

Designing Our World: Cybernetics as Conversation for Action

FH JOANNEUM
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MFA Interaction Design



MFA Interaction Design



Designing Our World: Cybernetics as Conversation for Action



Designing Our World



Challenges of 21st-Century Design

Energy

Global warming

Water

Food

Population

Health

Equality

Social justice

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Simple problems

Complex problems

[“Wicked problems”*

* In the strict sense of Rittel & Webber

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

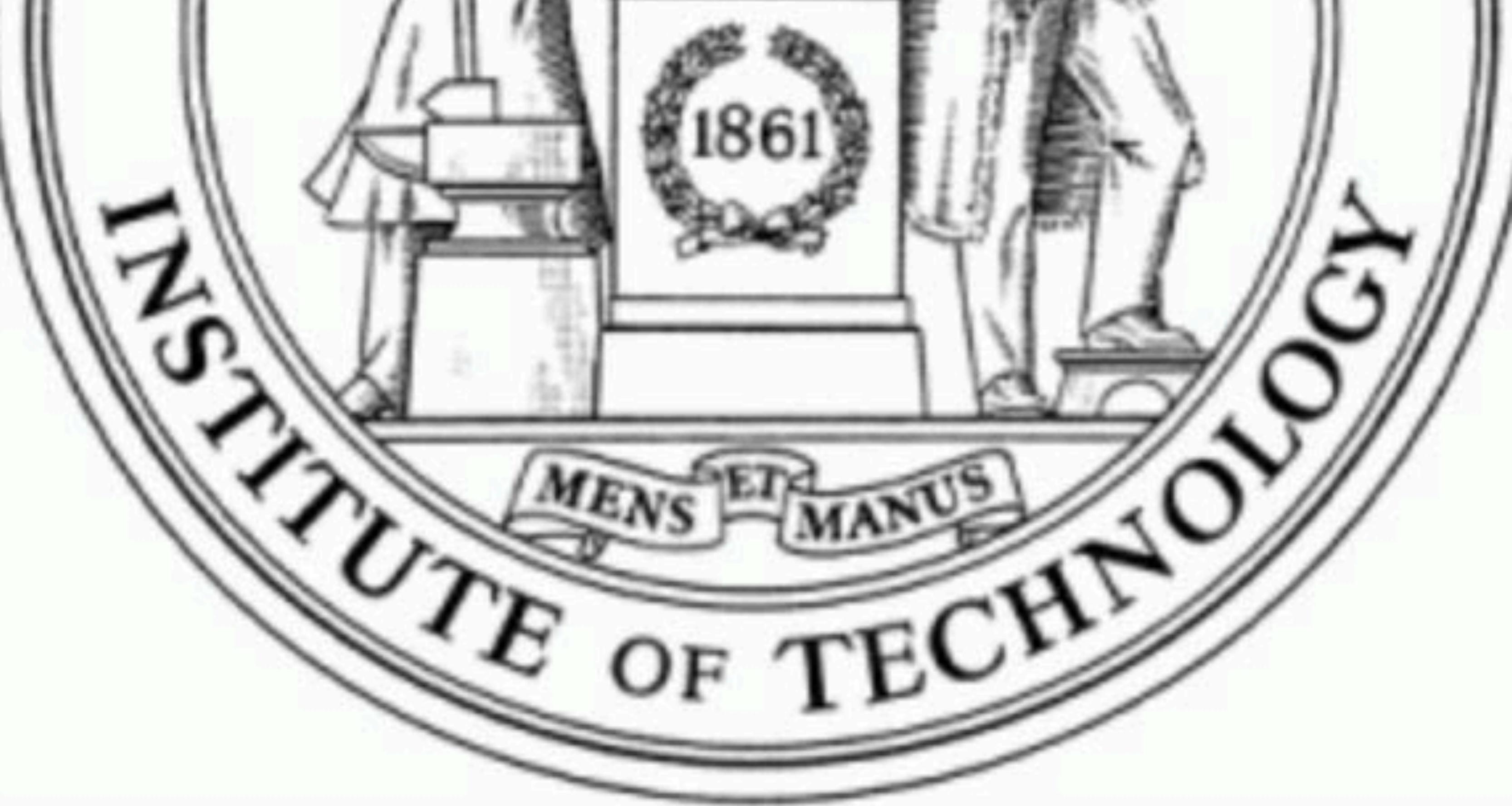


Designing Our World: Conversation for Action







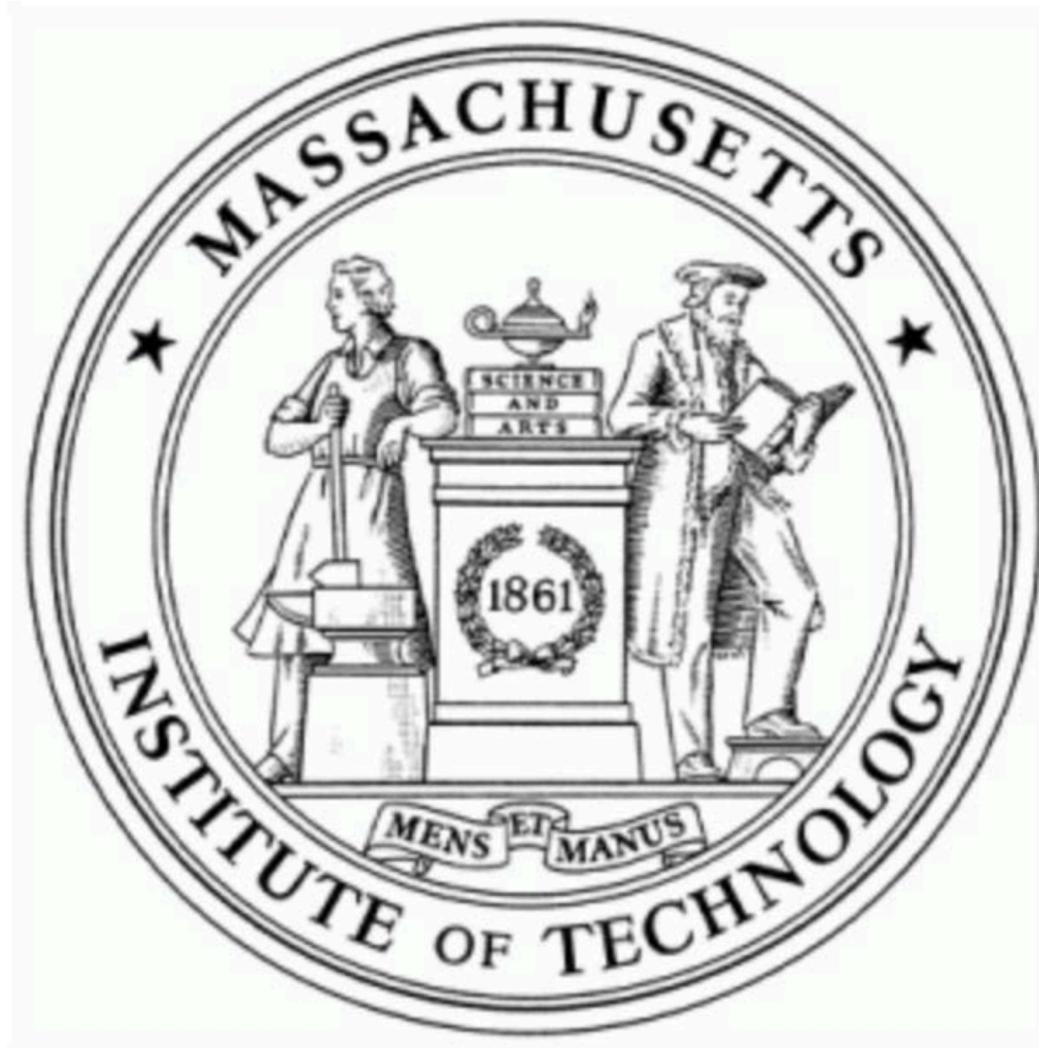


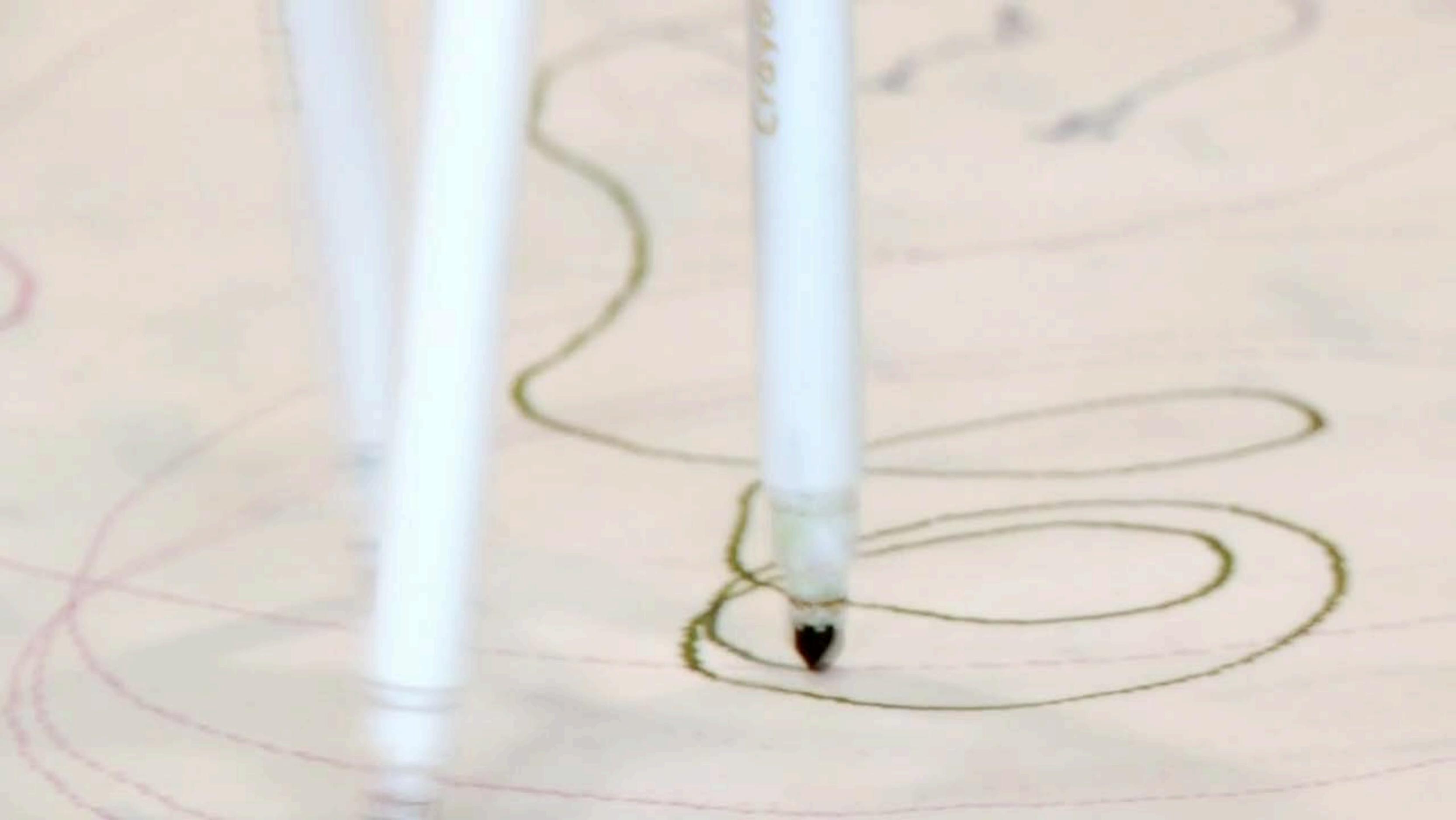
NATIONAL
