Webinar on Competition law and policy approaches towards digital platforms and ecosystems in cooperation with the BRICS Competition Law and Policy Centre and the Brazilian Administrative Council for Economic Defense (CADE)

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Digital platform ecosystems (DPEs) as complex adaptive systems

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Digital platforms ecosystems and natural ecosystems

- A new type of economic agent – a digital platform (DP), and a new kind of business models – a digital platform ecosystem (DPE) have emerged due to a **rapid development of digital connectivity**.

- Arguably, DPE success lies in flexibility, adaptability, reliance on self-organization, emergent complexity, and public value co-creation.

- Natural ecosystems (NE) exhibit the same characteristics.
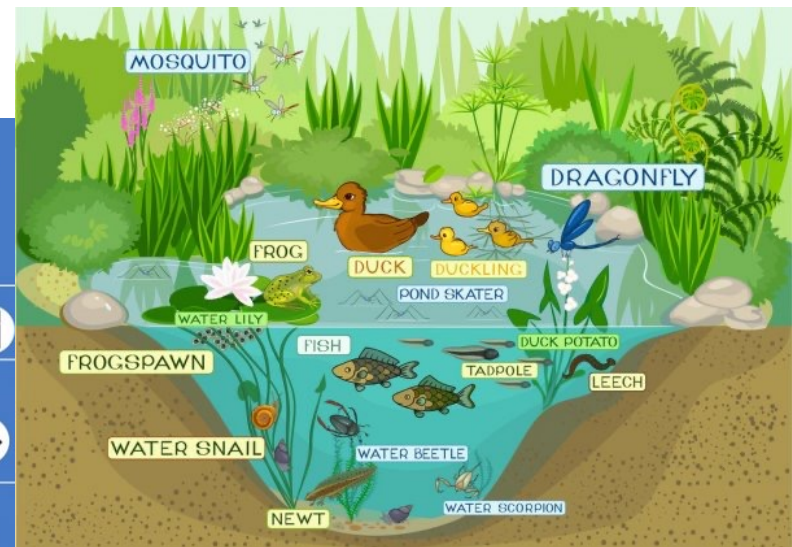
Complex adaptive systems

- Flexibility, adaptability, reliance on self-organization, emergent complexity, and public value co-creation are pertinent to complex adaptive systems (CASs):

    - **Complex**: A dynamic network of interactions; the system's behavior cannot be predicted based on the behavior of components – emergent properties

    - **Adaptive**: Replicator dynamics – trial-an-error process aimed at improving agent's objective function by modifying agent's characteristics or behavior

- Natural ecosystems are most prominent and most studied real-life prototype of CAS

    - Trial-and-error = mutation and selection of more successful traits

Collective, emergent behavior of system

Feedback

Localized interactions between agents
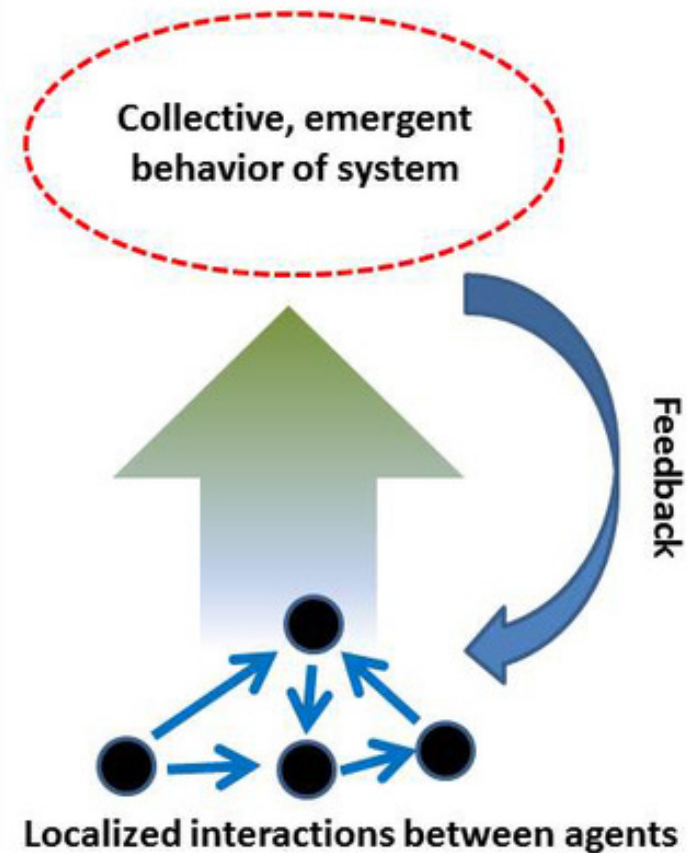
CAS is a mental model!

