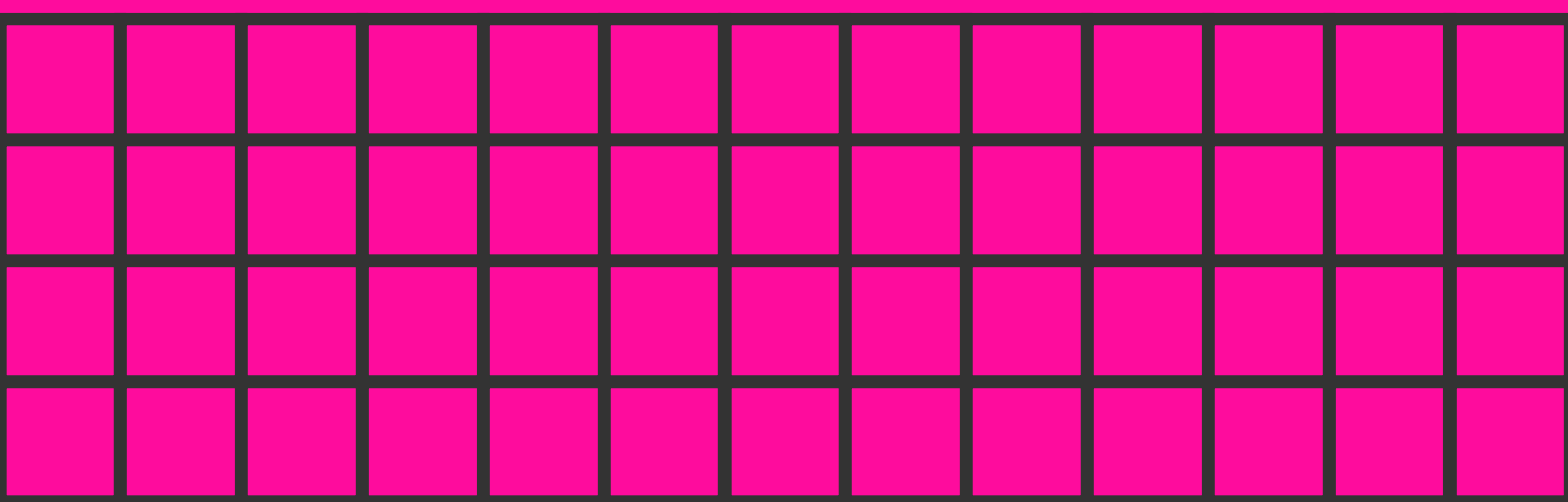
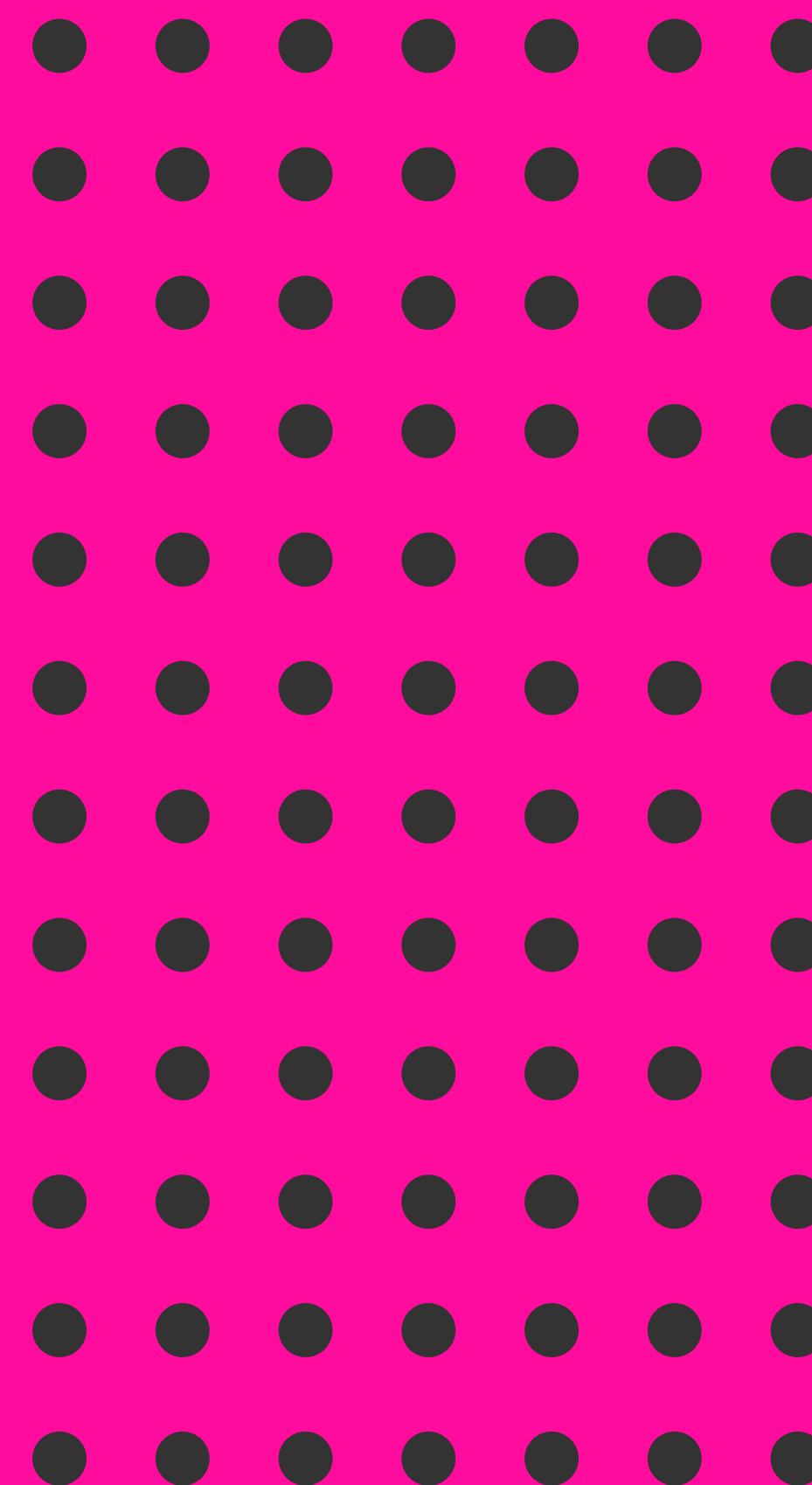


Making Chatbots Humane: Adopting the Technology of Human Conversation

Paul Pangaro, Associate Professor and Chair of MFA IxD Program at College for Creative Studies.





CONFERÊNCIA

2018

BOTS BRASIL

17 NOV • SÃO PAULO

Making Chatbots Humane: Adopting the Technology of Human Conversation



17 NOV • SÃO PAULO

Making Chatbots Humane: Adopting the Technology of Human Conversation



17 NOV • SÃO PAULO

See pangaro.com/bots2018/
for slides and references.

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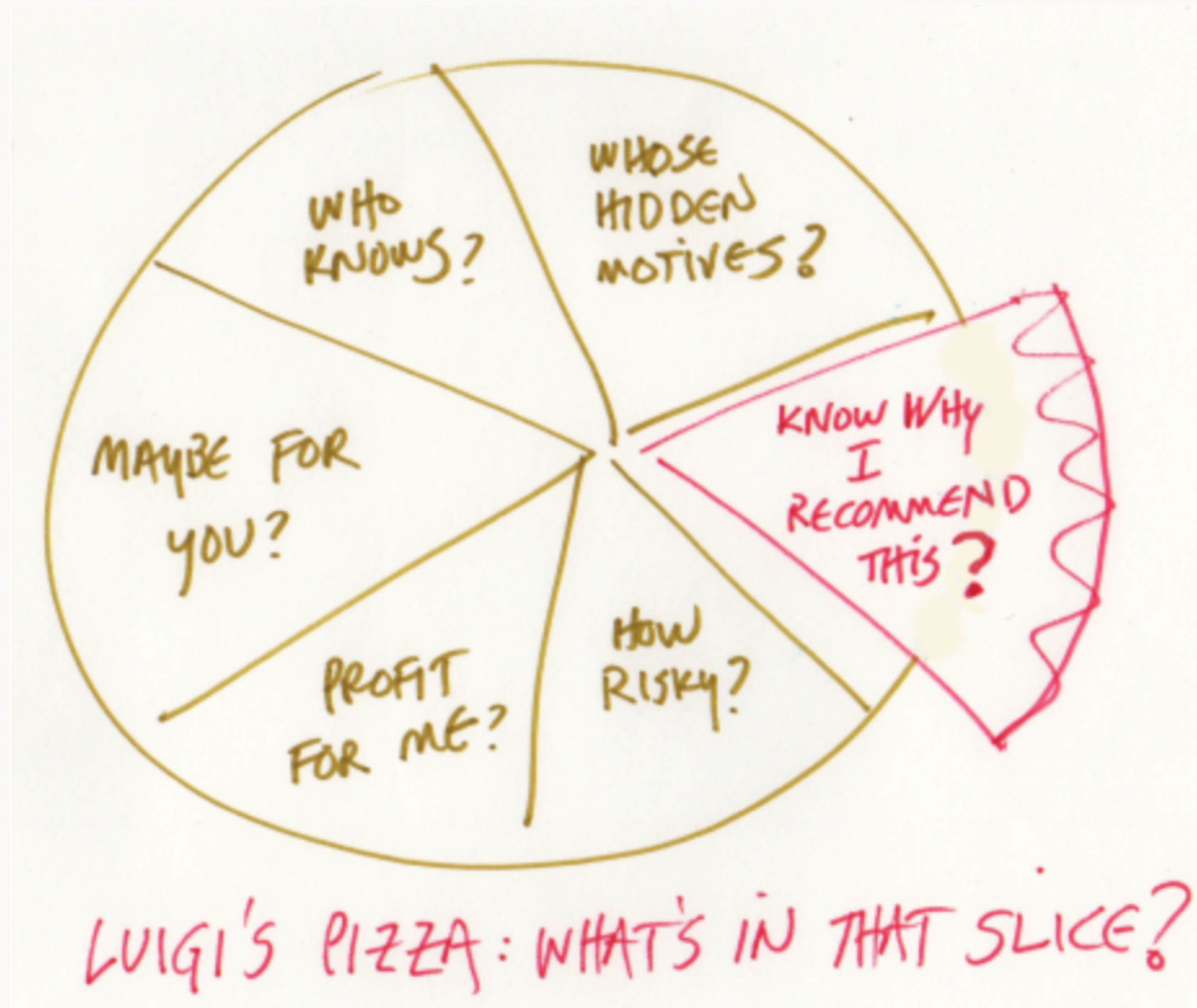
as of January 2019
Professor of Practice
Human-Computer Interaction Institute
Carnegie Mellon University, Pittsburgh



Luigi's Pizza – A Parable about Human Conversation



Luigi's Pizza – A Parable about Conversational Interfaces



<https://ccsmfa.blog/2016/11/08/luigis-pizza-a-parable/>

Luigi's Pizza – A Parable about Conversational Interfaces

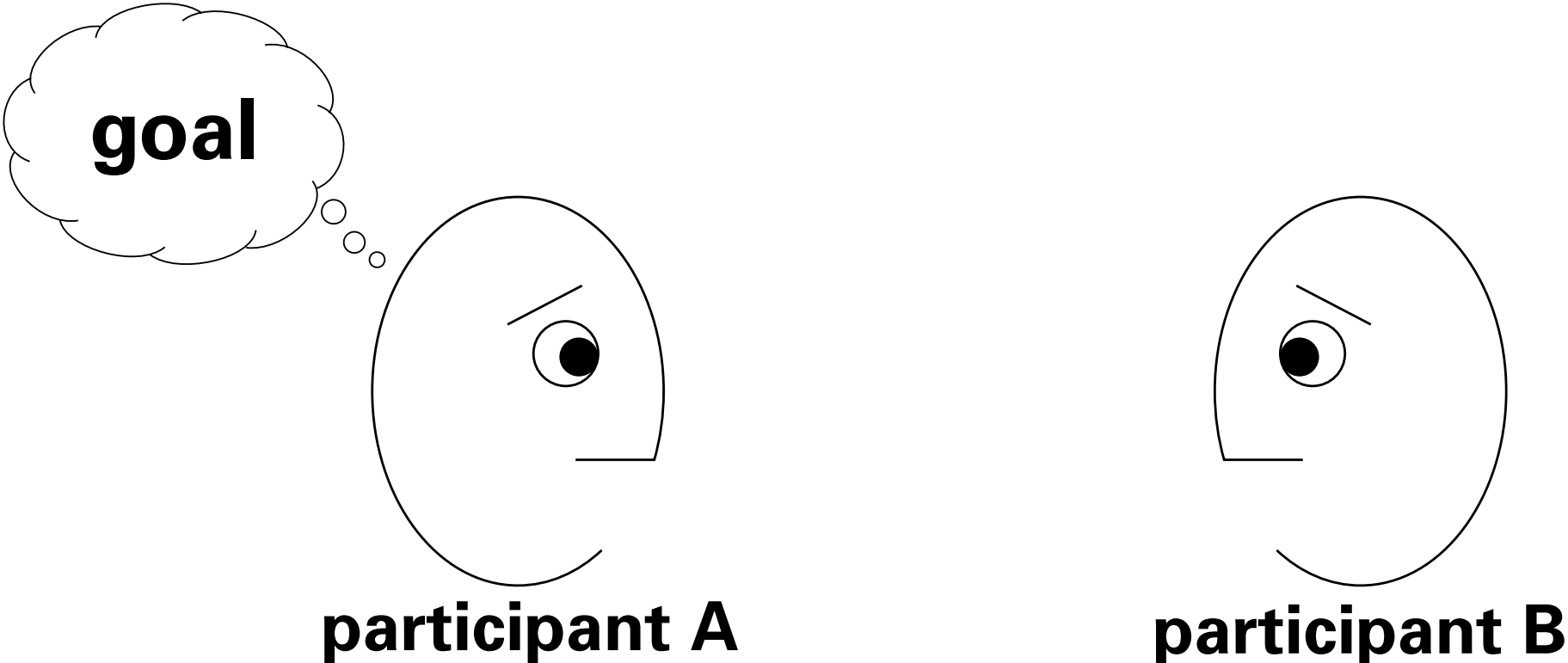
How do we go about “Making Chatbots Humane”?

- *apply models of human conversation*
- *propose interfaces that are cooperative, ethical, humane*
- *explore new forms of Conversational Interfaces.*

These are the offers in my presentation today.

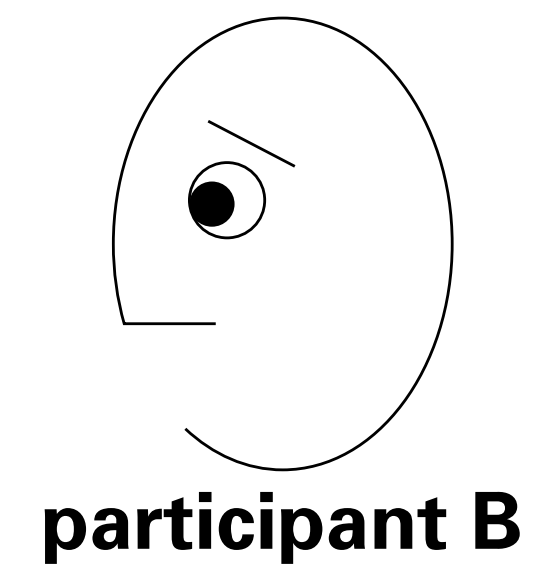
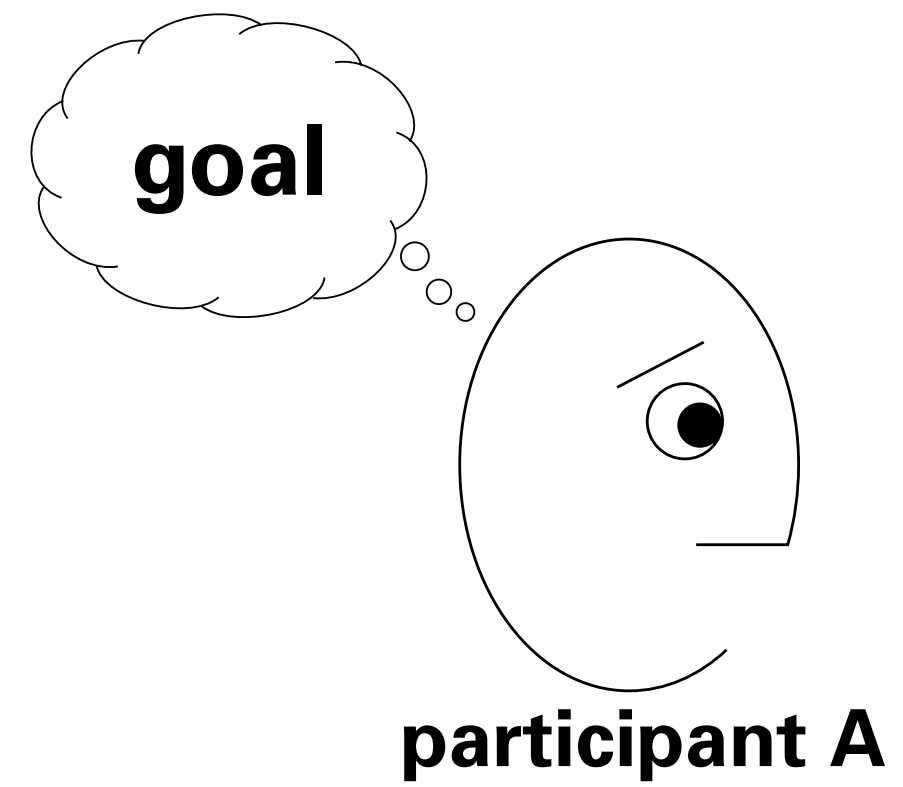
Alexa, can you please acquire the skill of conversation?
Alexa, what is “conversation”?

Conversational Frame

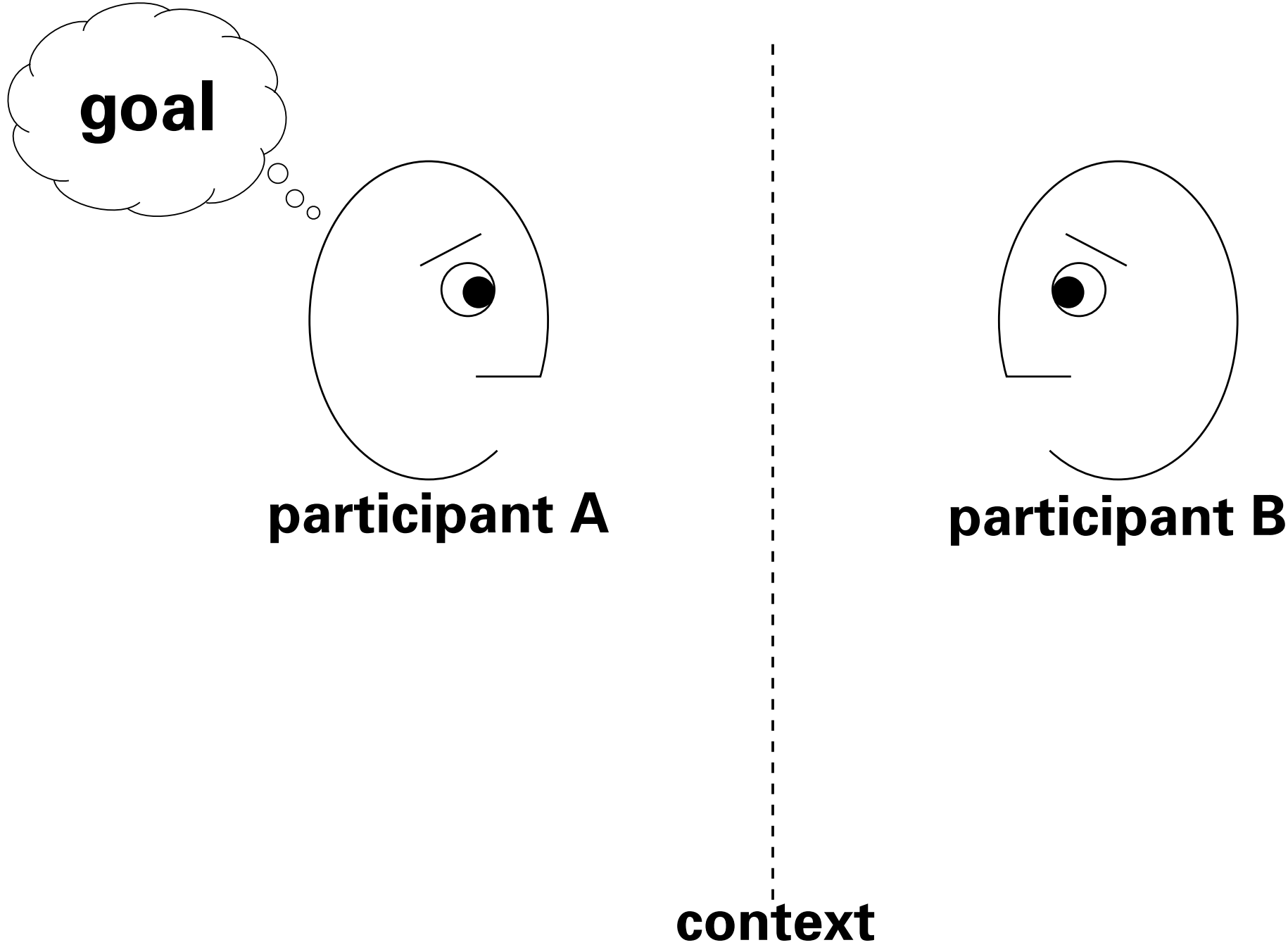


After Dubberly Design & Paul Pangaro

A participant has a goal.

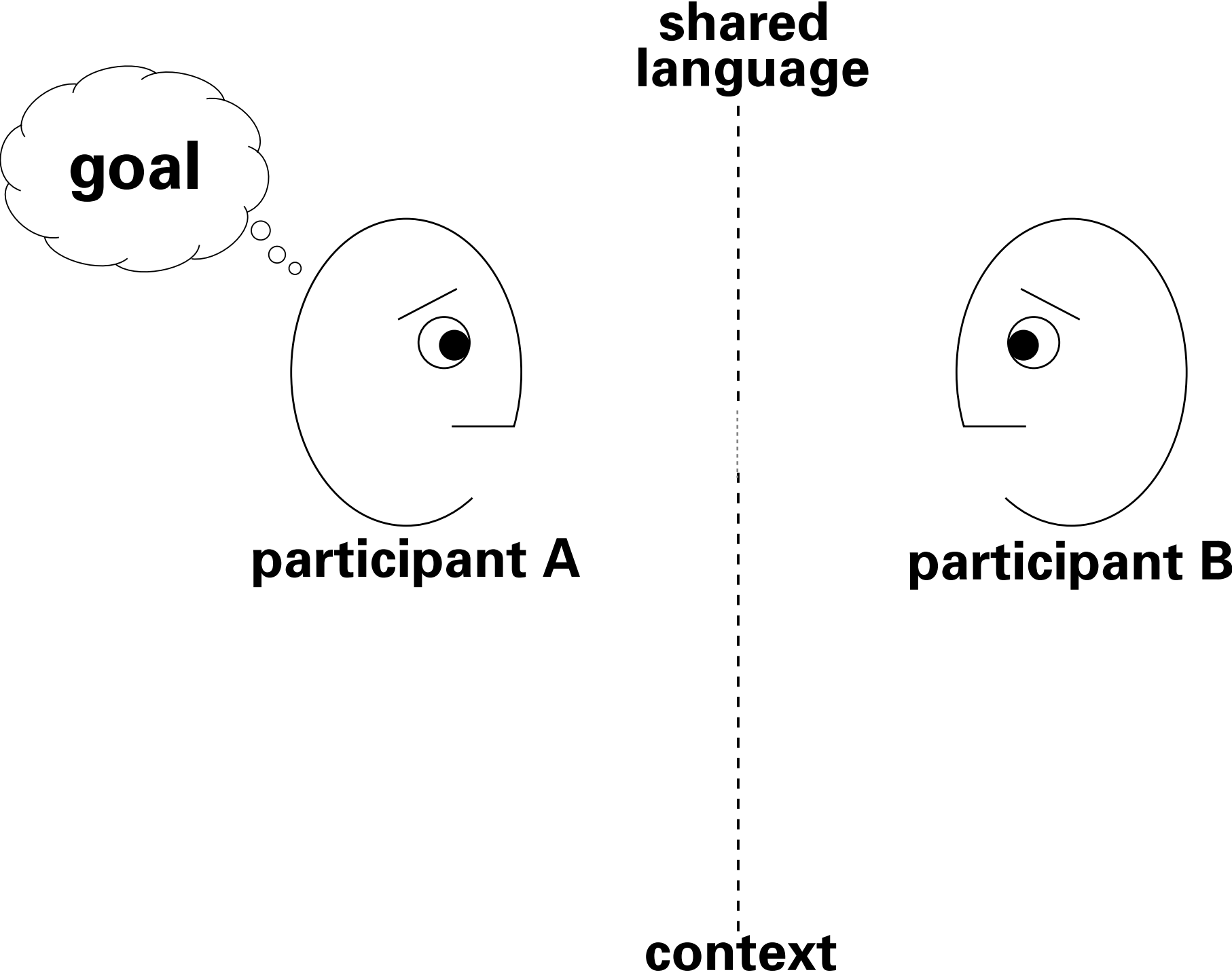


Chooses a context.