INSTITUTE

1861

MENS ET MANUS

OF TECHNOLOGY





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

**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

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

— Ranulph Glanville

Heinz von Foerster



photo by Robert Knisely 1989

Gordon Pask
Heinz von Foerster



photo by Robert Knisely 1989

Gordon Pask
Heinz von Foerster



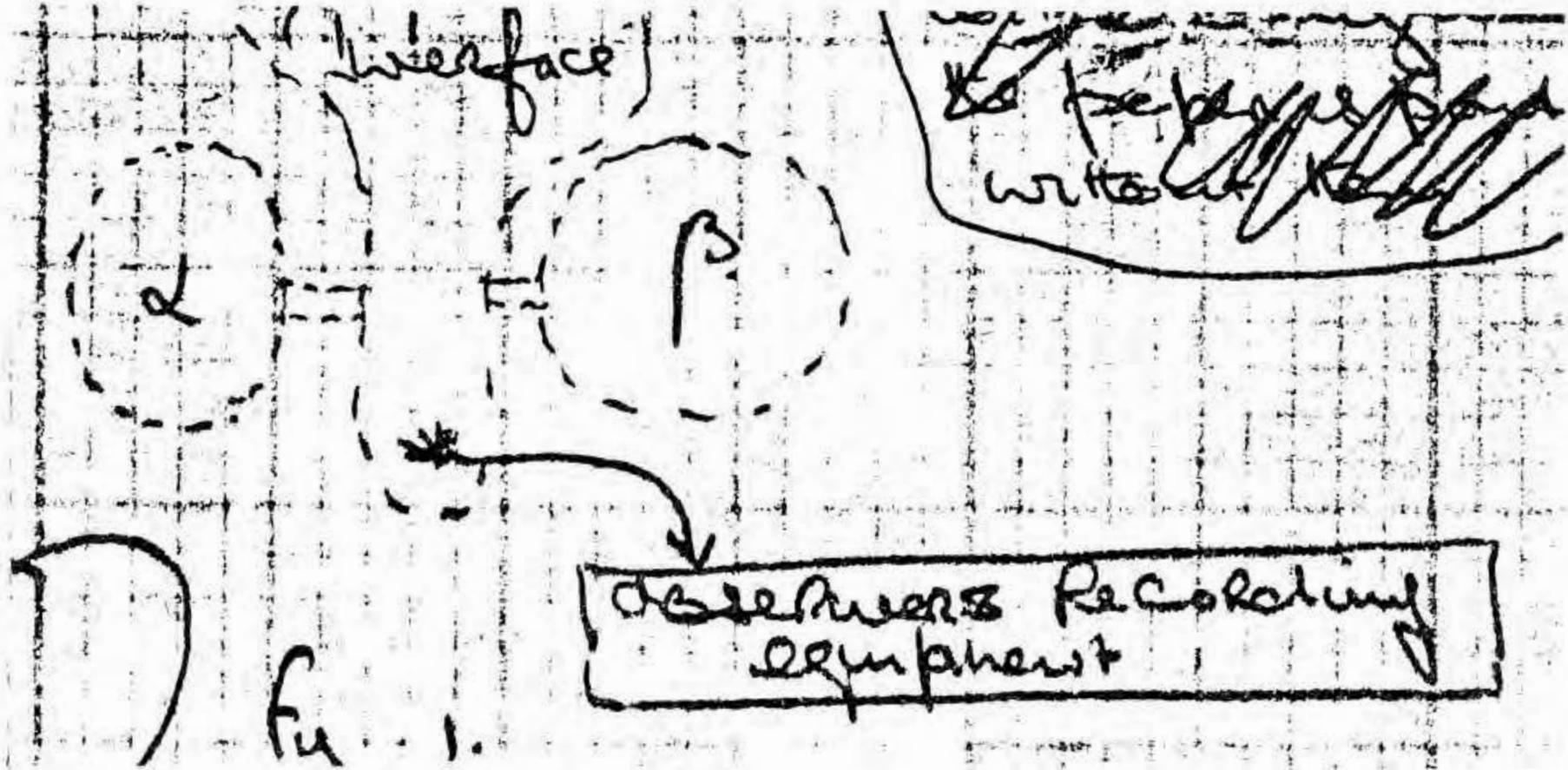
photo by Robert Knisely 1989

Gordon Pask
Paul Pangaro

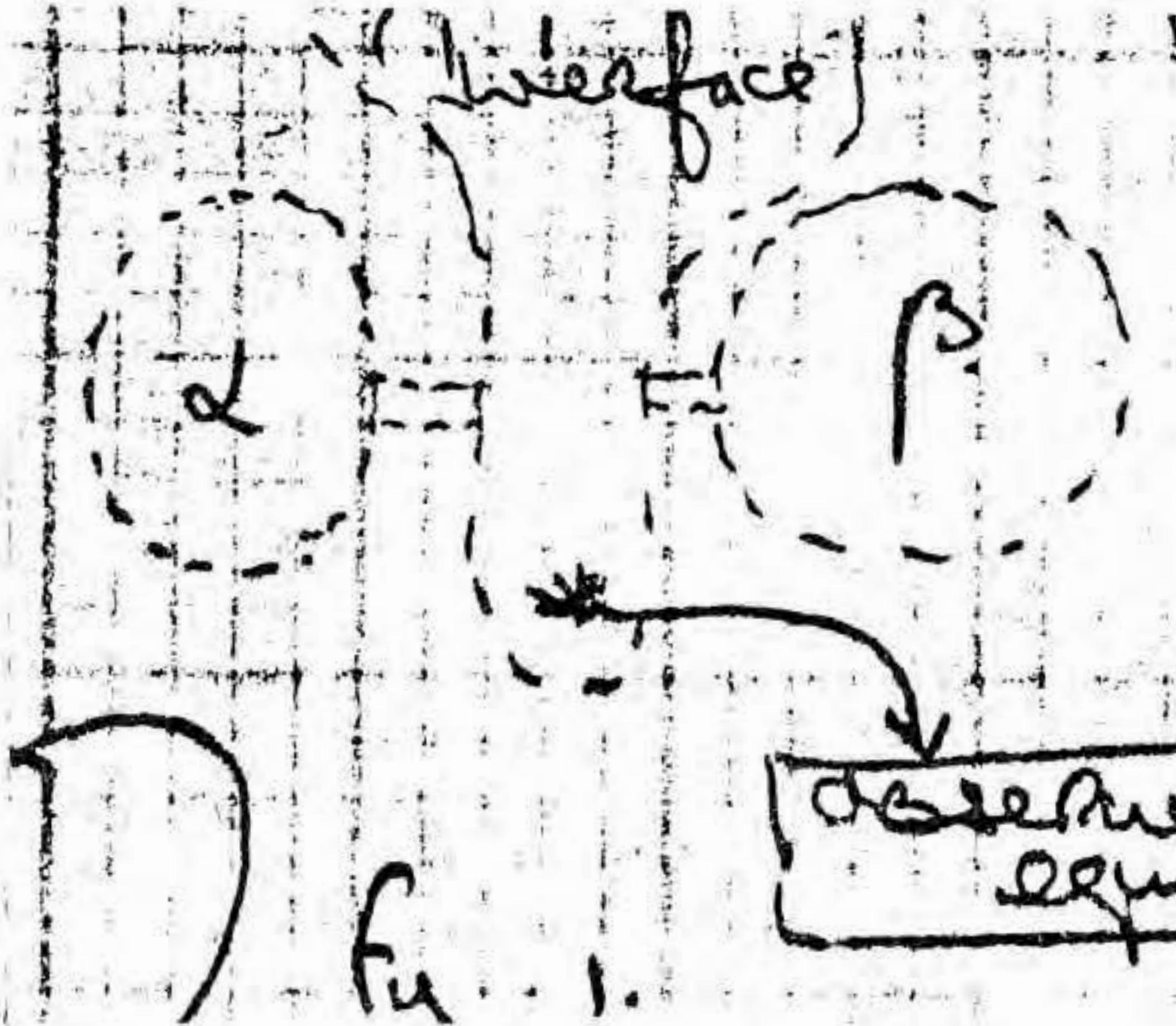


~1986

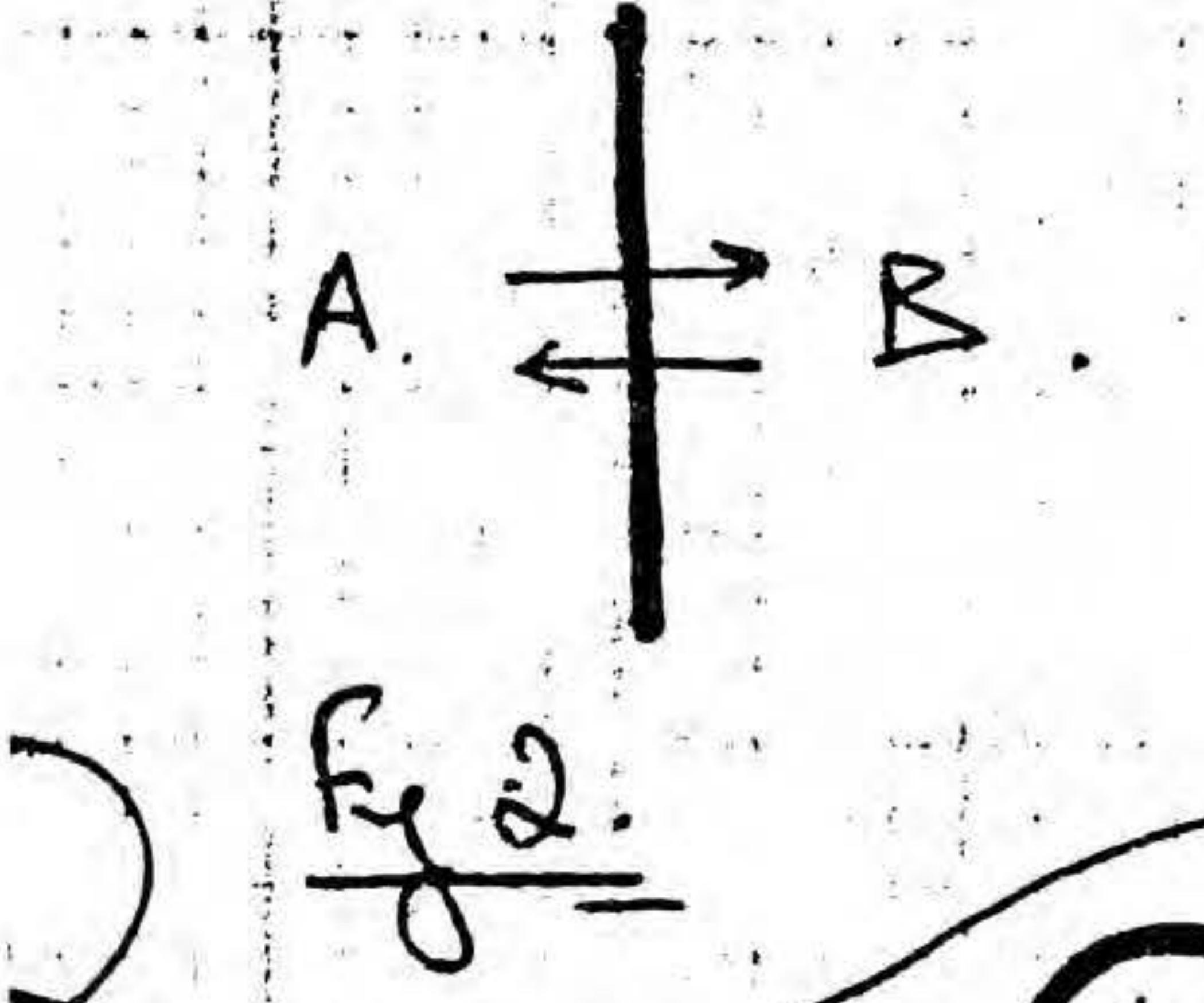
Conversation



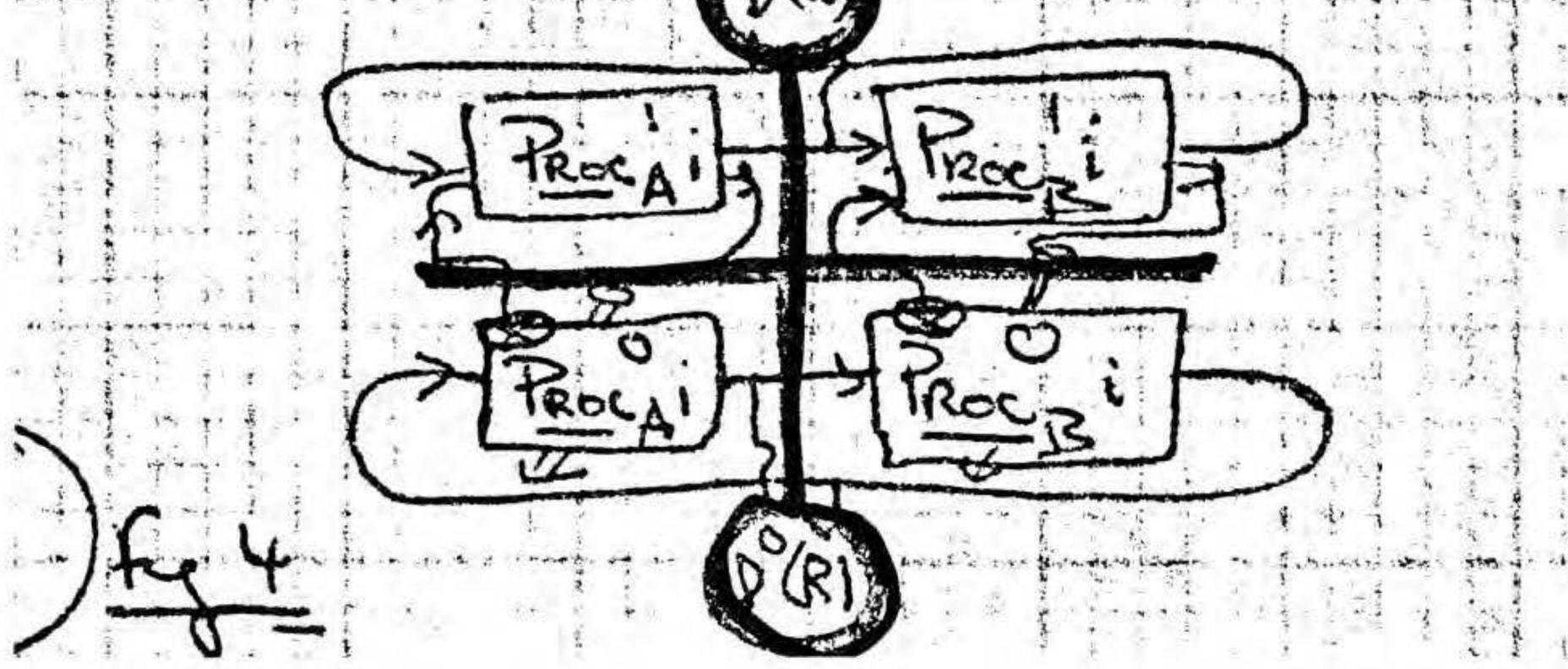
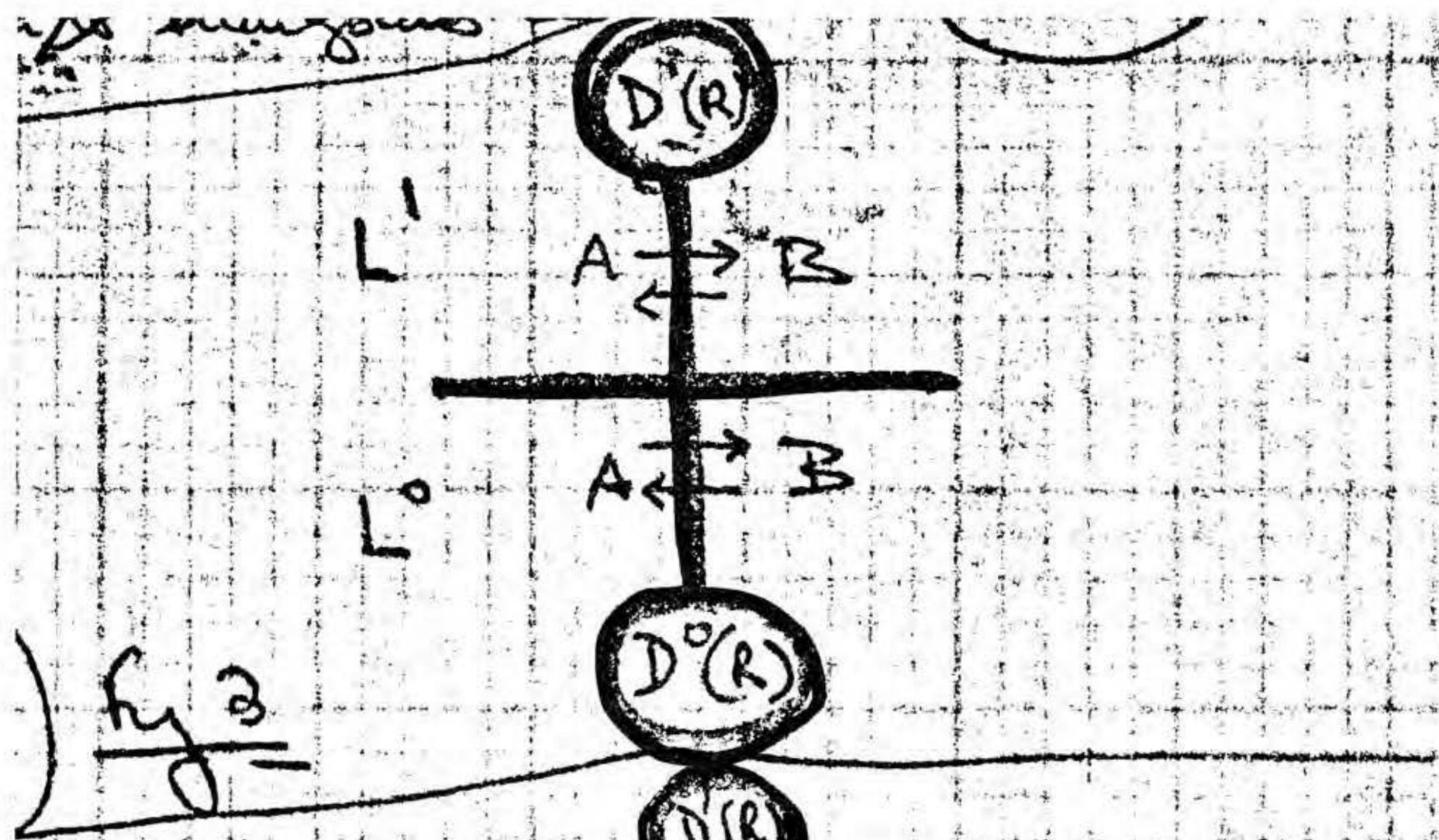
Conversation



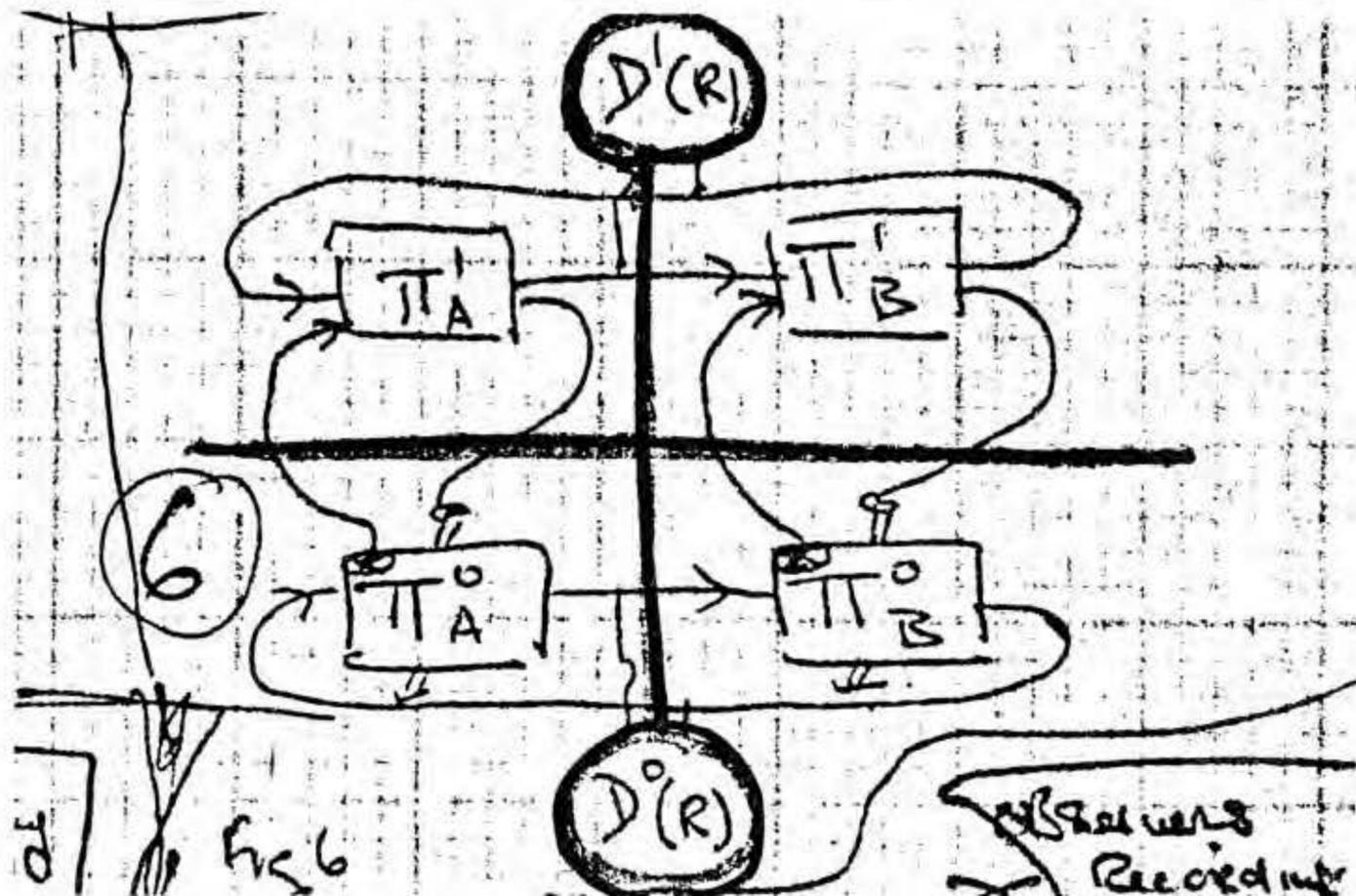
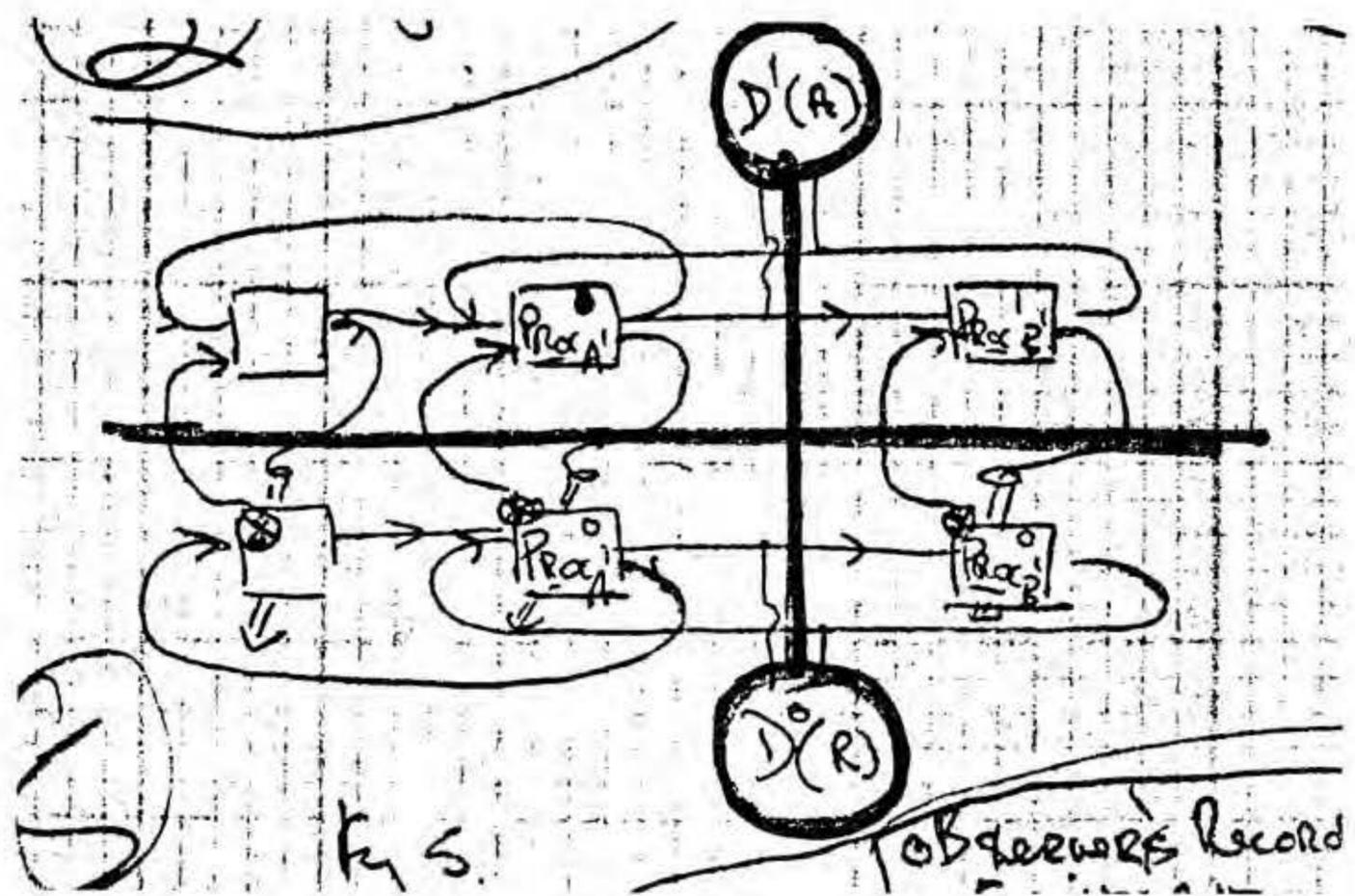
Conversation



