Cybernetics, AI, and Ethical Conversations

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Cybernetics, AI, and Ethical Conversations

Cybernetics + Macy Meetings

"Today's AI" + "Wicked Problems"

Cybernetics + Conversation

Gordon Pask + Ethical Interfaces

Ethical Intentions + #NewMacyMeetings

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Cybernetics + Macy Meetings

In the 1940s and 1950s, a series of small conferences were funded by the Josiah Macy Jr Foundation.

Experts from a vast range of disciplines focused on **purpose** in understanding and designing complex systems. They created a new way of thinking and acting in the world and started a revolution.

They called this new field **cybernetics** from a Greek word meaning the art of steering toward a goal —
that is, acting with purpose.

These original **Macy Meetings** changed the worlds of science, engineering, and humanities.

Cybernetics | Neural Nets | AI

McCulloch-Pitts neurons	— 1943	— "neural nets" are born
Macy Meetings on Circularity	— 1946-1953	— swarms the *Zeitgeist*
Cybernetics by Wiener	— 1948	— influences generations
Dartmouth AI Conference	— 1956	— *contra* Cybernetics
Symbolic AI rises	— 1956-1980	— AI swarms the zeitgeist
Perceptrons kills neural nets	— 1969	— Minsky denies von Foerster
Cybernetics languishes	— 1956-2010	— AI influences generations
Hinton brings back neural nets	— 1980s	— Expert Systems come & go
Internet brings Big Data	— 2000s	— NN swarm the *Zeitgeist*
"Surveillance Capitalism"	— 2000s-2020	— "Wicked problems" arise

Cybernetics | Neural Nets | AI — Chronology

1940s **Neural Nets + Cybernetics**

1960s **Symbolic AI**

1980s **Expert Systems**

2010s **Neural Nets + Big Data + Massive Compute**

2020s **"Today's AI"—AI everywhere in our lives**

"Wicked problems" arising from Today's AI

Manipulation of attention by Internet platforms

Manipulation of sentiment in politics & elections

Loss of privacy

"Dark Patterns" & "Deep Fakes"

Bias in law enforcement algorithms

Facial recognition leading to social control

Overpowering of human capacity & "Human Downgrading"

—AI is making the world we see and the world we live in.
—Human purpose is lost.

"Wicked problems" arising from Today's AI

Today's "Wicked Problems" demand conversations that:
- move toward action
- are trans-disciplinary
- and trans-global and trans-generational

Such scope is required to address all the pandemics of:
- biology and technology
- racism and inequality
- population and justice
- environment and health
- …

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These original **Macy Meetings** changed the worlds of science, engineering, and humanities. We need such a revolution again to tame today's "wicked problems" — **#NewMacyMeetings**.

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Cybernetics + Macy Meetings

"Today's AI" + "Wicked Problems" — *Discussion*

Cybernetics + Conversation

Gordon Pask + Ethical Interfaces

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Cybernetics | Design | "Wicked Problems"

Why Cybernetics?

Cybernetics = Antidisciplinarity*

Applies across siloed disciplines

Focuses on purpose, feedback, action in any system

Offers methodology for "complex adaptive systems"

Seeks to regulate and operate effectively, not dominate

Brings an ethical imperative to human action

*Andrew Pickering coined the phrase “antidisciplinarity” in the context of cybernetics in 2010: see his “Ontology and Antidisciplinarity”, in Barry and Born, *Interdisciplinarity: Reconfigurations of the Social and Natural Sciences*, Routledge, London 2013.

Cybernetics | Design | "Wicked Problems"

Why Cybernetics?

What are the alternatives?

What are the alternatives?

Science has failed to tame wicked problems.
Governance has failed.
Socio-technical systems have failed.
Today's AI has failed.
Engineering has failed.
Psychology has failed…

—Will society fail?

Cybernetics | Design | "Wicked Problems"

Why Cybernetics?
What are the alternatives? None apparent.

What are the alternatives?

"... we are trying to apply design to science and think that
second-order cybernetics X design
X some modern version of Bauhaus
is what we need to fix science..."

— Research Lab Director, 2014

Cybernetics | Design | "Wicked Problems"

Since "Wicked Problems" cut across complex adaptive systems, we need deep conversations across all domains.

We need #NewMacyMeetings* (global and virtual)
with Cybernetics as the glue, bridging humans and machines, societies and network platforms.

*Andrew Pickering invoked the phrase "Next Macy Meetings" in 2014: The Next Macy Conference: A New Synthesis"

Cybernetics | Design | "Wicked Problems"

Why Cybernetics?
What are the alternatives? None apparent.
What is missing?

Conversation

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

— Ranulph Glanville

Conversation X Design → "Wicked Problems"

Why does conversation matter?

- ***to tame "Wicked Problems", we must act together***
- ***to act together, we must reach agreement***
- ***to reach agreement, we must engage with others***
- ***to engage with others, we must have shared language.***

To cooperate and collaborate requires conversation.

Conversation X Design → "Wicked Problems"

What may follow from conversation?

- ***shared history***
- ***relationship***
- ***trust***
- ***respect***
- ***unity.***

All these require conversation.

Conversation X Design → "Wicked Problems"

What does conversation enable?

- ***community***
- ***commerce***
- ***culture***
- ***government***
- ***society.***

All these **demand** conversation.

Cybernetics | Design | "Wicked Problems"

Why Cybernetics?
What are the alternatives? None apparent.
What is missing? Conversation!

Conversation | Design | "Wicked Problems"

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Conversation | Design | "Wicked Problems"

Why Cybernetics?
What are the alternatives? None apparent.
What is missing? Conversation!
How does all this go together?

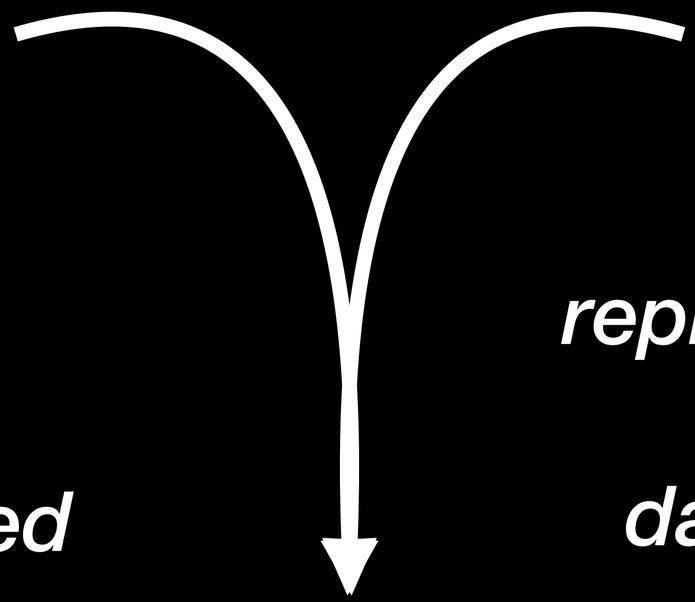
How does all this go together?

Conversation

-human
-organic
-resonant
-emergent
-socially-animated

Today's AI

machinic-
digital-
representational-
predictive-
data-animated-



Cybernetics

bilingual sensibility

How does all this go together?

