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Conversations and models:
Secrets to designing great products

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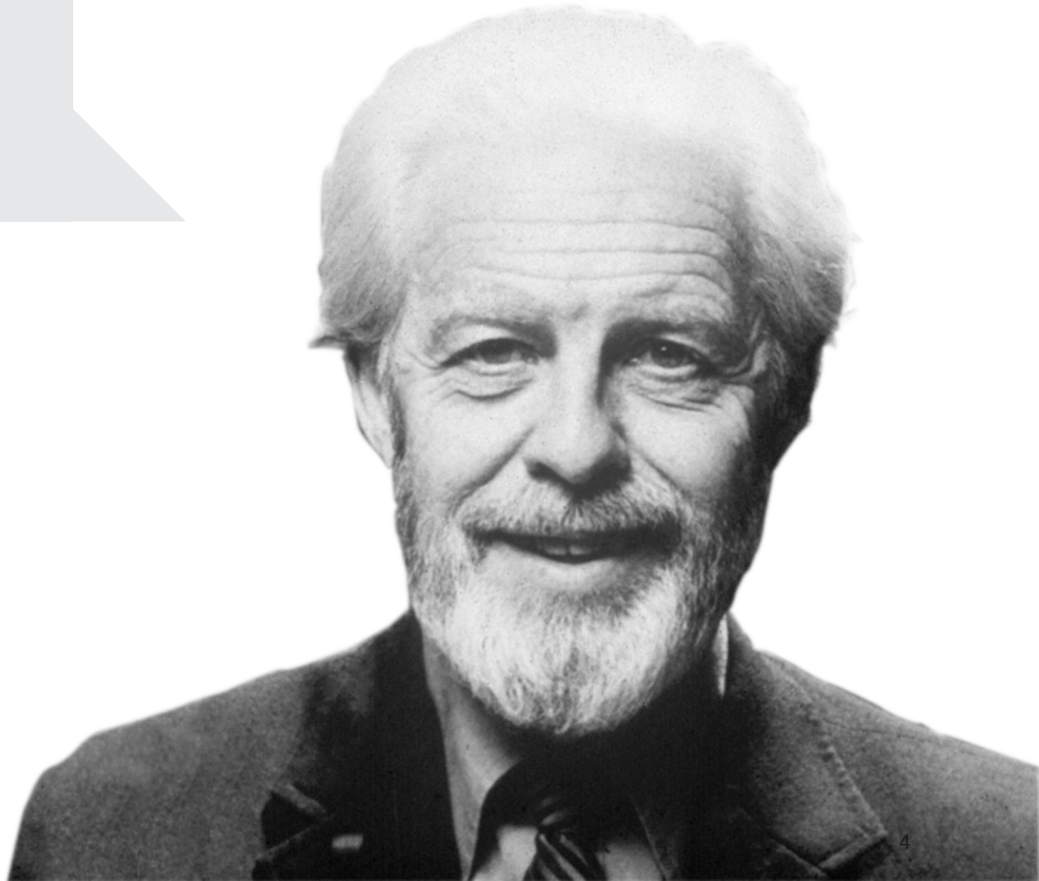
presentations.dubberly.com/conversations_and_models.pdf

This talk is about process—
how we design—
and how we can improve
how we design

So: How do you design?

Design pioneer **Jay Doblin** put it succinctly

"At the most basic level,
design can be described as an event
that begins with an existing state
and through some process
produces a more desirable state."



—Jay Doblin, "A Short Grandiose Theory of Design," 1987

Design as **transformation**

—after Jay Doblin

Doblin built on economist **Herbert Simon's** famous definition

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

—Herbert Simon, *Sciences of the Artificial*, 1969

Design as **transformation**

—after Herbert Simon

Simon published five years after architect **Christopher Alexander**

"...every design problem begins with an effort to achieve fitness between two entities: the form in question and its context."

"The form is the solution to the problem; context defines the problem. In other words, when we speak of design, the real object of discussion is not the form alone, but the ensemble comprising the form and its context."

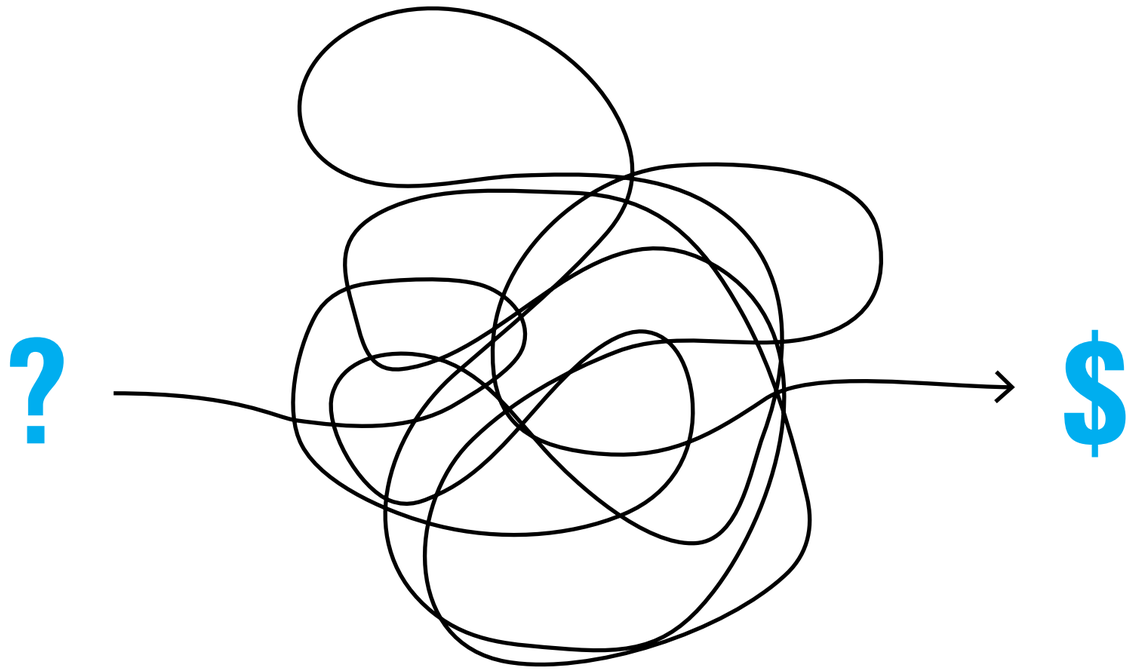
—Christopher Alexander, *Notes on the Synthesis of Form*, 1964

Design as **transformation**

—after Christopher Alexander

What's going on?
How does "transformation" work?
What's inside the "black box"?

Is designing a **random walk?**



—after Tim Brennan

Is designing **a science?**

research + problem solving = solutions

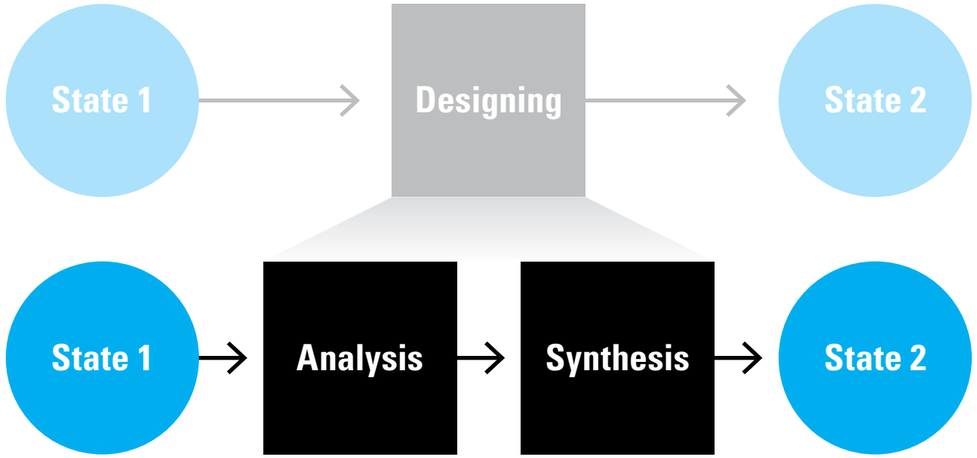
—after György “George” Pólya

Is designing **brainstorming** with Post-it Notes and pipe cleaners?

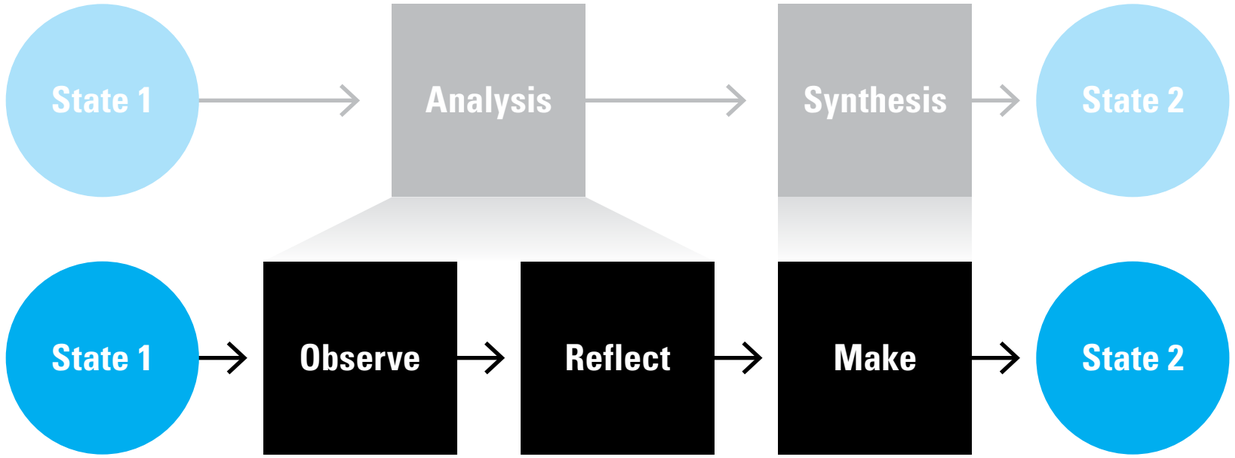
empathy + design thinking = innovation

—after Tim Brown, IDEO

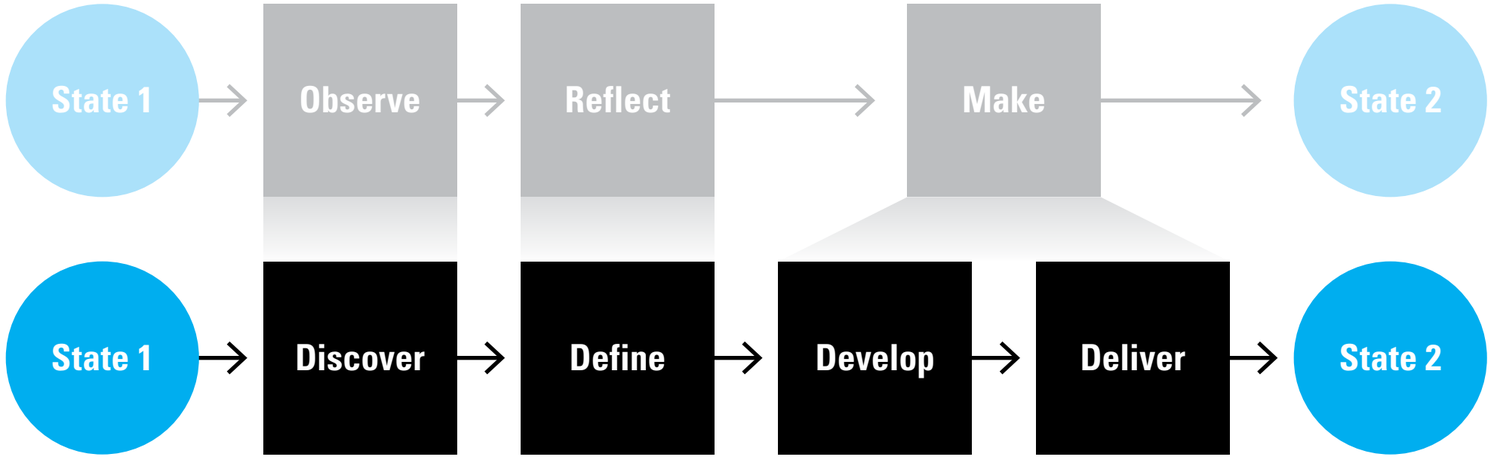
Designing may be divided into **two** sub-processes



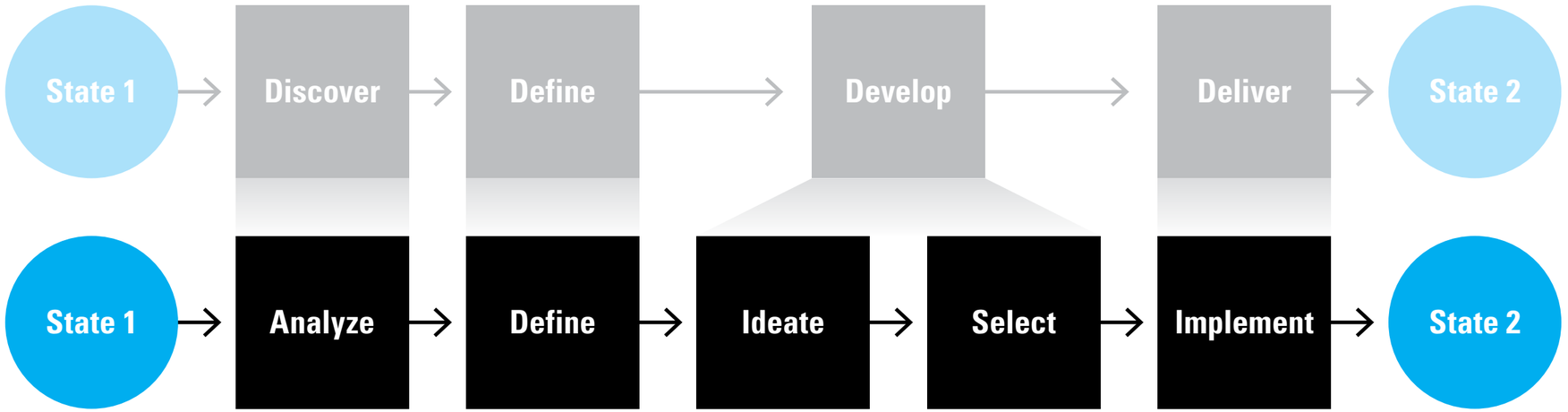
Sub-processes may be further divided into **three**