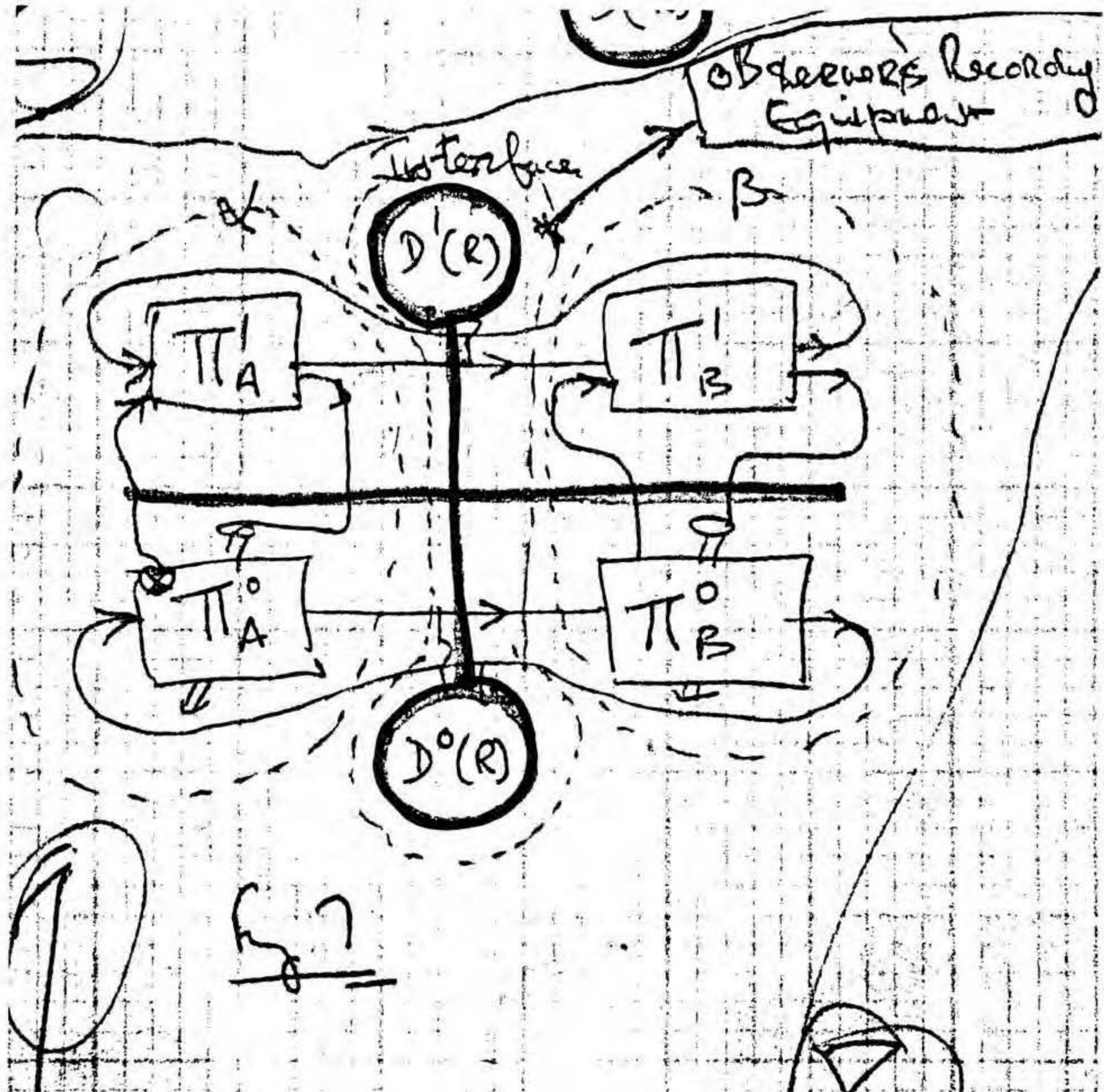
Conversation



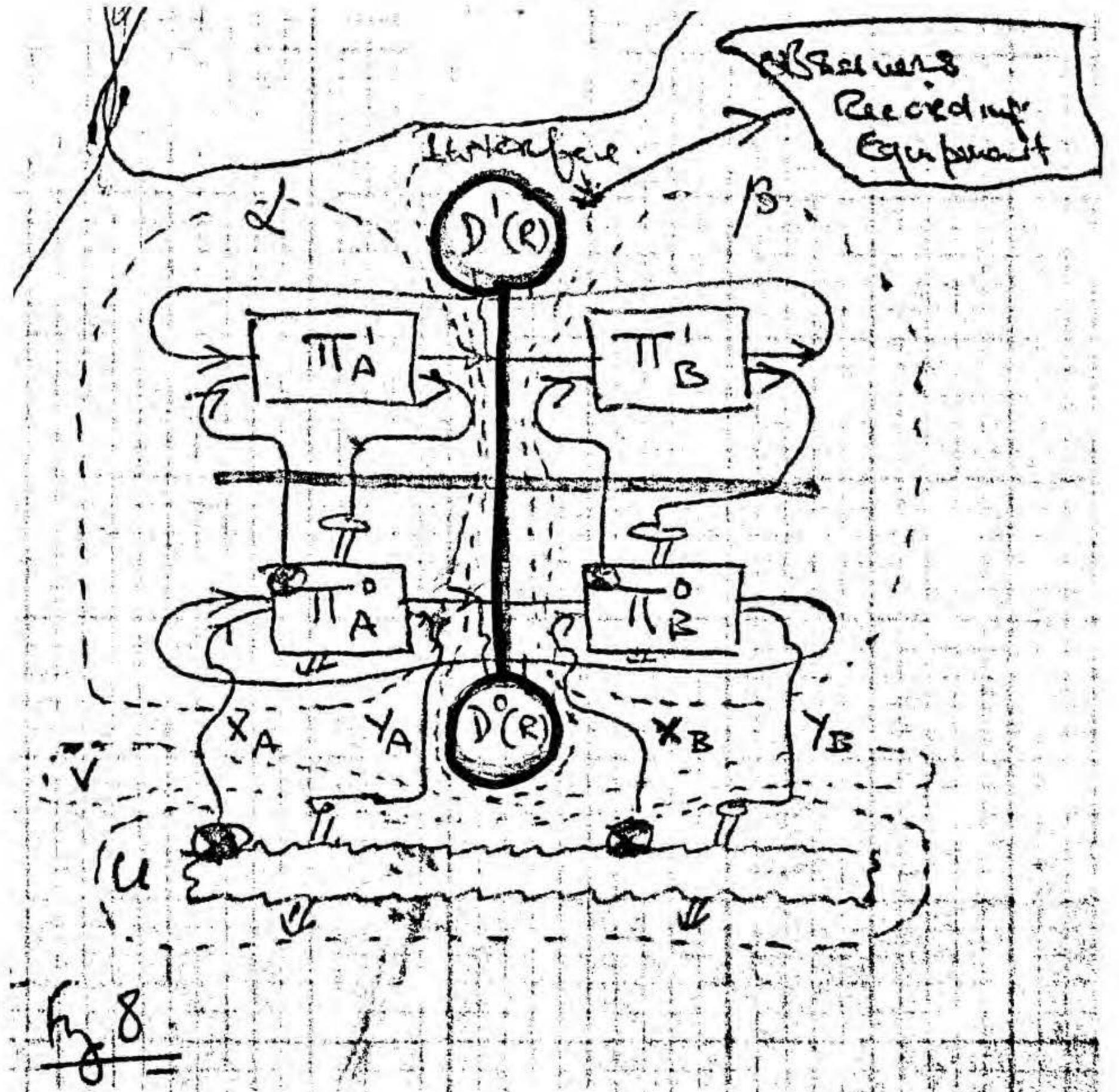
Conversation



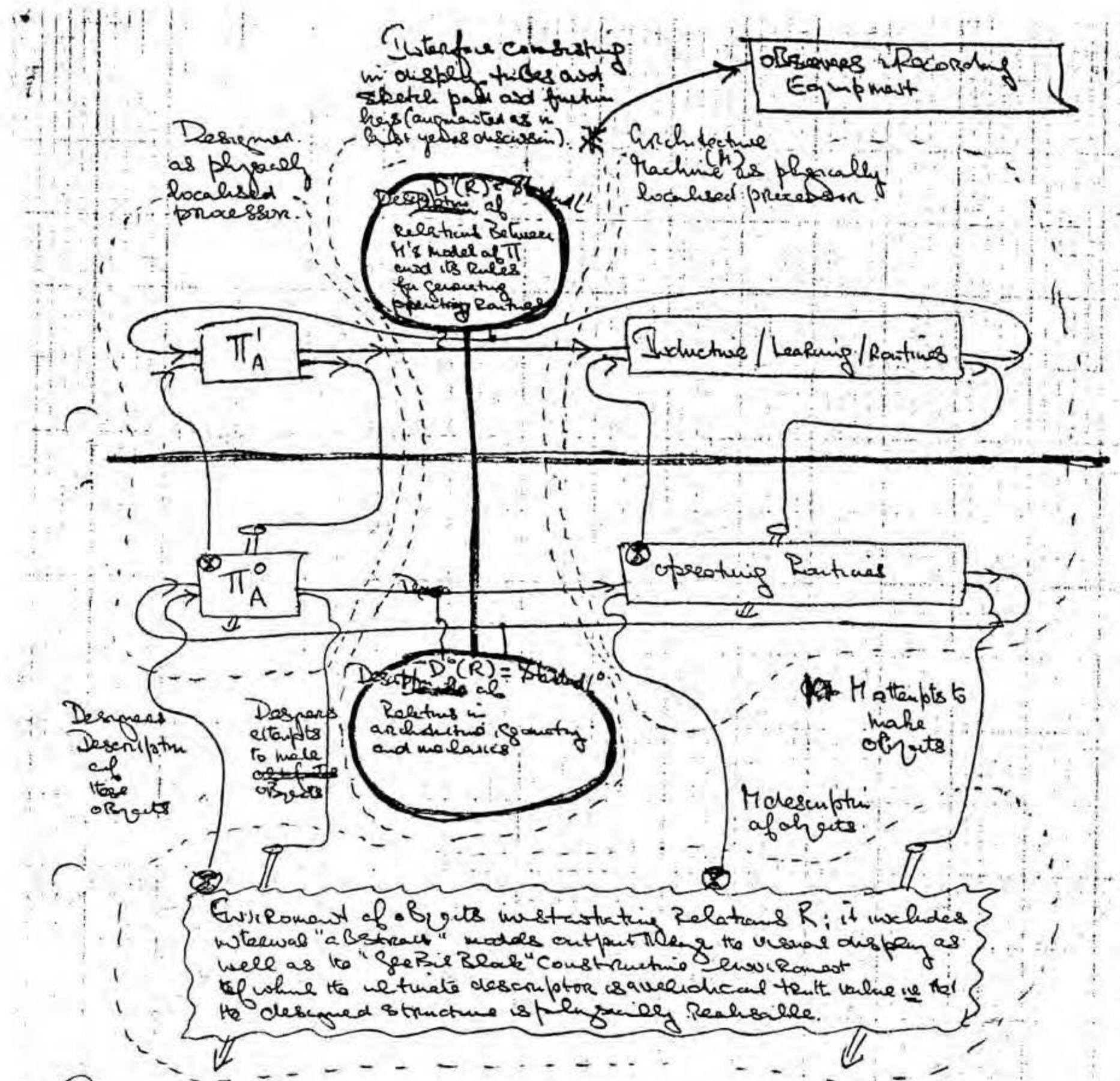
Conversation



Conversation



Conversation for Design



Conversation for Design



Conversation for Design

URBAN5:
A Machine
That Discusses
Urban Design

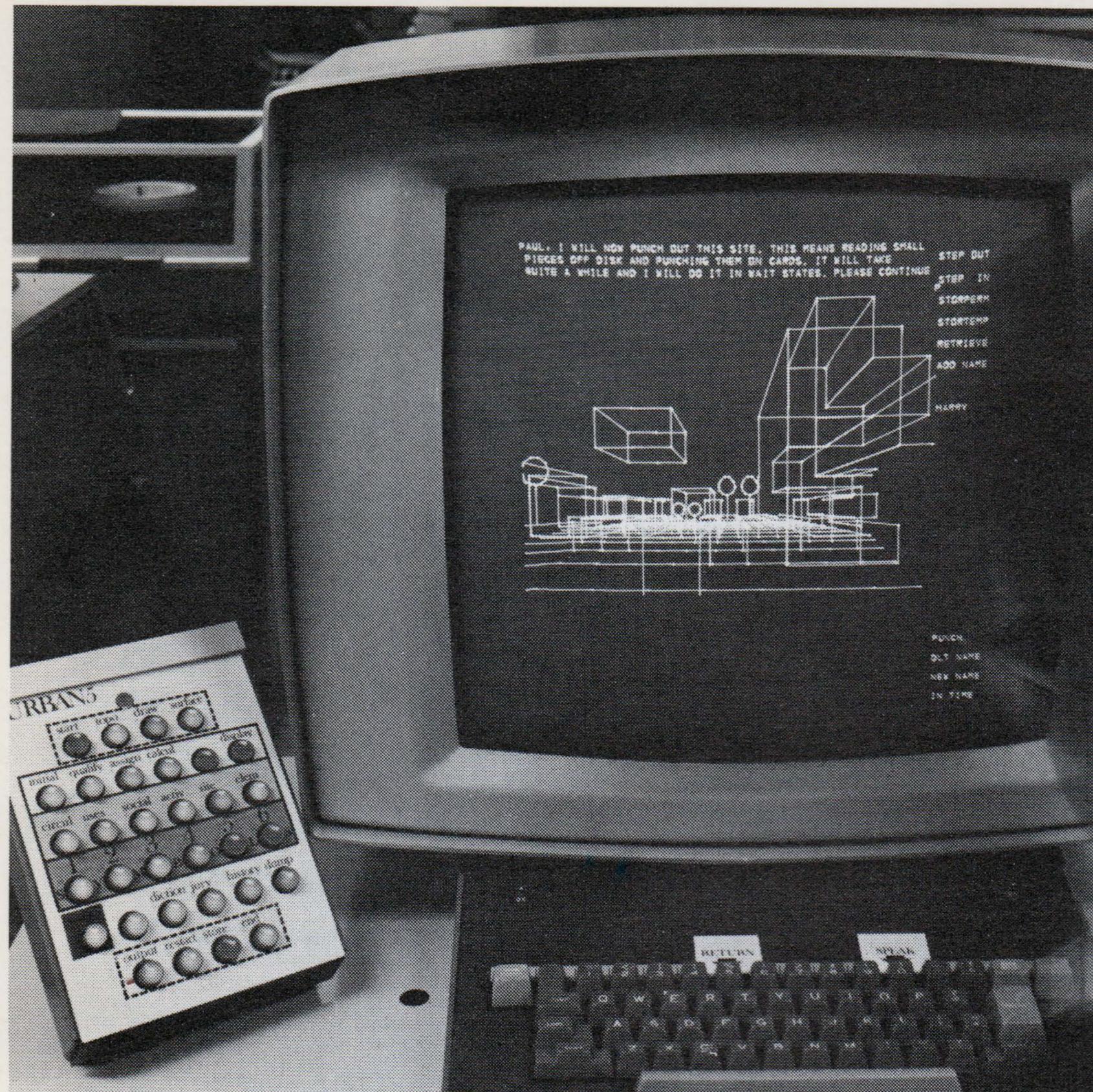


Conversation for Design

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



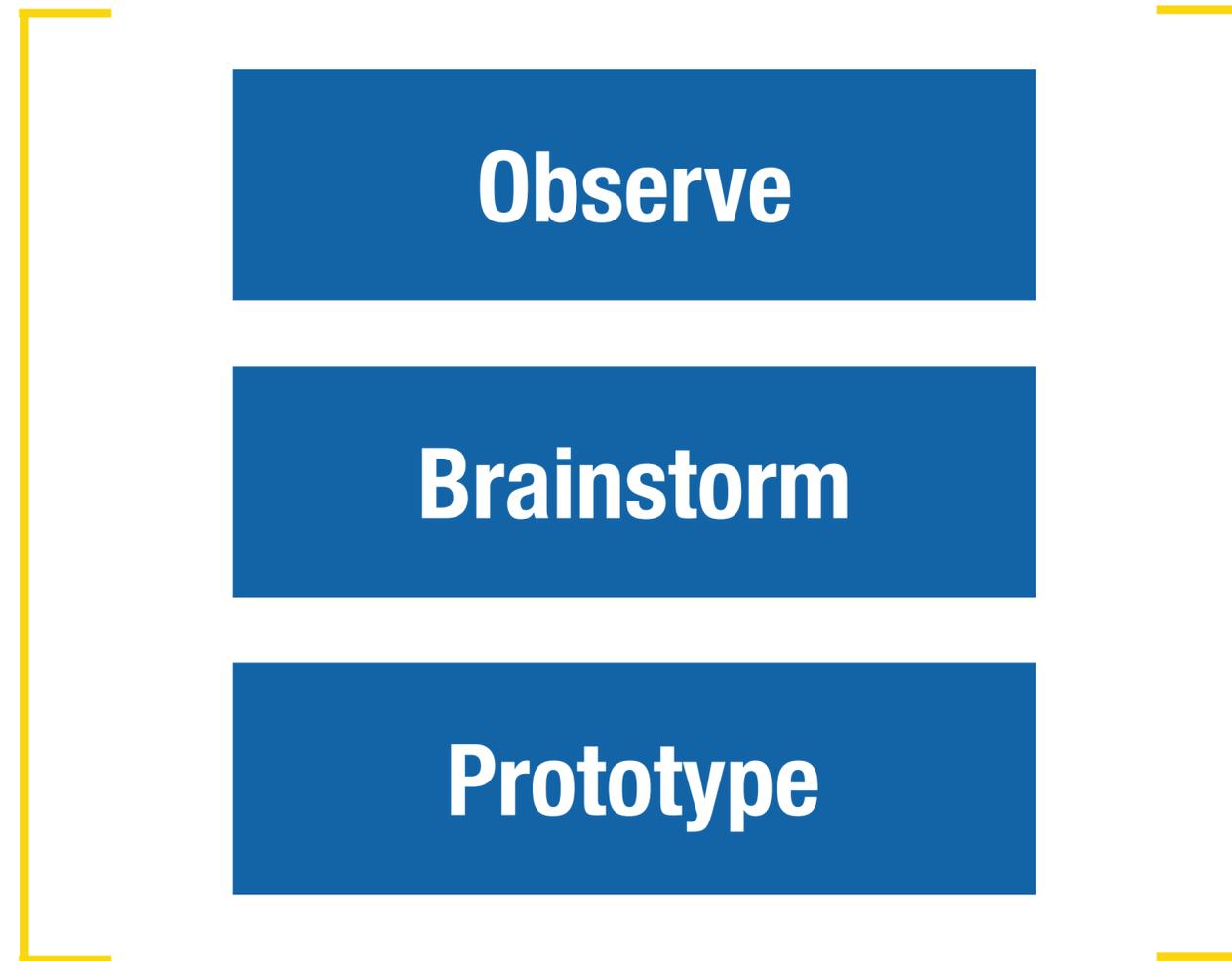
Design...

Design... from Thinking to Conversation



**Design
Thinking**

What is the process of Design Thinking?



What Does that mean?