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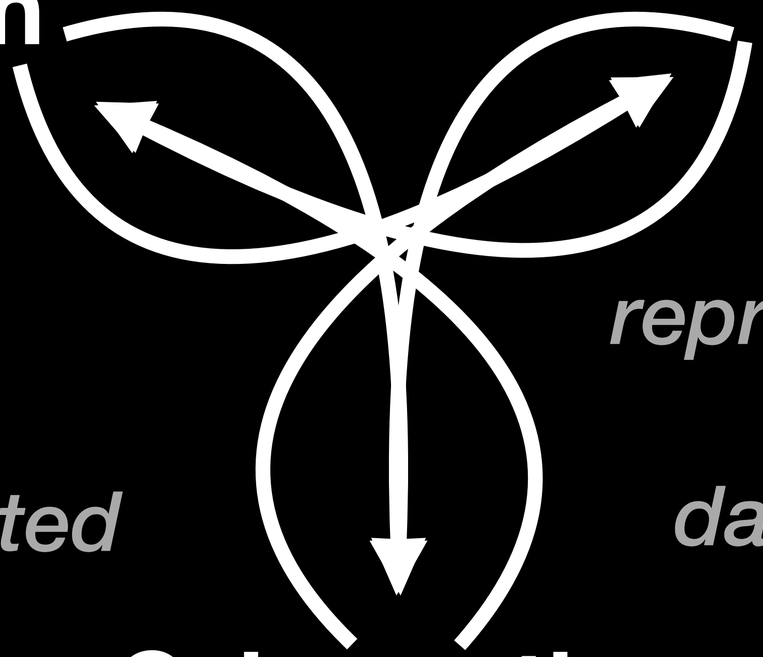

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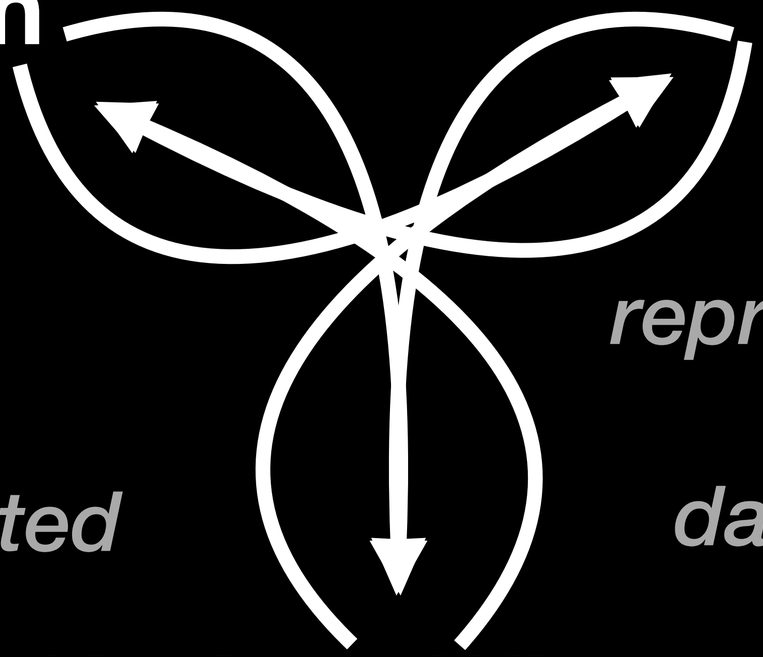

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Norbert Wiener

"*animal and machine*"

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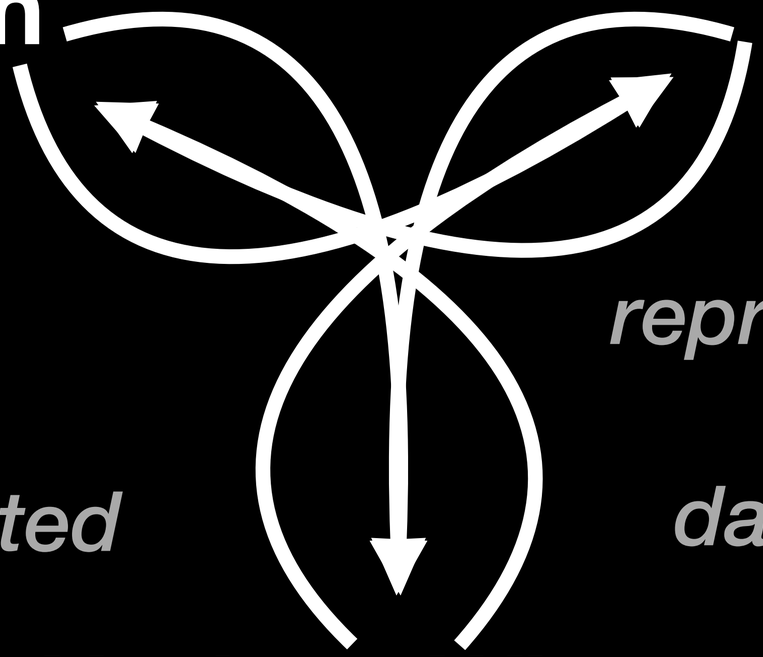

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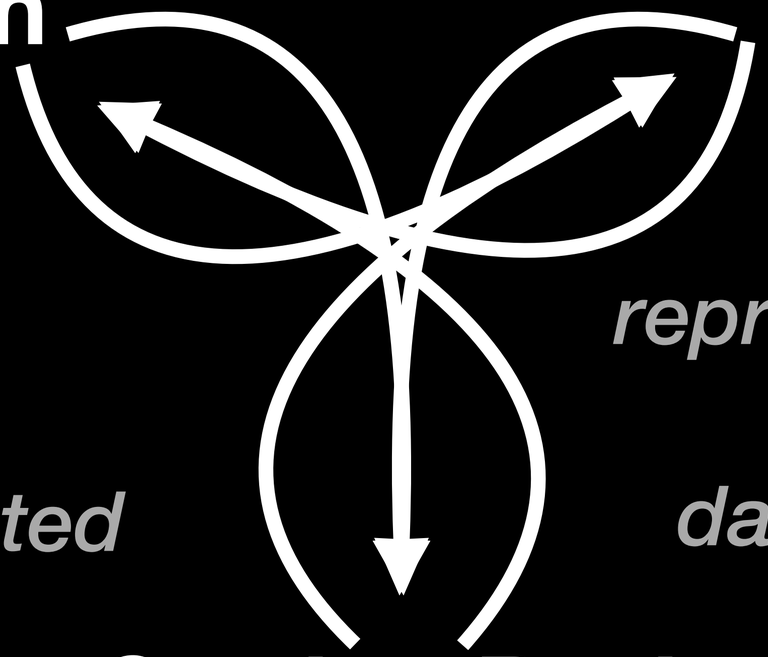

Today's AI

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digital-
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Gordon Pask

Conversation Theory — cybernetic praxis

Gordon Pask

Colloquy of Mobiles

Autonomous agents that learn and converse

Bilingual sensibility—human & social, machinic & digital

Resonance not representation

Interactional not stand-alone

Centre Pompidou
Paris 2020

Gordon Pask

Goals of Conversation Theory

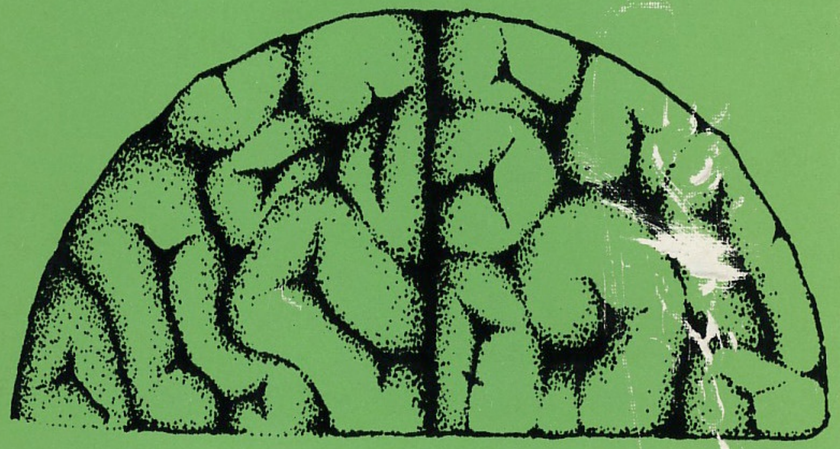
To rigorously understand what makes conversation work—
and to make machines conversant like humans.

To rigorously understand how systems learn—
and to makes machines that learn like humans.

1975

GORDON PASK

CONVERSATION, COGNITION AND LEARNING



A CYBERNETIC THEORY AND METHODOLOGY

ELSEVIER

GORDON PASK

CONVERSATION THEORY

APPLICATIONS IN EDUCATION AND EPISTEMOLOGY

ELSEVIER

1976

Soft Architecture Machines
Nicholas Negroponte, ed.,
MIT Press, 1976

Book Design: Muriel Cooper

1

Aspects of Machine Intelligence

Introduction by Gordon Pask

The current status of mindlike computer programs is summarized, at a philosophical rather than technical level, in the following short but authoritative papers: Minsky (1968), Simon (1966), Turing (1969). Whoever wishes to delve into this subject in greater depth may read the books where these papers are published in their entirety, augmenting them, to obtain comprehensive background, by Ernst and Newell (1969); Ashby (1960); Cohen (1966); Fogel, Owens, and Walsh (1966); Von Foerster and Zopf (1962); Uttley (1959); Von Foerster et al. (1968); McCulloch (1965); Oestreicher and Moore (1968); Amarel (1969); Rose (1970); Minsky and Papert (1969); Feigenbaum and Feldman (1963); Banerji (1969); and Garvin (1970). It is also worth perusing all volumes of the journal *Artificial Intelligence*.

