

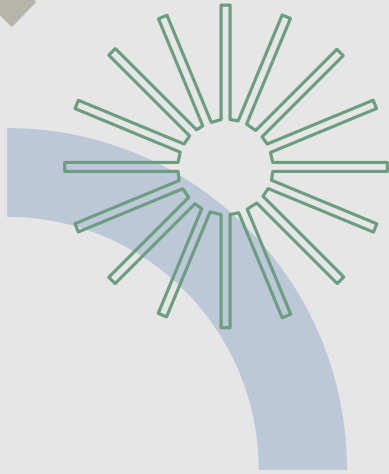
On reading, Loom, and meaning

*How **we know** that we know*

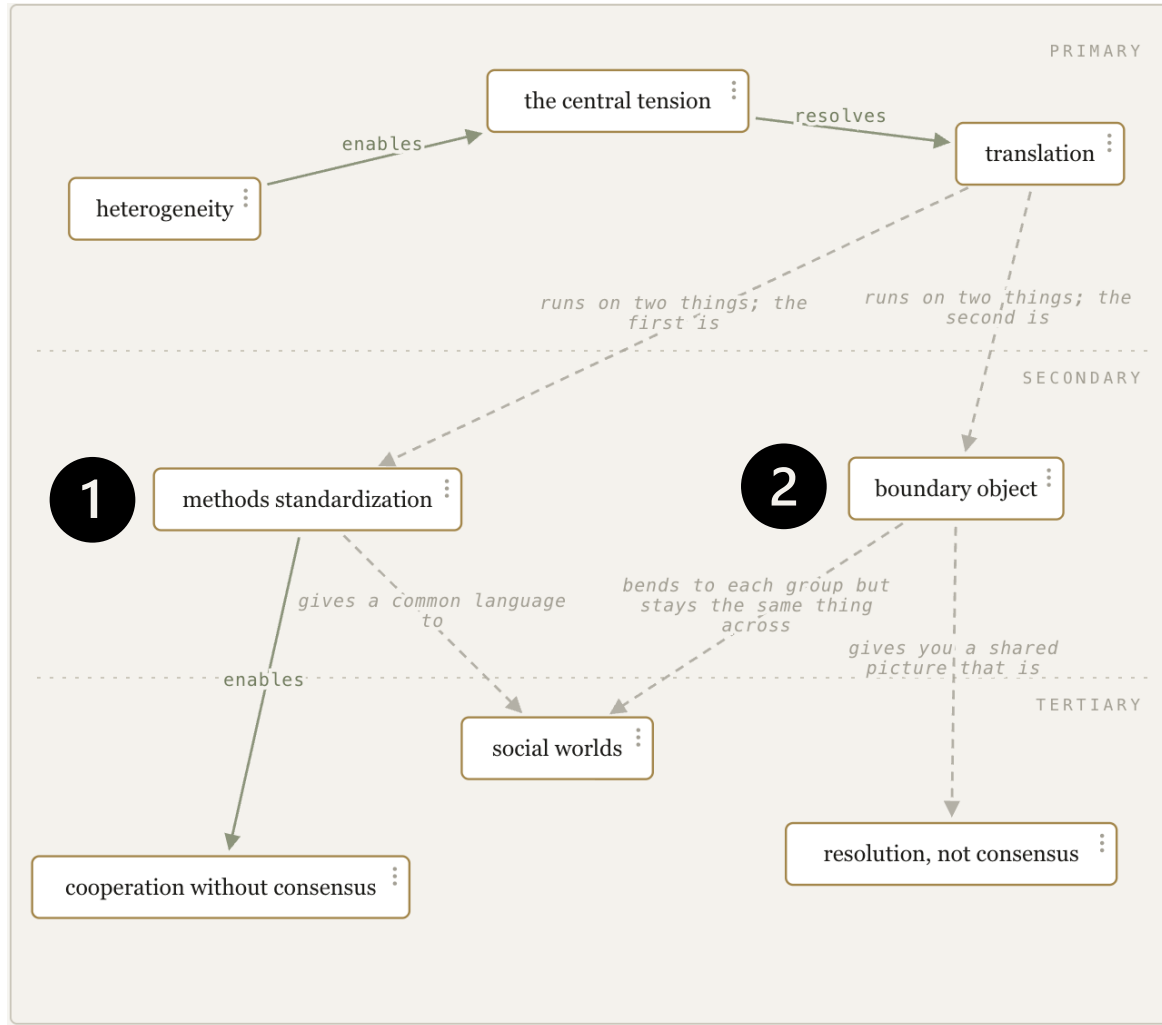
John Cain · john@zerowidth.ai
Frameworks · UC Berkeley MDes · September 2, 2026

TO START

I did the homework, too.



