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Practice-led Pedagogy for Socio-Technical Transitions: a Case Study in Systems Thinking

Francis Carter • Sofía Bosch Gómez • Ahmed Ansari

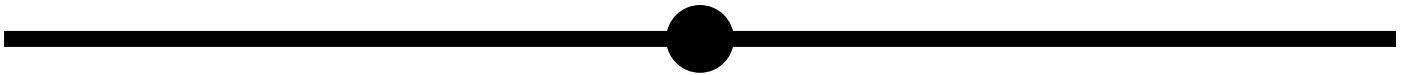
Carnegie Mellon University School of Design • **RSD8** • October 2019

01 BACKGROUND
02 STRUCTURE OF THE COURSE
03 TOOLS
04 STUDENT WORK

THEORY

DESIGN STUDIES

PRACTICE



THEORY

DESIGN STUDIES

PRACTICE

2015

Seminar

80%
Lecture & discussion

20%
In-class exercises

2017

Workshop-Driven Studio\Seminar Hybrid

50%
Lecture & discussion

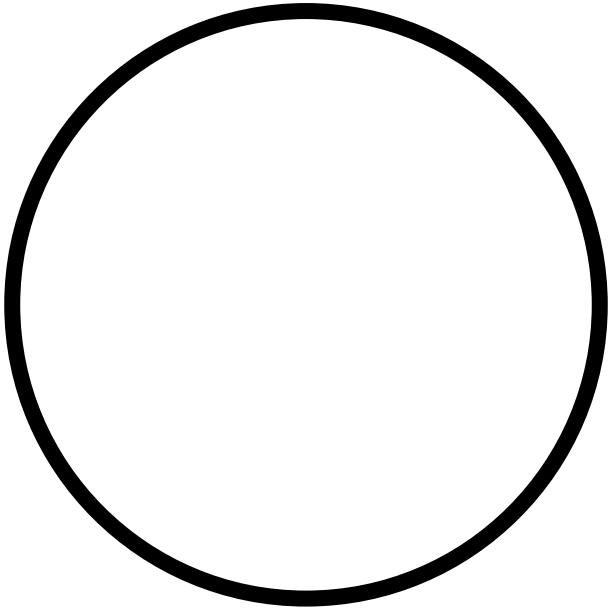
50%
In-class workshops

2019

Project-Driven Studio\Seminar Hybrid

50%
Lecture & workshops

50%
Studio projects



HISTORICALLY INFORMED
APPLIED THEORY

↳ HISTORICAL OVERVIEW

↳ HISTORICAL OVERVIEW

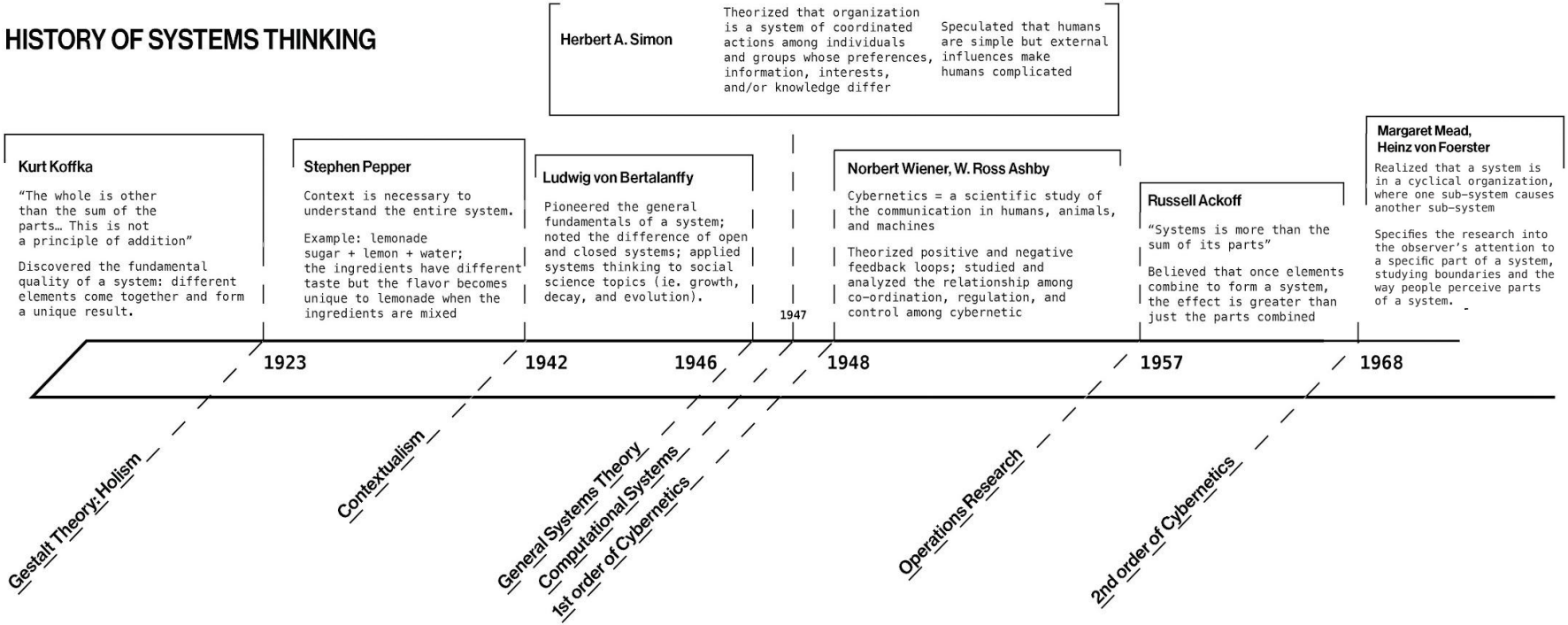
↳ FIRST ORDER CYBERNETICS

↳ SECOND ORDER CYBERNETICS

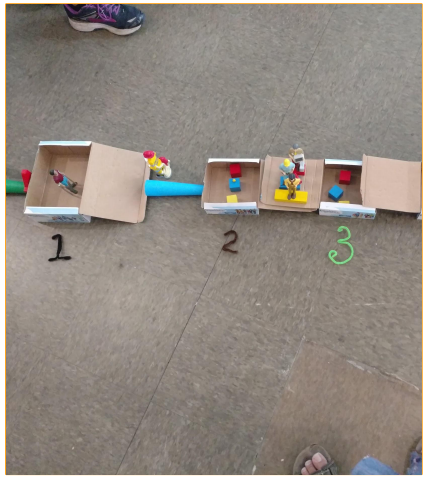
- ↳ HISTORICAL OVERVIEW
- ↳ FIRST ORDER CYBERNETICS
- ↳ SECOND ORDER CYBERNETICS
- ↳ WICKED PROBLEMS

