

Designing Our World: Cybernetics as Conversation for Action

Heinz von Foerster Lecture '17
University of Vienna
20 June 2017

Paul Pangaro, Ph.D.
Chair and Associate Professor
MFA Interaction Design Program
College for Creative Studies, Detroit
paul@pangaro.com



MFA Transportation Design
MFA Color & Materials Design
MFA Integrated Design
MFA Interaction Design
College for Creative Studies, Detroit

paul@pangaro.com



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MFA Interaction Design Program
College for Creative Studies, Detroit



MFA Interaction Design

Heinz von Foerster '17 / Vienna June 2017 / Paul Pangaro



MFA Interaction Design



Heinz von Foerster Gesellschaft | Wien | Vienna

heinz von foerster congress

2011 | 2009 | 2007 | 2005 | 2003

home | **schedule** | **abstracts**

registration | **credits** | **infos** | **contact**

Heinz von Foerster 100 Self-Organization and Emergence

Organizing Institutions:

Heinz von Foerster Gesellschaft / Wien

ASC – American Society for Cybernetics

WISDOM – Wiener Institut für

sozialwissenschaftliche Dokumentation und Methodik

Institut für Zeitgeschichte | Universität Wien

AINS – Austrian Institute for Nonlinear Studies

28. Oktober 2011

Selbstorganisation und Potenzgesetze in Ökonomie und Gesellschaft

9. November 2011

Understanding Heinz von Foerster and Ernst von Glasersfeld

Workshop der American Society for Cybernetics (ASC)

10. November 2011 | Wiener Vorlesungen | **S.J. Schmidt** (Münster)

Das Ende der Wirklichkeit im Konstruktivismus?

5th International Heinz von Foerster Conference | November 11th–13th 2011

Knowledge – Organisation – Society
 Heinz von Foerster and the Biological Computer Laboratory
 International Heinz von Foerster-Congress 2003 at the Wittgenstein-House

Thursday, November 13

Friday, November 14

Saturday, November 15

9:00 a.m.
– 11:00 a.m.

Conference Openings
Pille Bunnell
Ilse König
Allenna Leonard
Andreas von Foerster
Thomas von Foerster
 Moderator: **Karl H. Müller**

Alfred Inselberg
 BCL and the Visualization of
 Multidimensional Geometry
Lars Löfgren
 From Wittgenstein's Language-
 World Thesis to Holistic Language
 Moderator: **Allenna Leonard**

Robert Martin
 Inventing the World One
 Conversation at a Time: the Once and
 Future Invitation of Heinz von Foerster
Paul Pangaro
 The Past-Future of Cybernetics:
 Conversations, Von Foerster, and
 the BCL
 Moderator: **Pille Bunnell**

11:00 a.m.
– 1:00 p.m.

Ernst von Glasersfeld
 The Constructivist View of
 Communication
Ranulph Glanville
 Wonder
 Moderator: **Friedrich Stadler**

Ricardo Uribe
 Non-trivial Machines
Paul Weston
 A Walk through the Forest
 Moderator: **Markus Peschl**

Stuart Umpleby
 What I Learned from Heinz von
 Foerster about the Construction of
 Science
Siegfried J. Schmidt
 HvF: Heritage and beyond: How to
 Apply What We Have Learned
 Moderator: **Ranulph Glanville**

Afternoon Sessions

Session I
**Annual Conference of the American
 Society for Cybernetics**

Session III
On the History of the BCL

Session V
**Cybernetics and
 Cognitive Science Today**

Saturday, November 15

Robert Martin

Inventing the World One
Conversation at a Time: the Once and
Future Invitation of Heinz von Foerster

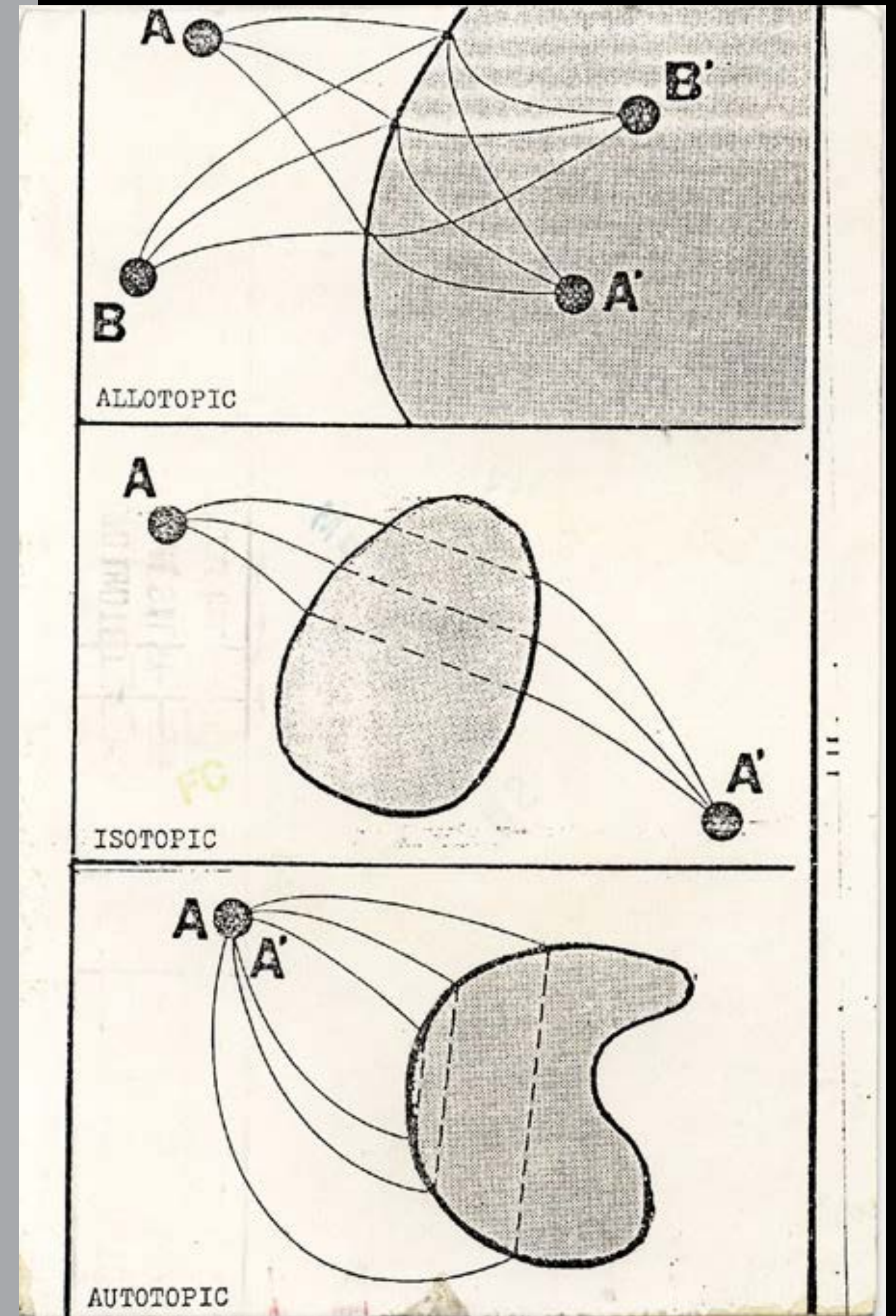
Paul Pangaro

The Past-Future of Cybernetics:
Conversations, Von Foerster, and
the BCL

Moderator: **Pille Bunnell**

Stuart Umpleby

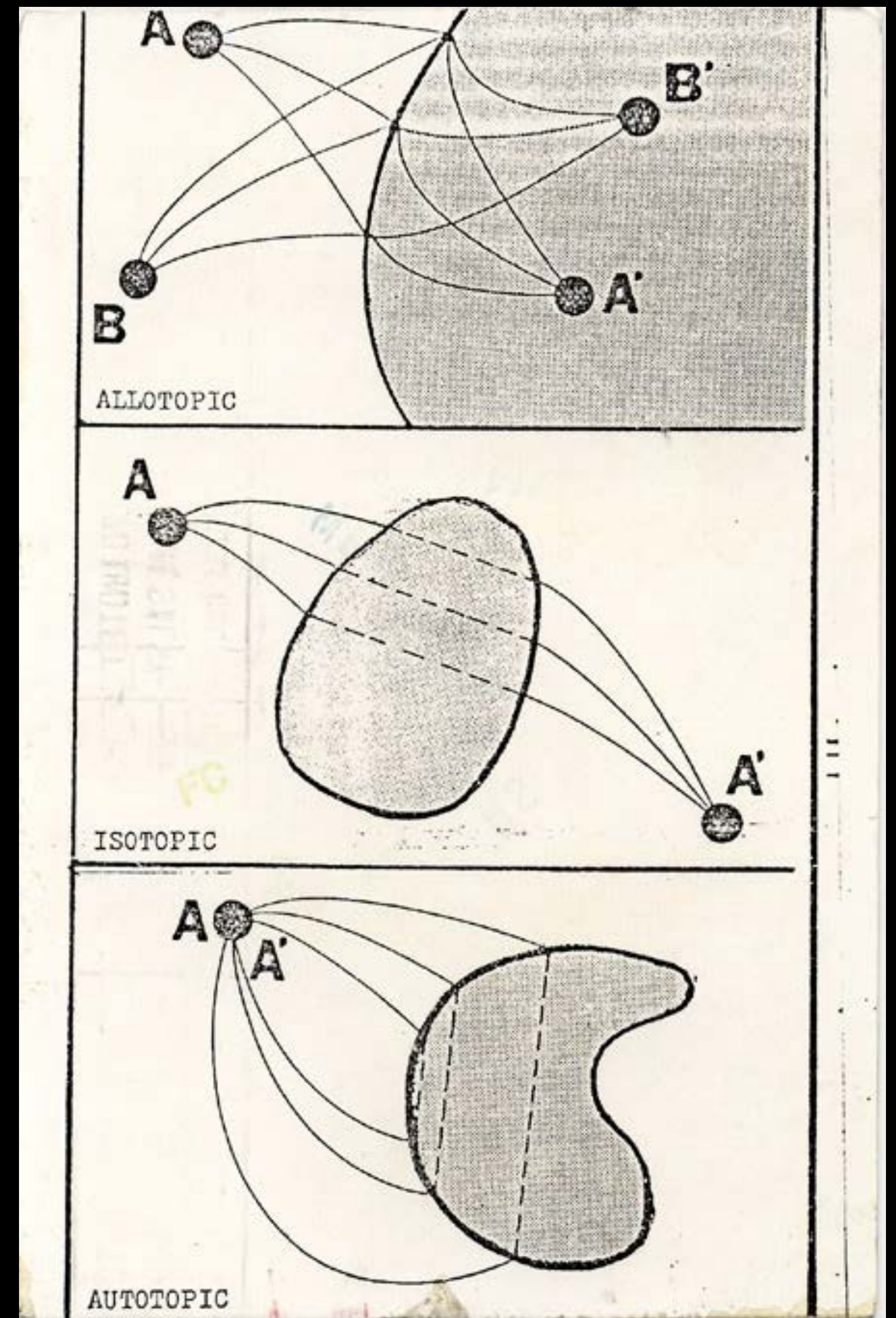
What I Learned from Heinz von

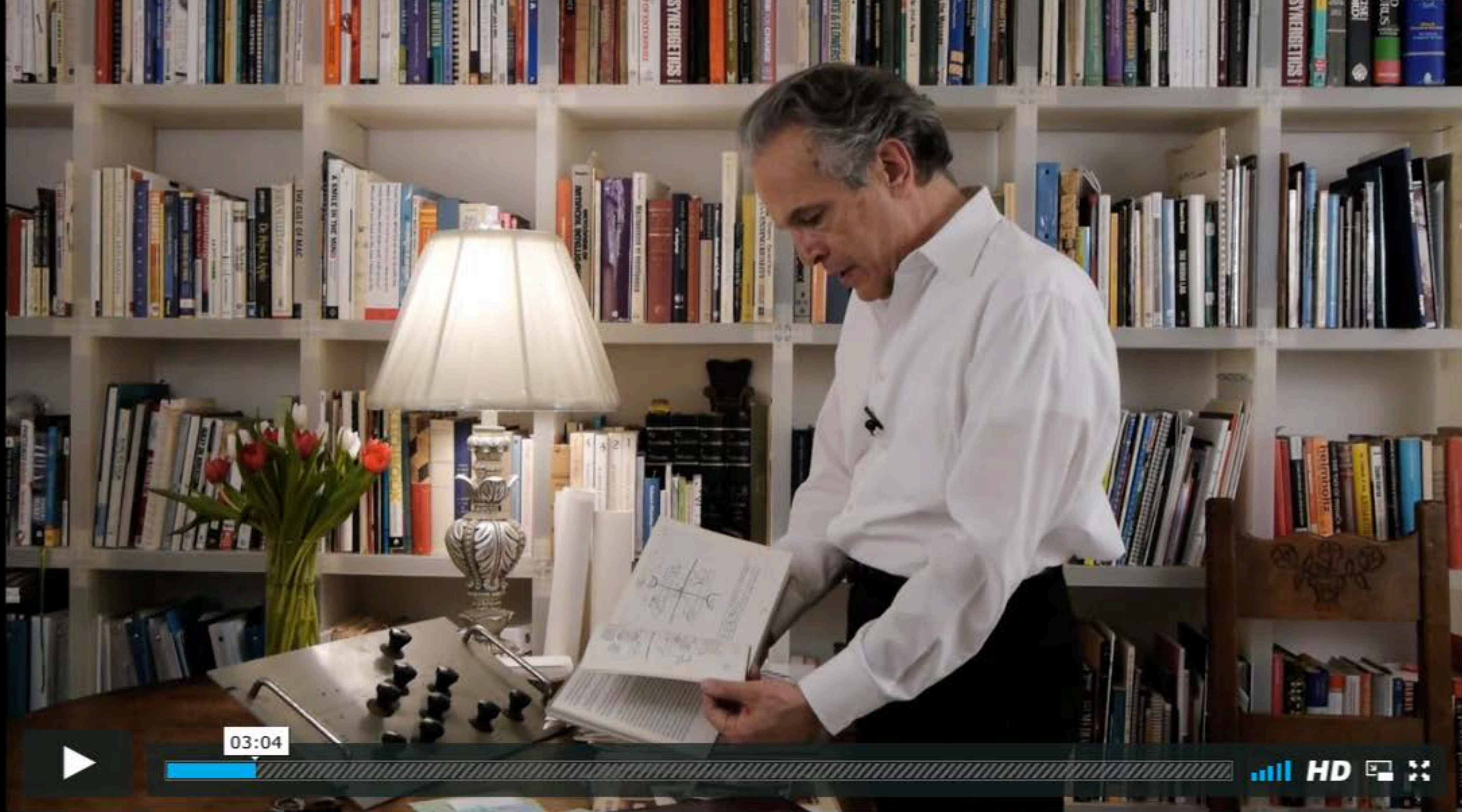


Paul Pangaro

The Past-Future of Cybernetics:
Conversations, Von Foerster, and
the BCL

<http://pangaro.com/Heinz-von-Foerster/>



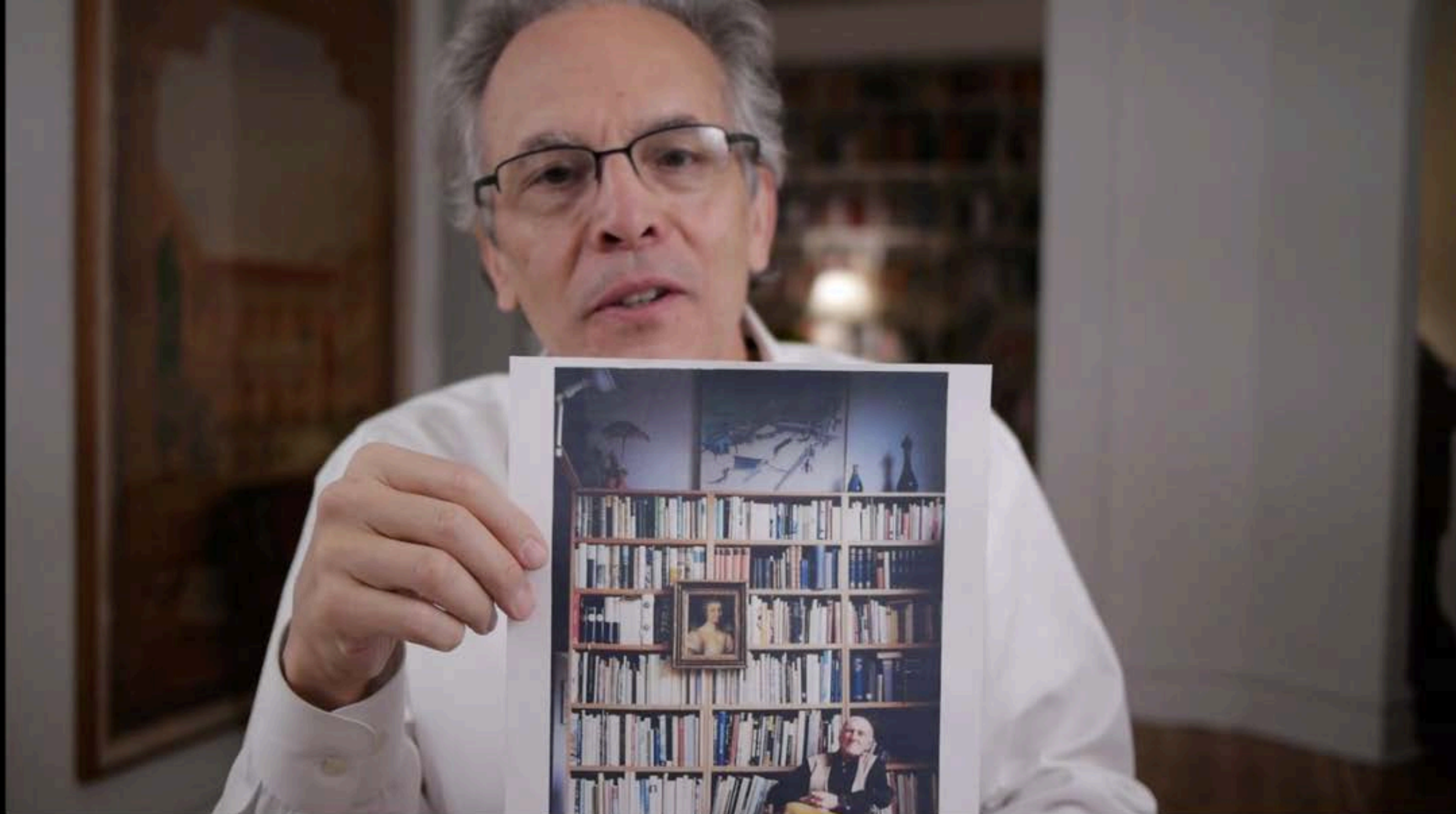


03:04



Contributions to the Viennese Archive of Gordon Pask

<https://vimeo.com/31987180>



Invitation to Recursioning (for Heinz von Foerster)

Heinz von Foerster

photo by Robert Knisely 1989

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Mai von Foerster
Heinz von Foerster



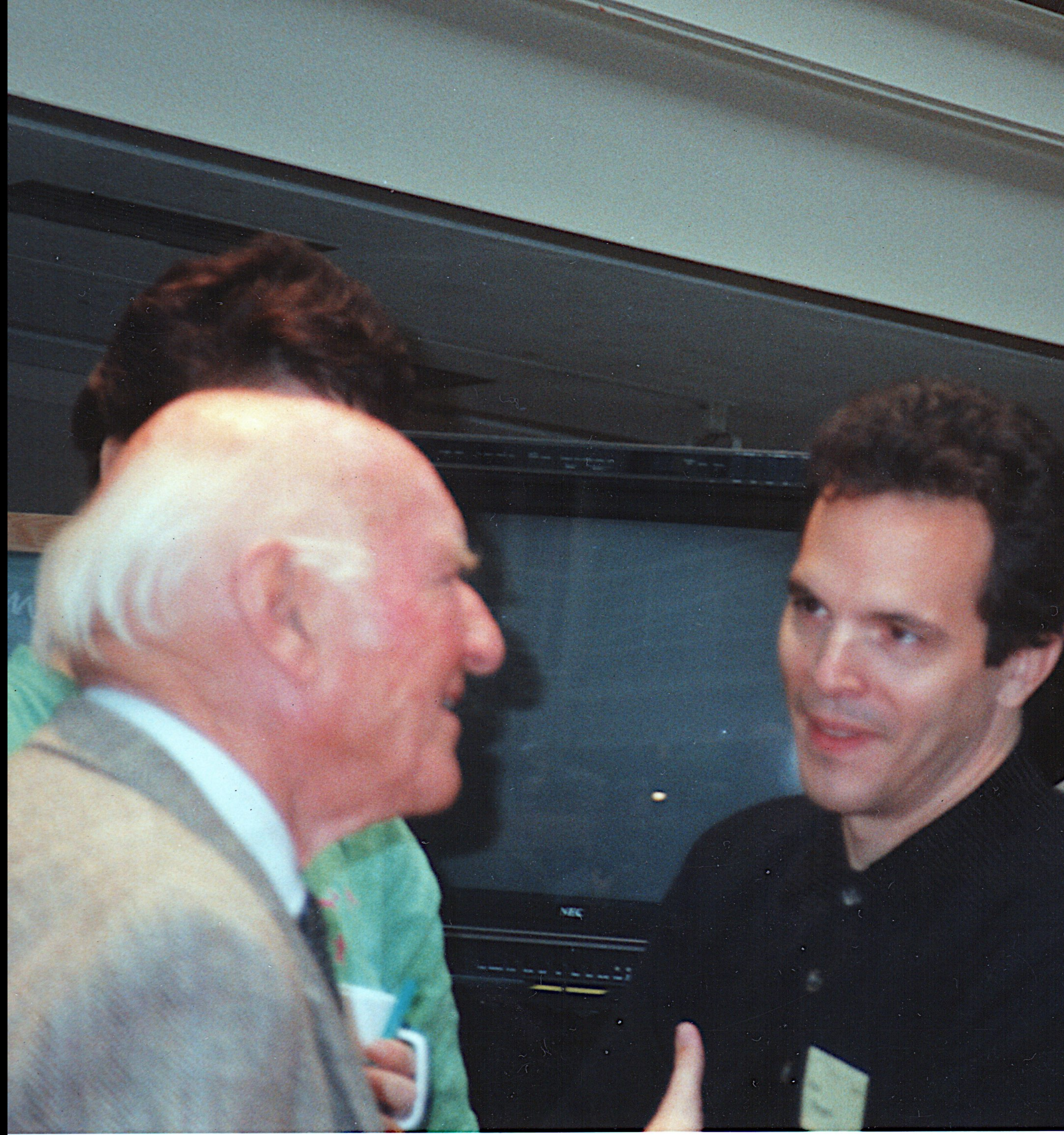
photo by Paul Pangaro ~1999

Heinz von Foerster '17 / Vienna June 2017 / Paul Pangaro

Heinz von Foerster
Paul Pangaro

1993

Heinz von Foerster '17 / Vienna June 2017 / Paul Pangaro



Designing Our World: Cybernetics as Conversation for Action



Designing Our World



Edith Ackermann



2014

<https://vimeo.com/104178407>



Learning is **less about acquiring or transmitting information** or existing ideas or values than it is about **collectively designing a world that is worth living in.**

— Edith Ackermann

Designing Our World

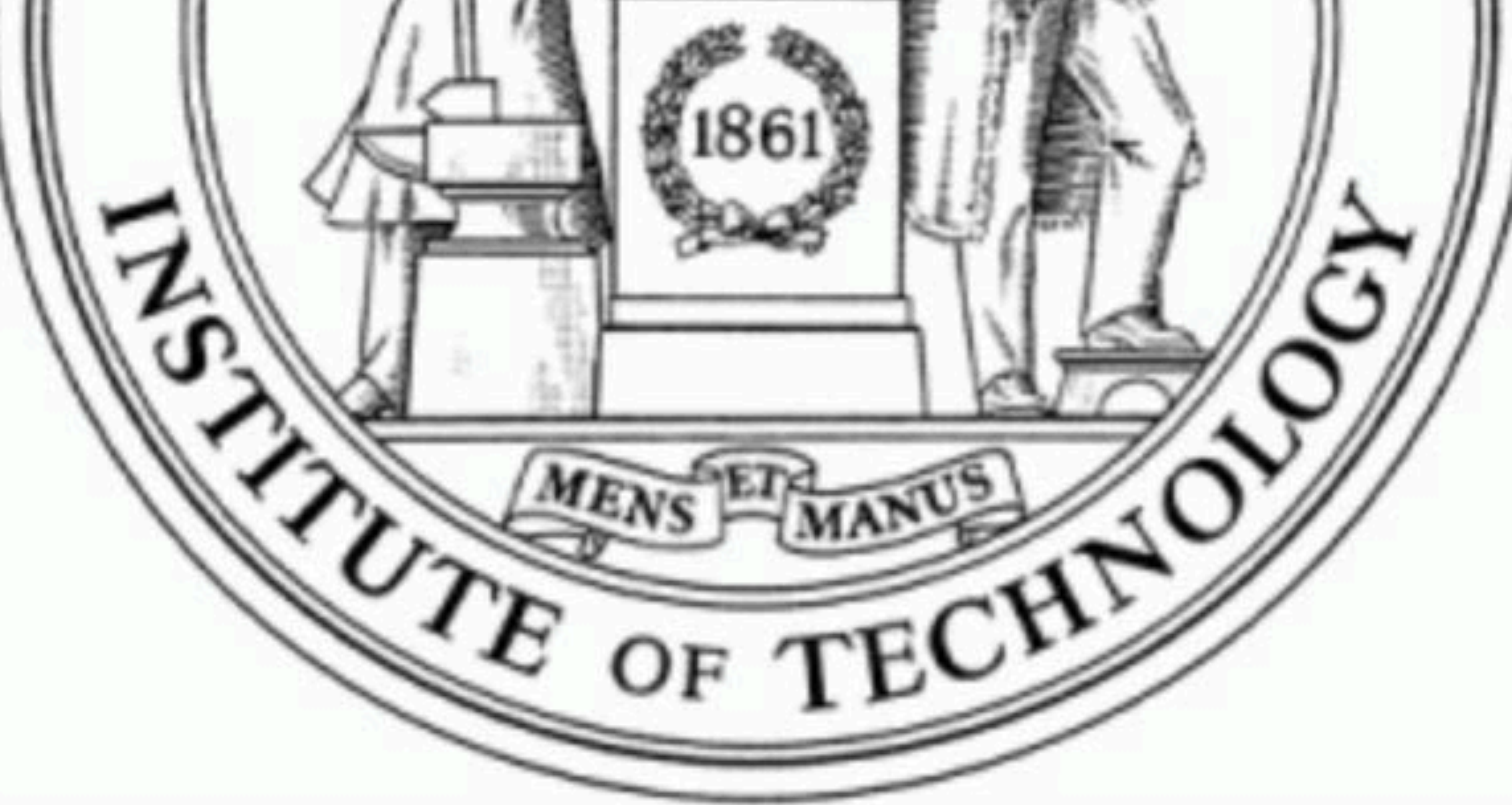


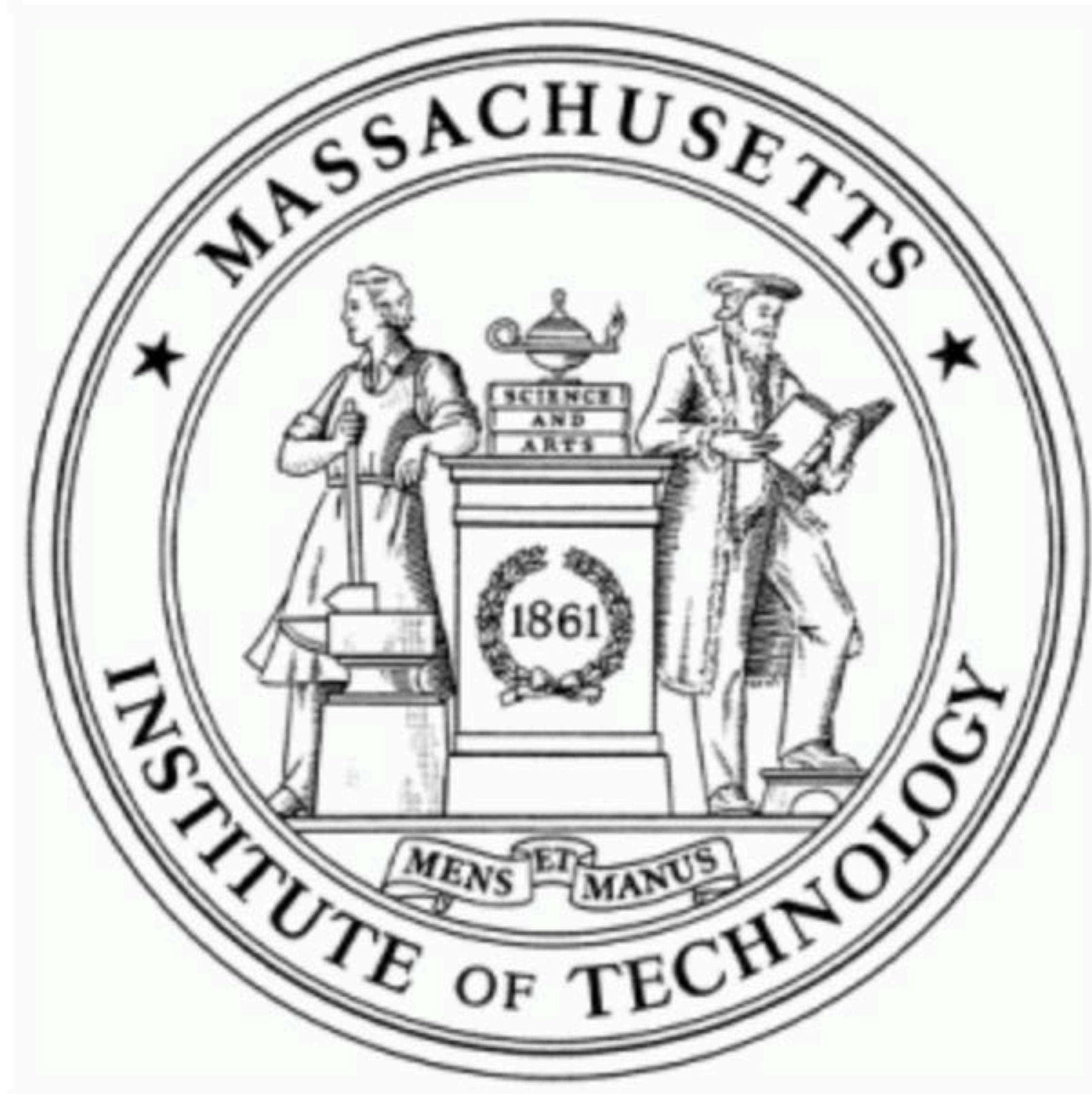
Designing Our World: Conversation for Action