Ethnography

Observe

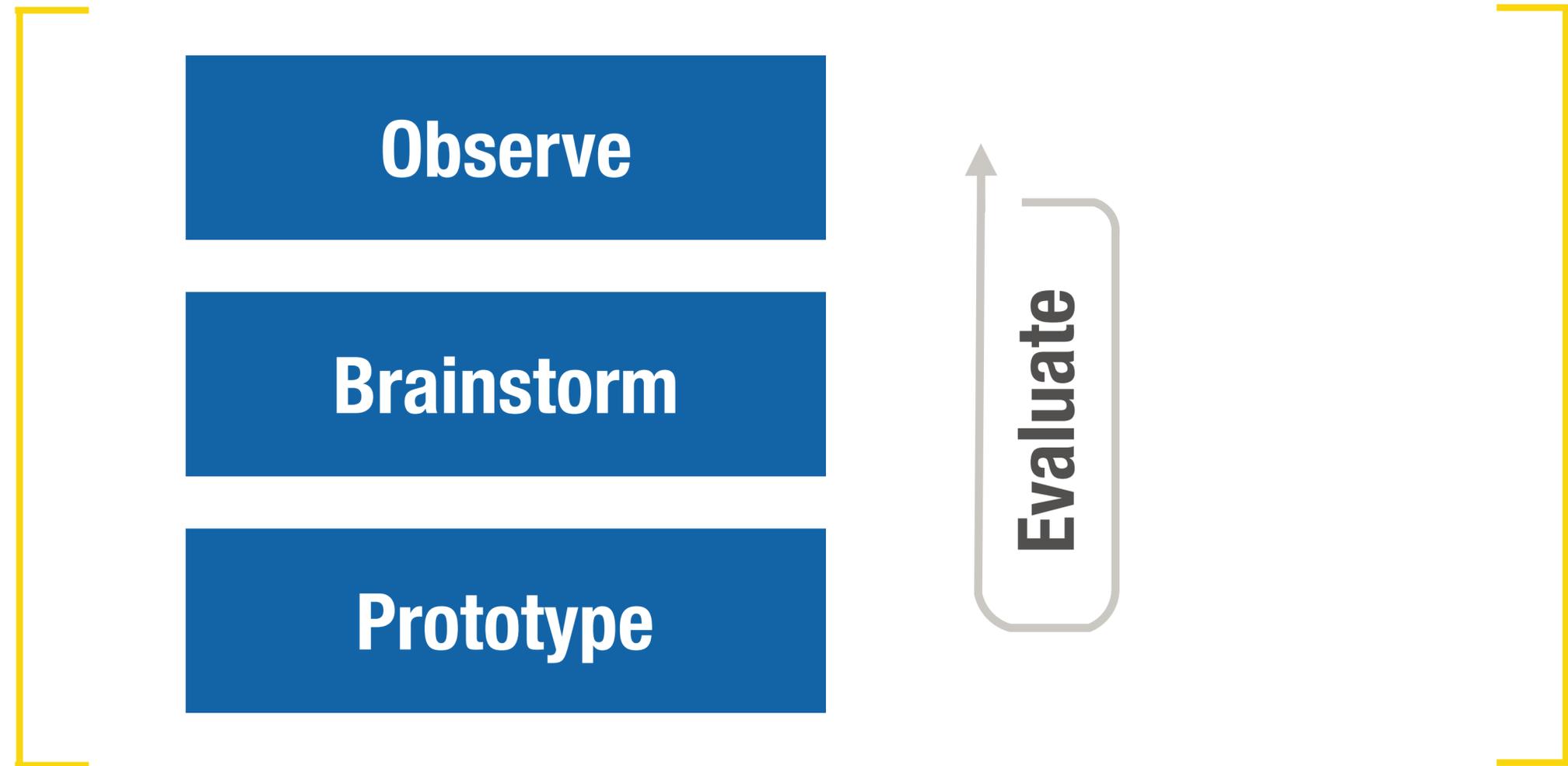
Open-ended idea
generation

Brainstorm

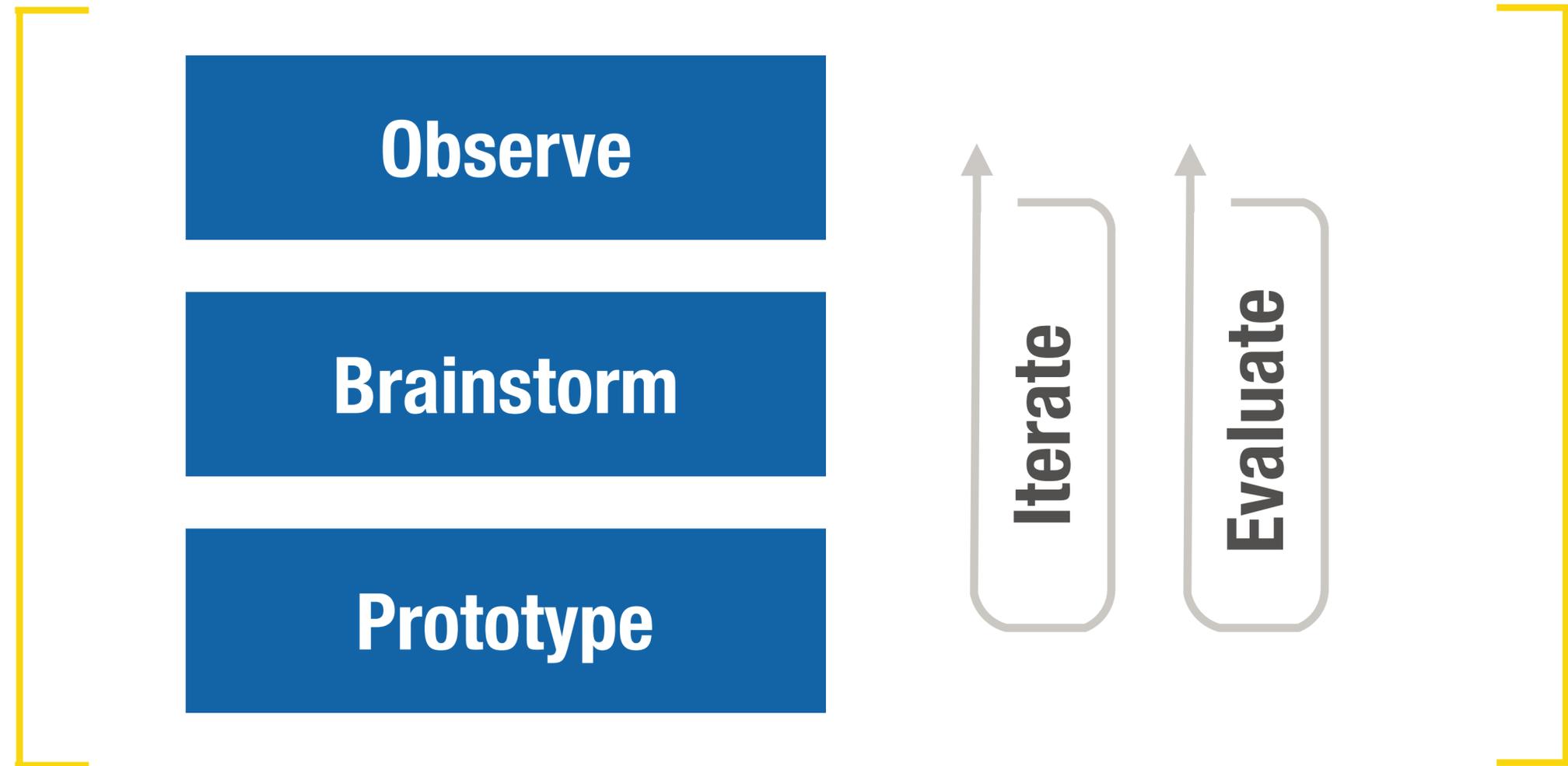
Making and
testing

Prototype

What Does that mean?



What Does that mean?



Limitations

Specific?

Rigorous?

Repeatable?

