the globe affect faster fortunes of people thousands of miles away (see for example recent banking and financial crisis)
- 24-hour economy
- In the 'new' economy a lot more knowledge, intelligence and 'style' embedded in products such as cars, cameras, washing machines, etc.





# The Benefits of the New Economy



- Productivity
- Economic growth
- Technological change incurs
  - Reduction of transaction – search costs
  - Development of new products and services
  - Immediate access to world markets
- Efficiency gains
  - Competition
  - Customization
  - E-commerce
- Flexible working patterns



# The Costs of the New Economy



- Employment insecurity
- Wage costs
- Social Isolation
- Flexible Working Patterns
- Social unsustainability
- Income inequality increasing



# Main Characteristics of Markets of Network Products



- Complementarity, compatibility and standards
- Consumption externalities
- Switching costs and lock-in
- Significant economies of scale in production

Source: Oz Shy, “ The Economics of Network Industries, 2001”



# Complementarity, compatibility and standards



- We analyze markets that supply goods that must be consumed together with other products (**compliments**)
  - Software and hardware, CD players and CD titles, ...
- Question: do firms benefit from designing machines that can work with machines produced by rival firms?
  - Complementarity products must be **compatible**
  - In other words: complementarity products must operate on the same **standard**
  - Problem of coordination as how firms agree on the standards
- Complementarity is a crucial factor in markets for information goods
  - Make use of complementarities to attract more customers
  - e.g.: New York Times – real-estate magazines



# Externalities

- The utility derived from the consumption of goods is affected by the number of other people using similar or compatible goods
  - Telephone service, email, ...
- Market outcome depends on how consumers form expectations on the size of the network of the users
- Question: what should be the minimal number of users (critical mass) needed for inducing all potential consumers to adopt a new technology?



# Switching Costs and Lock-in



- The degree of lock-in is found by calculating the cost of switching to a different service or adopting a new technology
- Types of switching costs
  - Contracts
  - Training and learning
  - Data conversion
  - Search cost
  - Loyalty cost: lose benefits such as frequent flyer mileage
- Switching cost affect price competition
  - Firms may raise prices to locked-in consumers
  - Firms may offer discounts and free complementarity products to attract consumers



# Significant Economies of Scale



- Information products have the characteristic that the production of the first copy involves a huge sunk cost whereas the second copy costs almost nothing to reproduce
  - Software, Britannica encyclopedia, ...
  - **sunk costs** are costs that cannot be recovered once they have been incurred
- These markets cannot function as competitive markets
  - Negligible marginal costs -> a competitive equilibrium does not exist



# Differences between the Old and the New Economy



- Information flow
- Skilled jobs – educated labor
- International competition
- Customer centric strategies





# Value



- The old economy creates value in a product through its physical attributes
- The new economy creates additional value through intangibles (experience, knowledge, ...)



# Τέλος Ενότητας



Ευρωπαϊκή Ένωση  
Ευρωπαϊκό Κοινωνικό Ταμείο



Με τη συγχρηματοδότηση της Ελλάδας και της Ευρωπαϊκής Ένωσης



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