

DESIGN FOR THE POSTHUMAN ERA

# Thinking in complex systems

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University Wide Arts Studies

# 1. Introduction

Socio-technical systems are systems that exhibit both physical and social complexity.



# 1. Introduction

“Urgent need for new thinking about the differentiated nature of human influences in **complex interactional systems**, and about the nature of such systems and agency within them, when new phenomena are conceived in non-anthropocentric ways.”

Braidotti & Bignall, 2018

## 2. The complexity turn

Open systems

A large flock of birds, possibly terns, is captured in flight against a sky transitioning from blue to a soft orange and pink hue, suggesting a sunset or sunrise. The birds are densely packed in the center of the frame, creating a textured, almost cloud-like appearance. The bottom edge of the image shows the dark silhouettes of trees.

## 2. The complexity turn

The complexity turn in social sciences

Recognizing *inter-connectedness*.

Challenging claims on:

- Linear causalities
- Regularities
- Predictability
- Manageability



# 3. Complex systems

Complexity approaches combine **system** and **process thinking** (Thrift, 1999).

Complex systems analyses investigate how systems **adapt** and **co-evolve** as they organize **through time**.



# 3. Complex systems / Features

Emergence

Complexity occurs where there are emergent features –a complex system is more than the sum of its parts.

Cudworth and Hobden, 2011



# 3. Complex systems / Features

Emergence

Large numbers behave differently from small numbers.

Resnick, 1997





# 3. Complex systems / Features

Self-organisation

Complex systems consist in a **network** of production processes. Each component of the network takes part in the production or transformation of other components.



# 3. Complex systems / Features

Tipping points

Sudden transitions in a system when surpassing a particular threshold.

- Non-linear dynamics
- Limited predictability
- Positive feedback loops



# 3. Complex systems / Features

Evolutionary dynamics

Ecological systems are on the **edge of chaos** without a natural tendency towards equilibrium.

The system is in constant change.



# 4. Systems thinking: Key components

COMPONENTS	QUESTIONS
Multiple perspectives	<ul style="list-style-type: none"><li>• Who/what are the key actors?</li><li>• What are their goals/motivations?</li><li>• What are the different ways in which the situation can be framed?</li></ul>
Interconnections	<ul style="list-style-type: none"><li>• How do the different actors interconnect?</li><li>• What is the nature of the relationship among them?</li><li>• What pattern emerge?</li></ul>
Boundaries	<ul style="list-style-type: none"><li>• What are the scope and scale you are designing for?</li><li>• Are other boundaries possible/feasible?</li><li>• What constitutes an improvement (and for who/what)?</li></ul>
Influences	<ul style="list-style-type: none"><li>• What drives the system in particular directions?</li><li>• Can you identify drivers, trends, enablers, blocks?</li><li>• Which leverage points are you going to focus to leverage change?</li></ul>

## 5. Final remarks

A posthuman system, “operates in an **open space** throughout which **things-flows** are **distributed**, rather than plotting out a closed space for linear and solid things ”

Deleuze & Guattari, 1987

# 6. References

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