Star / boundary objects



Different people use/needed/engaged one museum **for different reasons**.

They never had to agree (never agreed) on what it was for (purpose, goals, etc).

Two things made it work anyway:

1. everybody **collected and labeled the same way**, and
2. the **stuff they shared** could mean something different to each of them.

Boom, boundary objects!

What this hour is about: *how knowing...can...turn...into...meaning*

Reading Star gave me a feel, *that's knowing*.

Labeling, mapping, saying it out loud...names, links, a claim we can argue with
That's meaning, made

So, a proposition for you: making meaning is real work. If we have one need, it's the need to make meaning. You do it all day, just being yourself. Reading is some of that work.

→ **But, a trouble:** your newest tools will happily do that work of meaning-making for you and others. They hand you answers instead of possibilities, and they can never say why.

→ **So, Loom, a scaffolding tool, not an automatic answer machine,** built to give uncertain answers: "maybe," "what if."
It keeps the choosing with you, and what you **could say** *versus what you should say is the whole game.*

Where Hugh left us last week...

“

*“If we know that the reality that we live
arises through our emotioning,
and we know that we know,
we shall be able to act according to our awareness...
That is, we shall become responsible of what we do.”*

- Language brings forth our world
- This hour: the practice of that responsibility
- Where meaning gets made — and by whom

Humberto Maturana, “Metadesign,” 1997
The closing slide of Hugh's week-1 lecture

So, why is this a design school's problem?

Because designing is making choices for *people you are not*

1. **Every choice in design rests on something you know** -about people, about materials, about **what good looks like**.
2. **Most of what you know, you can't yet say.** That's not a flaw. It's the human condition.
3. This course —frameworks— is the discovery of ‘tools to think with’, AND the craft of getting knowing **into a form you can share**, argue, test, and be wrong about, *together*.
4. **Beware:** your newest tools already have a position on what knowing is. A strong one. They never say it out loud.

Knowing something –*anything, really*- can sit on a line.

What moves along it is the ‘why’ — felt at one end, said at the other.

*after Bourdieu · Schön · others
could also be tacit/explicit
could also be latent/patent*

What I know about X is...

IMPLICIT

associative · sub-symbolic

*like knowing a friend's voice
instantly, but nothing you
could write down*

or having 'a feel for the game'

EXPLICIT

relational · symbolic

*like a recipe...every ingredient
and step written out*

At each end of the line

The relation is...

Implicit — *a feel that you know*

You can act, and act well. You know the voice; you make the move.

But you can't say why. You can teach it by apprenticeship.

You can't be argued with —the terms- only felt to be wrong. When it fails, nobody can say which part.

It dies with you. My Swedish grandmother's apple pie recipe, and...the friend's voice · a feel for the game · the master's hands · an embedding · a chat window

The relation is...

Explicit — *a 'token' you've said*

Term, word, utterance

The link/relation travels without you.

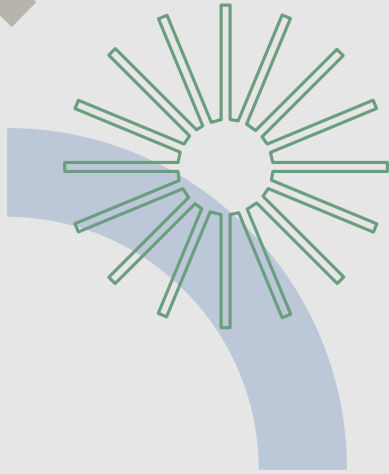
It can be shared, taught, disputed, corrected, accumulated — negotiated across communities that don't share a feel.

When it fails, you can say where.

The cost: it took work to make, and it lost something on the way. My written version of her recipe never tastes like her hands.

THE TURN

Design is never one knower.