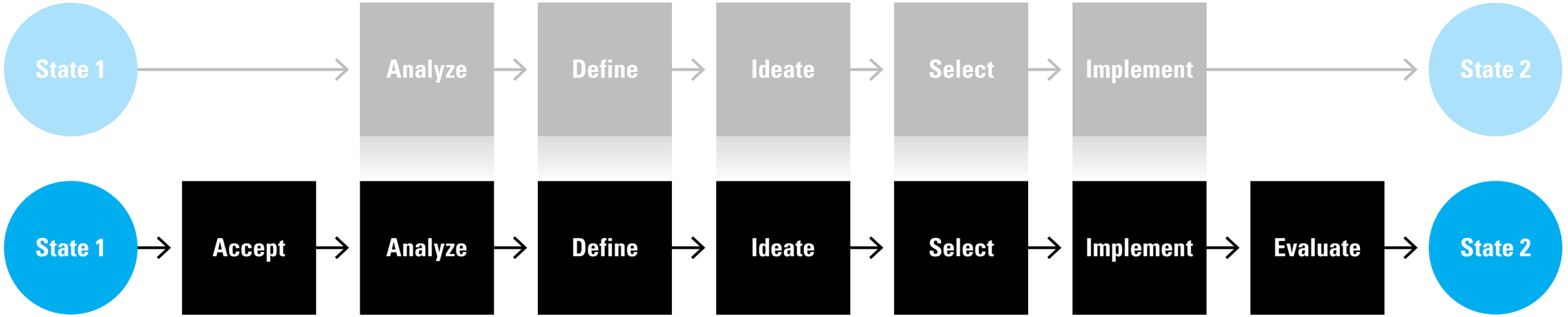
Or maybe **four**



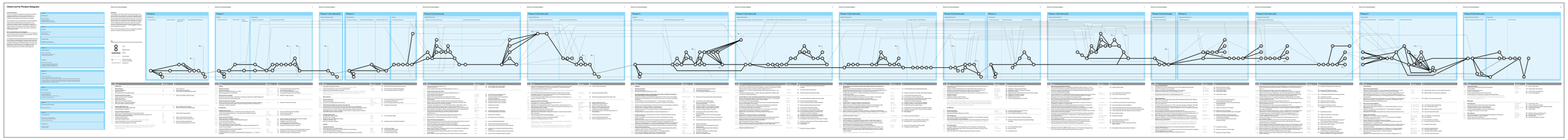
Or **five**


State 1
Discover
Define
Develop
Deliver
State 2
State 1
Analyze
Define
Ideate
Select
Implement
State 2

Or **seven**


State 1
Analyze
Define
Ideate
Select
Implement
State 2
State 1
Accept
Analyze
Define
Ideate
Select
Implement
Evaluate
State 2

Subdividing steps can continue almost indefinitely, for example, Bruce Archer's **229**-step design process



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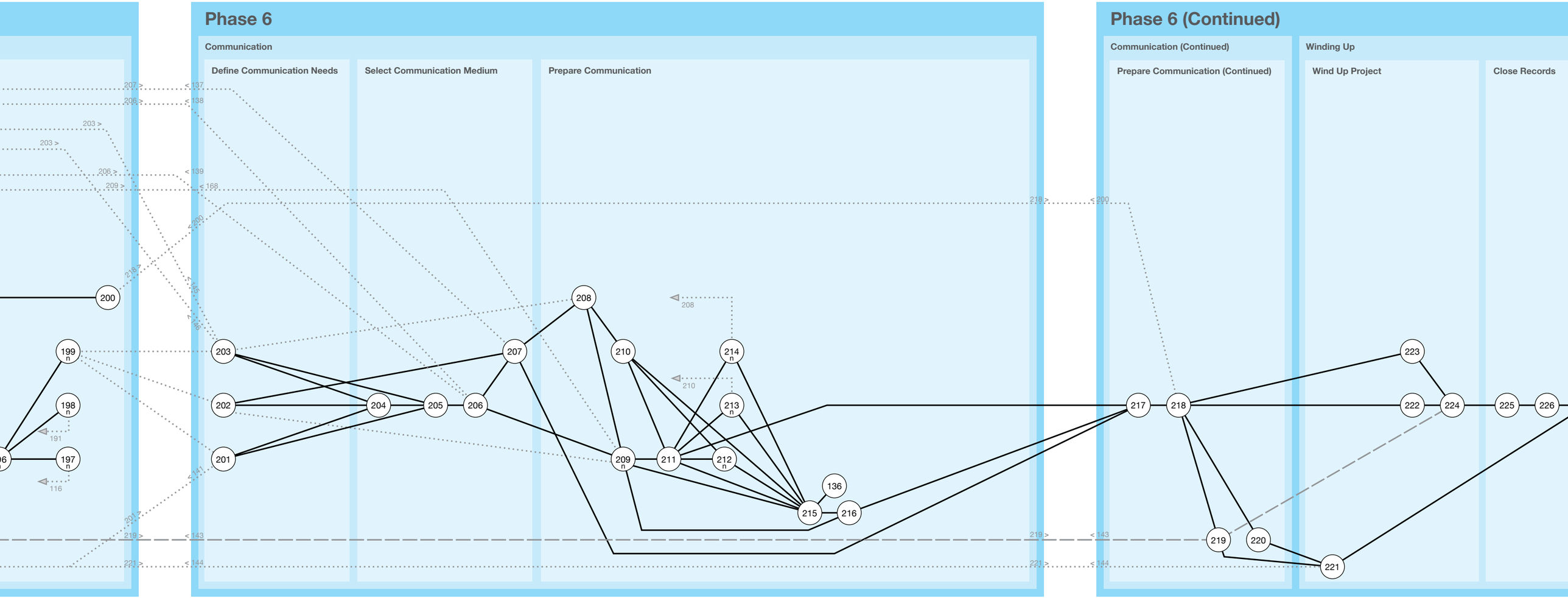
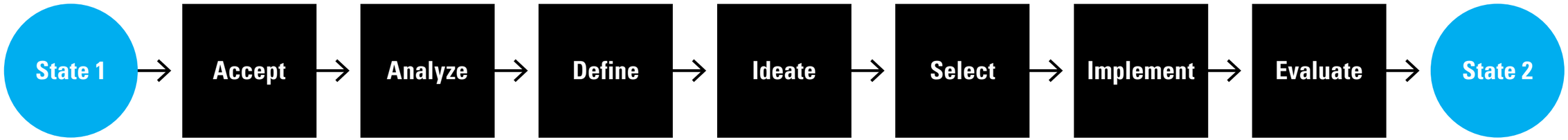


However, after about **seven** steps, remembering the steps becomes difficult



See George A. Miller's "The Magic Number Seven Plus or Minus Two, Some Limits on Our Capacity for Processing Information," 1956

Short, linear models of the design process are common, because they solve a very particular **business problem:**

They enable sales of design services

- We will deliver X in Y days for $Z,
  fixed fee-for-service vs unlimited time-and-materials
- We will follow steps A, B, and C to get to X
- We've done this before; so your risk is minimized;
  in fact, we're so confident, we will guarantee our fee,
  (unless, of course, you change something)

The linear structure is crucial to the sale—because it's **bounded, finite, and deterministic**

– Has a clear beginning and end,
suggesting the process is not open-ended

– Has clear stages,
suggesting rationality, rigor, and repeatability

– Proceeds in one direction,
suggesting it can be measured and managed

Unfortunately, life is often messy

Unexpected events complicate things

Clients and designers change their minds

The truth is:
designing is rarely bounded, finite, or deterministic;
it's almost always **open-ended, particular, and contingent**

- Starting and stopping conditions are arbitrary
- The process is iterative; feedback drives improvement
- It's also recursive; playing out in-the-large and in-the-small

The design process rarely reaches **a clear stopping point**

"You stop for any planning problem,
because you have ***run out of time, money, or patience;***
but that has nothing to do with the logic of the problem,
and you can always try to do better."

—Horst Rittel, "On the Planning Crisis: Systems Analysis of the 'First and Second Generations,'" 1972

If the design process
has no clear stopping point,
it's not a recipe

That means, **we need a different model,**
a model that's less mechanical
and more organic

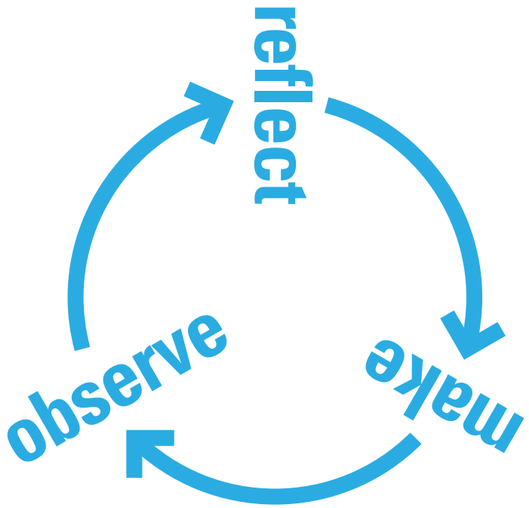
Computer scientist **Terry Winograd** describes the reality of designing

"There is no direct path between the designer's intention and the outcome. As you work a problem, you are continually in the process of developing a path into it, forming new appreciations and understandings as you make new moves."

—Terry Winograd, *Bringing Design to Software*, 1996

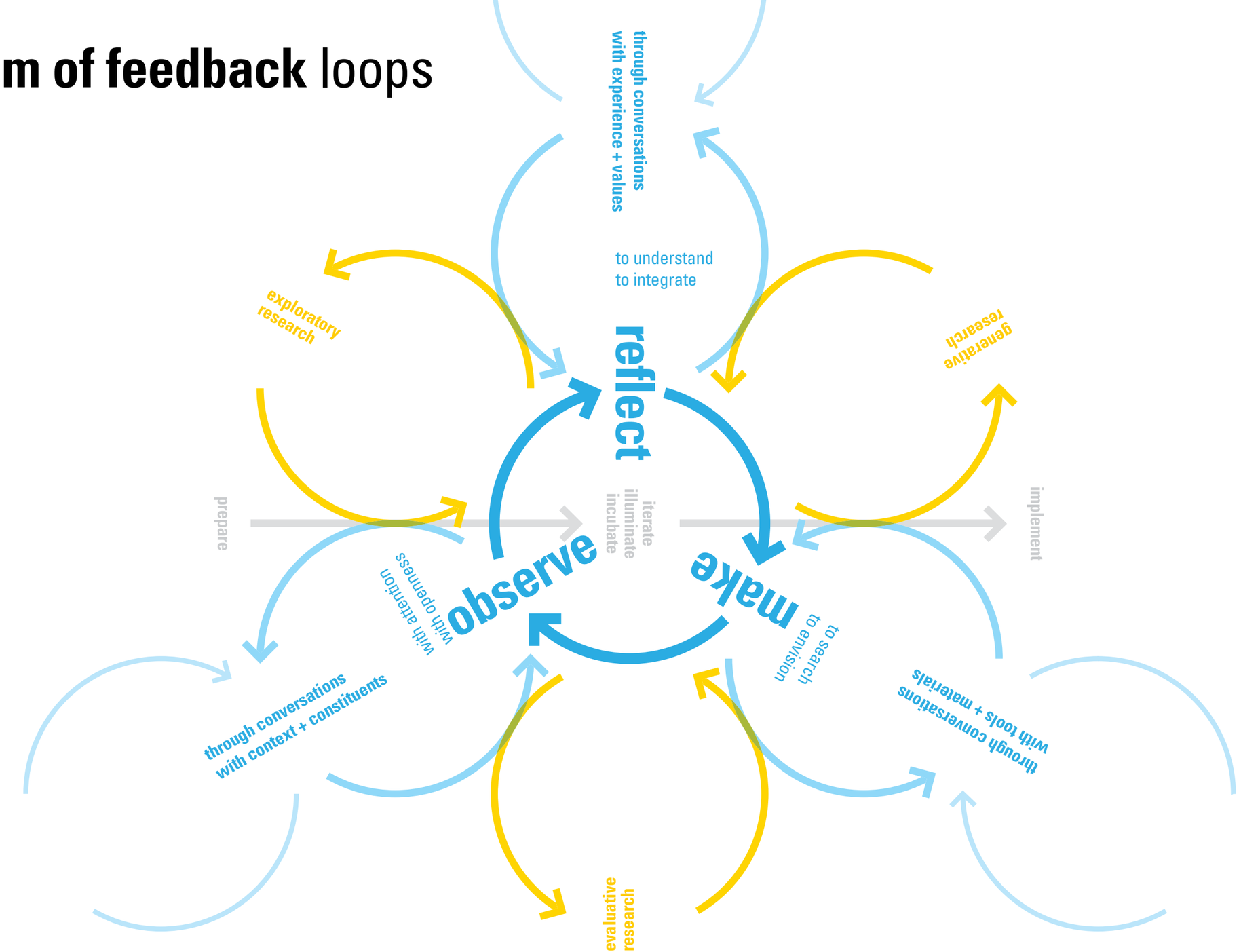
Some design process models indicate iteration, with a **feedback loop, spiral, or helix**

