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Complex Adaptive Team Systems (CATS)

Systems

Open –vs– Closed Systems

Systems Theory

Complex Adaptive Team System
(CATS)

Complex Adaptive Systems

Complexity Theory

Open –vs– Closed Systems

Open Systems

Linear

Predictable

Presents Simple Problems

Closed Systems

Non-Linear

Non-Predictable

Presents Complex & Wicked Problems

Systems theory

Input – Process – Output

Changes in one part of the system effects other parts of the system.

The system is the sum of the parts.

Changes are generally predictable.

Complex Adaptive Systems

“Interdependent **agents** that interact, learn from each other, and adapt their behaviors accordingly.”

(Beck & Plowman, 2014, p. 1246)

The **building block** for higher level agents or systems while continuously adapting to environmental changes.

(Bovaird, 2008)

CAS - Characteristics

- Non-Linearity
- Open System
- Feedback Loops
- Scalable
- Emergence
- Contains many constituents interacting non-linearly.
- Open in which boundaries permit interaction with environment.
- Contains Feedback loops.
- Structure spanning several scales.
- Emergent behavior leads to new state.

Complexity Theory

“Targets a sub-set of **all systems**; a sub-set which is abundant and is the basis of all novelty; a sub-set from which structure **emerges**.... That is, **self-organization** occurs through the dynamics, **interactions** and feedback of heterogeneous components.”

(Strathern & McGlade, 2014, p. 12; see also Allen, 2007)

Characteristics of Complexity Theory

- Interactions
- Non-linear Distributive Patterns
- Interdependent/Autonomous Agents
- Emergence
- Self-Organizing
- The Driver of Emergence (***the level of analysis**)
- Changing Patterns of Order
- Agents Interact & Bounded by Objectives
- Reformation of Existing Structures
- Adaptive (able to react to environment)

The System Holism Principle

- Complexity relates to the emerging whole, which differentiates complexity theory from GST.
 - GST follows the holism principle: “the whole is **greater** than the sum of its parts”.
 - Complexity theory operates on the principle: “the whole is **different** from the sum of its parts and their interactions.”

(Richardson, 2004, p. 77)

This leads to the following Questions:

WHAT DOES A CAS LOOK LIKE?

WHAT DOES ITS STRUCTRE LOOK LIKE?

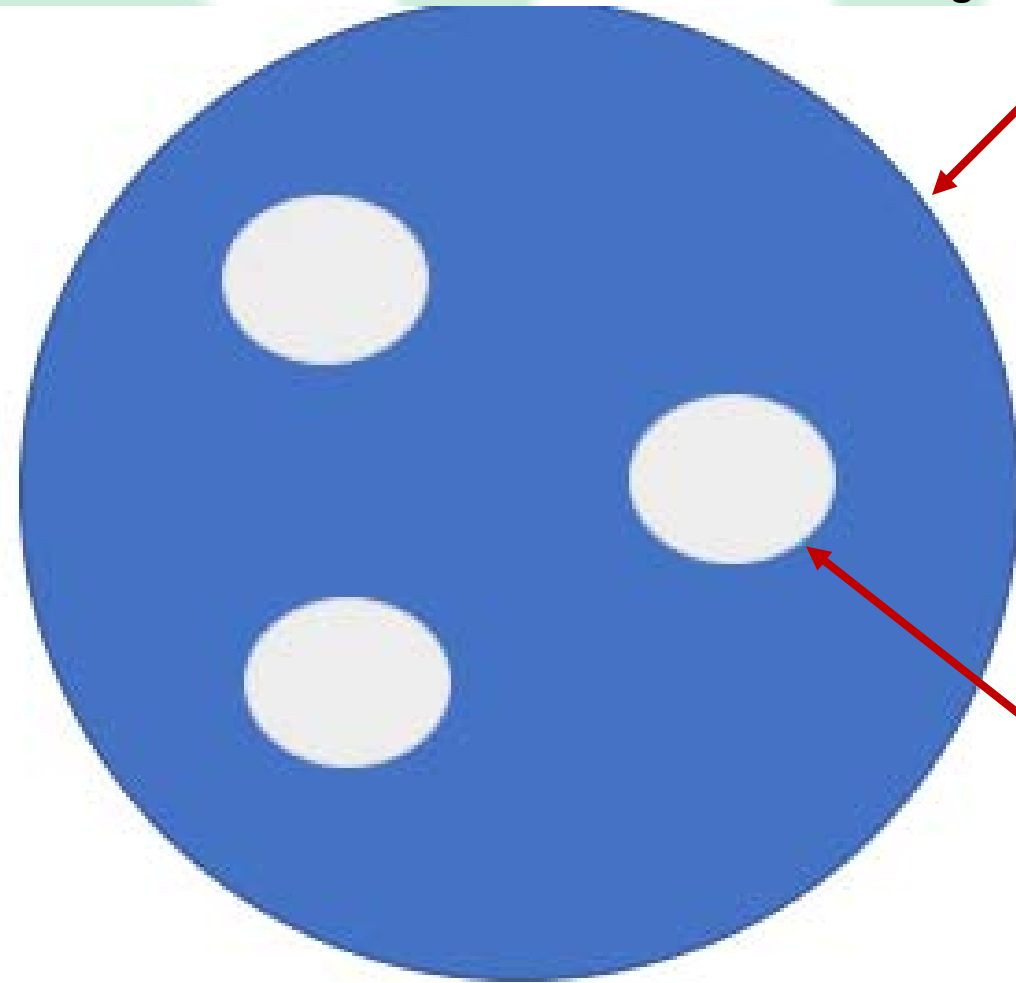
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Organization