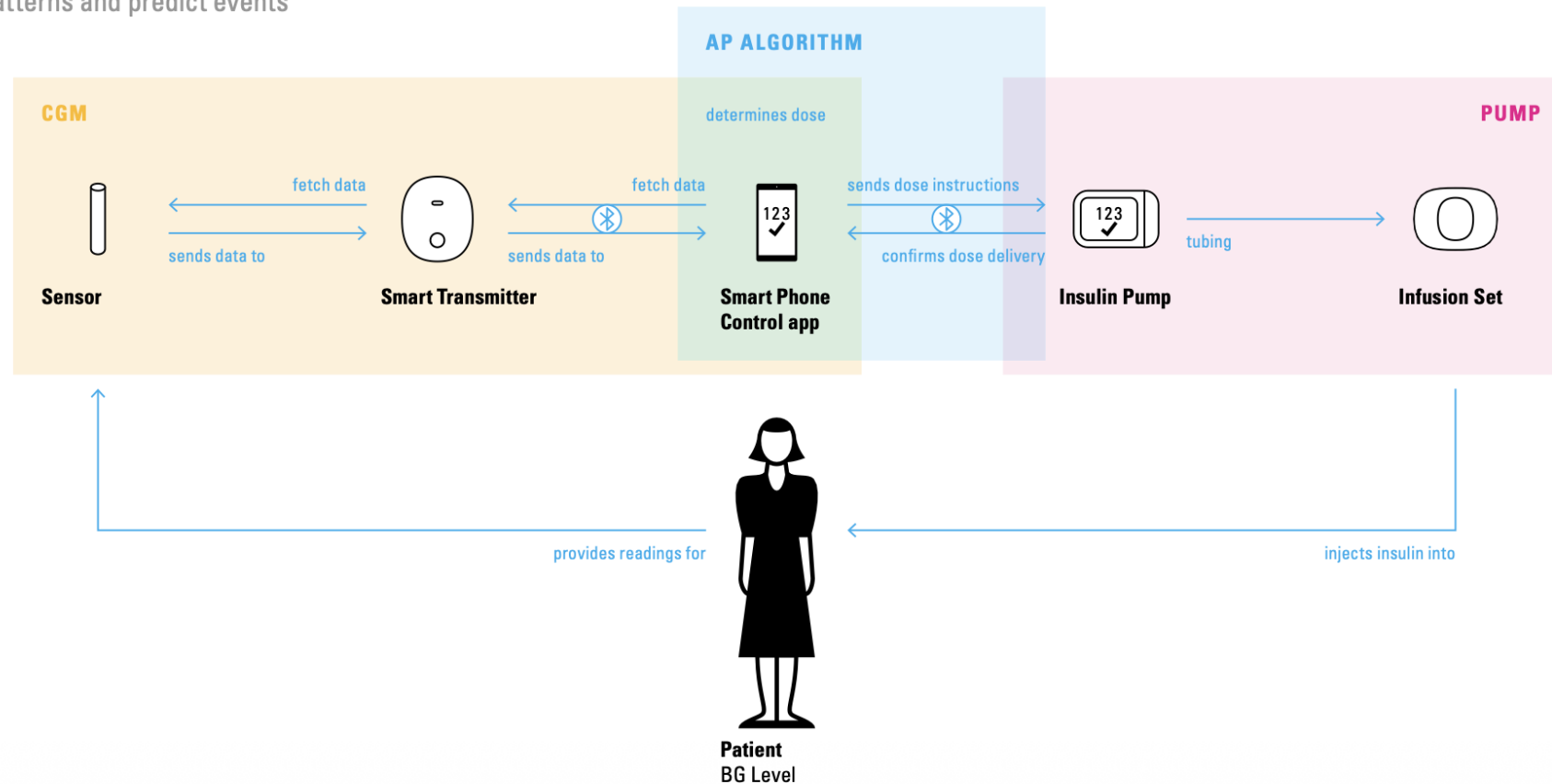


Jabari, last week

Modern services are scaffolded by information systems,

that

- recognize users and personalize responses
- collect, store, and analyze data
- look for patterns and predict events



Everyone who builds a thing sees a *different thing*

—Bucciarelli calls these "object worlds" (1994)

Ask the people who build a phone what a phone is...

To the structural engineer: load paths and drop tests.

To the RF engineer: an antenna with a screen attached.

To marketing: a position in a market.

To my mom: the name on the back.

What this means for design

Each answer is partial — and real.

The thing gets built only where those knowings meet, get said, and settle.