A simple **feedback** loop

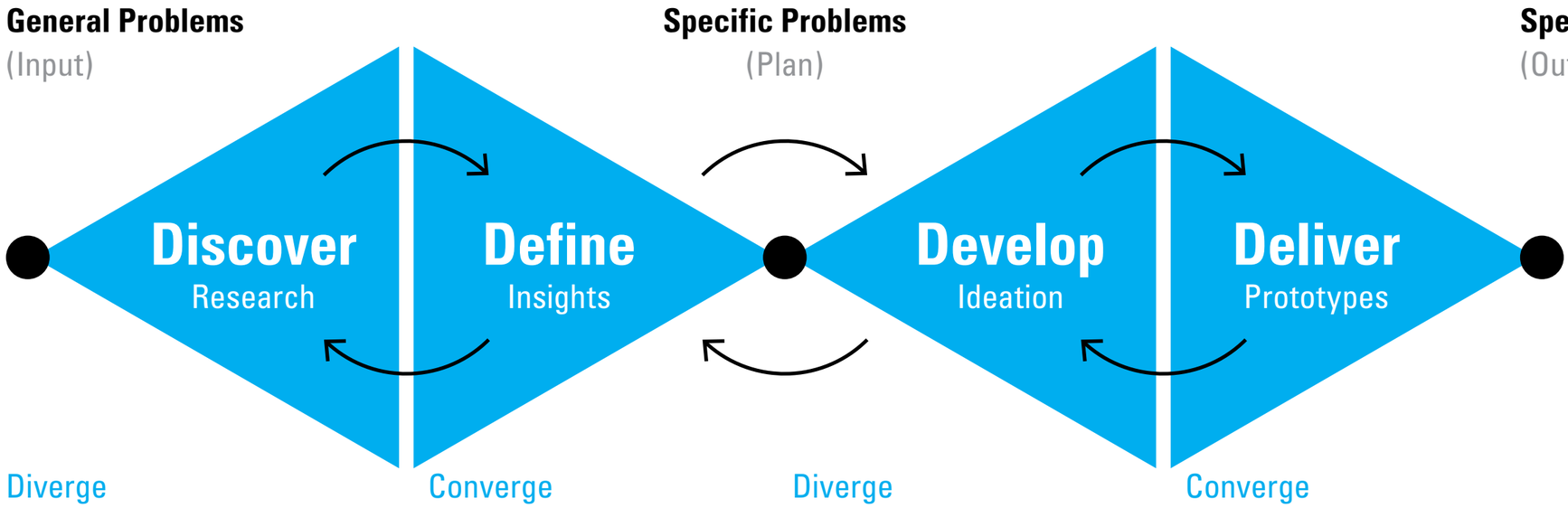


—Hugh Dubberly and Shelley Evenson

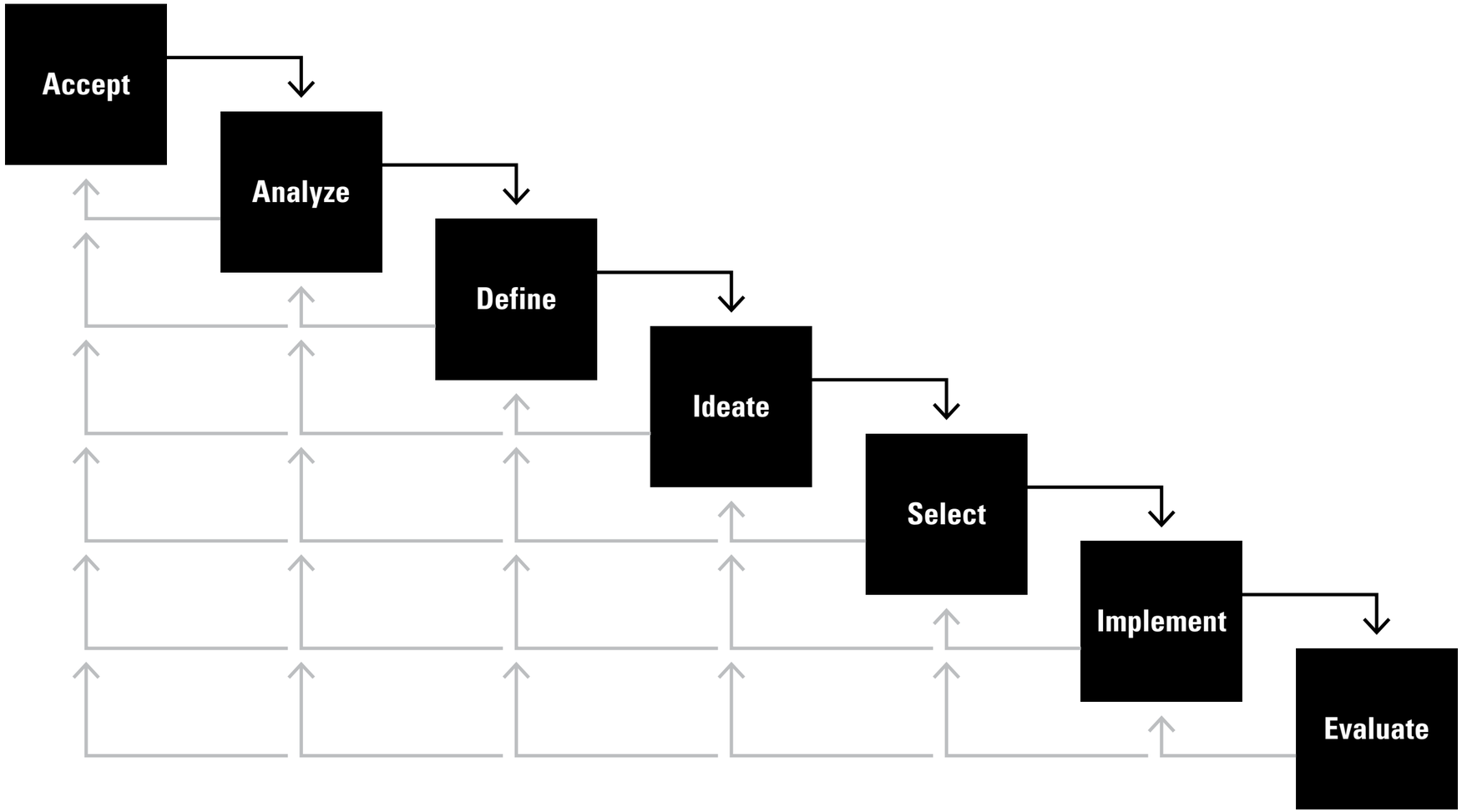
A **system of feedback** loops



A **double diamond** indicating divergence and convergence



A **waterfall** with multiple feedback loops



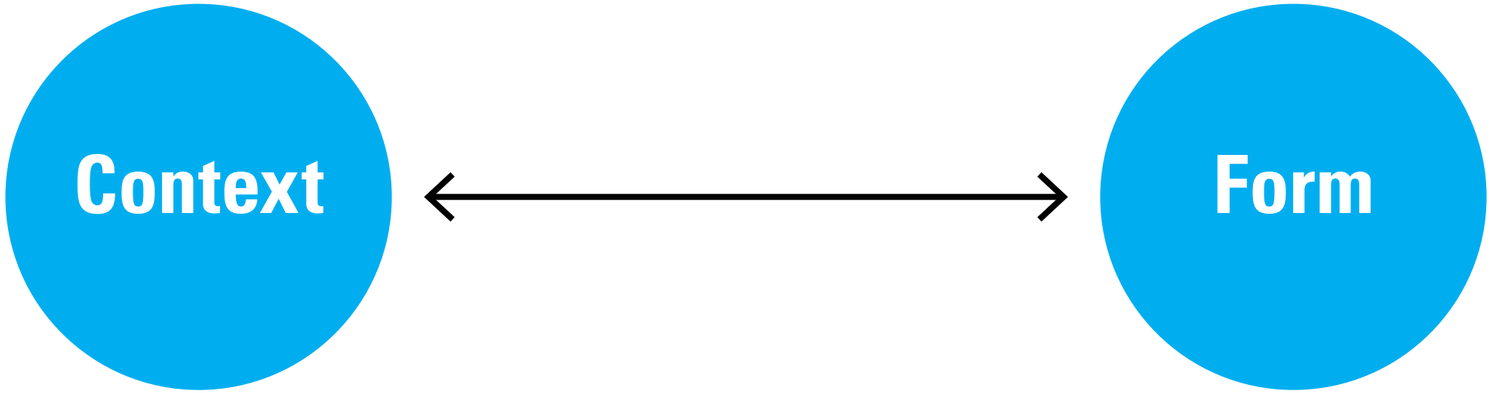
—after Don Koberg and Jim Bagnall, *The Universal Traveler*, 1972

What Alexander calls “fit” is based on **continuous symmetrical feedback**

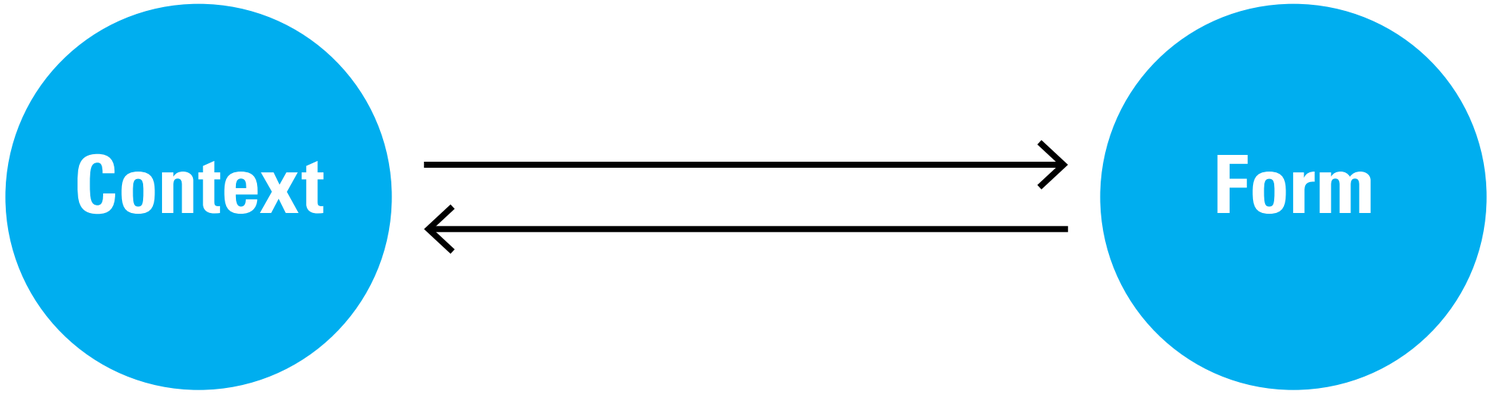
“... adaptation is a mutual phenomenon referring to the context’s adaptation to the form as much as the form’s adaptation to the context...”

—Christopher Alexander

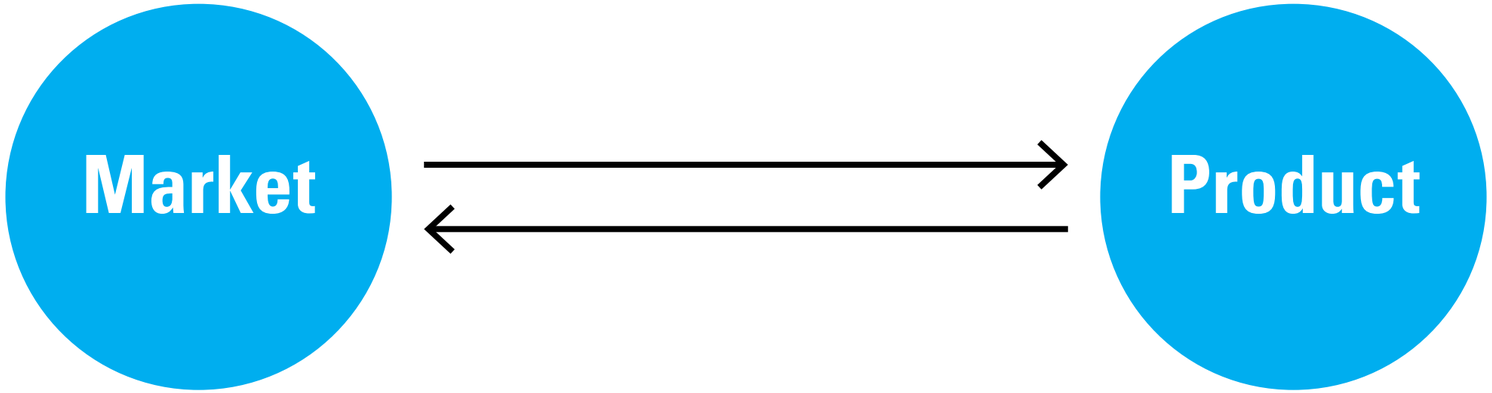
In Alexander’s original model, **the arrow points in both directions**



Two arrows might be more clear;
context and form interact, co-evolve

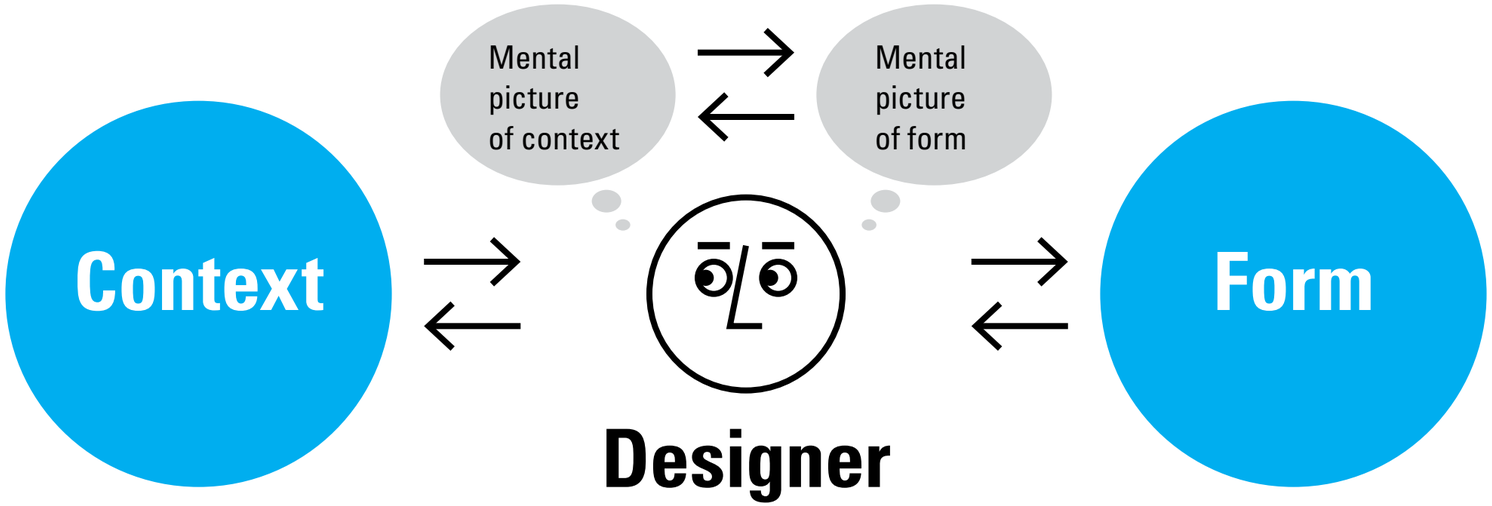


In other words,
products have conversations with markets:
the market teaches the product,
and the product teaches the market



Product stands for simple products,
services, systems,
and product-service ecologies.

Something's missing: **the designer, interacting with the situation and materials**



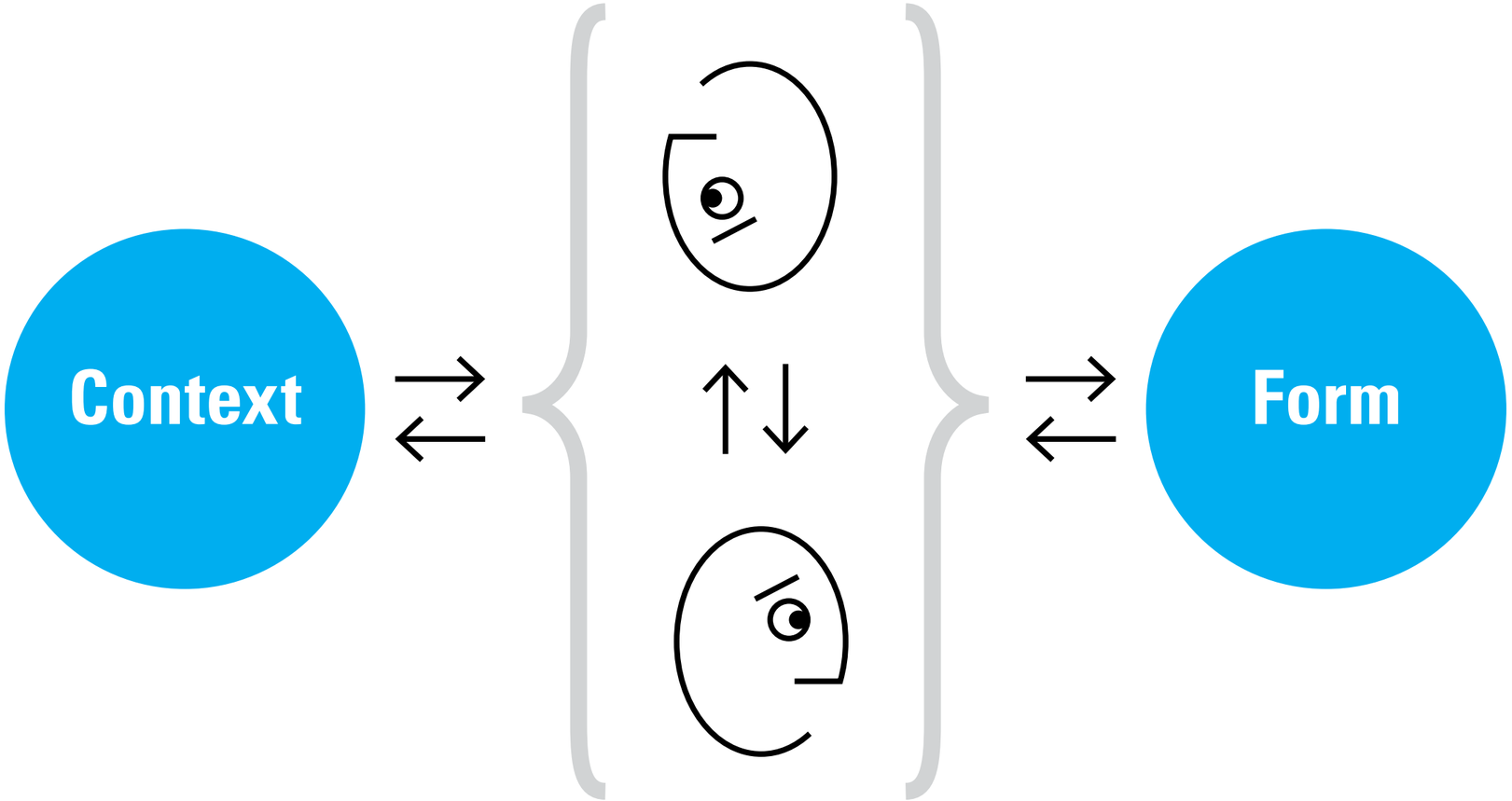
Sociologist Donald Schön describes these **conversations**