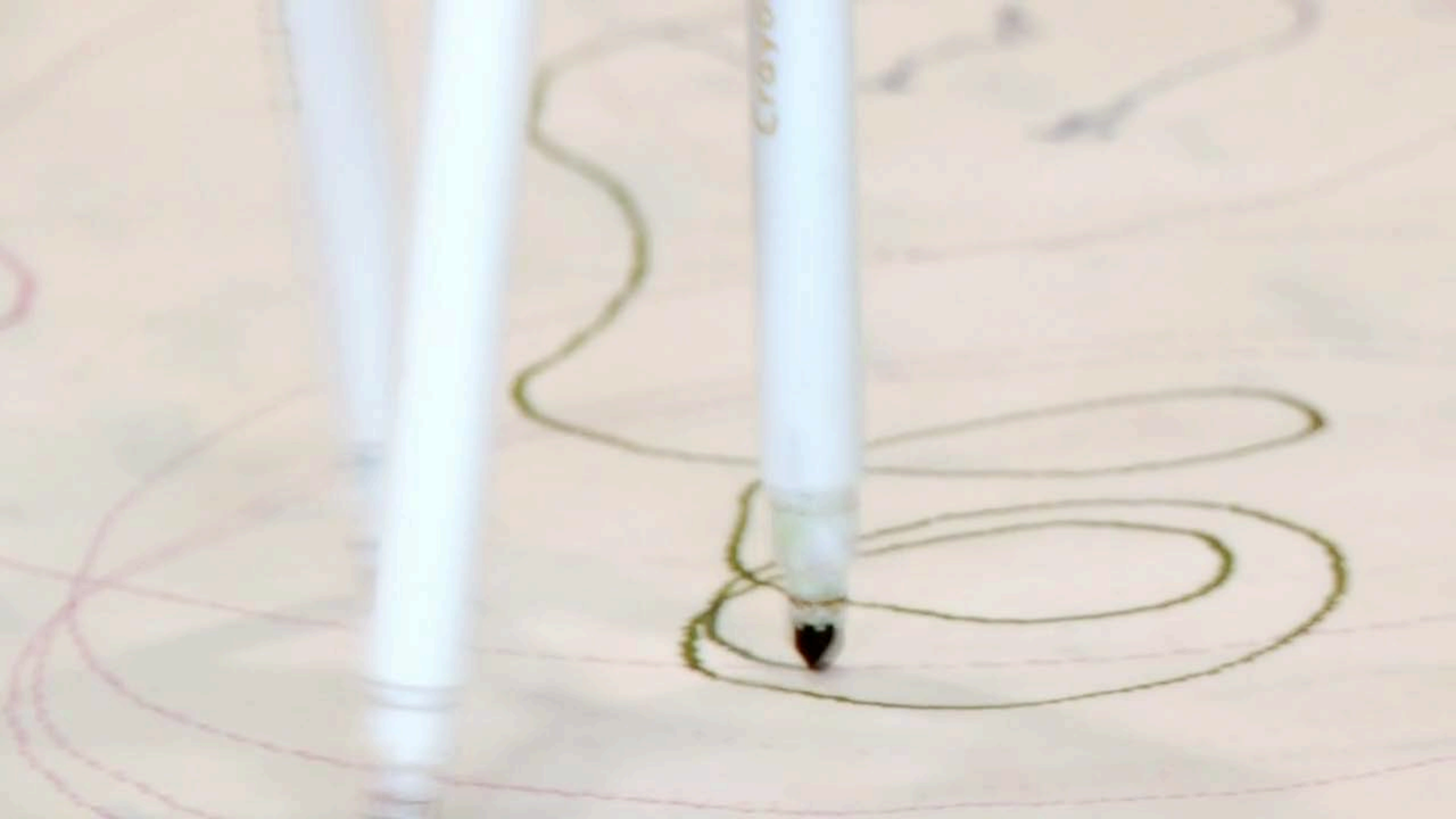












Ranulph Glanville



Photo from
[https://systemic-design.net/
remembering-ranulph-glanville/](https://systemic-design.net/remembering-ranulph-glanville/)

I can have a piece of paper and I can make a mark and go away and come back and look at it later.

And you know what happens when you draw on something and you come back and look at it later? It looks different than you thought you'd drawn it.

So... you're taking two roles: the person who draws, the person who looks, the person who draws, the person who looks.

***[This] is what is at the center of designing.
This, for me, is the act that makes design design.***

— Ranulph Glanville

Designing Our World: Cybernetics as Conversation for Action



Designing Our World: Cybernetics as Conversation for Action



“Everyone designs who devises courses of action aimed at changing existing situations into preferred ones.”

— Herbert Simon

“Design and cybernetics are really the same thing.”

— Ranulph Glanville

***“Conversation is the bridge
between cybernetics and design.”***

— Ranulph Glanville

**We construe design as a conversation for action —
that is, as cybernetics.**

— Dubberly & Pangaro, *Cybernetics and Design: Conversations for Action*, 2017

Cybernetics is a necessary foundation for 21st century design practice.

— Dubberly & Pangaro, *Cybernetics and Design: Conversations for Action*, 2017

If design, then systems:

- The prominence of digital technology in daily life cannot be denied (or reversed).
Digital technology comprises systems of systems (Internet of Things).
- Design has expanded from **giving-form** to **creating systems** that support interactions.
Human interactions span thinking and acting, whether mundane or metaphysical.

We must model and tame this complex mesh of mechanisms.

Therefore: systems literacy is a necessary foundation for design.

If design, then systems.

If systems, then cybernetics:

- Digital interactions comprise reliable connections, communication, and feedback.
Human interactions comprise purpose, feedback, and learning.
- The science of communication and feedback, interaction and purpose, is cybernetics.

We must model communication and intention in a common frame.

Therefore: cybernetics is a necessary foundation for design.

If design, then systems.

If systems, then cybernetics.

If cybernetics, then second-order cybernetics:

- Framing “wicked challenges” requires articulating human values and viewpoints. Values and viewpoints are subjective.
- Designers must offer a persuasive rationale for our subjective viewpoints.
- Modeling subjectivity is the province of second-order cybernetics.

We must embrace values and subjectivity at the heart of designing.

Therefore: second-order cybernetics is a necessary foundation for design.

If design, then systems.

If systems, then cybernetics.

If cybernetics, then second-order cybernetics.

If second-order cybernetics, then conversation:

- Taming “wicked challenges” must be grounded in argumentation.
- Argumentation requires conversation so that participants may understand and agree.
- Agreement is necessary for collaboration and effective action.

We must embrace argumentation and collaboration to the heart of 21st-century design.

Therefore: conversation is a necessary foundation for design.

If design, then systems.

If systems, then cybernetics.

If cybernetics, then second-order cybernetics.

If second-order cybernetics, then conversation.