Henceforward, it is assumed either that the reader knows the *kind* of symbolic operations performed by computer programs and other artifacts, that he will study the matter at leisure, or that he will take these operations for granted. With this supposition in mind I shall give a personal and possibly idiosyncratic view of the conditions under which *artificially intelligent* is a properly used term and offer an interpretation of these conditions with respect to *use* of the *architecture machine*. Apart from the pictograms or ikons developed in the text, the only special symbols used are the special brackets < and > which enclose *ordered* collections of objects; the equality sign =; and $\triangleq$, which is read as " *defined as equal to.*"

Overview

The contention is as follows: Intelligence is a property that is ascribed by an *external observer* to a *conversation* between *participants* if, and

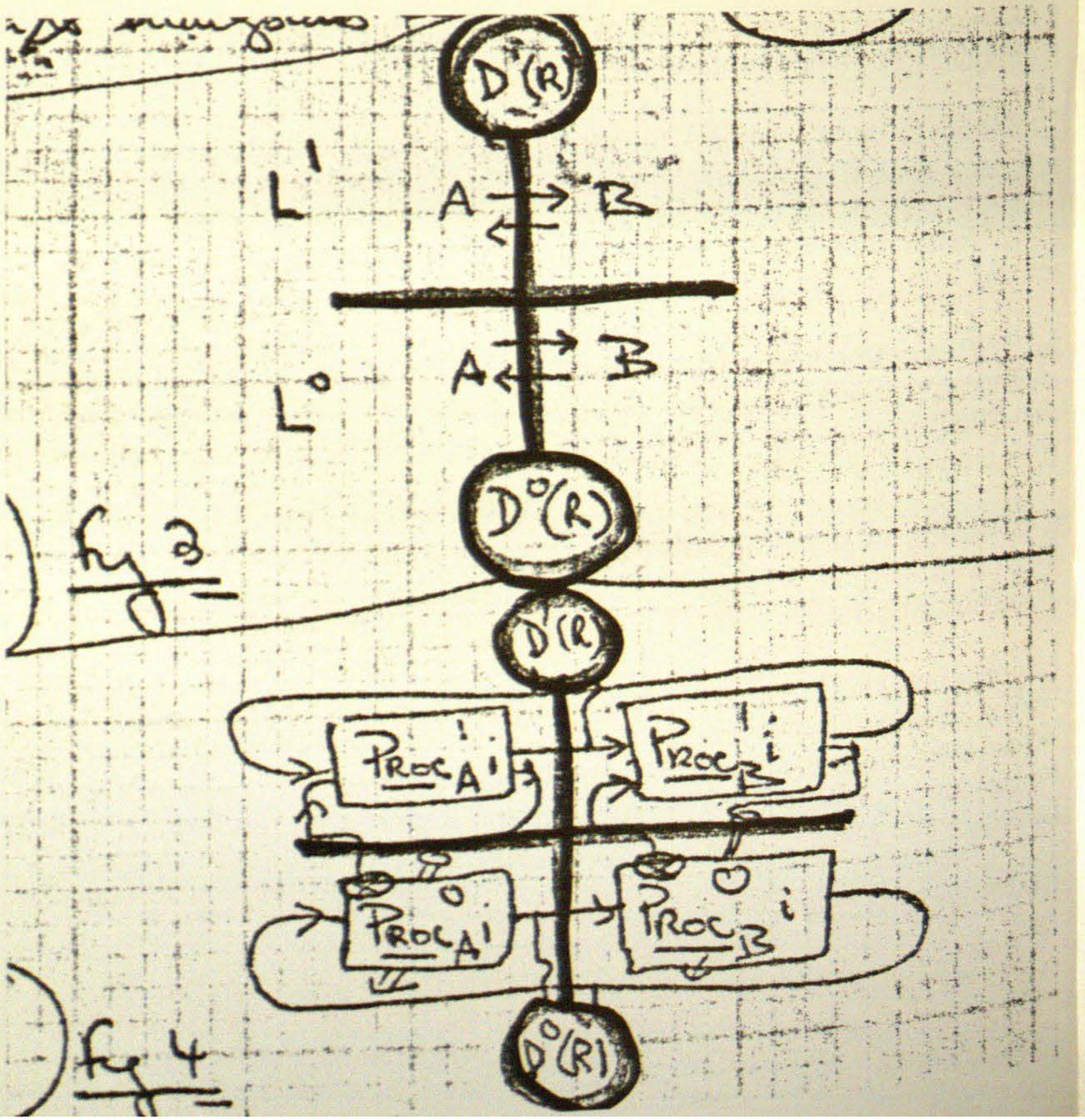


fig 3

fig 4

7.2. ♀ means "operates upon according to a hypothesis," and ⊗ means "gives a description (in the language appropriate to the level where the line terminates), which may or may not confirm the hypothesis."

7.3. Thus a complete circuit on one side of I , starting at ⊗, passing through — to a *Proc,* and returning by way of — and ♀ on the original *Proc* is a *causal* coupling, or, equivalently, it permits *reproduction* of the original *Proc.*

7.4. The unadorned, horizontal connections have a different meaning: they are *inferential* couplings, which, limiting cases apart, entail the notion of choice.

7.5. Hence, any complete circle (such as the line emanating from $Proc_A$ *i* to $Proc_B$ *i* and terminating on $Proc_A$ *i*) may be called a deductive chain.[5]

7.6. Finally, the lines to and from *D' (R)* and *D°(R)* indicate whatever is referenced by the inference, that is, whatever R_i in *R* is ostended by the participants *A* and *B* on occasion *n.*

7.7. Call this ikon (Figure 4) the conversational *paradigm.*

7.8. If one ikon is created by filling the spaces in Figure 3, then (obeying the proper rules) the process can be iterated laterally to yield a further *paradigm,* for example, the ikon in Figure 5. The motivation for doing so is noted in Section 2.1.1 ≙ to represent as much of mind as desired.