"A designer... shapes the situation,
...the situation 'talks back,'

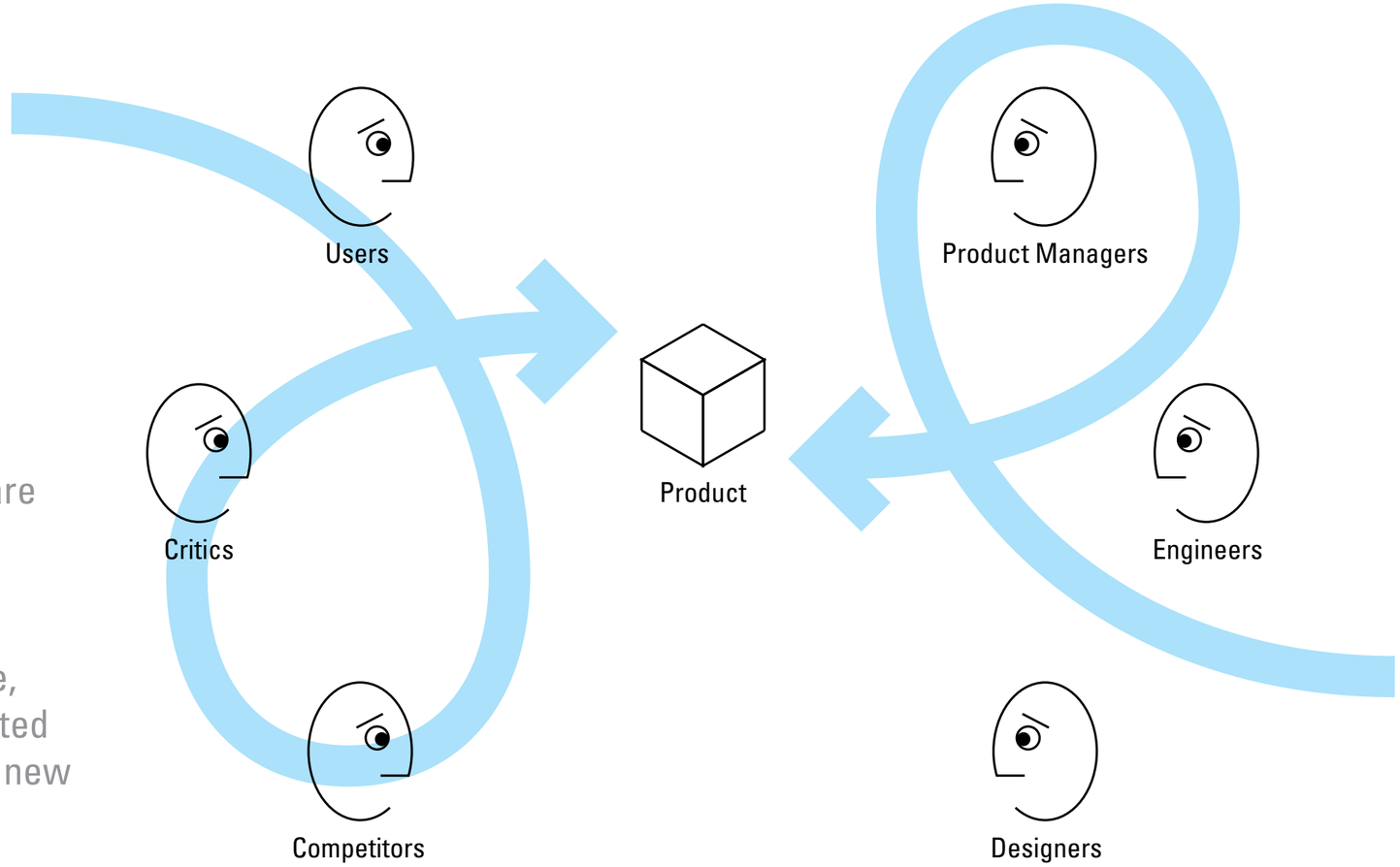
In a good process of design,
the designer reflects-in-action
on the construction of the problem,
the strategies of action,
or the model of the phenomena..."

—Donald Schön, *The Reflective Practitioner*, 1984

Designers rarely work in isolation;
they're often engaged in conversation
with clients, engineers, suppliers, and many others



“Providers” are **constantly in conversation** with “consumers;” services are co-created at the point of delivery



Some conversations are with the marketplace.

Those conversations are difficult to manage, though smart, connected products are creating new possibilities.

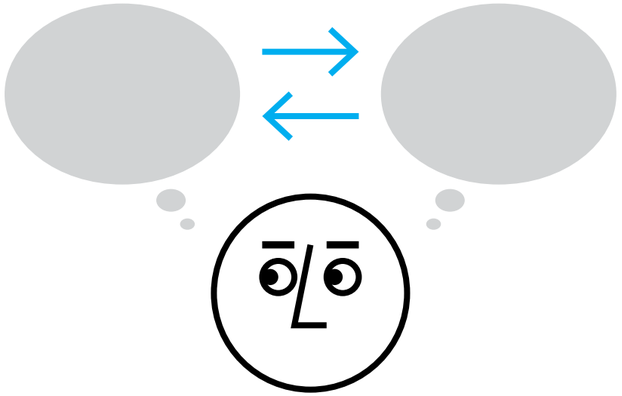
Some conversations are with the product team.

Those conversations cannot be controlled, but they can be supported. That is, managers, engineers, and designers can create conditions in which the right conversations flourish.

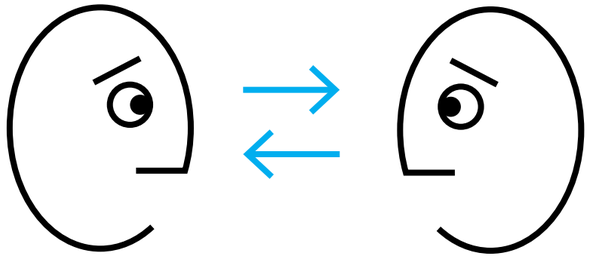
Marketplace

Product team

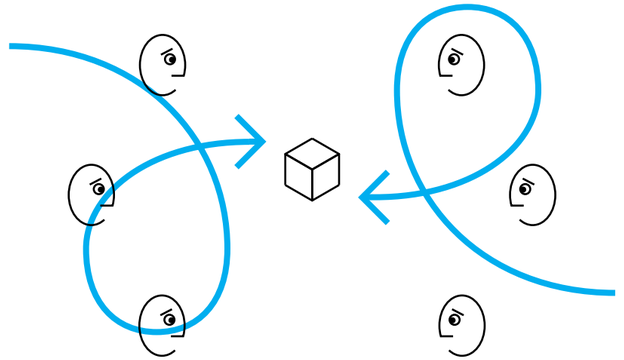
Conversation takes place in **three domains**



Between you and yourself,
e.g., a soccer player weighs options for a kick



Between you and another person,
e.g., two players pass the ball back and forth



Between one group and another,
e.g., two teams interact throughout a match

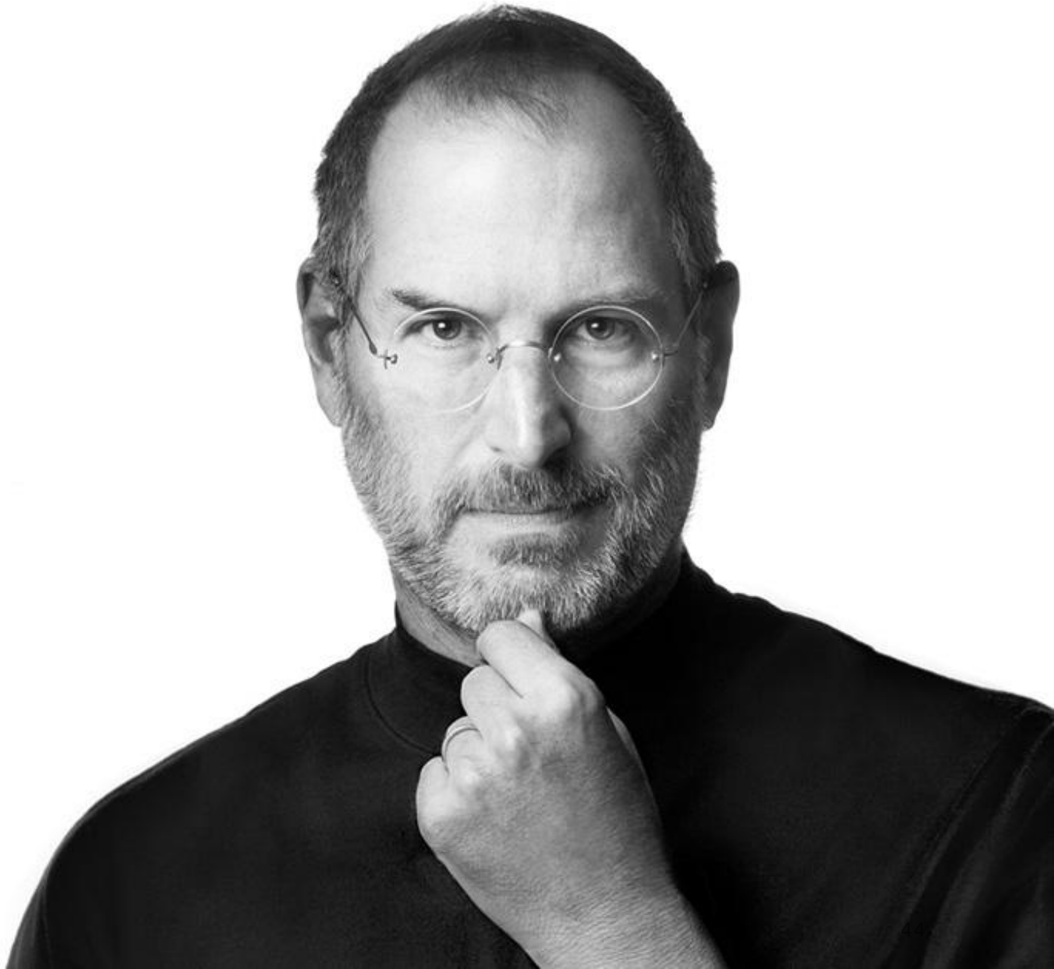
So: How do we ensure
a good process of design
in all three domains?

"... reflect[ion]-in-action
on the construction of the problem,
the strategies of action,
or the model of the phenomena..."

Steve Jobs knew a thing or two about great products

> *"Design is the fundamental soul of a man-made creation..."*

—Steve Jobs, *Fortune*, January 24, 2000



How did he define and refine that soul?
Through conversation.

The partnership between **Steve Jobs and Jony Ive** is famous.
What's rarely discussed is what it means, what we can learn from it.

It was an on-going conversation that built a **relationship and trust.**

"We had lunch together pretty much every day.

He would spend many afternoons a week in the design studio, and we became very close friends."

—Jony Ive, *Financial Times*, March 13, 2015

The Jobs-Ives **conversation is not unique;** pretty much everywhere you find great design sustained over time, you find such conversations.

Adriano Olivetti + Marcello Nizzoli = Olivetti

Walter Paepke + Herbert Bayer = Container Corp.

Tom Watson, Jr. + Eliot Noyes = IBM

Artur & Erwin Braun + Dieter Rams = Braun

William Paley + William Golden = CBS

Frank Stanton + Lou Dorfsman = CBS

Max Dupree + George Nelson = Herman Miller

Hans Knoll + Florence Schust = Knoll

Martha Stewart + Gael Towey & Eric Pike = Martha Stewart

Steve Jobs + Jonathan Ive = Apple

Ed Catmull + John Lasseter = Pixar

Pixar has made 17 hit movies—in a row—**by design, not luck.**
Founder Ed Catmull explains how in his book, *Creativity, Inc.*

Story meetings at Pixar—**conversations**, without laptops, supported by a dedicated project room, lots of sketches, a high-info-density physical environment.

