Business ecosystem as the new approach to complex adaptive business environments

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Agenda

- Different views to ecosystem analogy
  (biological, industrial, economy as an ecosystem, digital business ecosystem)
- Different interpretations of business ecosystem
- Relevant complexity concepts
- Relevant areas in economics
- Our own interpretation
Biological Ecosystem

• A system of organisms occupying a habitat, together with those aspects of the physical environment with which they interact

• A community of living organisms with air, water and other resources
   (The Merriam-Webster Third New International Dictionary of the English Language 1986)

• Ecosystems do have some kind of extended web structure
   (Kauffman 1993)

• Not unambiguous how to distinguish biological ecosystems
Industrial Ecosystem

- Environmental protection by the means of nature
  (Frosch & Gallopoulos 1989)
- All material is recycled infinitely and efficiently
- Co-operate by using each other’s waste material and waste energy flows as resources
- Minimum input of virgin material and energy
  (Korhonen et al. 2001)
Economy as an Ecosystem

- Social science approach
- Eyes global economy as an entity
- Organizations and consumers are the organisms of the ecosystem
- Competition, specialization, co-operation, exploitation, learning, growth
  (Rothschild 1990)
Digital Business Ecosystem

• “Digital environment” populated by “digital species”

• The environment enables species to behave like species in natural world
  - Evolve
  - Interact
  - Become extinct
  (Nachira 2002)

• EU funded program to enhance the development of SMEs in software business
Social Ecosystem

- System theoretical view
- Each organization is a fully participating agent which both influences and is influenced by the social ecosystem made up of all related businesses, consumers, and suppliers, as well as economic, cultural, and legal institutions
- Interdependence of all entities

(Mitleton-Kelly 2003)
Business Ecosystem: J. F. Moore

• “An economic community supported by a foundation of interacting organizations and individuals – the organisms of the business world”
• Customers, lead producers, competitors, and other stakeholders
• “The keystone species”
• Four phases
Business Ecosystem: Iansiti & Levien

• A large number of loosely interconnected participants who depend on each other for their mutual effectiveness and survival
• Keystone, dominator, hub landlord, niche player
• Productivity, robustness, niche creation
Business Ecosystem: Power & Jerjian

• E-business view

• Integrated electronic business: Ecosystem consists of an interacting system of web sites and physical entities

• There is often one highly linked species

• Gradual birth of new businesses and the death of old ones
Complexity concepts

- Self-organization
- Emergence
- Adaptation
- Co-evolution
- Fitness
- Fitness landscape
- Selection
Economics

• Evolutionary economics
  - Variation, search and selection
  - Selecting the smudge of sufficient efficiency
    (Nelson & Winter 1982, Potts 2000)

• Agent-based computational economics
  - The computational study of economies modeled as evolving systems of autonomous interacting agents
  - Multi-agent simulation modeling
    (Tesfatsion 2002)
Conclusions

• The ecosystem analogy has been widely used
• Different interpretations emphasize different aspects of ecosystem and thus do not have much to contribute to each other
• Economy as an ecosystem and social ecosystem are the closest analogies to business ecosystems
• Business ecosystems are as difficult to outline as natural ecosystems
Our Interpretation

• Business ecosystem is an interconnected population of organizations which forms a dynamic structure
• Business ecosystem is self-sustaining and develops through self-organization and co-evolution
• Competition and co-operation are present simultaneously
• Boundaries are possible to find by examining the web structure
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