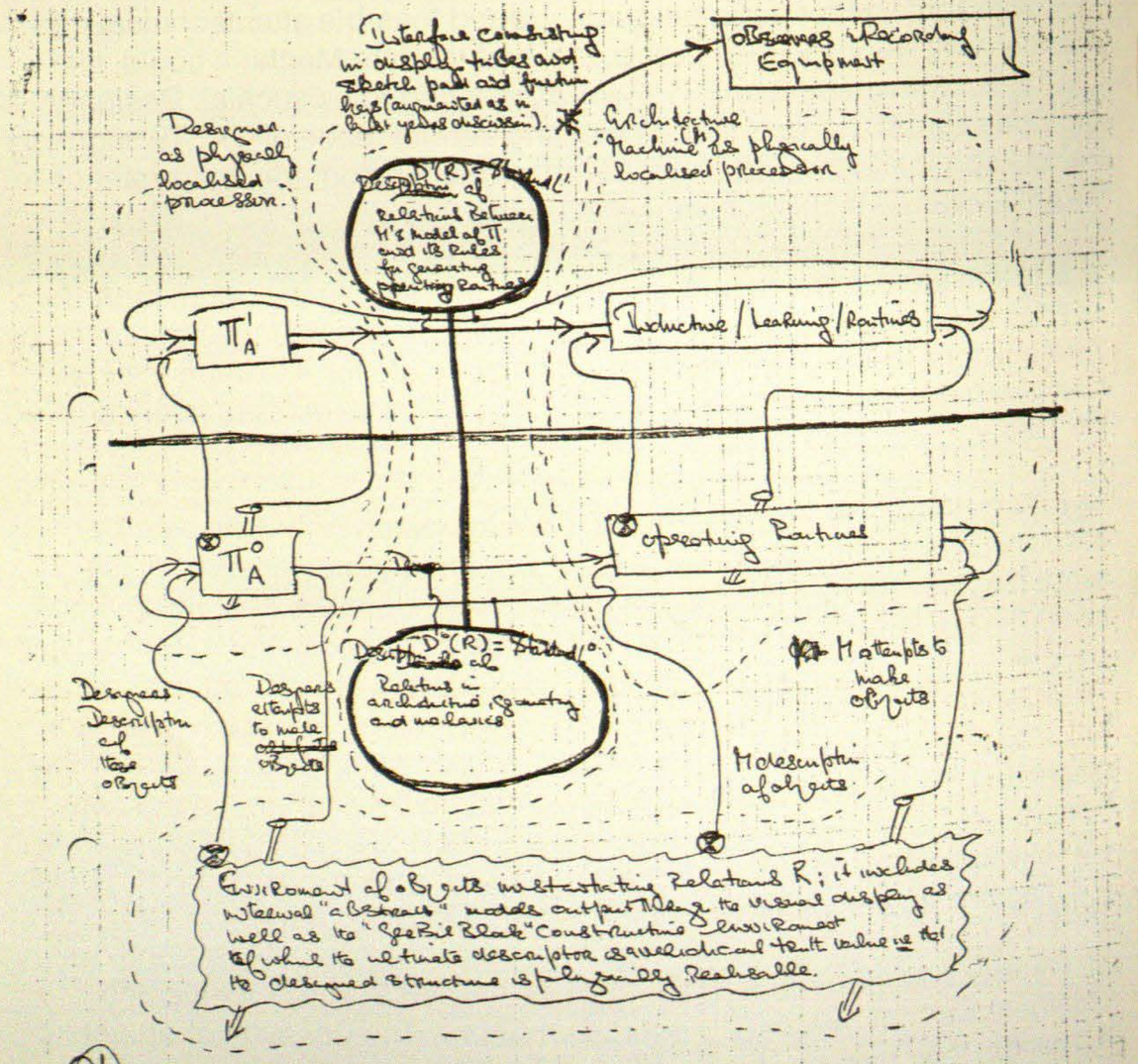


Fig 9.

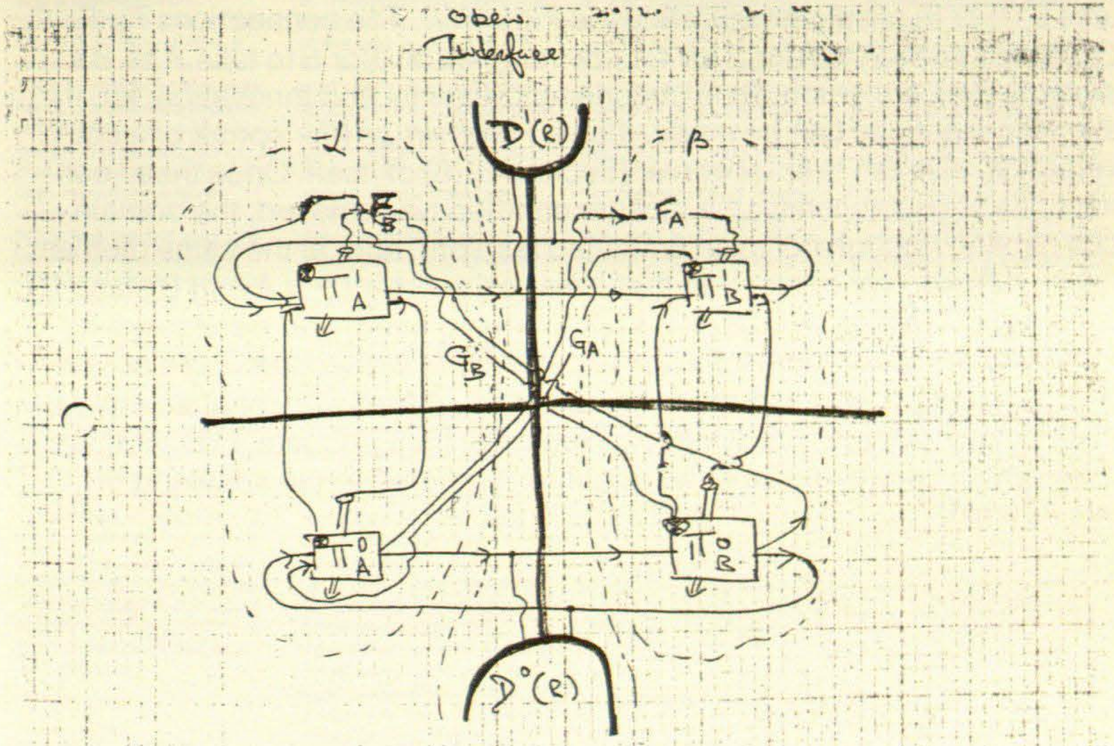
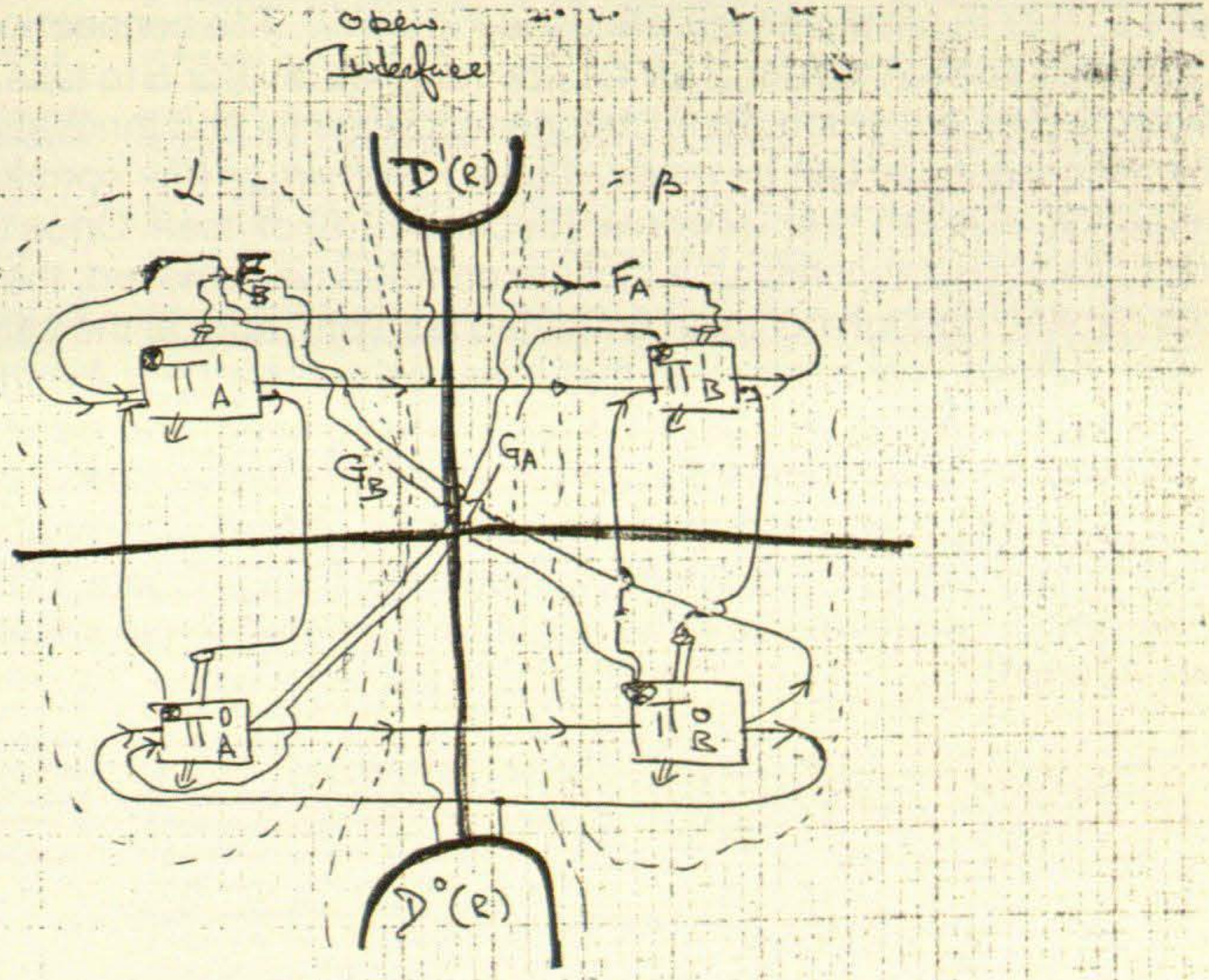