Increasingly, venture capital (VC) and business consulting firms are bringing senior designers into their **conversations.**

- Google Ventures named Braden Kowitz “Design Partner”
- Khosla hired Irene Au, former head of design at Google
- Kleiner-Perkins hired John Maeda, former RISD President

- Accenture bought European service design firm Fjord
- Deloitte bought design planning firm Doblin Group
- McKinsey bought SF product design firm Lunar

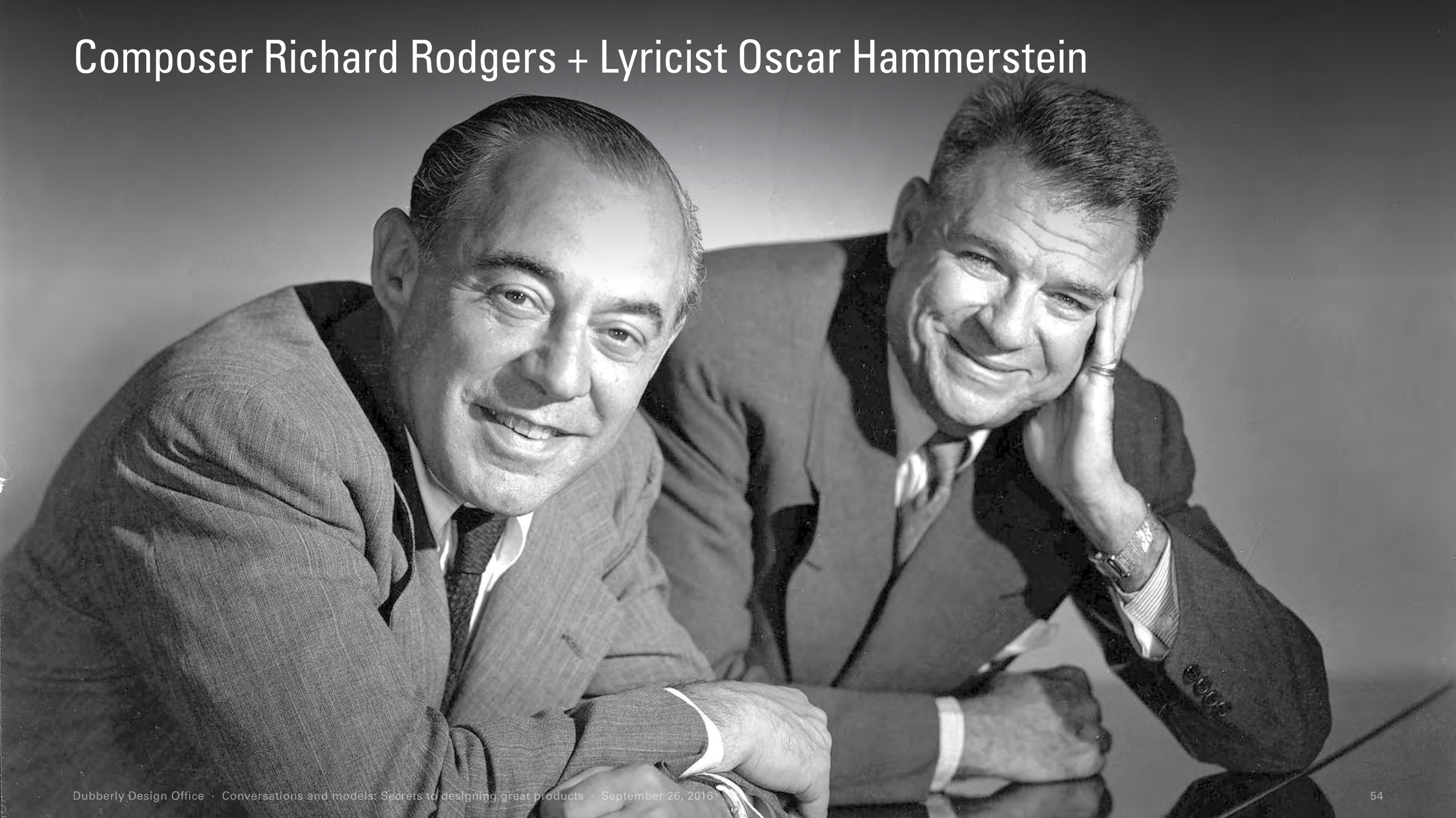
These firms didn’t hire these designers to make wireframes;
they hired them to change the nature of their conversations.

Generative conversations
with pairs collaborating
take place at all levels
and across many disciplines.

Art Director Lee Clow + Copywriter Steve Hayden

Copywriter Peggy Olsen + Art Director Don Draper

Composer Richard Rodgers + Lyricist Oscar Hammerstein

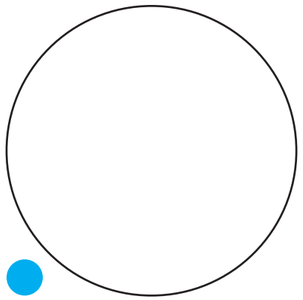


Director Steven Spielberg + Composer John Williams

Agent Fox Mulder (believer) + Agent Dana Scully (skeptic)

Pair Programming

The quality of the conversation depends on **the relationship between a design group and the organization** that it supports.

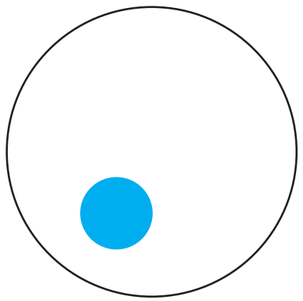


Separate

Design as external resource

Design thinking and methods have no continuous presence in the organization.

They are add-ons, limited to traditional problems: form, communication, function.

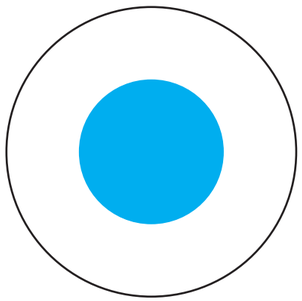


Peripheral

Design as part of the organization

Design thinking and methods practiced somewhere within the organization.

They apply to specific products and services.

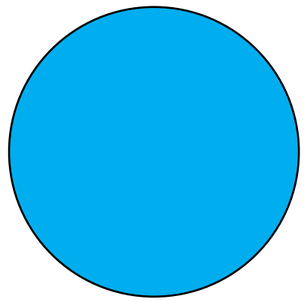


Central

Design at the core of the organization

Design thinking and methods are highly visible and take a central position.

They unify products and services across an organization; apply to corporate design and brand strategy.



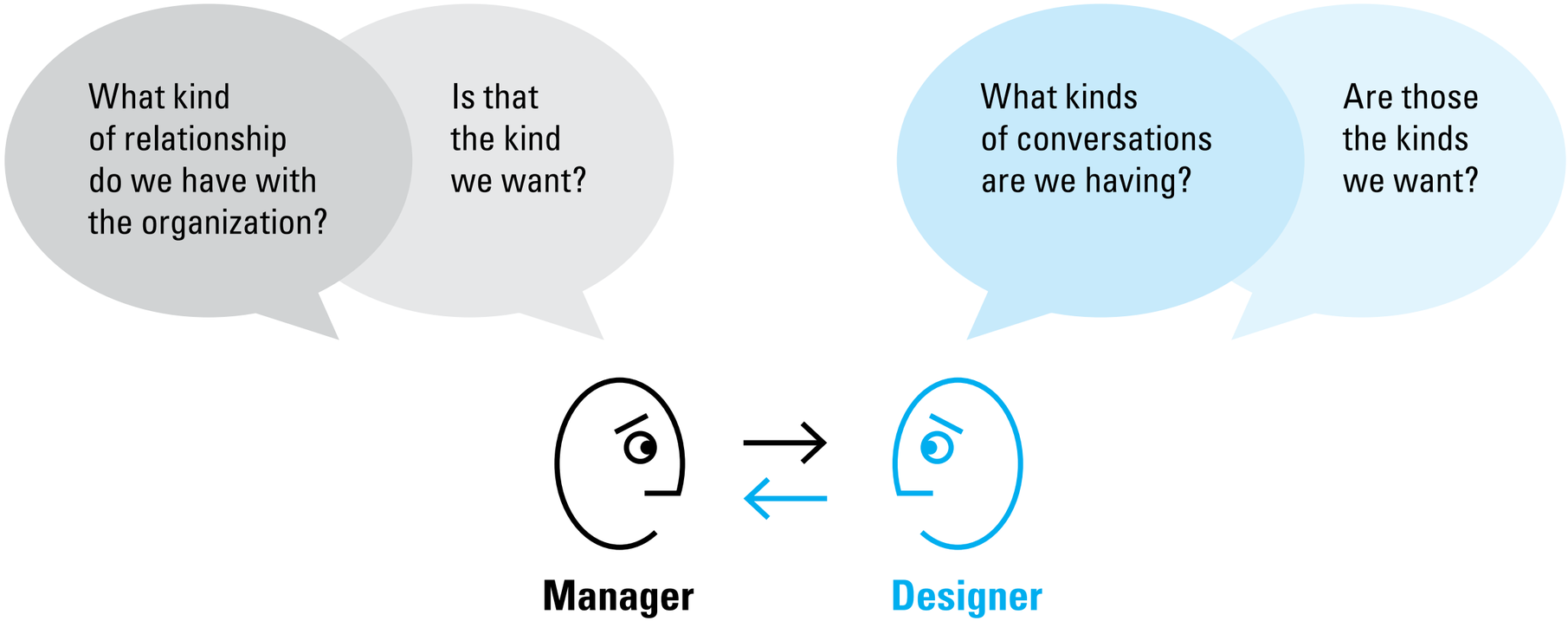
Integrated

Design integral to all aspects of the organization

Design thinking and methods are being applied at an organization's top level as means to inquire into a wide range of organizational problems with the aim to develop integrated solutions.

—Sabine Junginger, 2009

Mature organizations have **conversations about conversations;** managers and designers ask themselves and their colleagues:

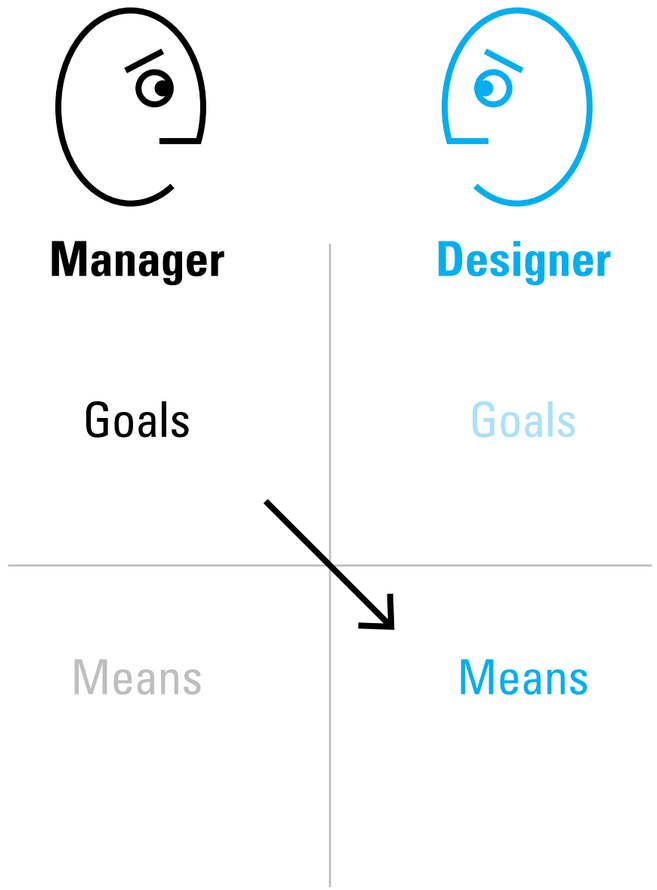


Controlling

Manager tells designer what to do and how to do it

Hallmark of a traditional industrial-age organization; may be appropriate for new or under-performing employees

e.g., “Make the logo bigger.”



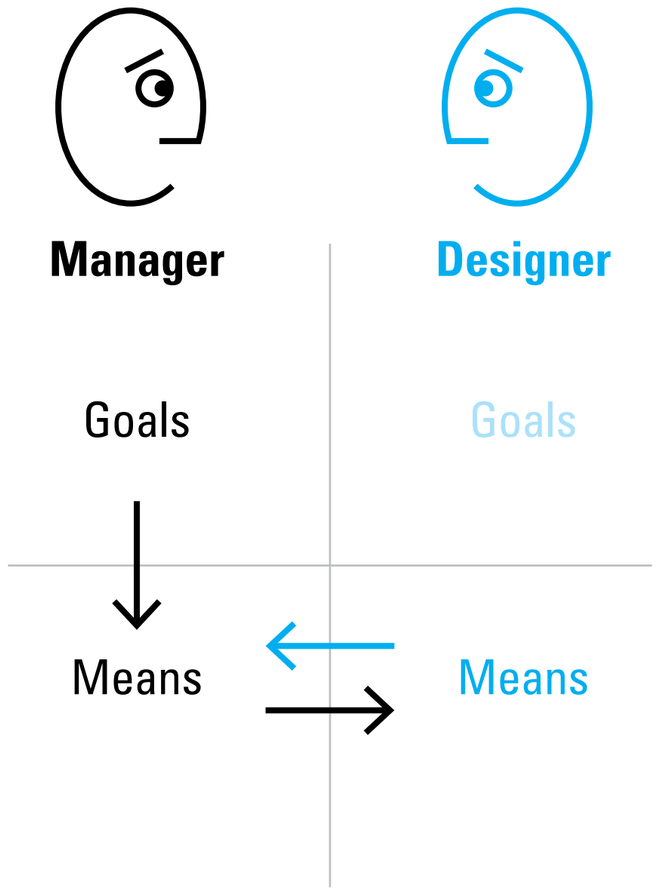
—after Paul Pangaro and Gordon Pask

Mentoring

Manager sets goals and discusses means with designer

Enlightened managers realize
that teaching is a key responsibility

e.g., “What’s the best way
to make sure our name really pops?”

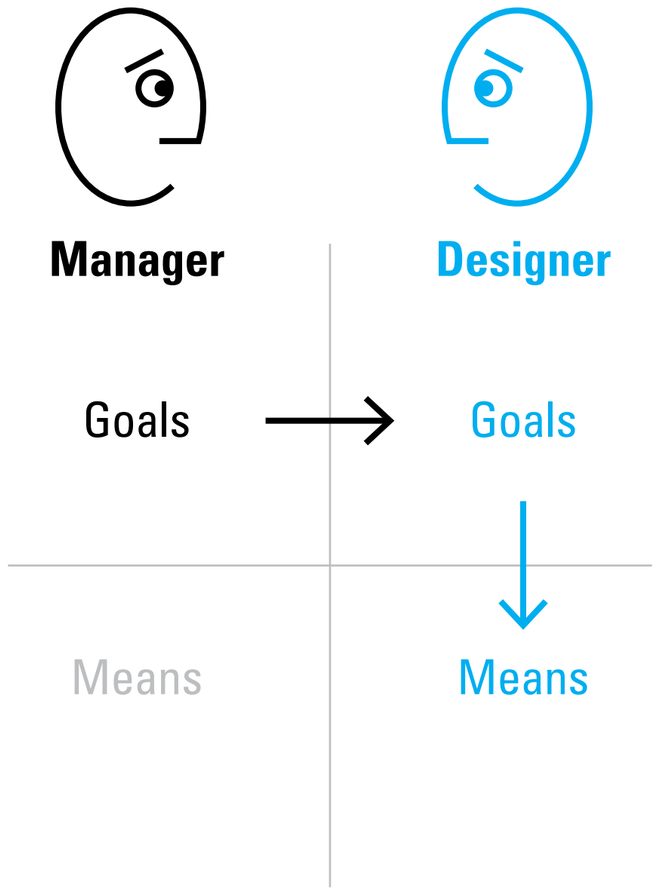


Delegating

Manager sets goal and leaves means to the designer

Good managers get out of the way
of good employees
and let them to do their jobs

e.g., “Make sure this ad gets noticed.”