— Dubberly & Pangaro, *Cybernetics and Design: Conversations for Action*, 2017

***“Design is the action;
Second-order Cybernetics is the explanation.”***

— Ranulph Glanville

Heinz von Foerster

photo by Robert Knisely 1989

Heinz von Foerster '17 / Vienna Jur



Gordon Pask
Heinz von Foerster



photo by Robert Knisely 1989

Gordon Pask
Heinz von Foerster



photo by Robert Knisely 1989

Ranulph Glanville
Gordon Pask
G. Spencer-Brown



photo by Paul Pangaro 1990

Ranulph Glanville
Gordon Pask
G. Spencer-Brown



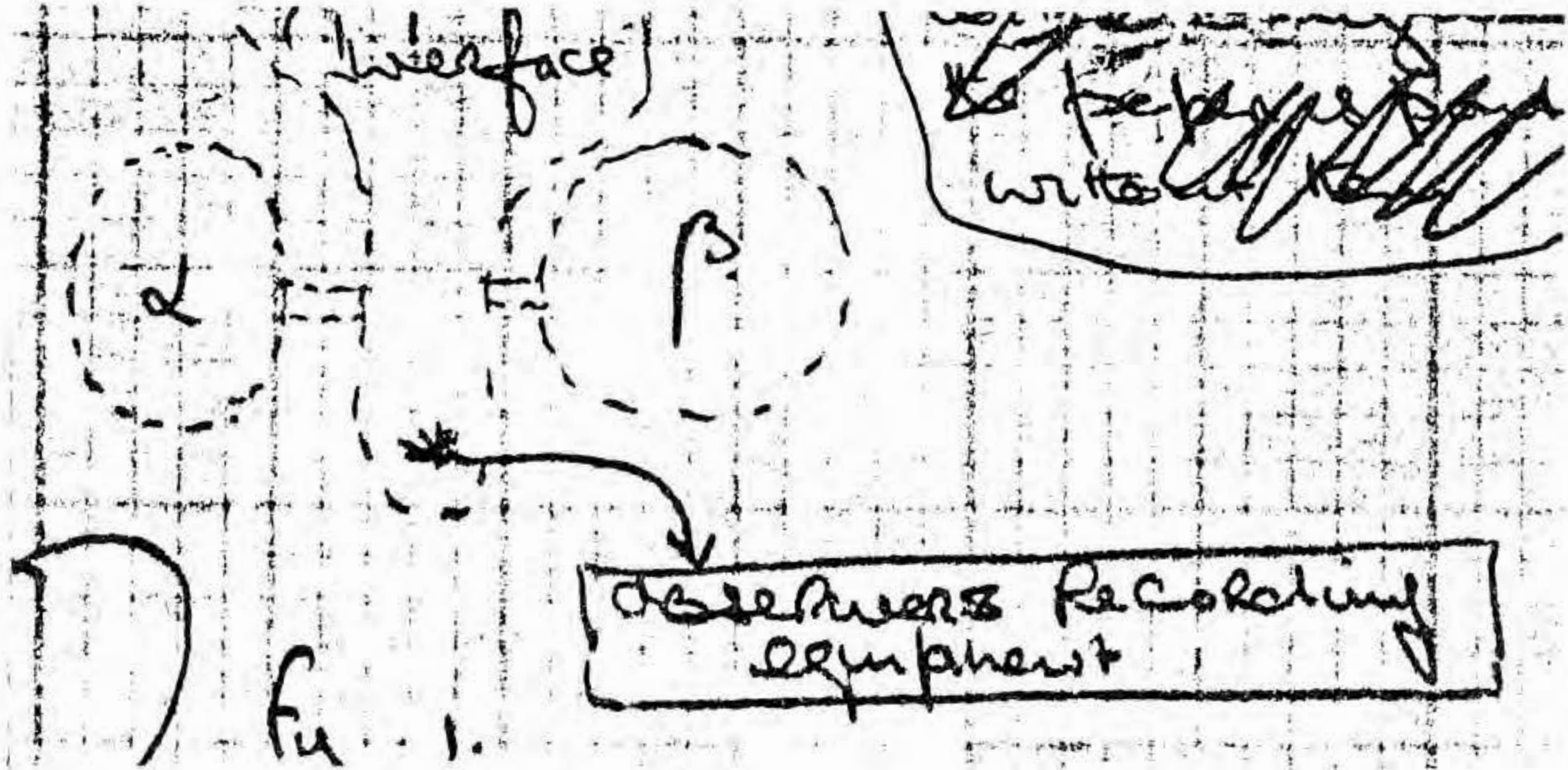
photo by Paul Pangaro 1990

Gordon Pask
Paul Pangaro

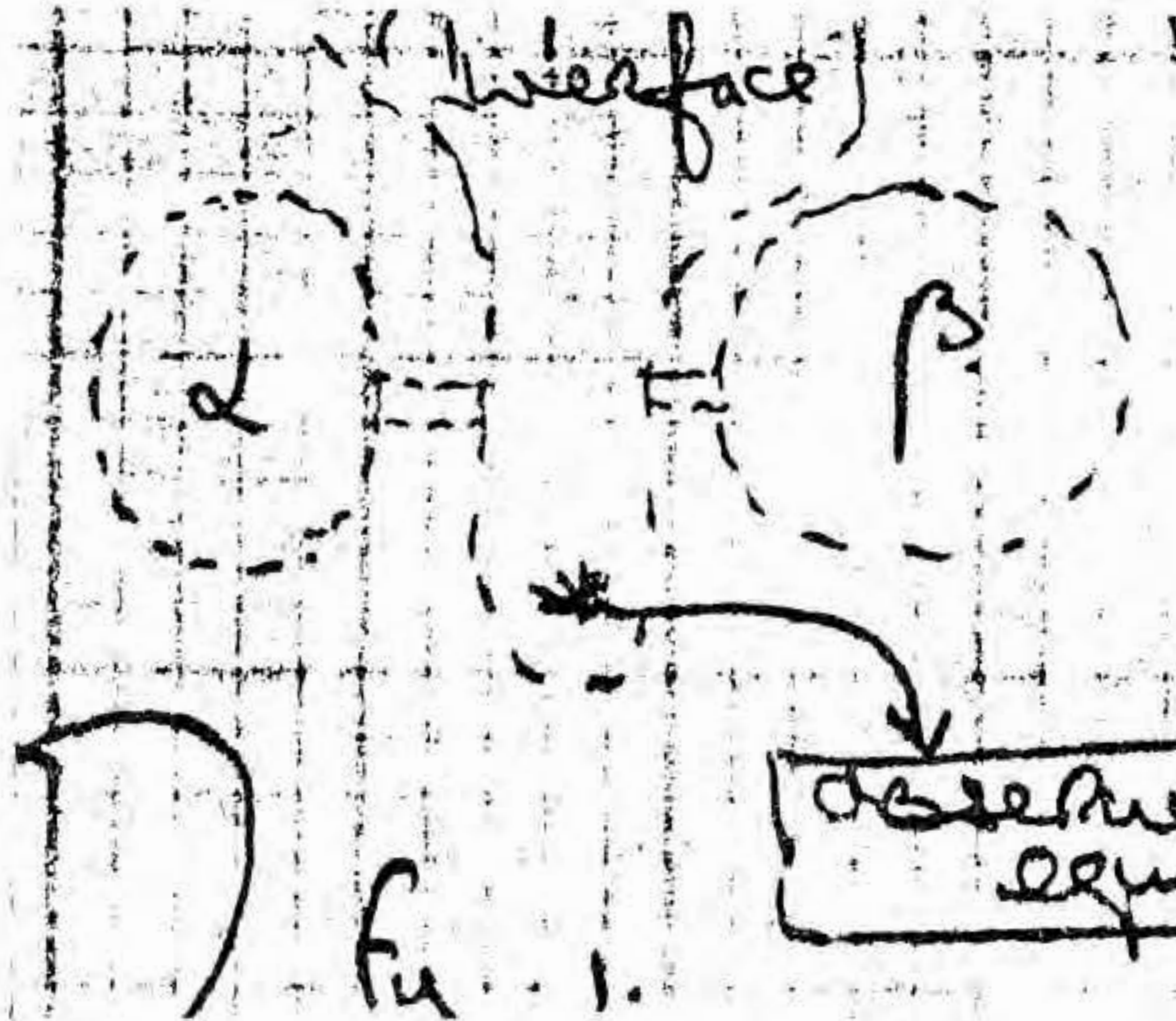


~1986

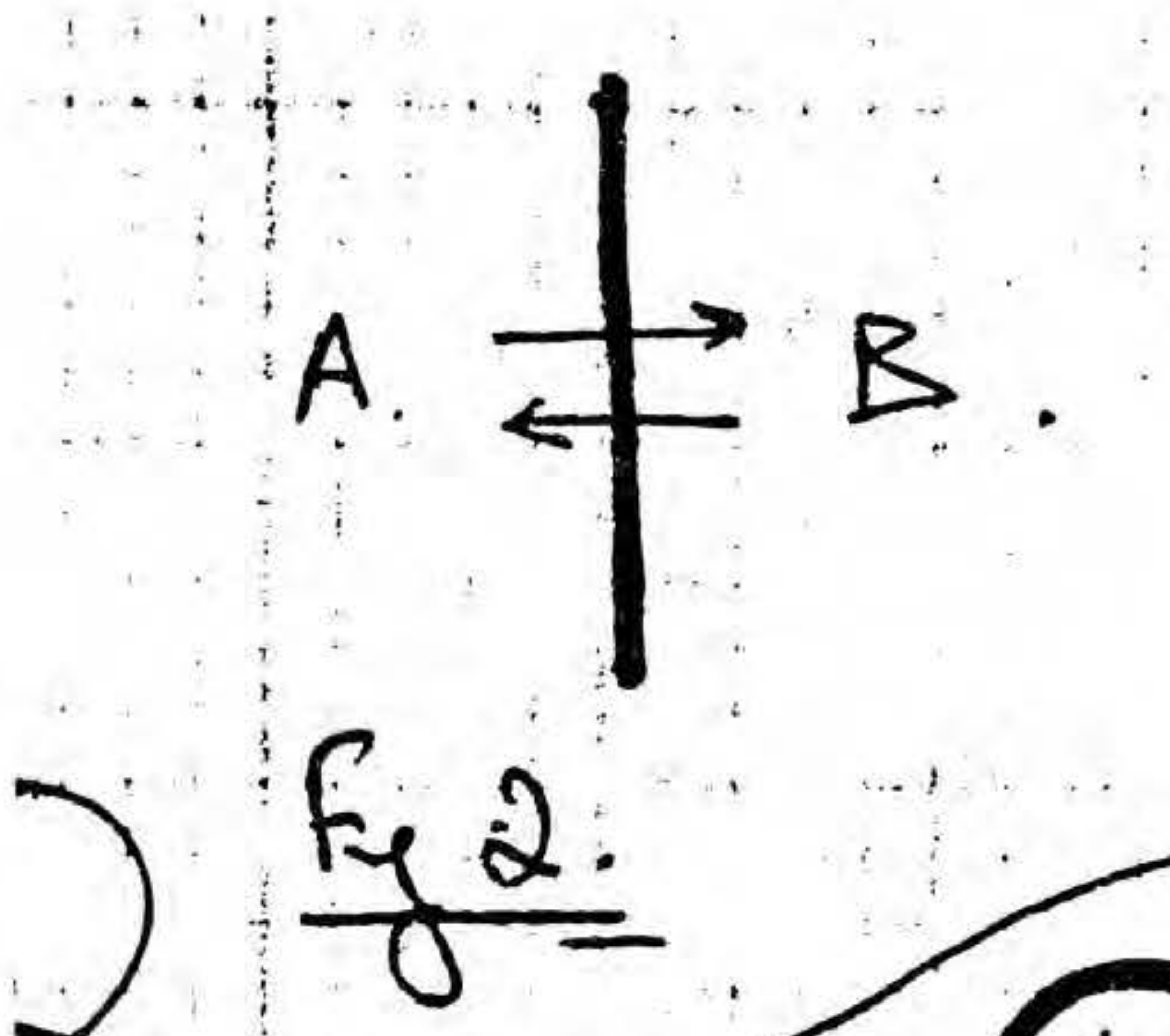
Conversation



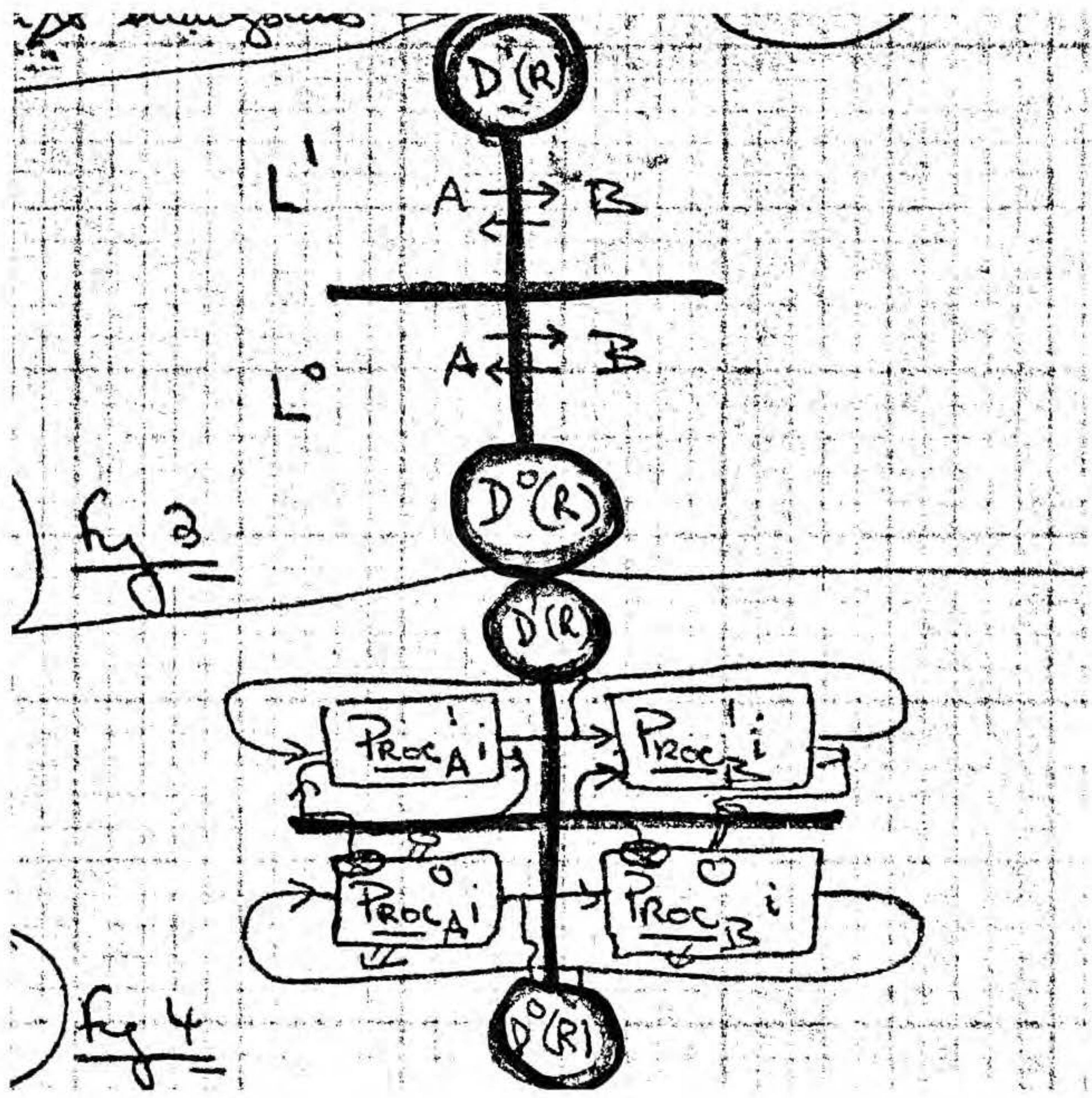
Conversation



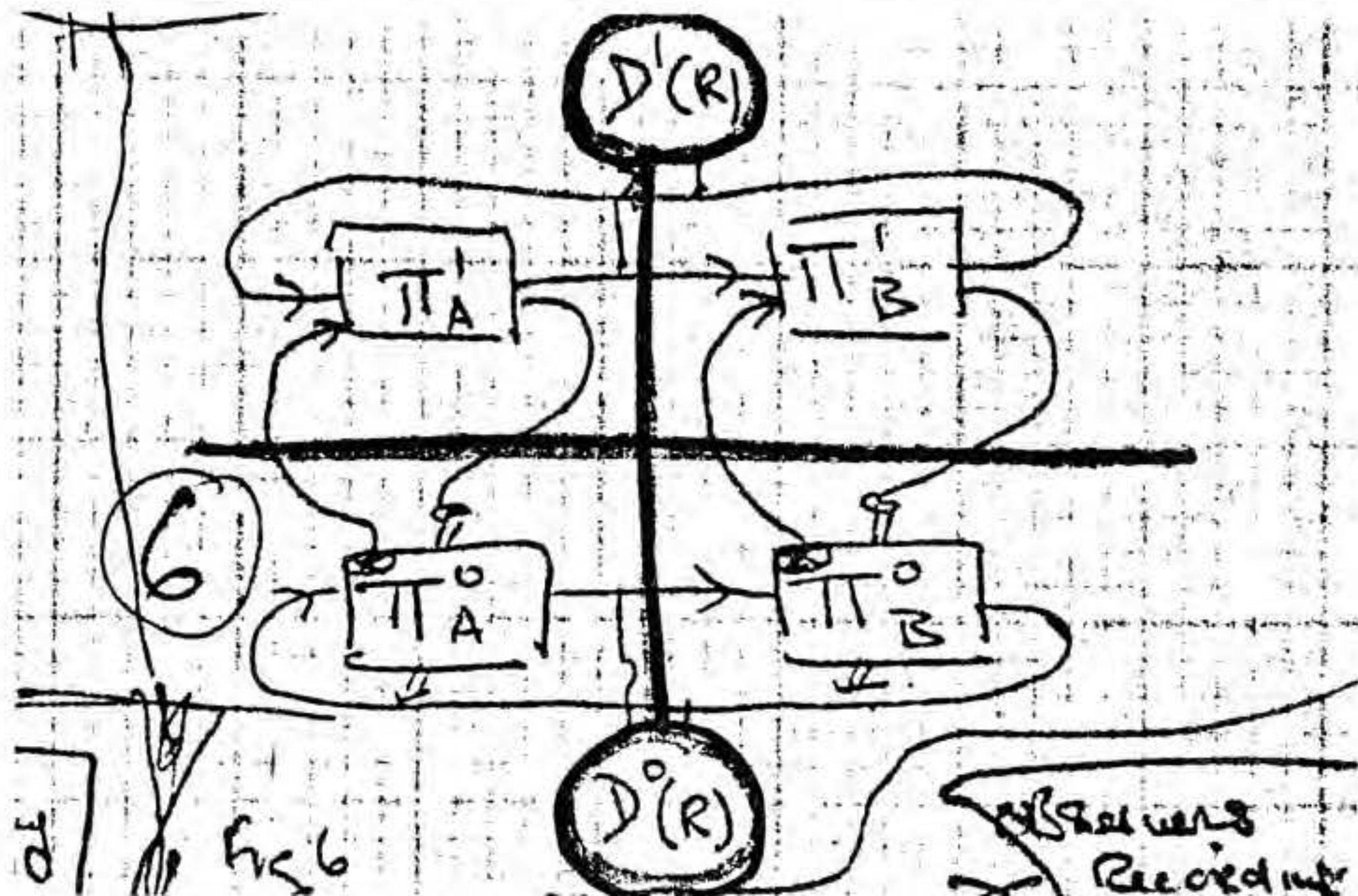
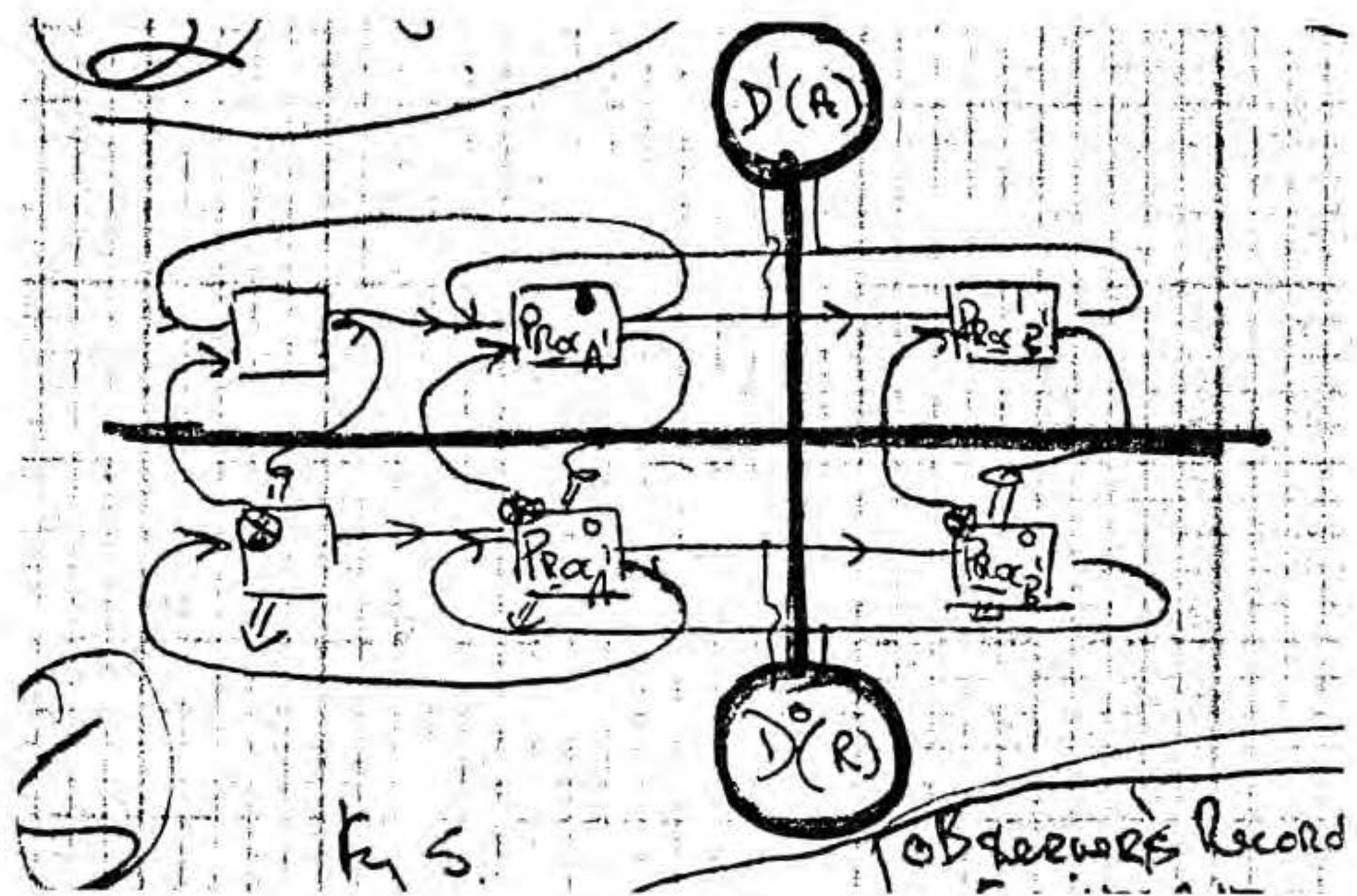
Conversation



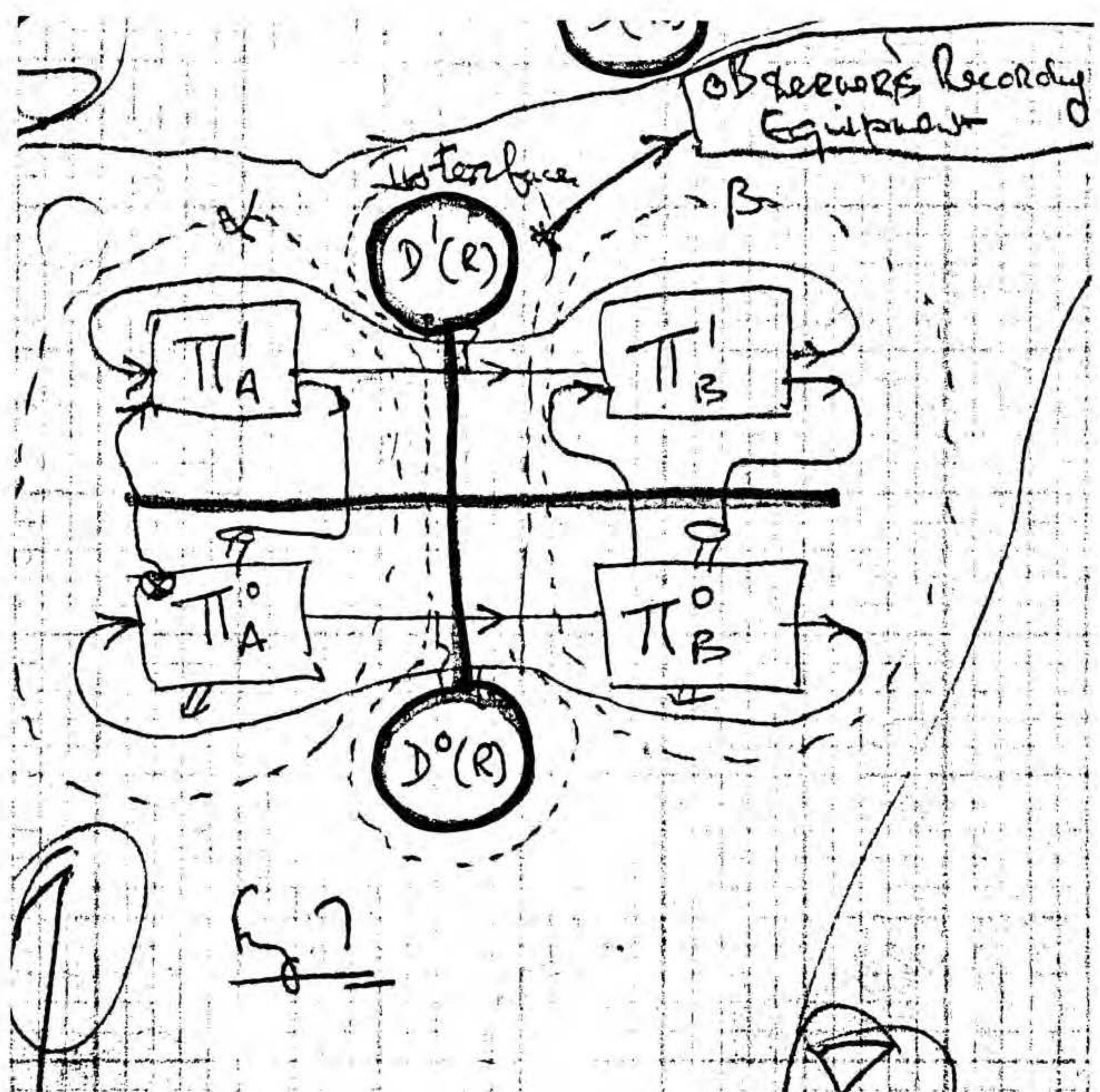
Conversation



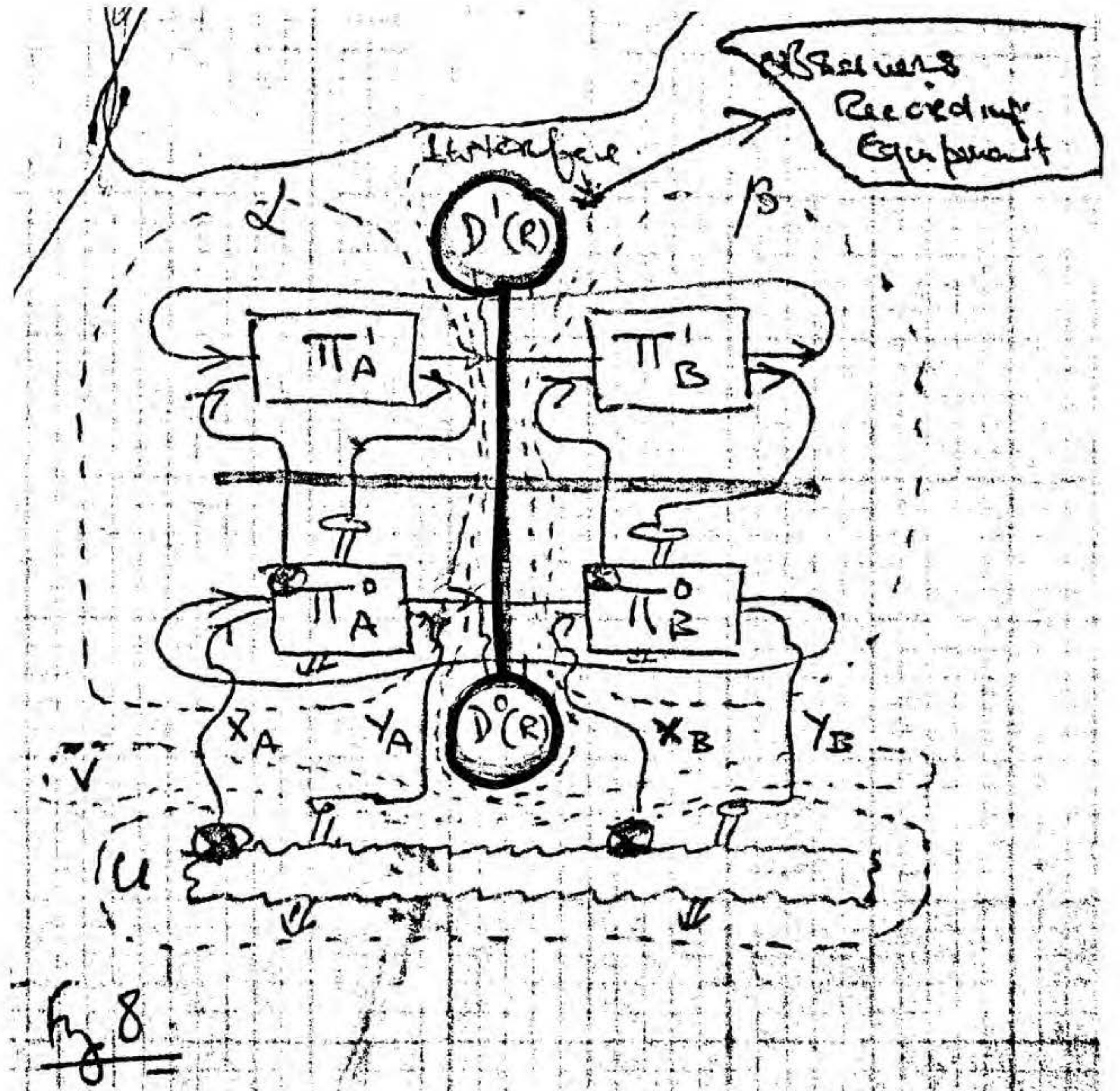
Conversation



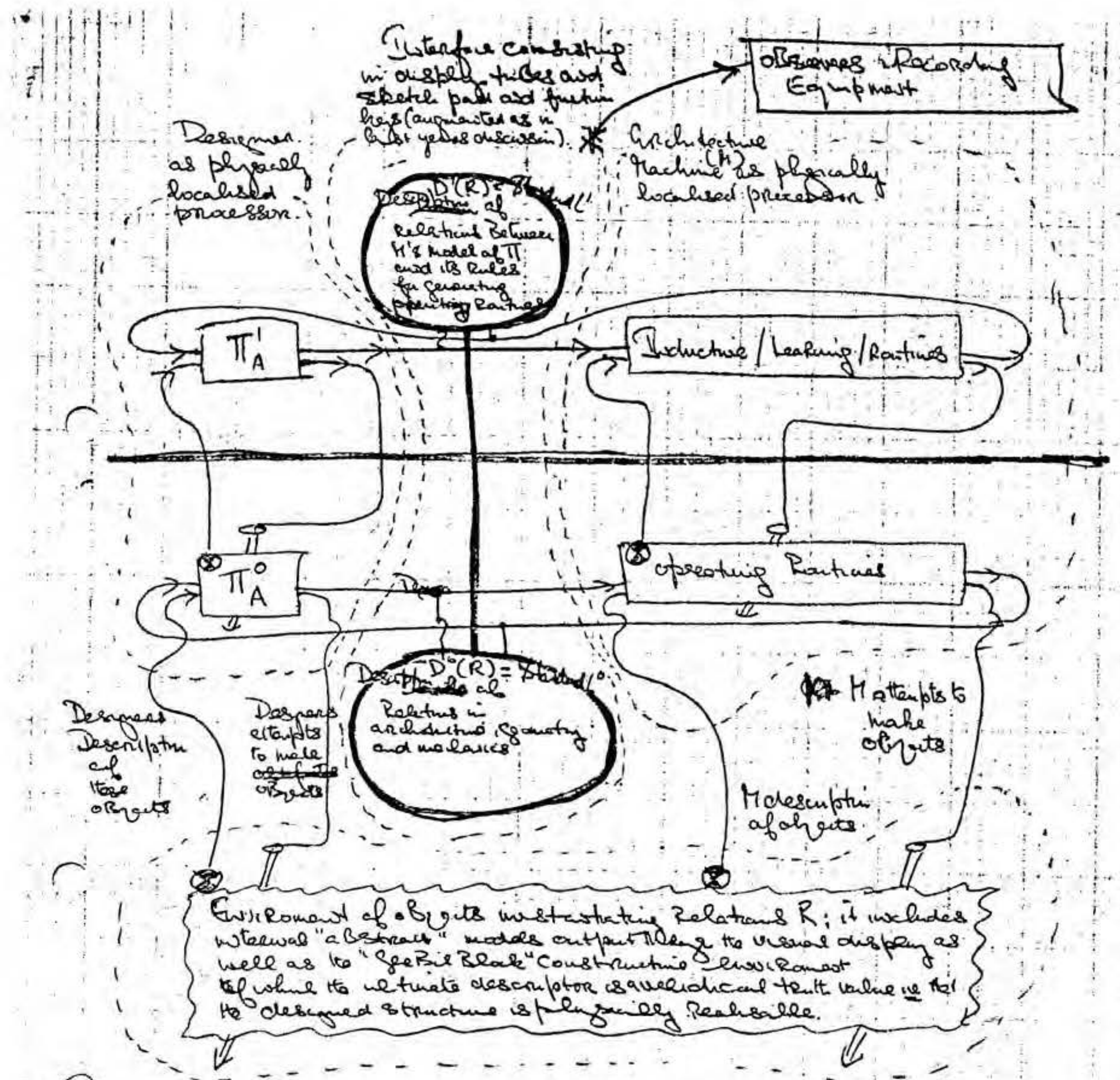
Conversation



Conversation



Conversation for Design

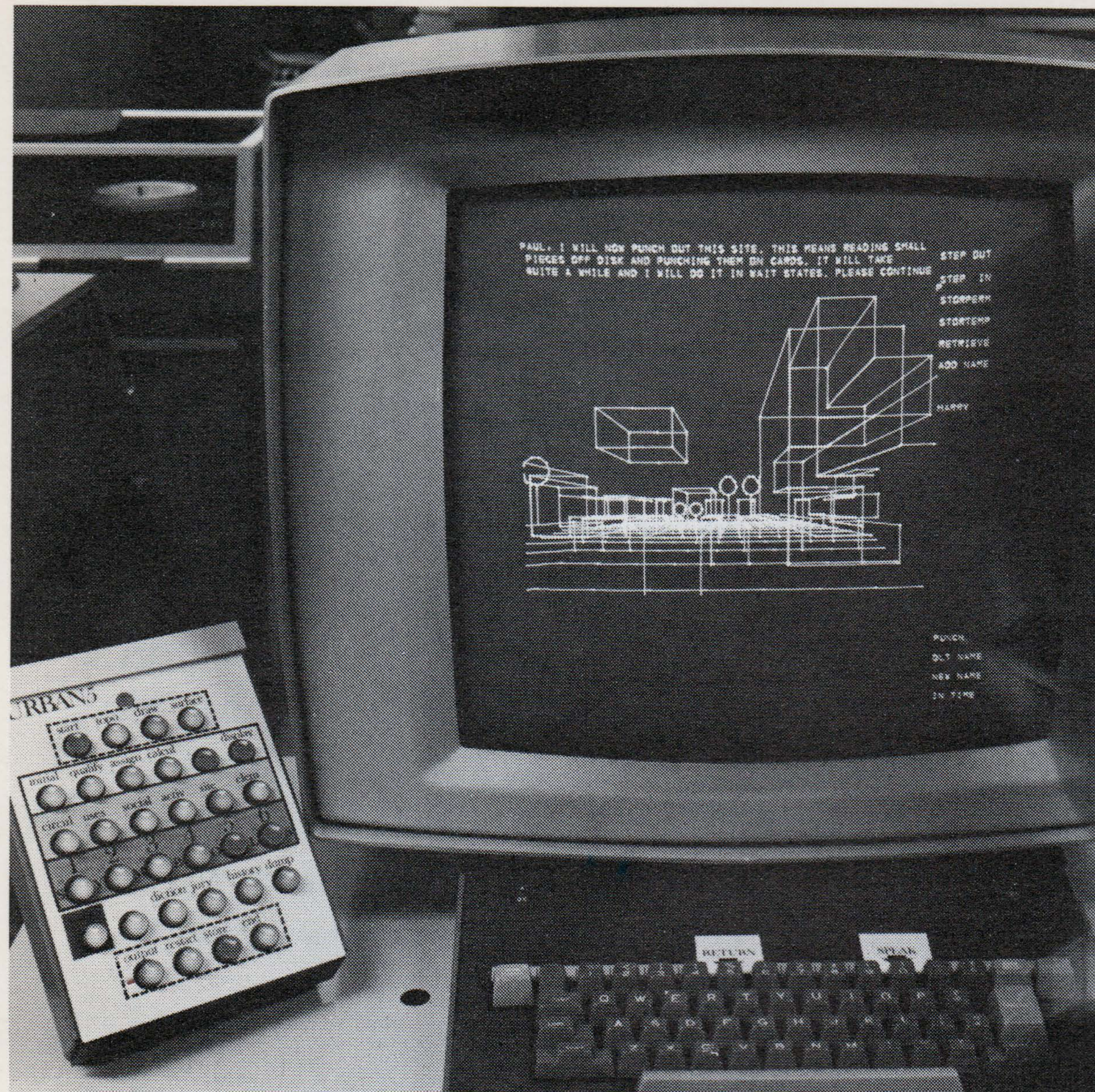


Conversation for Design



Conversation for Design

URBAN5:
A Machine
That Discusses
Urban Design



Conversation for Design

URBAN5: A Machine That Discusses Urban Design

Nicholas Negroponte and
Leon Groisser

International Business Machines
Cambridge Scientific Center and
Department of Architecture,
Massachusetts Institute of
Technology
Cambridge, Massachusetts



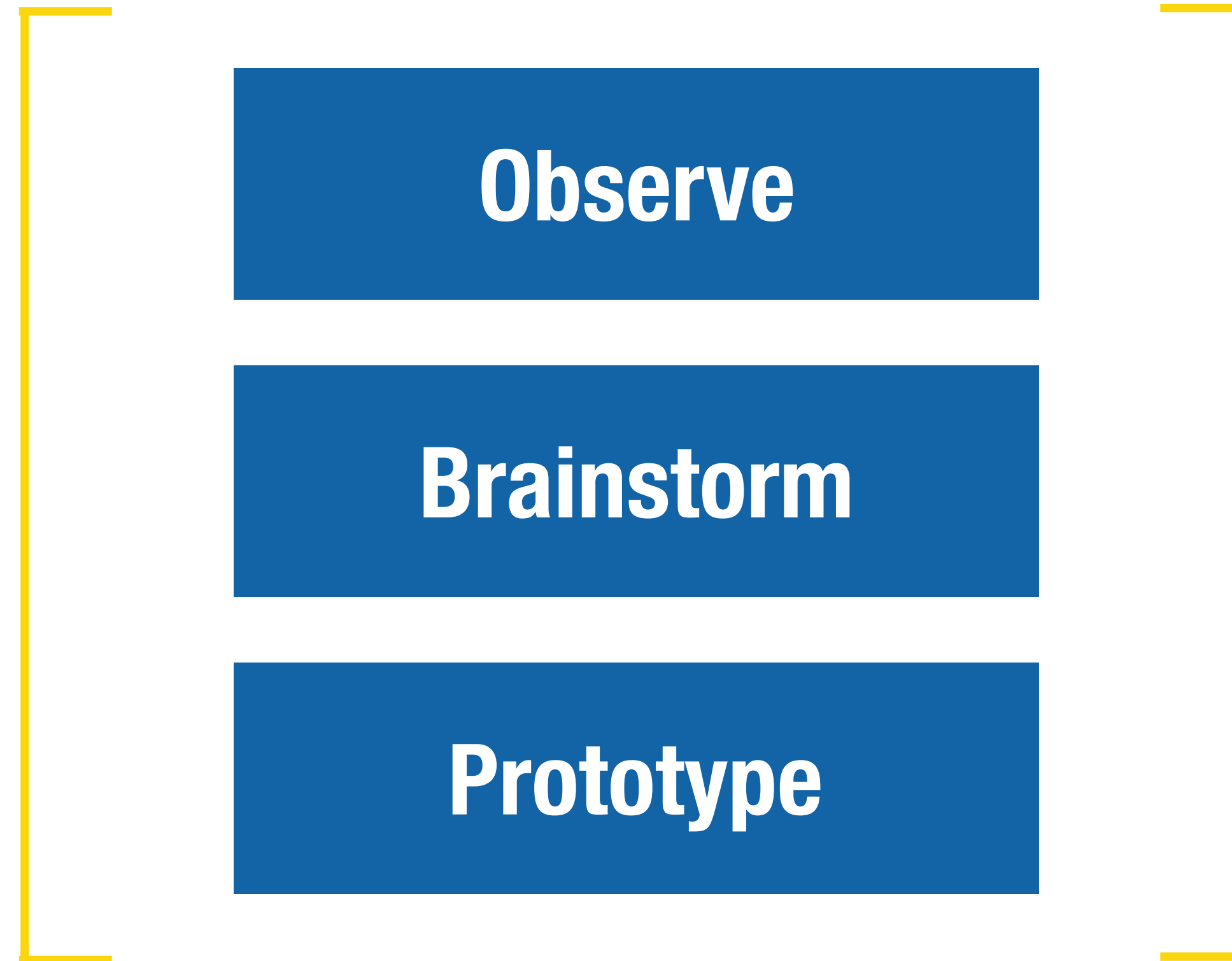
Design...

Design... from Thinking to Conversation



**Design
Thinking**

What is the process of Design Thinking?



What Does that mean?

Ethnography

Observe

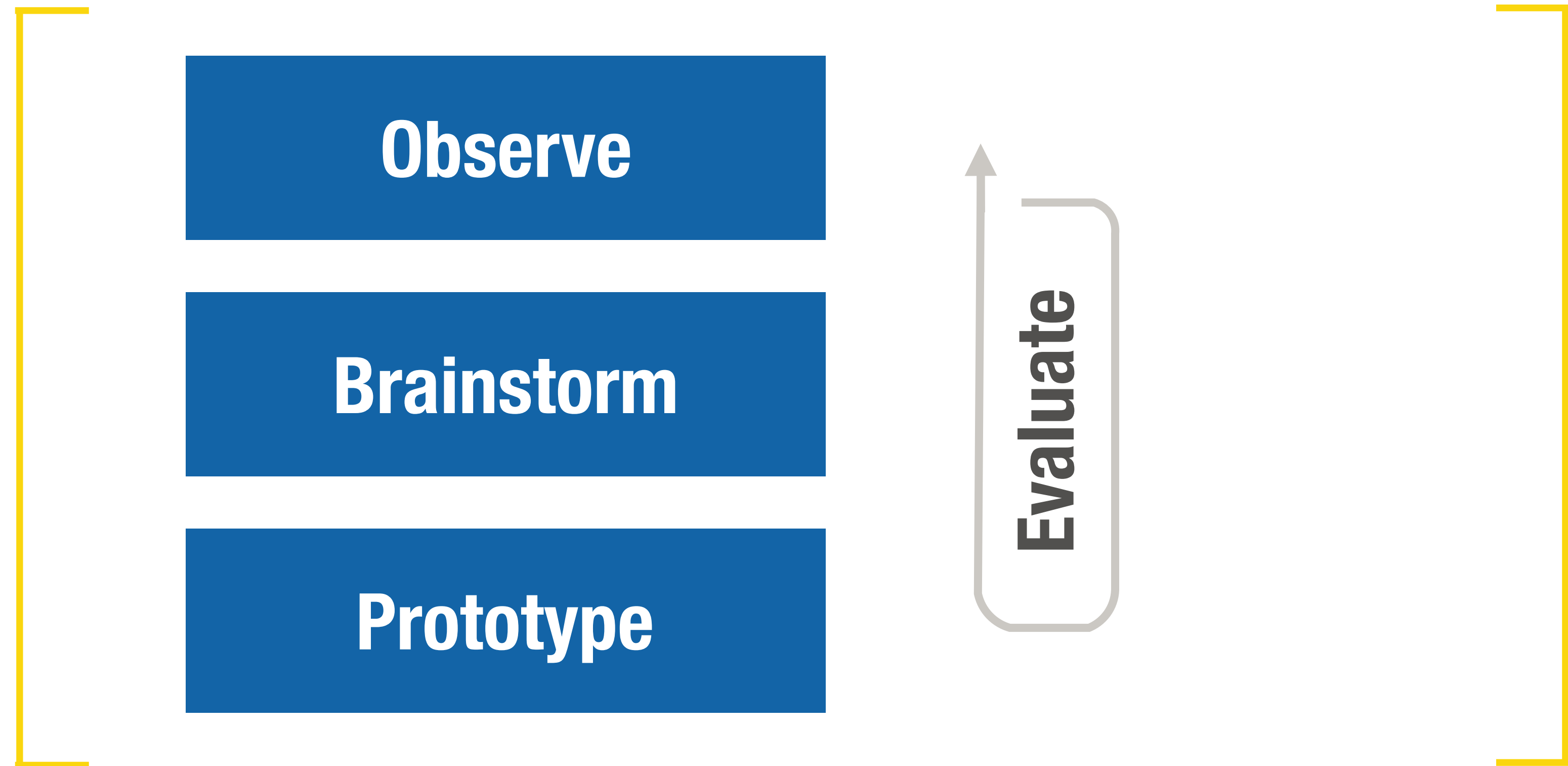
Open-ended idea
generation

Brainstorm

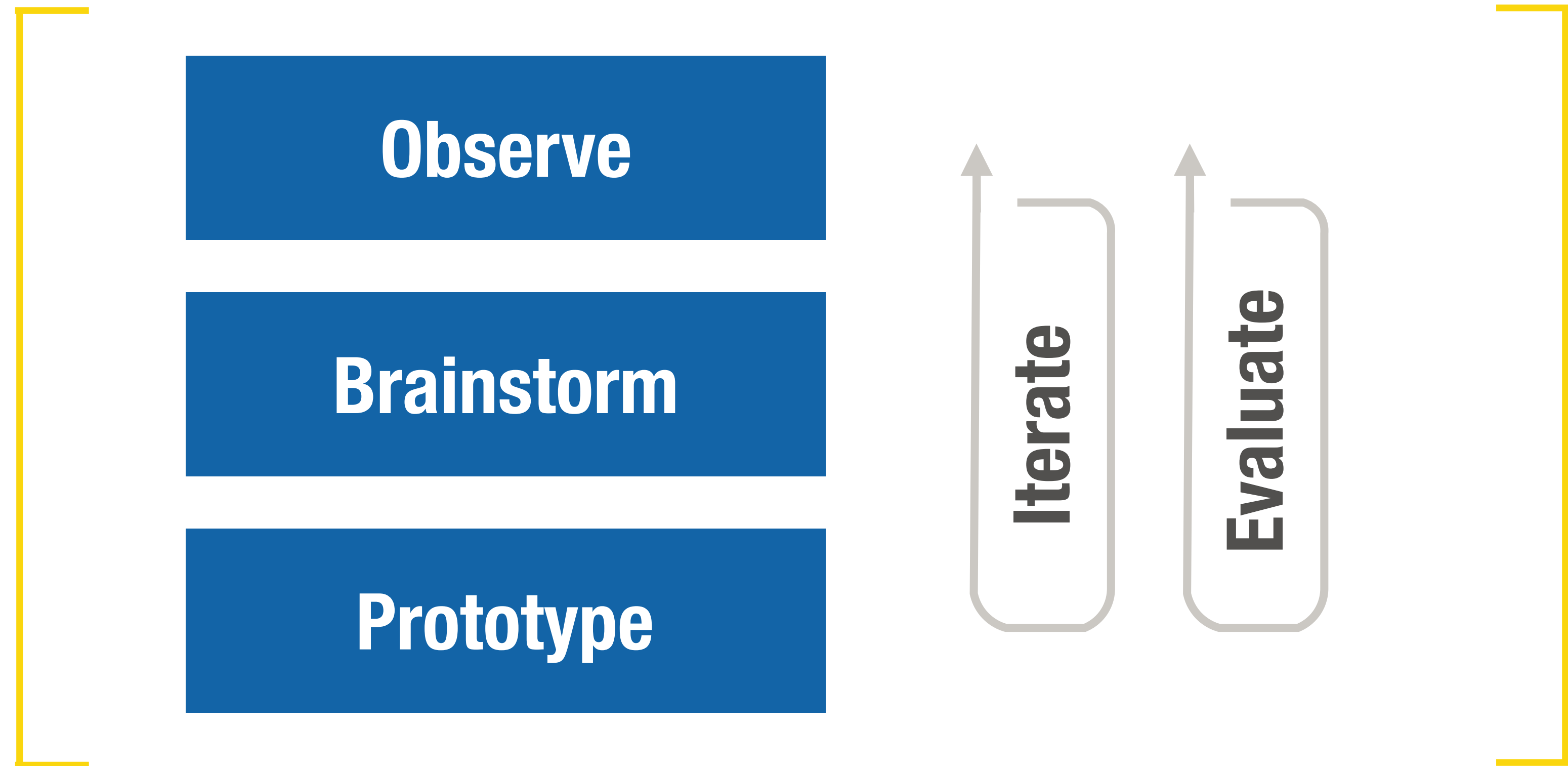
Making and
testing

Prototype

What Does that mean?