Observe

Brainstorm

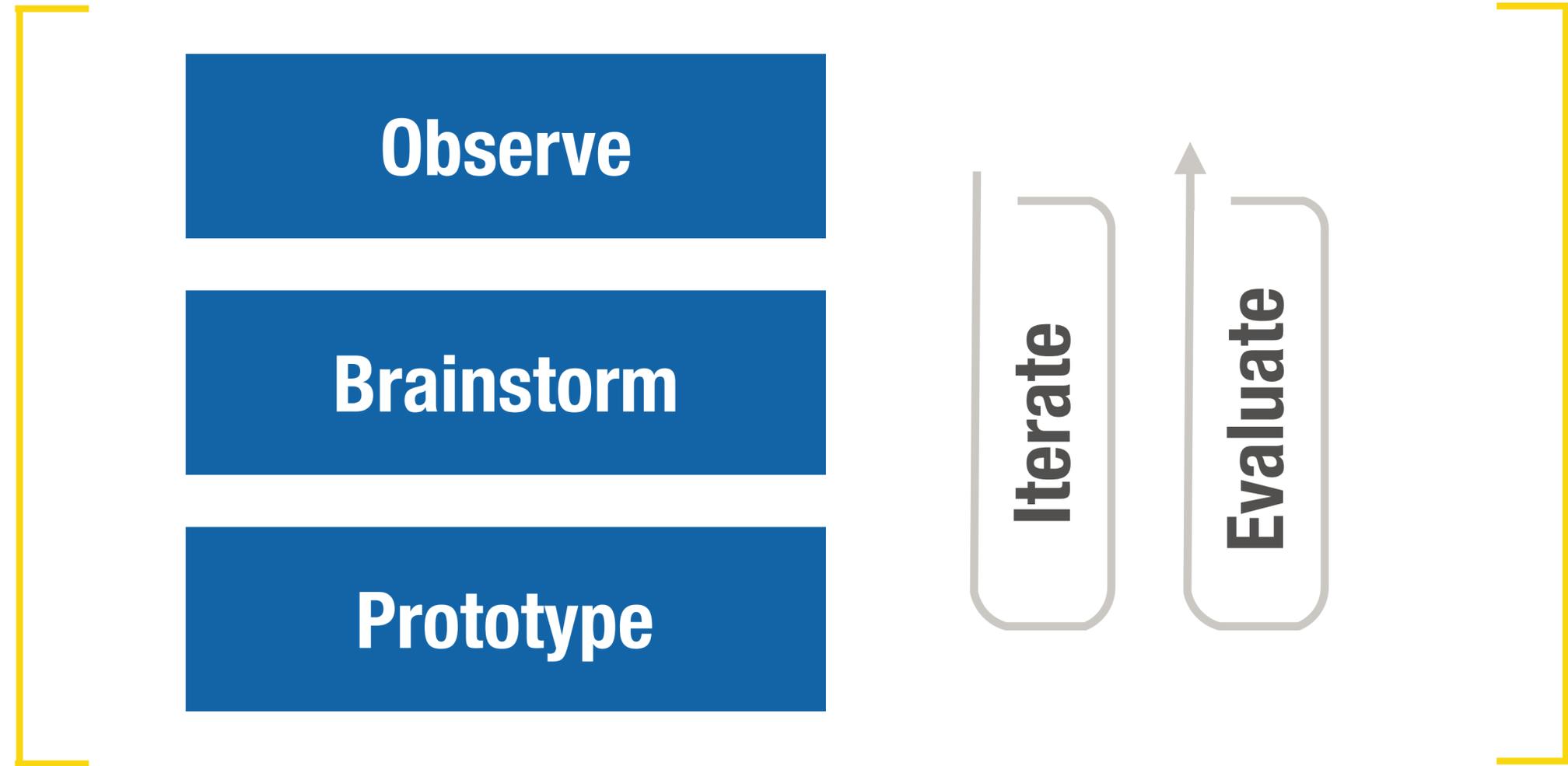
Prototype

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**

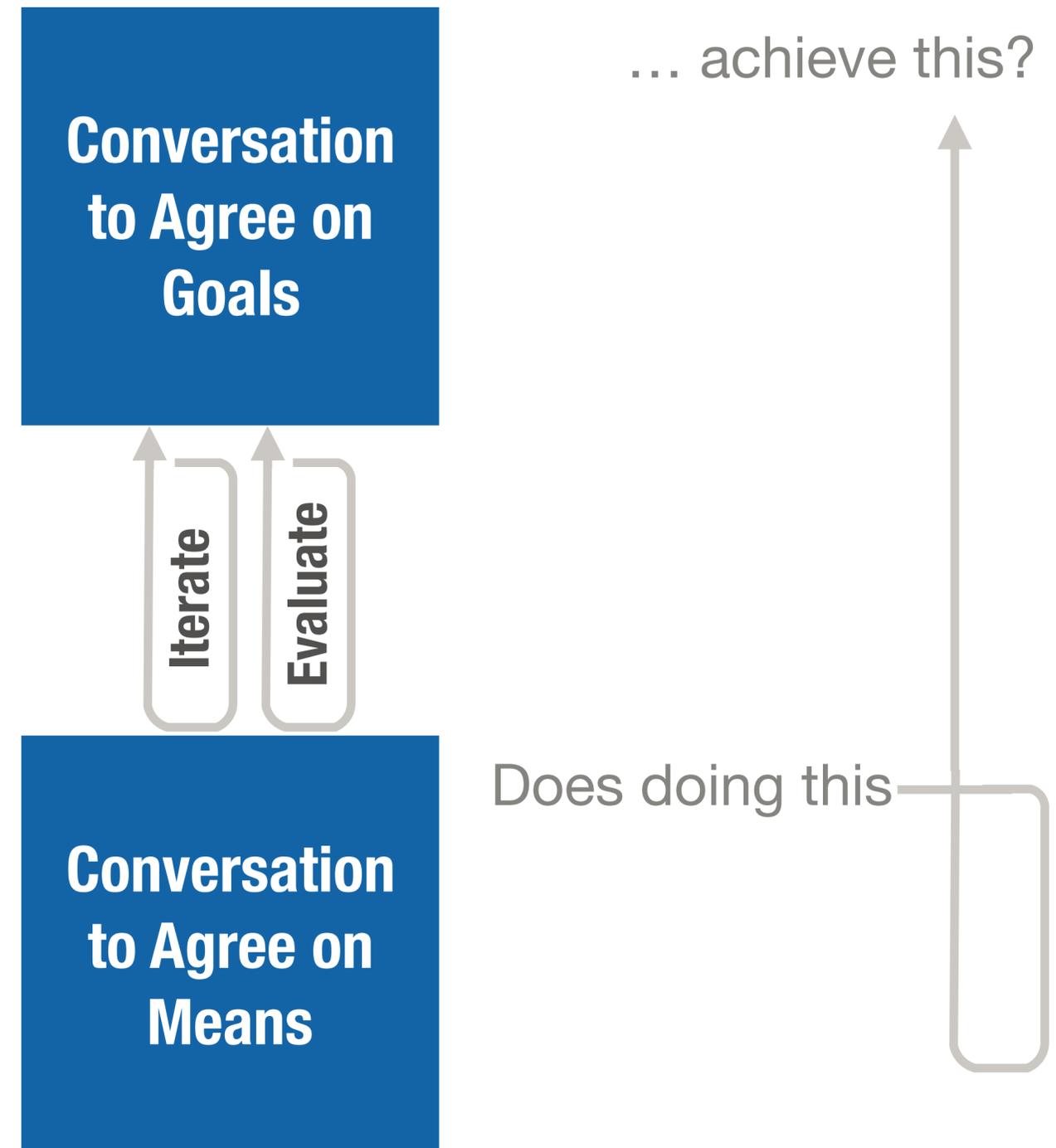
Rethinking Design Thinking

**Conversation
to Agree on Means**

Design as Conversation

**Conversation
to Agree on
Means**

Design as Conversation

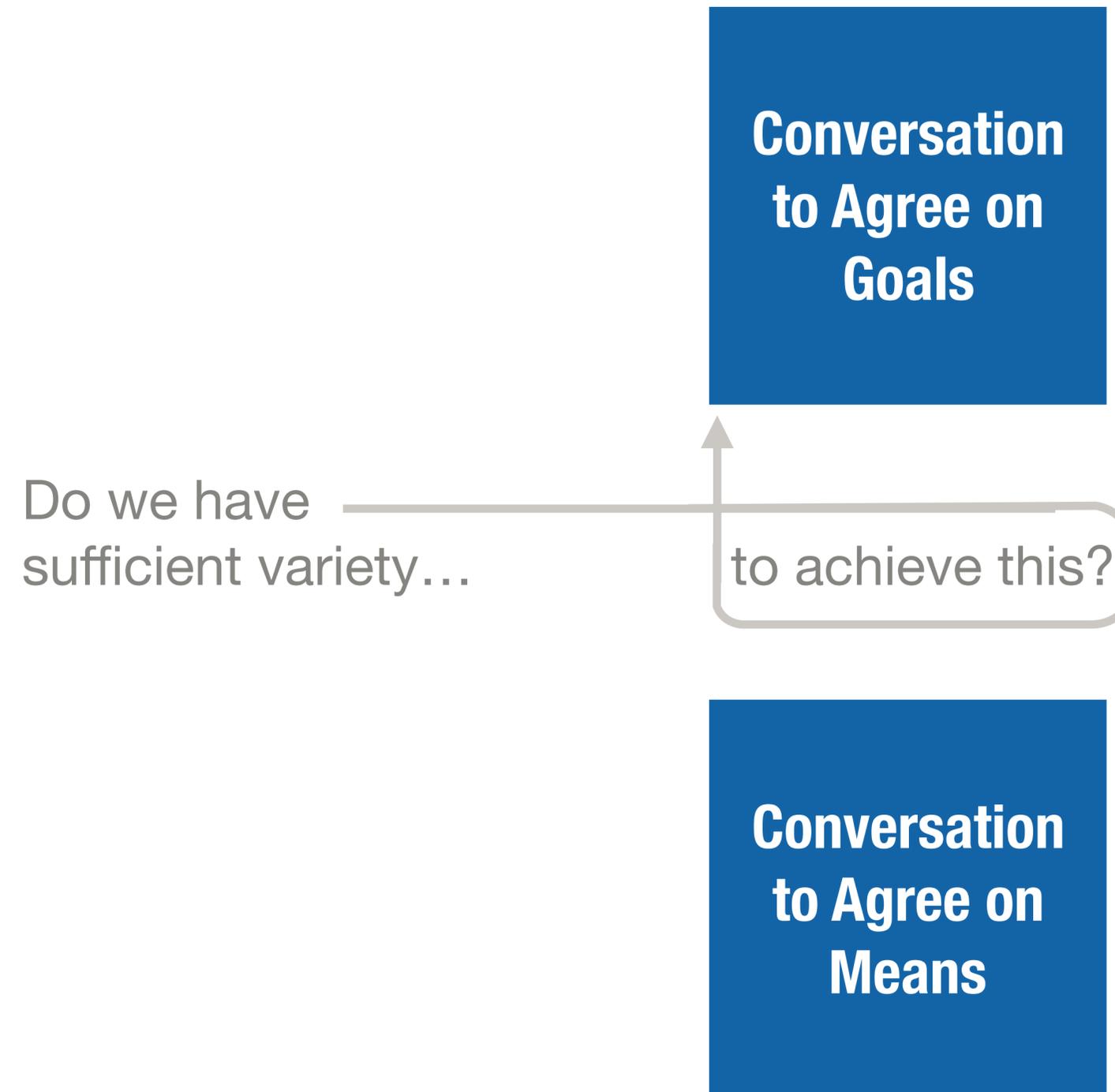


Design as Conversation

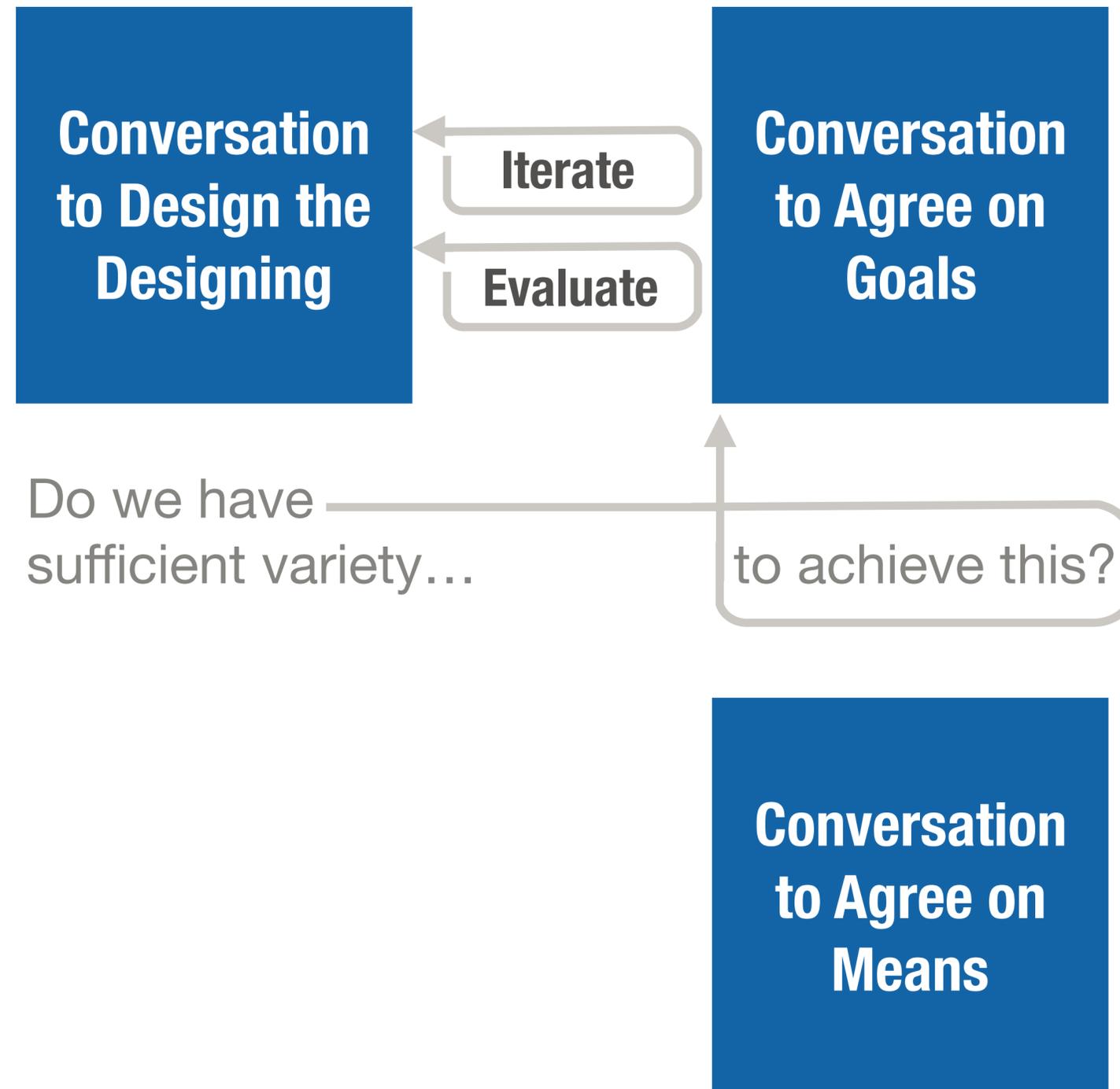
**Conversation
to Agree on
Goals**

**Conversation
to Agree on
Means**

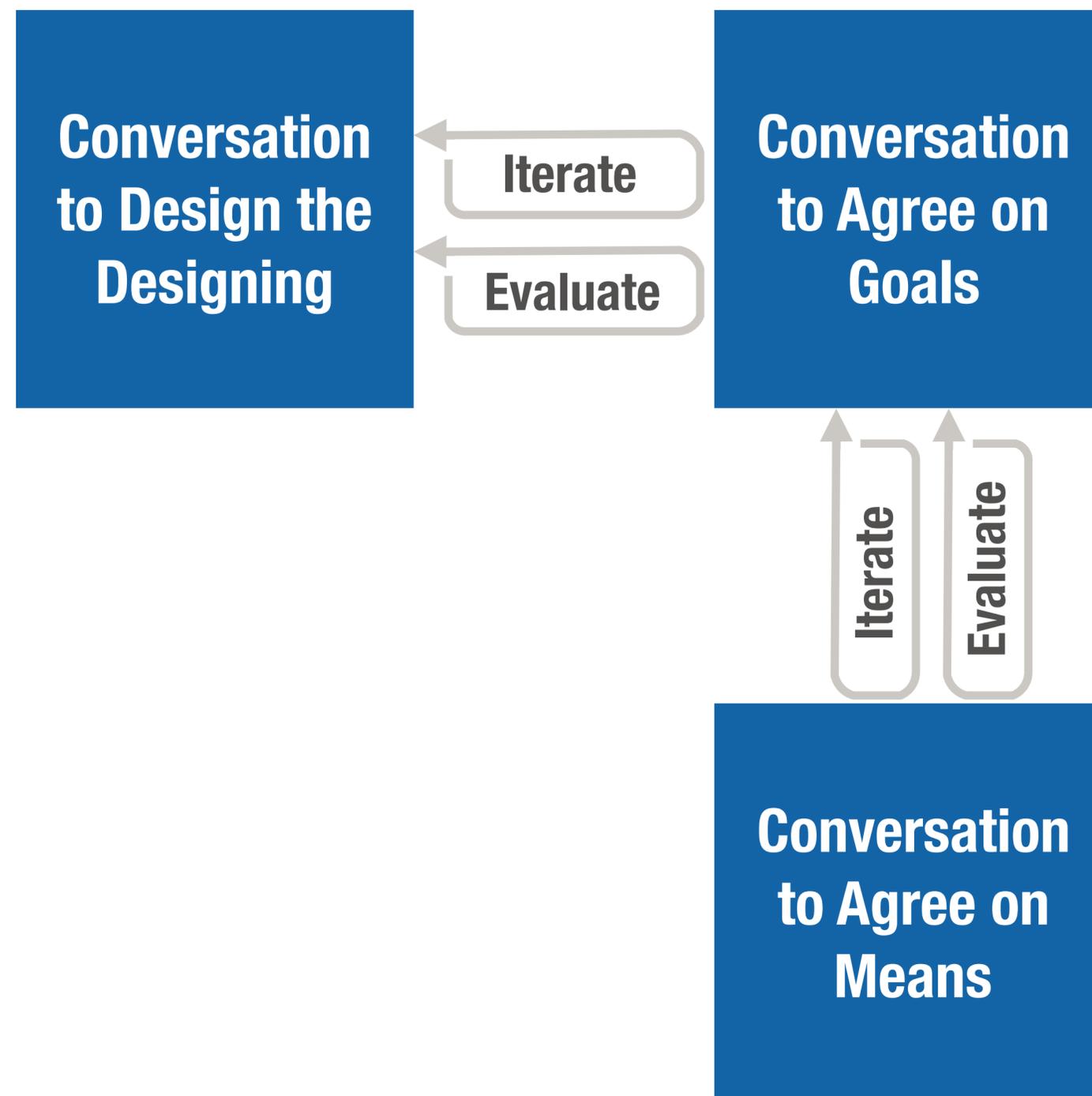
Design as Conversation



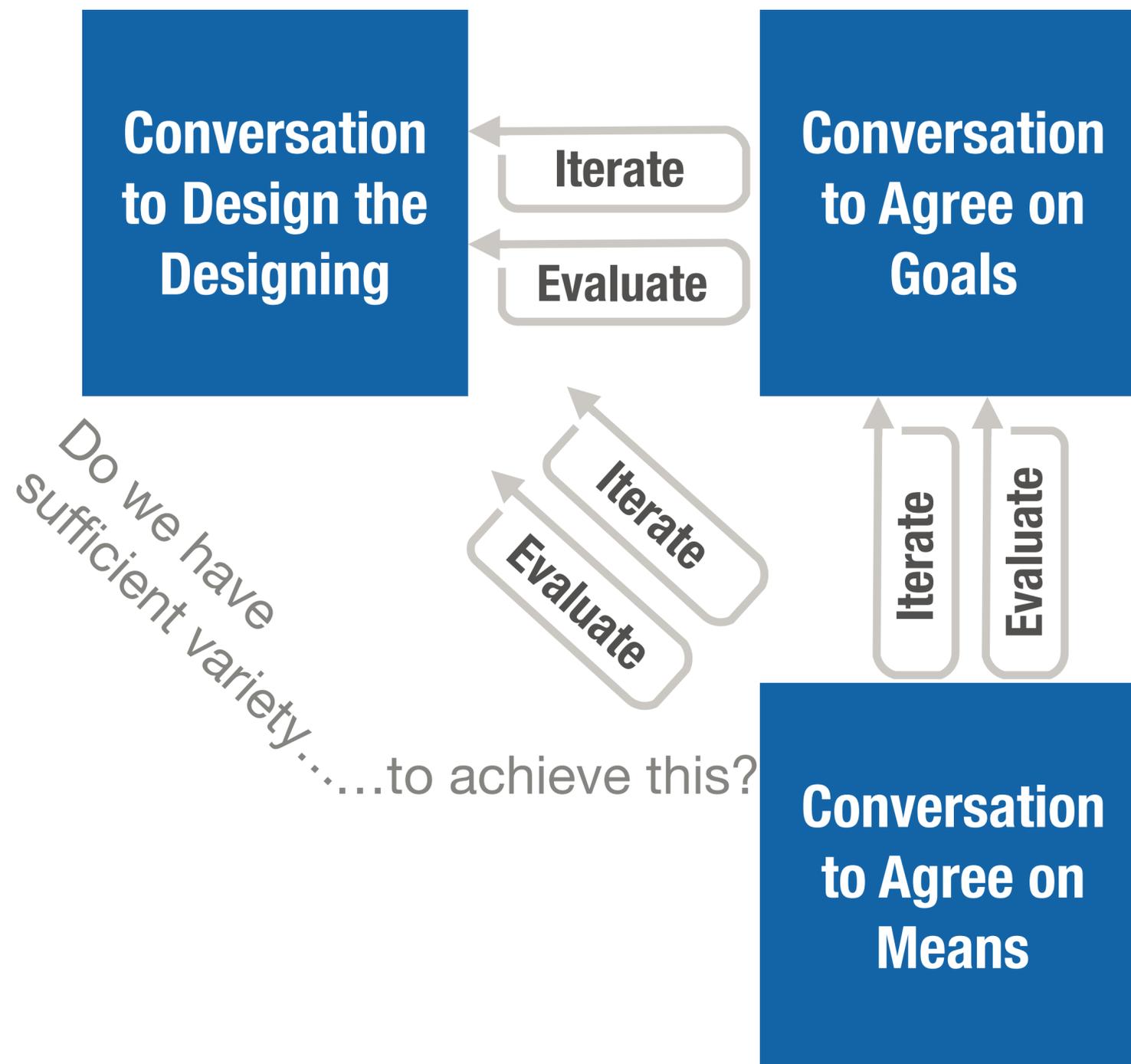
Design as Conversation



Design as Conversation

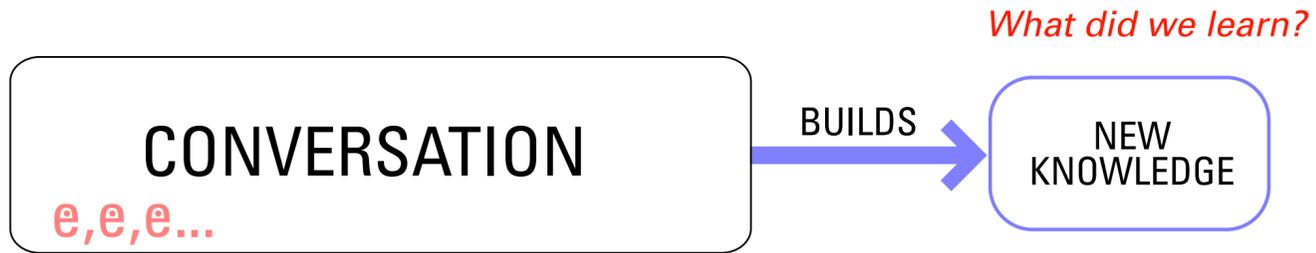


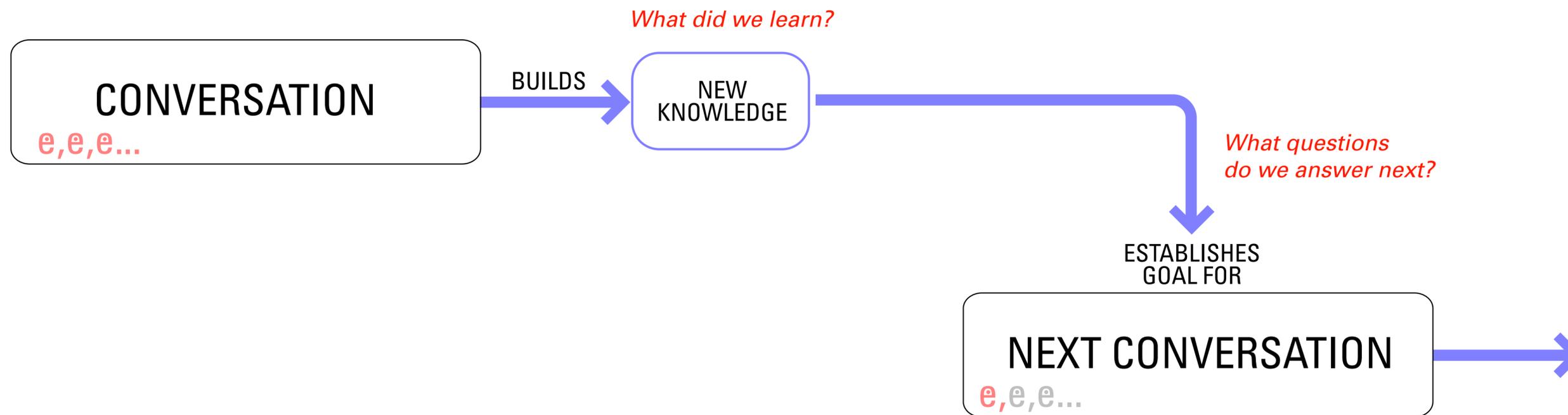
Design as Conversation

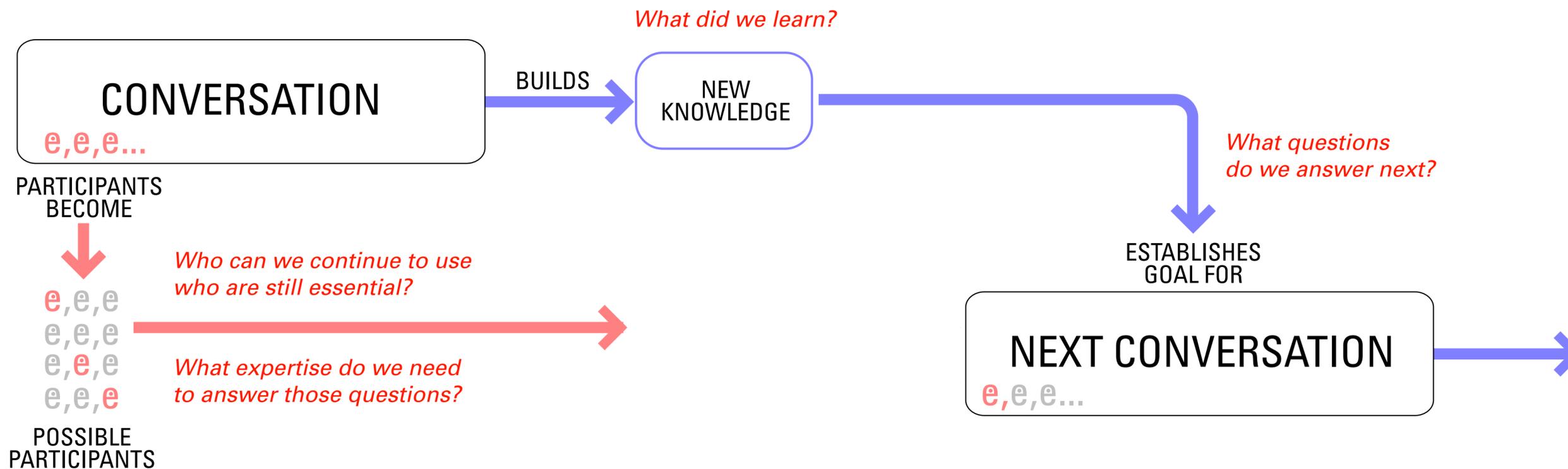


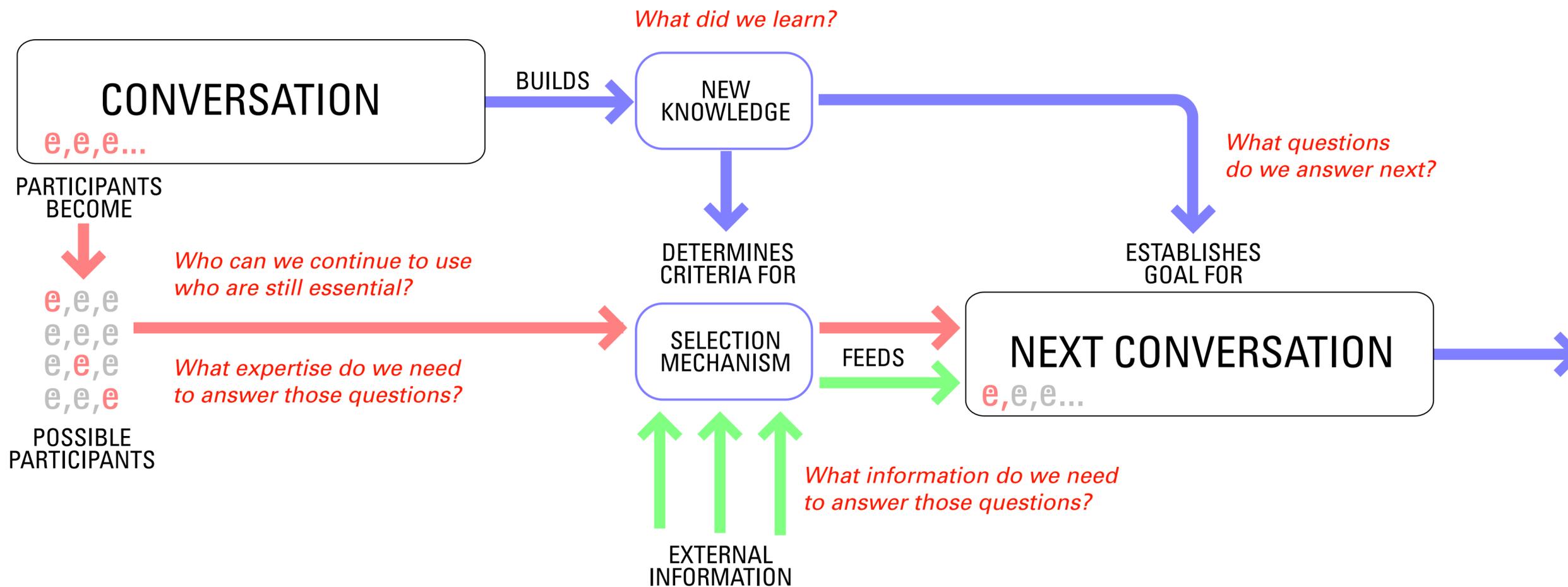
CONVERSATION

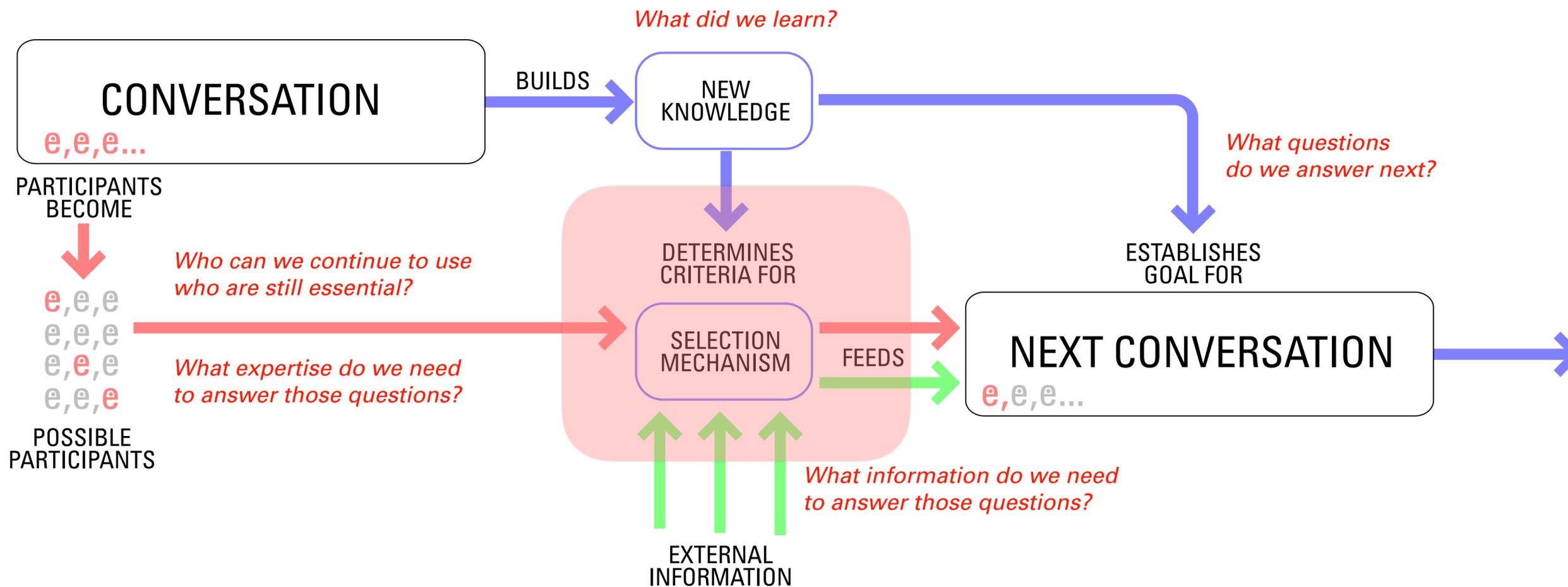
e,e,e...