- ↳ HISTORICAL OVERVIEW
- ↳ FIRST ORDER CYBERNETICS
- ↳ SECOND ORDER CYBERNETICS
- ↳ WICKED PROBLEMS
- ↳ LEVERAGE POINTS

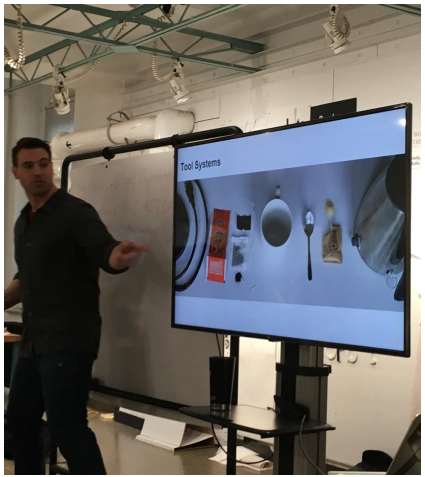
HISTORY OF SYSTEMS THINKING



CONCEPTUAL MODELING

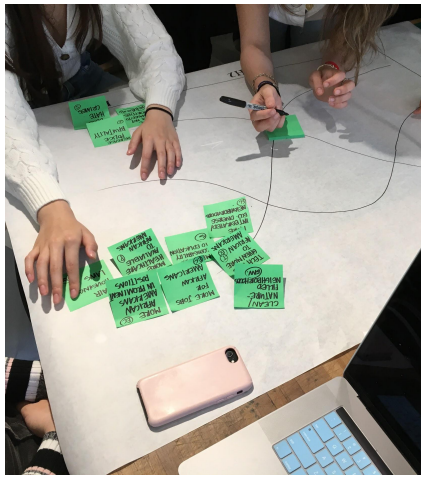


TOOL SYSTEMS

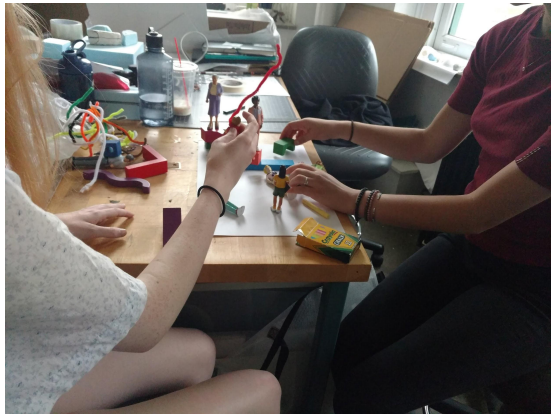


COMPLEXITY MAPPING

THREE HORIZONS



Conceptual Modelling



Introducing students to the idea of systems as representations or models of reality