What Does that mean?



Limitations

Specific?

Rigorous?

Repeatable?

Observe

Brainstorm

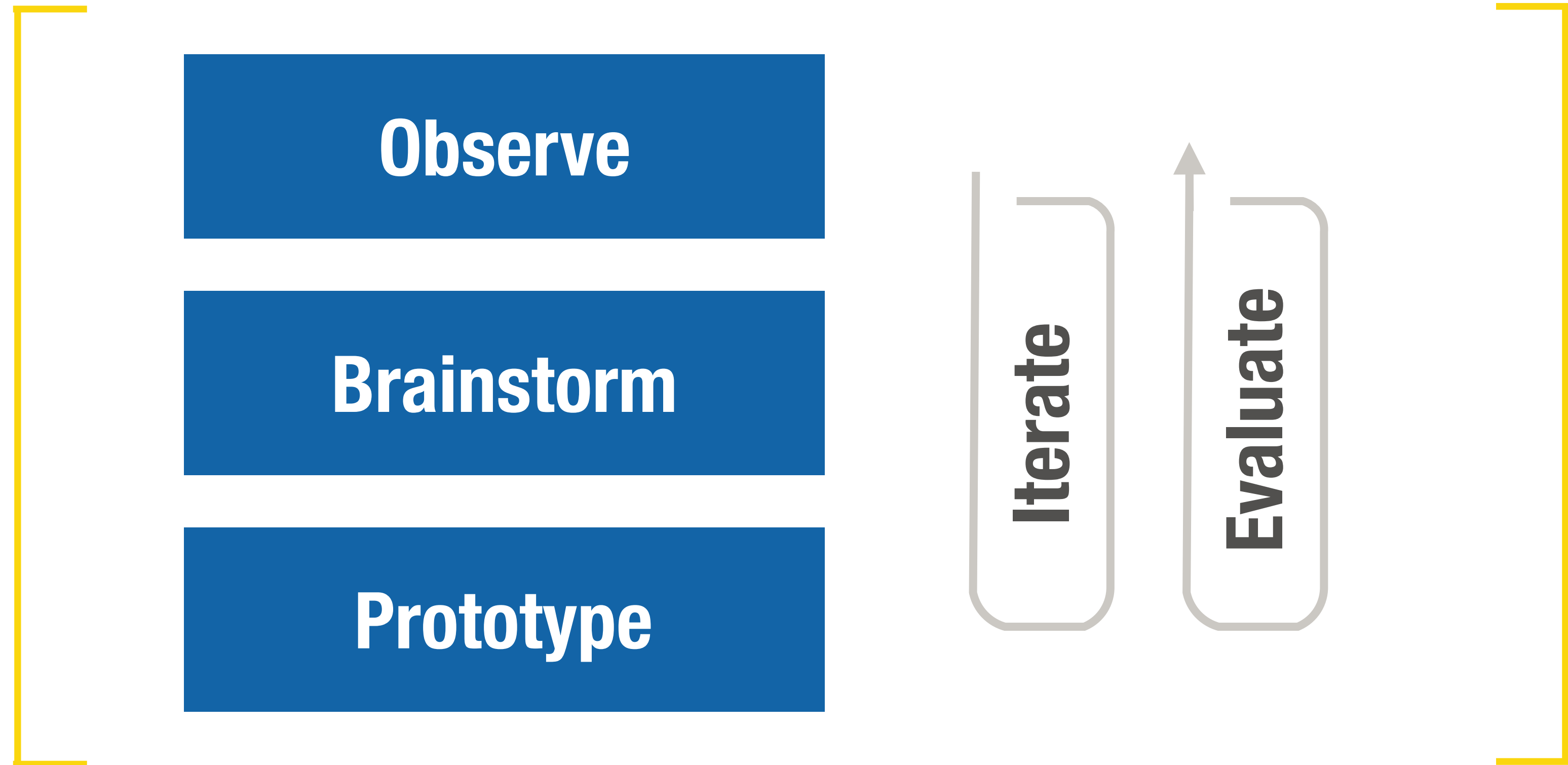
Prototype

Iterate

Evaluate

Evaluate...