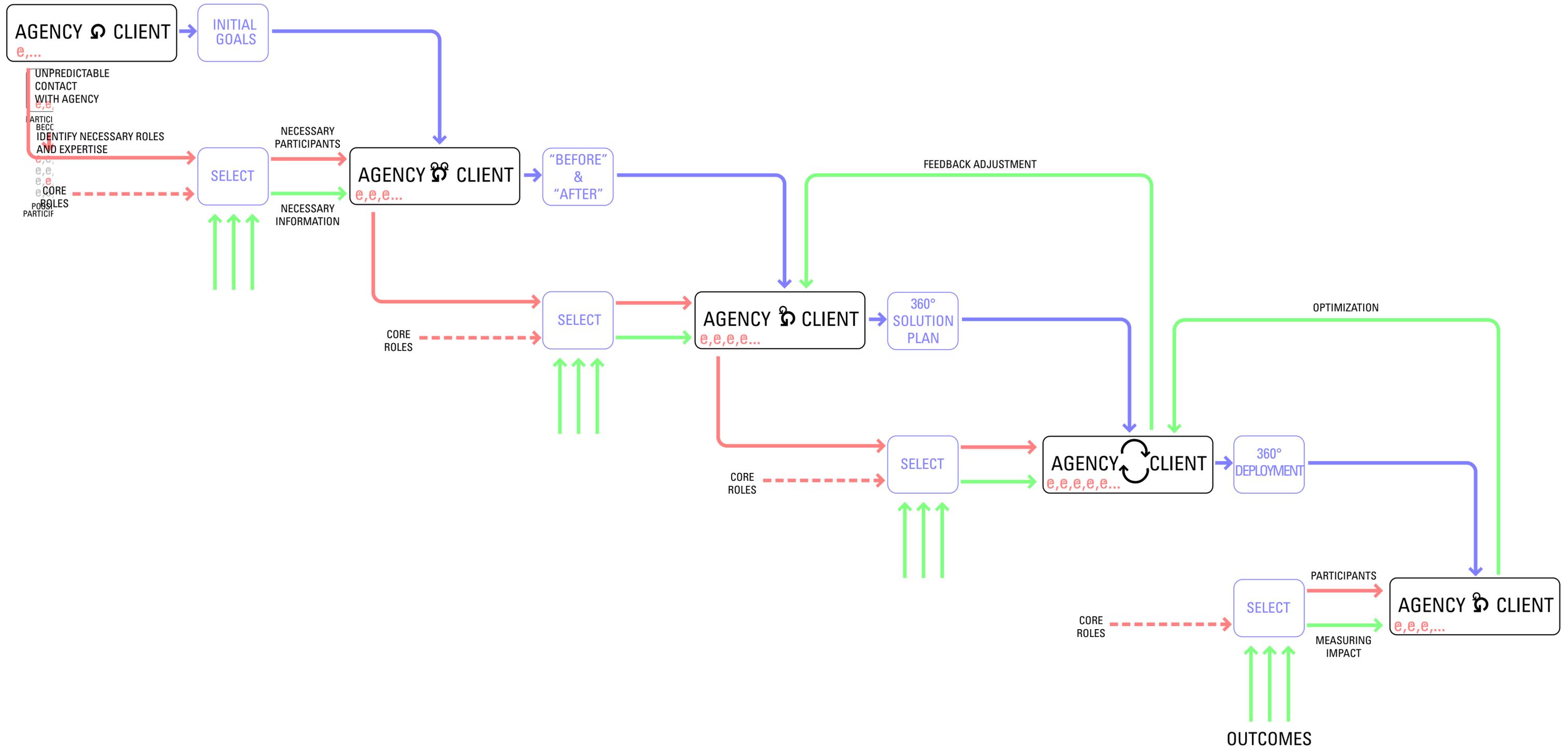
catalyst

ideation

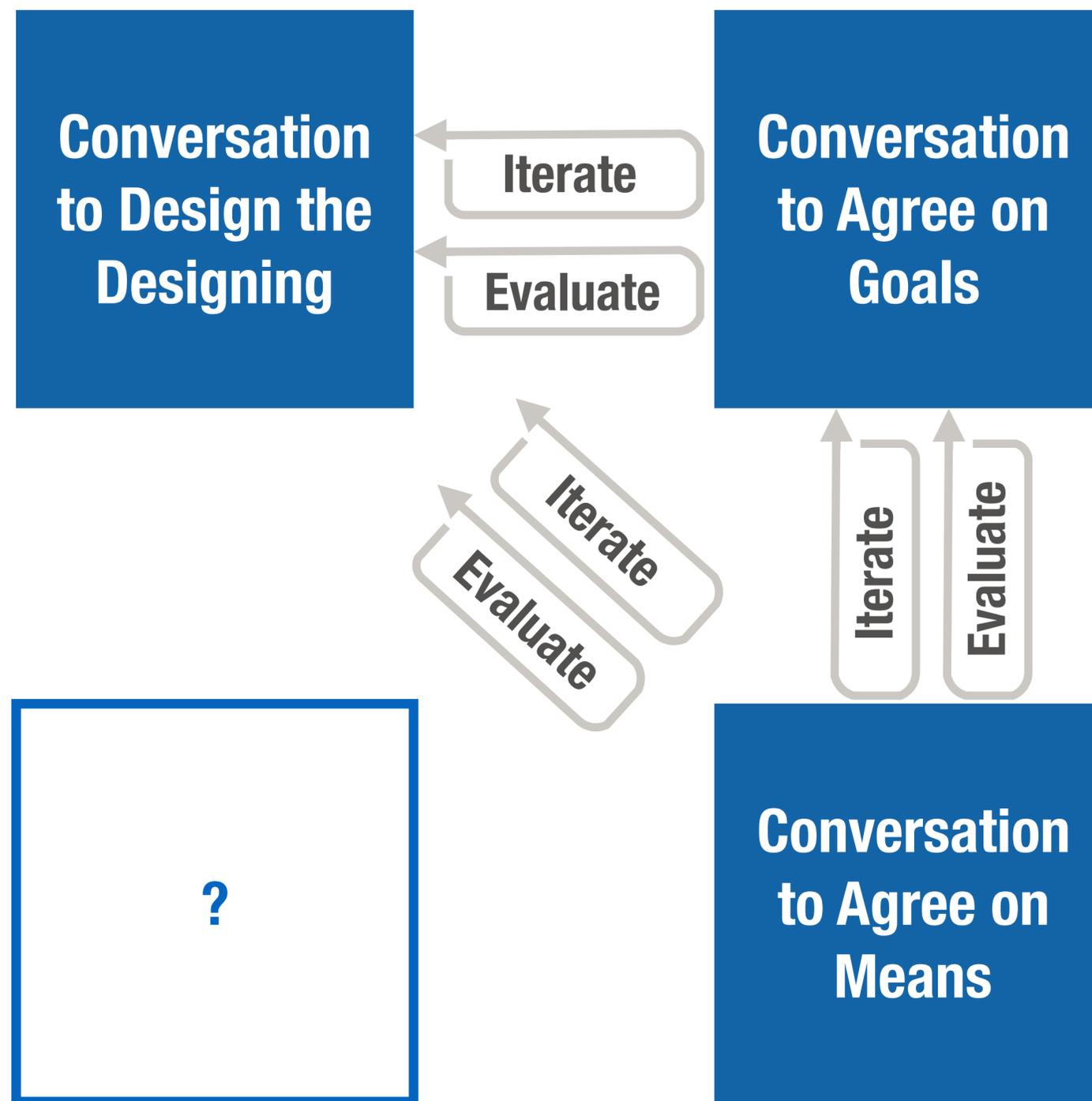
solution

delivery

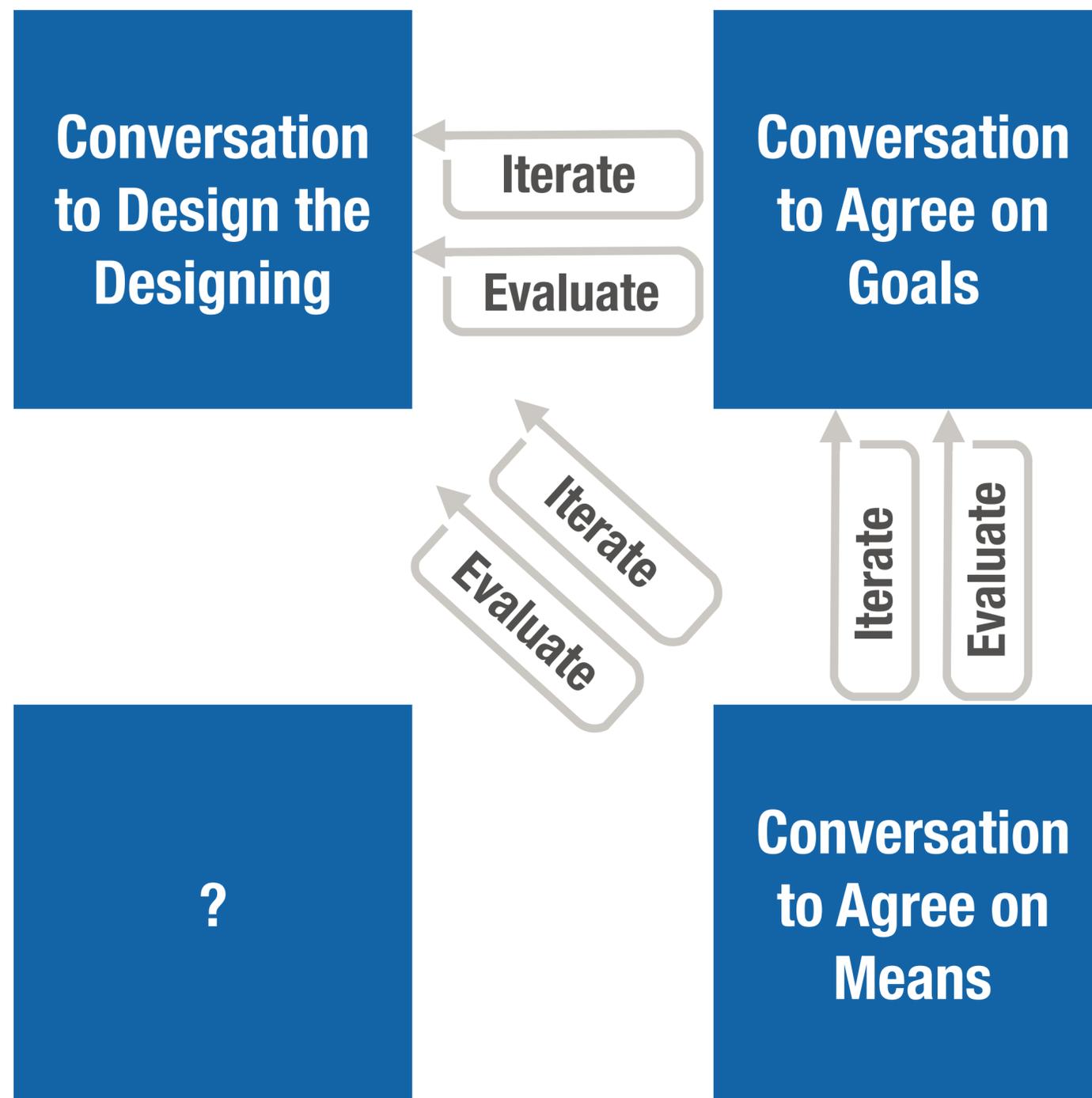
evaluation



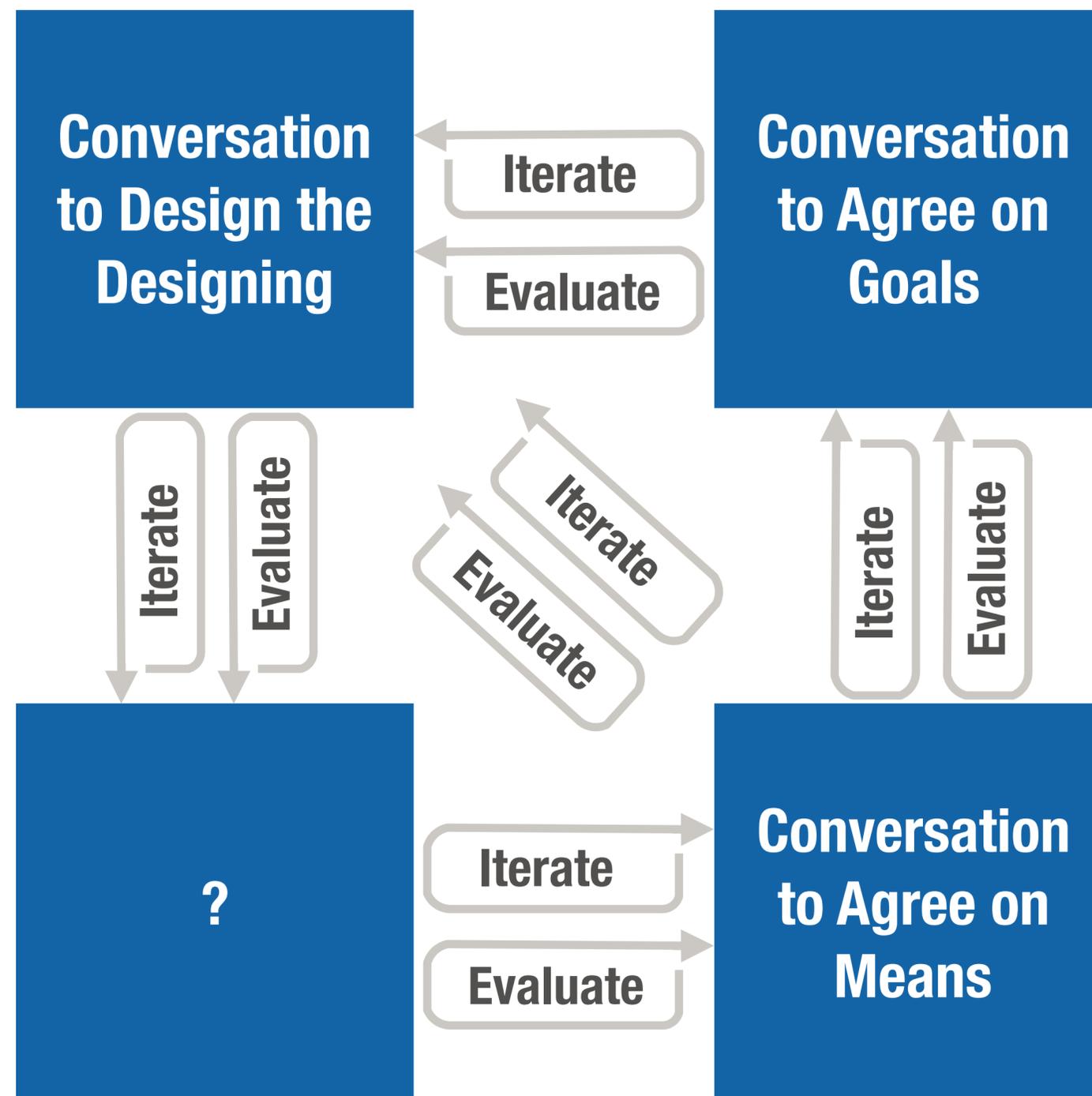
Design as Conversation



Design as Conversation



Design as Conversation

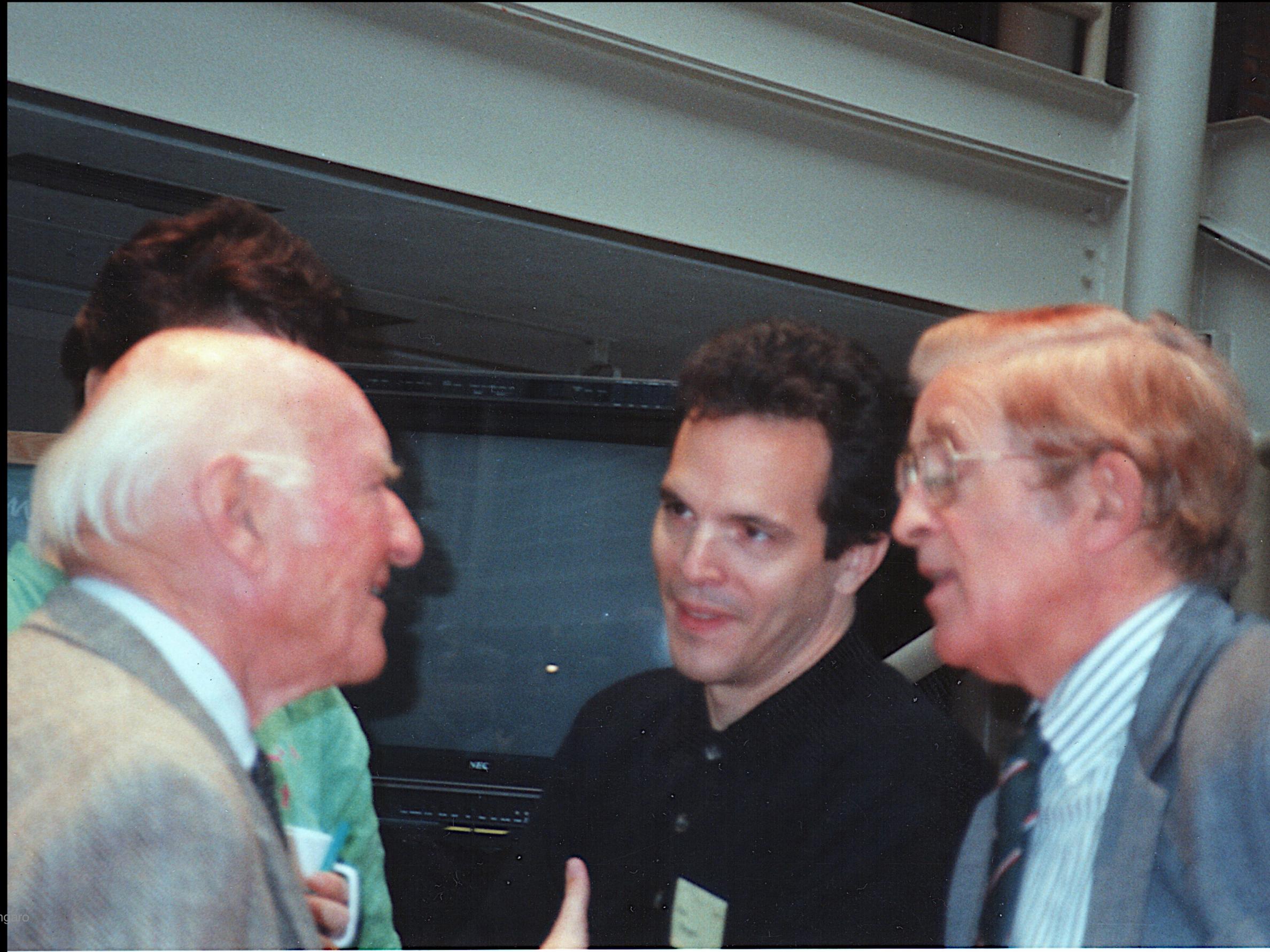


Heinz von Foerster
Paul Pangaro

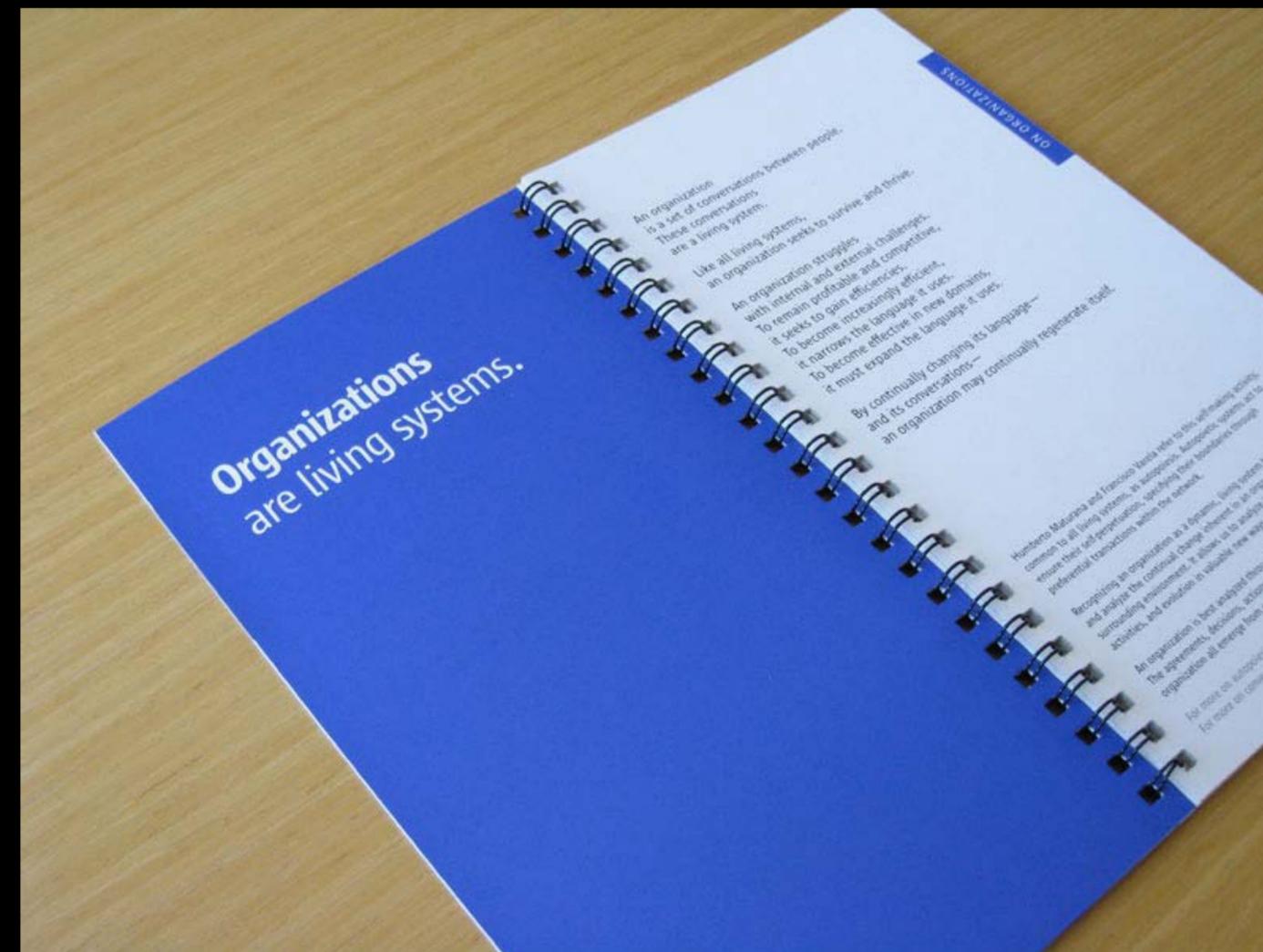
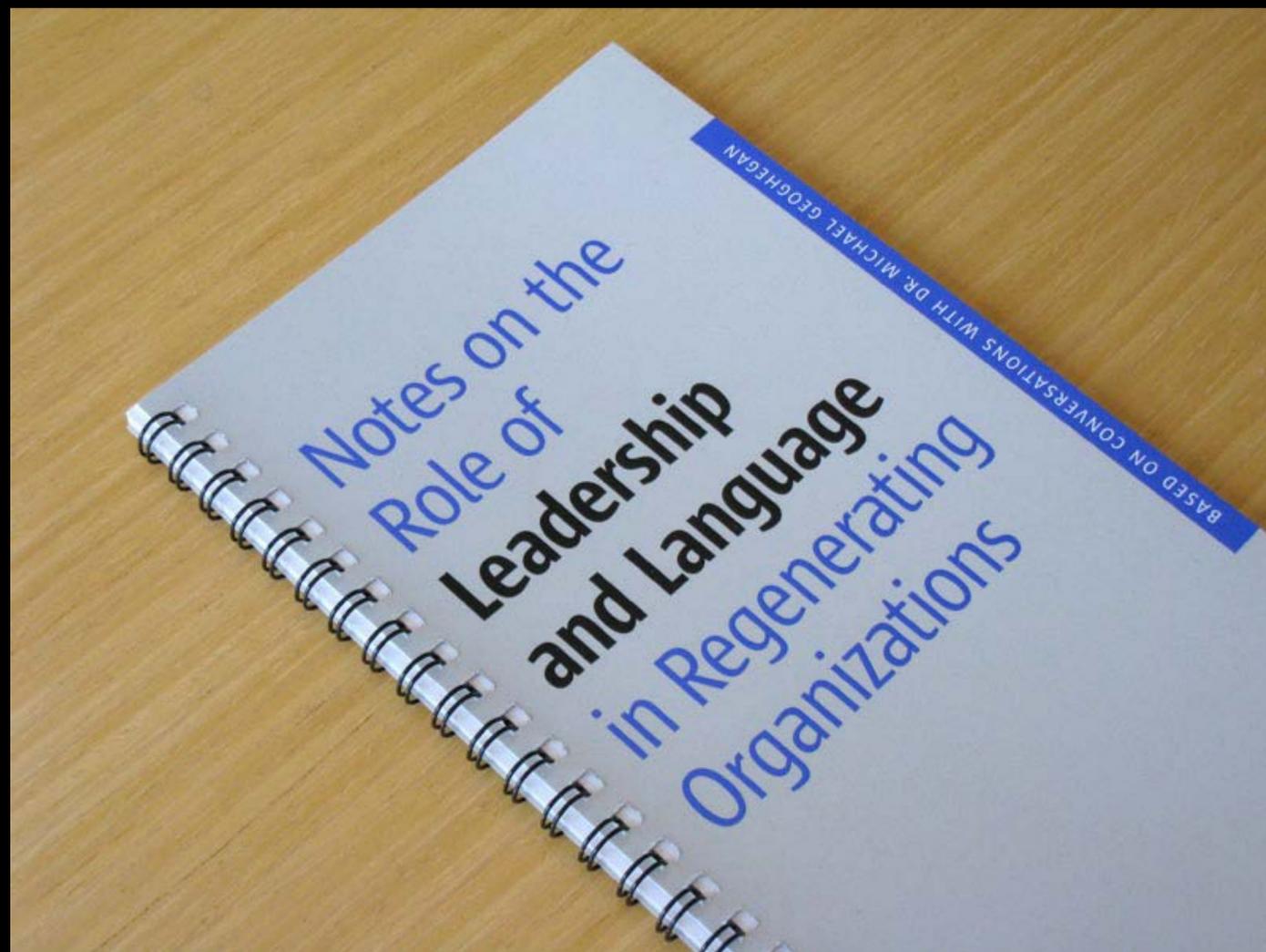


1993

Heinz von Foerster