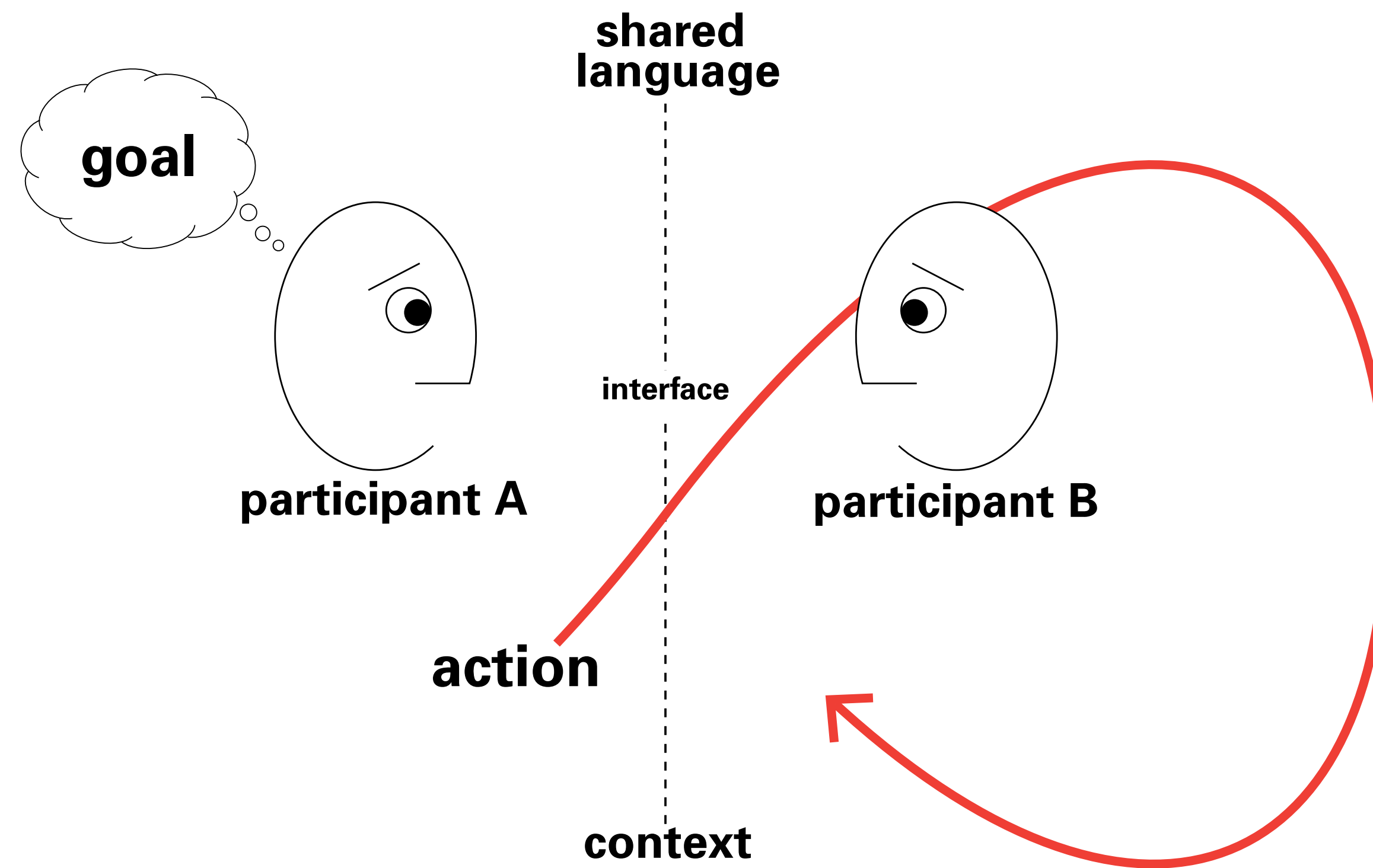
After Dubberly Design & Paul Pangaro

Chooses a language.



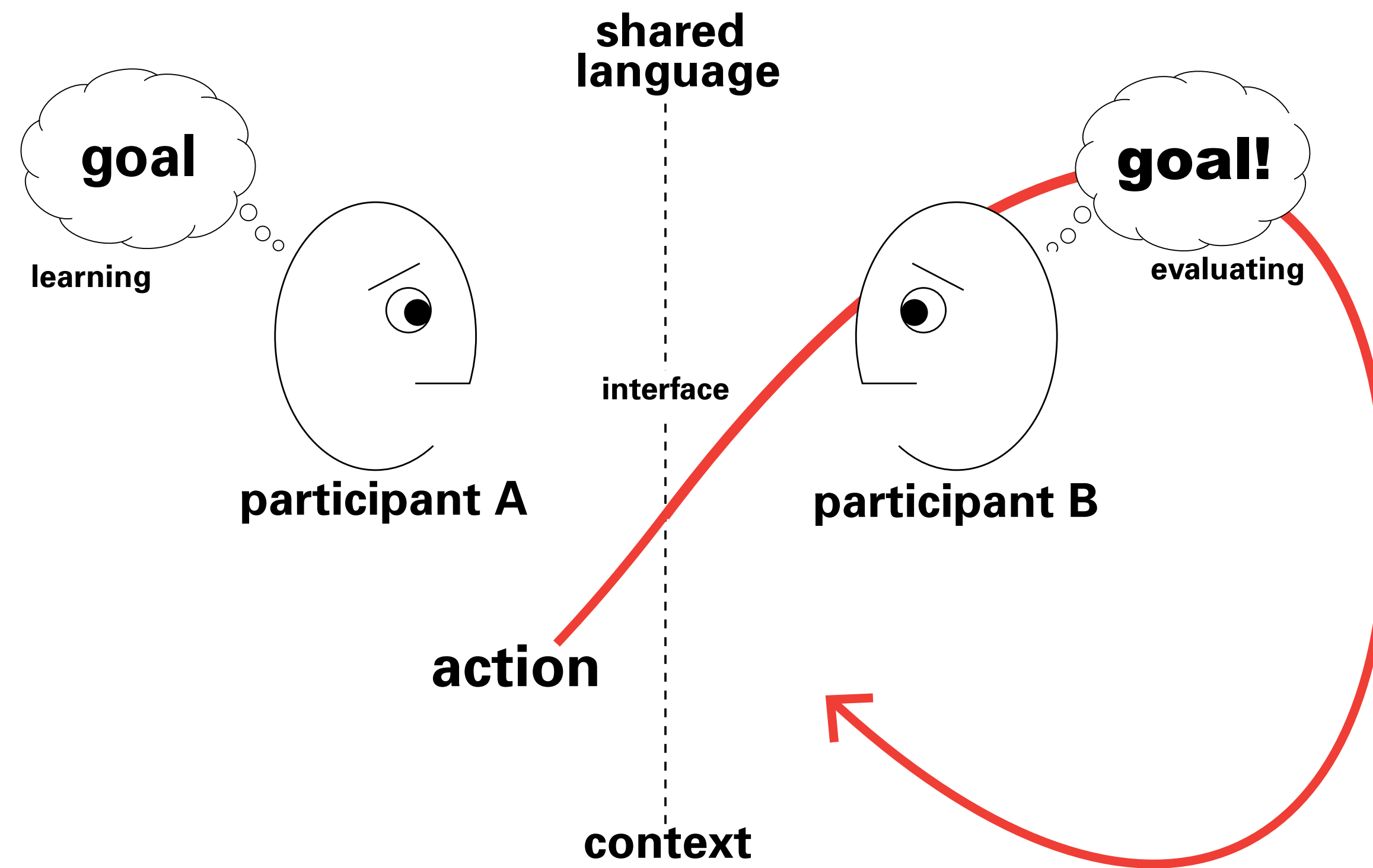
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Begins an exchange.



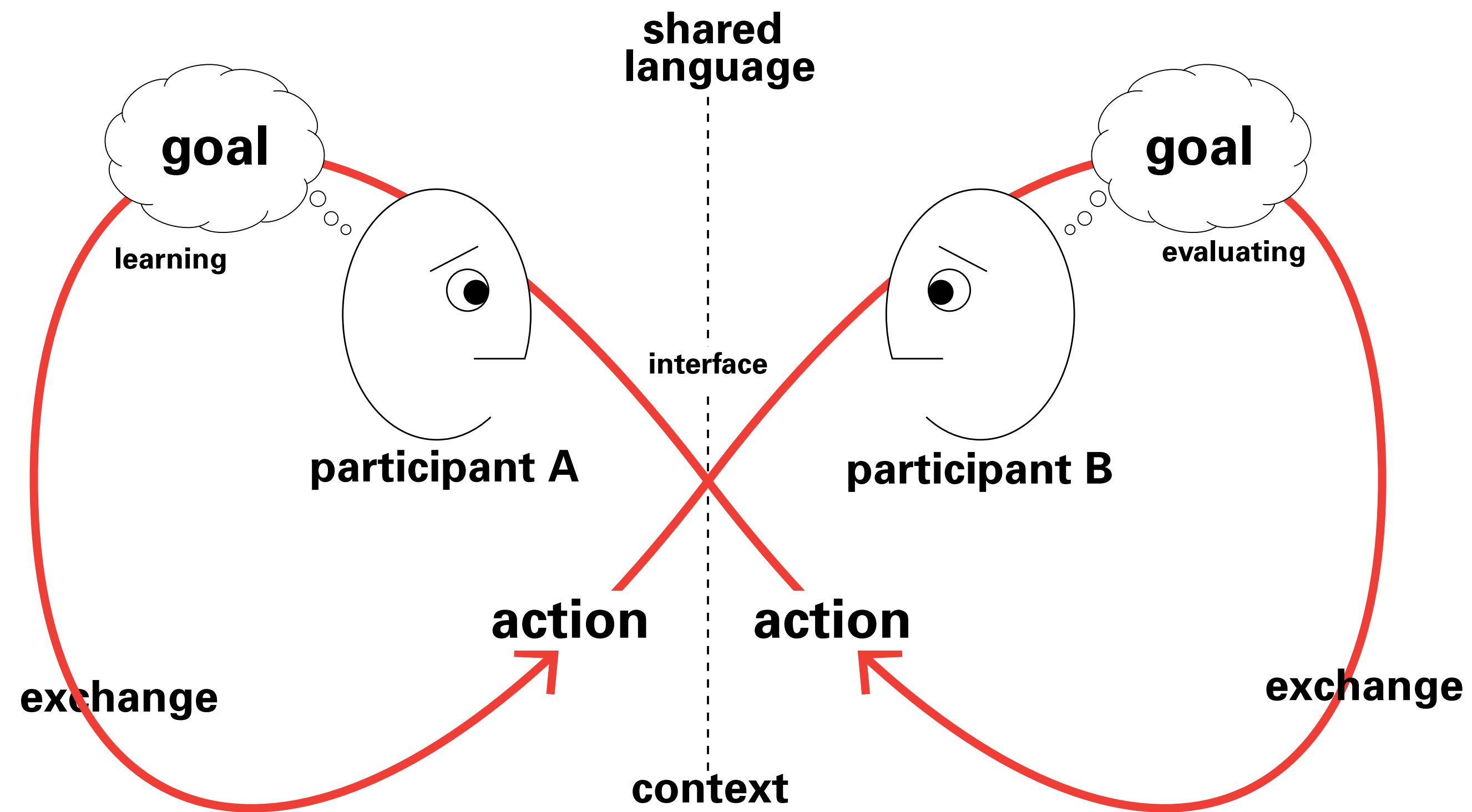
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May evoke a response...



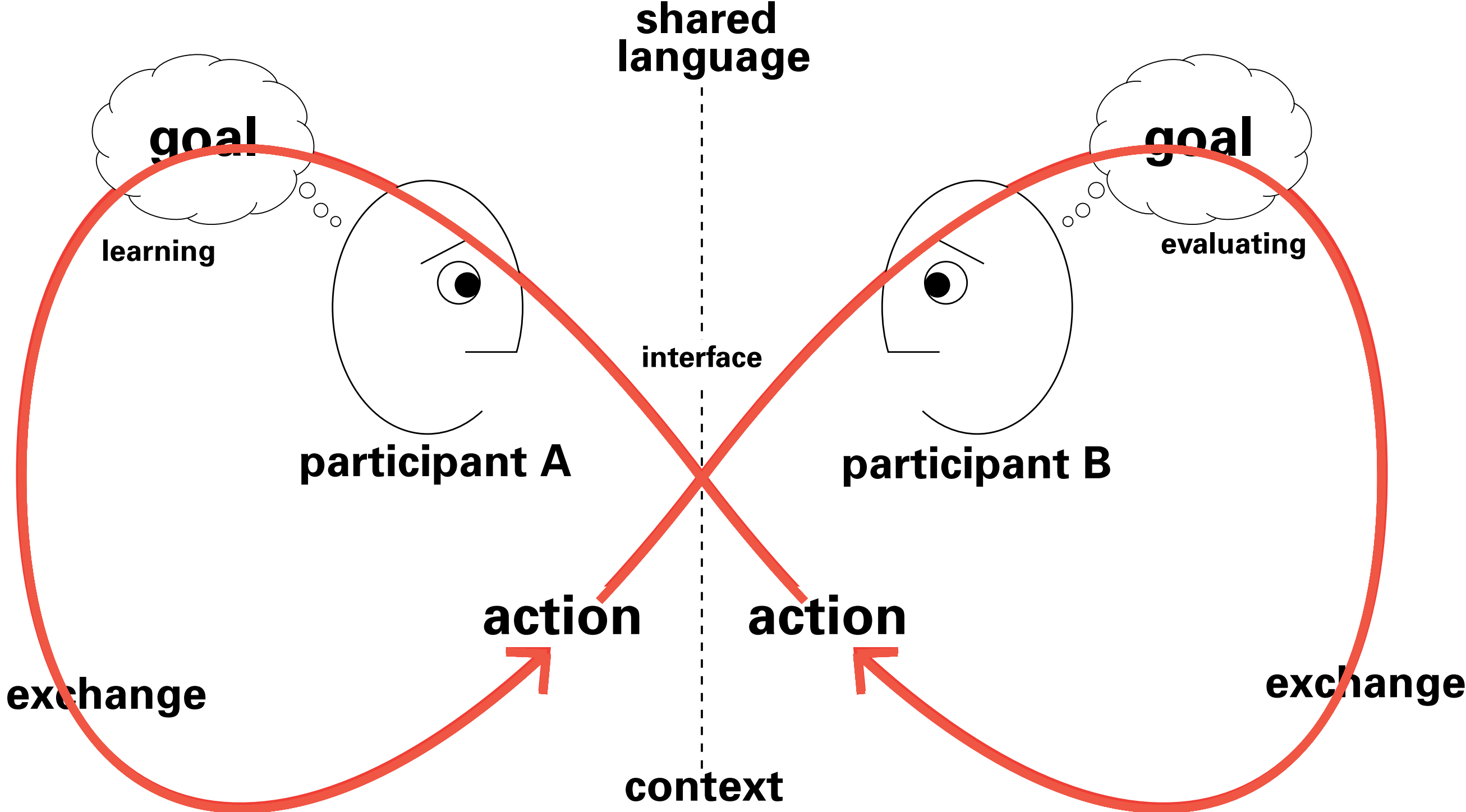
After Dubberly Design & Paul Pangaro

... and a reaction that evokes a reaction...



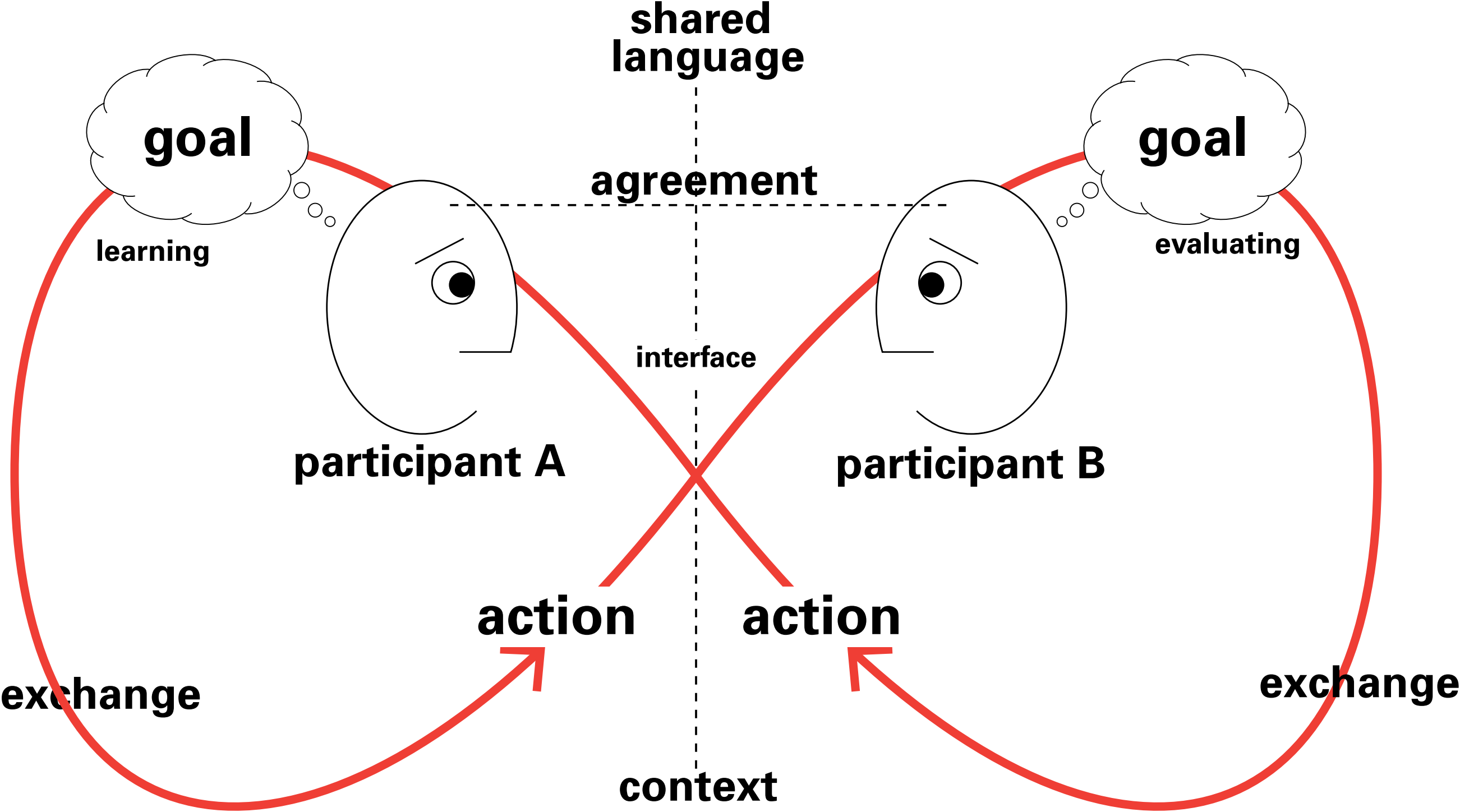
After Dubberly Design & Paul Pangaro

The engagement may continue.



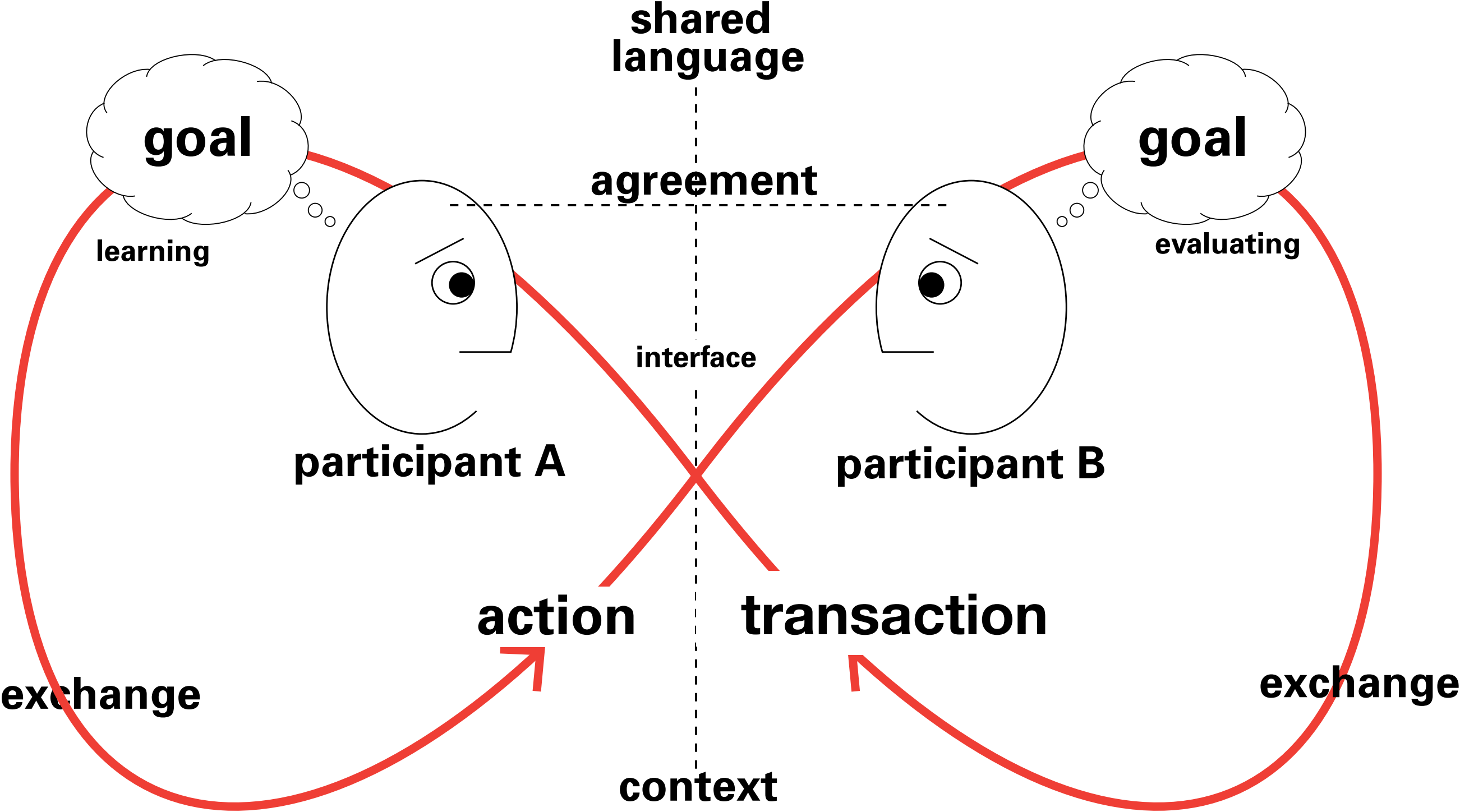
After Dubberly Design & Paul Pangaro

An agreement may be reached.



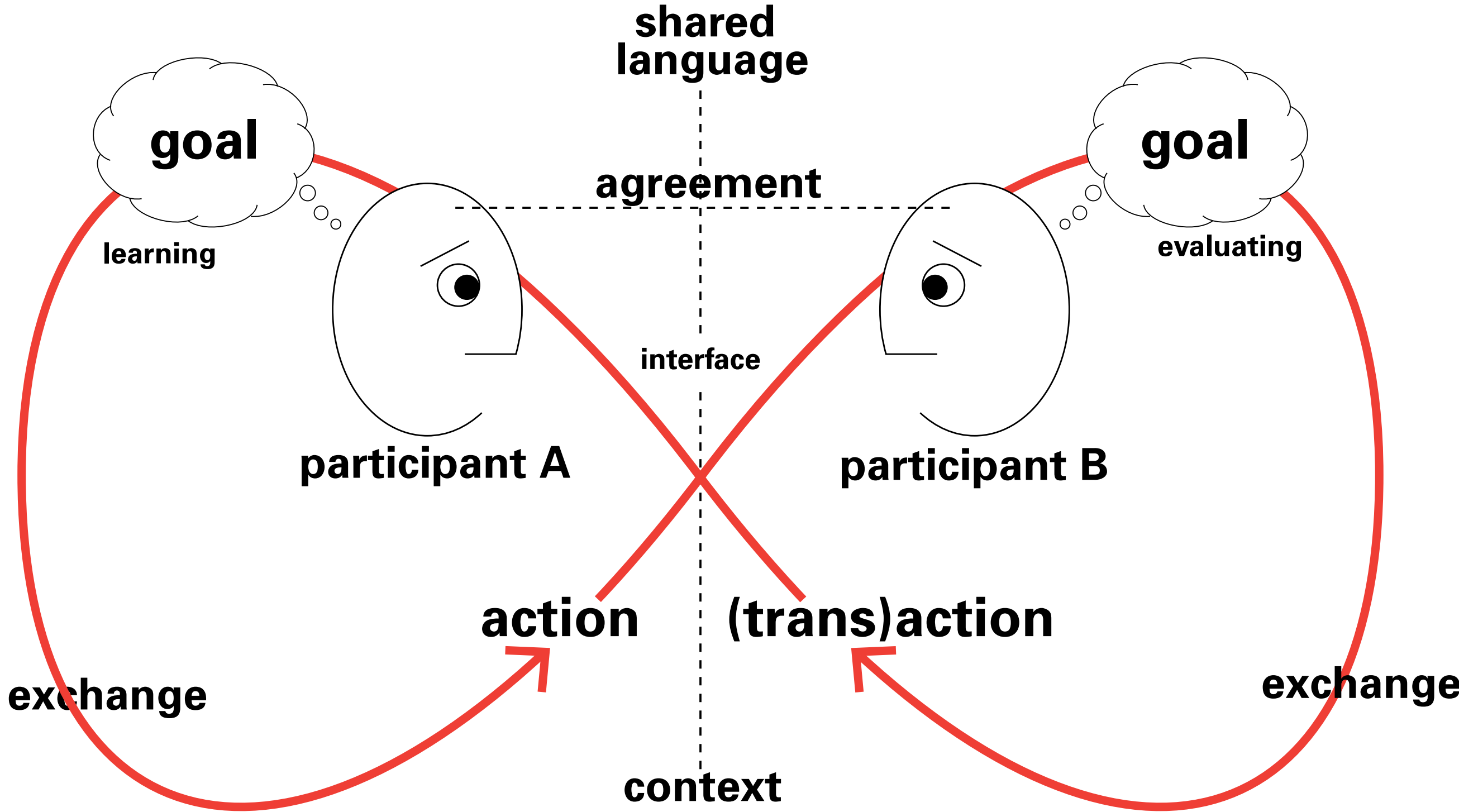
After Dubberly Design & Paul Pangaro

A transaction may occur.



