INTERNATIONAL SYSTEM DYNAMICS CONFERENCE

ISDC

Oscillations in Organizational Attention: Resource Allocation Dynamics Under Multiple Objectives

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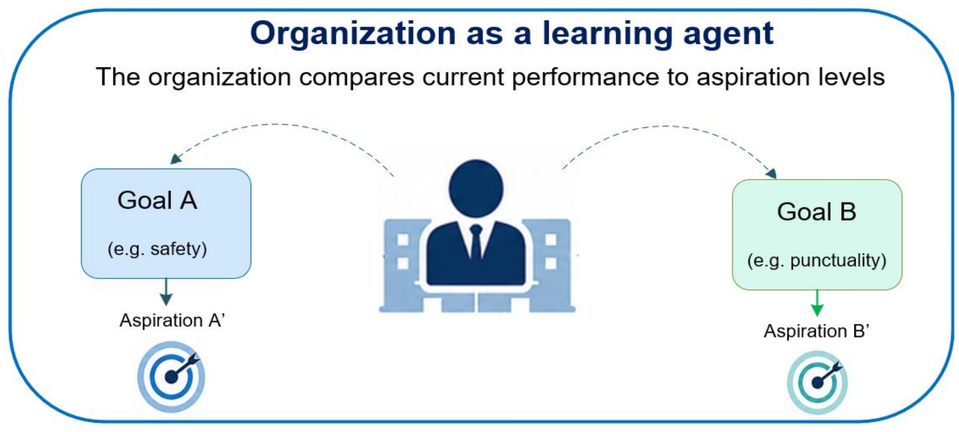
PURPOSE

Problem

Organizations pursue multiple goals that may support or weaken each other. When resources shift toward the goal below aspiration, this adaptive response can either stabilize performance or generate oscillation and persistent underperformance.

Approach

We model the organization as a learning agent that reacts to performance gaps by reallocating resources across goals. Through simple decision rules, the agent learns where investment is likely to improve performance, allowing us to examine how these adaptive choices generate oscillation, lock-in, or improvement over time.



Research Question

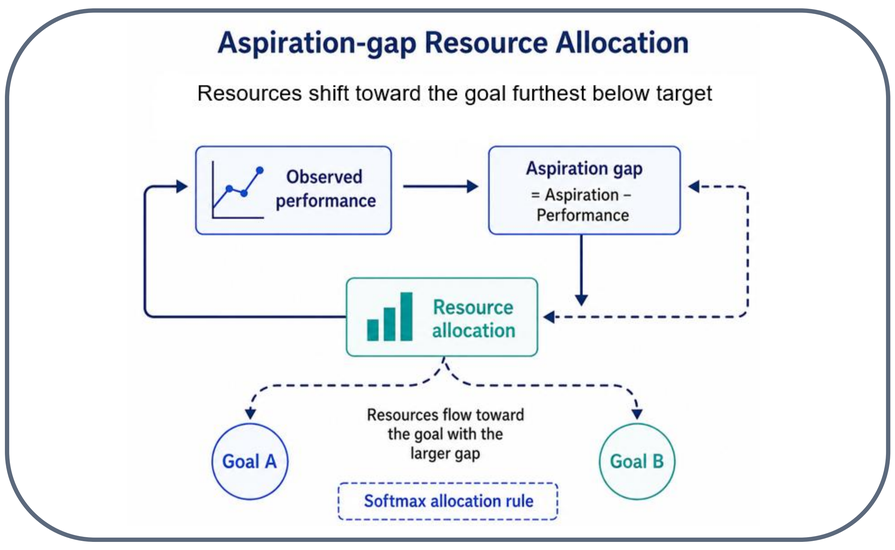
How do interdependencies between organizational goals shape the dynamics of learning, resource allocation, and performance over time?