AIGA Designer 2025
Twentieth-century principles of design

TRENDS AND COMPETENCIES

COMPLEXITY

AGGREGATION and CURATION

BRIDGING PHYSICAL and DIGITAL EXPERIENCES

RESILIENT ORGANIZATIONS

CORE VALUES MATTER

NEW FORMS OF SENSEMAKING

ACCOUNTABILITY FOR PREDICTING OUTCOMES OF DESIGN ACTION

INTRAPERSONAL

INTERPERSONAL

INSTITUTIONAL

IDEOLOGICAL

INTERVENTIONAL

- ↳ INTRAPERSONAL
- ↳ INTERPERSONAL
- INSTITUTIONAL
- IDEOLOGICAL
- INTERVENTIONAL

INTRAPERSONAL

INTERPERSONAL

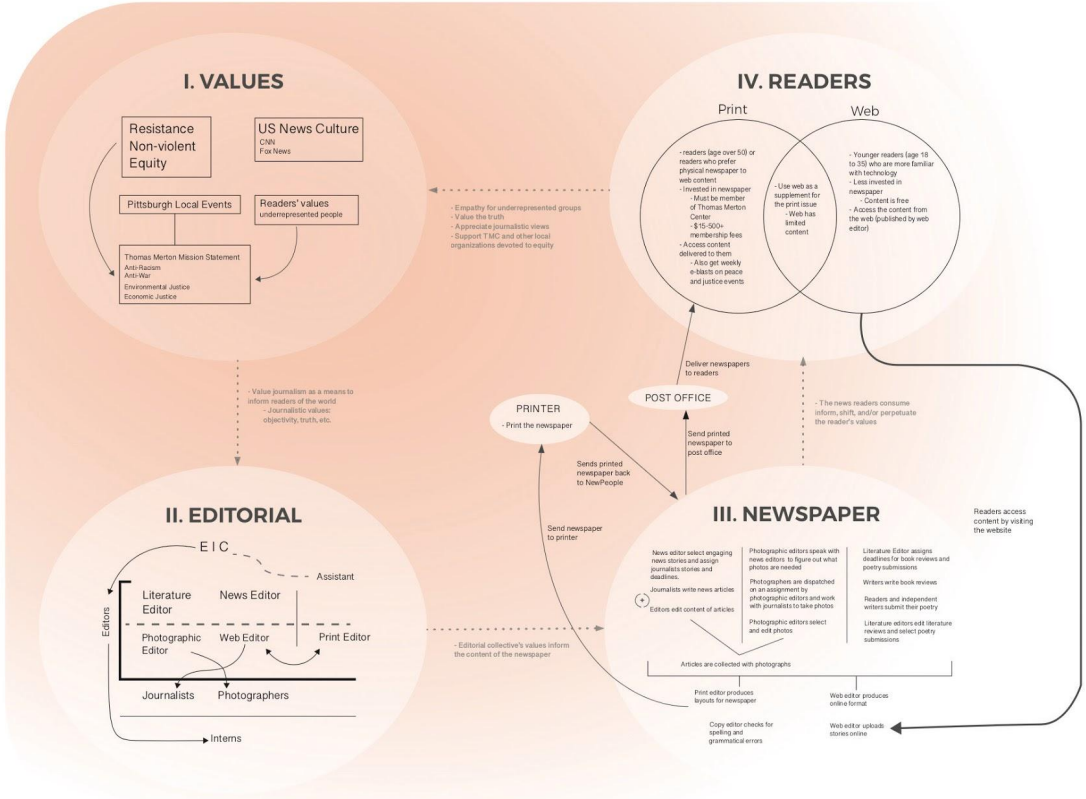
↳ INSTITUTIONAL

↳ IDEOLOGICAL

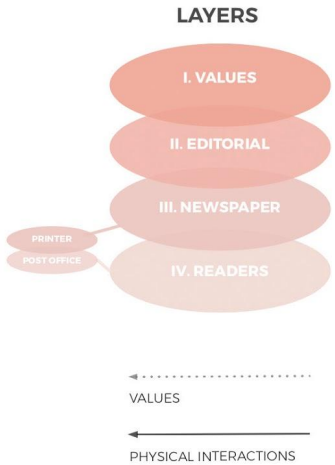
INTERVENTIONAL

THE NEW PEOPLE

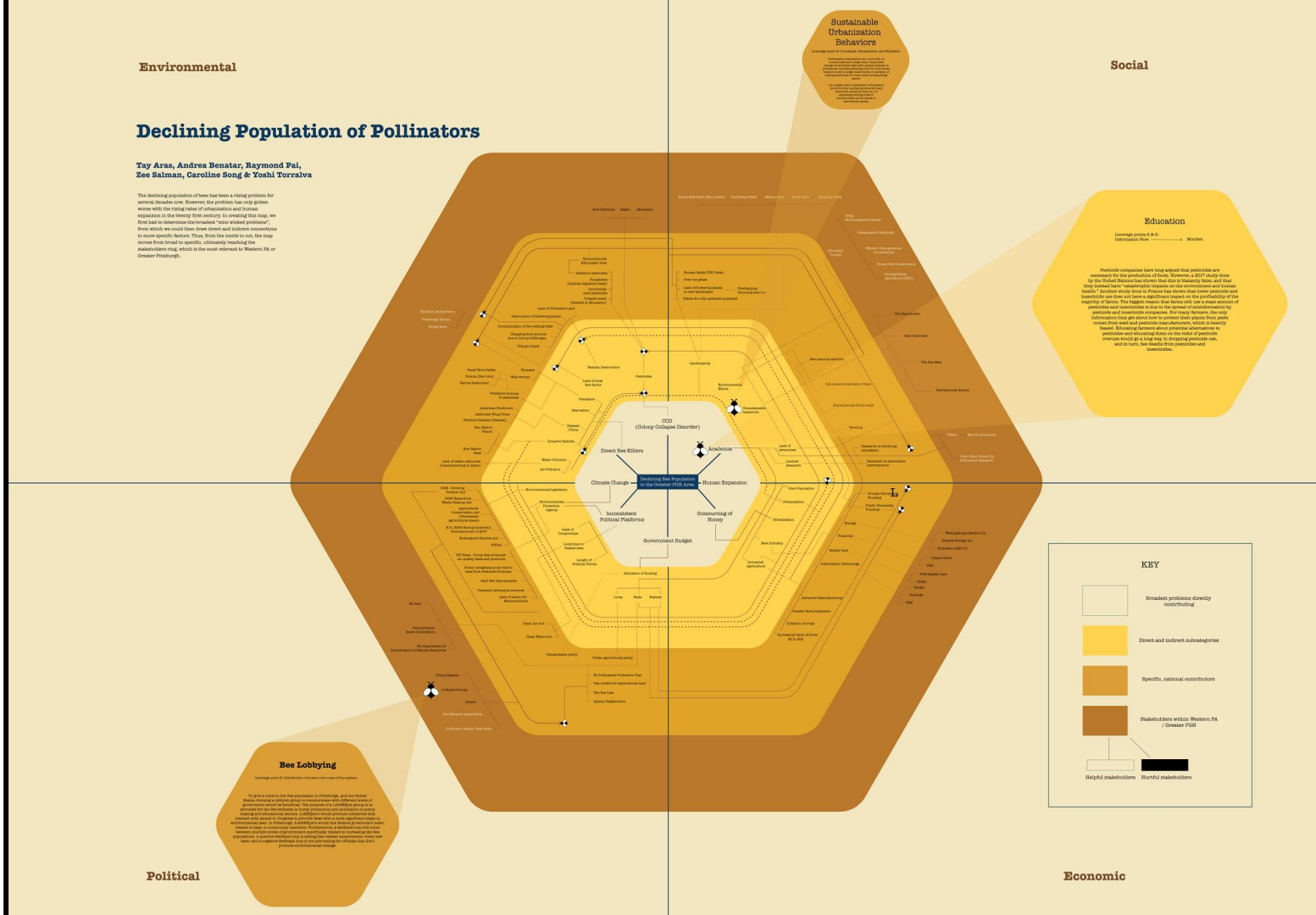
Raymond Pai
CeCe Liu
Laurel Rountree
Angela Lee