CAS

Typical Representation of CAS.

What does the structure of a CAS look like?



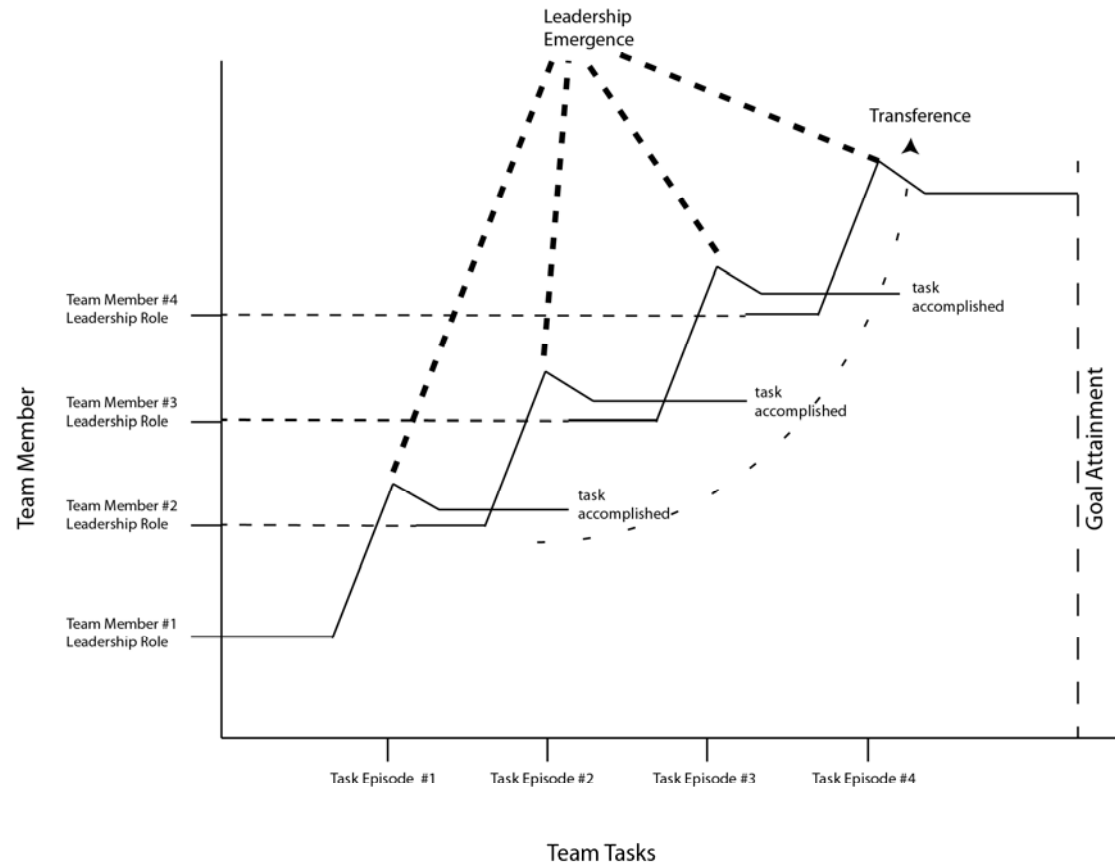
CAS

TELDE

The Team Emergence Leadership Development & Evaluation Model

(Turner & Baker, 2017)

(Romine, Turner, & Baker, 2017)