Measure
Improvements
for Users



Iterate & Evaluate

Measure
Improvements
for Users

Measure
Convergence
on design goals

Observe

Brainstorm

Prototype

Iterate

Evaluate

Iterate & Evaluate

Measure
Improvements
for Users

Measure
Convergence
on design goals

**Conversation to
Agree on Means**

Iterate

Evaluate

Conversation is the core

Measure
Improvements
for Users

Measure
Convergence
on design goals

**Conversation to
Agree on Means**


Conversation is the core

Measure
Improvements
for Users

Measure
Convergence
on design goals

**Conversation to
Agree on Means**

Design... from Thinking to Conversation



**Design
Thinking**

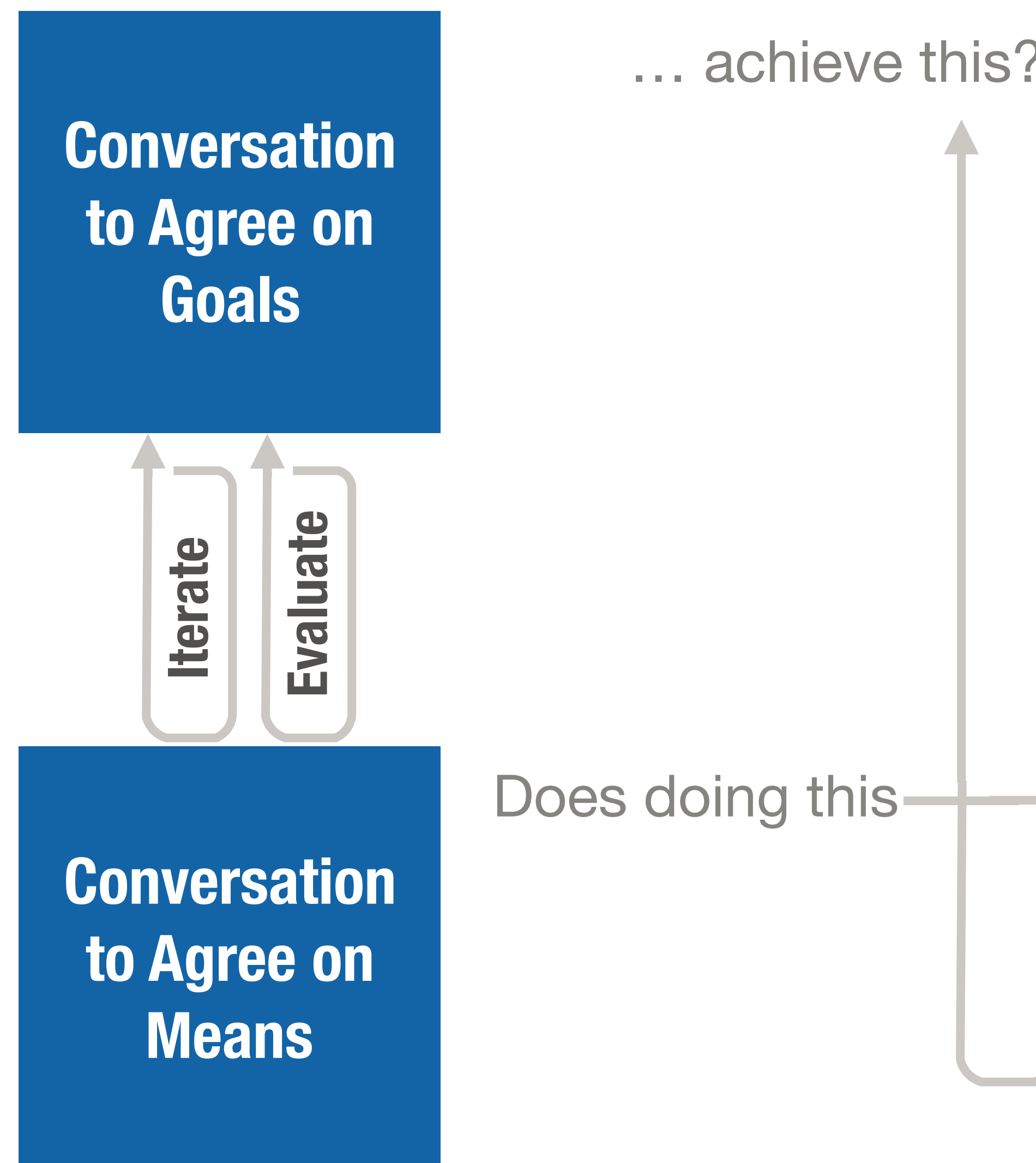
Rethinking Design Thinking

**Conversation
to Agree on Means**

Design as Conversation

**Conversation
to Agree on
Means**

Design as Conversation

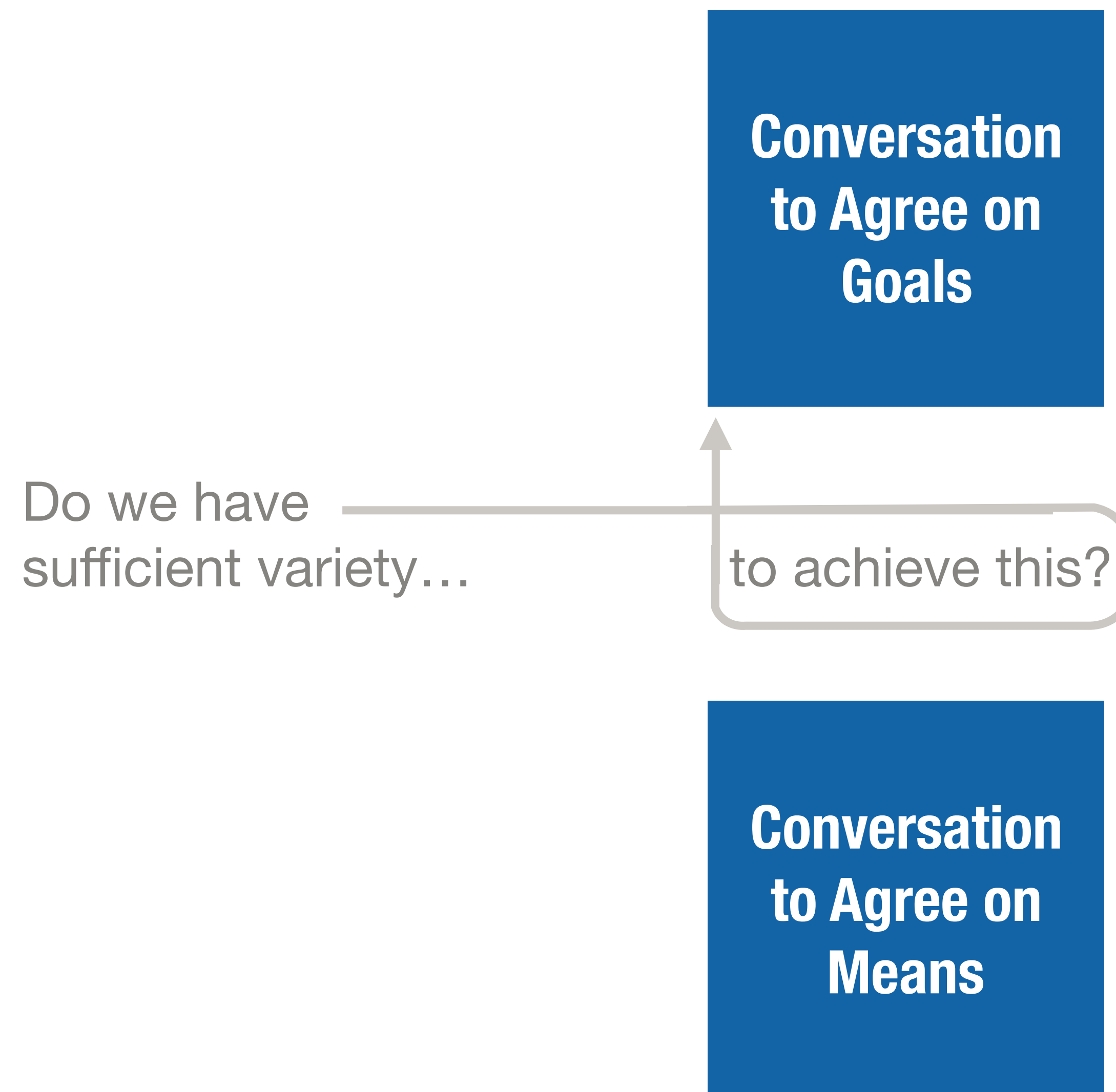


Design as Conversation

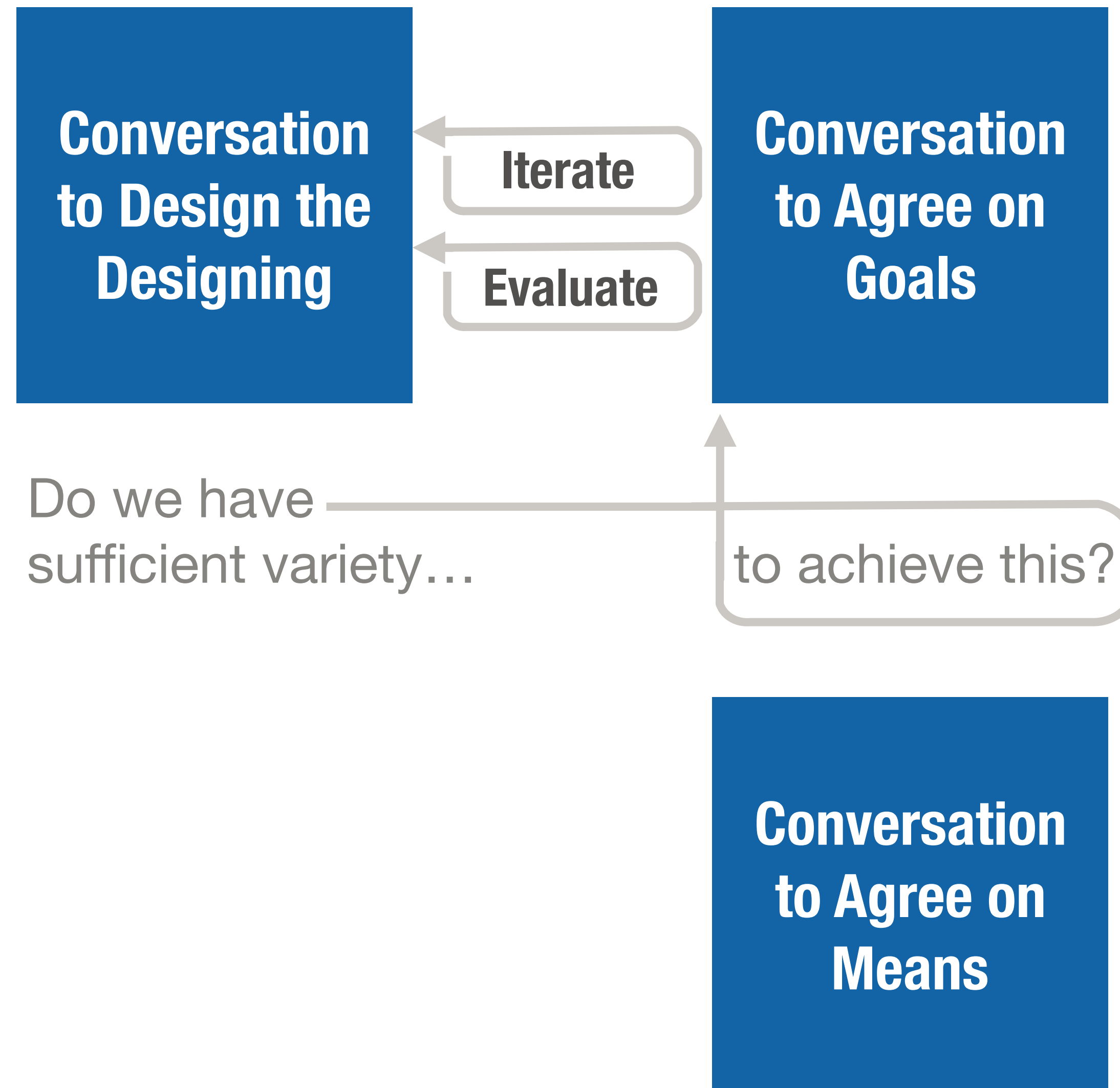
**Conversation
to Agree on
Goals**

**Conversation
to Agree on
Means**

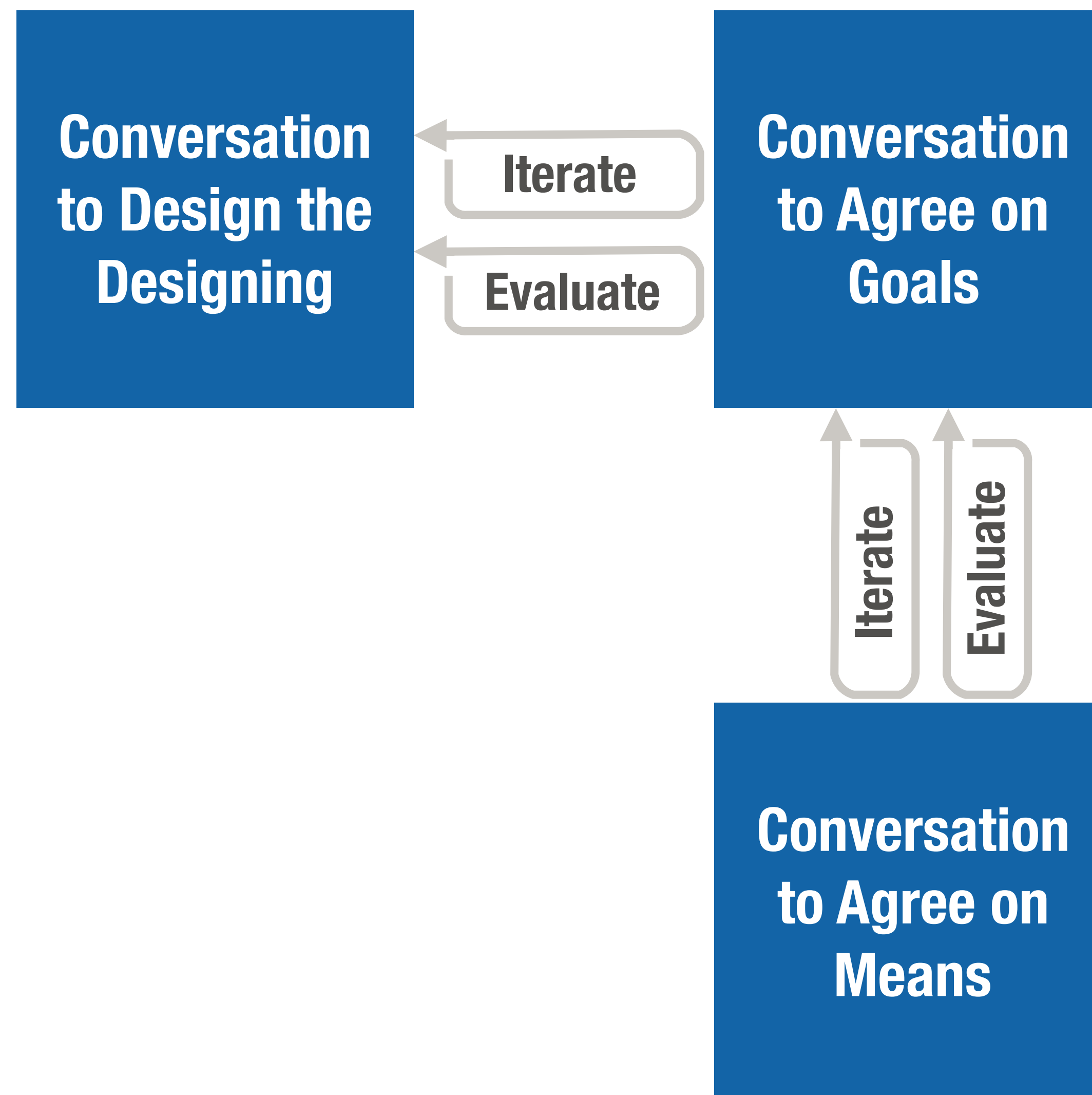
Design as Conversation



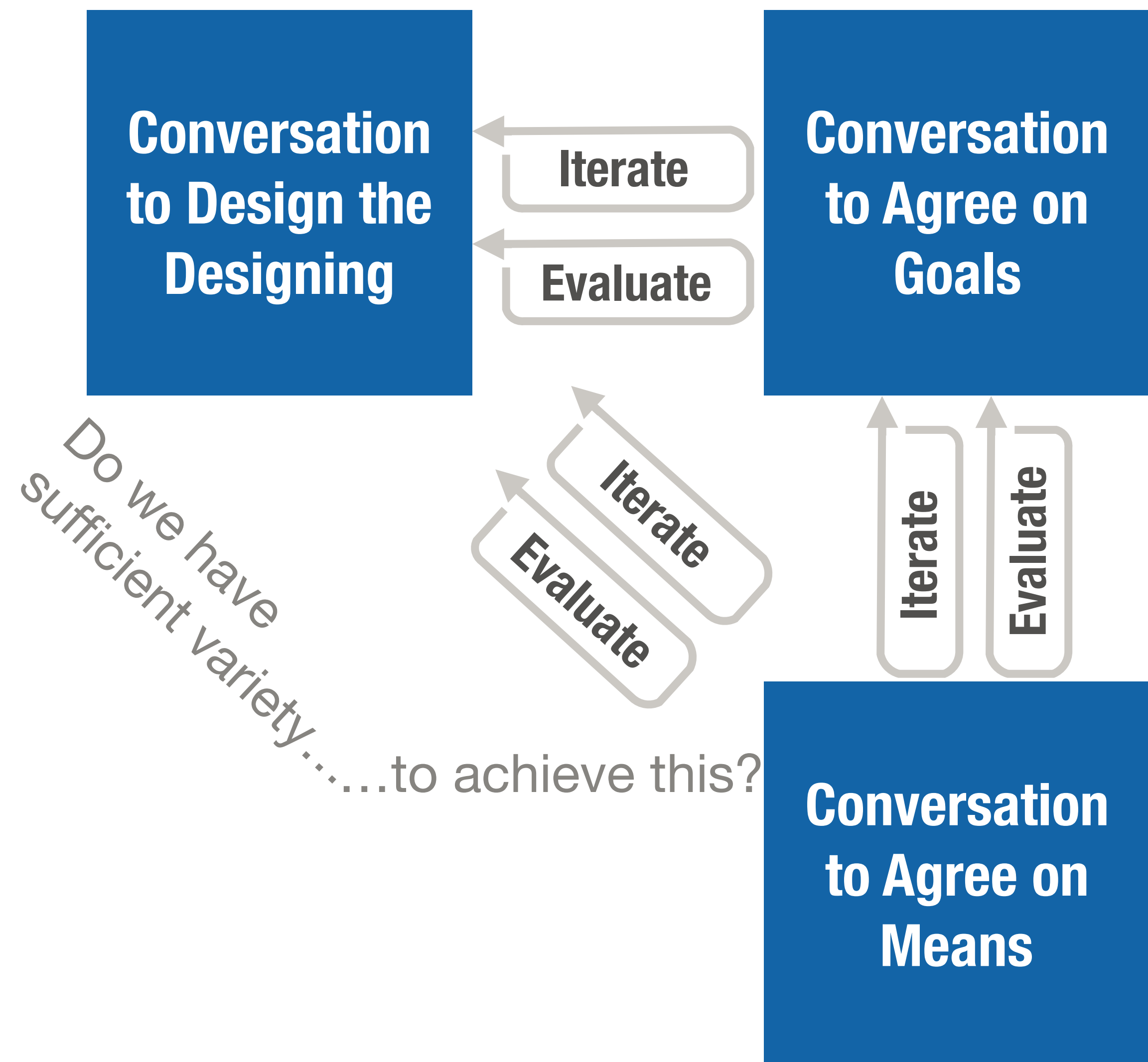
Design as Conversation



Design as Conversation

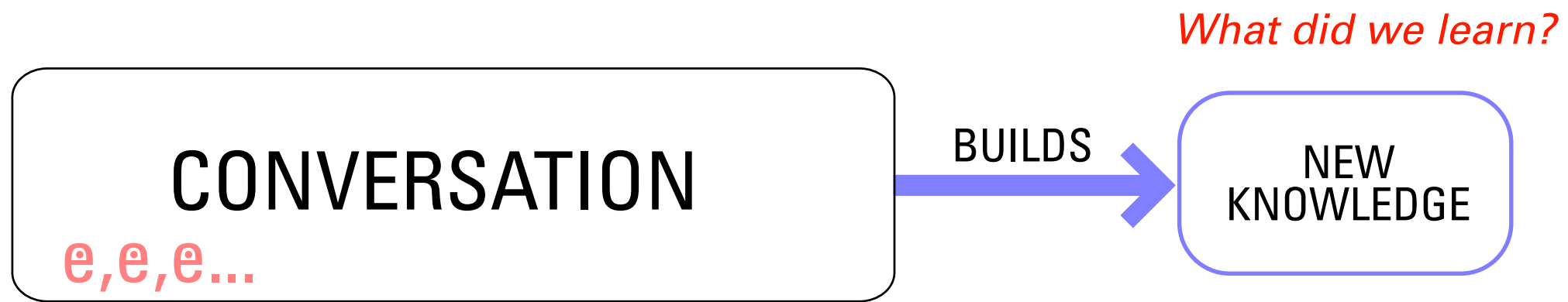


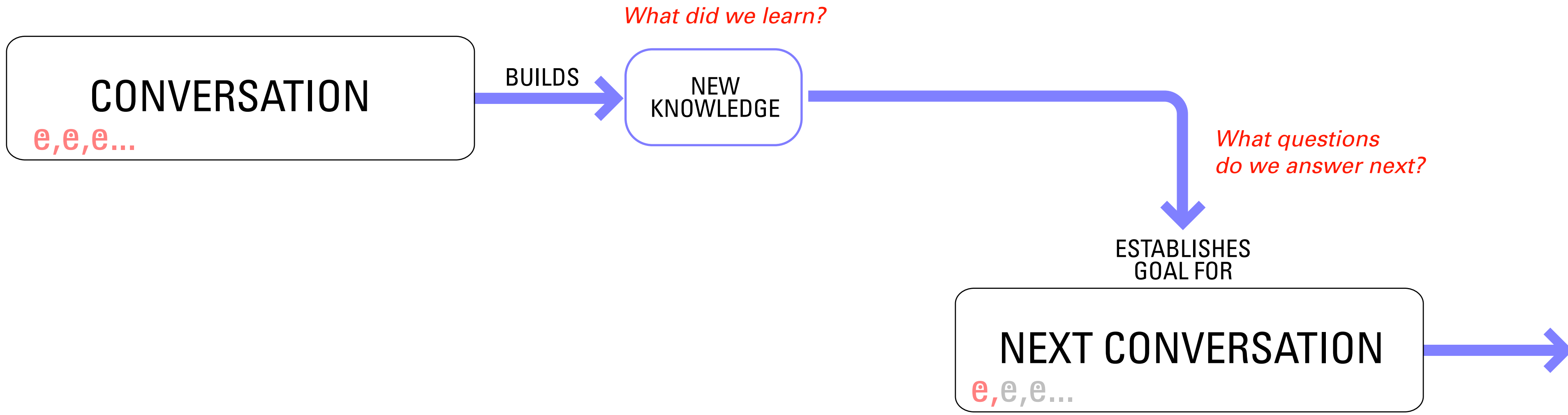
Design as Conversation

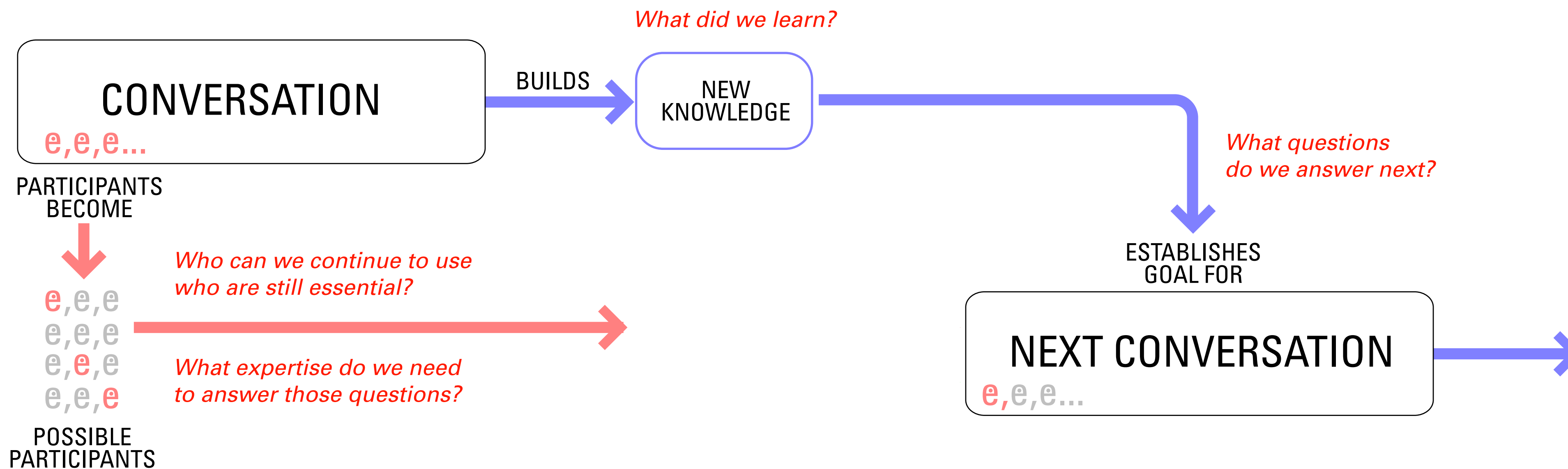


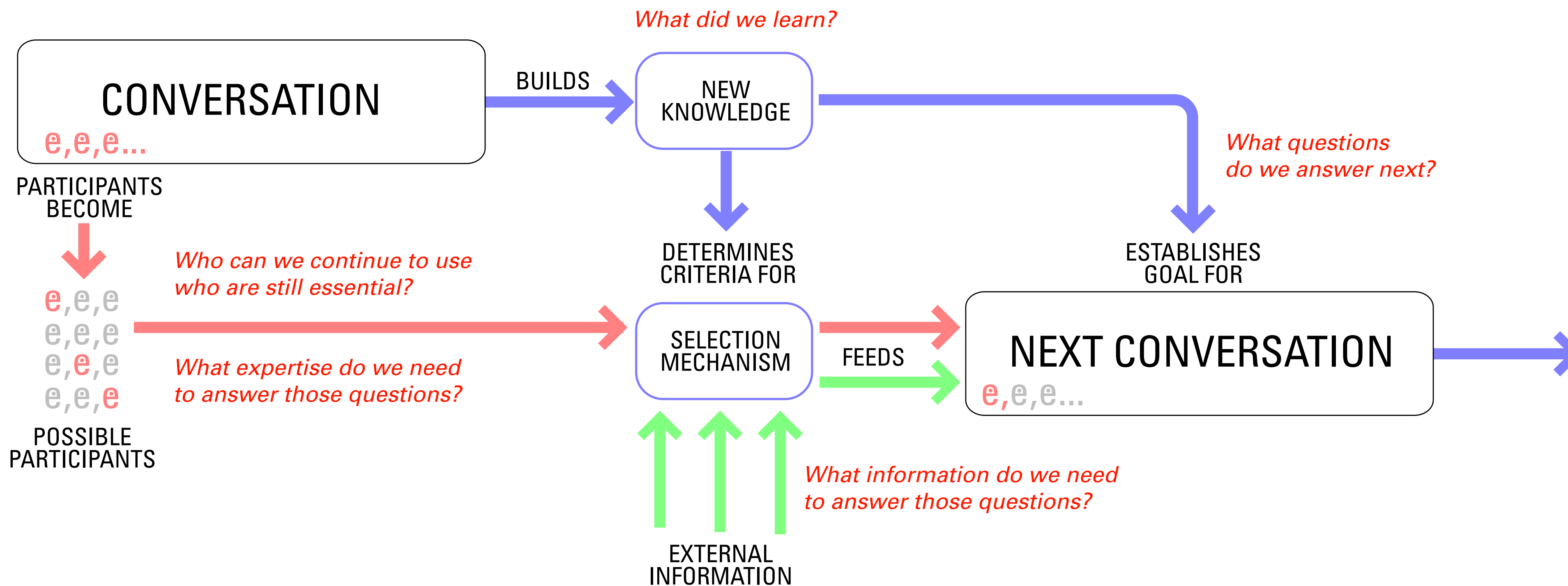
CONVERSATION

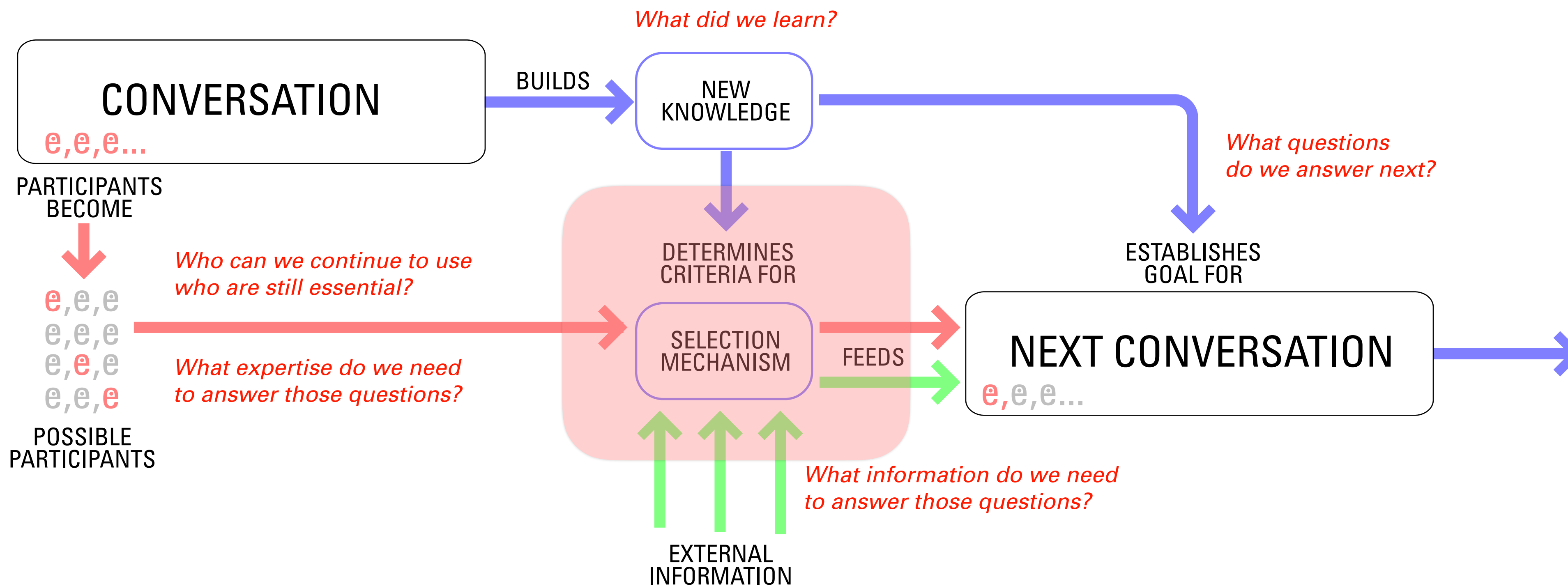
e,e,e...