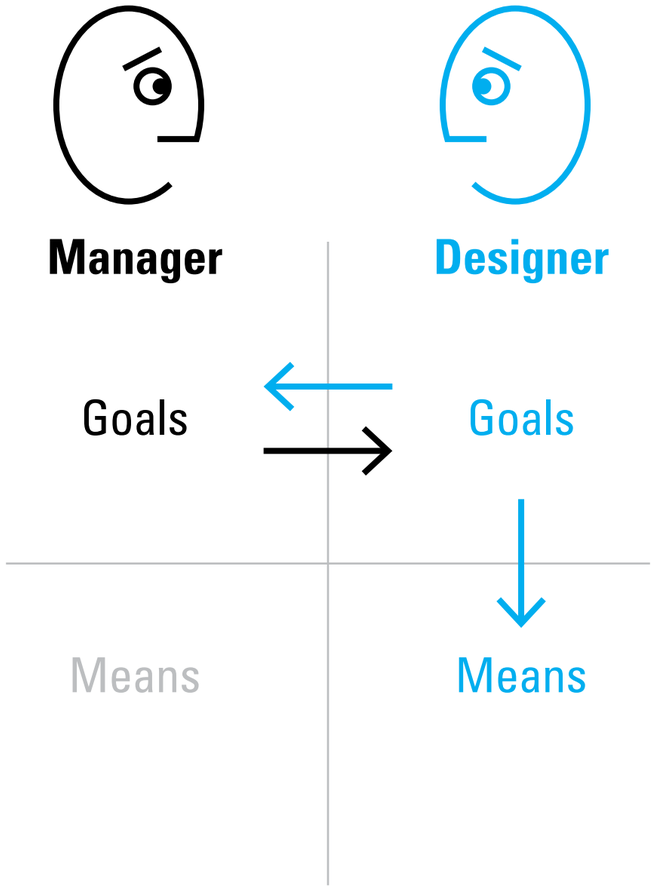


Collaborating

Manager and designer set goals together

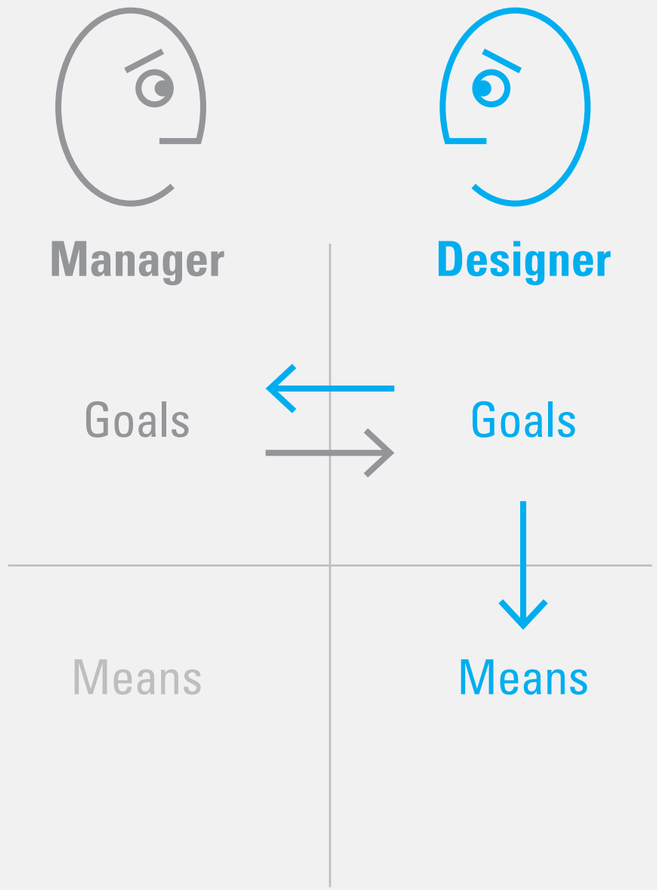
Information-age management
is less hierarchical
and more collegial

e.g., “Which methods
of engaging customers
are right for us?”



So far, we have assumed **problems are familiar,** and standard operating **procedures are effective**

Existing language, procedures, and people



are sufficient for

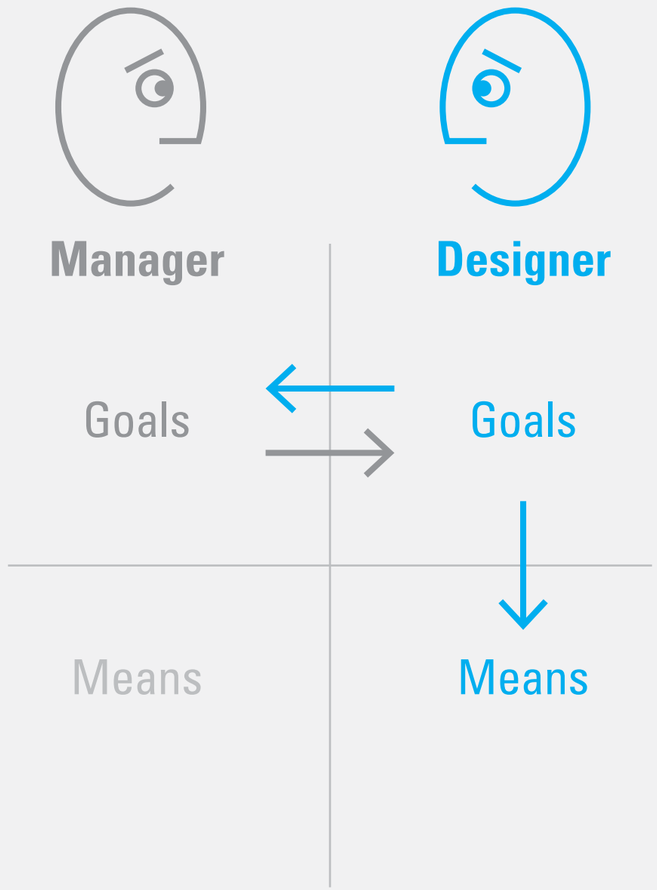
Existing classes of problems

More and more organizations face **unfamiliar problems** and find existing procedures are less and less effective

New classes of problems

challenge

Existing language, procedures, and people



are sufficient for

Existing classes of problems

Inventing

Manager and designer develop new language

New classes of problems

require

Existing language, procedures, and people

New language:
new questions,
new distinctions,
new connections,
new frames,

Manager **Designer**

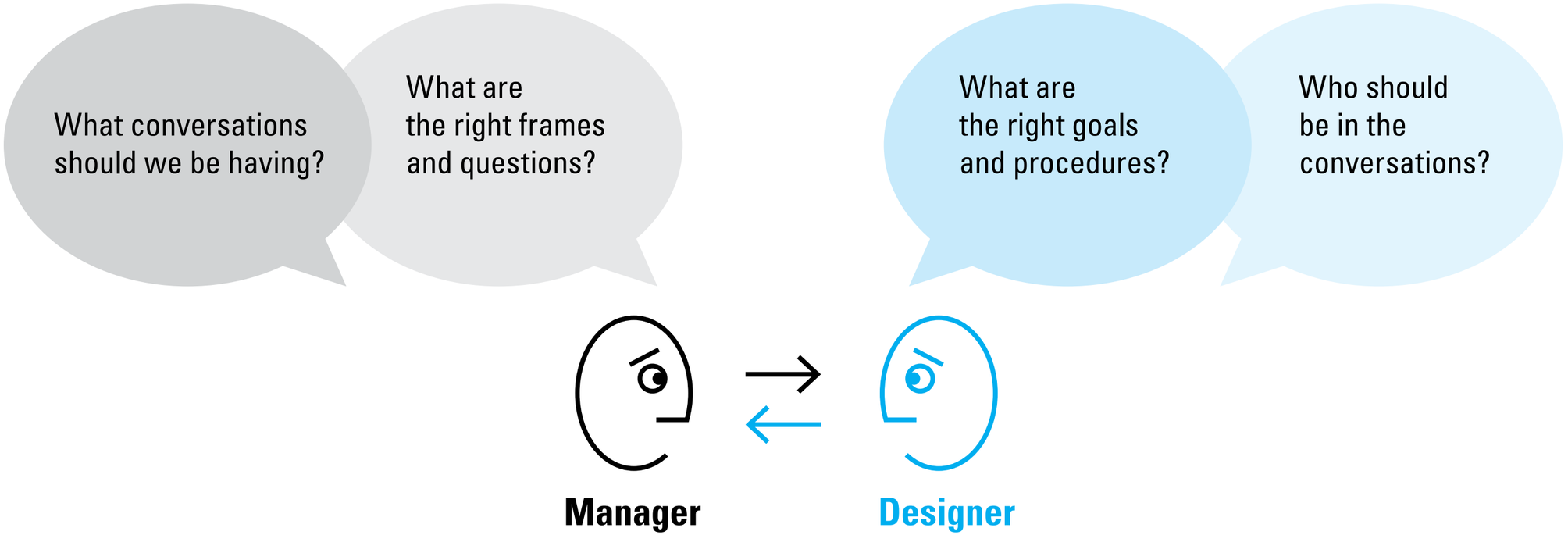
which come from conversations about language

are sufficient for

Existing classes of problems

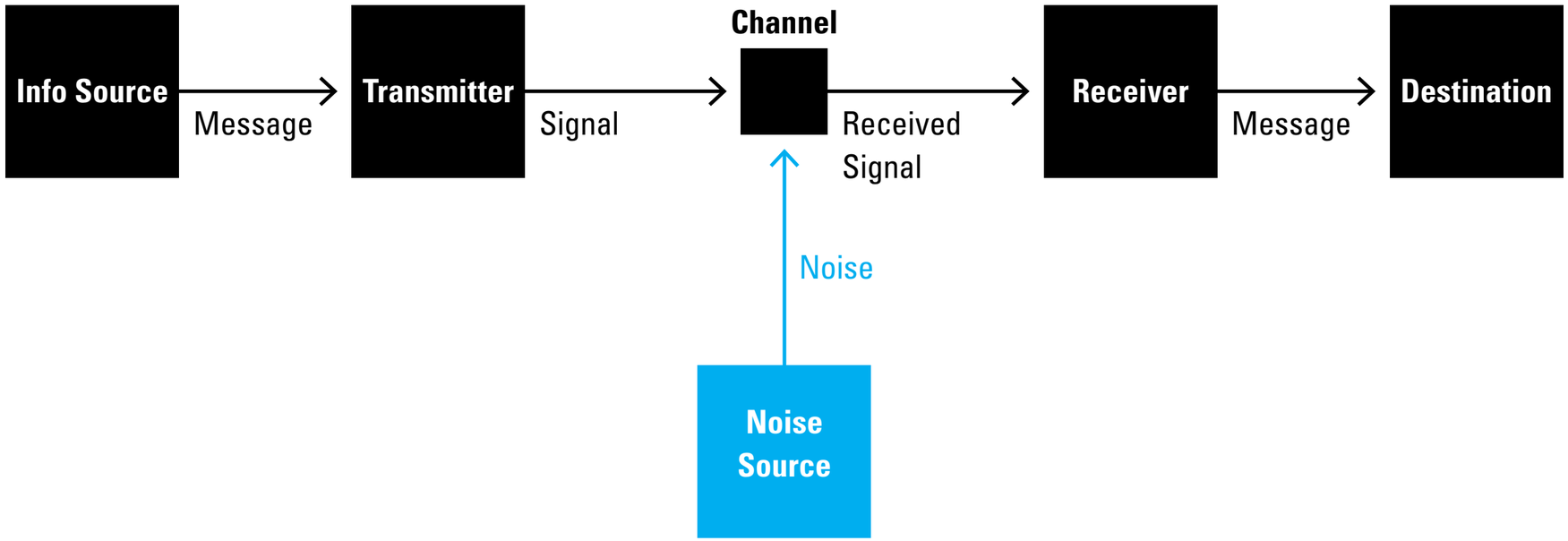
Bootstrapping

Manager and designer develop new conversations



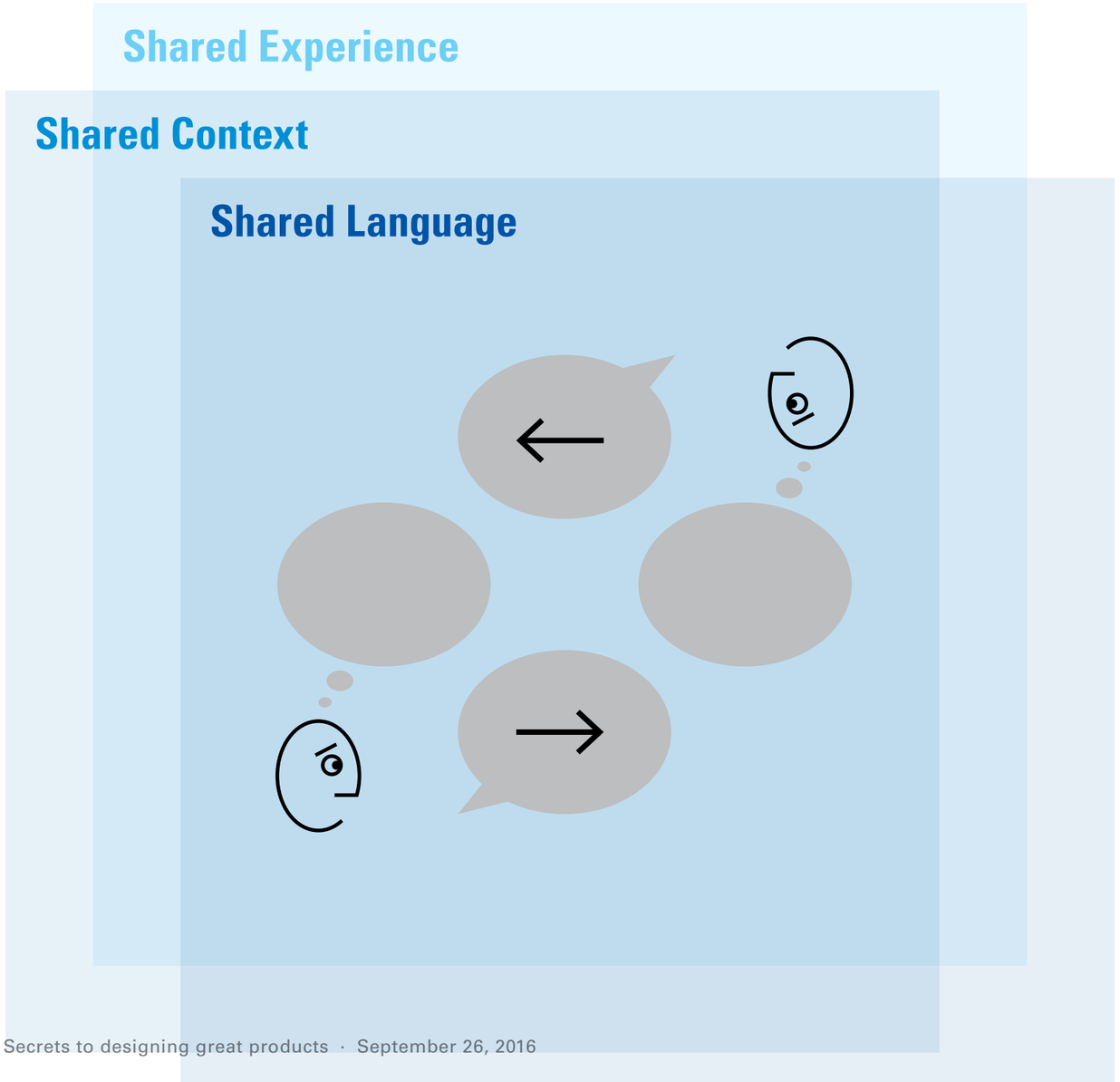
Ok. How does conversation work?