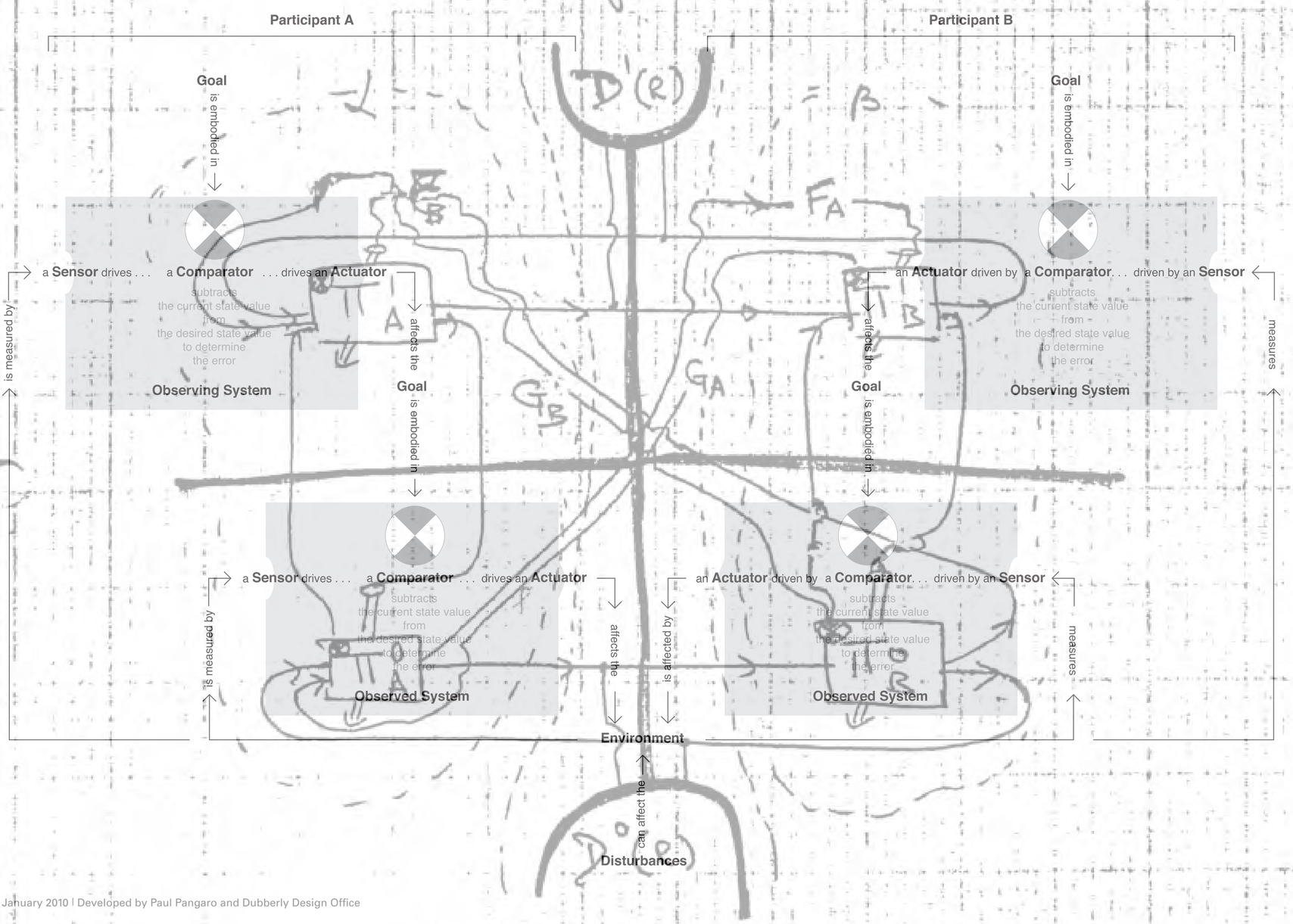
Fig 10. The conditions to be satisfied as a prerequisite for creative and innovative activity. The former may be exhibited by if either of F_A, F_B or F_B, G_B are properly coupling. For creativity (communicable insight) it is essential that both F_A, F_B and G_A, G_B are ~~defined~~ realised

10

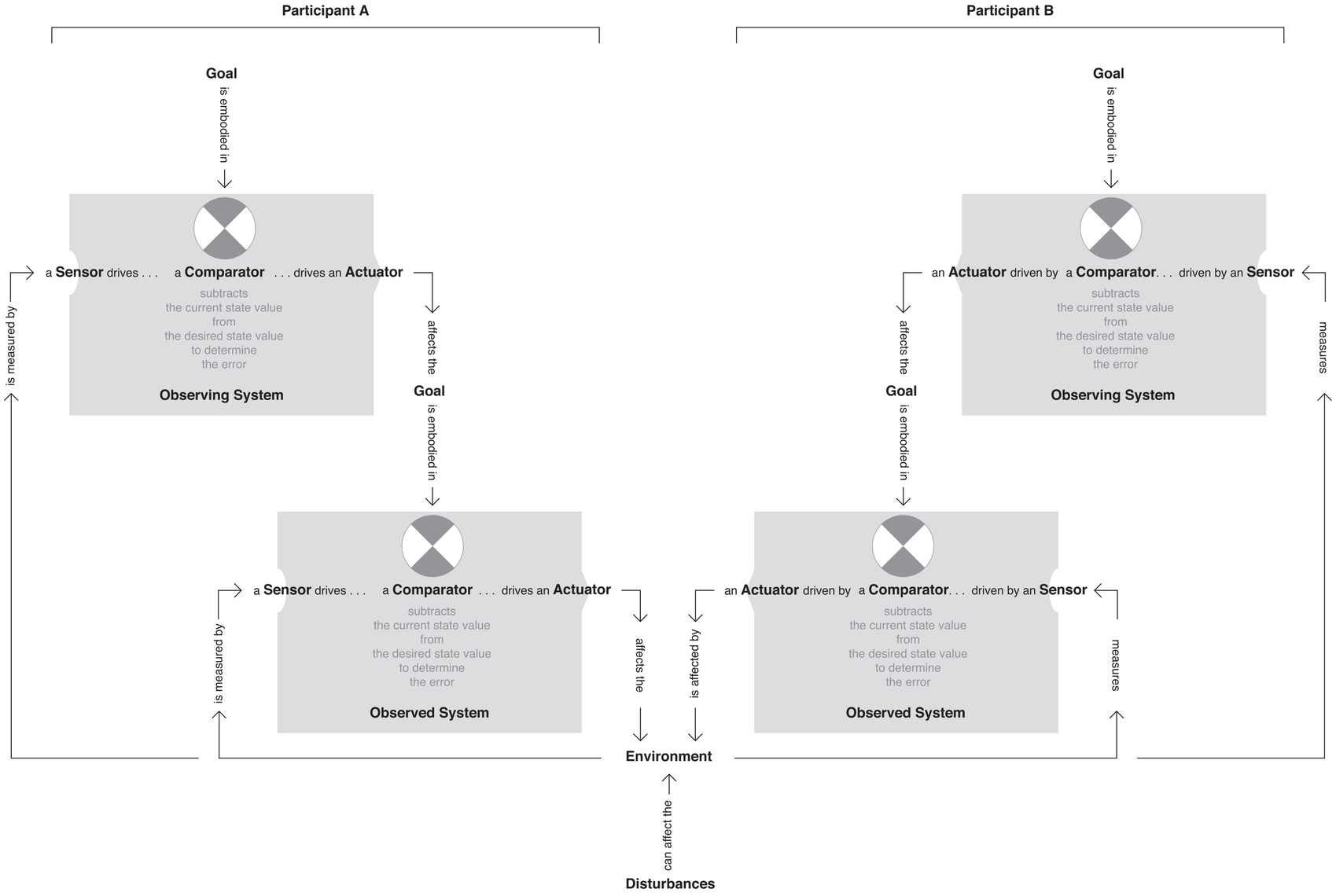


Open
Interface
D'(R)
α
β
F_B
F_A
Π^1_A
Π^1_B
G_B
G_A
Π^0_A
Π^0_B
D°(R)