NewPeople is a newspaper published as part of the Thomas Merton Center in Pittsburgh. As a social justice newspaper, it focuses on writing stories about groups marginalized and ignored by mainstream news. This systems map explores the NewPeople newspaper by placing it in context of its values, the people involved, its impact, and the interactions between these layers.



- INTRAPERSONAL
- INTERPERSONAL
- INSTITUTIONAL
- IDEOLOGICAL
- ↳ INTERVENTIONAL



INTRAPERSONAL

INTERPERSONAL

INSTITUTIONAL

IDEOLOGICAL

↳ INTERVENTIONAL

Pittsburgh, PA

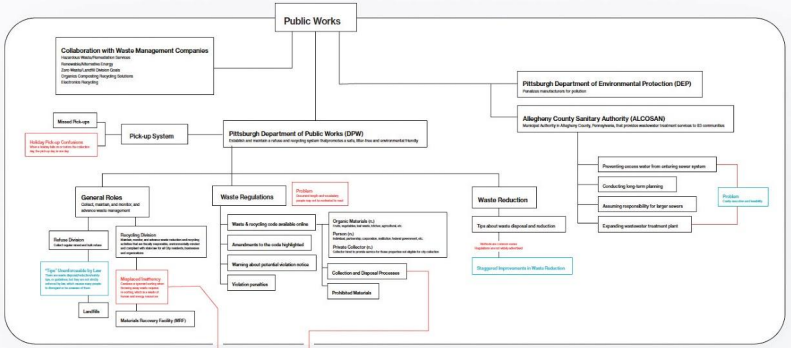
Waste Management

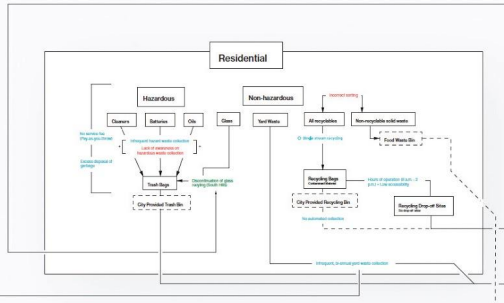
Youie Cho
Elizabeth Han
Sammie Kim
Charmaine Qiu
Mia Tang
Joseph Zhang