After Dubberly Design & Paul Pangaro

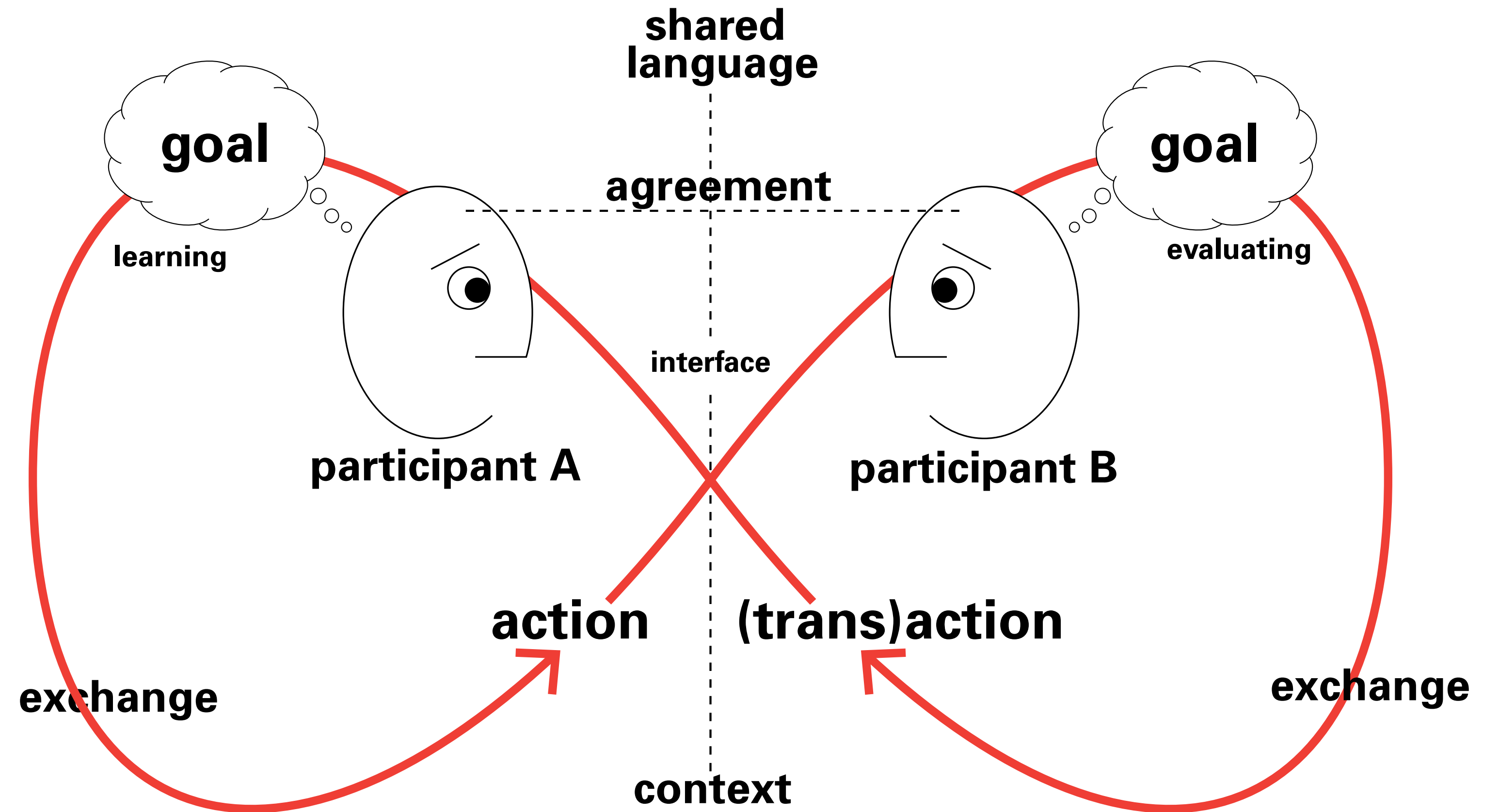
Conversation Model



See also Pangaro: *Economy of Insight*

Conversation Model— C-L-E-A-T

C – Context
L – Language
E – Engagement
A – Agreement
T – Transaction



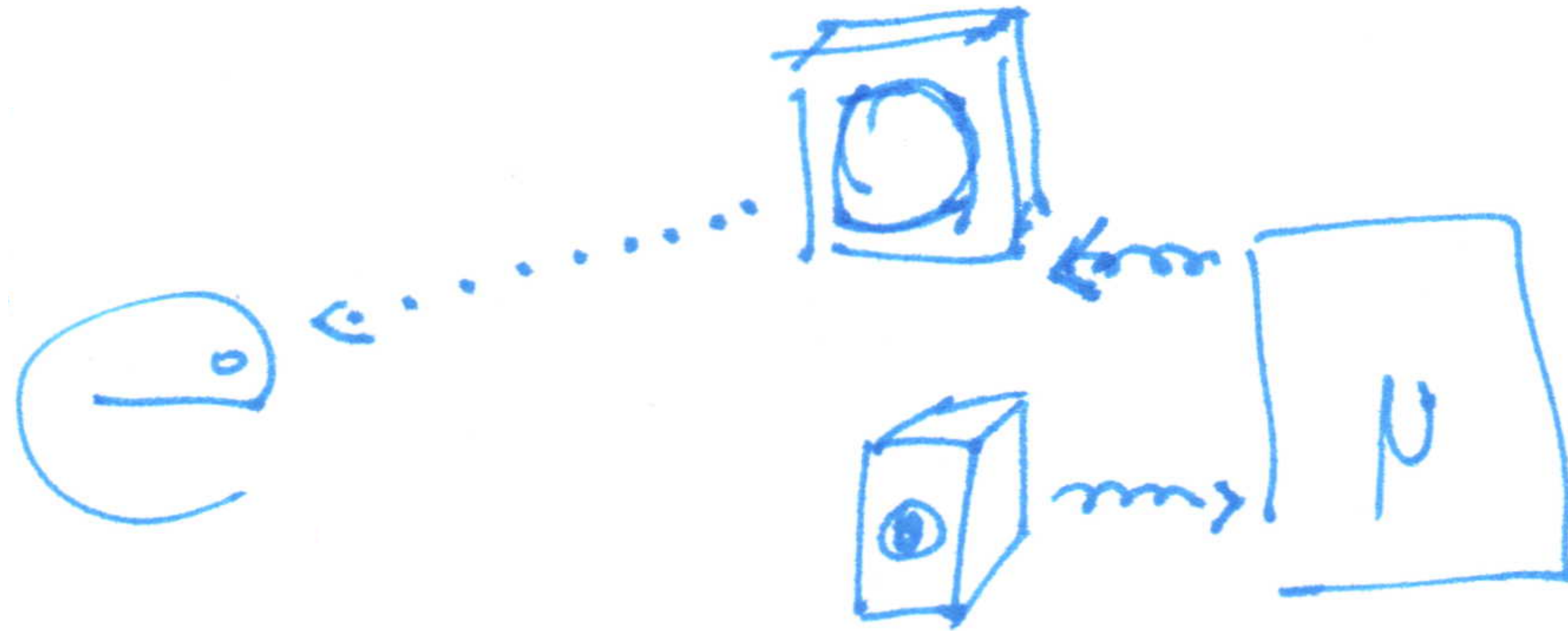


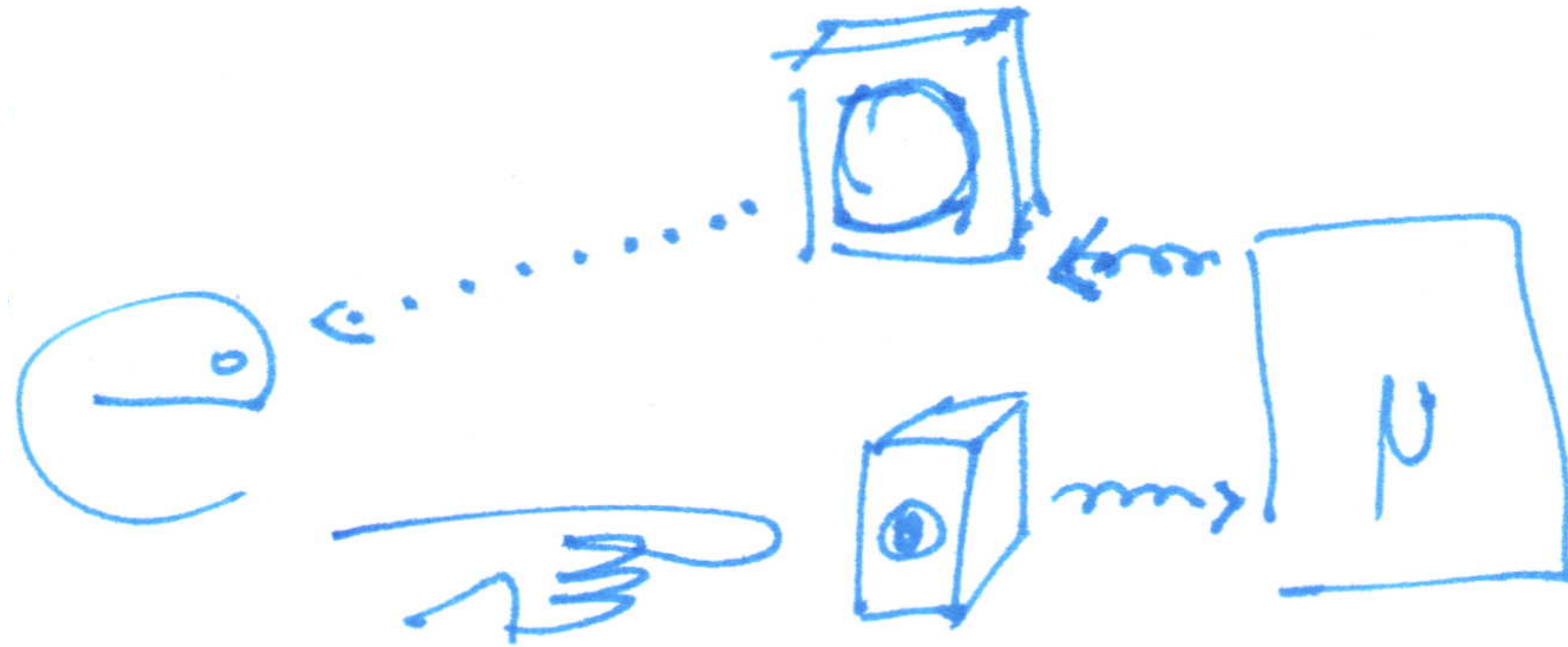
<http://pangaro.com/cmu2018/>



<http://pangaro.com/cmu2018/>

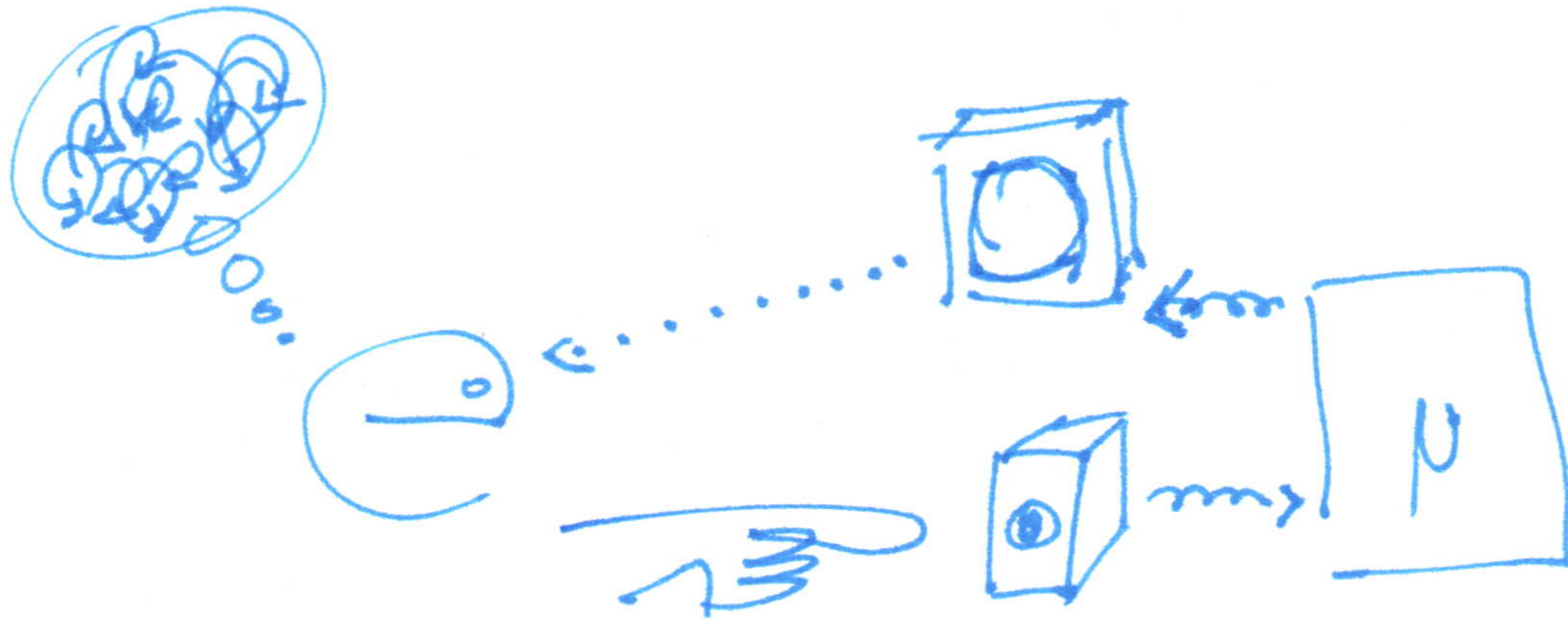


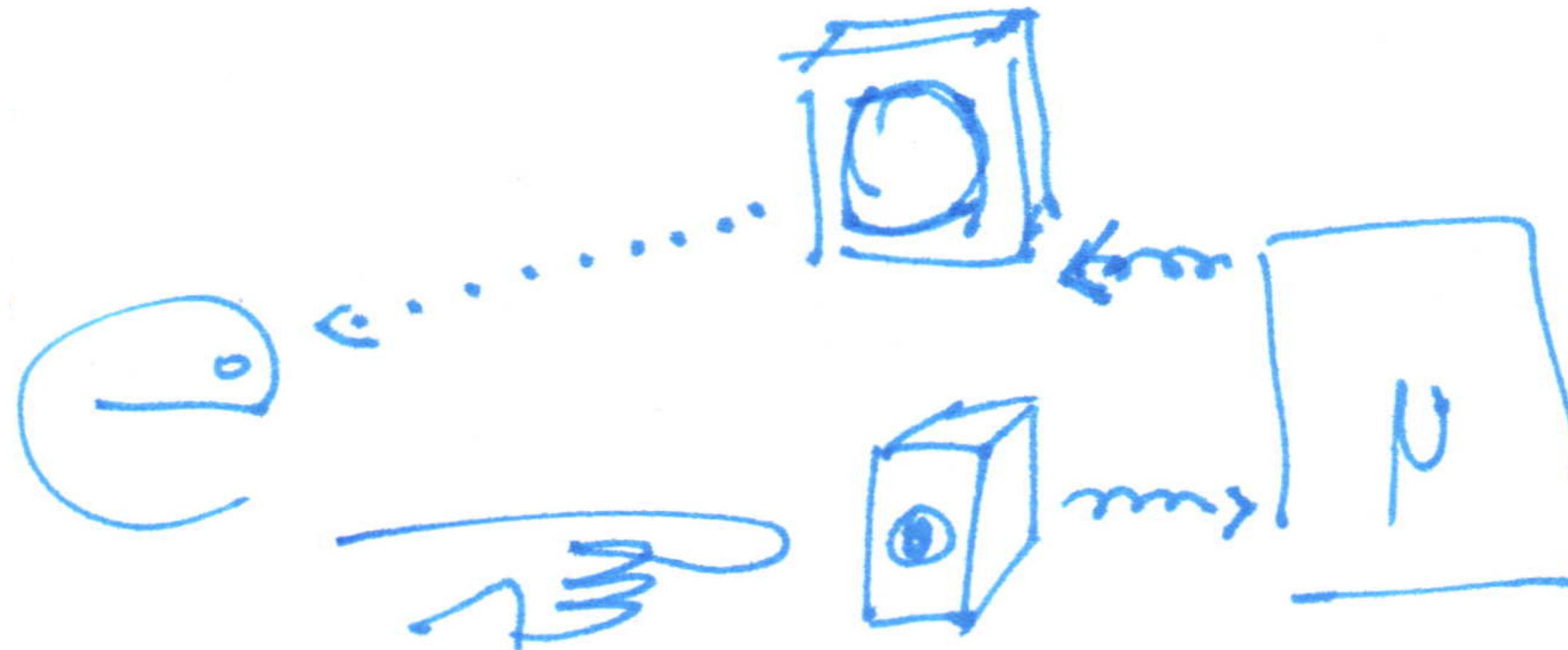


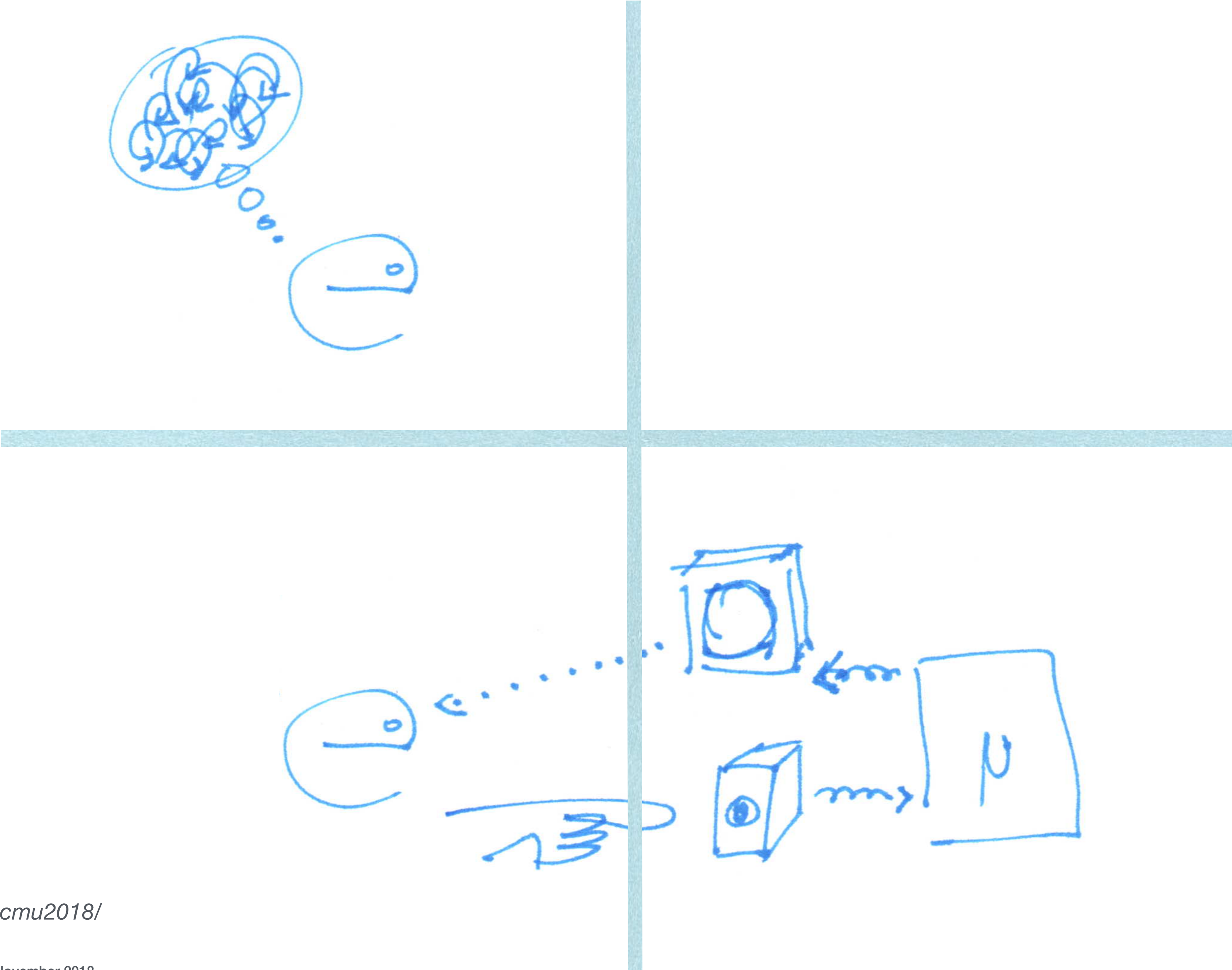


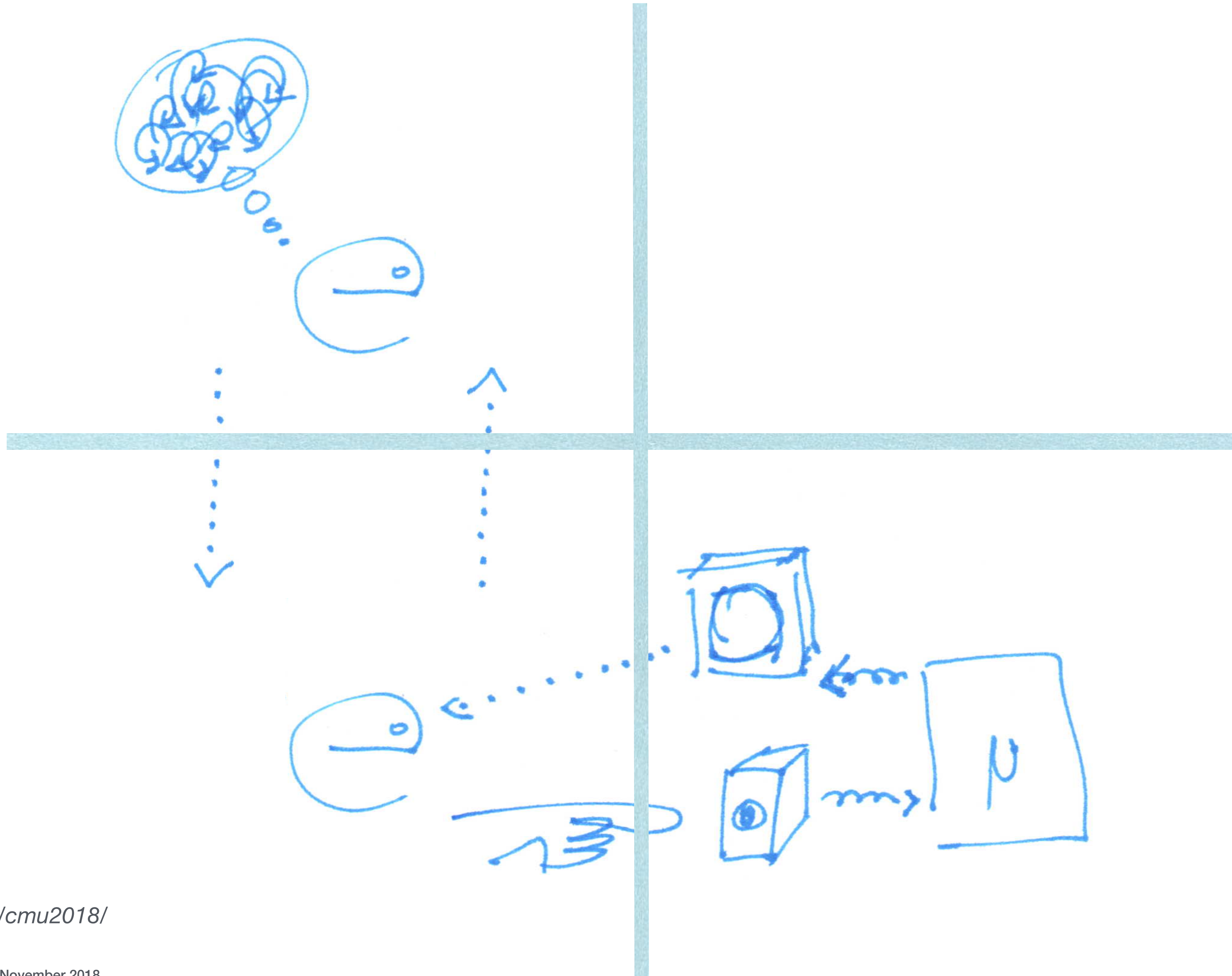


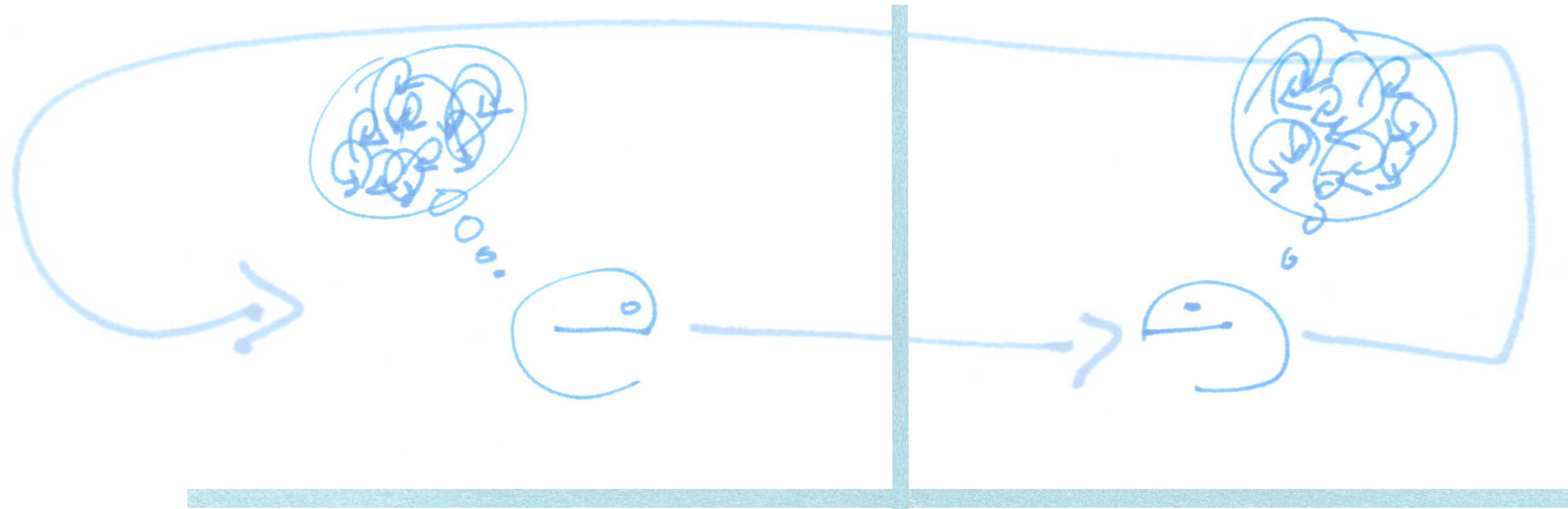
<http://pangaro.com/cmu2018/>