SCENARIOS

Effect of B on A

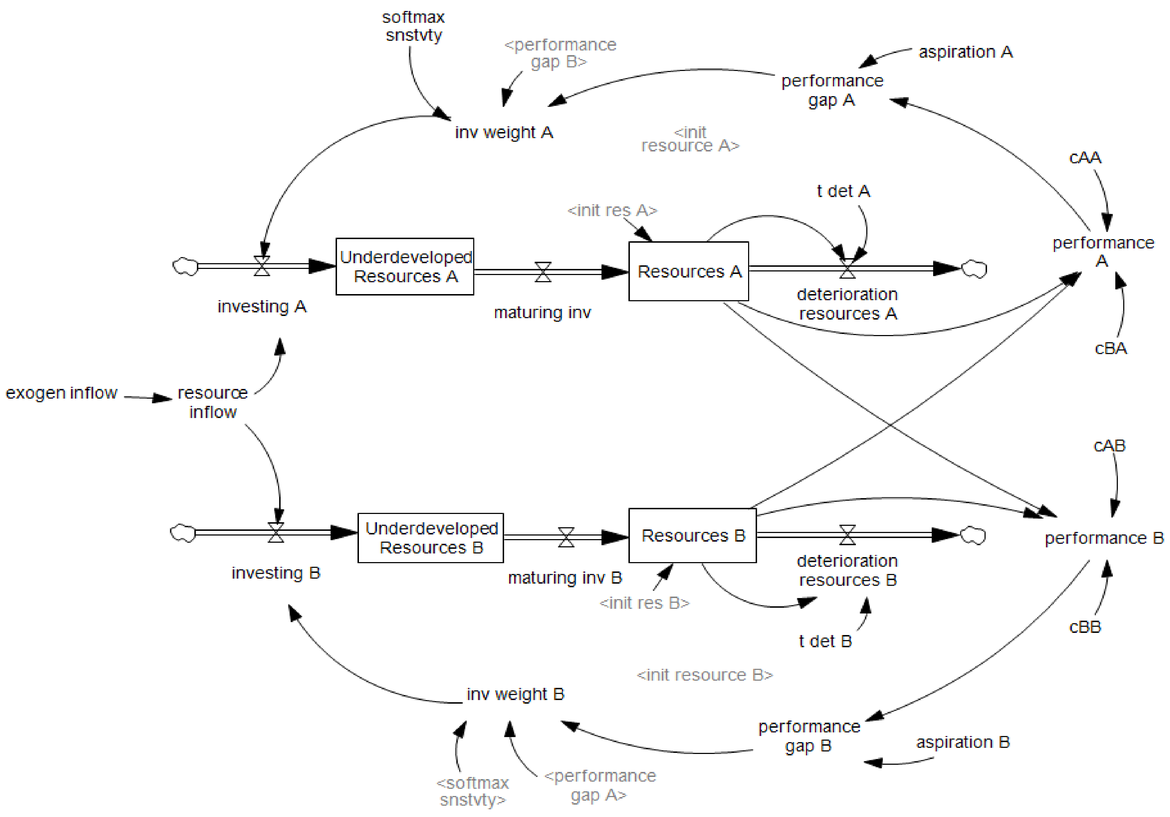
Effect of A on B	−	0	+
−	Mutual drag (4)	A hurts B (2)	Asymmetric
0	B hurts A (3)	Independent (1)	B helps A (6)
+	Asymmetric	A helps B (5)	Synergy (7)

Interdependence determines whether goal pursuit creates synergy, independence, or conflict.



Model parameters

- Initial resources for the two goals: A=120, B=80
- Resources mature through a two-stage accumulation delay before affecting performance.
- Softmax allocation set at 0.4: shifts investments toward the larger aspiration gap
  - Low sensitivity → resources are shared more evenly.
  - High sensitivity → resources quickly shift toward the goal with the larger gap.
- cAB and cBA range from -1 to 1: represent cross-goal effects