Paul Pangaro
Michael Geoghegan



1993



2002

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

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.

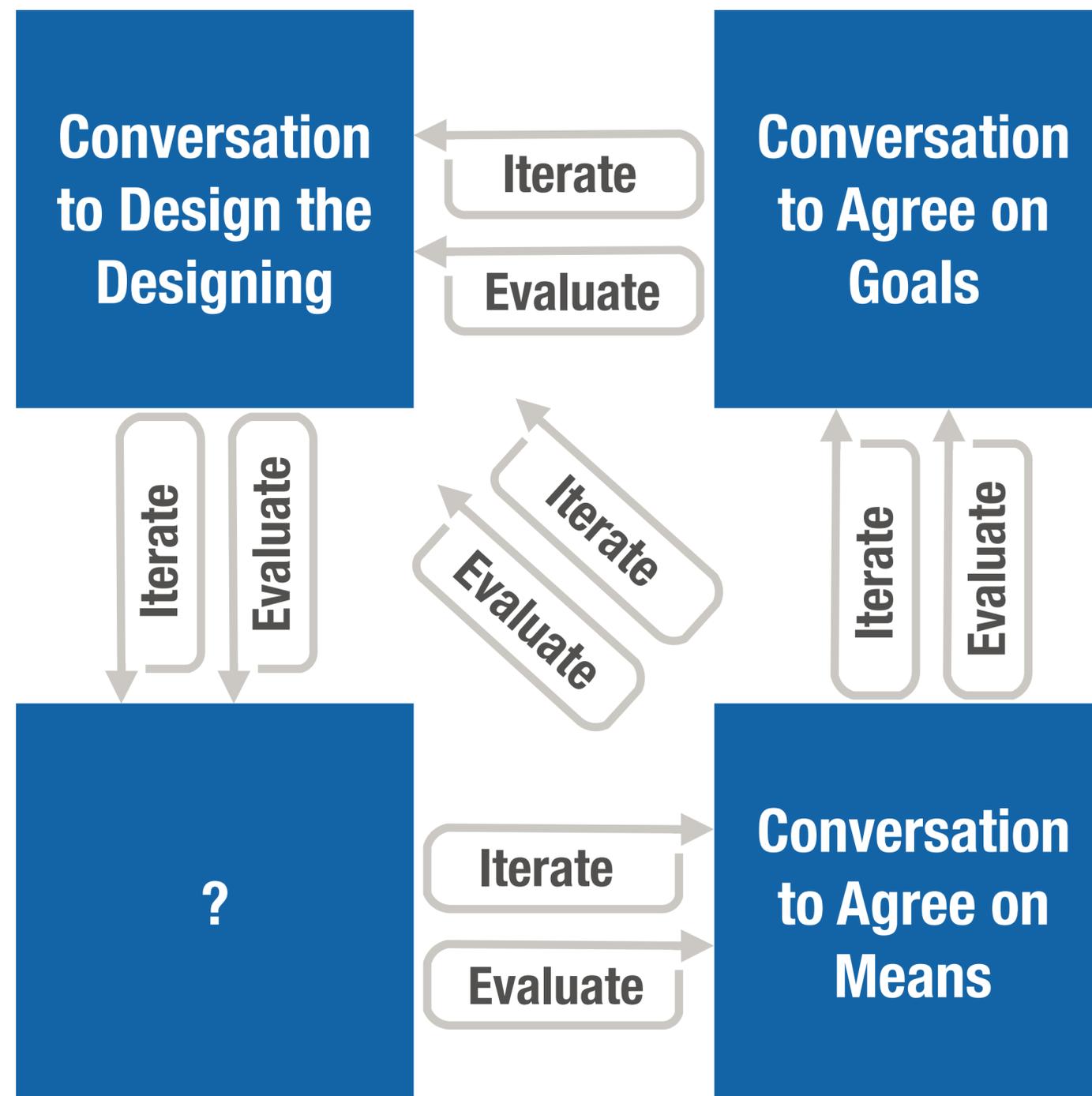
To regenerate,
an organization creates
a new **language**.

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

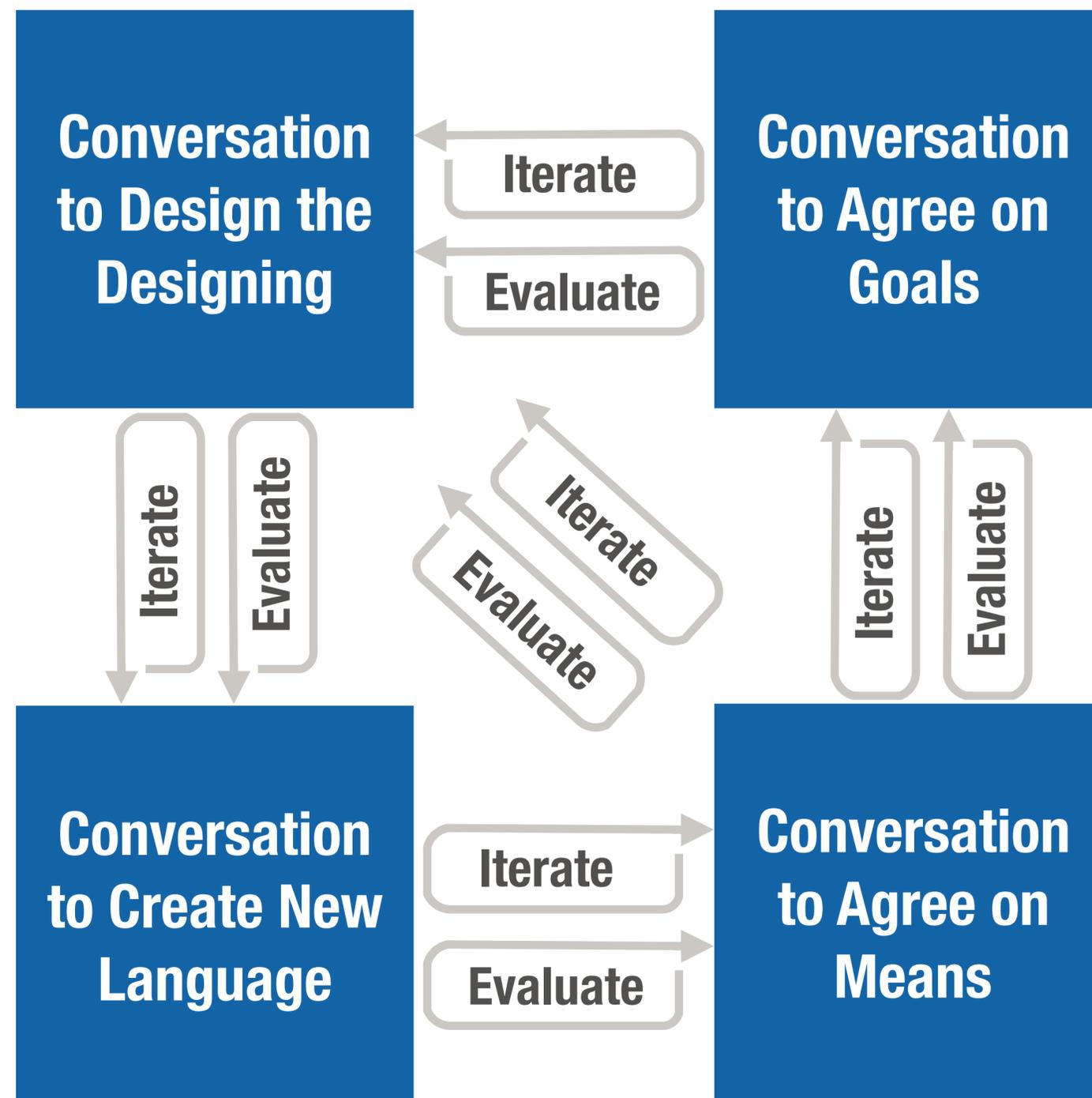
They do so by generating new language that appropriate groups in the organization come to understand and embrace.