- Innovation in products and business strategies ~ trial-and-error process

- Digital connectivity has facilitated relevance of CAS* model for treating economic systems of the 21st century due to high reliance of digital businesses on innovation
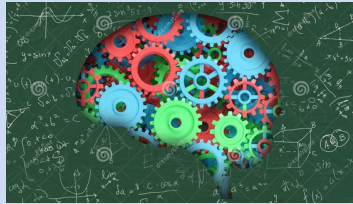
"Ecological approach"

to understanding and regulating DPEs

CAS*=Complex Adaptive System

"Ecological approach" to understanding and regulating DPEs

Transfer specific models and other analytical approaches from ecology to the DPE context

Transfer concepts and insights from ecology to the DPE context

Adopt an ecological worldview when dealing with the DPE context

Metaphors are reflective of and can influence our worldview

- Worldviews are foundational to our perceptions of complex matters. Worldviews inspire metaphors, and once metaphors become part of a mental model, information is perceived through the perceptual filter of those metaphors.

- Metaphors are crucial for the human understanding of experience (Lakoff and Johnson, 1980). Even a subtle use of a metaphor can impact on how people address social problems, and this impact is often underestimated by people themselves (Luks 1998).

- Economics routinely uses metaphors, e.g., invisible hand, price mechanism, equilibrium etc. Many of them are aligned with a 'mechanistic' view on the economy reflective of the 'mechanistic trap' (Capra & Mattei, 2015).

Metaphors are reflective of and can influence our worldview

- Ecosystem as a metaphor for a platform-based networked business affects the way we perceive this kind of business. Business leaders' adoption of this metaphor has arguably contributed to their success.

- Further adoption of ecological metaphors has been sparse and, conceivably, constrained by limited familiarity on the side of economists and other experts of ecology and evolution.

- Our approach aspires to facilitate such links and propose new metaphors/analogies from evolution and ecology relevant for DPEs and challenges of regulators.

Metaphoring is a widely used heuristic for informing decisions

- Within the ecological worldview, policymakers might choose to see themselves as gardeners rather than engineers.

Examples of metaphors from existing literature

- Iansiti and Levien (2004): 'Keystone' role of ecosystem orchestrators for the success of business ecosystems – rely on the concept of keystone (itself is a metaphor!) species in natural ecosystems.

Removal of the **keystone sea otter** : sea urchins overgraze kelp and destroy the kelp forest community.

New ideas

See:

Research Square

An Ecological Perspective to Master the Complexities of the Digital Economy

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Intraguild predation: The illustration depicts intraguild predation in an ecosystem where a larger, stronger predator attacks a smaller predator, which is itself hunting or holding prey.

~ killer acquisition

Modelling approaches from ecology could be useful to model digital economy

- **Complexity science and network science:** Focus on interconenctions at the micro level lead to the emergence of processes, properites, and patterns at the macro level.

- **Agent-based modelling:** With the increased computational capacity, it has become possible to simulate behaviors of individual economic agents (e.g., consumers or firms) and hence depart from the assumptions of a representative rational agent.

- **Evolutonary game theory:** In ecology, EGT is used to model evolution including mutation, selection, and retention. Evoltuonary economics emerged as a discipline that models economic and technolgoical progress as an evolutionary process, which includes, for example, social learning. Assumptions of evolutionary economics seem to be particulalry appropritate for modelling digital economy.

Questions? Comments?