Conversation: Formal Mechanism

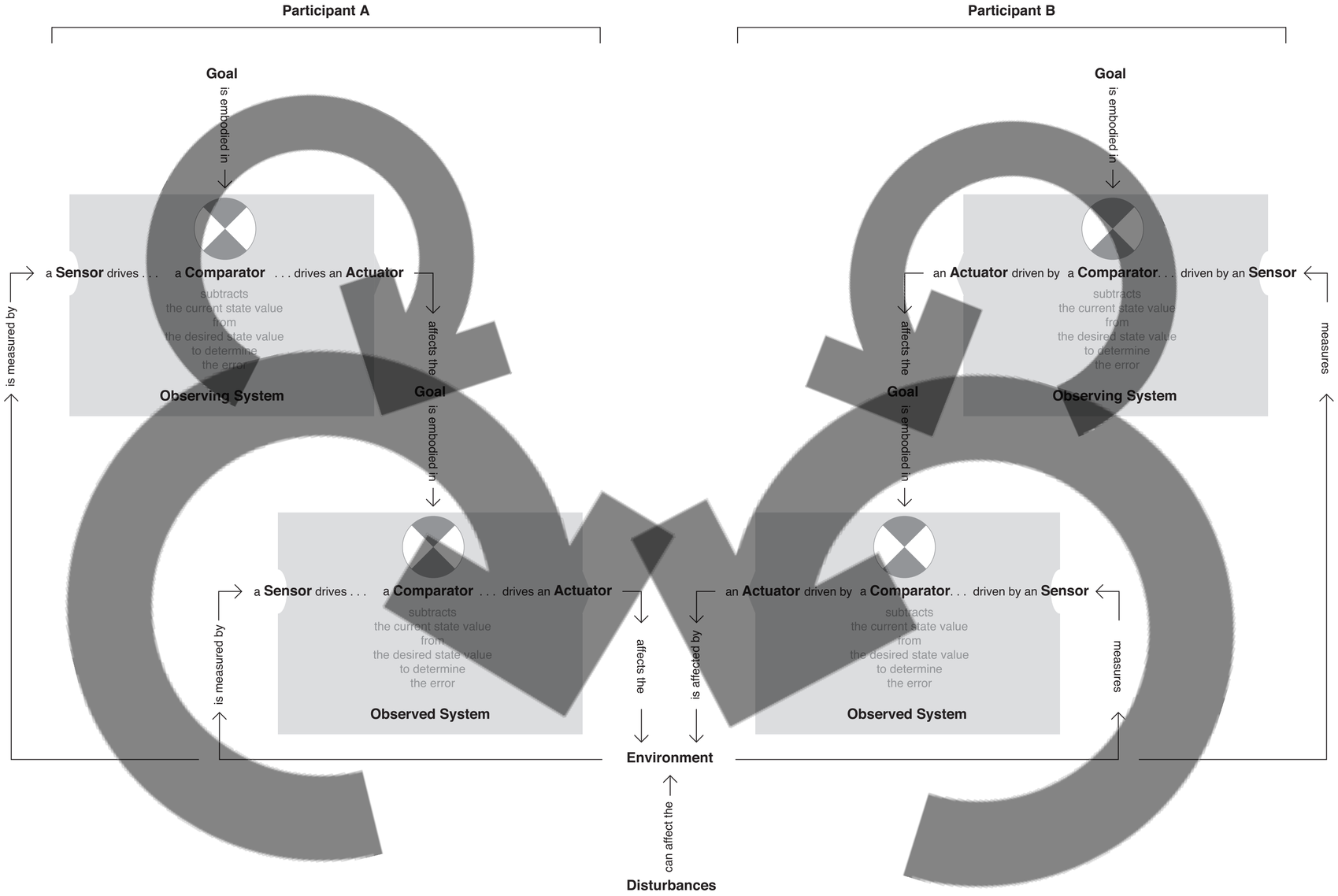


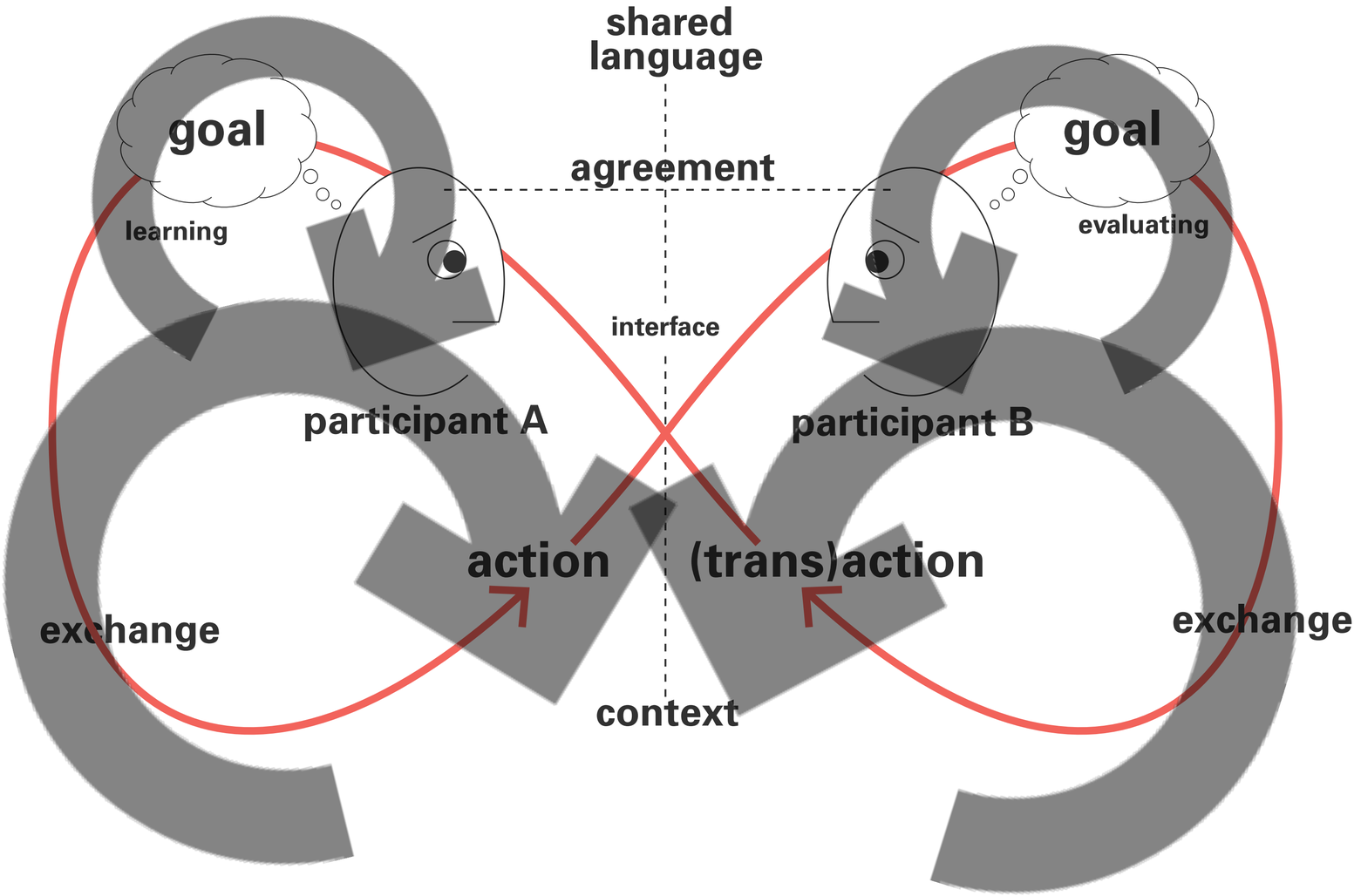
Conversation: Formal Mechanism



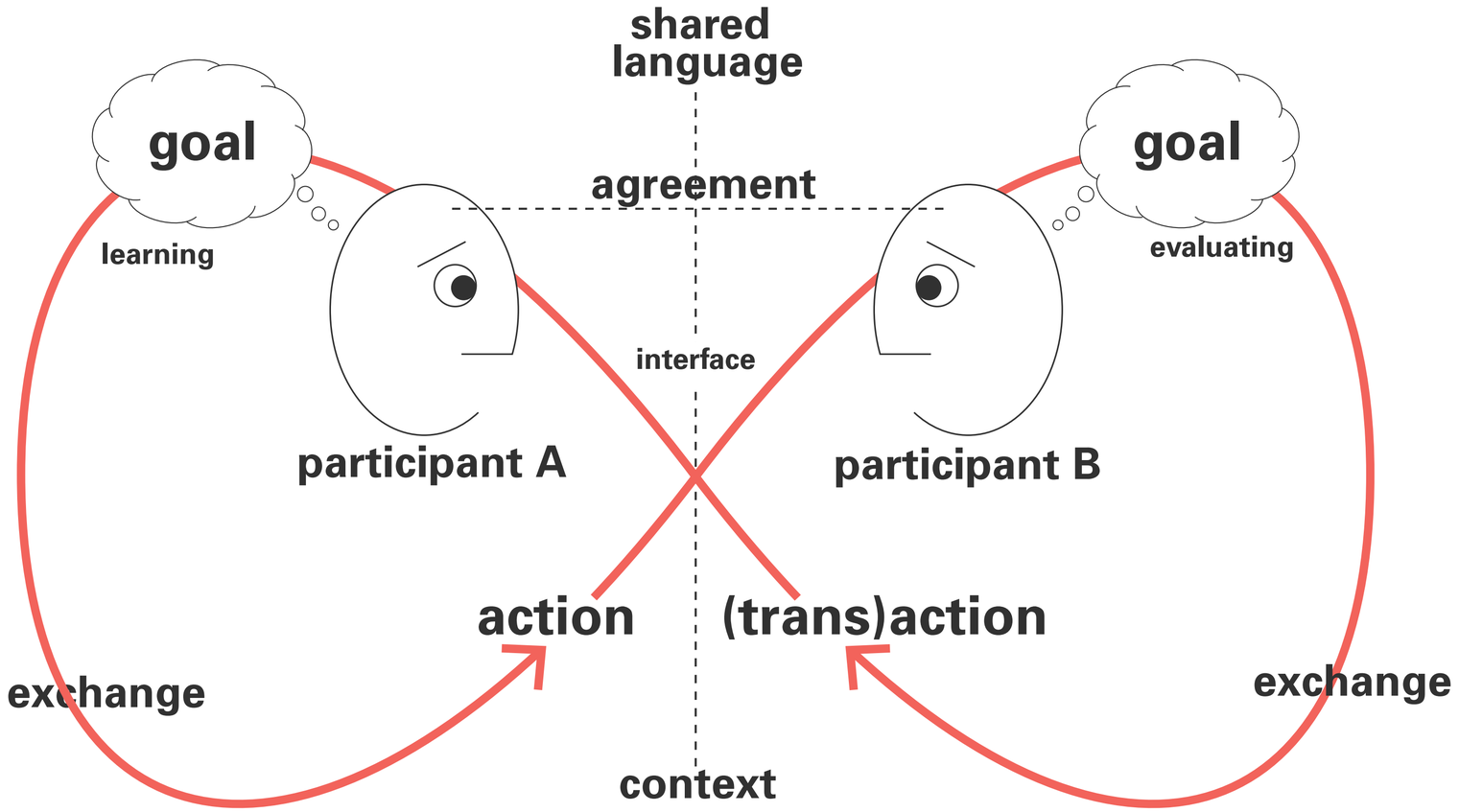
January 2010 | Developed by Paul Pangaro and Dubberly Design Office

Conversation: Formal Mechanism



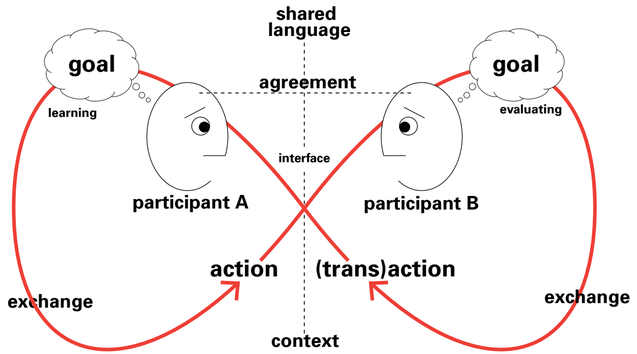

shared
language
goal
agreement
goal
learning
evaluating
interface
participant A
participant B
action
(trans)action
exchange
exchange
context

Conversation Model



See also Pangaro: Economy of Insight

Preferred Conversations



What is an effective conversation?

***A conversation in which something changes**
and brings (lasting) value to one or more participants.

*changes may be informational, transactional, rational, emotional…

Dubberly and Pangaro, 2009: "What is conversation? Can we design for effective conversation?"

Gordon Pask

Goals of Conversation Theory

To rigorously understand what makes conversation work—
and to make machines conversant like humans.

To rigorously understand how systems learn—
and to makes machines that learn like humans.

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Conversation | Design | "Wicked Problems"

Goals of Ethical Interfaces

To rigorously understand what makes conversation work—
and to make machines conversant like humans.

To rigorously understand how systems learn—
and to makes machines that learn like humans.

To build better machines
— to build a better society.

How do we do all this?

Organizing Principle

“I shall act always…

Organizing Principle

“I shall act always so as to increase…

Organizing Principle

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

Organizing Principle

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

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Organizing Principle

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

— Heinz von Foerster

Heinz von Foerster, 1991: “Ethics and Second-Order Cybernetics”

Organizing Principle

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

— Ethical Imperative, Heinz von Foerster

Heinz von Foerster, 1991: “Ethics and Second-Order Cybernetics”

Ethical Interfaces — Axiom #1

> ***"As a designer, I shall act always so as to increase the total number of choices for a user."***
>
> — Designer's Ethical Imperative

What the hell does this mean? How do we do this?

Ethical Interfaces — Axiom #2

“I shall act always to create conditions such that others may converse — with others and with themselves.”

"Design ***for*** Conversation"

What is the praxis of Ethical Design? I propose we:

- ***apply models of human conversation***
- ***strive for interfaces that are cooperative, ethical, humane***
- ***push for new forms of conversational interfaces.***

These are the offers in my presentation today.

Designing Ethical Interfaces

Intention #1 — Build cooperative interfaces

Conversation is a cooperative interface when sequences of coherent interactions enable participants to evolve points-of-view such that understanding and agreement are ongoing.