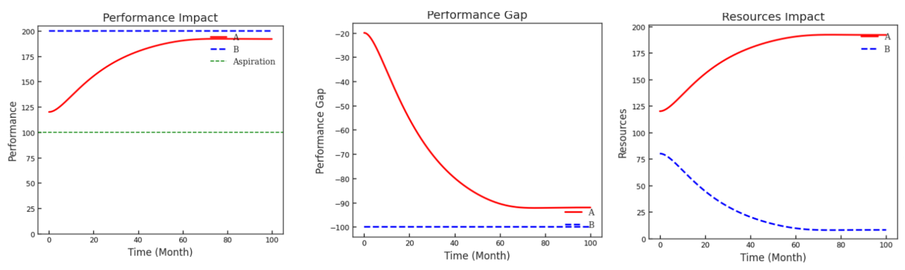


RESULTS

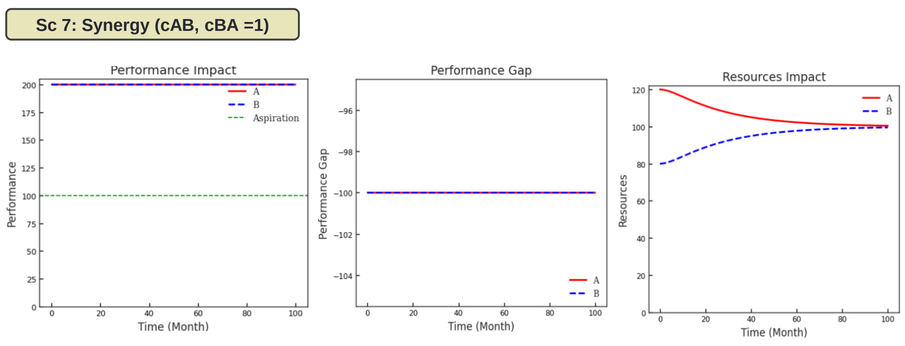
Synergy stabilizes allocation

When goals reinforce each other, investment in one goal improves both. This reduces performance gaps and helps the system settle into a more stable allocation.

Sc 5: One way gain (cAB=1)



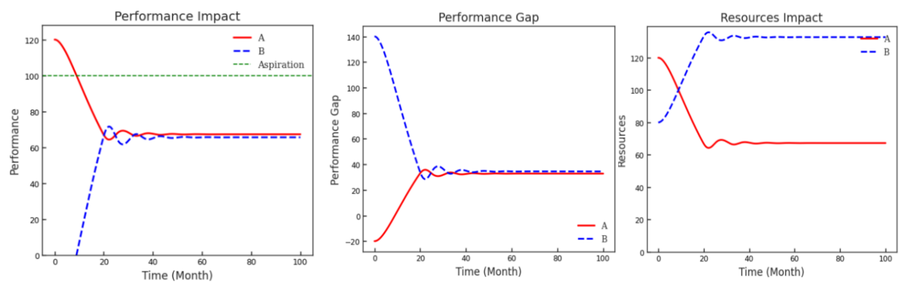
Sc 7: Synergy (cAB, cBA =1)



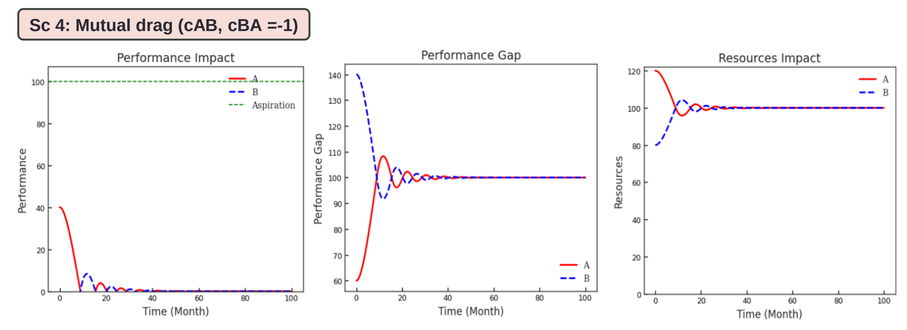
Antagonism generates oscillation

When investment in one goal weakens the other, the organization keeps shifting resources between them. As one goal improves, the other falls behind, creating repeated cycles of attention and reallocation.

Sc 2: A hurts B (cAB= -1)



Sc 4: Mutual drag (cAB, cBA =-1)



TAKE AWAYS

1. **A simple learning agent can discover useful allocation patterns.**
Even without knowing the interdependence structure, the agent adjusts investment toward goals that generate stronger overall performance gains.

2. **Antagonism generates oscillation.**
When investment in one goal weakens the other, resources shift back and forth as each underperforming goal becomes salient.

3. **Synergy stabilizes allocation.**
When goals reinforce each other, investment in one goal also helps the other, reducing performance gaps and limiting oscillation.

4. **Interdependence shapes when prioritization is needed.**
When goals conflict, equal attention may sustain underperformance; when goals support each other, simultaneous pursuit becomes more feasible.

NEXT STEPS

- Add historical/endogenous aspirations based on past performance.
- Introduce explicit goal prioritization when both goals cannot be satisfied.
- Sweep interdependence parameters to identify where oscillations begin or disappear.

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