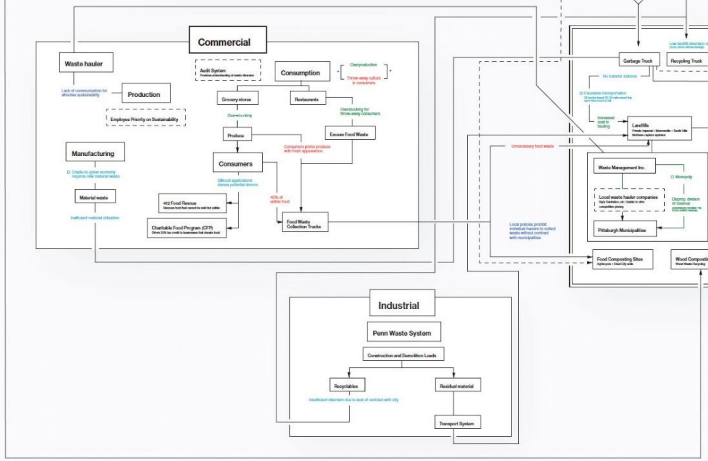
This poster explores the wicked problem of Pittsburgh's waste management system. It examines how various types of waste get transported to and from different locations and the complex issues that arise during the processes. Many networks within the waste management system have a notable impact on the environment, people, and various aspects of human society.

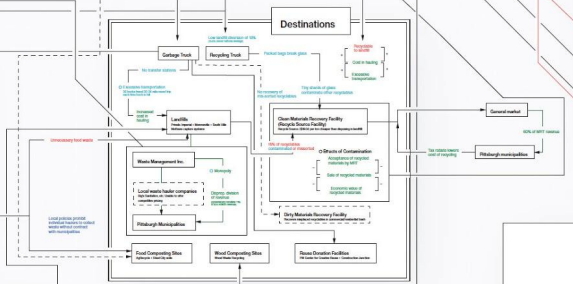
Types of Problems

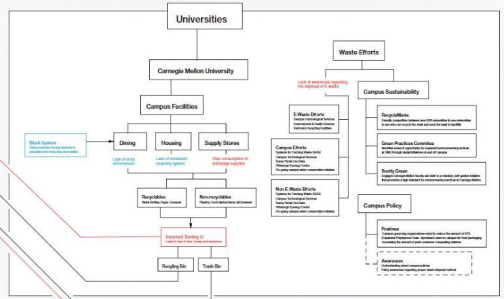
- Missing Infrastructure
- Systematic
- Awareness
- Economic
- Stakeholder Relationships
- Key Problem