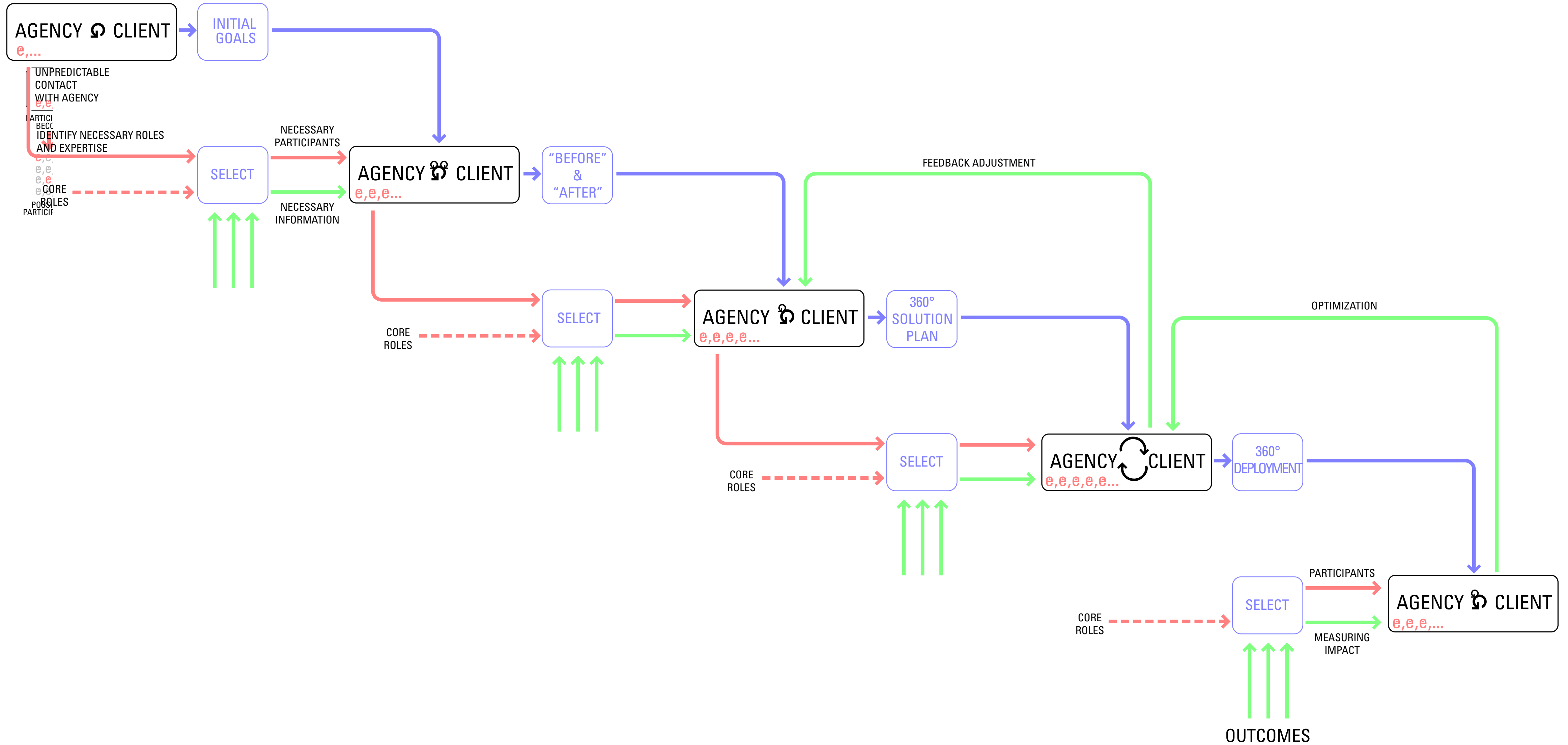
catalyst

ideation

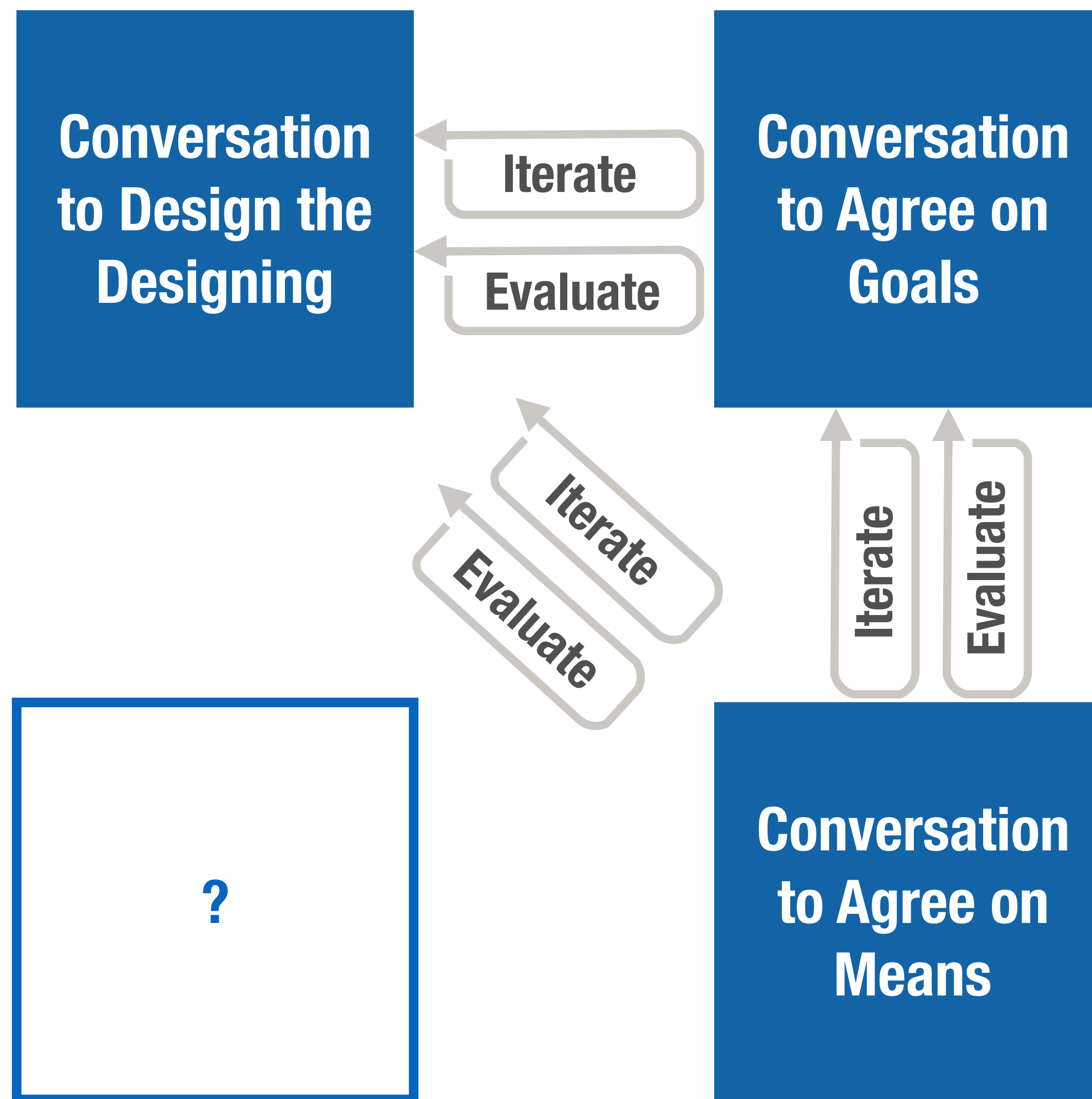
solution

delivery

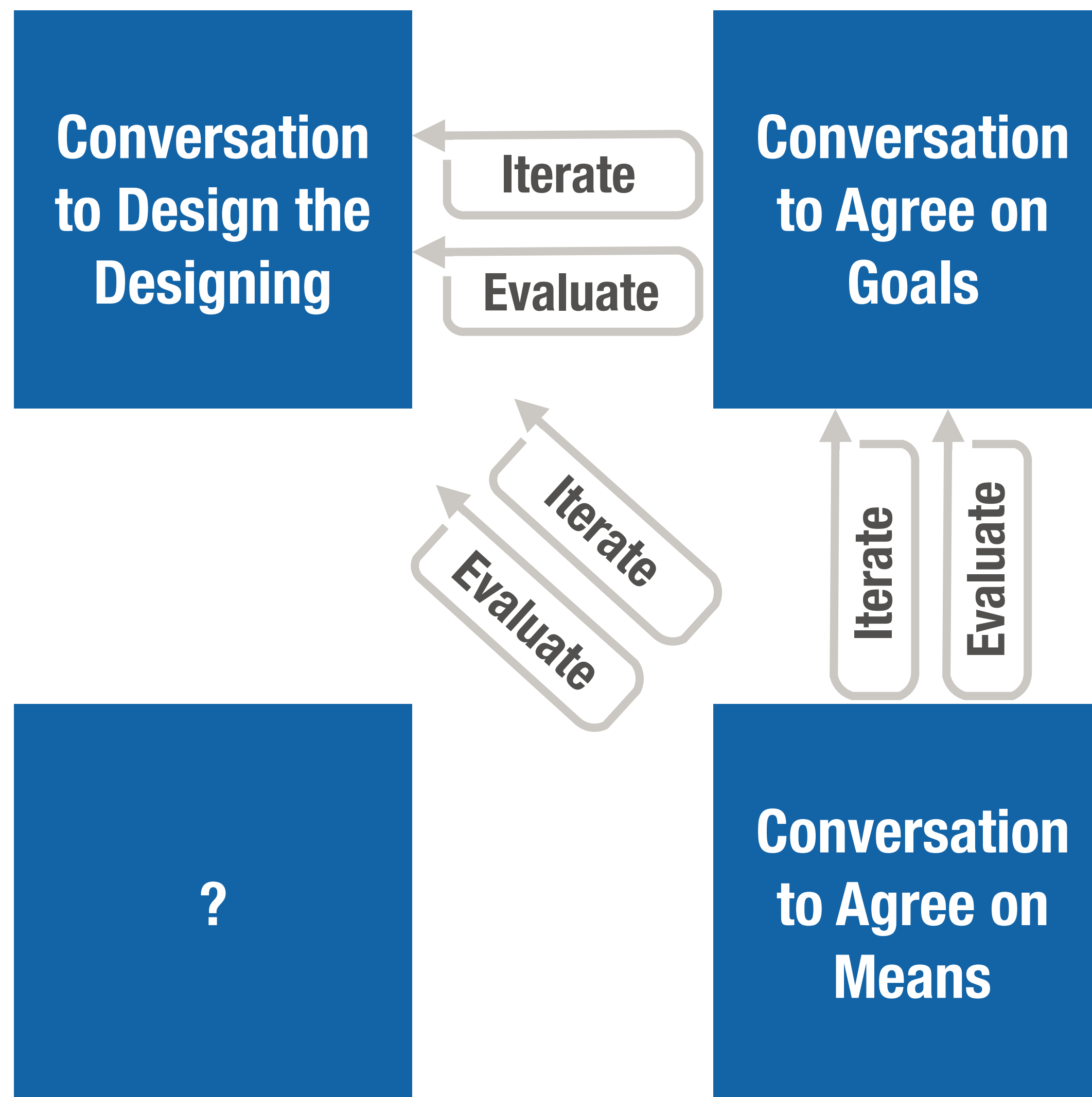
evaluation



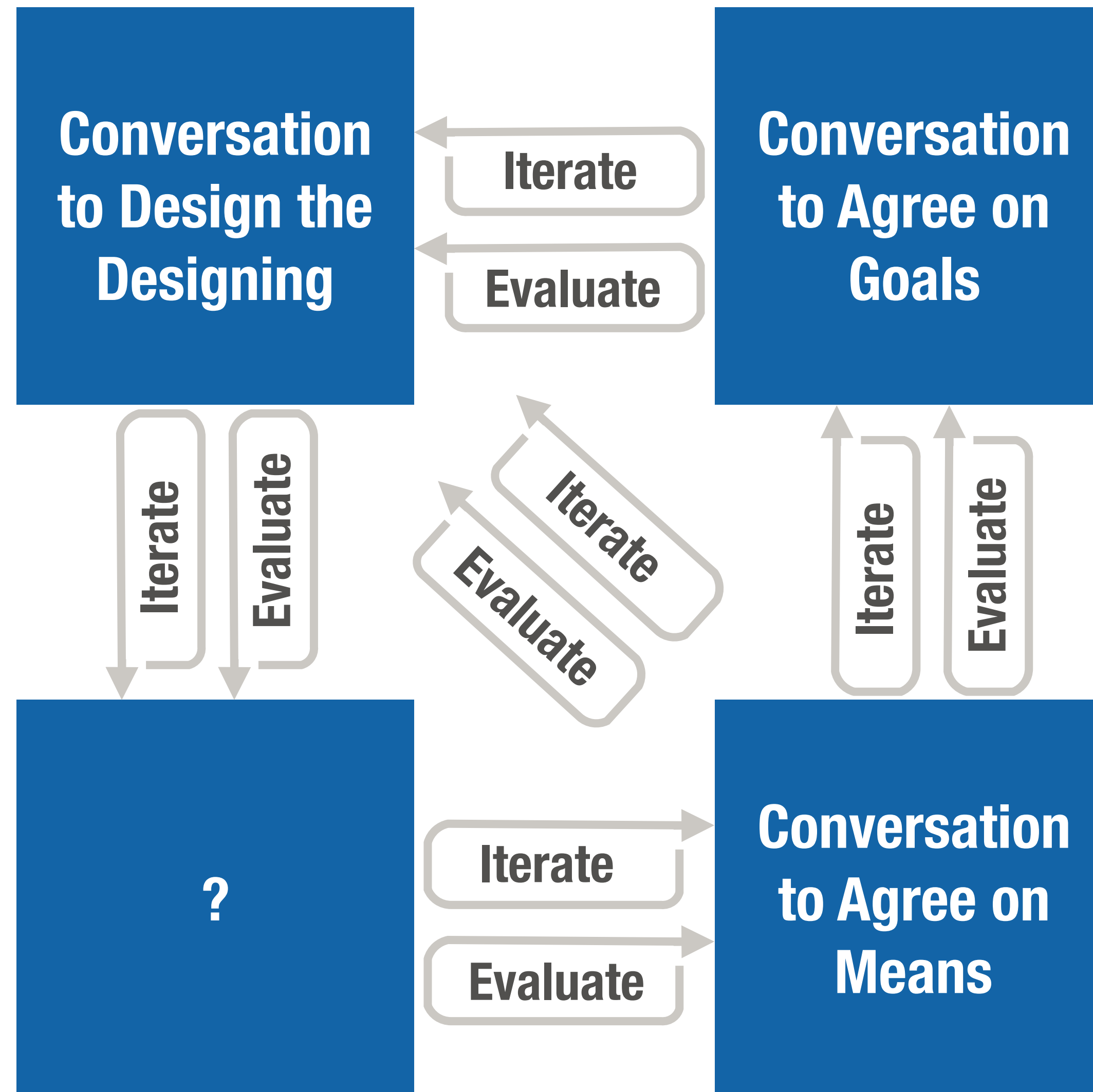
Design as Conversation



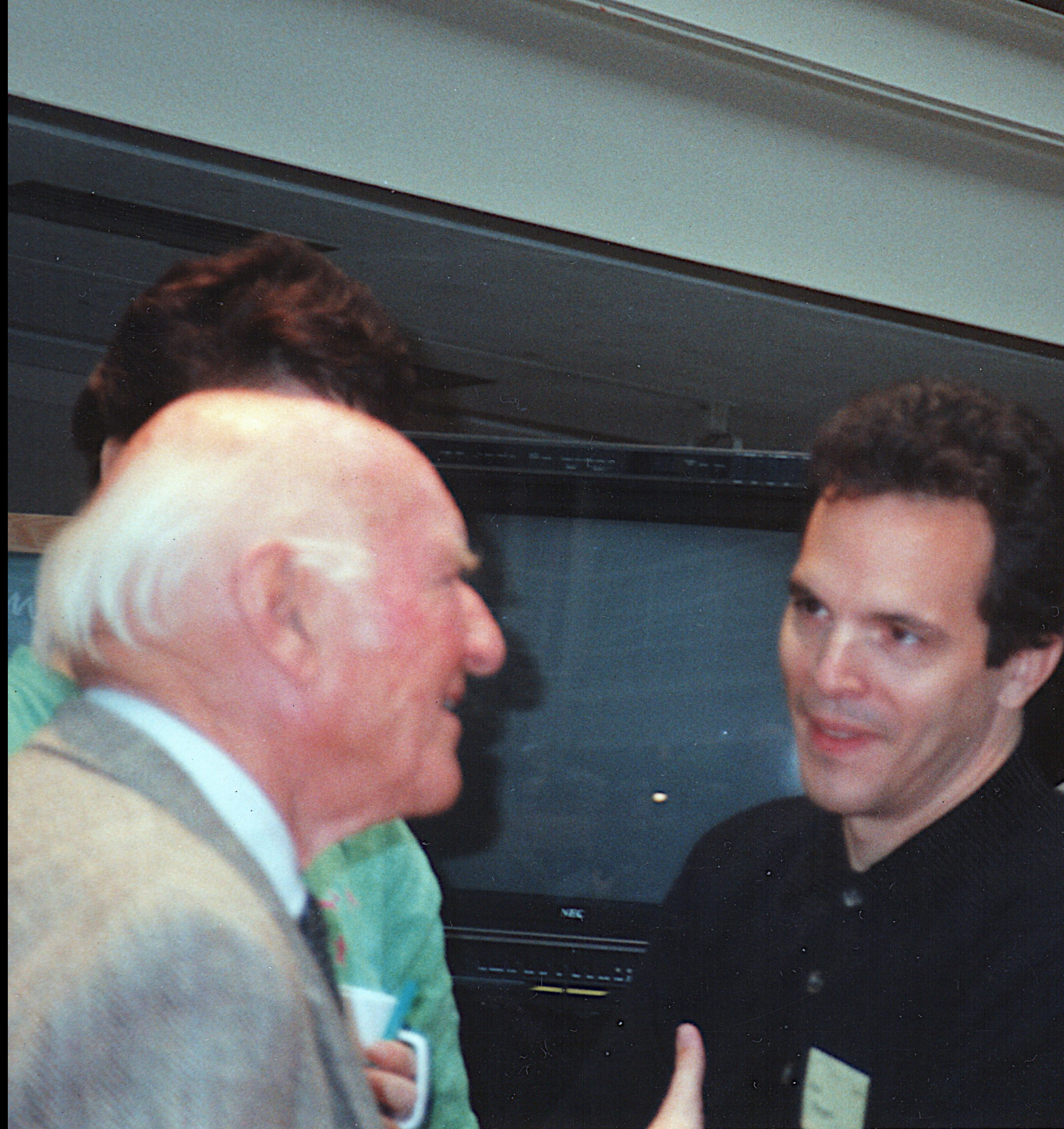
Design as Conversation



Design as Conversation

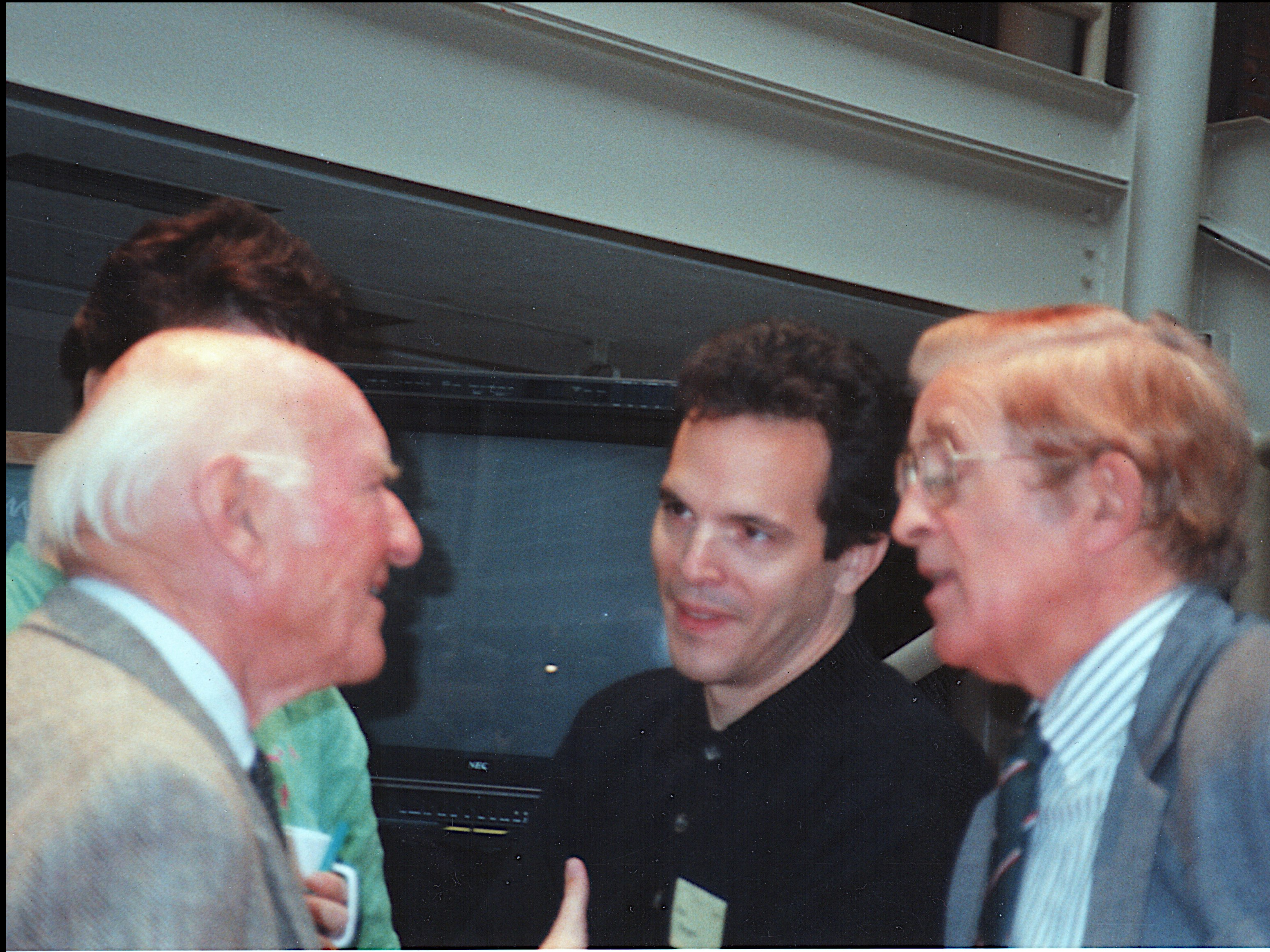


Heinz von Foerster
Paul Pangaro



1993

Heinz von Foerster
Paul Pangaro
Michael Geoghegan

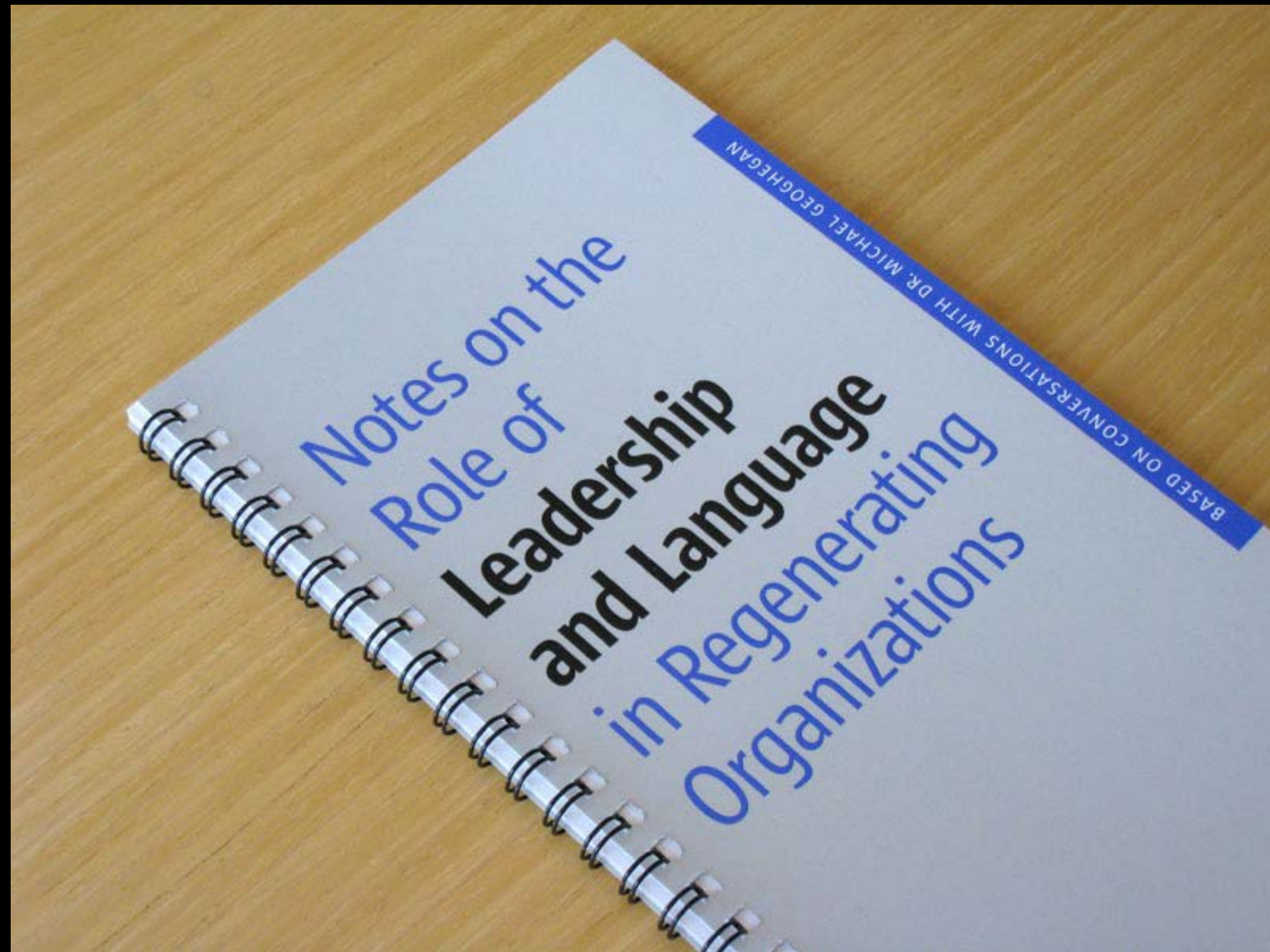


1993

Don Schön
Paul Pangaro
Michael Geoghegan
Gordon Pask
Frank Galuszka



1993



2002

<http://pangaro.com/leadership-language-regenerating-organizations.html>

Heinz von Foerster '17 / Vienna June 2017 / Paul Pangaro

An organization is its language.

Ultimately,
an organization consists of conversations:
who talks to whom, about what.

Each conversation
is recognized, selected, and amplified
(or ignored) by the system.
Decisions, actions, and a sense of valid purpose
grow out of these conversations.

Conversation leads to agreement.
Agreement leads to transaction.

Narrowing language increases efficiency.

Organizations create their own internal language to solve specific problems.

This language serves as a kind of shorthand: Managers use it every day, knowing they will be clearly understood.

Over time, this internal language grows increasingly specialized — and narrow.

Narrowing **language** also increases ignorance.

The organization's internal language is designed to help managers facilitate present-day business — not look beyond it.

Using the internal language, managers increase efficiencies, but cannot recognize new fields of research, new discoveries, new approaches.

Past language limits future vision.

Managers understand the organization's past behavior. But this knowledge, and the language that accompanies it, limit their vision of the organization's potential future state.

Using the language of the past, managers may try to provide a vision for the future. But it is an old future — a memory of what the future could be.

Managers may strive for fundamental change, but their language prevents them from achieving it.

Expanding **language** increases opportunity.

The conversations necessary for generating new opportunities come from outside the system.

For an organization to survive, it must be able to acquire new, relevant language domains.

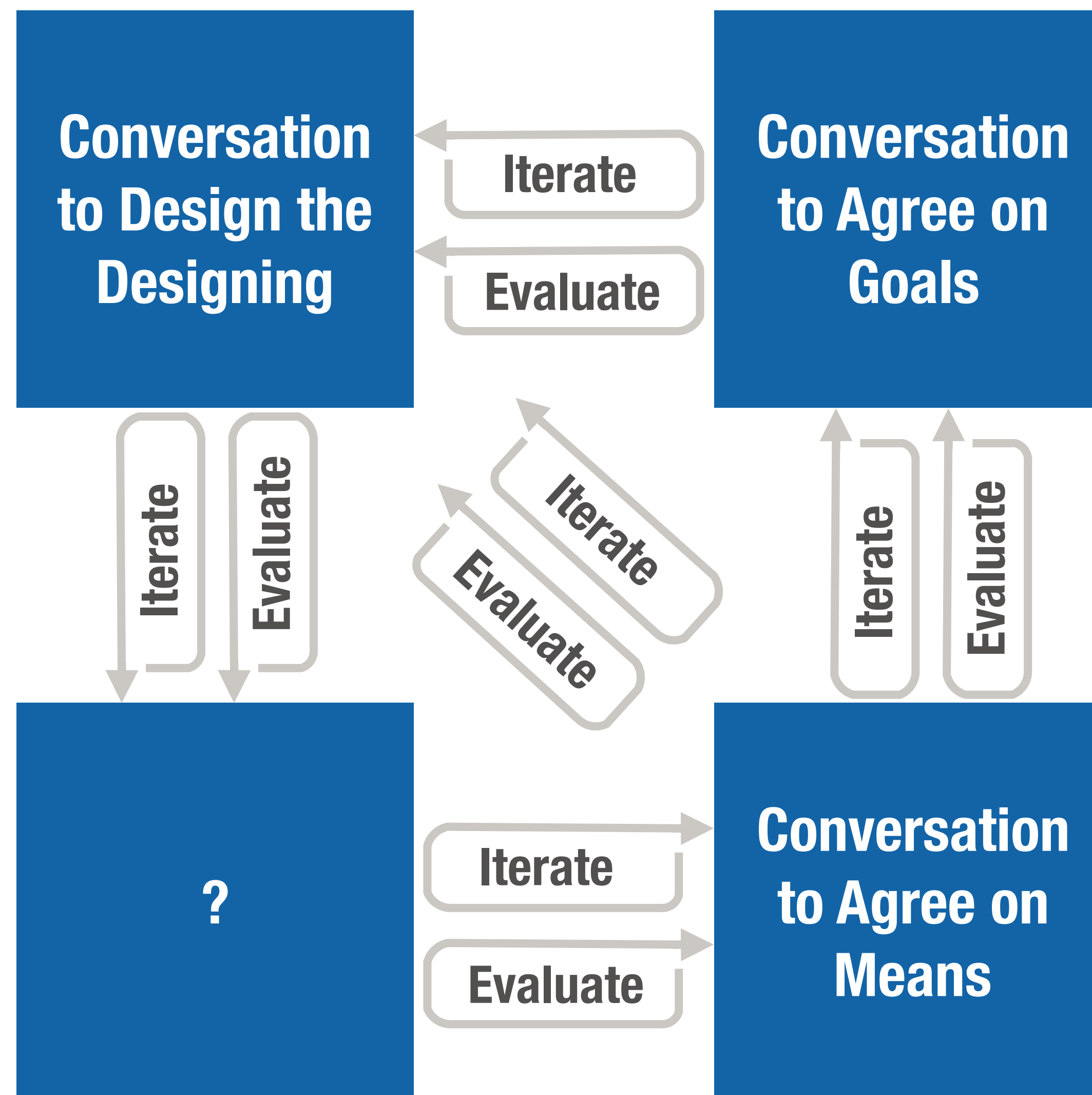
To regenerate,
an organization creates
a new **language**.

To support an organization's future viability, effective decision makers actively introduce change into the system.

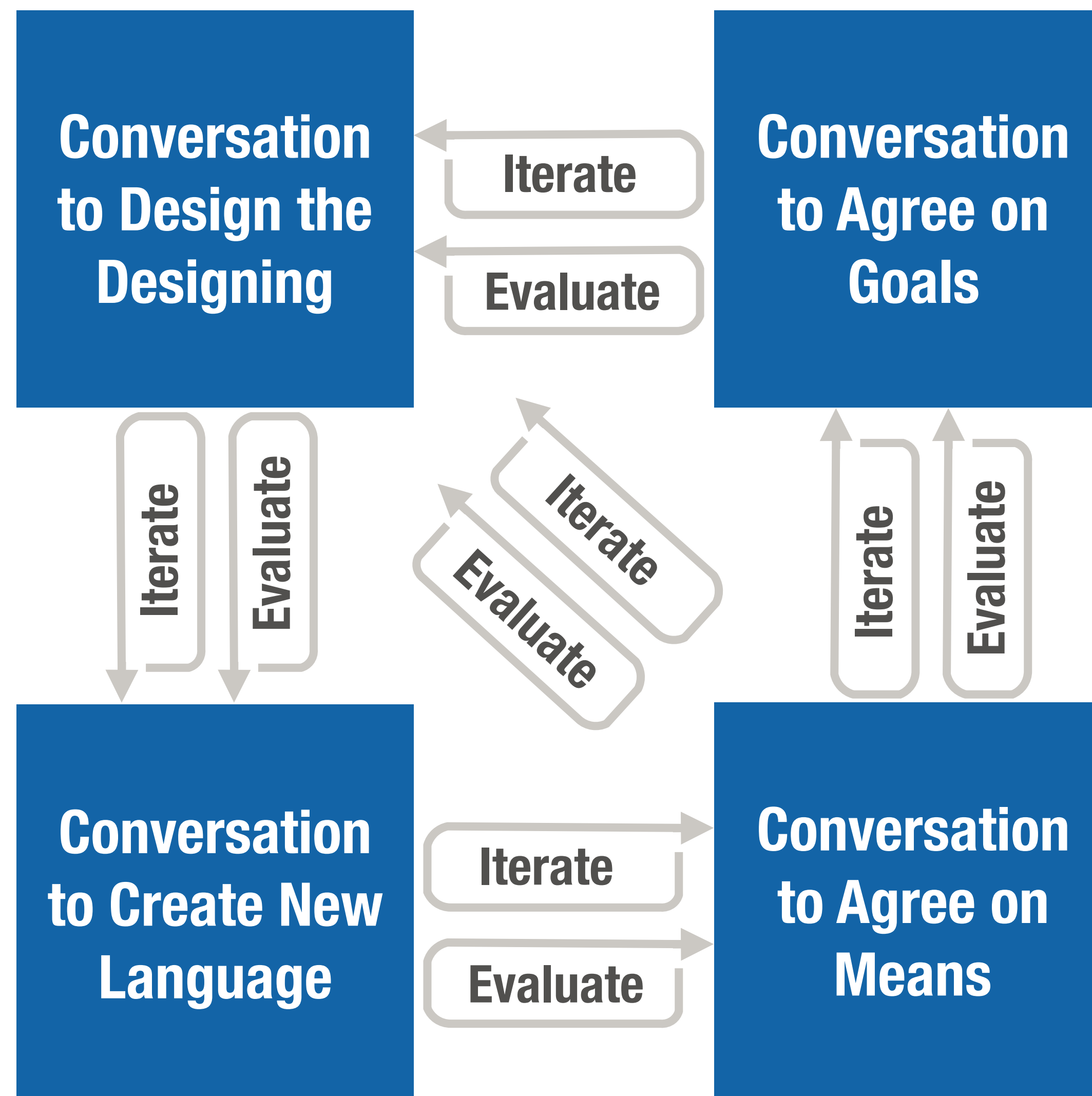
They do so by generating new language that appropriate groups in the organization come to understand and embrace.

This new language does not overtly challenge the pre-existing, efficient system, but rather creates new distinctions and supportive relationships.

Design as Conversation



Design as Conversation



**Paul Pangaro
Stafford Beer**



1984

VSM — Viable System Model

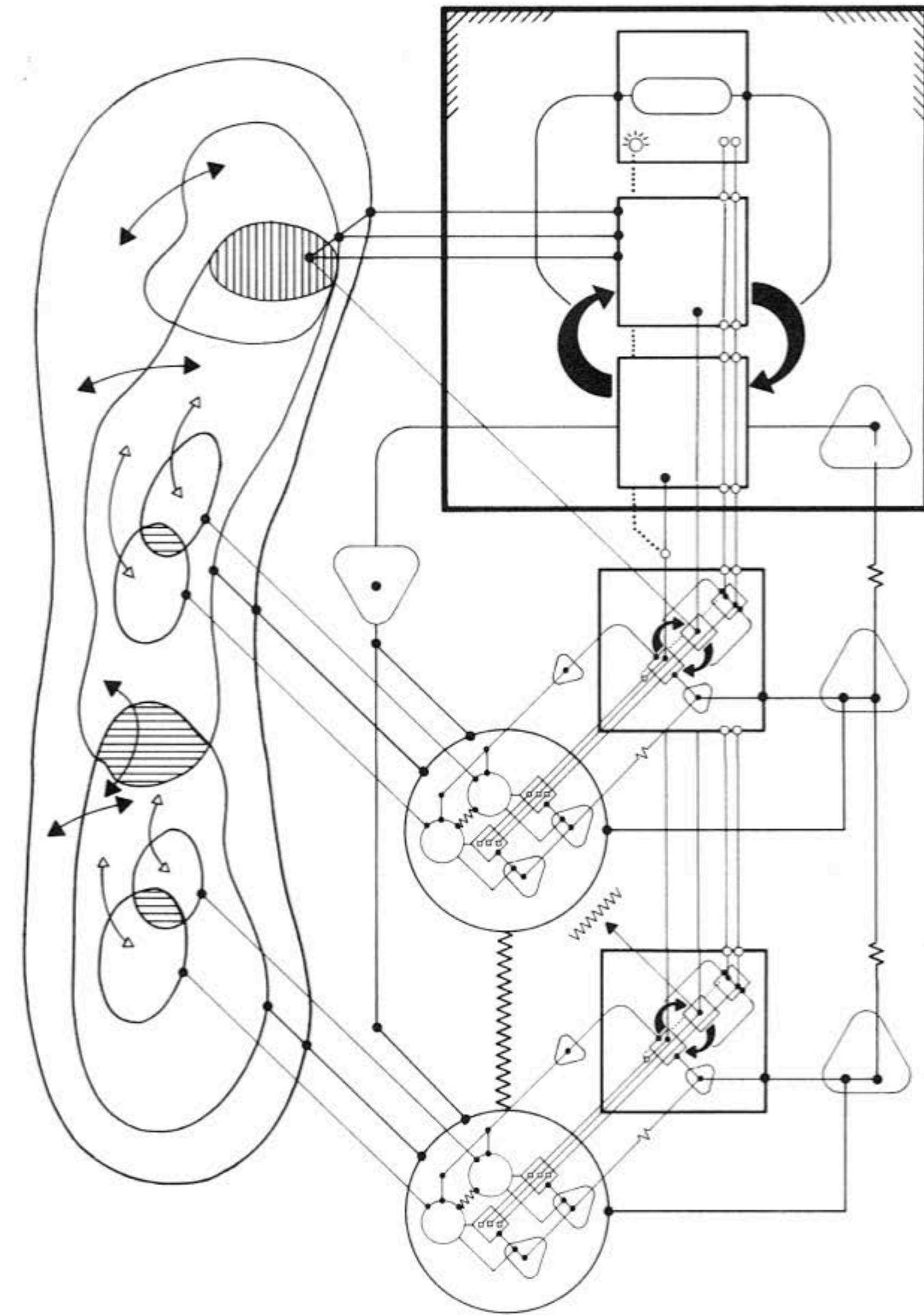
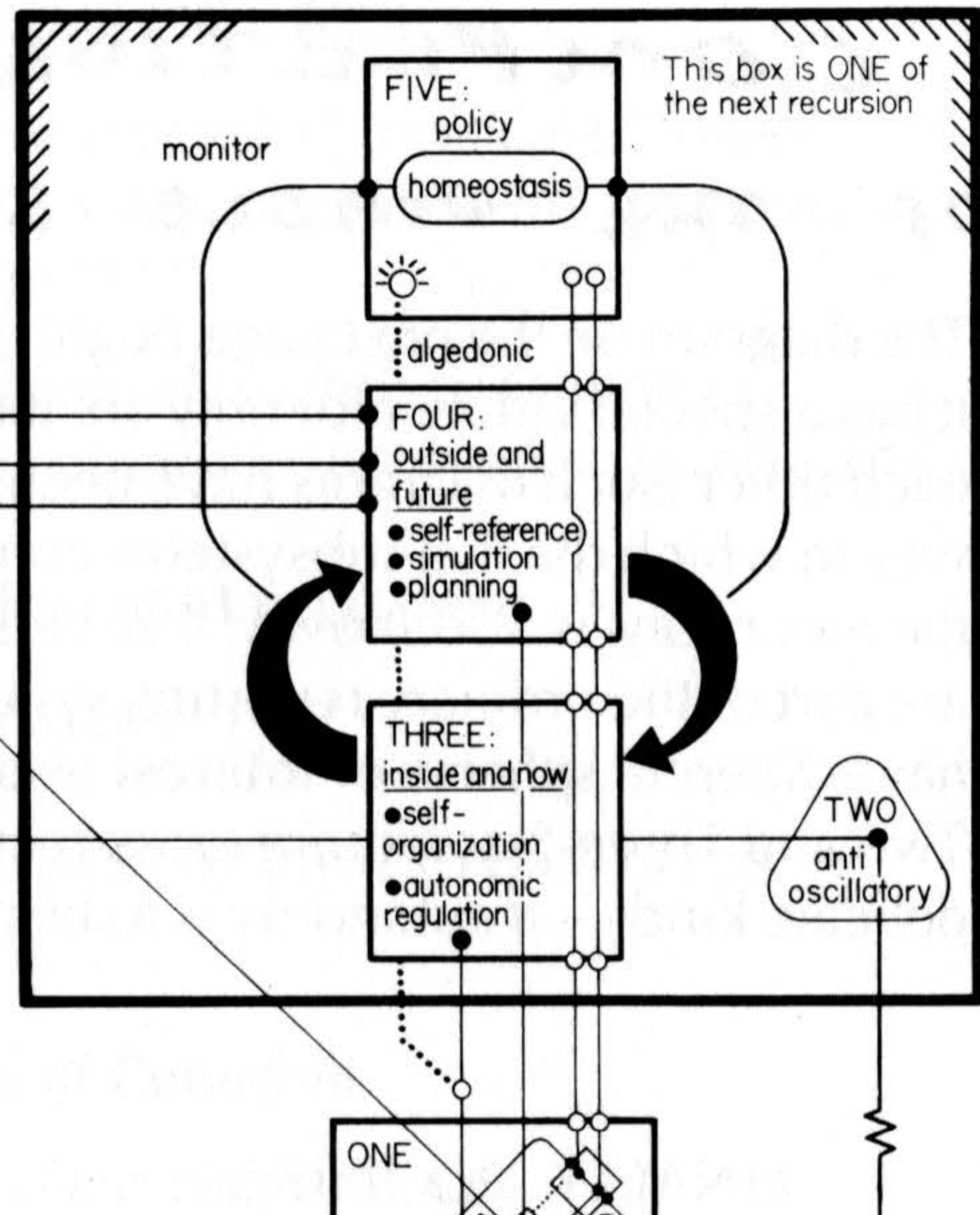
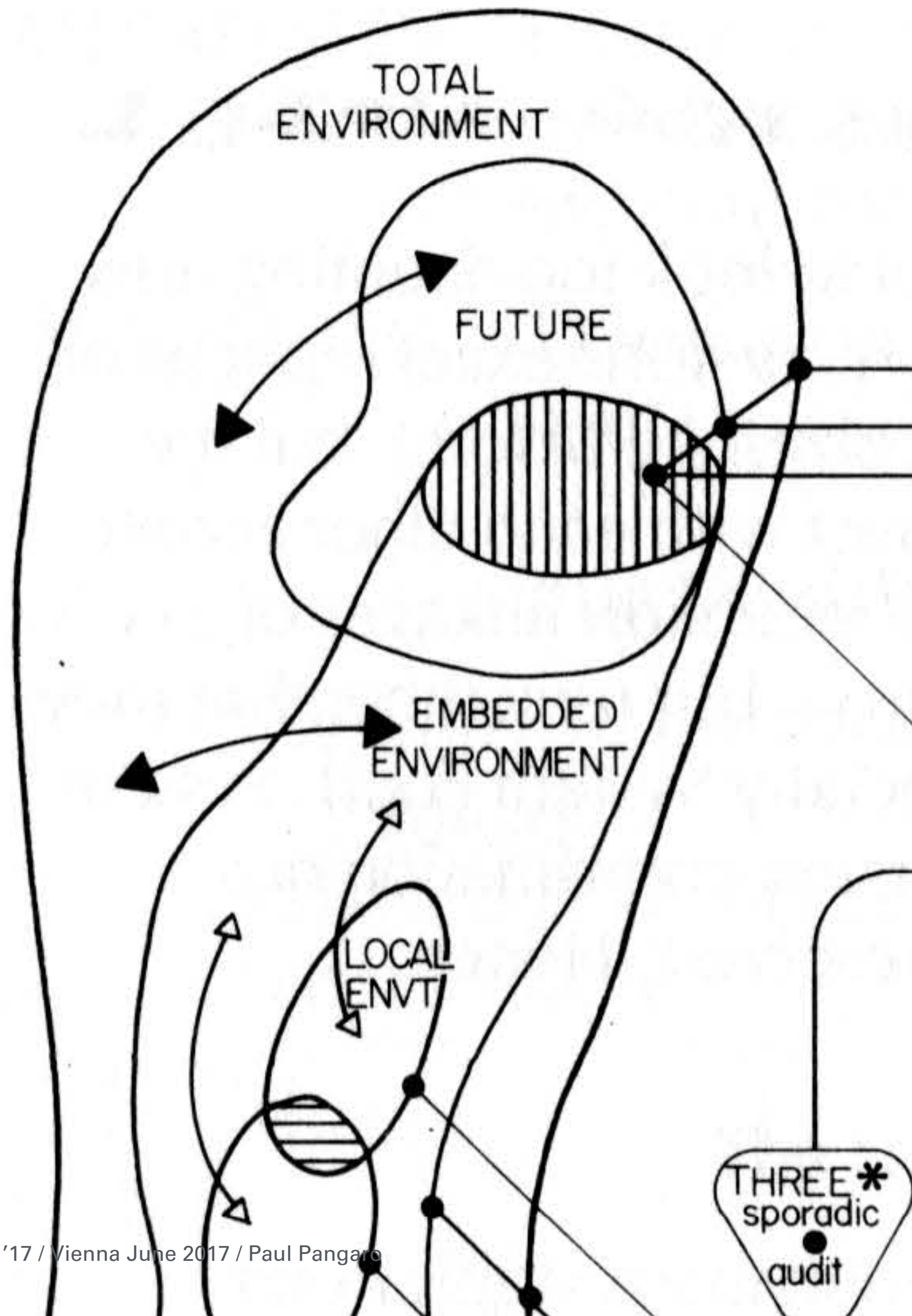