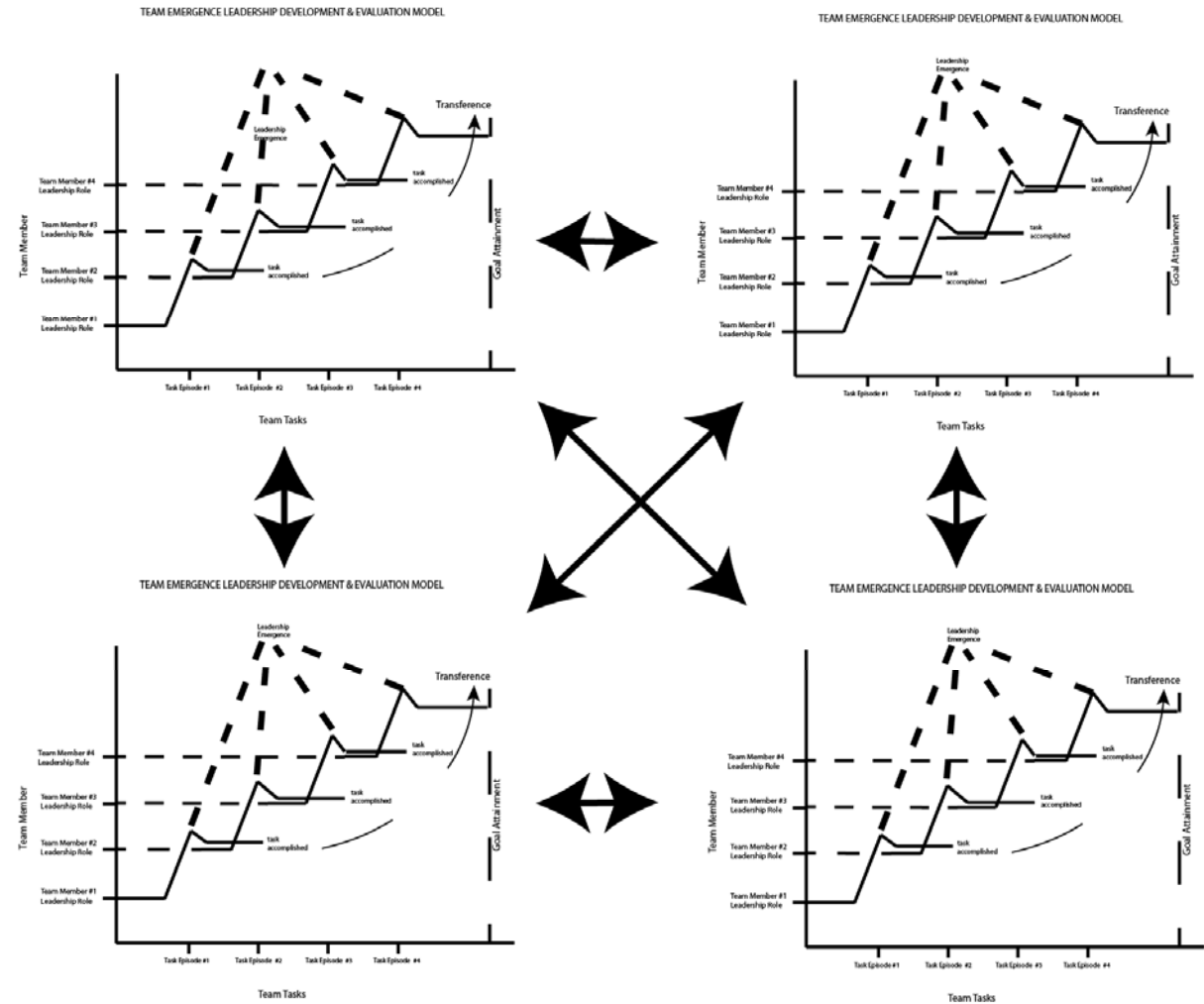


Multi-Teams

The TELDE model stylized in a multi-team Setting becomes a CATS.

Interactions Drive Emergence.

- For the CATS model, **interactions** are the level of analysis.