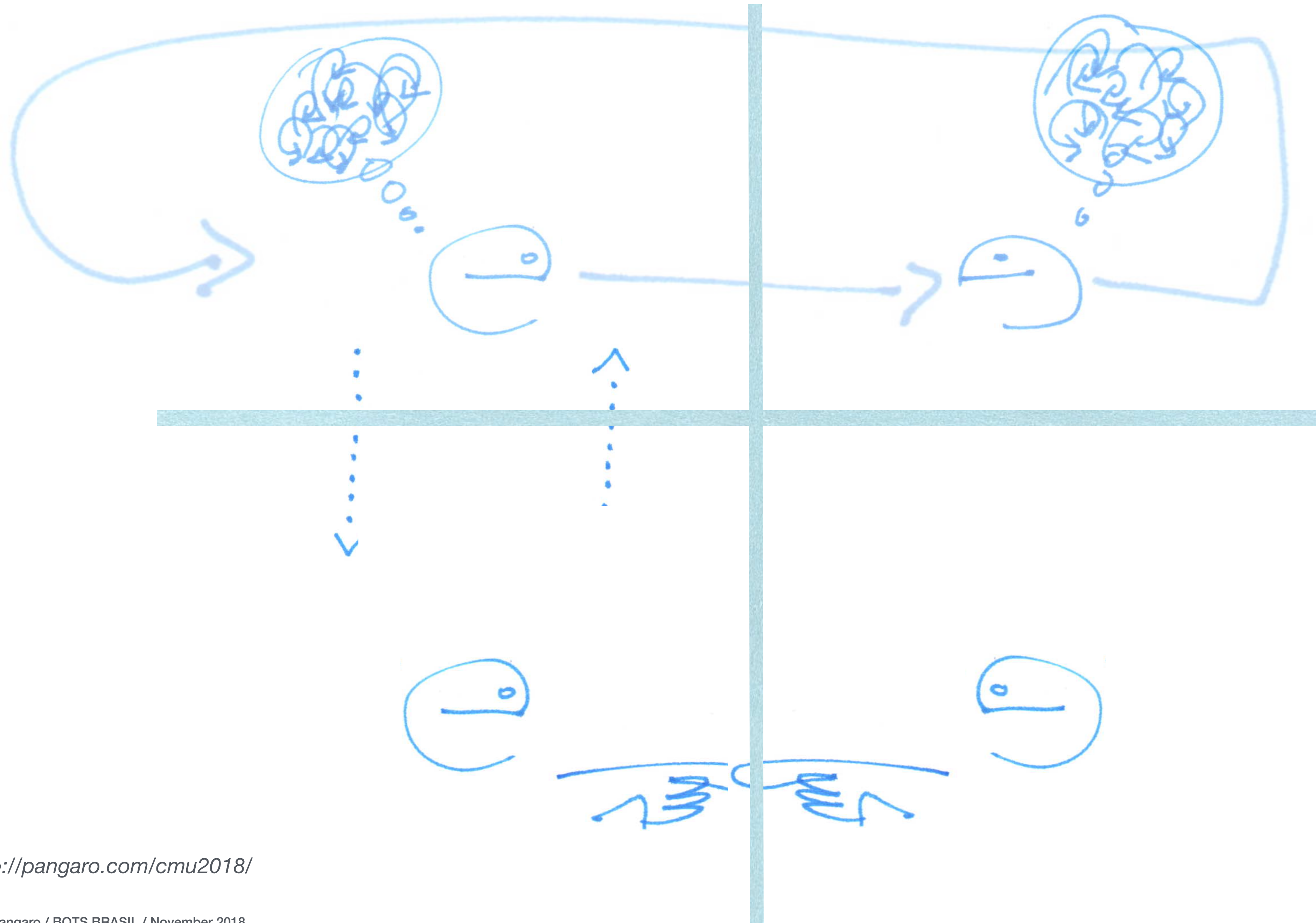




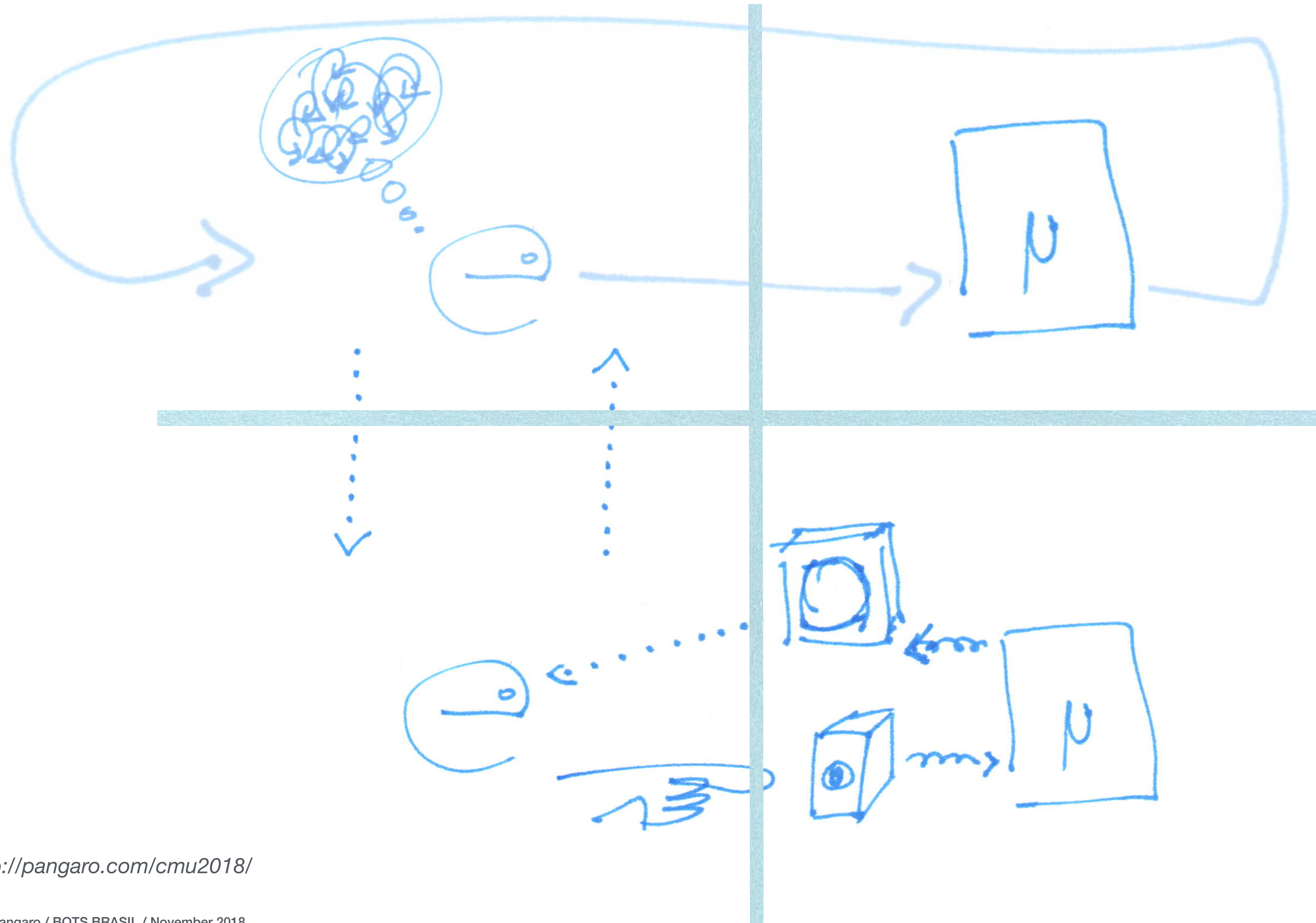


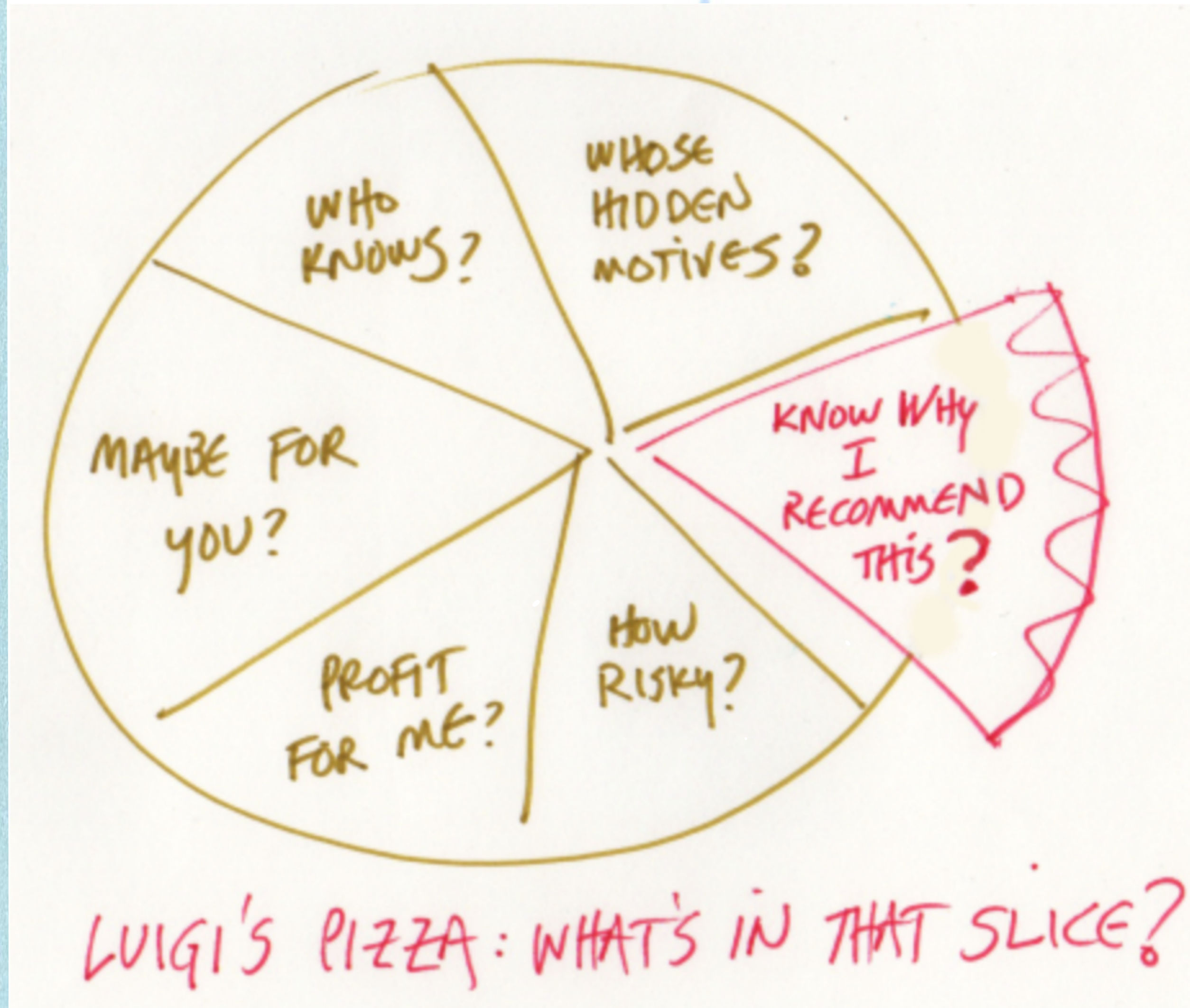


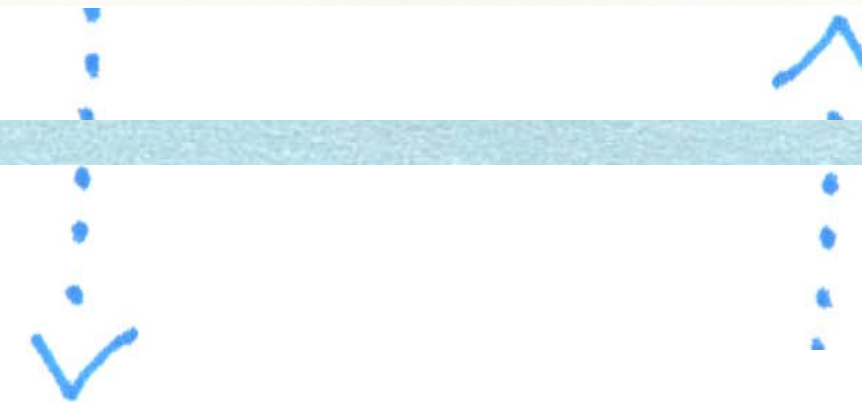
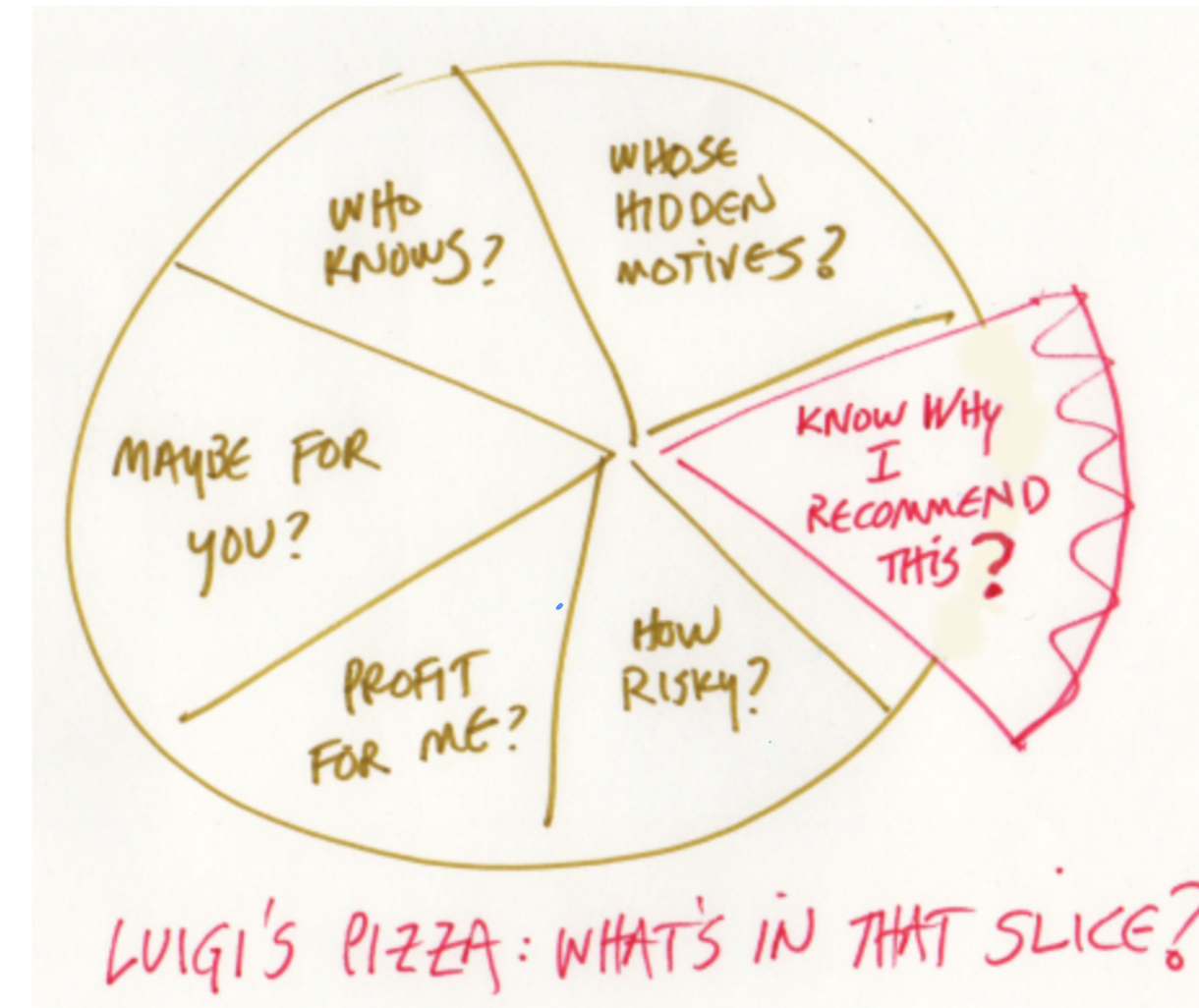
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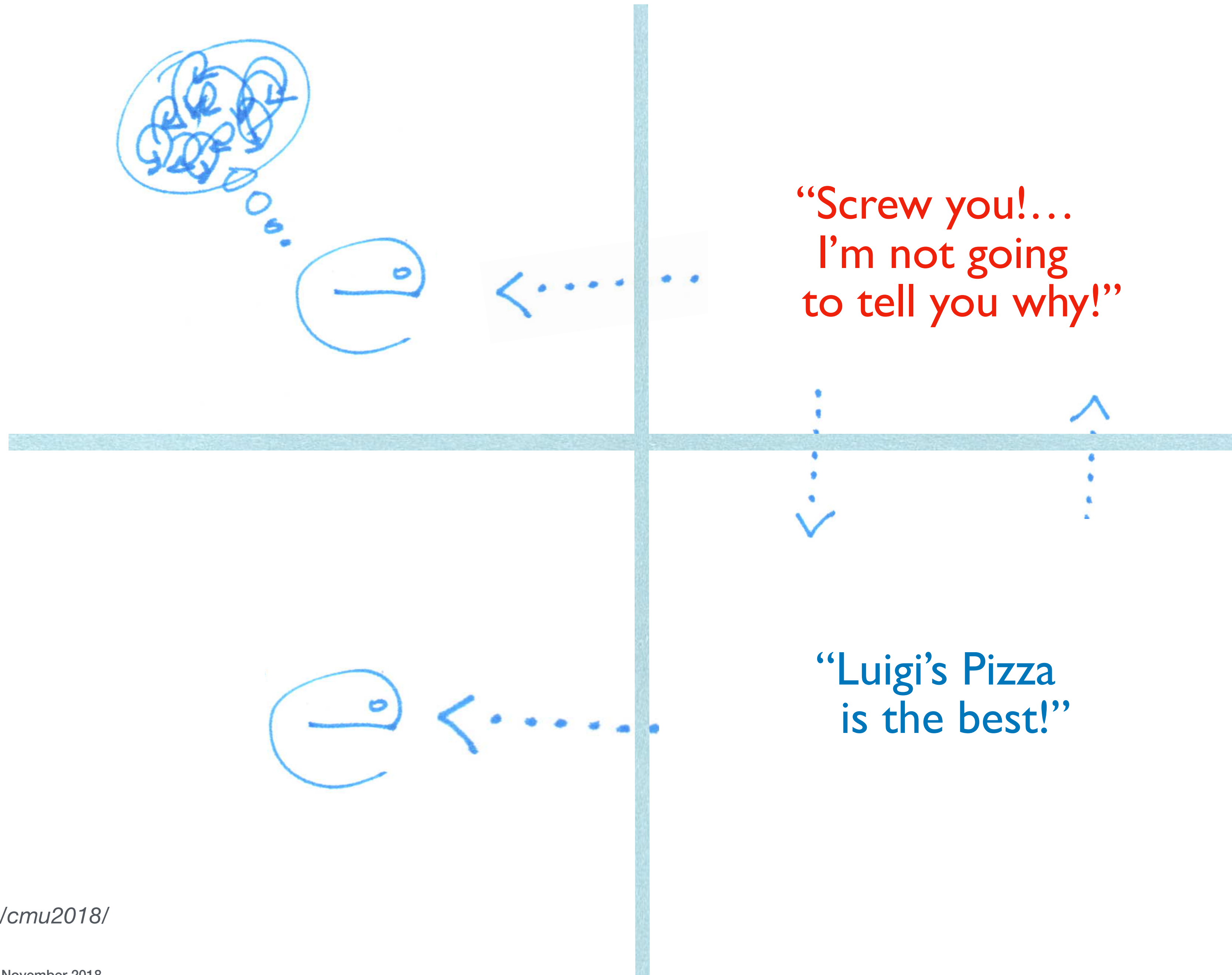
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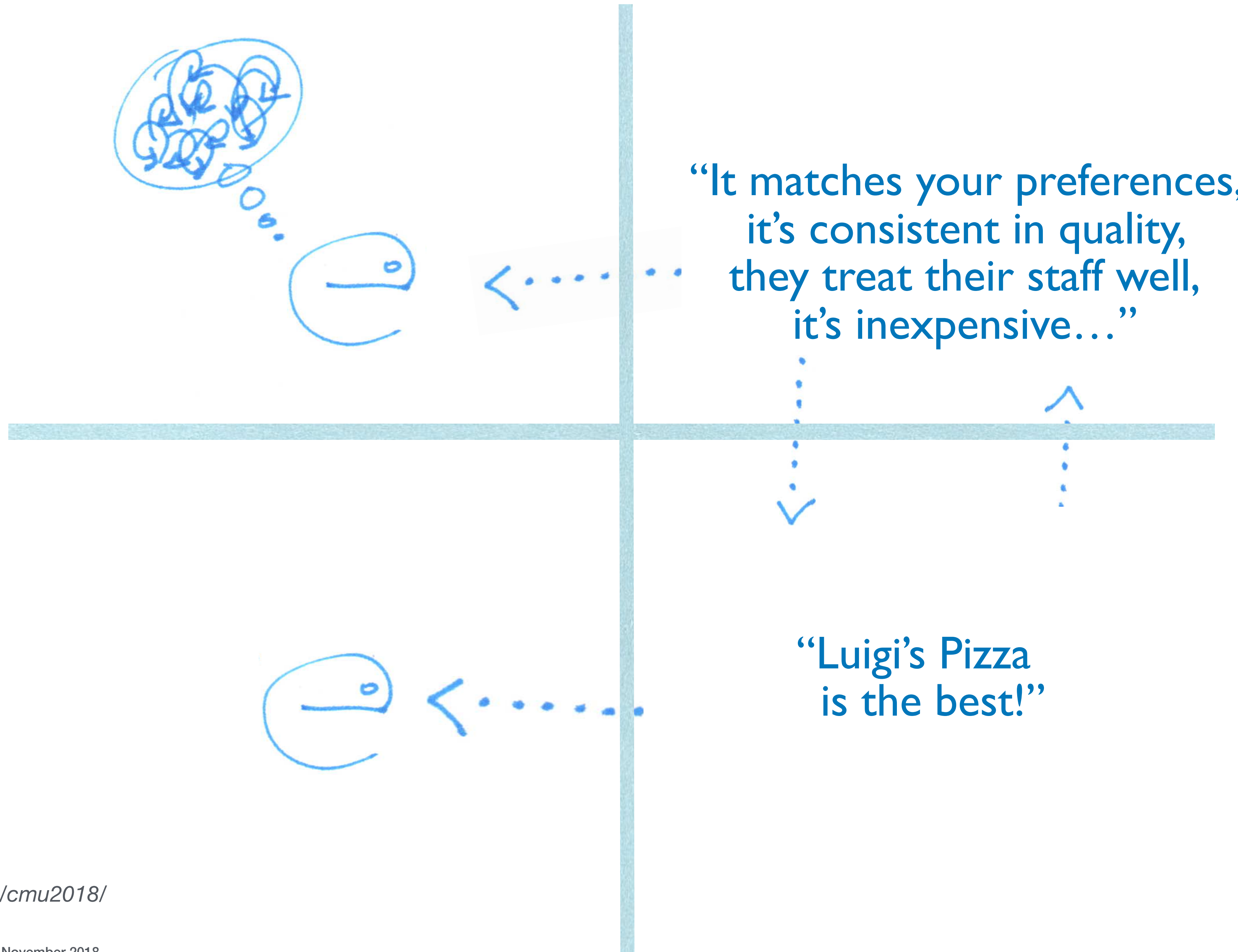






“Luigi’s Pizza is the best!”





Intent



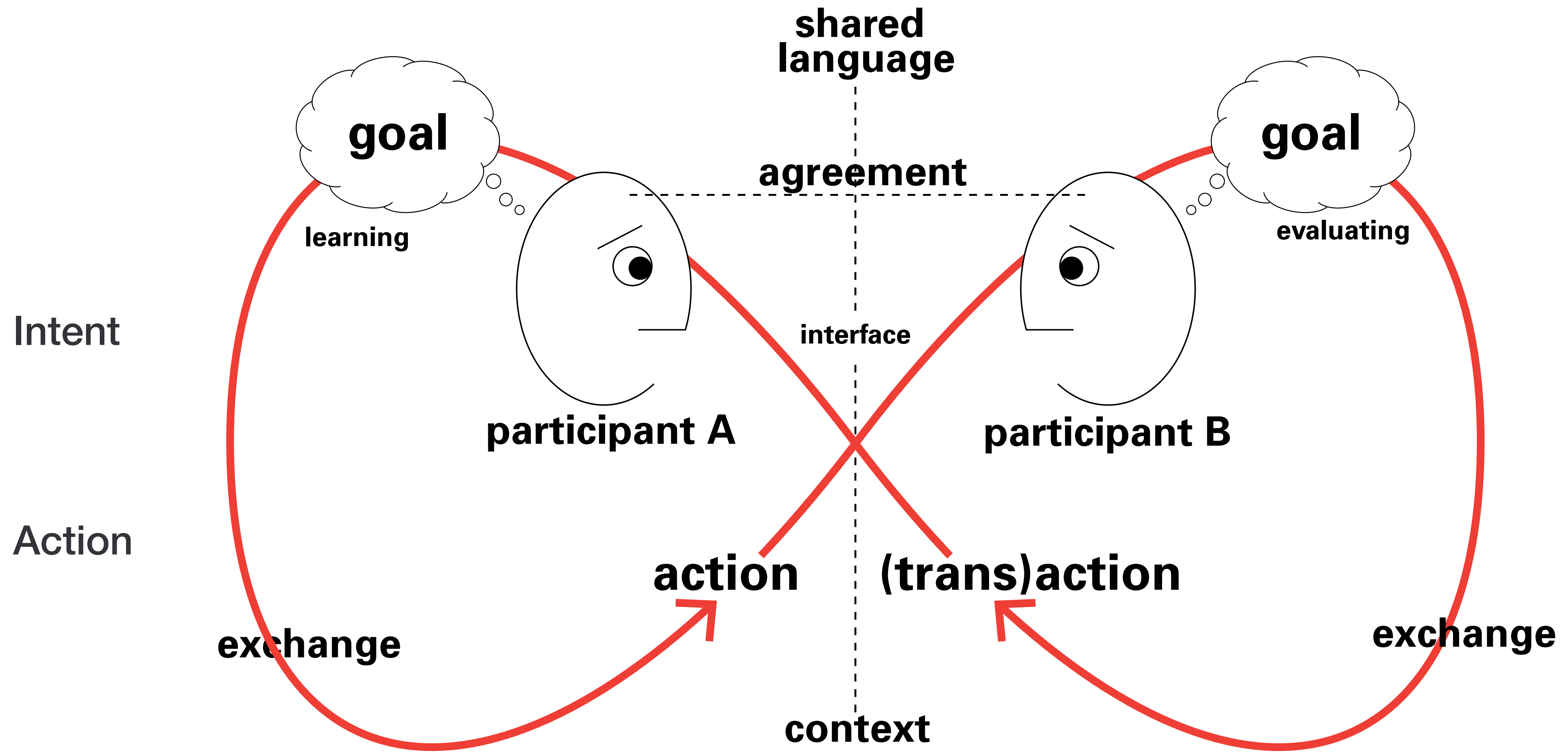
*Why shall
we do it?*

Action



*What shall
we do?*

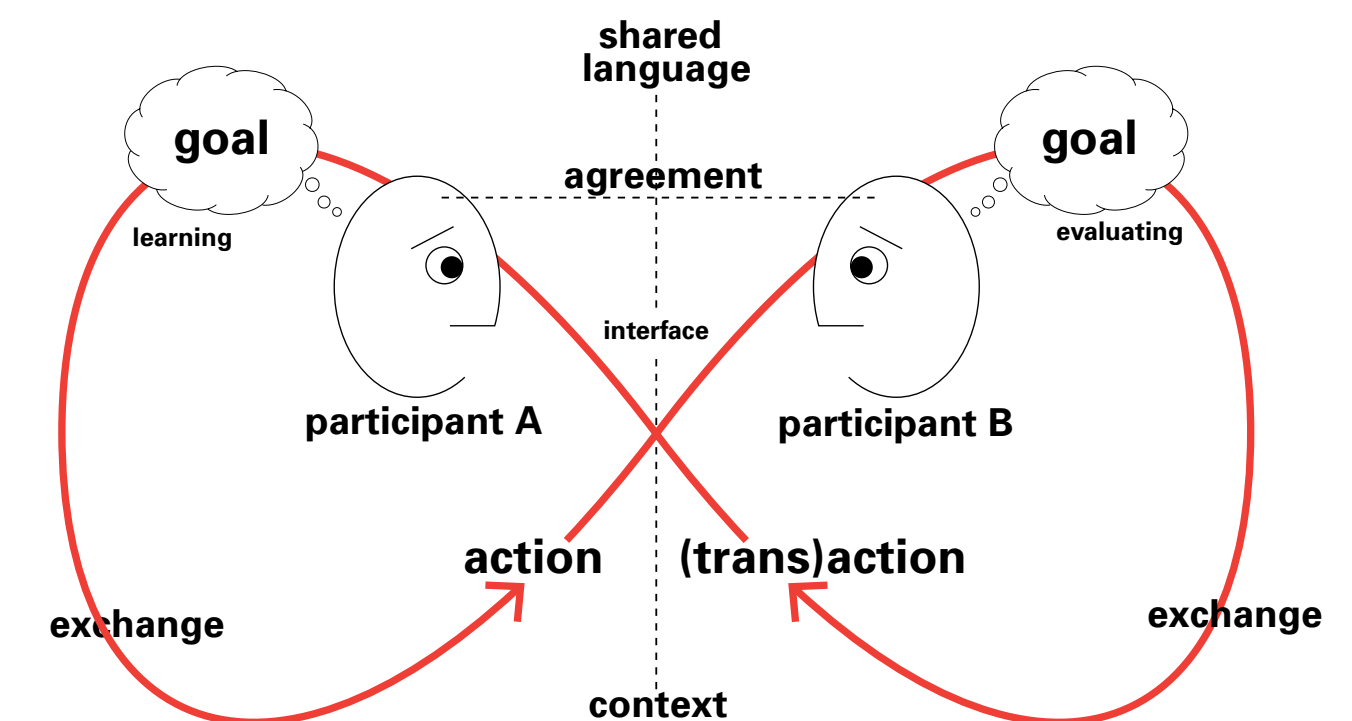
<http://pangaro.com/cmu2018/>



Why does conversation matter?