Intentions of Interactions for Conversation v4 — November 2019

Designing Ethical Interfaces

Intention #2 — Build ethical interfaces

Conversation is an ethical interface when there is reliable transparency of action + intent (what + why), such that trust may build and be maintained over time.

Intentions of Interactions for Conversation v4 — November 2019

Last modified: December 18, 2017 (view archived versions) Hide examples

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Accessing and updating your personal information

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Whenever you use our services, we aim to provide you with access to your personal information. If that information is wrong, we strive to give you ways to update it quickly or to delete it – unless we have to keep that information for legitimate business or legal purposes.

We aim to maintain our services in a manner that protects information from accidental or malicious destruction. Because of this, after you delete information from our services, we may not immediately delete residual copies from our active servers and may not remove information from our backup systems.

Information we share

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We do not share personal information with companies, organizations and individuals outside of Google unless one of the following circumstances applies:

- **With your consent**

  We will share personal information with companies, organizations or individuals outside of Google when we have your consent to do so. We require opt-in consent for the sharing of any sensitive personal information.
- **With domain administrators**

  If your Google Account is managed for you by a domain administrator (for example, for G Suite users) then your domain administrator and resellers who provide user support to your organization will have access to your Google Account information (including your email and other data). Your domain administrator may be able to:
  - view statistics regarding your account, like statistics regarding applications you install.
  - change your account password.
  - suspend or terminate your account access.
  - access or retain information stored as part of your account.
  - receive your account information in order to satisfy applicable law, regulation, legal process or enforceable governmental request.
  - restrict your ability to delete or edit information or privacy settings.

  Please refer to your domain administrator's privacy policy for more information.
- **For external processing**

  We provide personal information to our affiliates or other trusted businesses or persons to process it for us, based on our instructions and in compliance with our

If other users already have your email, or other information that identifies you, we may show them your publicly visible Google Profile information, such as your name and photo.