Conversation requires communication, though **communication is not conversation**

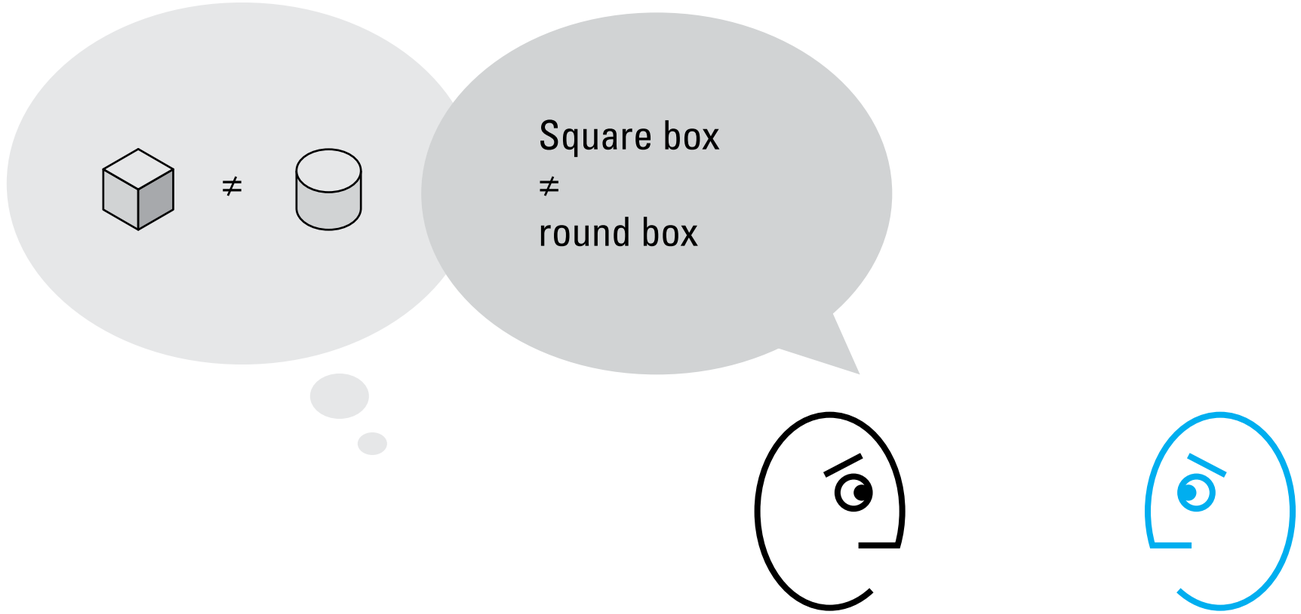


See Claude Shannon, “A Mathematical Theory of Communication,” 1948

In addition to communication, conversation requires **shared context, experience, and language**



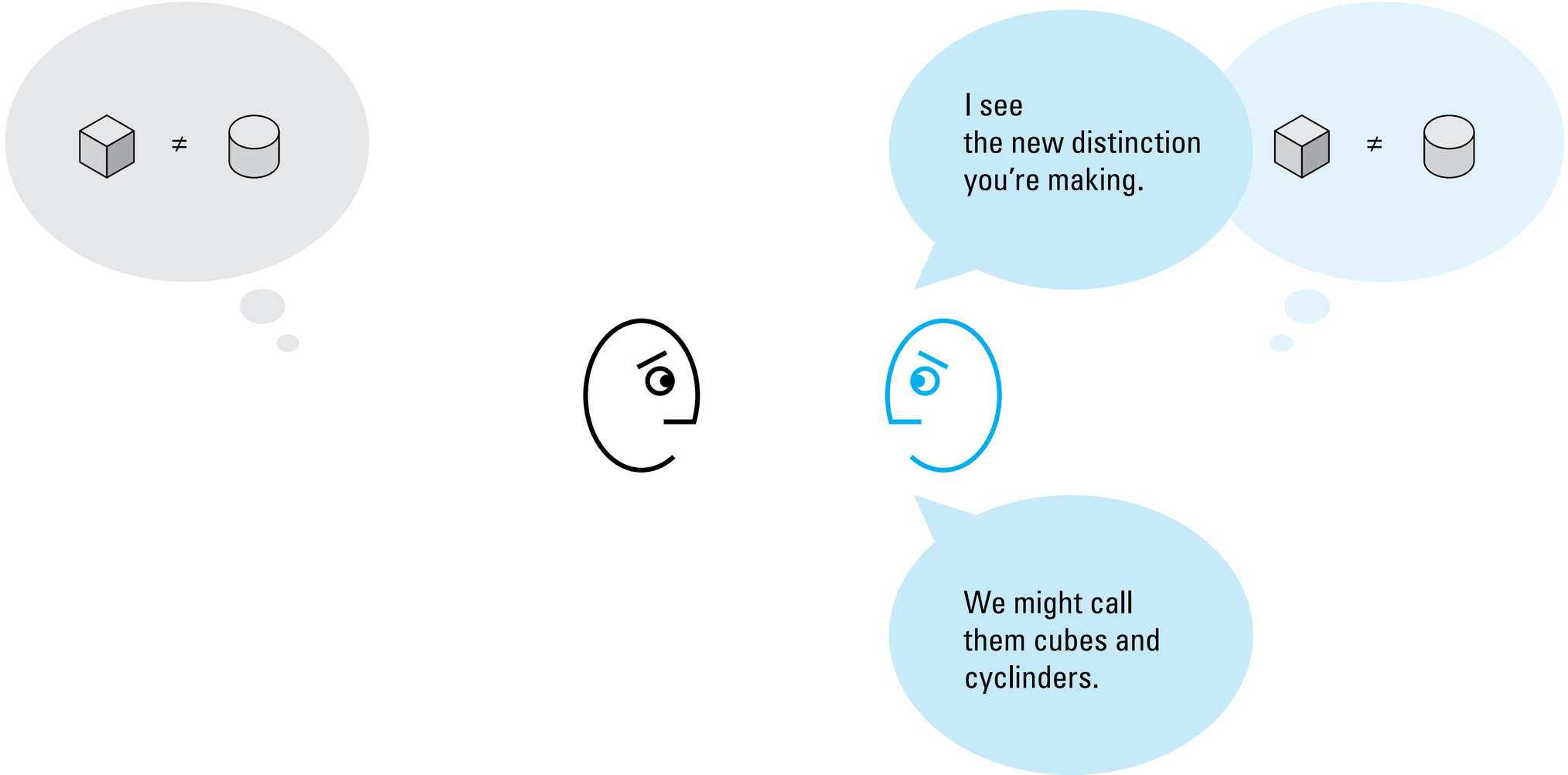
Conversation begins with **distinctions,** noticing differences, suggesting boundaries,* e.g., up/down, front/back, inside/outside



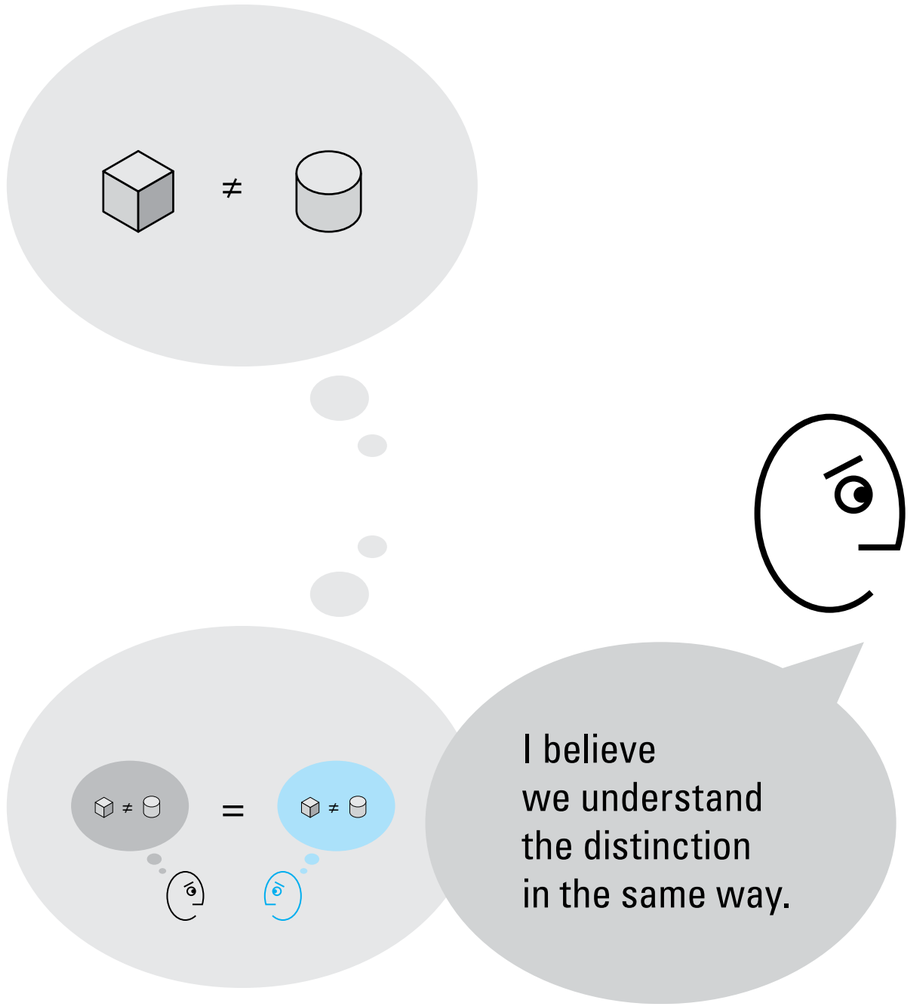
*See Gregory Bateson's *Steps to an Ecology of Mind: Collected Essays in Anthropology*, 1972,
"a bit of information is a difference that makes a difference."

See also G. Spenser Brown's *Laws of Form*, 1969,
"we cannot make an indication without drawing a distinction."

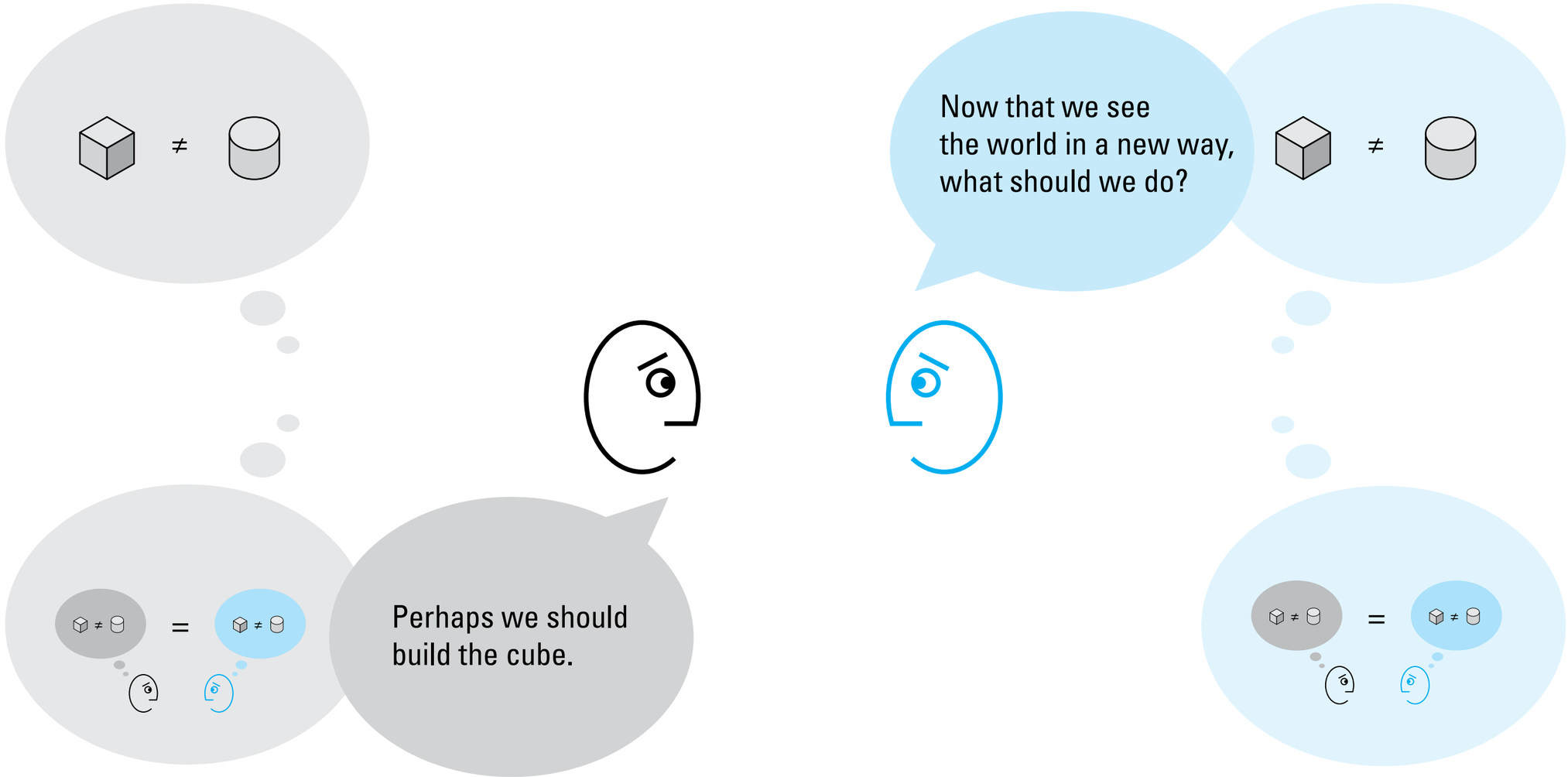
Conversations about distinctions may lead to **understanding**



Further conversations may lead to **agreement**

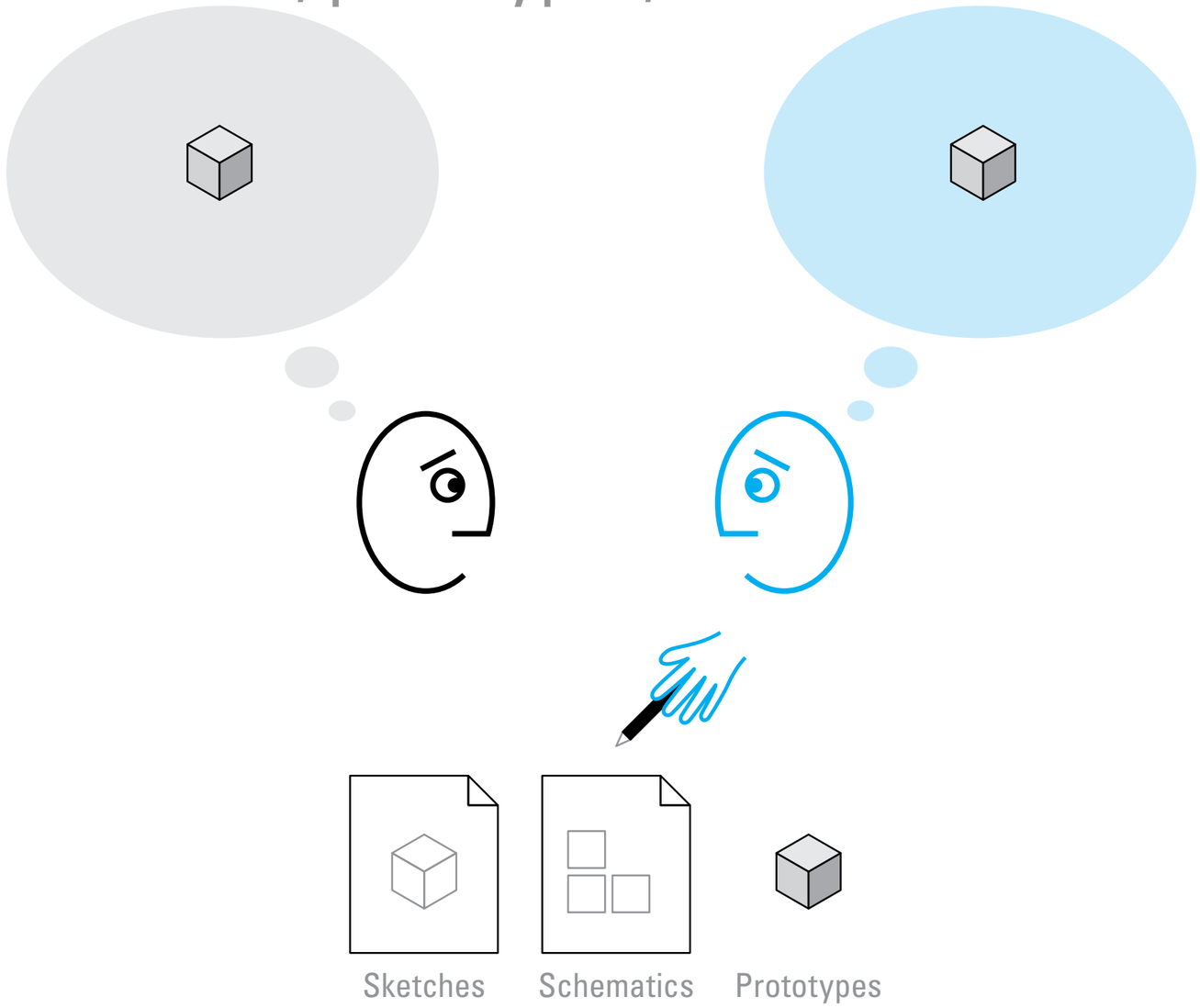


Further conversations may lead to **action**



Conversation is aided by **showing what we mean,**

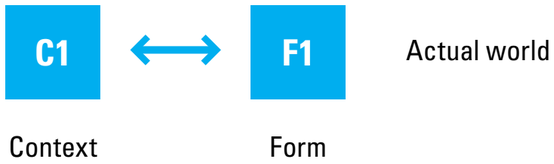
e.g., sketches, schematics, prototypes, etc.