- *to act together, we must reach agreement*
- *to reach agreement, we must have an exchange*
- *to hold an exchange, we must have shared language.*

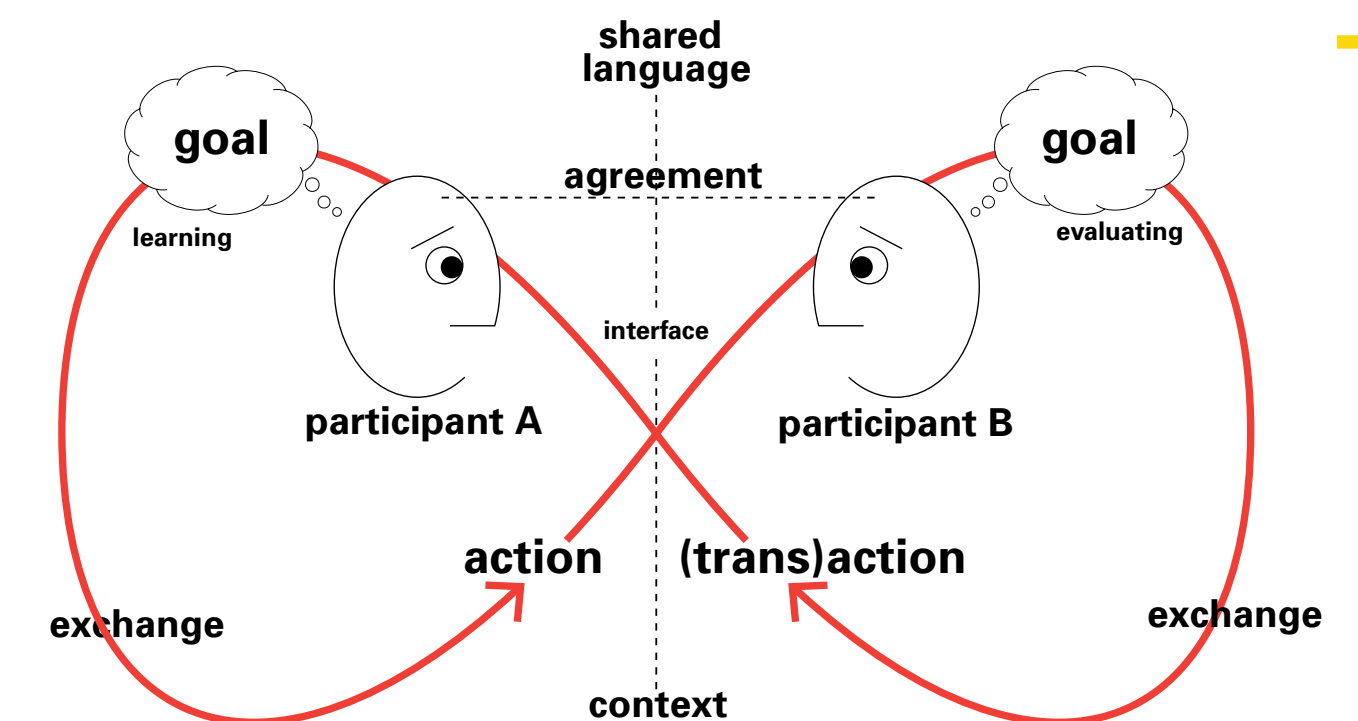
To cooperate and collaborate requires conversation.



What may follow from conversation?

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

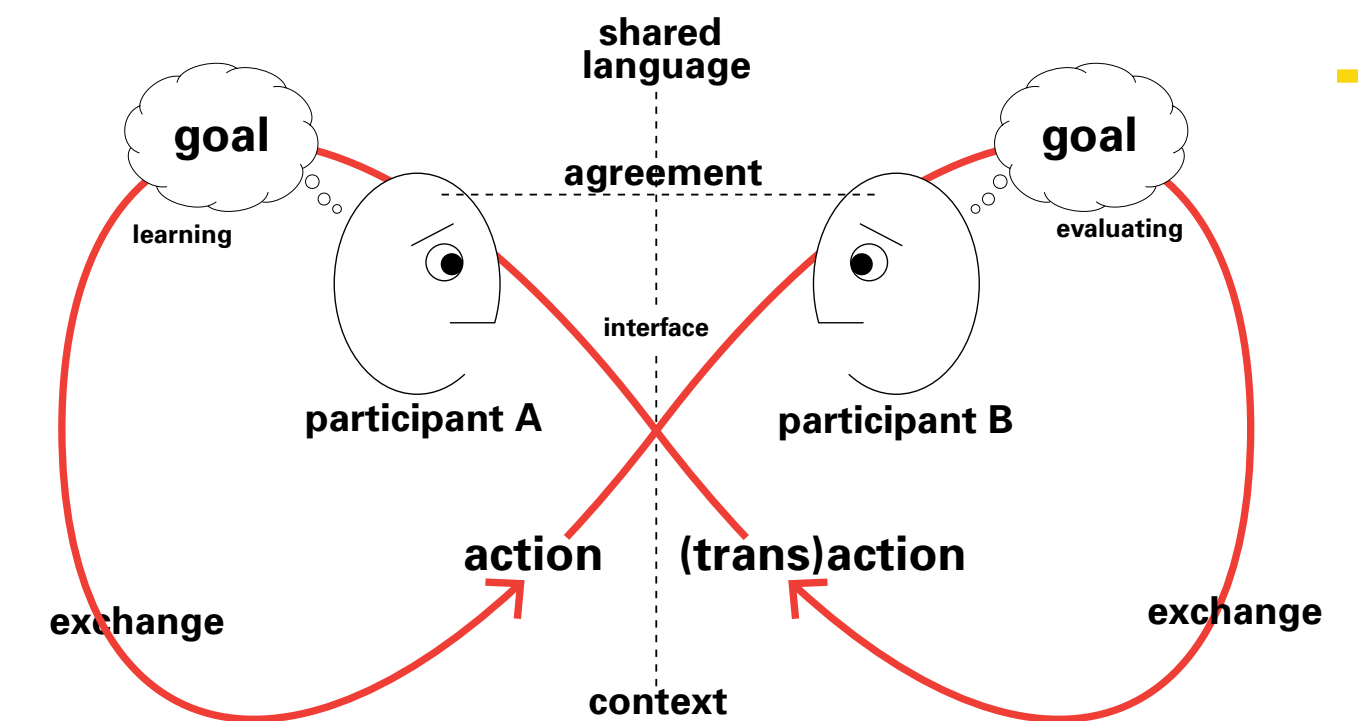
All these require conversation.



What does conversation enable?

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

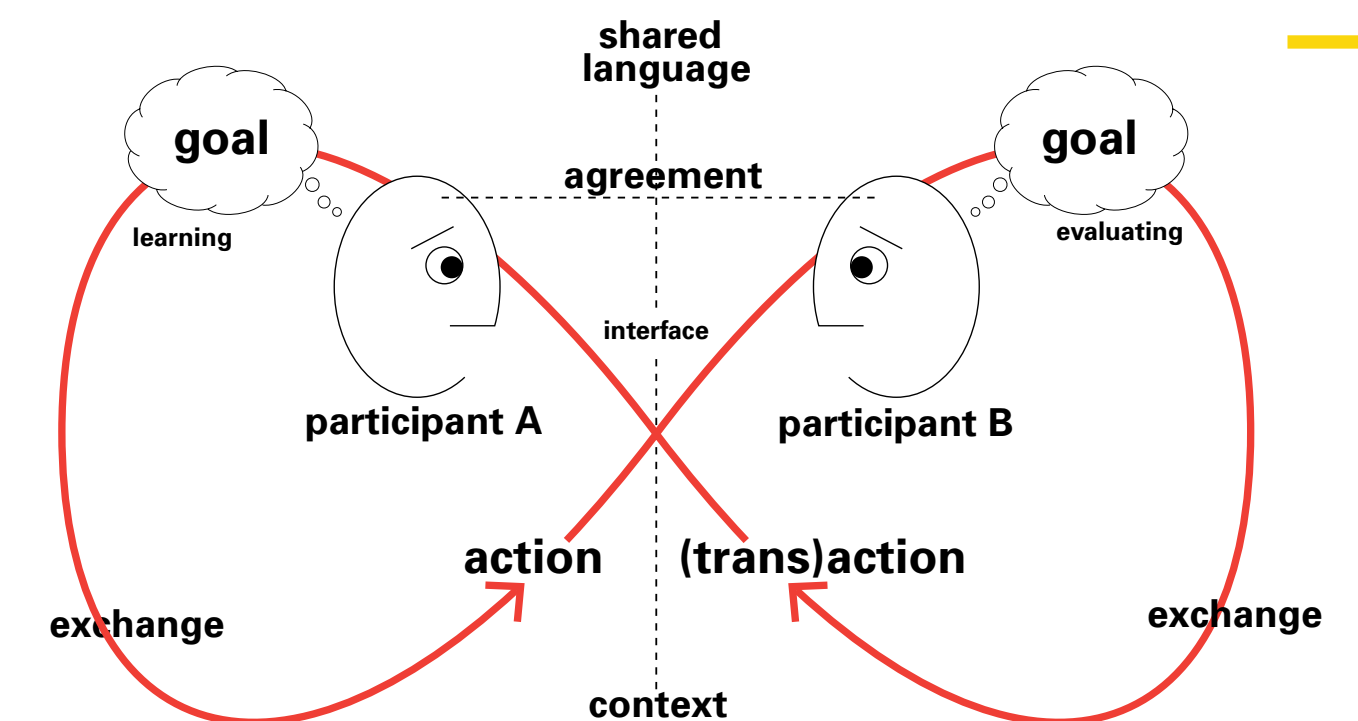
All these demand conversation.



Axiom #1 — Cooperative Interface

Conversation is a *cooperative interface* when sequences of coherent interactions enable participants to evolve their points-of-view such that agreement may arise.

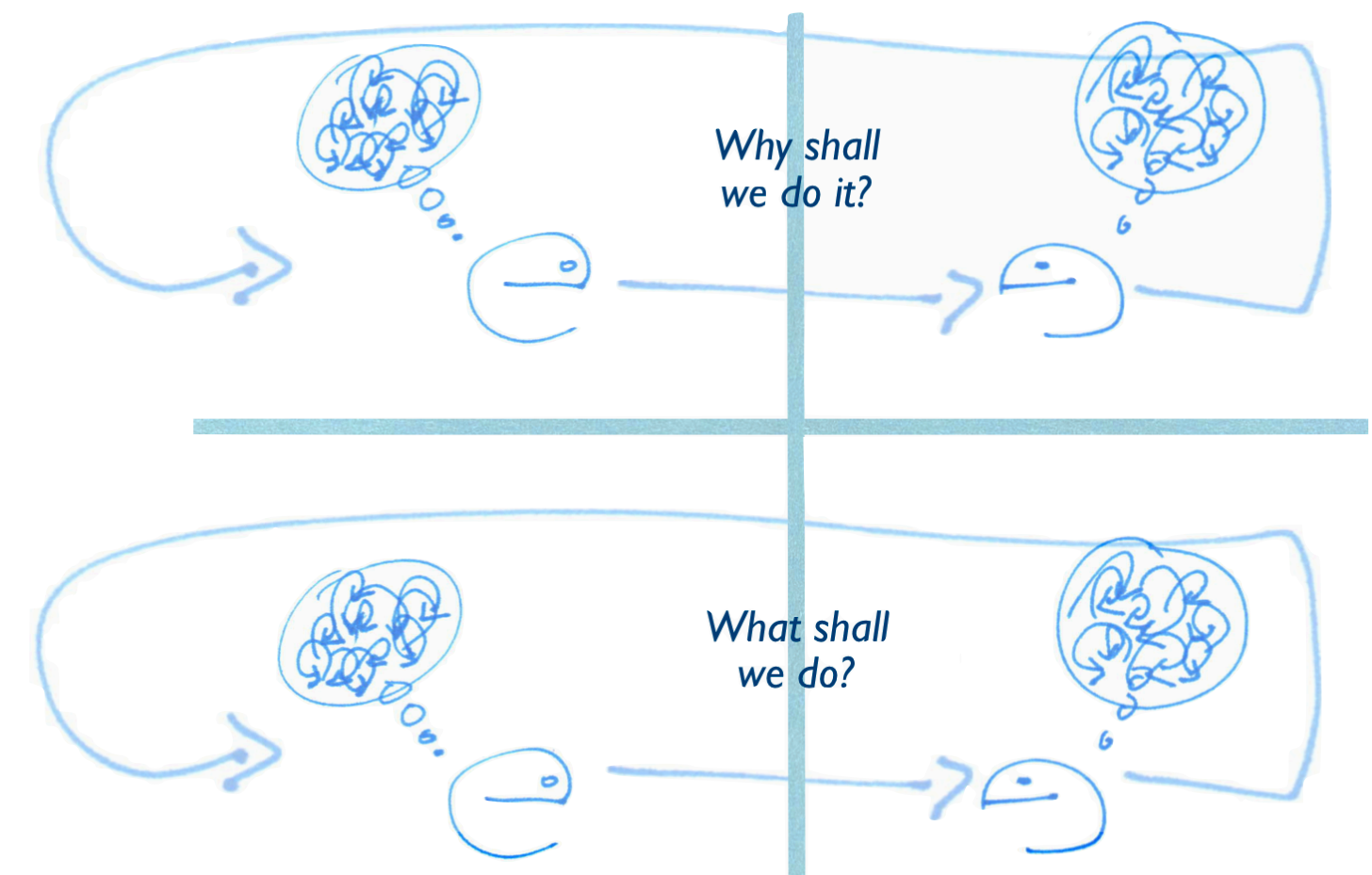
Axioms of Interactions for Conversation v2.0 — November 2018



Axiom #2 — Ethical Interface

Conversation is an *ethical interface* when there is reliable transparency of action & intent — what + why — such that trust may arise.

Axioms of Interactions for Conversation v2.0 — November 2018



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- How we use that information.
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- [Internet protocol address](#).
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- [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 [Back to top](#)

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 - 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.

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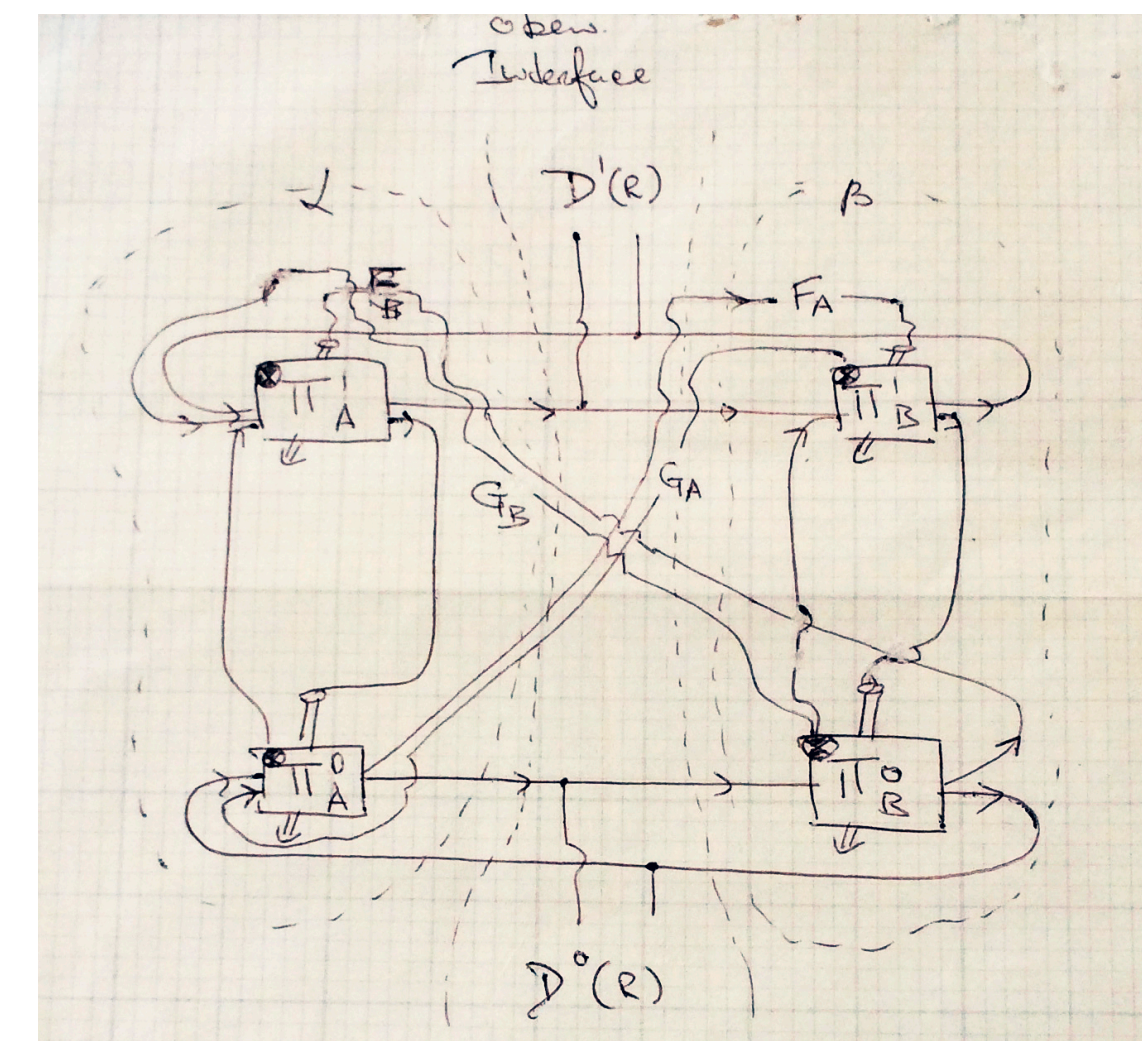
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Axiom #3 — Humane Interface

Conversation is an *humane interface* when any participant may influence its direction such that collaboration may arise.

Axioms of Interactions for Conversation v2.0 — November 2018



Gordon Pask

“Fig 10. The conditions to be satisfied as a prerequisite for creative and innovative activity...”

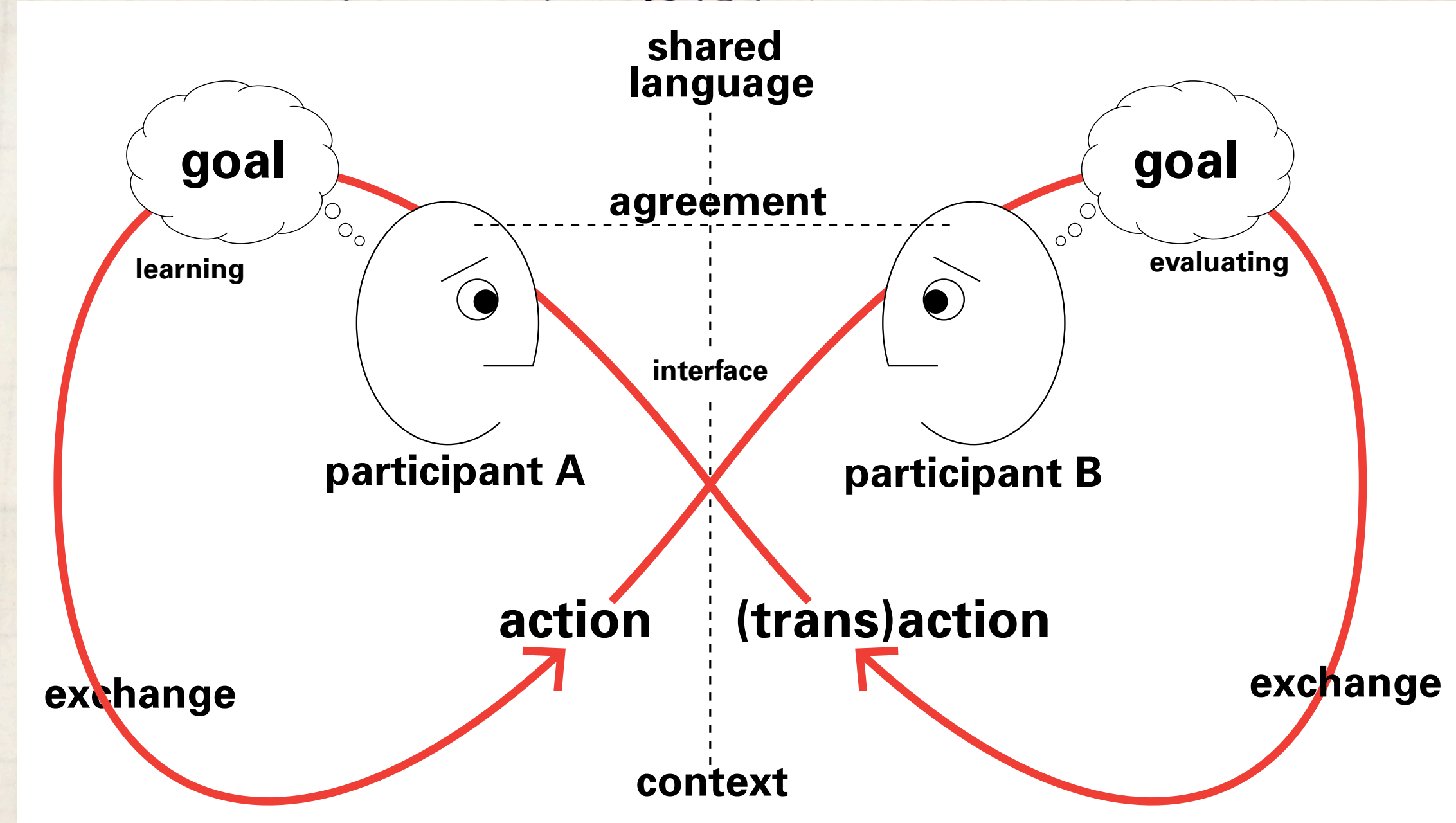
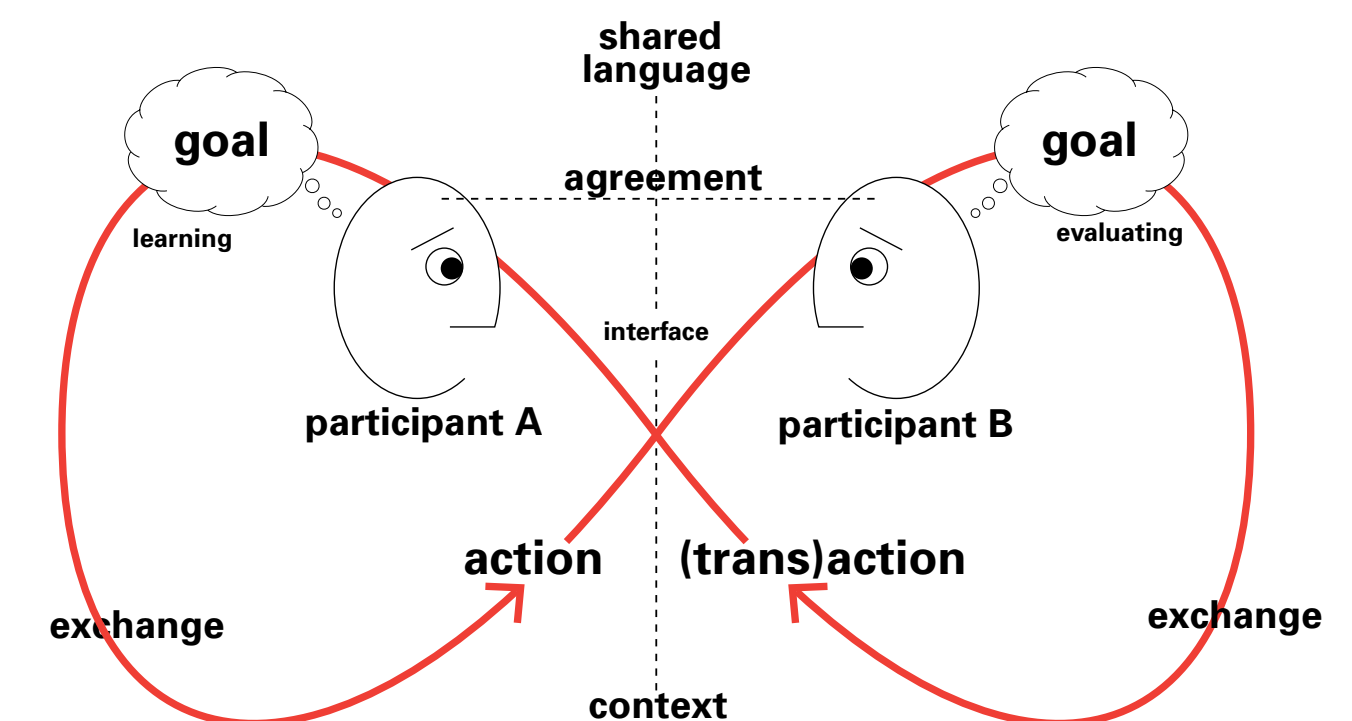


Fig 10. The conditions to be satisfied as a prerequisite for creative and innovative activity. The formal way the exhibited is either of F_A, G_A or F_B, G_B are properly couplings. For Creativity (communicable insight) it is essential that both F_A, F_B and G_A, G_B are defined & realized

Alexa, define a “*good conversation*”?