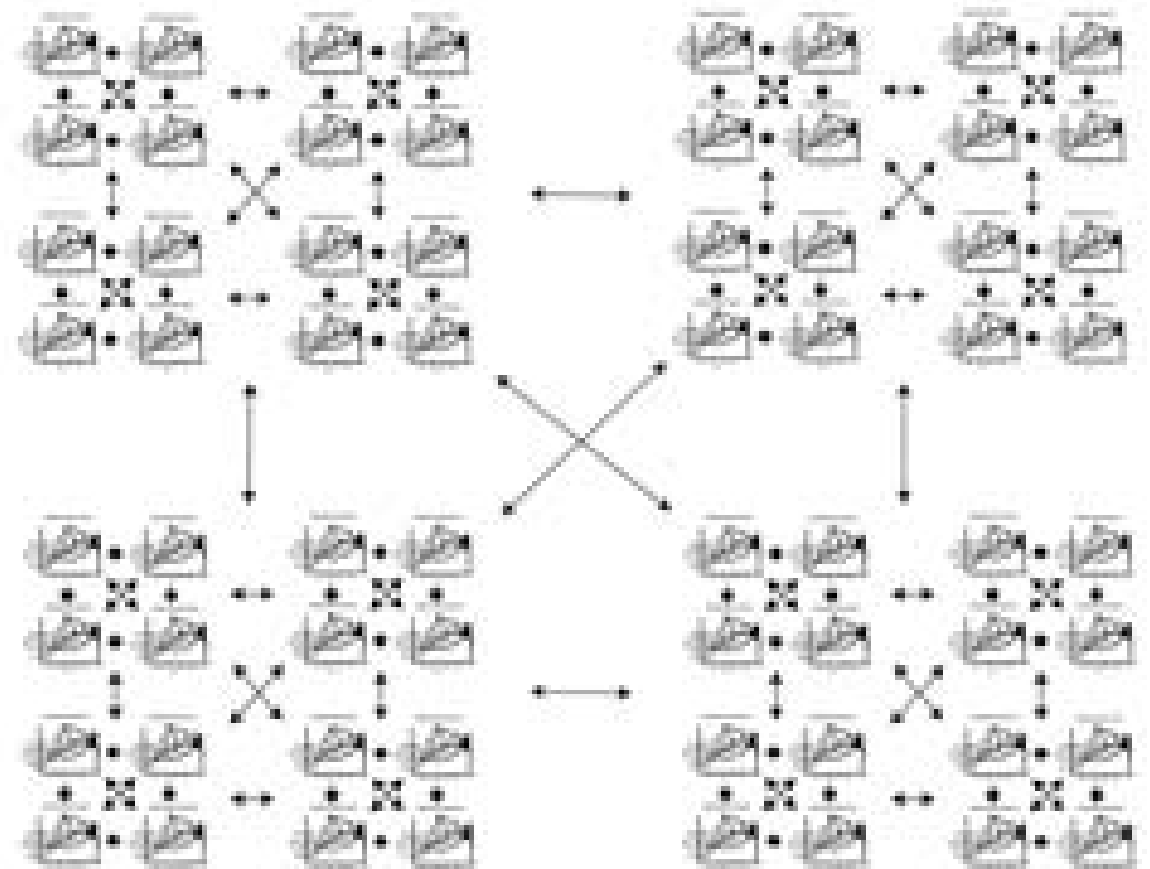
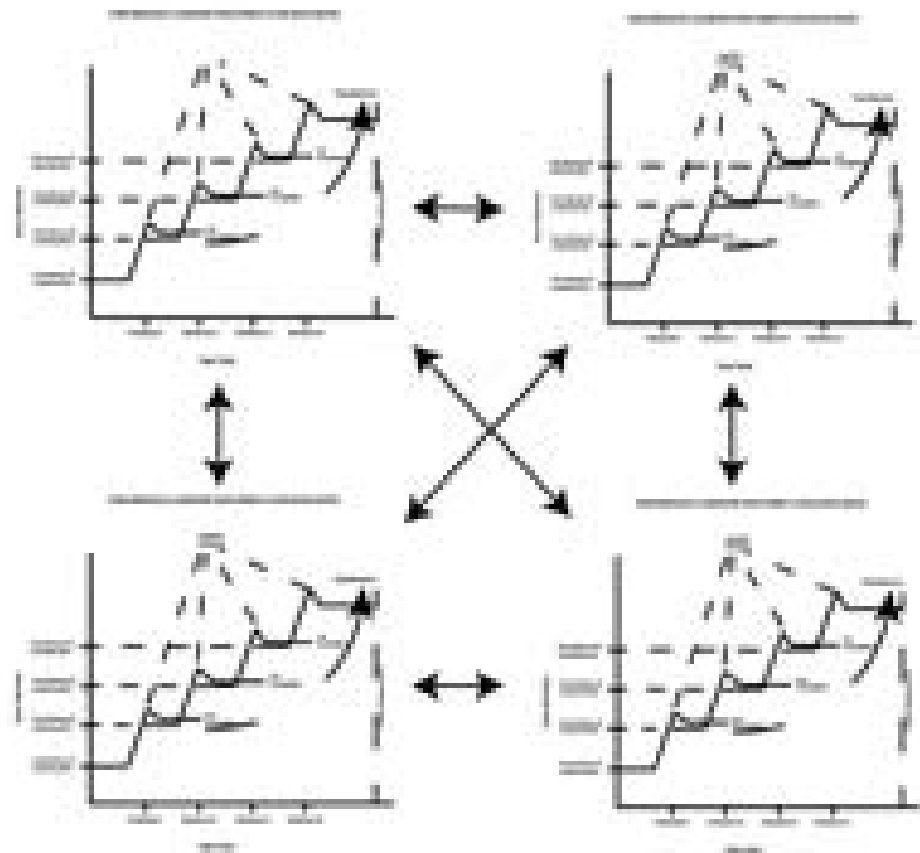


INTERACTIONS & MTS

“Whereas collaboration among members within teams is always important, it is the requirement of collaborative **interaction across component teams, along with the superordinate goal, that sets MTSs apart from other organizational forms**”.

(Zacarro et al., 2012; as cited in Luciano, DeChurch, & Mathieu, 2018, p. 1068)

CATS – Network Model



Management's Role

Management must:

- **Create the structure and interactions** of which CAS/CATS operate in, allowing them to self-organize and emerge. (Boal & Schultz, 2007)
- **Be a participant** in the flow of events.
- Make available organizational **resources** while releasing control of the CAS/CATS system, allowing the system to self-organize and emerge into a new order. (Campbell-Hunt, 2007)

Thank You.

Questions?

Today's new leadership is best identified as being capable of influencing "existing dynamics in and of a system."

(Hunt, Osborn, & Boal, 2009)