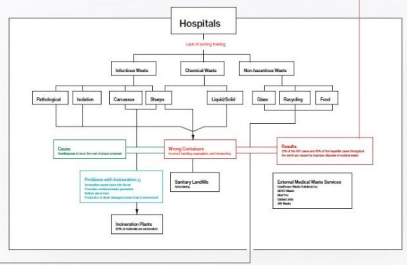


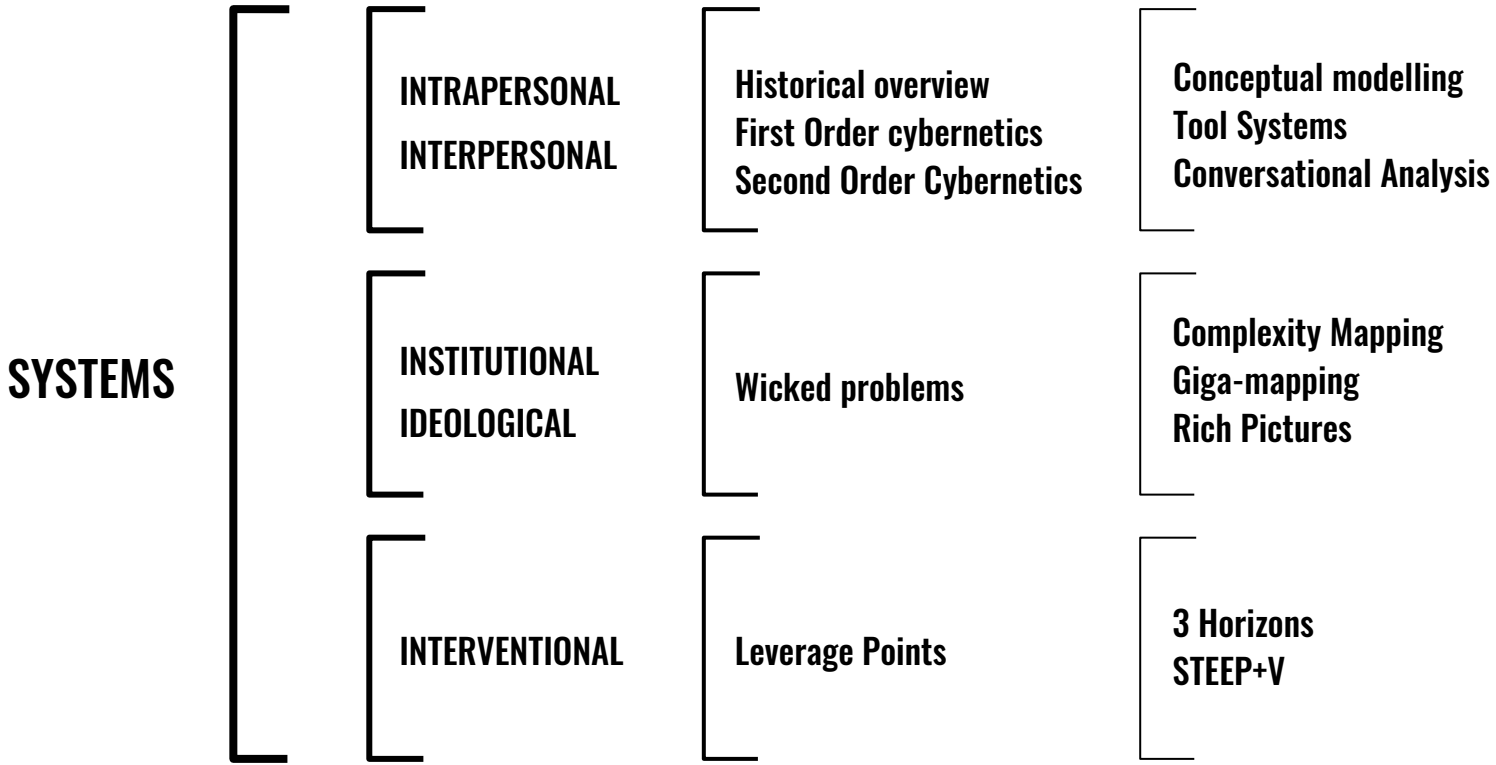











SYSTEMS
INTRAPERSONAL
INTERPERSONAL
Historical overview
First Order cybernetics
Second Order Cybernetics
Conceptual modelling
Tool Systems
Conversational Analysis
INSTITUTIONAL
IDEOLOGICAL
Wicked problems
Complexity Mapping
Giga-mapping
Rich Pictures
INTERVENTIONAL
Leverage Points
3 Horizons
STEEP+V

CHALLENGES

From a lecture seminar to a practice-based theory course

CHALLENGES

From a lecture seminar to a practice-based theory course

SUCCESSES

Scalar thinking

Interdisciplinary team work

Student reflections

CHALLENGES

From a lecture seminar to a practice-based theory course

SUCCESSES

Scalar thinking

Interdisciplinary team work

Student reflections

LESSONS

Scoping & grounding

Modular structure

Small exercises with overarching projects

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