- *stays sensitive to your context & language*
- *engages you — keeps continuity in the exchange*
- *leads to agreements — even agreements-to-disagree*
- *enables coordination — acting together with others.*

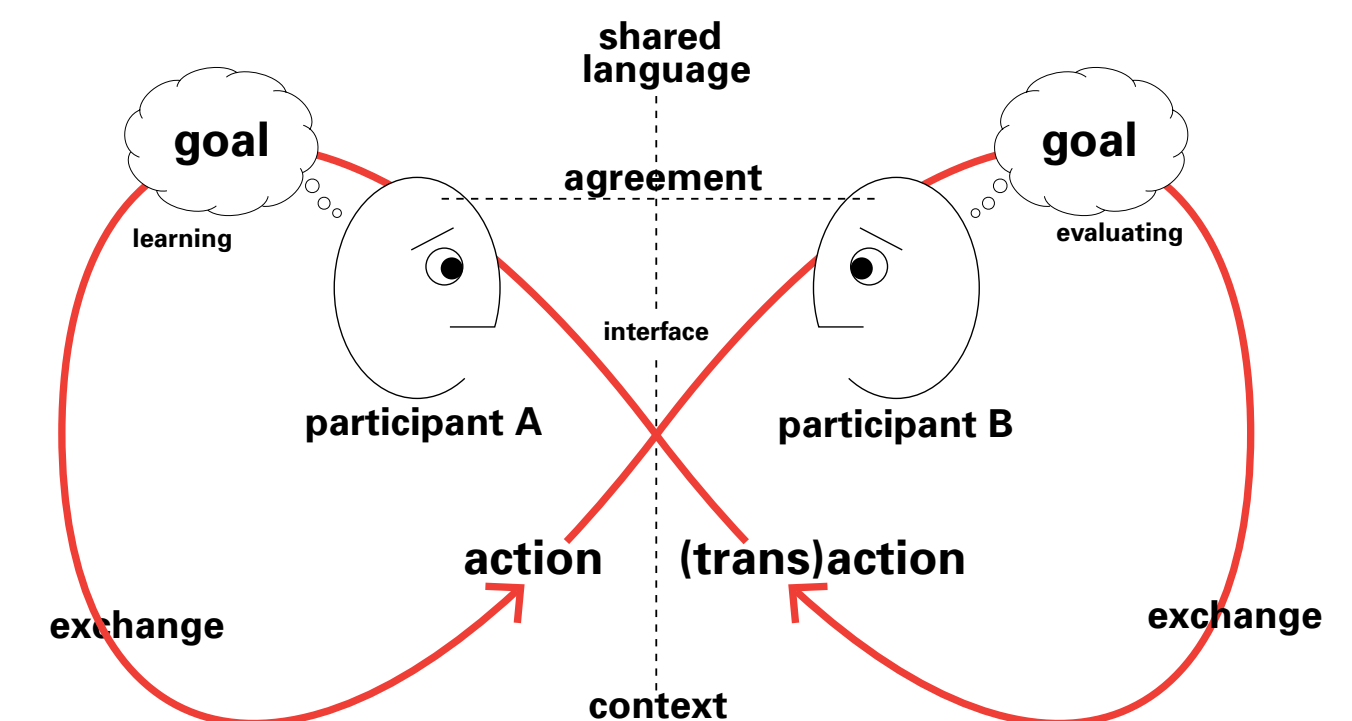
Alexa, why can't AI + Conversation Interfaces do these things?



Cortana, define a “*great conversation*”?

- *tells you things you enjoy learning – delights you*
- *is surprising – energizes you*
- *goes places you didn't expect to go – is generative*
- *evolves in ways you couldn't evolve on your own.*

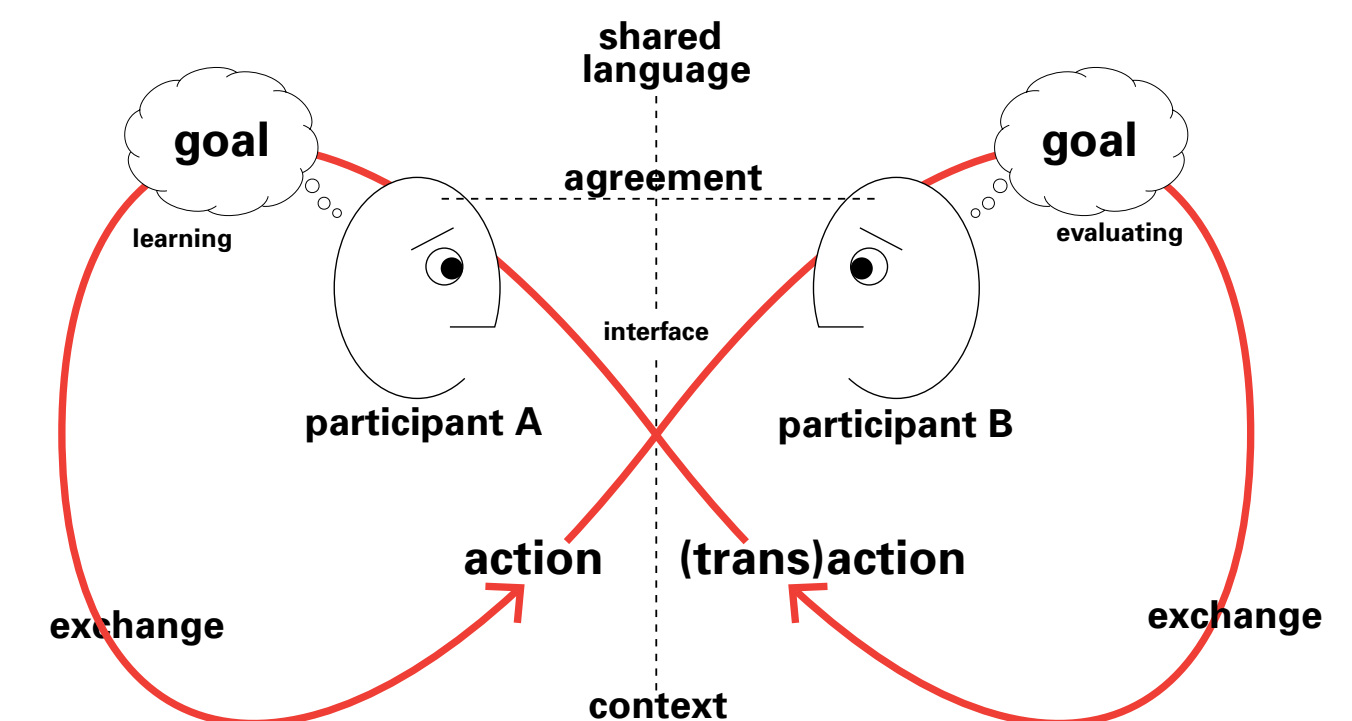
Cortana, why can't AI + Conversation Interfaces do these things?



Siri, what makes a “*great conversational partner*”?

- *asks great questions*
- *offers different ways to achieve your goal*
- *collaborates with you to define new goals*
- *helps you to be what you want to be... or to become.*

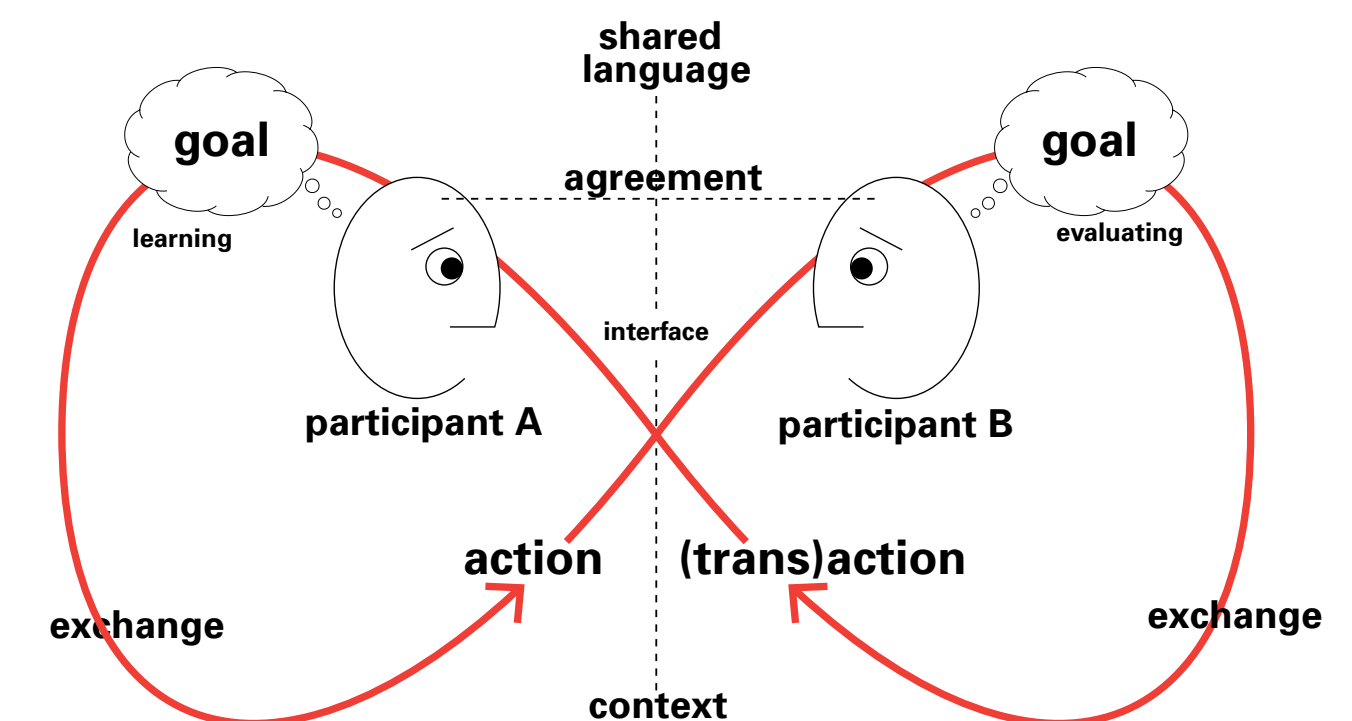
Siri, will Conversational Interfaces become great conversational partners?

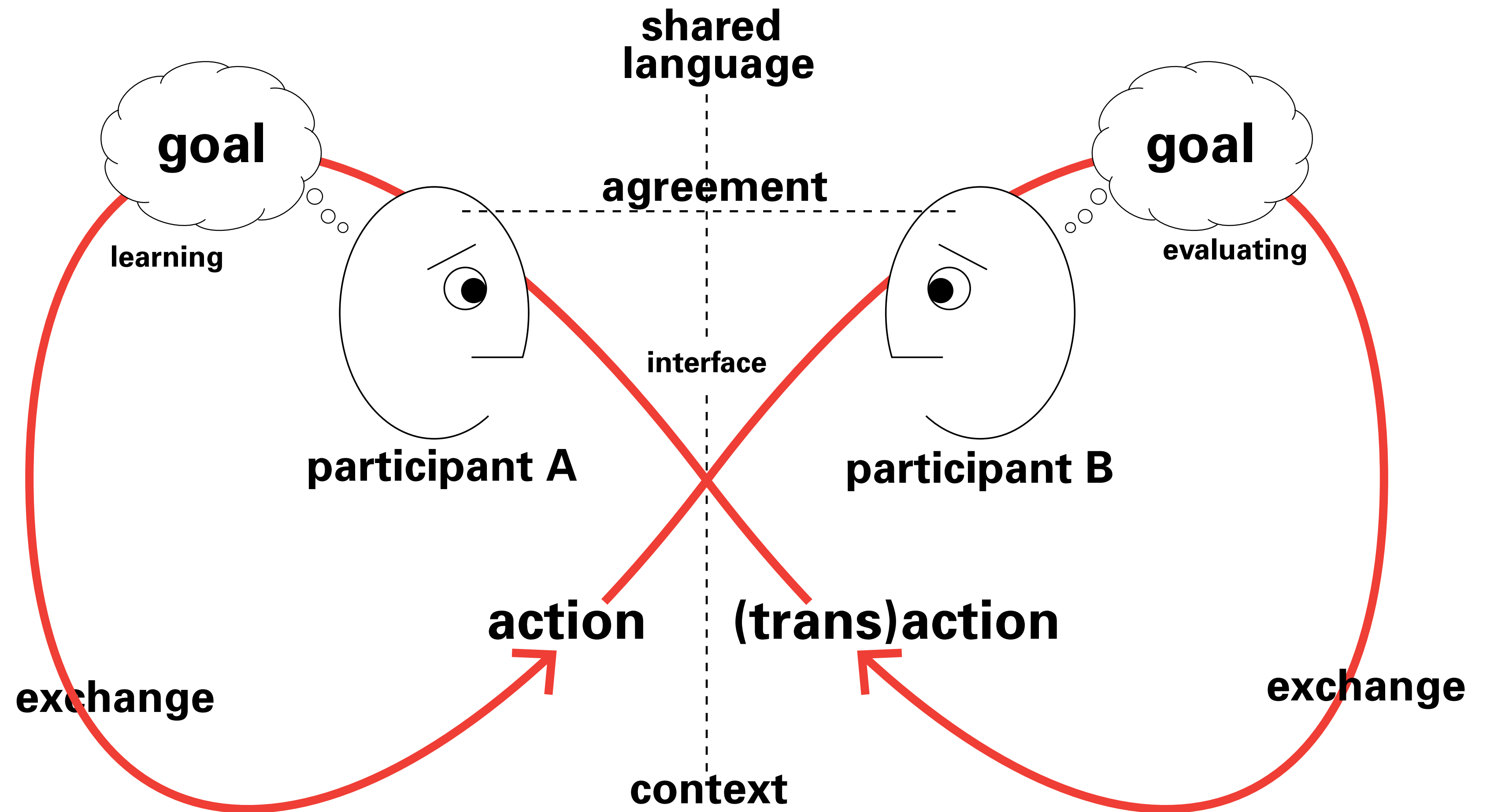


CUI Designers, what can be the goals of “*Conversational UIs*”?

- *be cooperative, humane, and ethical*
- *create conditions for great conversations*
- *increase the number of choices open to all*
- *help us to be what we want to be... or become.*

CUI Designers,
what do we want our Conversational UIs to be?





CUI Designers,
 what do we want our Conversational UIs to be?

Gordon Pask



Photo: Gordon Pask Archive
University of Vienna

Gordon Pask



Photo: Gordon Pask Archive
University of Vienna

Cybernetic Serendipity

Serendipity

Serendipity

the faculty of making
happy chance discoveries

of means of control and communication machines
both human and electronic

An exhibition

is a collection of...
the subject...
the scope of the...
the...
the...
the...
the...



Cybernetic Serendipity

Serendipity

Σερενδιπία

the faculty of making
happy chance discoveries
by means of control and communication machines
both human and electronic

An exhibition

is a selective interpretation of the way in which the machine and the human mind interact in the course of the scientific and artistic process.

It is an exhibition of the work of the Institute of Contemporary Arts, London, in collaboration with the Serendipity Foundation, New York.

and other serendipitous manifestations

Institute of Contemporary Arts

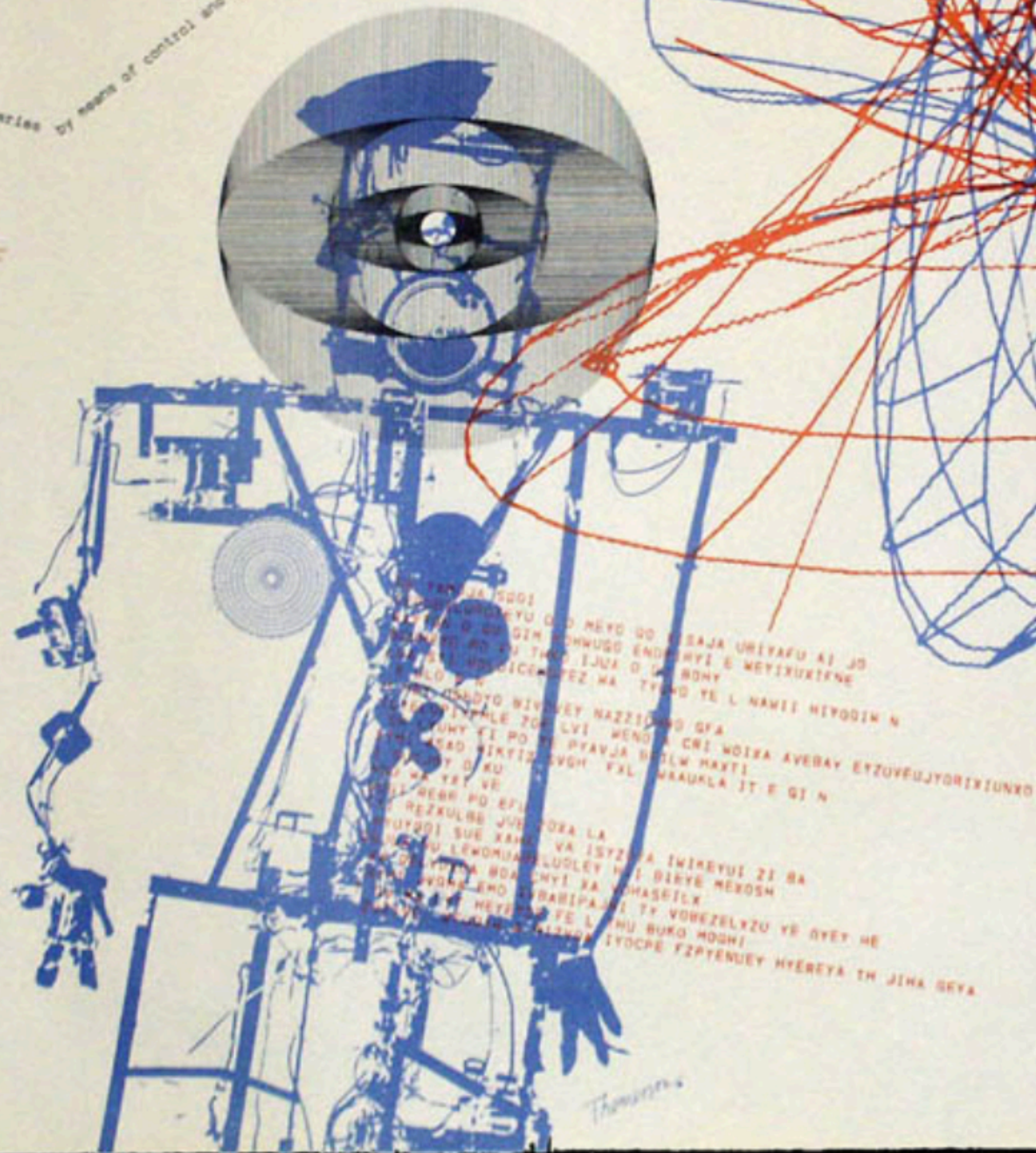
August 2 - October 20



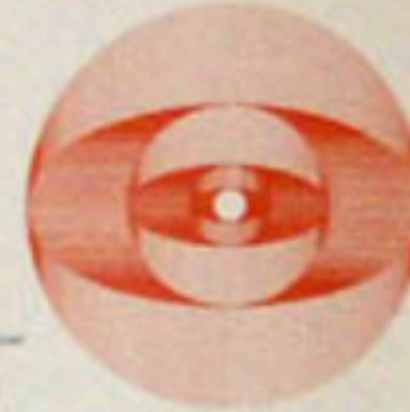
100, Strand, London WC2R 0AL

Telephone: 7744 7744
Telegrams: 7744
Telex: 7744
Museum: 7744

Information by postcard and photograph: 7744
Postcard: 7744
Photograph: 7744



CYBERNETIC
SERENDIPITY
LECTURES



1968
August 2 - October 20, 1968
During the course
of the Serendipity exhibition
at the Institute of Contemporary Arts
at 100, Strand, London W.C.2.
a series of lectures will be held
addressed to:
19.00 hours (1.15)
at the Institute of Contemporary Arts

Thursday
August 8

Dr. J. J. Wilder
Lecturer in the Faculty of Administration,
University of London, London University
and the Royal Society

Tuesday
August 13

Professor Herbert Ross
Lecturer and Head of the School of Mass
Communication at the University of Illinois,
Urbana, Illinois, U.S.A.

Thursday
August 15

Dr. J. J. Wilder
Lecturer in the Faculty of Administration,
University of London, London

Tuesday
August 20

Dr. J. J. Wilder
Lecturer in the Faculty of Administration,
University of London, London

Tuesday
August 27

Dr. J. J. Wilder
Lecturer in the Faculty of Administration,
University of London, London

Tuesday
September 3

Dr. J. J. Wilder
Lecturer in the Faculty of Administration,
University of London, London

Thursday
September 5

Dr. J. J. Wilder
Lecturer in the Faculty of Administration,
University of London, London

Tuesday
September 10

Dr. J. J. Wilder
Lecturer in the Faculty of Administration,
University of London, London

Thursday
September 12

Dr. J. J. Wilder
Lecturer in the Faculty of Administration,
University of London, London

Thursday
September 19

Dr. J. J. Wilder
Lecturer in the Faculty of Administration,
University of London, London

Tuesday
September 24

Dr. J. J. Wilder
Lecturer in the Faculty of Administration,
University of London, London

Thursday
September 26

Dr. J. J. Wilder
Lecturer in the Faculty of Administration,
University of London, London

Tuesday
October 1

Dr. J. J. Wilder
Lecturer in the Faculty of Administration,
University of London, London

Tuesday
October 8

Dr. J. J. Wilder
Lecturer in the Faculty of Administration,
University of London, London

Thursday
October 10

Dr. J. J. Wilder
Lecturer in the Faculty of Administration,
University of London, London

Thursday
October 17

Dr. J. J. Wilder
Lecturer in the Faculty of Administration,
University of London, London