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

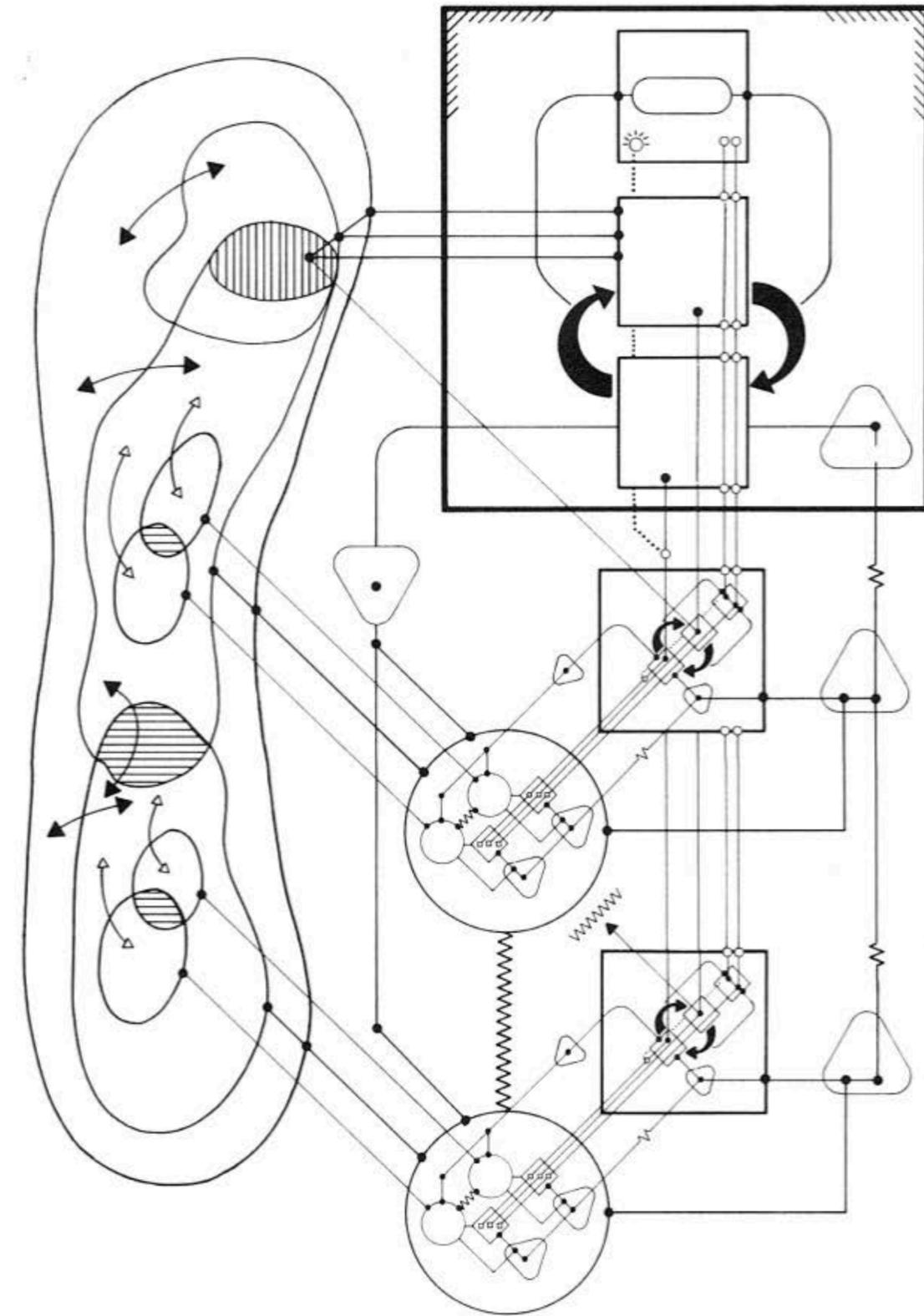


CHART ONE

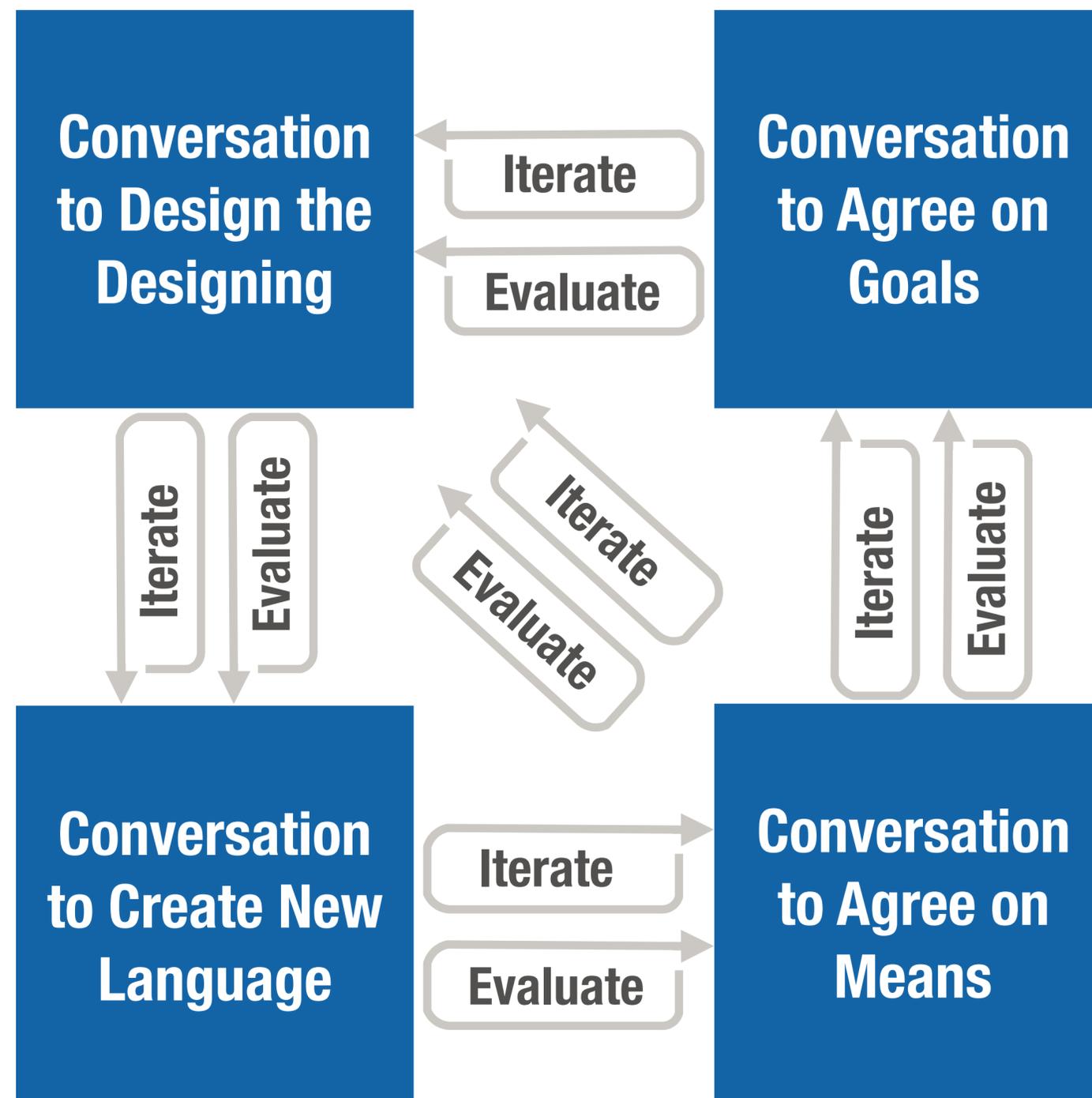
NAME OF THE VIABLE SYSTEM IN FOCUS:

© S. Beer 1985

Diagnosing the System for Organizations
Stafford Beer 1985

SKIP

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.

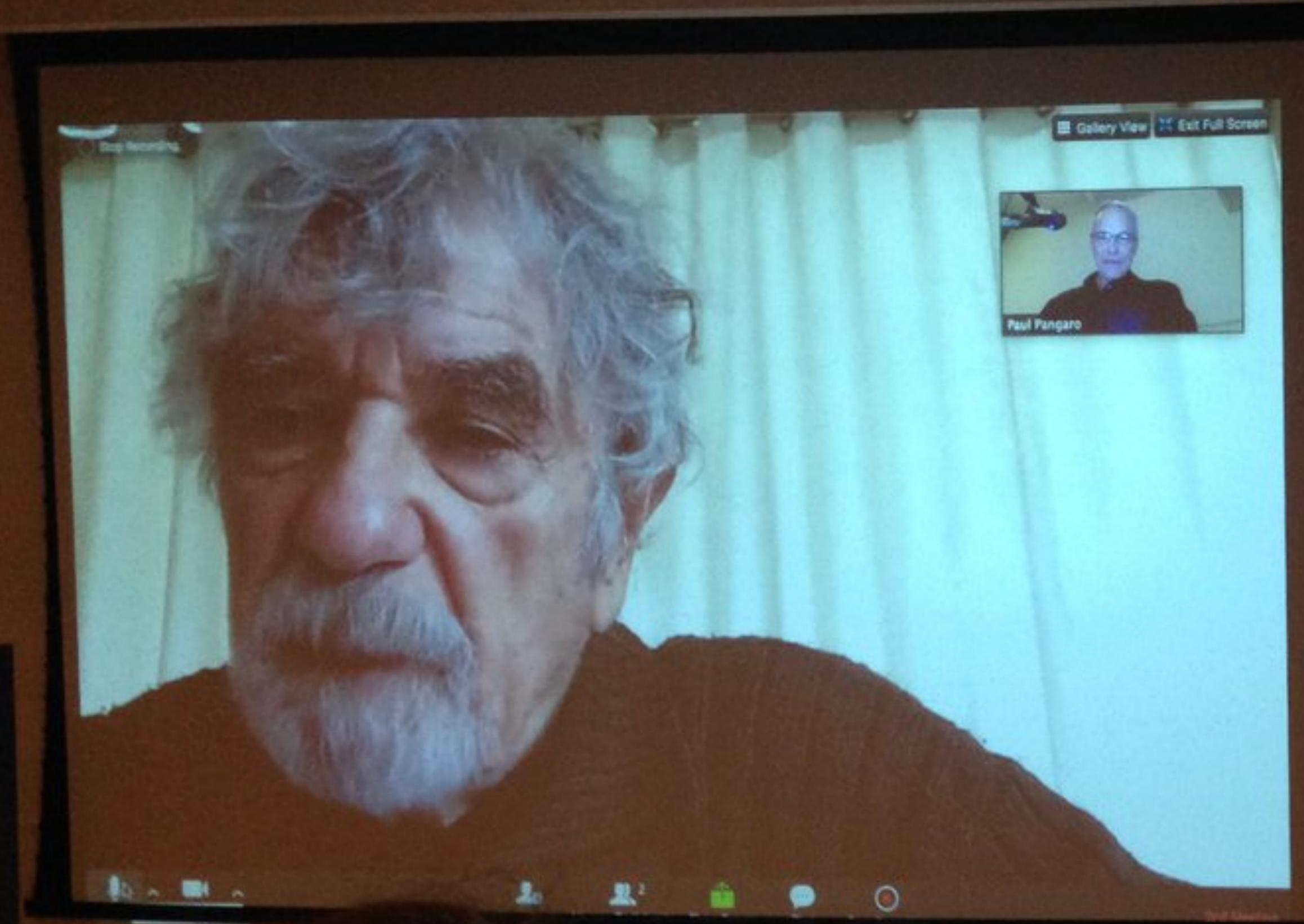
We construe design as a conversation for action — that is, as cybernetics.

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

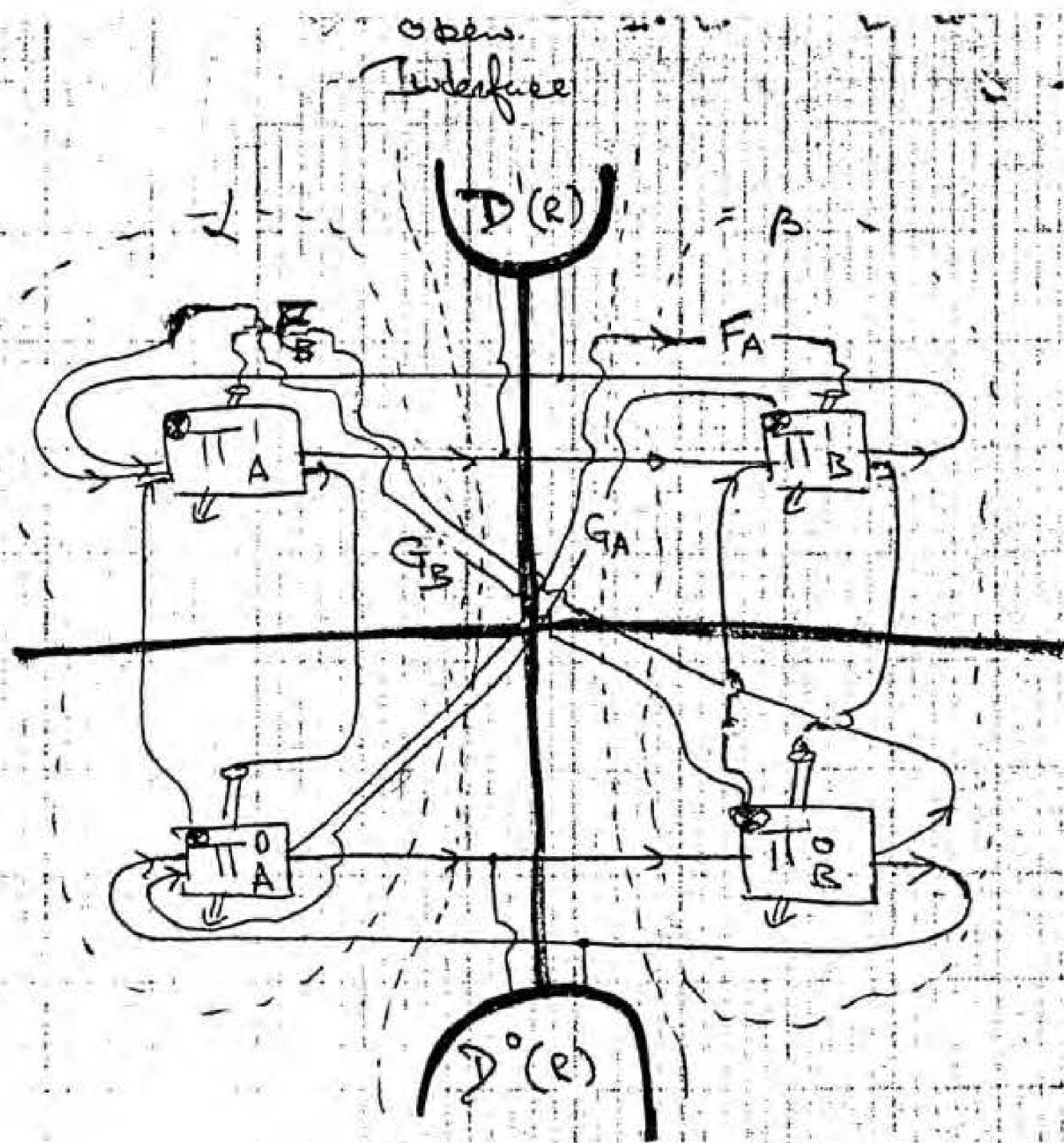
Humberto Maturana



2016

<https://vimeo.com/189999302>

Conversation as Living Together in Languageing



10. The conditions to be satisfied as a prerequisite for creative and innovative activity, the former may be exhibited by either of F_A, G_A or F_B, G_B and to have a...

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
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(To create new language is innovative.)

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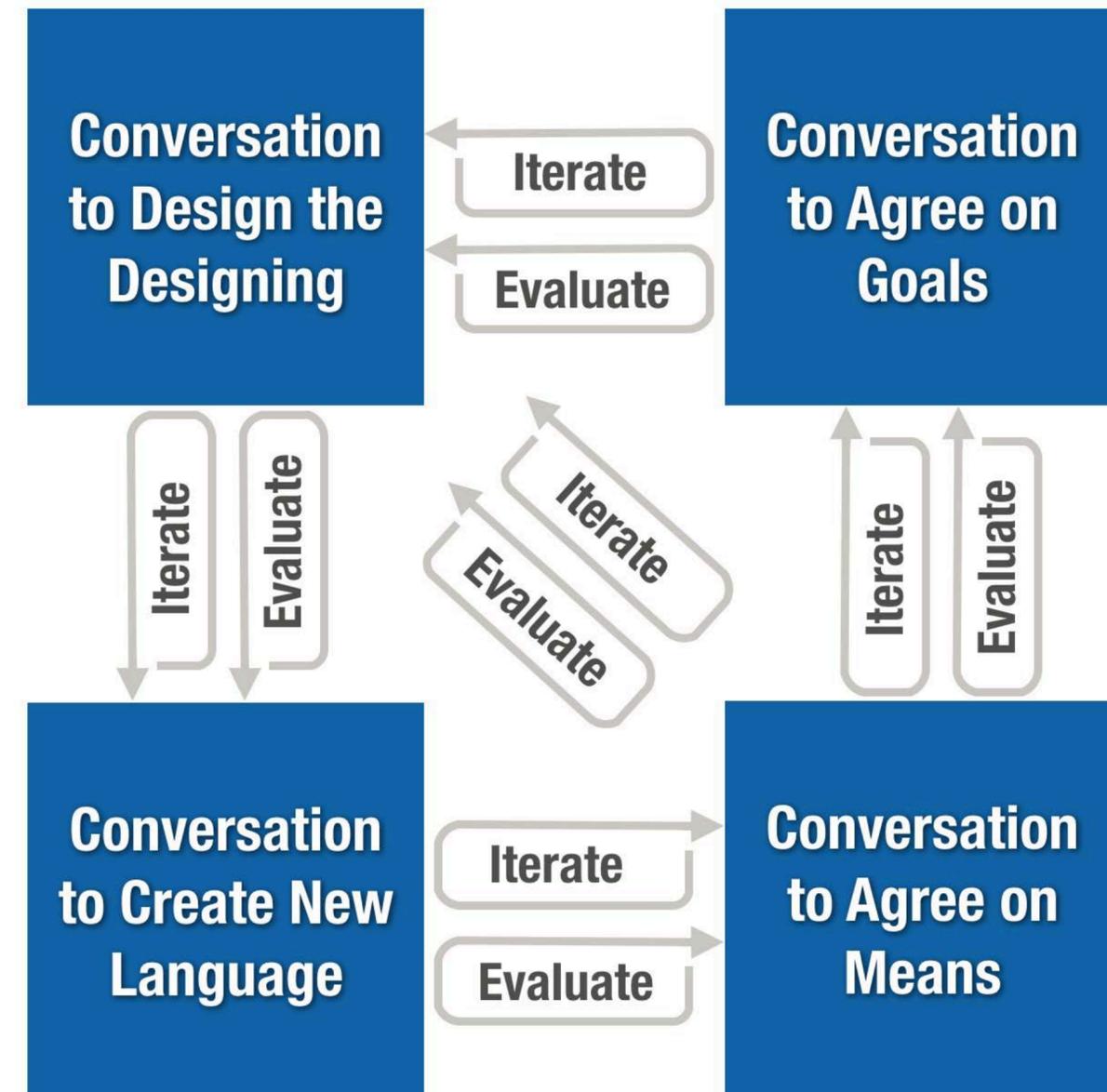
Design = Conversations for Action

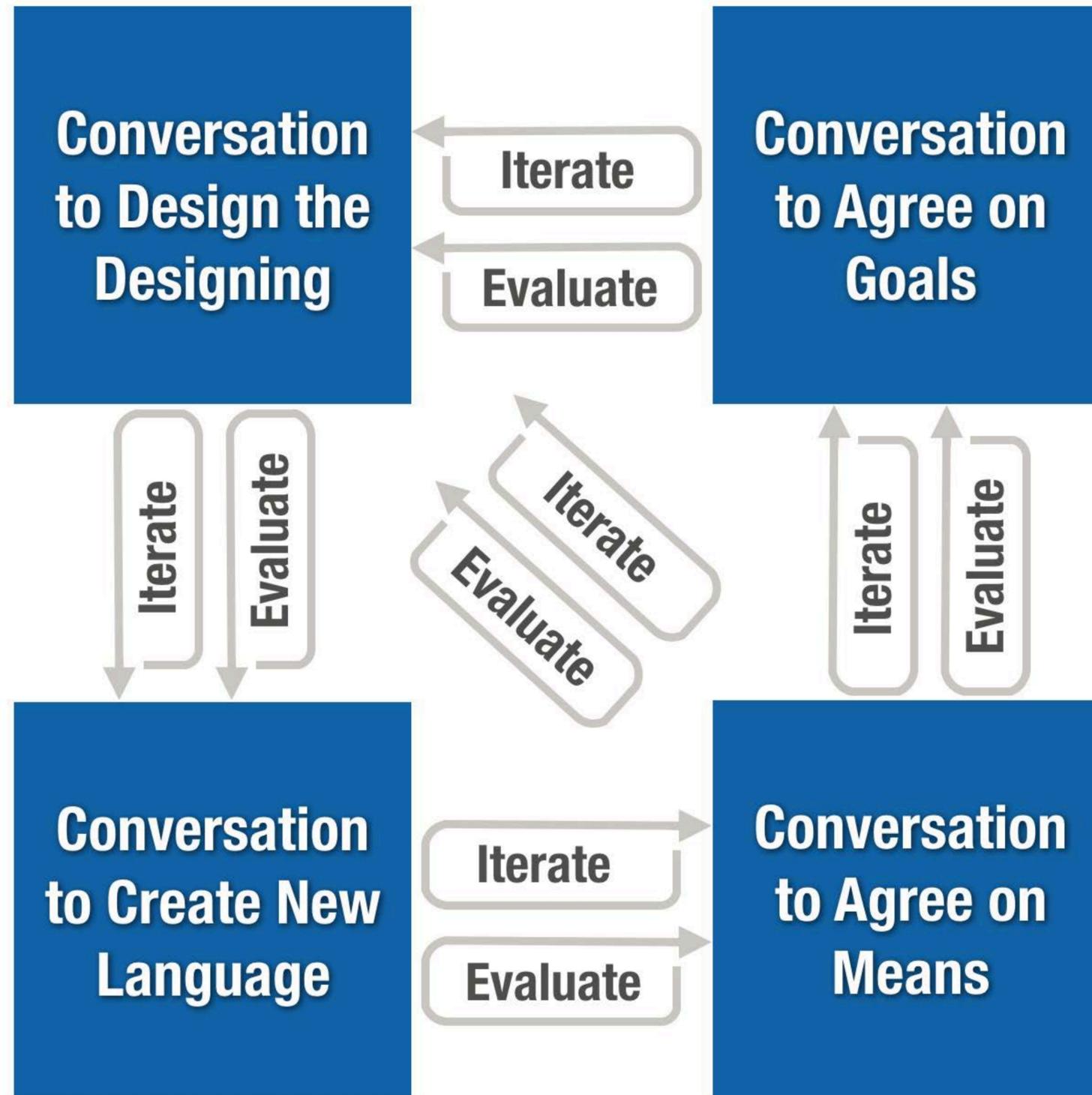
(To agree on goals is ethical.)

(To agree on means is collaborative.)

(To create new language is innovative.)

(To design the designing is responsible.)





Design of Conversations for Action

Challenges 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

“A is better off when B is better off”

— Heinz von Foerster

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

— Aesthetic Imperative, Heinz von Foerster

Edith Ackermann



2014

<https://vimeo.com/104178407>

Thank you.

See pangaro.com/hvf17/ for related slides and additional materials

Special Thanks to:

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Daniel Fabry

Hugh Dubberly

Pooja Upadhyay

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