Alexander’s thesis is summed up in his **original diagram**

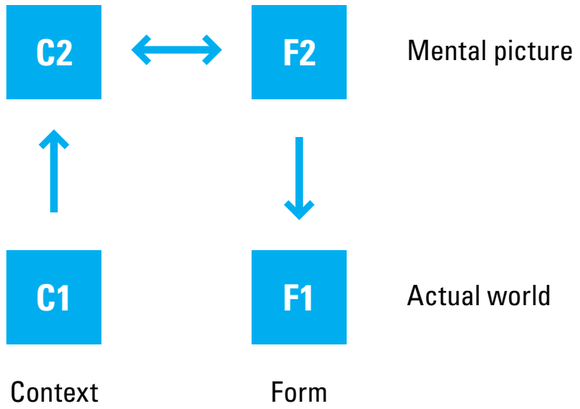
Unselfconscious design

Direct making



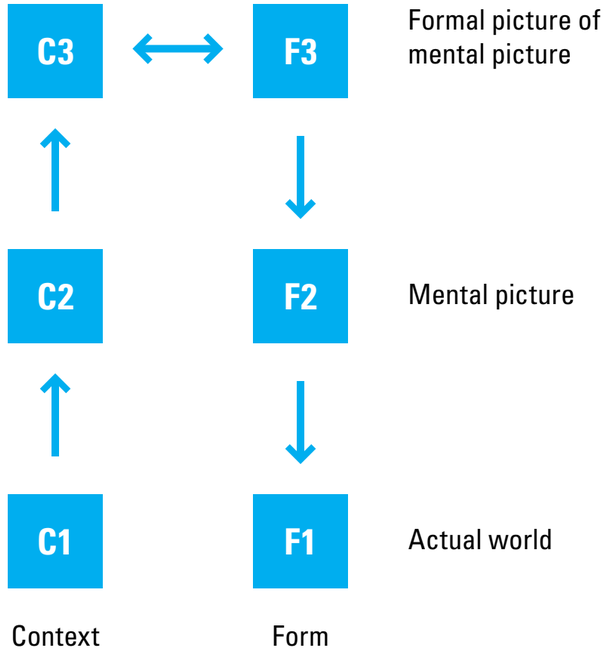
Selfconscious design

Working it out in your head



Mediated design

Creating shared representations



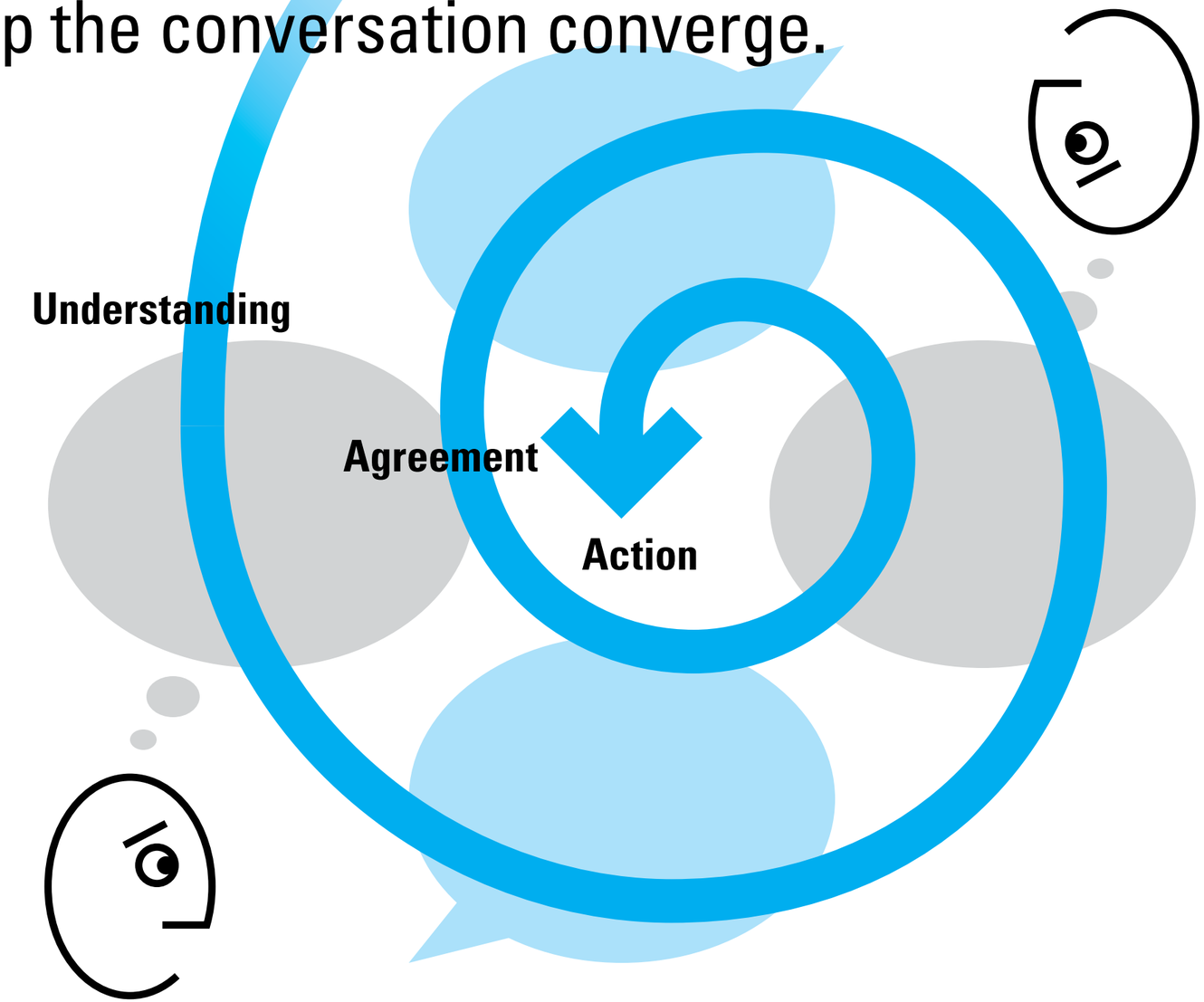
—after Christopher Alexander

Alexander spells out why **modeling is key** to design

"...physical clarity cannot be achieved in a form
until there is first some programmatic clarity
in the designer's mind and actions;
and that for this to be possible, in turn,
the designer must first trace his design problem
to its earliest functional origins
and be able to find some sort of pattern in them."

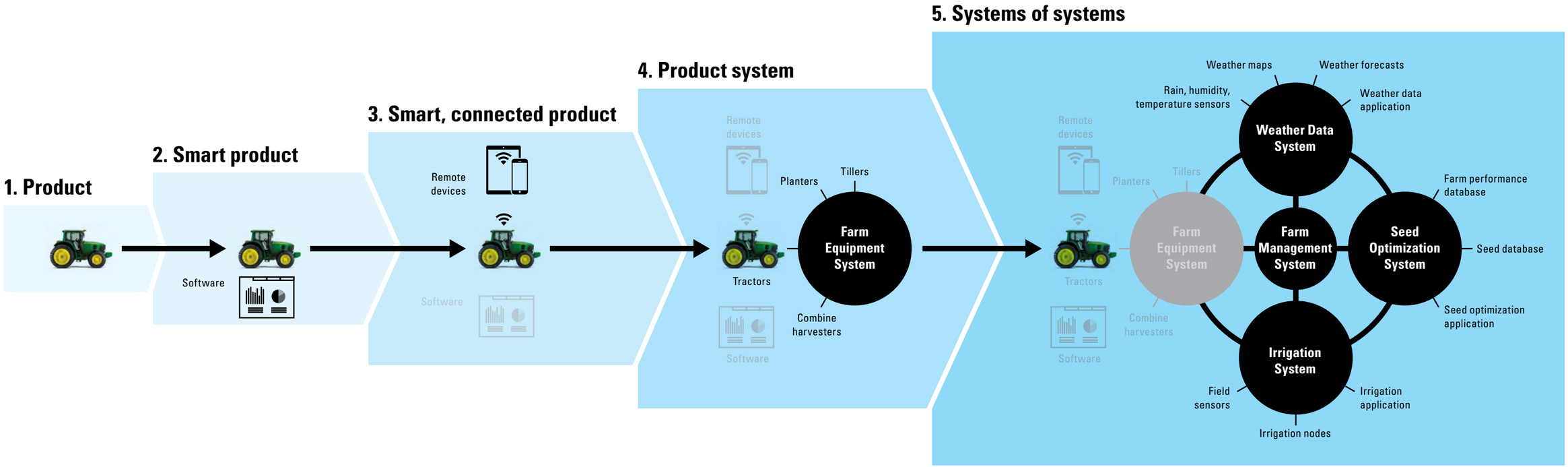
—Christopher Alexander

In sum: design is **conversation for action,** and models help the conversation converge.



Related ideas

Increasingly, products are embedded in systems and systems-of-systems (product-service ecologies), and **systems design requires models**



—Michael Porter and James Heppelmann, "How Smart, Connected Products Are Transforming Competition," *Harvard Business Review,* November 2014

Related ideas

We are beginning to build **“intelligent agents,”**
so called “artificial intelligences”

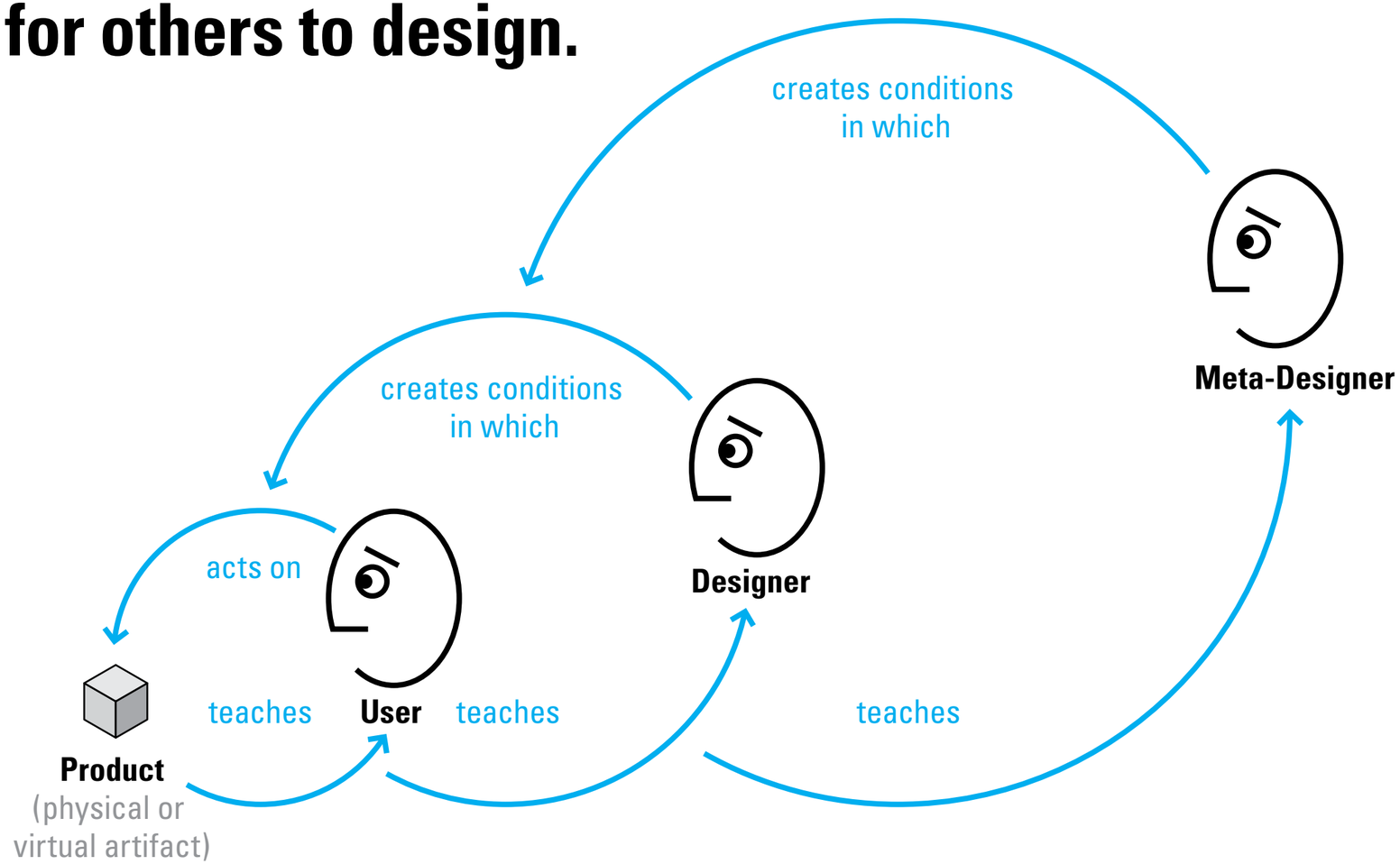
In some areas, they already surpass human abilities;
yet AIs **coupled with humans** may be even more powerful

Designing these couplings,
creating the possibility of **human-computer conversation,**
is unexplored territory and an important challenge

Amazon Echo with Alexa

Related ideas

The future of design is designing for conversation,
creating opportunities in which others can have conversations for action—
creating opportunities for others to design.



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