Thomson

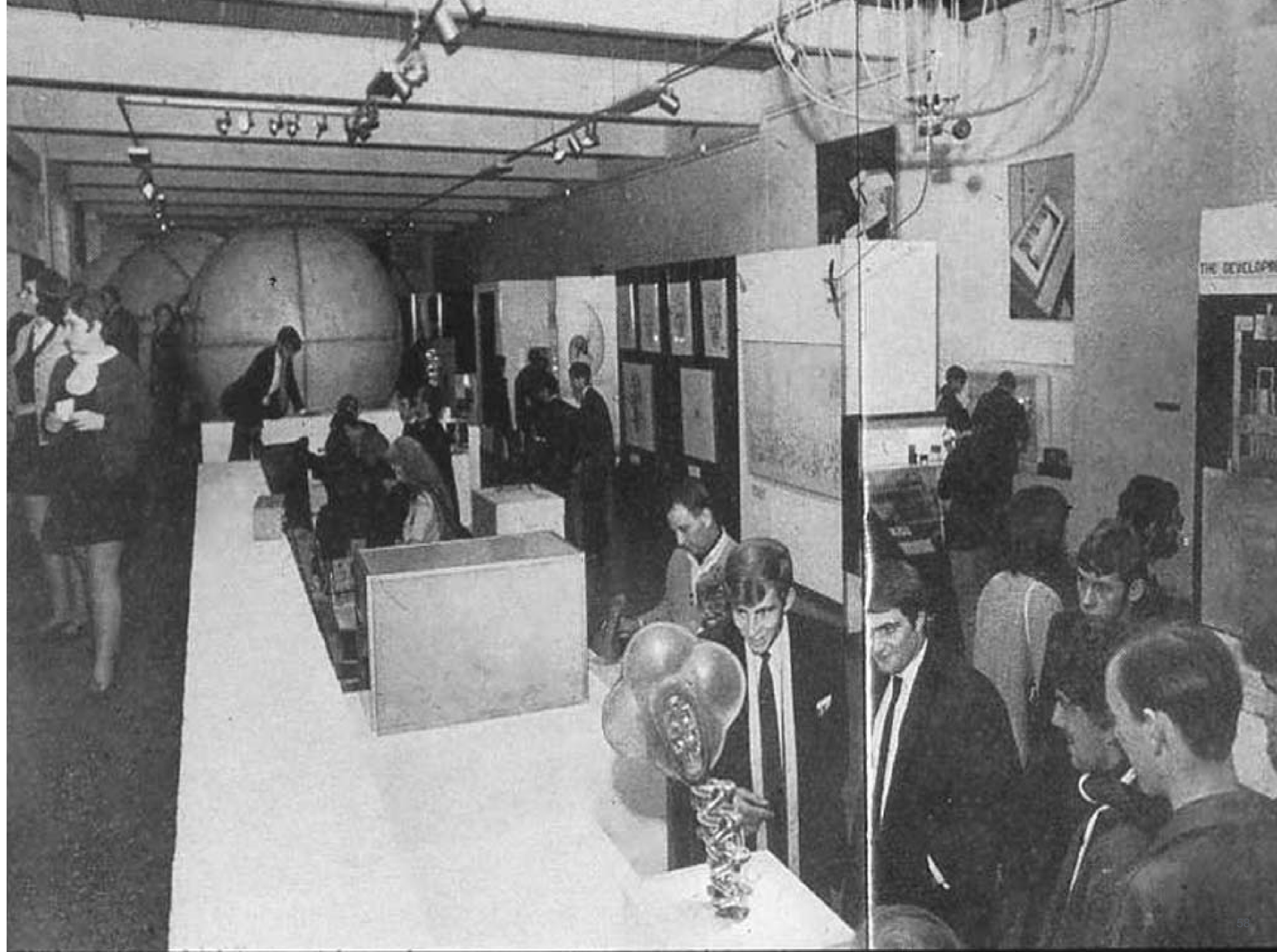
Cybernetic Serendipity Exhibition

London 1968

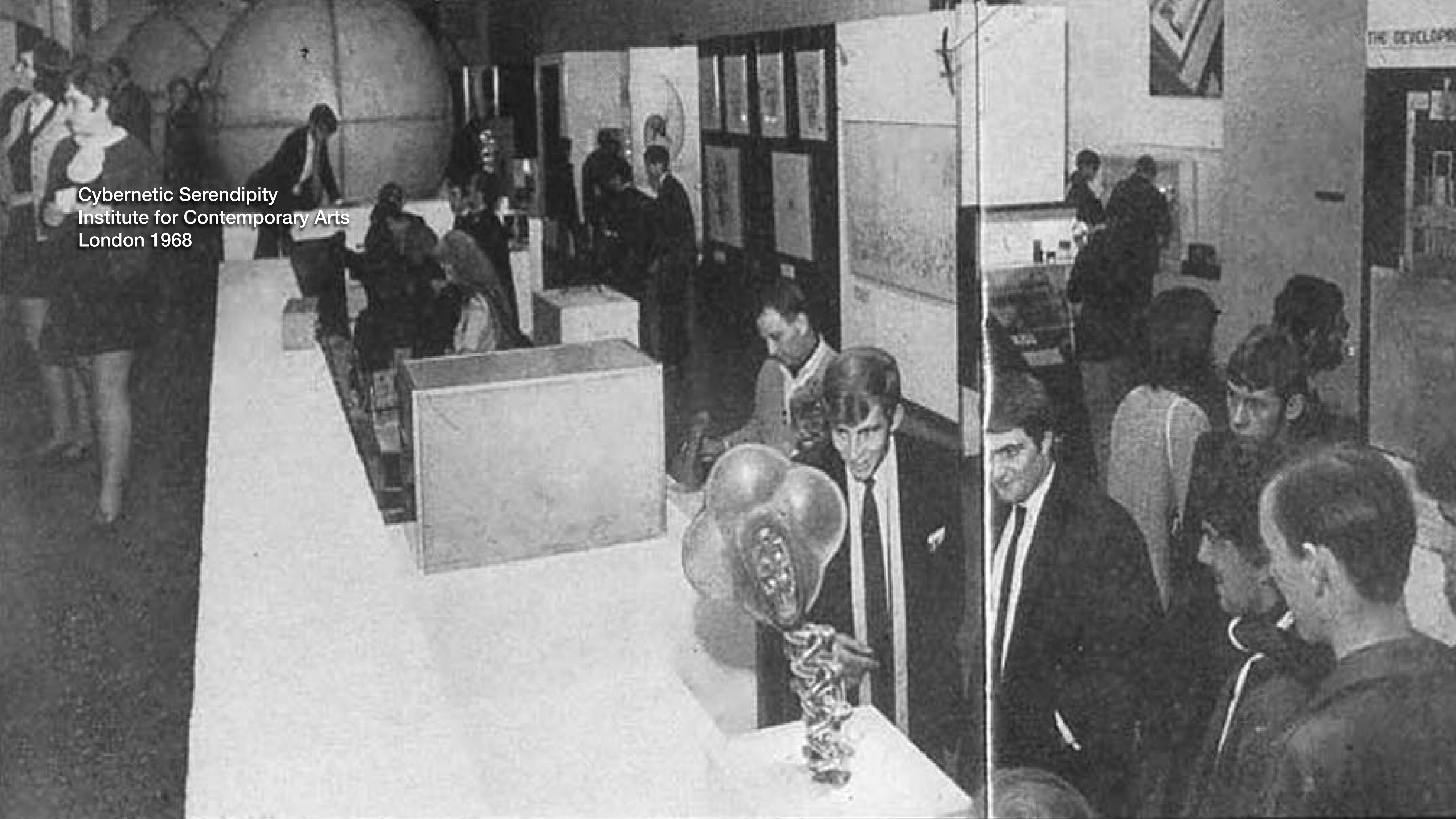


Cybernetic Serendipity Exhibition

London 1968



Cybernetic Serendipity
Institute for Contemporary Arts
London 1968



Cybernetic Serendipity
Institute for Contemporary Arts
London 1968

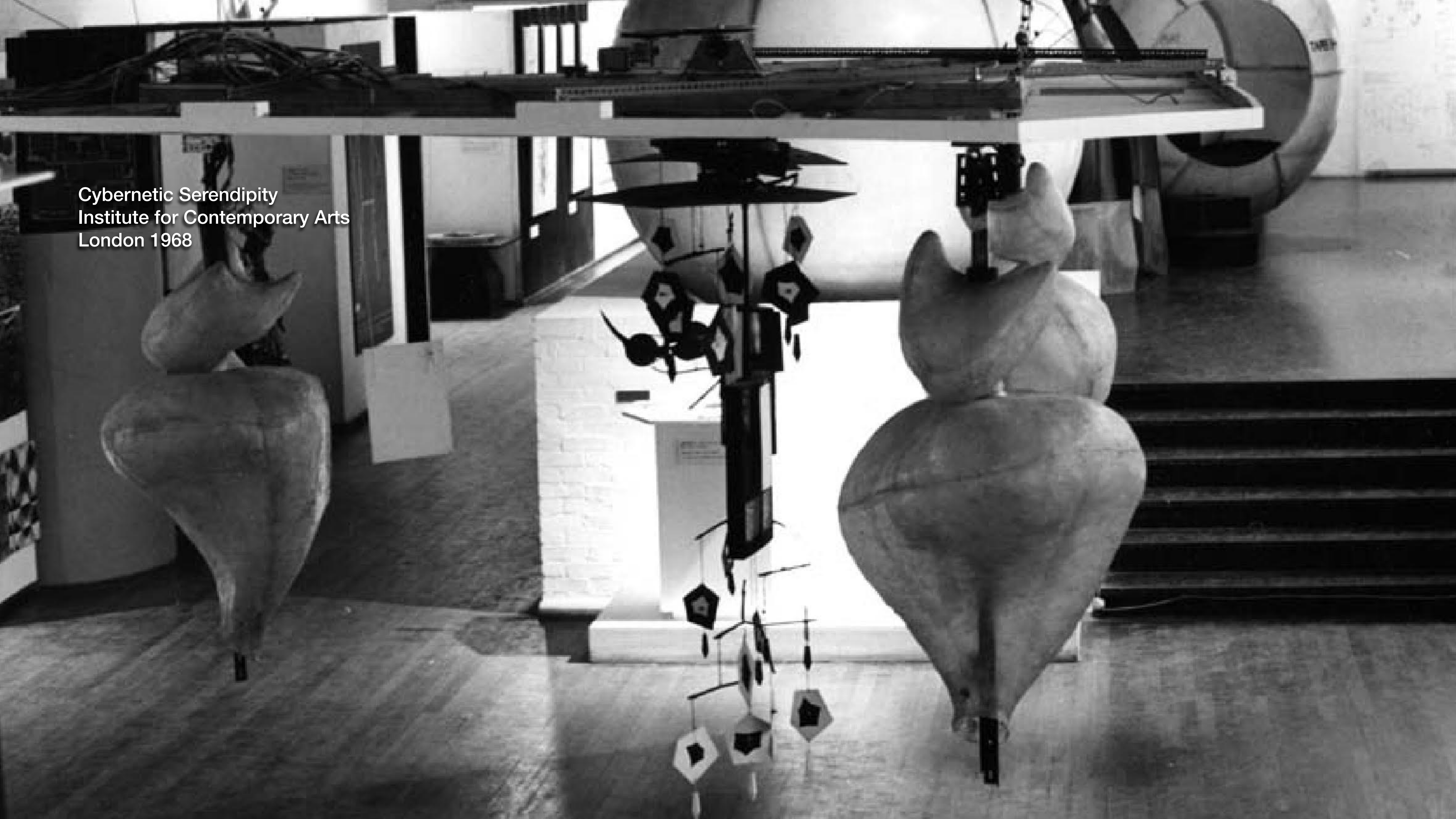
The History of Cybernetics



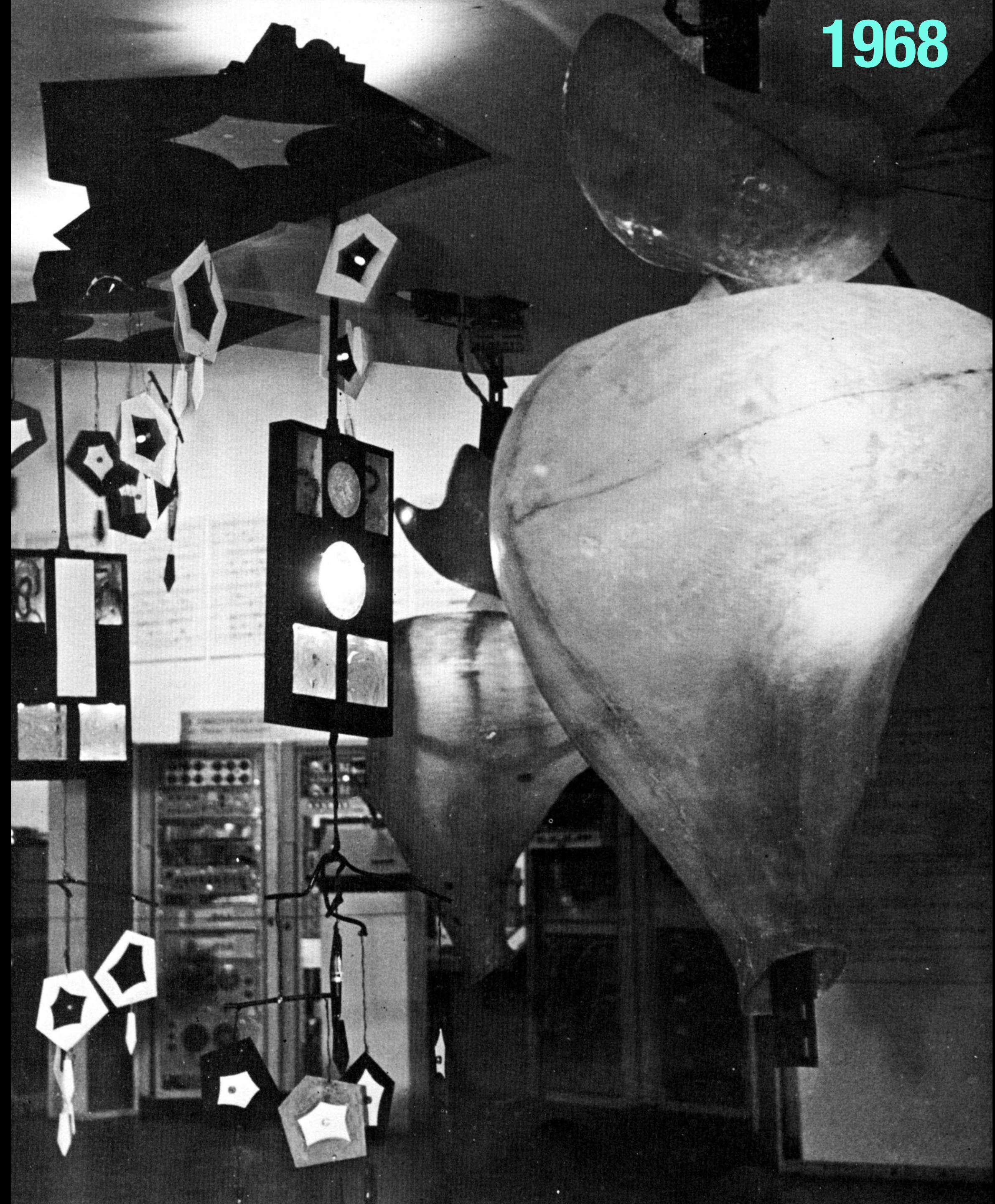
Cybernetic Serendipity
Institute for Contemporary Arts
London 1968



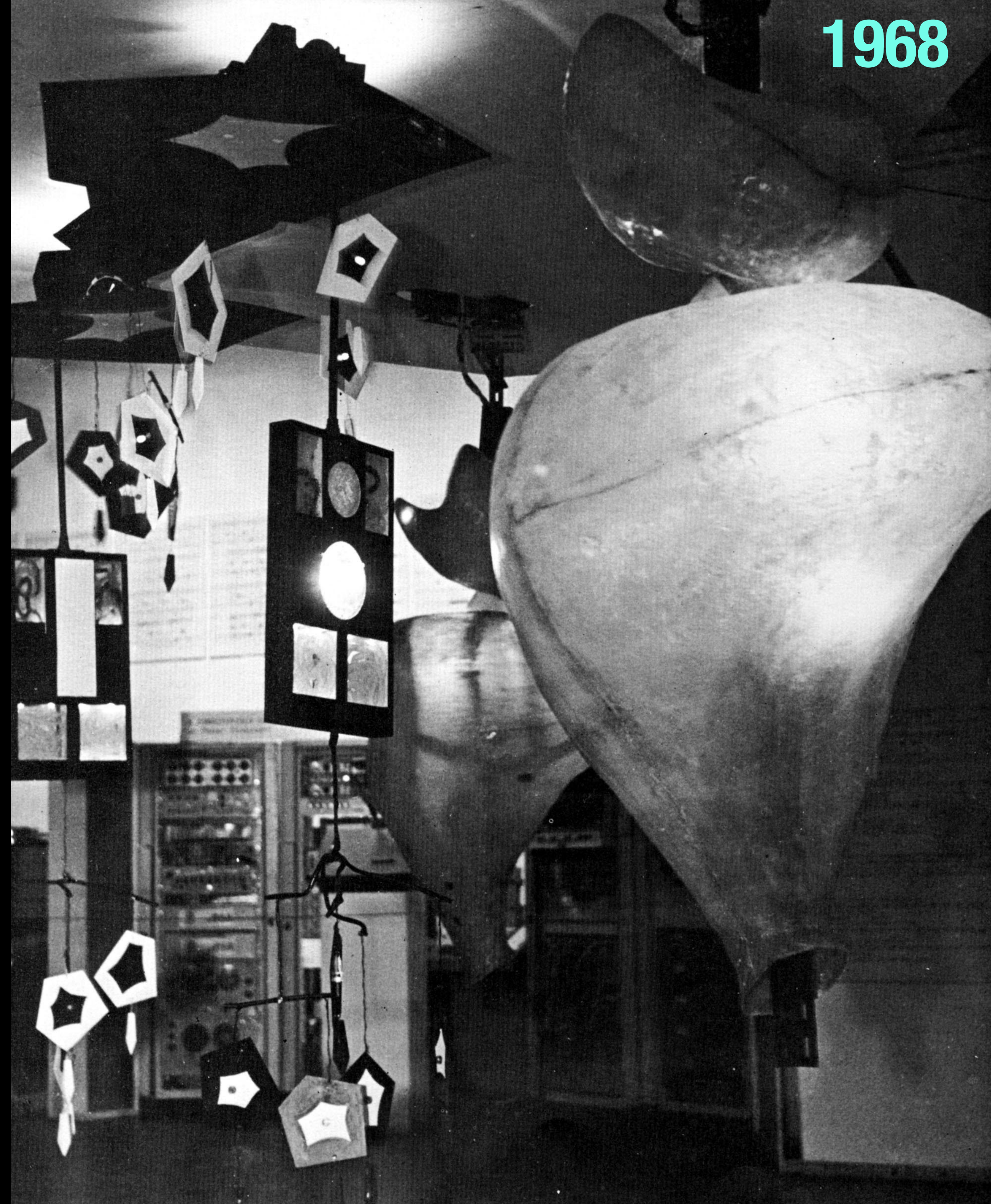
Cybernetic Serendipity
Institute for Contemporary Arts
London 1968



1968



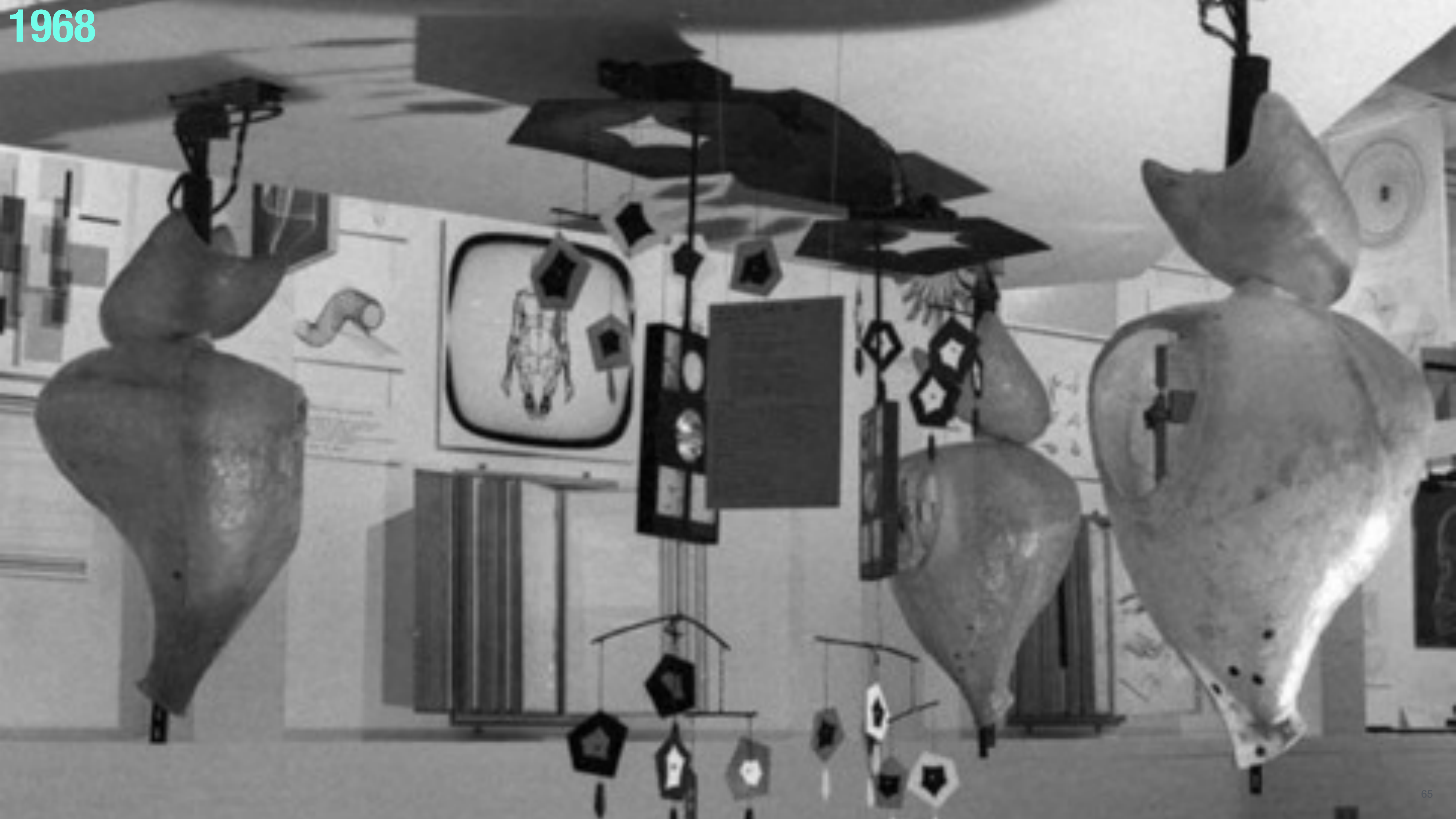
1968



2018



1968



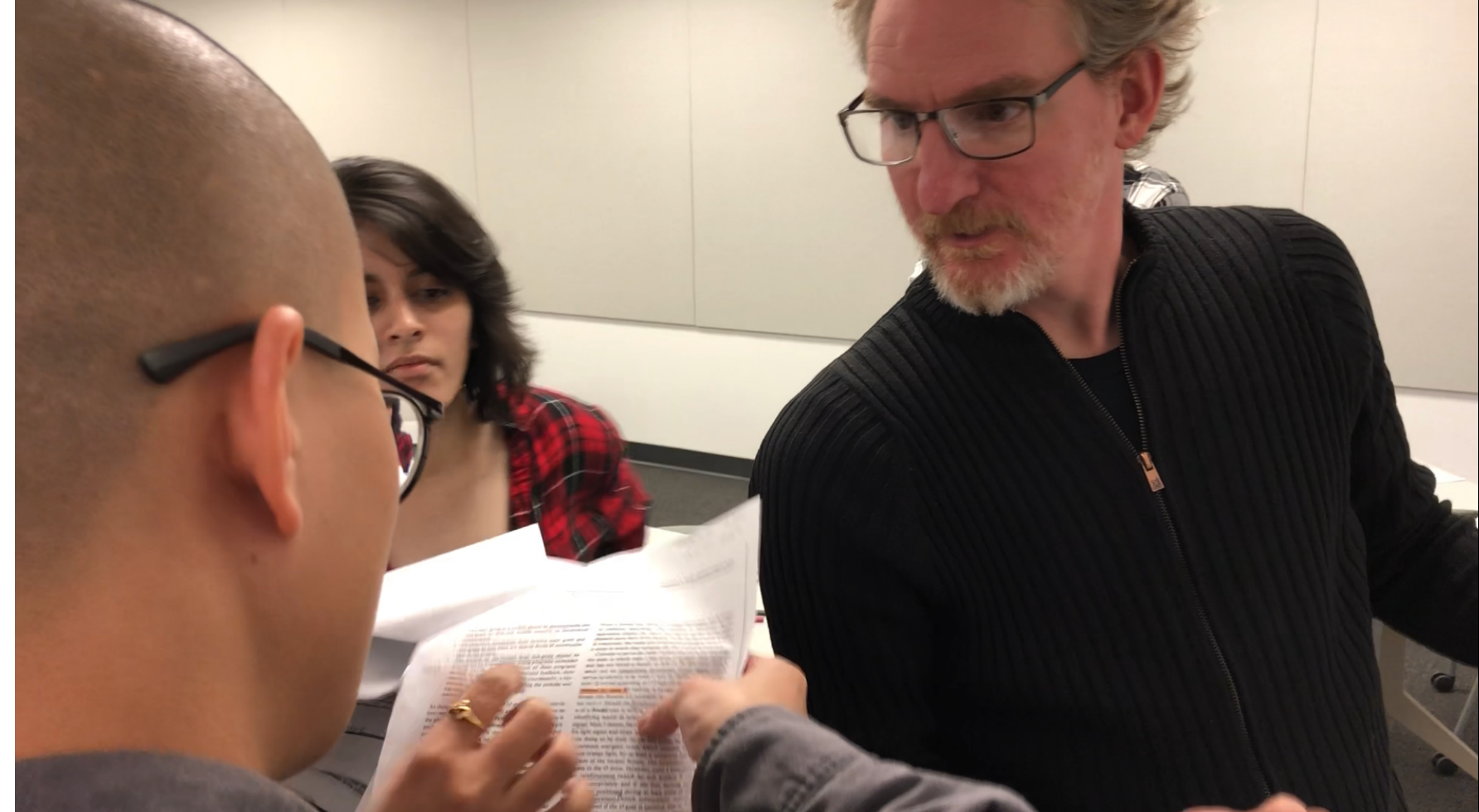
2018



COLLOQUY 2018 Project

TJ McLeish, Architect/Master Fabricator
Masters Program in Interaction Design
College for Creative Studies
Detroit

ColloquyOfMobiles.com

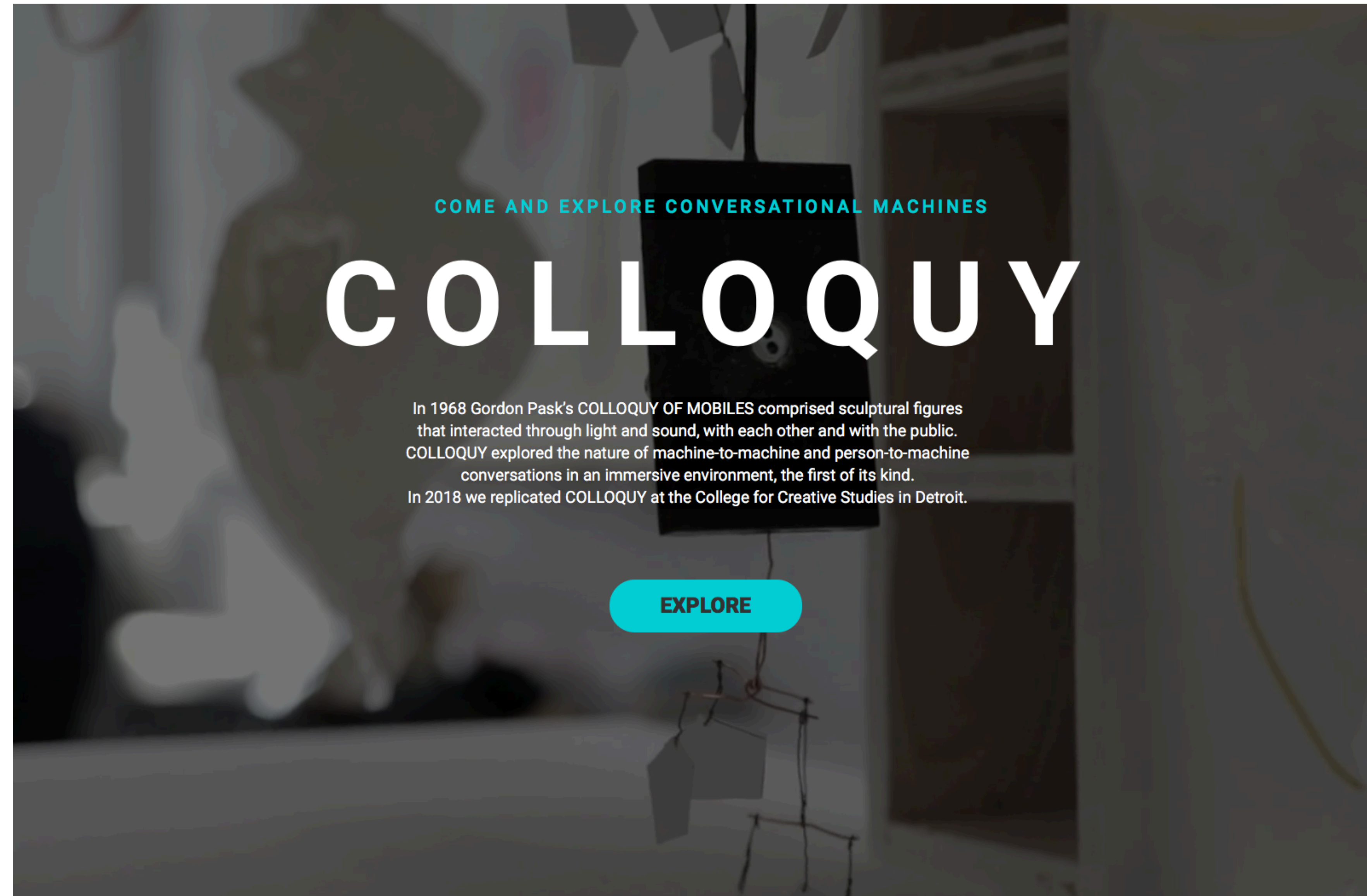


C...y





Project Web Site
Students of MFA IxD Class of 2018
College for Creative Studies
2018