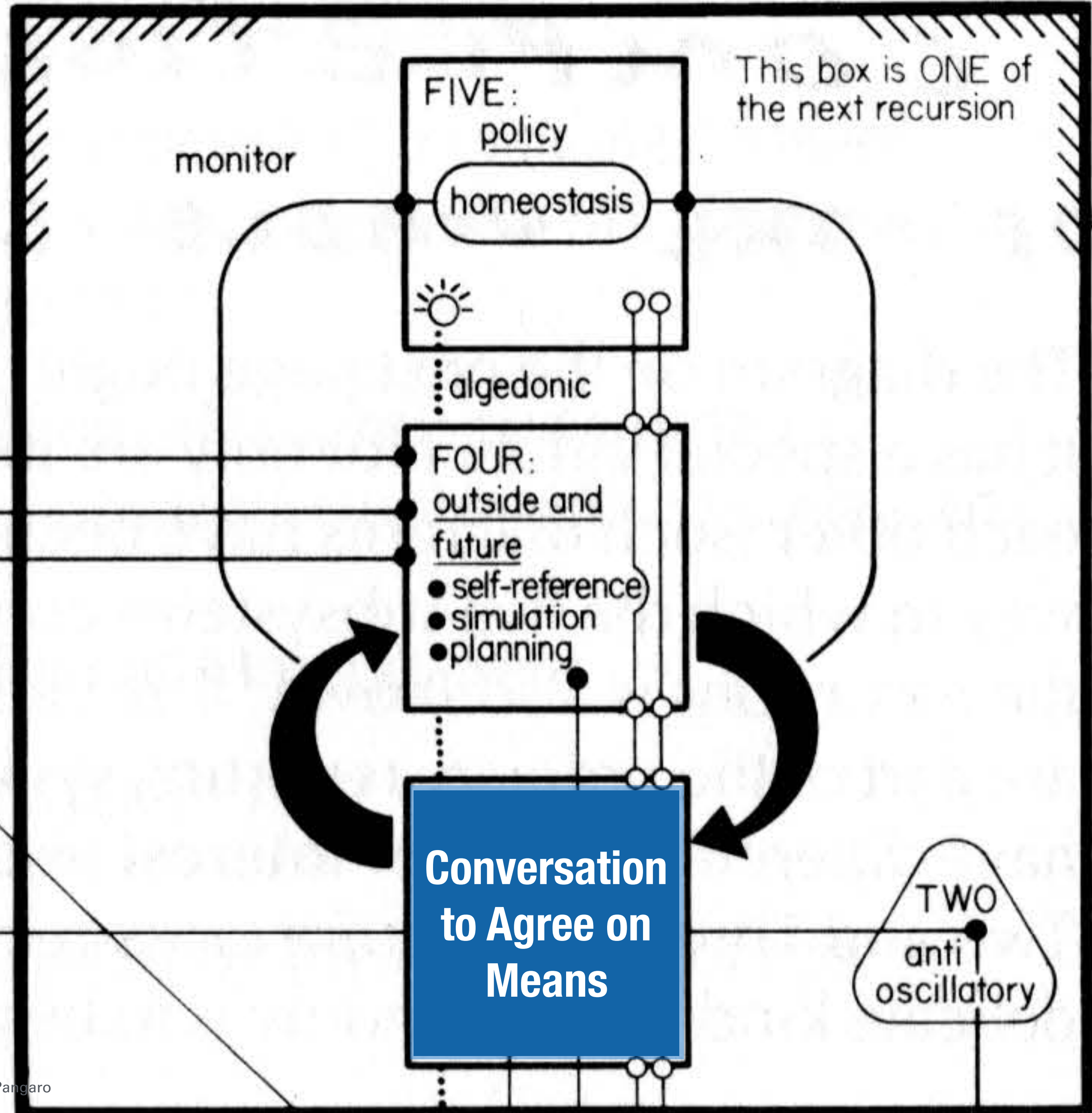
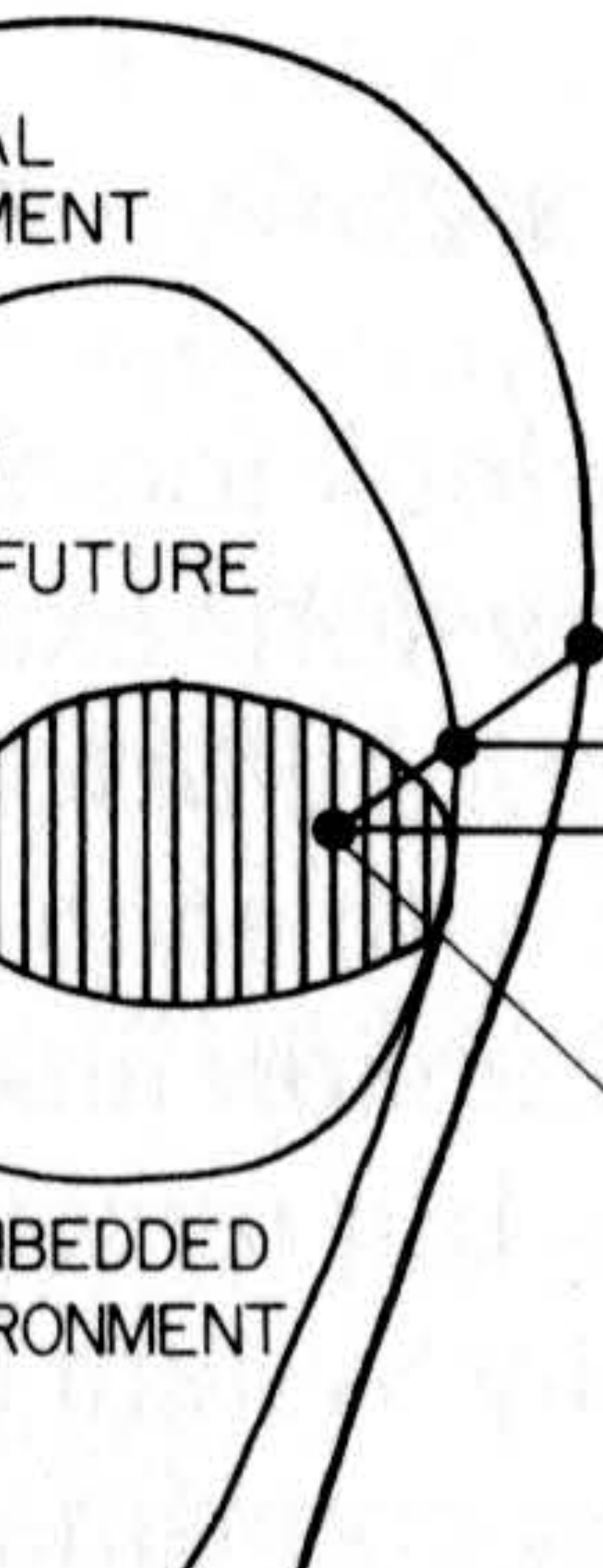
CHART ONE

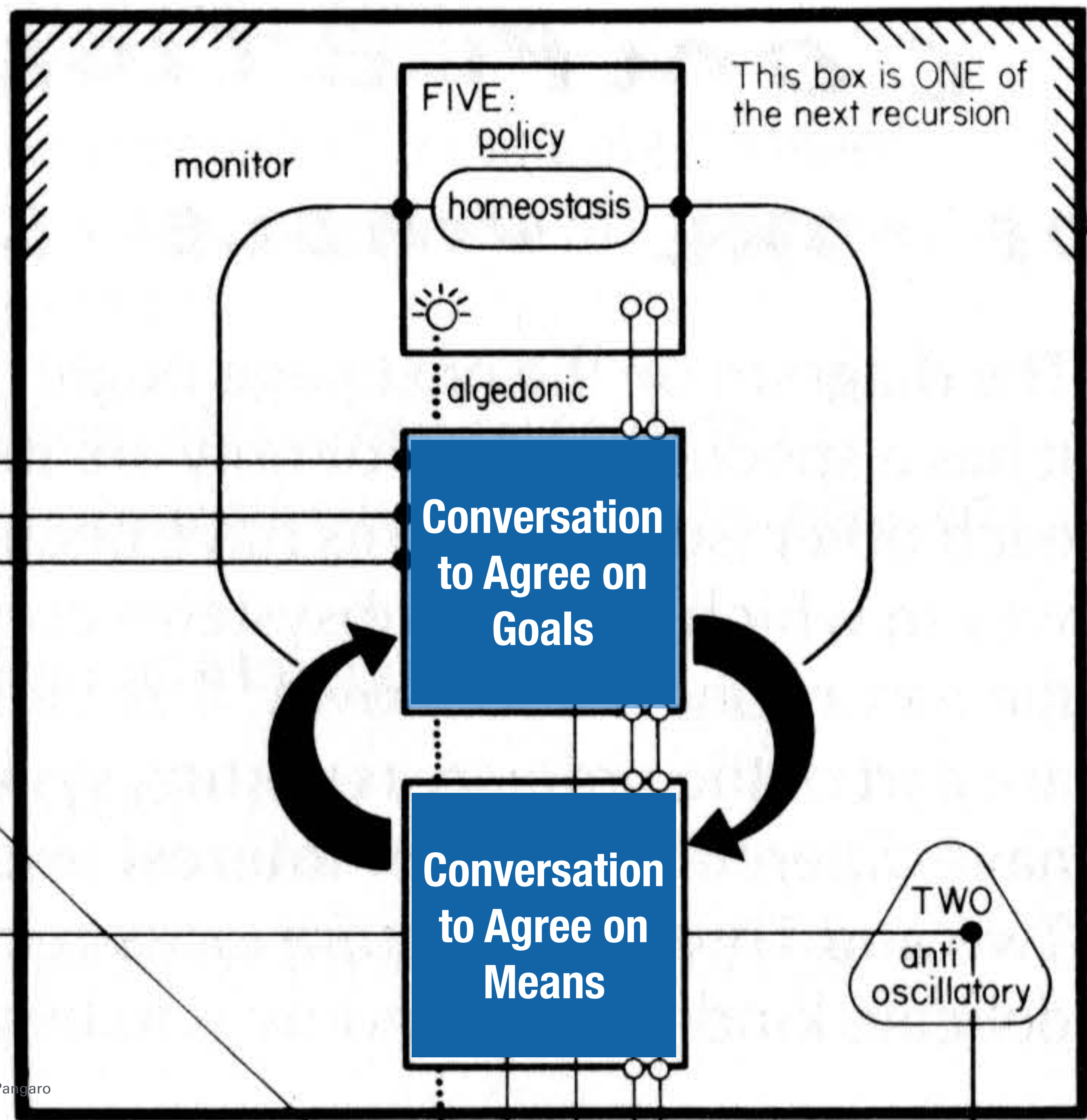
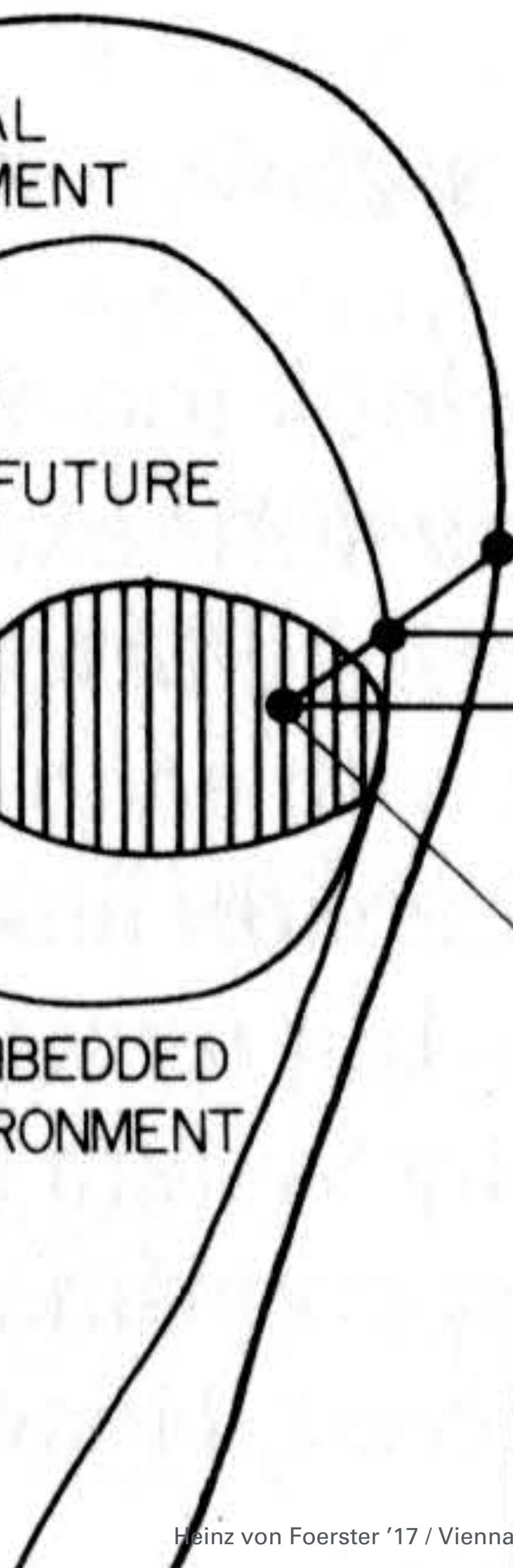
NAME OF THE VIABLE
SYSTEM IN FOCUS:

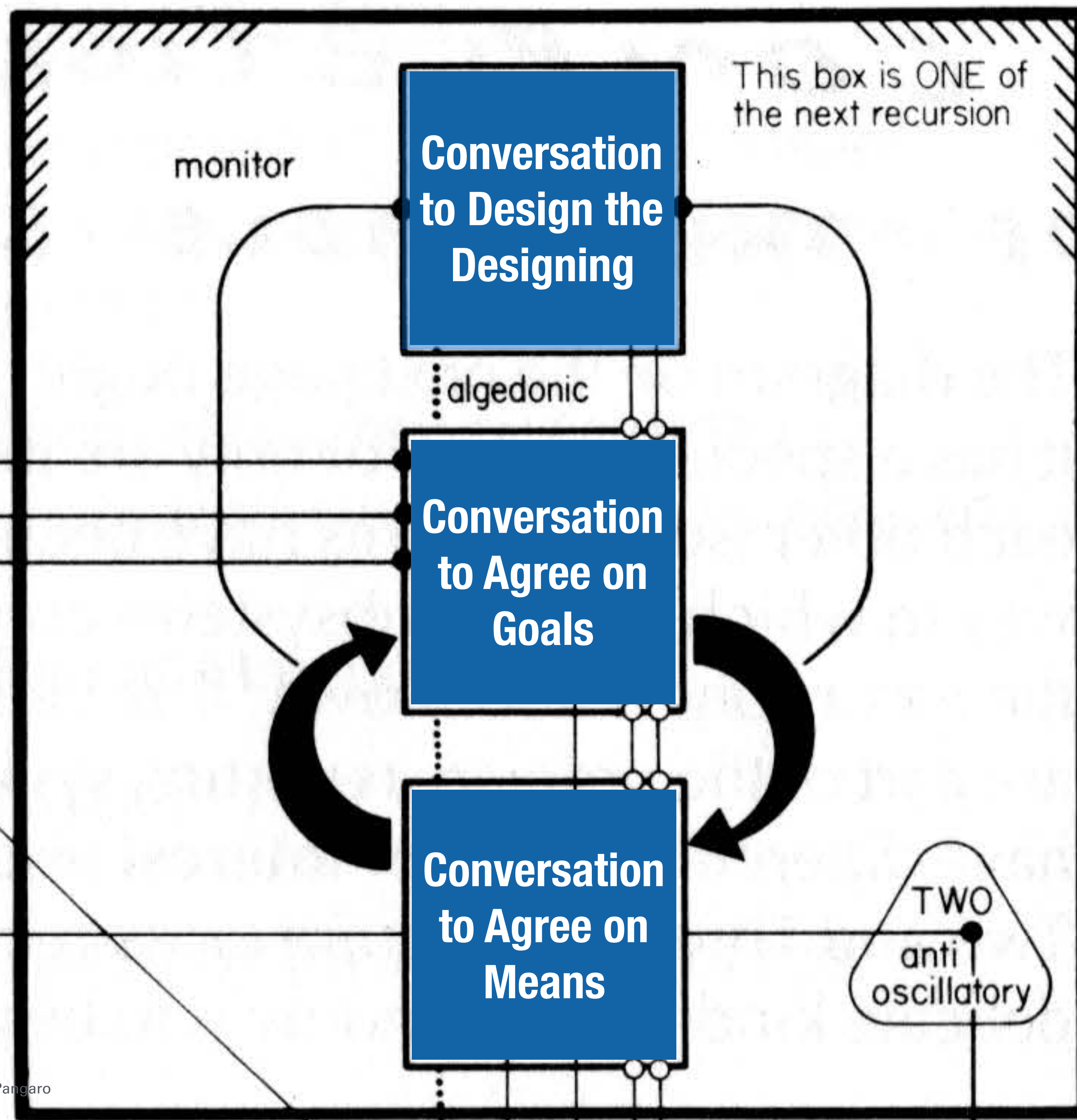
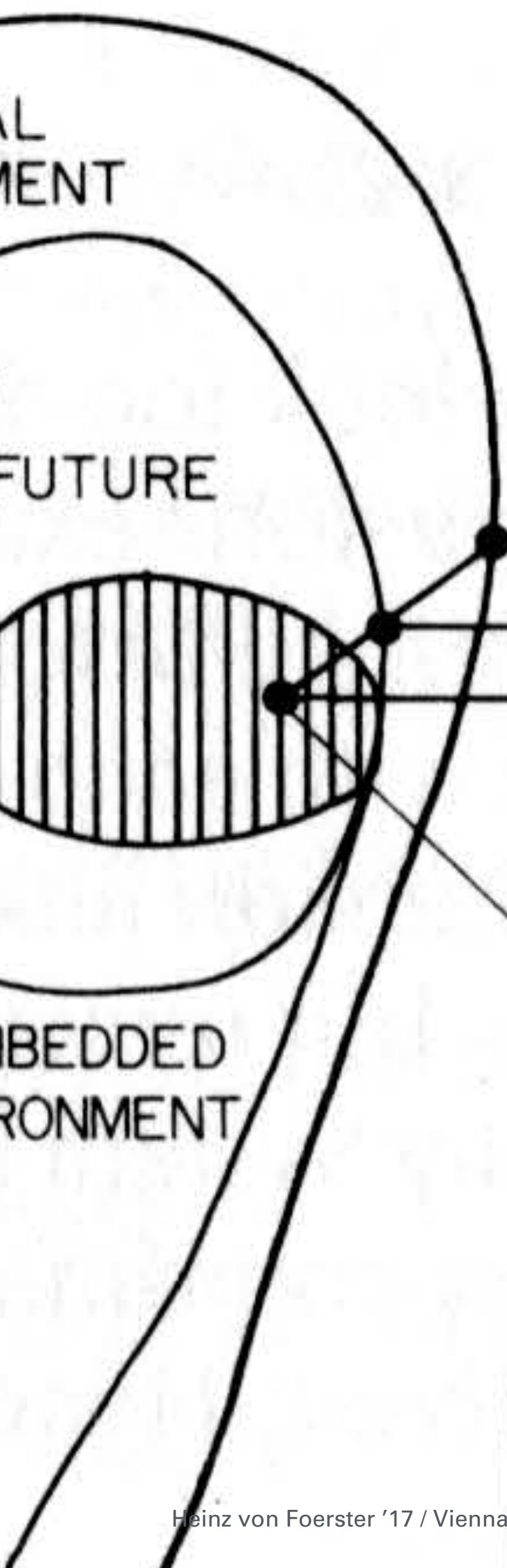
© S. Beer 1985

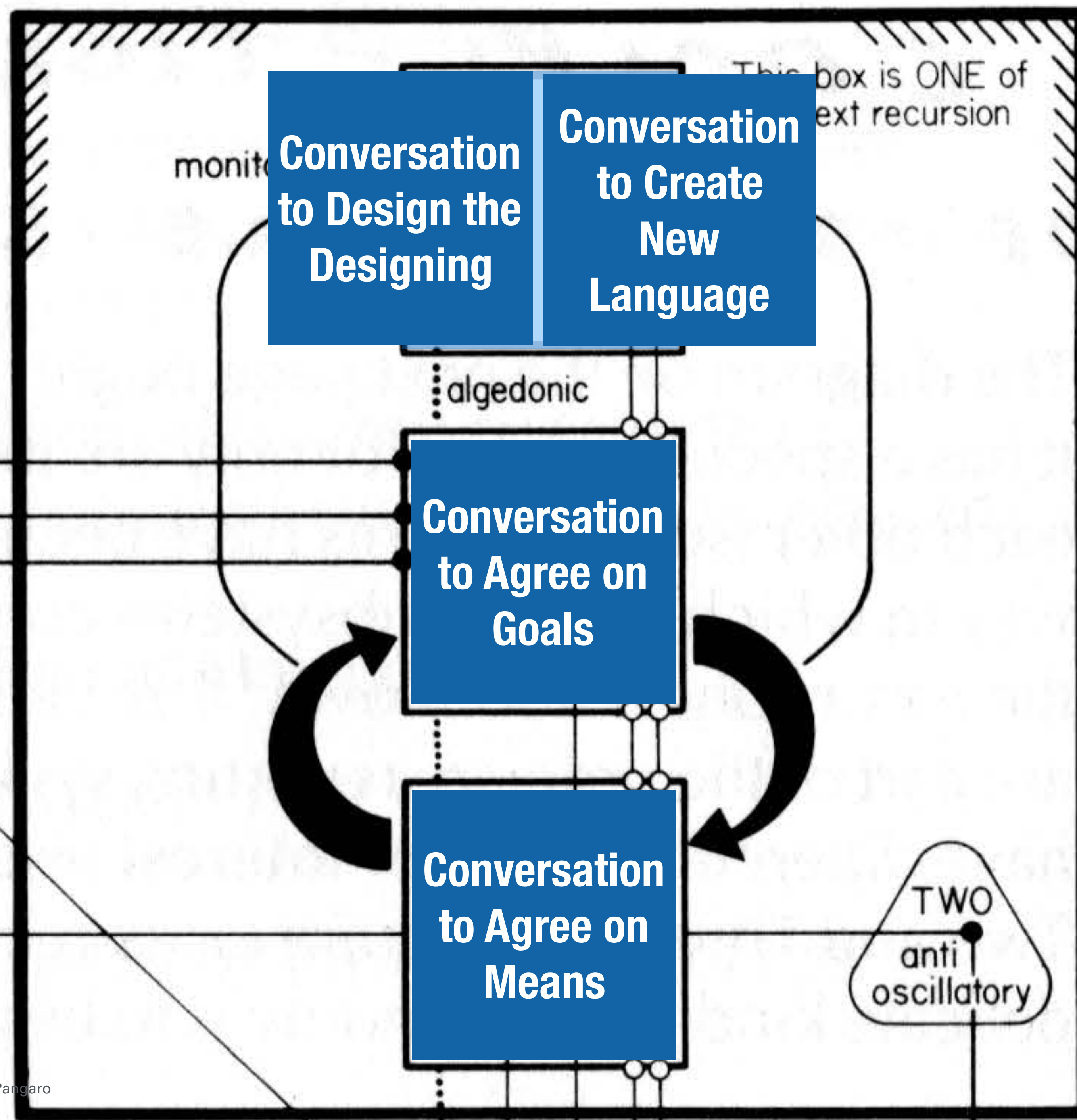
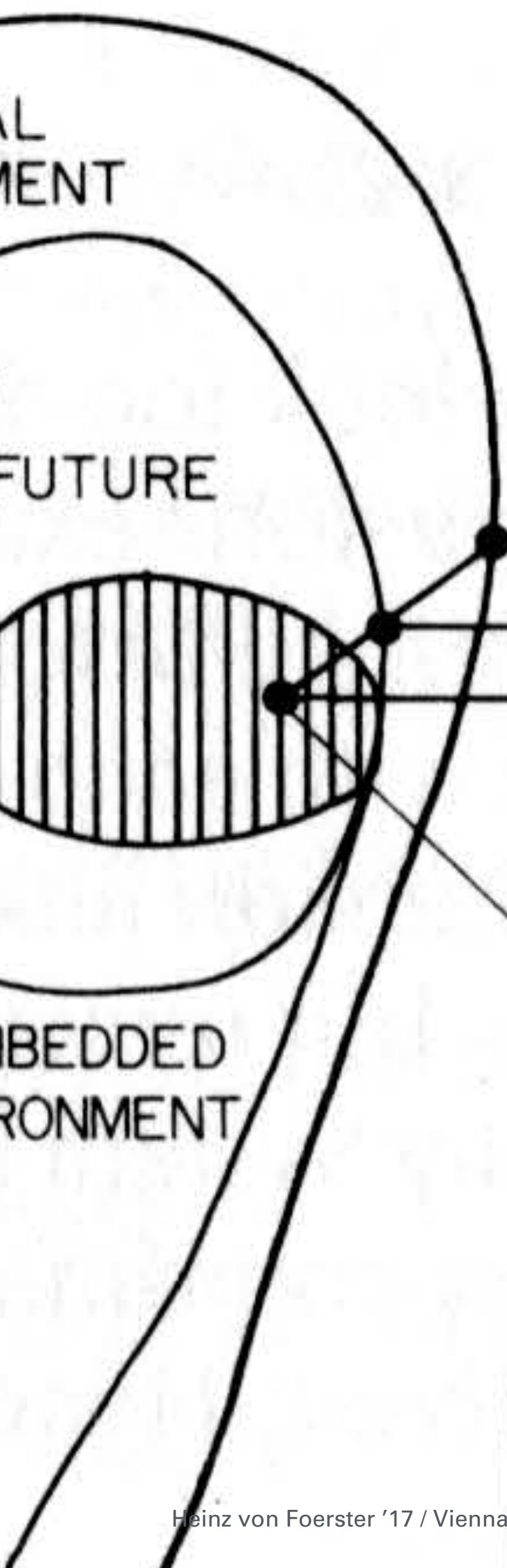
Diagnosing the System for Organizations
Stafford Beer 1985