If you have a Google Account, we may display your Profile name, Profile photo, and actions you take on Google or on third-party applications connected to your Google Account (such as +1's, reviews you write and comments you post) in our services, including displaying in ads and other commercial contexts. We will respect the choices you make to limit sharing or visibility settings in your Google Account.

When you contact Google, we keep a record of your communication to help solve any issues you might be facing. We may use your email address to inform you about our services, such as letting you know about upcoming changes or improvements.

We use information collected from cookies and other technologies, like pixel tags, to improve your user experience and the overall quality of our services. One of the products we use to do this on our own services is Google Analytics. For example, by saving your language preferences, we'll be able to have our services appear in the language you prefer. When showing you tailored ads, we will not associate an identifier from cookies or similar technologies with sensitive categories, such as those based on race, religion, sexual orientation or health.

Our automated systems analyze your content (including emails) to provide you personally relevant product features, such as customized search results, tailored advertising, and spam and malware detection.

We may combine personal information from one service with information, including personal information, from other Google services – for example to make it easier to share things with people you know. Depending on your account settings, your activity on other sites and apps may be associated with your personal information in order to improve Google's services and the ads delivered by Google.

We will ask for your consent before using information for a purpose other than those that are set out in this Privacy Policy.

Compliance and cooperation with regulatory authorities

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We regularly review our compliance with our Privacy Policy. We also adhere to several self regulatory frameworks, including the EU-US and Swiss-US Privacy Shield Frameworks. When we receive formal written complaints, we will contact the person who made the complaint to follow up. We work with the appropriate regulatory authorities, including local data protection authorities, to resolve any complaints regarding the transfer of personal data that we cannot resolve with our users directly.

Changes

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Our Privacy Policy may change from time to time. We will not reduce your rights under this Privacy Policy without your explicit consent. We will post any privacy policy changes on this page and, if the changes are significant, we will provide a more prominent notice (including, for certain services, email notification of privacy policy changes). We will also keep prior versions of this Privacy Policy in an archive for your review.

Specific product practices

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The following notices explain specific privacy practices with respect to certain Google products and services that you may use:

- Chrome and Chrome OS
- Play Books
- Payments
- Fiber
- Project Fi
- G Suite for Education
- YouTube Kids
- Google Accounts Managed with Family Link

For more information about some of our most popular services, you can visit the Google Product Privacy Guide.

Other useful privacy and security related materials

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Further useful privacy and security related materials can be found through Google's policies and principles pages, including:

- Information about our technologies and principles, which includes, among other things, more information on
  - how Google uses cookies.
  - technologies we use for advertising.
  - how we recognize patterns like faces.
- A page that explains what data is shared with Google when you visit websites that use our advertising, analytics and social products.
- The Privacy Checkup tool, which makes it easy to review your key privacy settings.
- Google's safety center, which provides information on how to stay safe and secure online.

- **For external processing**

  We provide personal information to our affiliates or other trusted businesses or persons to process it for us, based on our instructions and in compliance with our Privacy Policy and any other appropriate confidentiality and security measures.
- **For legal reasons**

  We will share personal information with companies, organizations or individuals outside of Google if we have a good-faith belief that access, use, preservation or disclosure of the information is reasonably necessary to:
  - meet any applicable law, regulation, legal process or enforceable governmental request.
  - enforce applicable Terms of Service, including investigation of potential violations.
  - detect, prevent, or otherwise address fraud, security or technical issues.
  - protect against harm to the rights, property or safety of Google, our users or the public as required or permitted by law.

We may share non-personally identifiable information publicly and with our partners – like publishers, advertisers or connected sites. For example, we may share information publicly to show trends about the general use of our services.

If Google is involved in a merger, acquisition or asset sale, we will continue to ensure the confidentiality of any personal information and give affected users notice before personal information is transferred or becomes subject to a different privacy policy.

Information security

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We work hard to protect Google and our users from unauthorized access to or unauthorized alteration, disclosure or destruction of information we hold. In particular:

- We encrypt many of our services using SSL.
- We offer you two step verification when you access your Google Account, and a Safe Browsing feature in Google Chrome.
- We review our information collection, storage and processing practices, including physical security measures, to guard against unauthorized access to systems.
- We restrict access to personal information to Google employees, contractors and

Terms and Conditions

Privacy Policy

Designing Ethical Interfaces

Intention #3 — Build humane interfaces

Conversation is a humane interface when any participant may influence its focus and flow such that collaboration is ongoing.

Intentions of Interactions for Conversation v4 — November 2019

Designing Ethical Interfaces

Ethical Intentions = Conversational Interfaces

1. Cooperative → evolving points-of-view → agreement

2. Ethical → reliable transparency of what + why → trust

3. Humane → shared focus and flow → collaboration

Cybernetics, AI, and Ethical Conversations

Cybernetics + Macy Meetings

"Today's AI" + "Wicked Problems"

Cybernetics + Conversation

Gordon Pask + Ethical Interfaces — *Discussion*

Ethical Intentions + #NewMacyMeetings

pangaro.com/aitechagora2020/

Conversation | Design | "Wicked Problems"

Goals of Ethical Interfaces

To rigorously understand what makes conversation work—
and to make machines conversant like humans.

To rigorously understand how systems learn—
and to makes machines that learn like humans.

To build better machines
— to build a better society

Conversation | Design | "Wicked Problems"

Goals of Ethical Design

To rigorously understand what makes conversation work—
and to make machines conversant like humans.

To rigorously understand how systems learn—
and to makes machines that learn like humans.

To build better machines
— to build a better society.

How do we do all this?

Conversation | Design | Wicked Challenges

Wicked Challenges

Surveillance Capitalism + "Human Downgrading"

Contagion + Climate Change

Water + Food Insecurity

Population + Health

Equality + Social Justice

Conversation | Design | Wicked Challenges

Why Cybernetics?
What are the alternatives? None apparent.
What is missing? Conversation!
How does all this go together?
Who else do we need in this conversation?

Conversation | Design | Wicked Challenges

Early Generations — Concepts & Guidance

W. Ross Ashby—Requisite Variety
Margaret Mead—Second-order Anthropology
Heinz von Foerster—Second-order Cybernetics
Stafford Beer—Cybersyn (regulating a country's economy)

Jerry Lettvin—Subjectivity of the nervous system
Humberto Maturana—Biology of Cognition
Gordon Pask—Conversation Theory, Calculus of Cognition

Michael C. Geoghegan—Regeneration of Organizations
Hugh Dubberly—Design & Systems
Ranulph Glanville—Design & Cybernetics
Peter Cariani — Neural Systems

Conversation | Design | Wicked Challenges

Next Generations — Passion & Praxis

Usman Haque
Ruairi Glynn
Guilherme Kujawski
Jude Lombardi
Despina Papadopoulos
Larry Richards
Margit Rosen

Marcelo Mejia Cobo
Delfina Fantini von Ditmar
Daniel Rosenberg
George Wharton

Tirelle Barron
Cameron Burgess
Estefania Ciliotta Chehade
Gissoo Doroudian
Abby Loughrey
Innocent Ndubuisi-Obi, Jr
Shalini Sahoo
Eddie Schodowski
Cole Shiffer
Ensar Temizel

Conversation | Design | Wicked Challenges

Next Generations

Why Cybernetics?
What are the alternatives? None apparent.
What is missing? Conversation!
How does all this go together?
Who else do we need in this conversation?
How do we begin? **#NewMacyMeetings**

Cybernetics, AI, and Ethical Conversations

Cybernetics + Macy Meetings

"Today's AI" + "Wicked Problems"

Cybernetics + Conversation

Gordon Pask + Ethical Interfaces

Ethical Intentions + **#NewMacyMeetings**

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#NewMacyMeetings
Cybernetics, AI, and Ethical Conversations

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Ethical Intentions + #NewMacyMeetings

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#NewMacyMeetings
Cybernetics, AI, and Ethical Conversations

Thank you.

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"As a designer, I shall act always so as to increase the total number of choices for a user."

Thank you.

Links

Related page at pangaro.com

Appendices to this deck

Video of Lecture – First Rationale for #NewMacy – March 2020

#NewMacyMeeting #1 — Sept 2020 — Background and Description

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