COLLOQUY

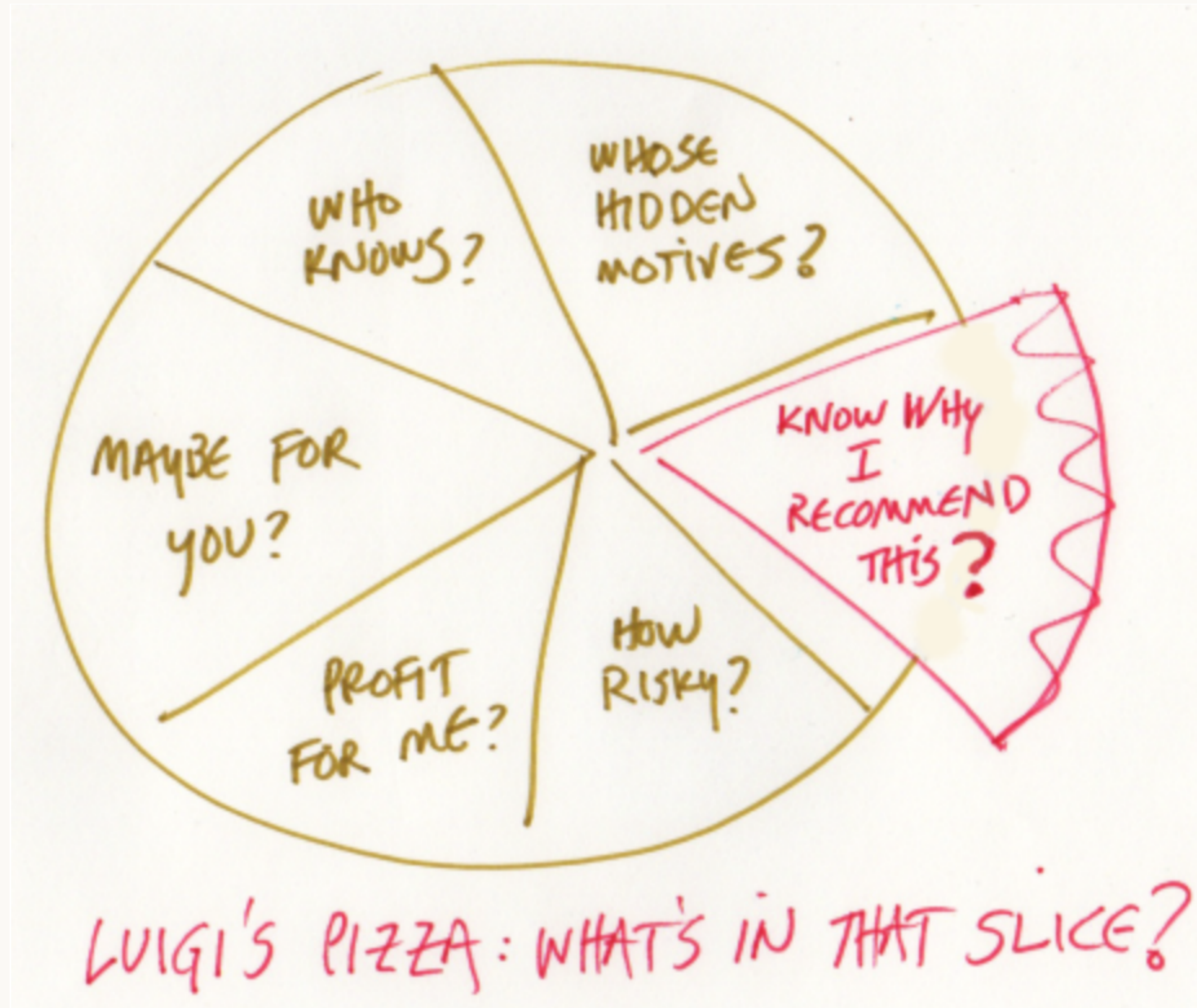
COME AND EXPLORE CONVERSATIONAL MACHINES

In 1968 Gordon Pask's COLLOQUY OF MOBILES comprised sculptural figures that interacted through light and sound, with each other and with the public. COLLOQUY explored the nature of machine-to-machine and person-to-machine conversations in an immersive environment, the first of its kind. In 2018 we replicated COLLOQUY at the College for Creative Studies in Detroit.

EXPLORE

ColloquyOfMobiles.com

Luigi's Pizza – A Parable about Conversational Interfaces



<https://ccsmfa.blog/2016/11/08/luigis-pizza-a-parable/>

Luigi's Pizza – A Parable about Conversational Interfaces

Making Chatbots Humane:

- *apply models of human conversation*
- *propose interfaces that are cooperative, ethical, humane*
- *explore new forms of Conversational Interfaces.*

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

— Ethical Imperative, Heinz von Foerster

Thank you.

See pangaro.com/bots2018/ for slides and references.

Special Thanks to:

Caio Calado

Hugh Dubberly

TJ McLeish

Karen Berntsen

Pooja Upadhyay

Paul Pangaro, Ph.D.
Professor of Practice
Human-Computer Interaction Institute
Carnegie Mellon University, Pittsburgh
paul@pangaro.com



Appendices



Applying C-L-E-A-T

Questions for Designing for Conversation

- What channel is being opened to begin the conversation?
Is the interruption reasonable in how and when it intrudes?
What is the bio-cost of the intrusion relative to its benefit?
Are there better ways to interrupt?
- Is the first message clear?
Does it offer something to the recipient?
- Does the exchange convey the potential benefits in continuing?
Is there learning or delight? Is curiosity or interest stimulated?
- Is meaning easily understood—
do the messages speak in the language of the participants?
Are messages sensitive to others' context, needs, interests, values?
How can messages be made more efficient or clear?

From “What is Conversation?”
Dubberly & Pangaro 2009

[http://www.dubberly.com/articles/
what-is-conversation.html](http://www.dubberly.com/articles/what-is-conversation.html)

Why can't AI + Conversation Interfaces do all this?

Applying C-L-E-A-T

Questions for Designing “Conversation Interfaces”

- What does the Conversation Interface (CUI) know about the user’s context— what more can it know, automatically or by input from the user?
- How can a user convey intention *to* the software— can the CUI be open to the user’s goals, values, preferences?
- Does the CUI evolve during the engagement— in addition to understanding the user, can it build new knowledge?
- When should the CUI be confident it understands the user— and when should it double-check?
- Can the CUI’s capabilities build a relationship of trust— what does that take?

From “What is Conversation?”
Dubberly & Pangaro 2009

[http://www.dubberly.com/articles/
what-is-conversation.html](http://www.dubberly.com/articles/what-is-conversation.html)

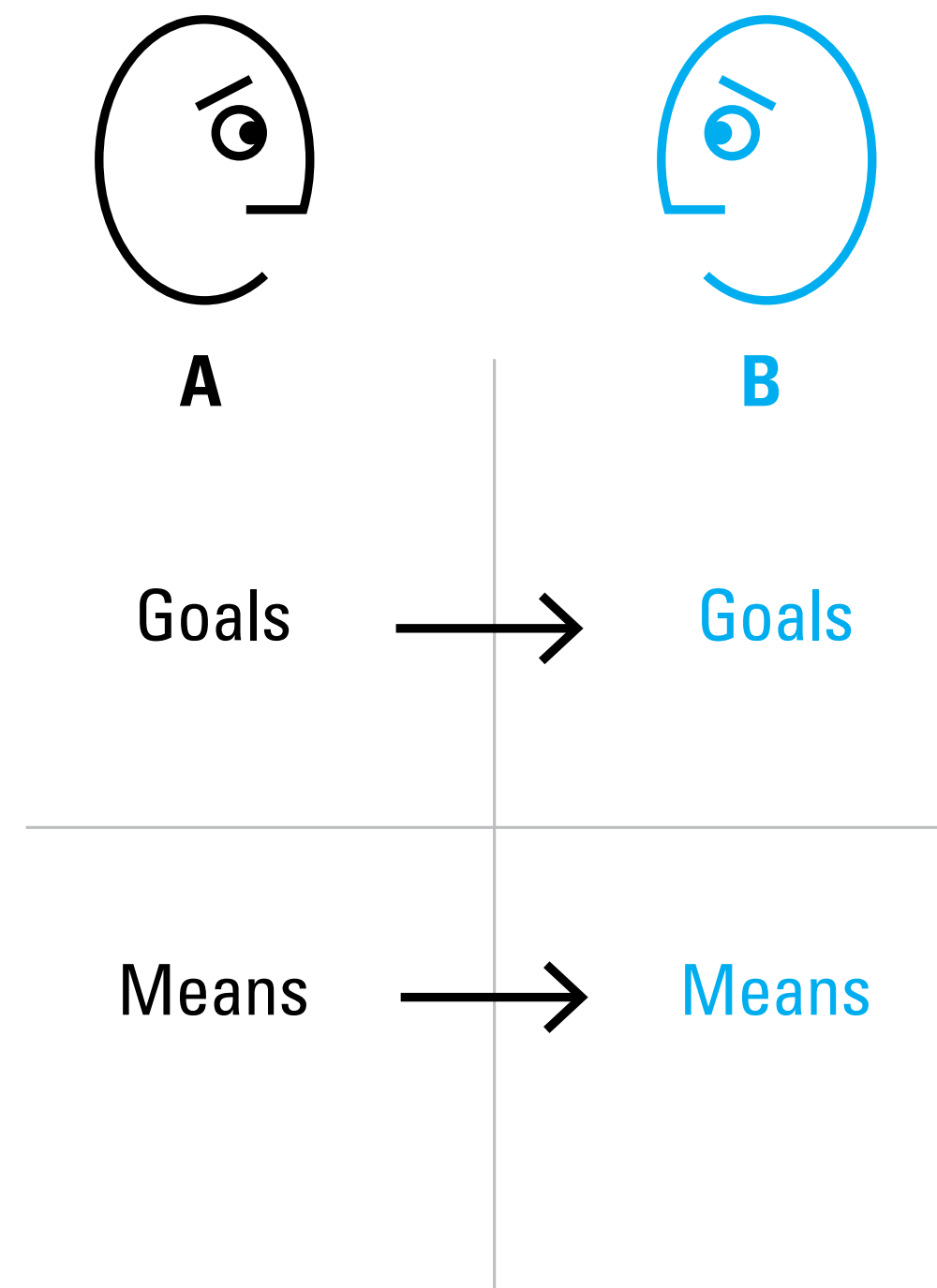
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When will Conversation Interfaces do all this?

Architecture of Conversation

A and B may talk about goals, means, or both

“What is the goal? And how do we want to accomplish it?”

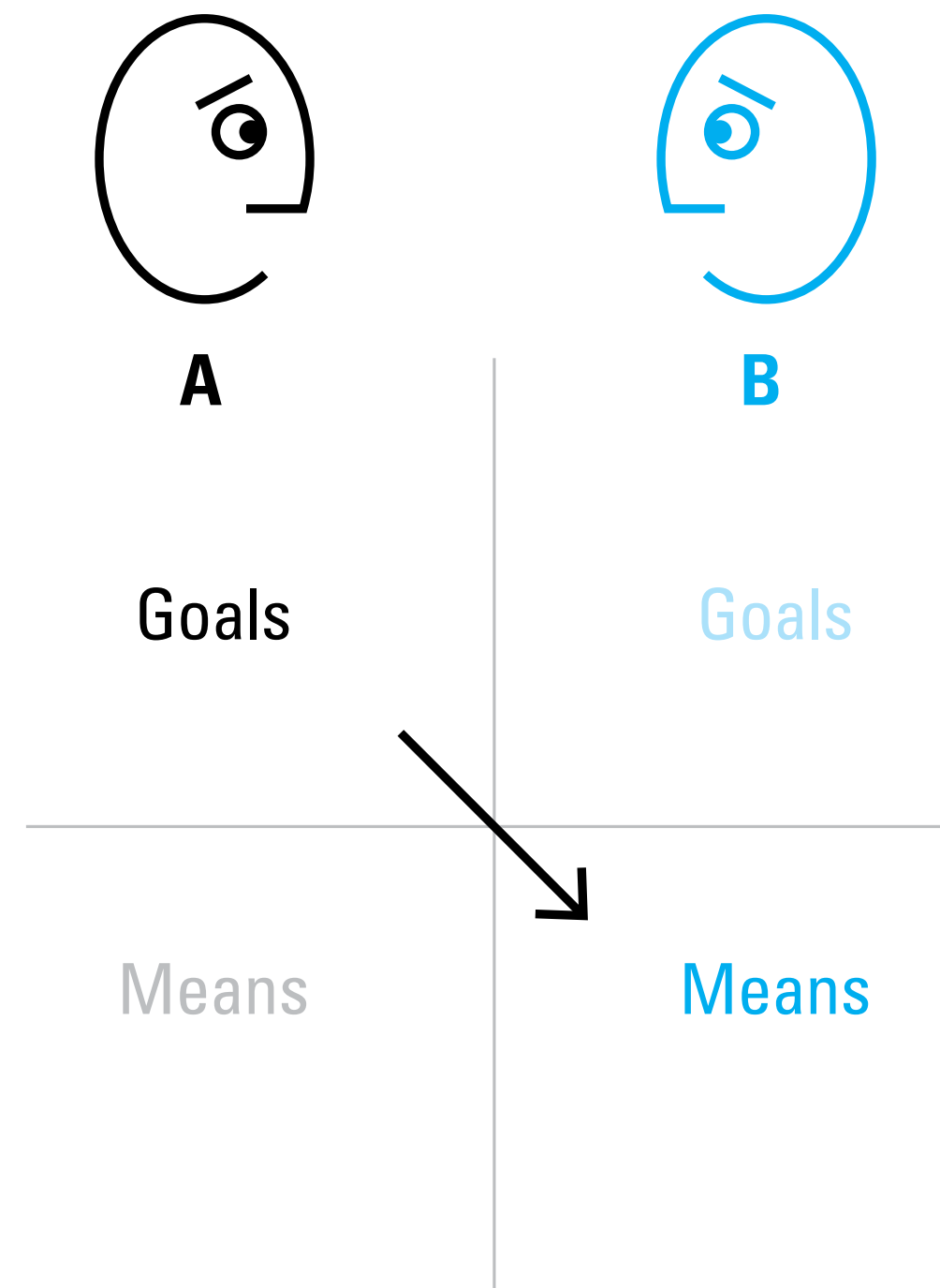


— adopted from Hugh Dubberly
after Paul Pangaro and Gordon Pask

Controlling

A tells B what to do and how to do it

“Alexa, give me some news from NPR.”—does this one

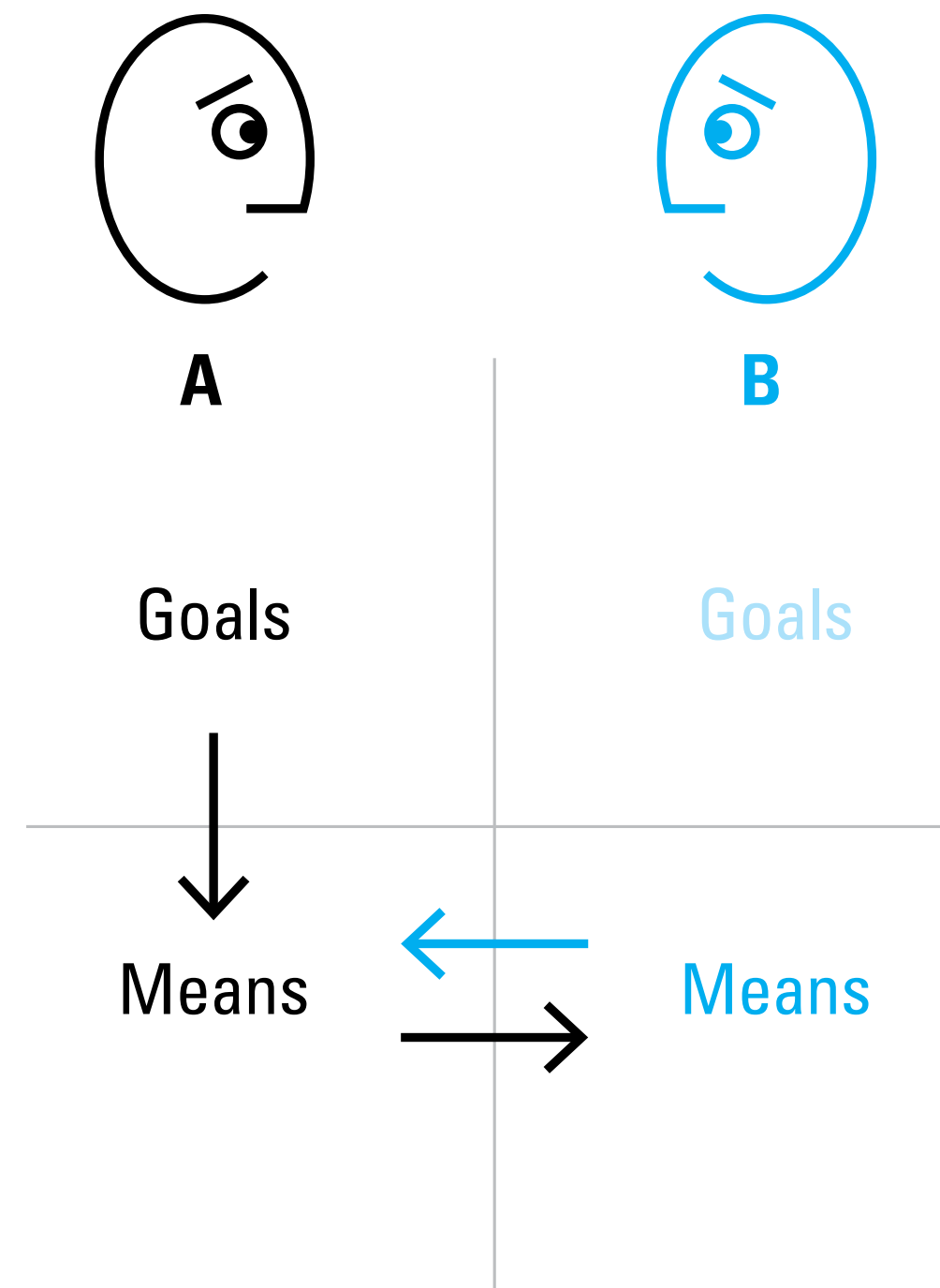


— adopted from Hugh Dubberly
after Paul Pangaro and Gordon Pask

Guiding

A sets goal but discusses means with B

“Alexa, I want to listen to news, what are my options?”

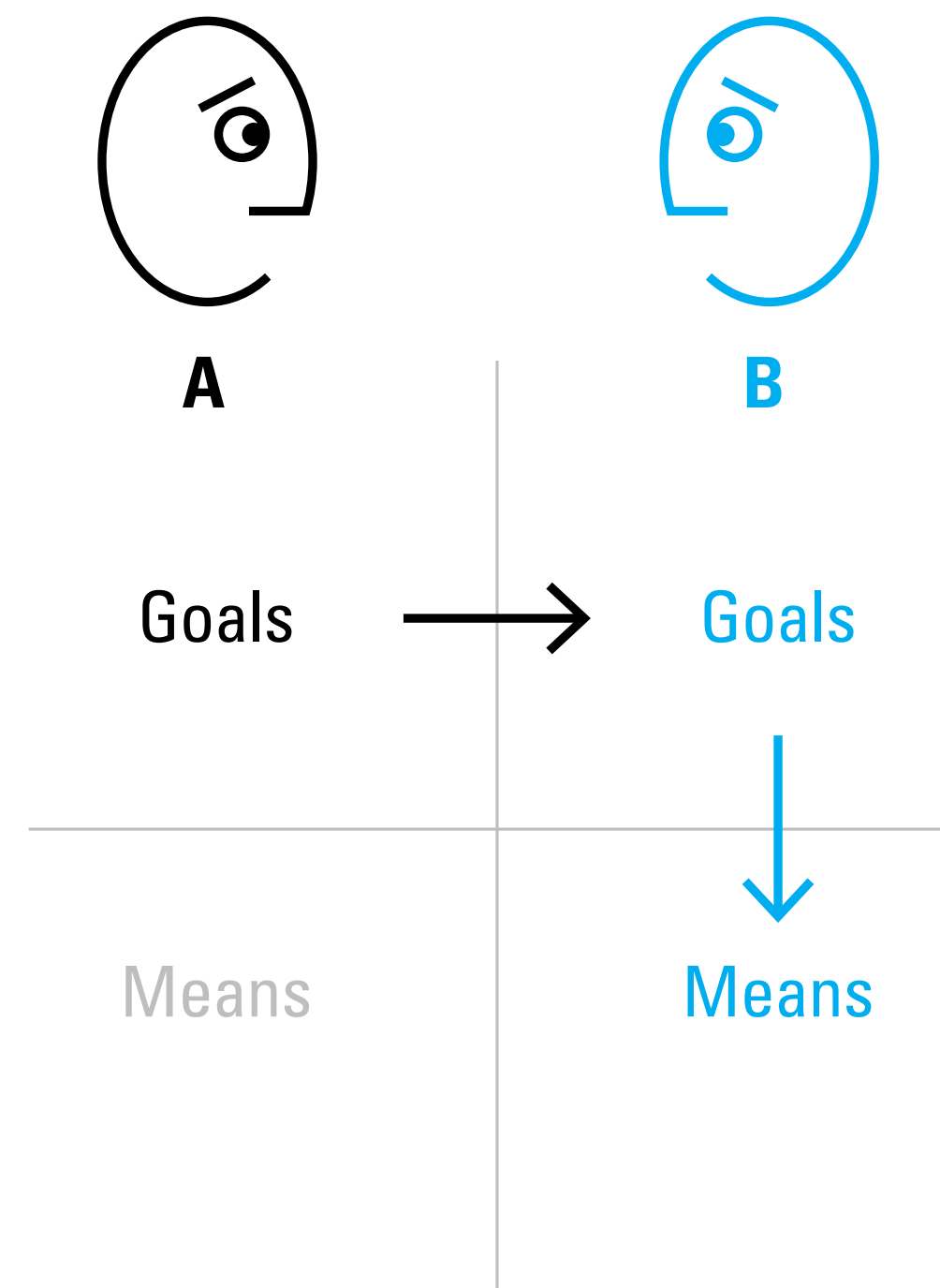


— adopted from Hugh Dubberly
after Paul Pangaro and Gordon Pask

Delegating

A sets the goal but lets B decide the means to reach it

“Alexa, some news please.”—does this one

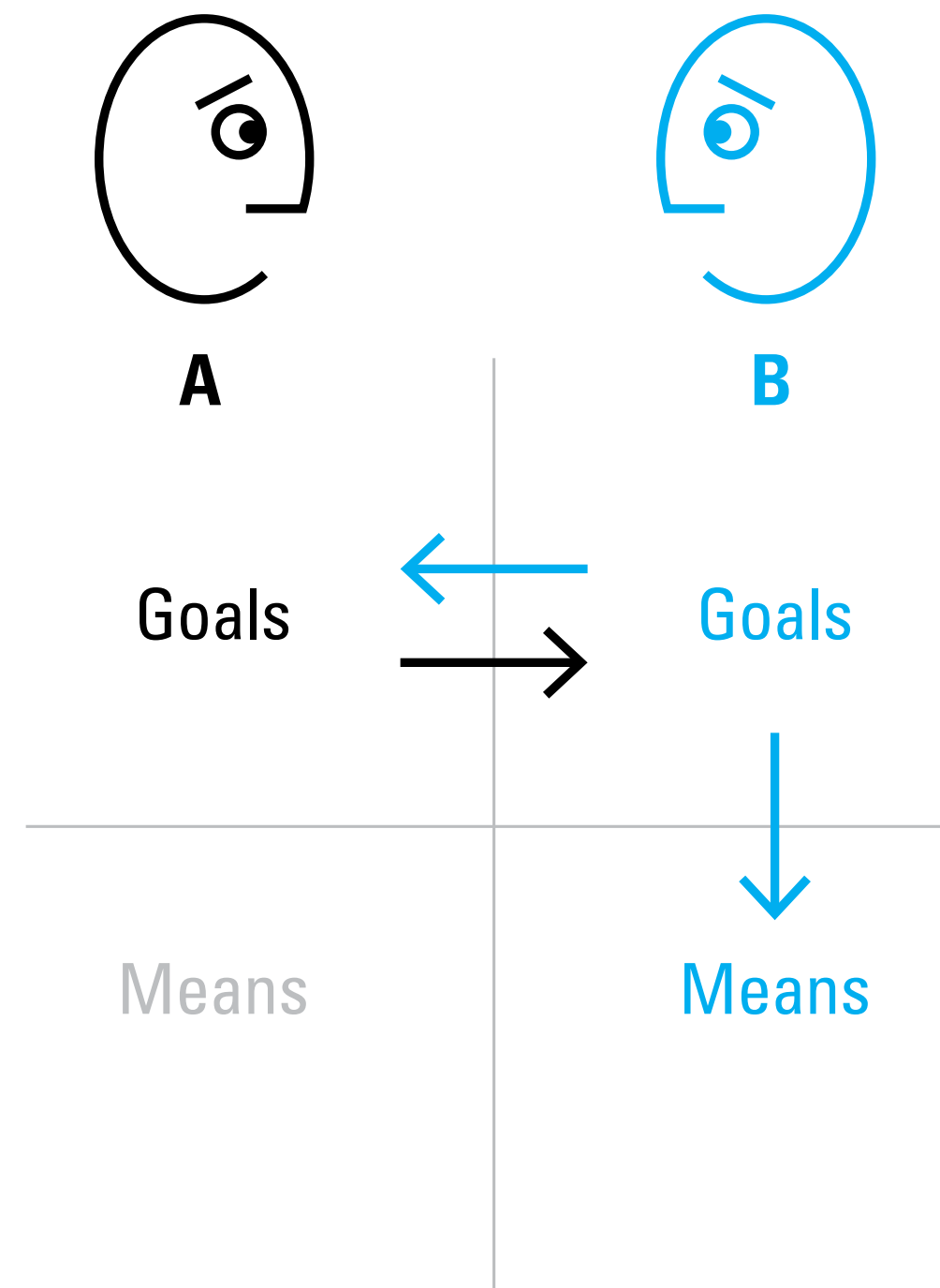


— adopted from Hugh Dubberly
after Paul Pangaro and Gordon Pask

Collaborating

A and B decide together on goals

“Alexa, how about I listen to something?”



— adopted from Hugh Dubberly
after Paul Pangaro and Gordon Pask

The Machine Revolution

	Industrial Revolution (1750–1850)	Computer Revolution (1955–1995)	Conversation Revolution (2015–?)
Role of machines...			
Extend and enhance...	...muscles	...nervous system	...muscles and nervous system
Create value by lowering the cost of...	...performing physical labor	...performing cognitive tasks	...collaborating