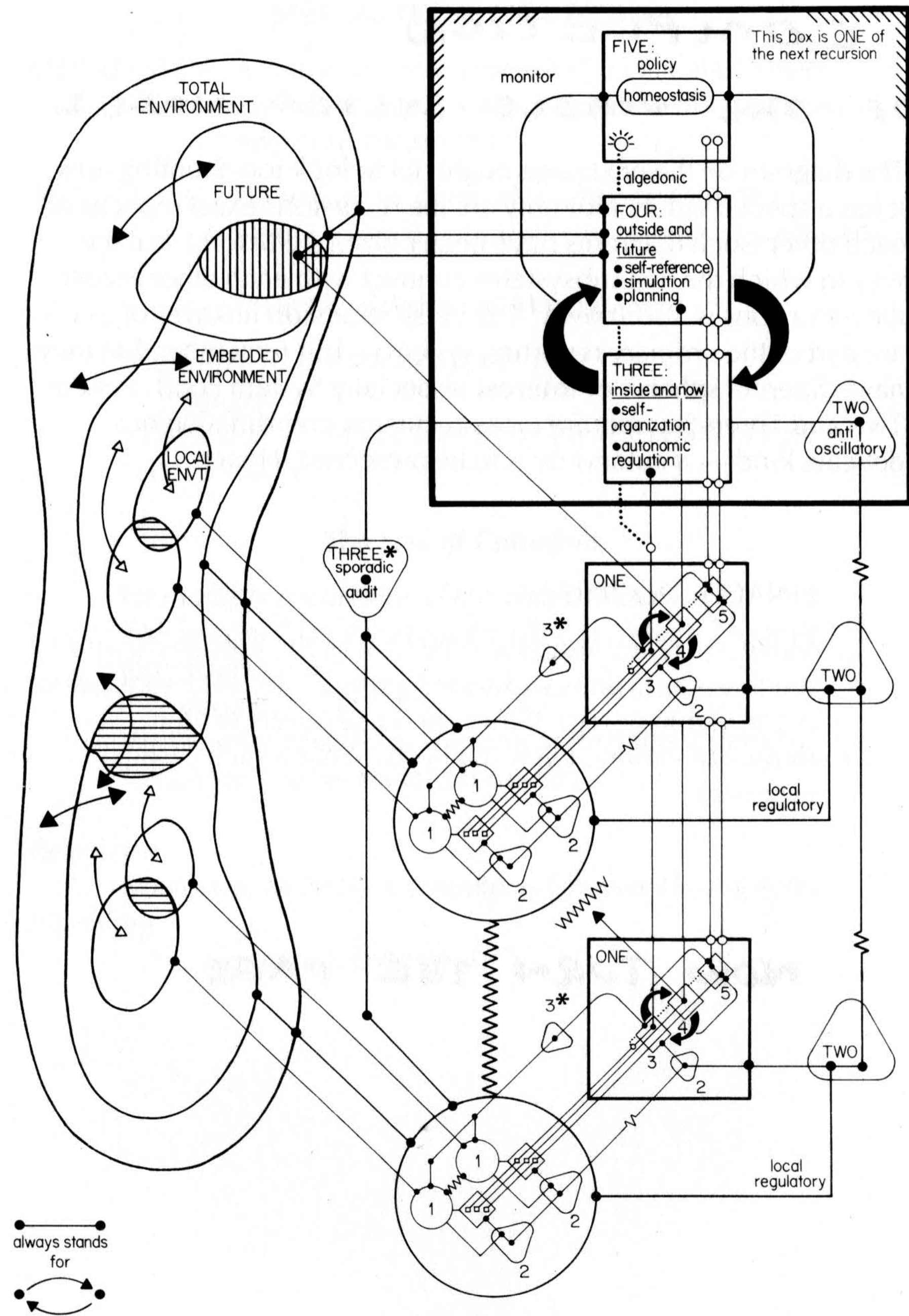


FIGURE 37

THE VIABLE SYSTEM
- Stafford Beer

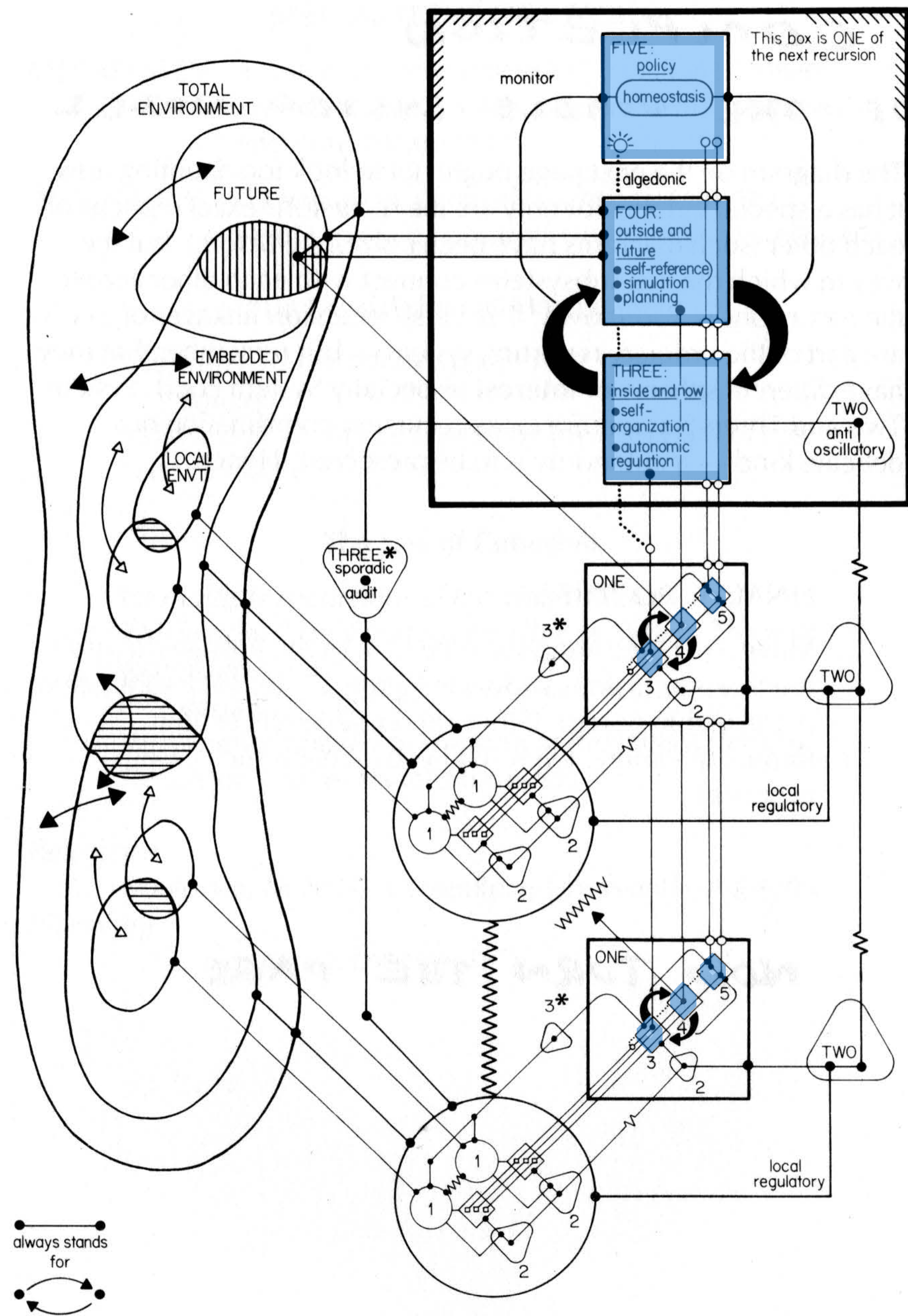


FIGURE 37

THE VIABLE SYSTEM
- Stafford Beer

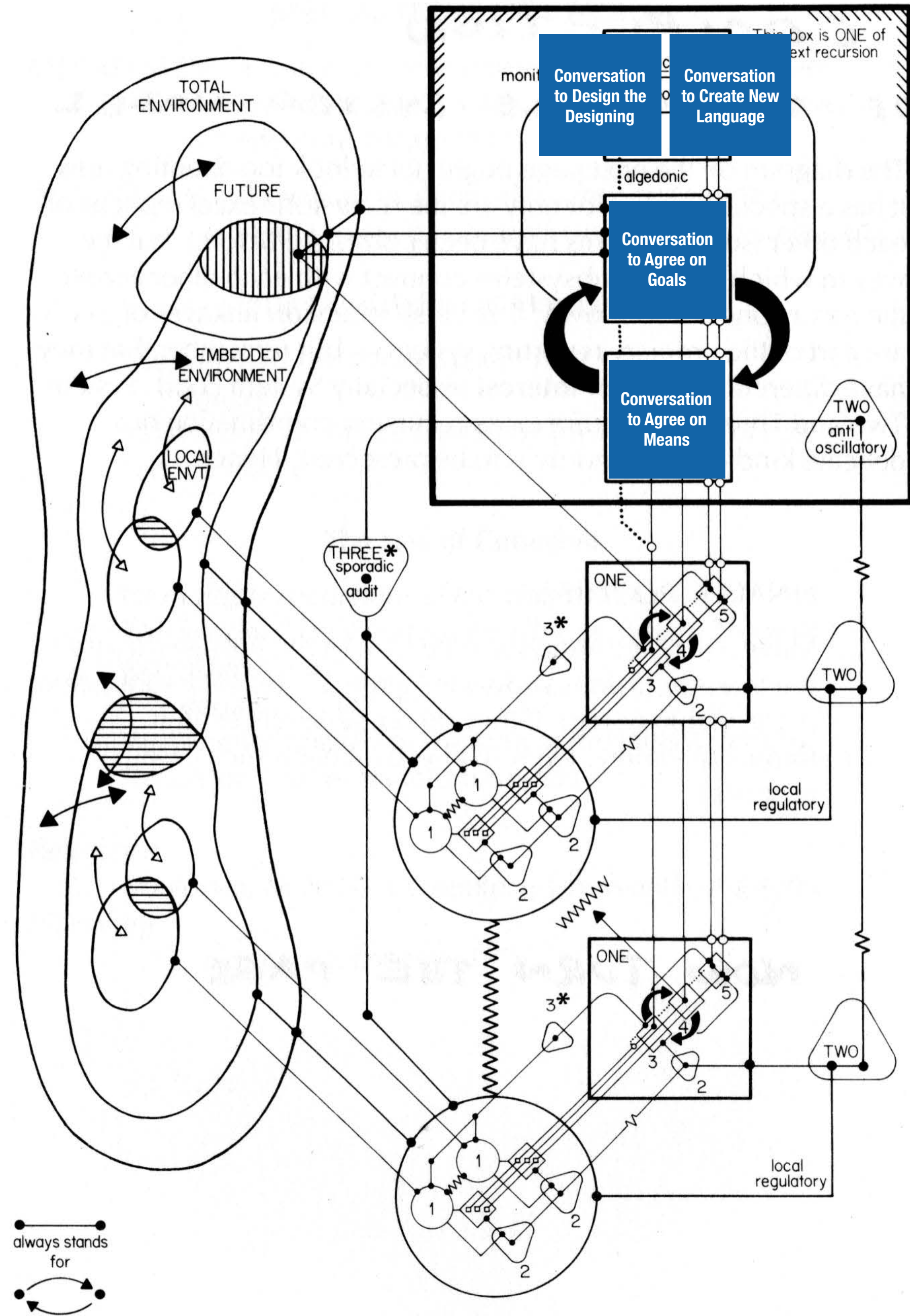
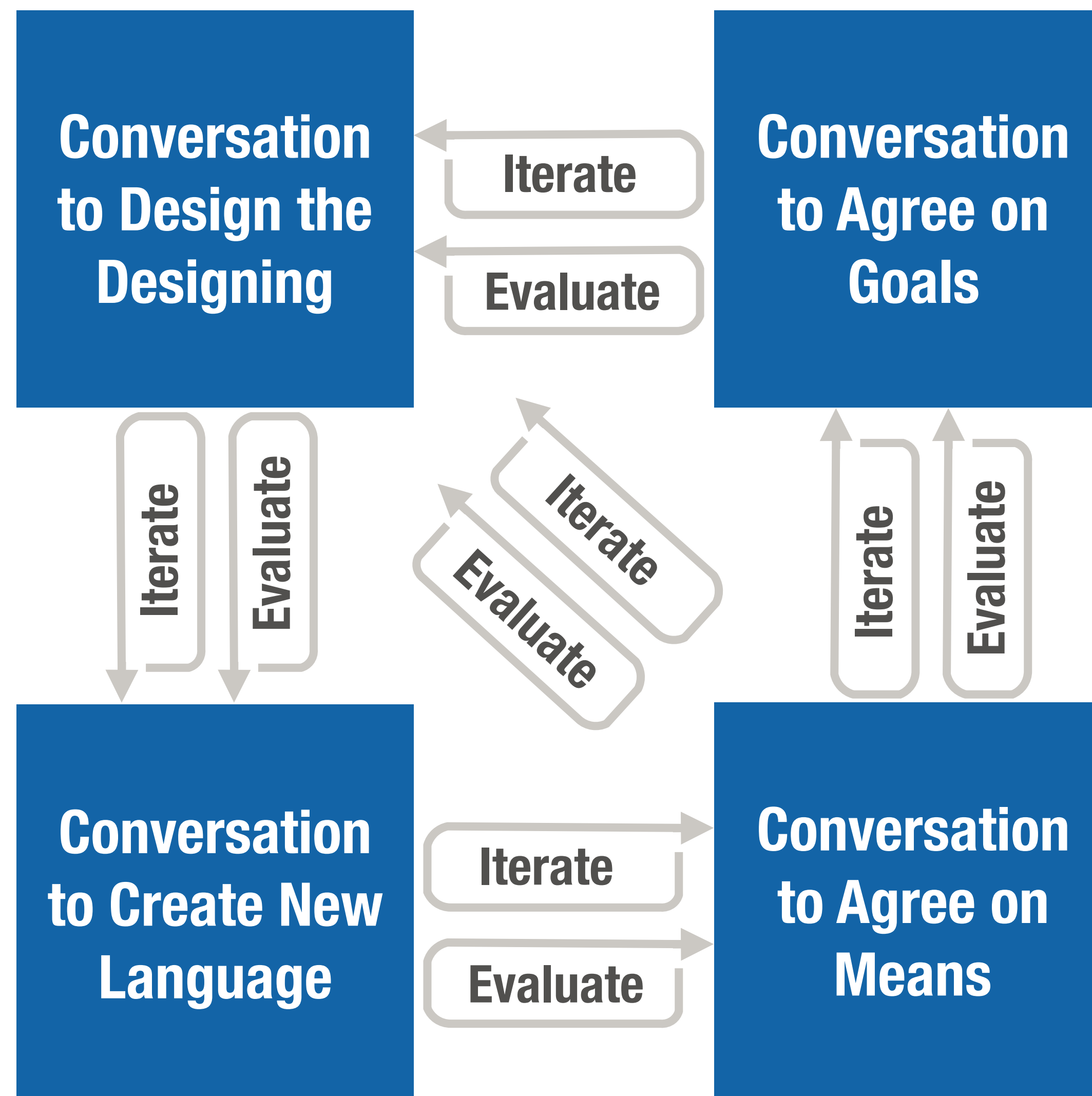


FIGURE 37

THE VIABLE SYSTEM
- Stafford Beer

Design as Conversation



**We construe design as a conversation for action —
that is, as cybernetics.**

**We construe design as a conversation for action —
that is, as cybernetics.**

Action may either conserve or change a situation.

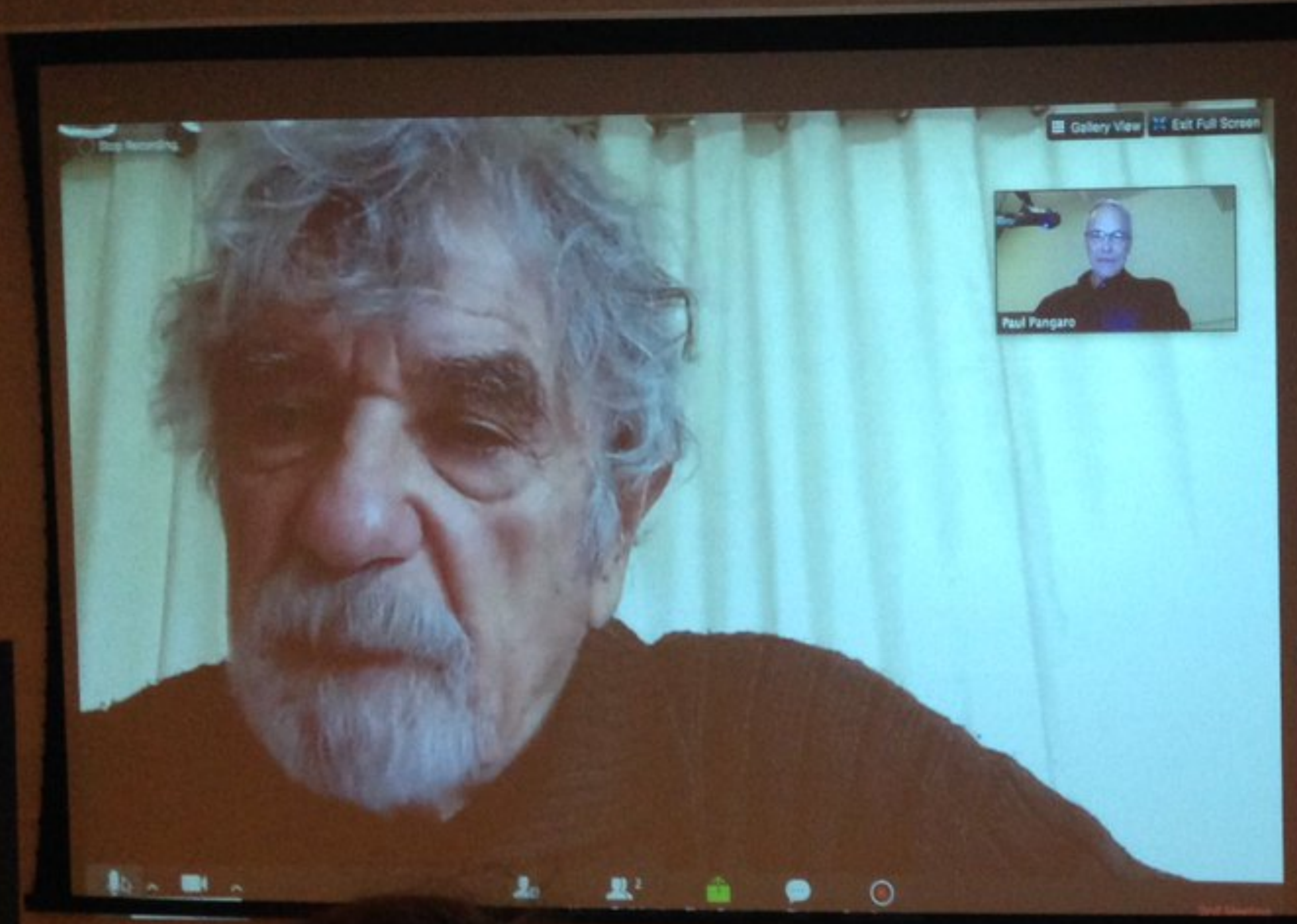
We construe design as a conversation for action — that is, as cybernetics.

Action may either conserve or change a situation.

In other words, design is a conversation about what to conserve and what to change, a conversation about what we value.

— Dubberly & Pangaro, *Cybernetics and Design: Conversations for Action*, 2017

Humberto Maturana



2016

<https://vimeo.com/189999302>

Design = Conversations for Action

If we converse explicitly about goals, we are transparent about frames and values.

(This is ethical.)

**If we converse about the means to achieve those goals,
we more fully engage participants and their abilities, improving outcomes.**

(This is collaborative.)

**If we converse to co-evolve new language, we can escape the limitations
of current viewpoints, and create new frames and new possibilities.**

(This is innovative.)

**If we converse about the design process, we enter all our conversations
as participants, answerable for our actions.**

(This is responsible.)

Design = Conversations for Action

If we converse explicitly about goals, we are transparent about frames and values.

(To agree on goals is ethical.)

**If we converse about the means to achieve those goals,
we more fully engage participants and their abilities, improving outcomes.**

(To agree on means is collaborative.)

**If we converse to co-evolve new language, we can escape the limitations
of current viewpoints, and create new frames and new possibilities.**

(To create new language is innovative.)

**If we converse about the design process, we enter all our conversations
as participants, answerable for our actions.**

(To design the designing is responsible.)

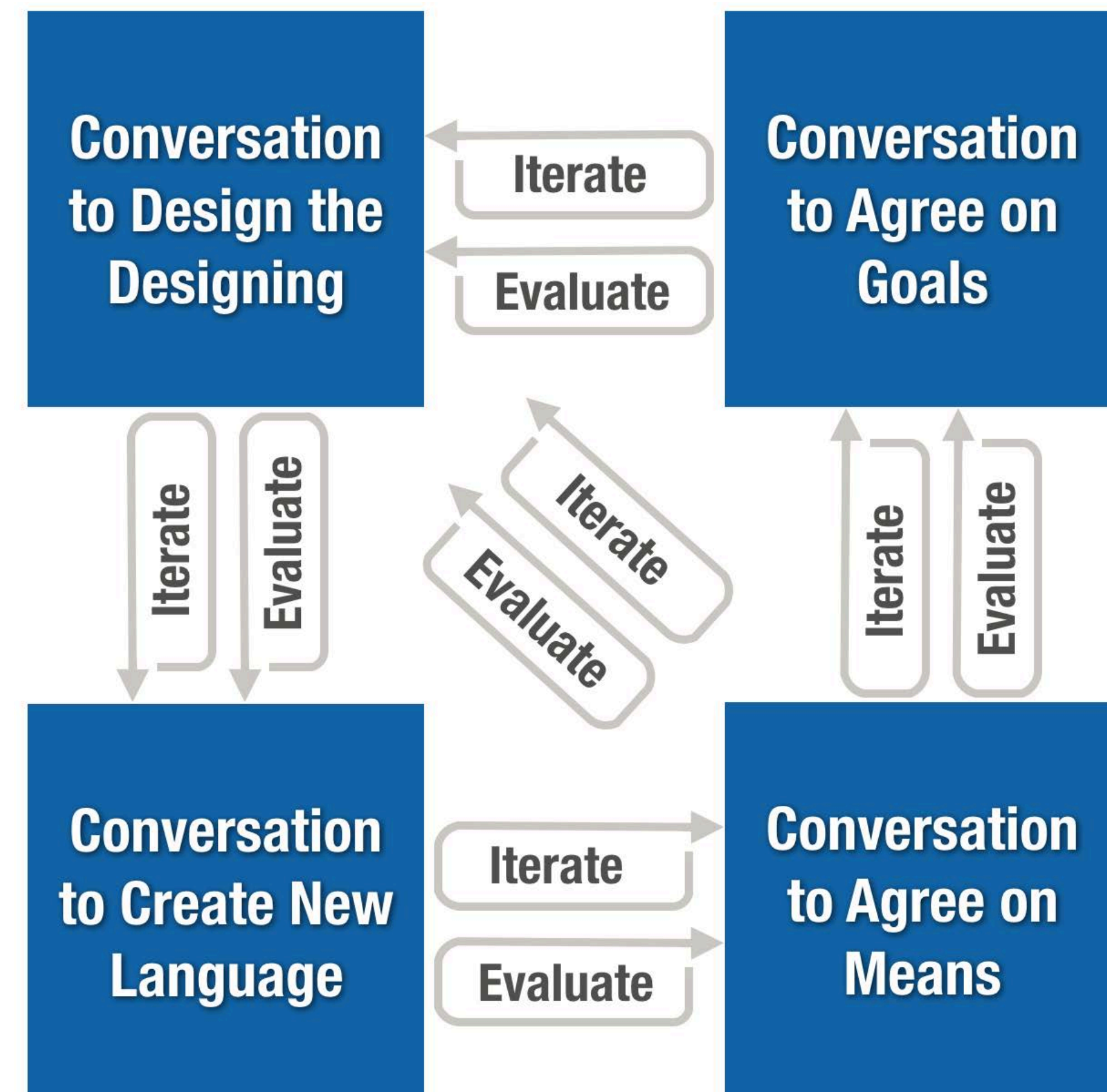
Design = Conversations for Action

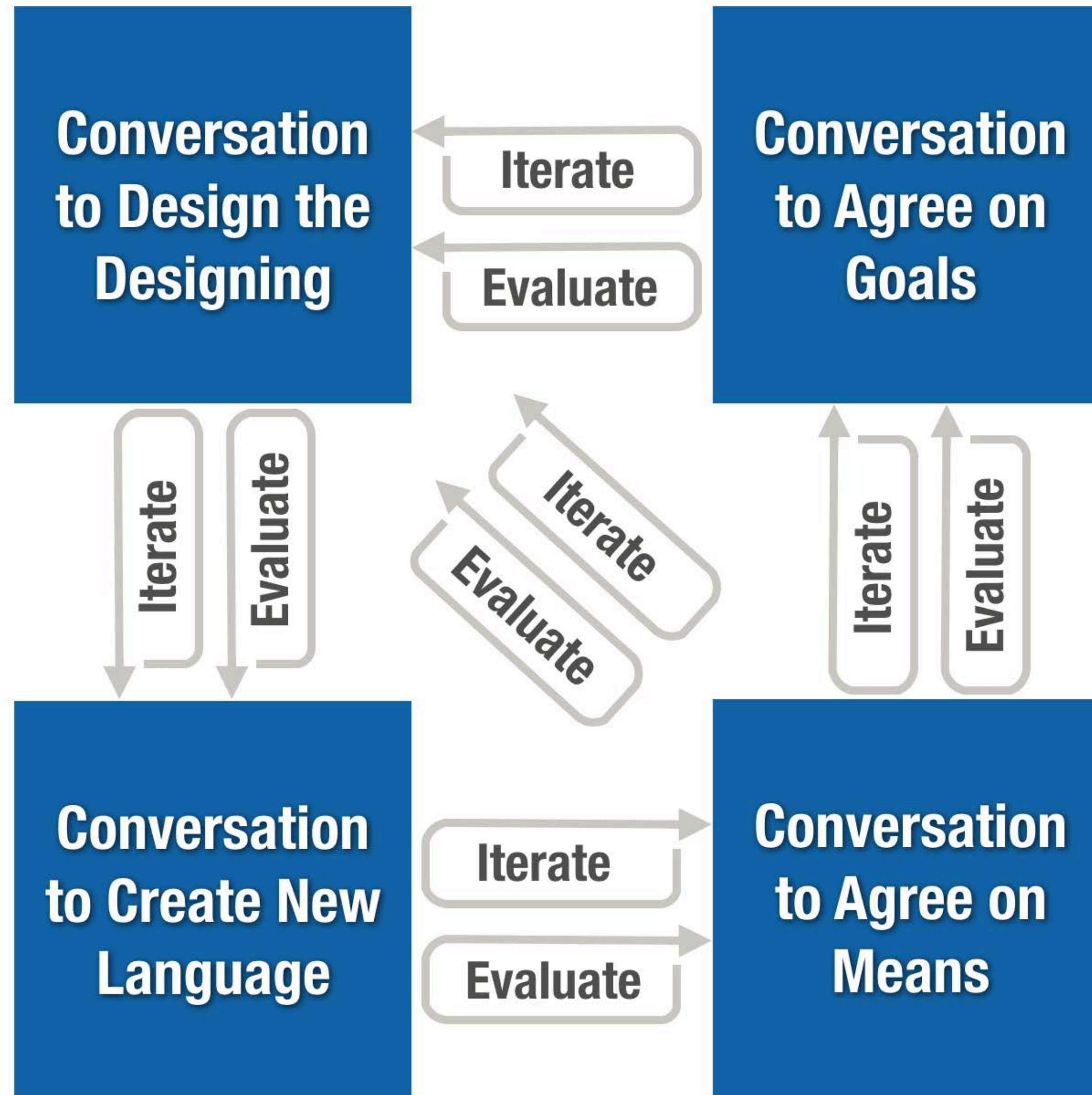
(To agree on goals is ethical.)

(To agree on means is collaborative.)

(To create new language is innovative.)

(To design the designing is responsible.)





Design of Conversations for Action

Challenges of 21st-Century Design

Energy

Global warming

Water

Food

Population

Health

Equality

Social justice

Challenges to 21st-Century Design

Energy

Global warming

Water

Food

Population

Health

Equality

Social justice

Challenges to 21st-Century Design

Energy

Global warming

Water

Food

Population

Health

Equality

Social justice

Simple problems

Complex problems

[“Wicked problems”*

* In the strict sense of Rittel & Webber

Second-order Design = Design for Conversation

**The goal of second-order design is
to facilitate the emergence of conditions
in which others can design —
to create conditions in which
conversations can emerge —
and thus to increase the number of choices open to all.**

— Dubberly & Pangaro, *Cybernetics and Design: Conversations for Action*, 2017

“I shall act always so as to increase the total number of choices.”

— Ethical Imperative, Heinz von Foerster

“If you desire to see, learn how to act.”

— Aesthetic Imperative, Heinz von Foerster

Edith Ackermann



2014

<https://vimeo.com/104178407>

**Mai von Foerster
Heinz von Foerster**



Thank you all.

Designing Our World: Cybernetics as Conversation for Action

Special Thanks to:

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Ranulph Glanville

Pooja Upadhyay

See pangaro.com/hvf17/ for slides and references

Paul Pangaro, Ph.D.

Chair and Associate Professor

MFA Interaction Design Program

College for Creative Studies, Detroit

paul@pangaro.com



Questions for Heinz #1

What is the ratio of *information vs. noise* for 1 billion daily users on Facebook?

Questions for Heinz #2

As the population increases, what is the consequence of that ratio?

**Mai von Foerster
Heinz von Foerster**



Thank you all.