That's what drawings, specs, and maps are for: places where different knowings can meet.

Settle a boundary and it disappears into the product.

Leave it open, and somebody absorbs the friction...

Boundaries don't settle themselves. People settle them...slowly

The phone took a century: a person absorbed the friction until a mechanism could



Settled doesn't mean perfect...friction has somewhere to go

Settled = worked out once, said out loud, never reopened -the dial, the wall plug, the SIM slot

My mom's (93) 'Words With Friends' stopped working.

She called Apple.

Why?



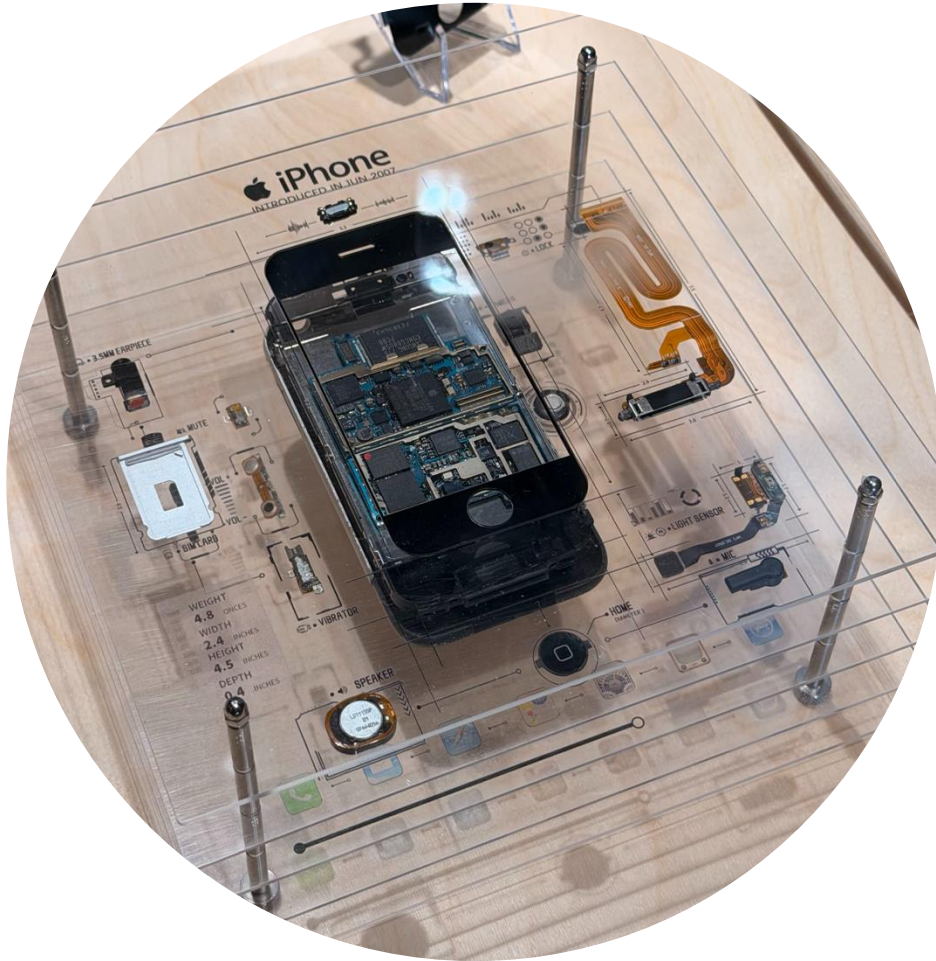
Chip, OS, app, servers, carrier — dozens of object worlds,

compressed to a name on the back.

The iPad isn't “settled.” It's made of settled boundaries.

Connector, SIM slot, radio protocol — each one an argument somebody finished.

This stack of settled worlds...



...compressed to the words on the back.



'Designed by Apple in California'

The iPad settles function for her about as well as anything ever built

That's why she can use it at 93 knowing nothing technical per se

Where it fails her is precisely at **the one seam that was never settled with her world in view**: what happens when something *leaks*.

A better iPad has *her world* in the negotiation:

1. A better iPad settles the "what broke" boundary in her terms
2. When Words With Friends dies, the device knows, or could know, which world failed, i.e., the game's servers, her wifi, the app, the OS
3. It just doesn't tell her, in her language



THIS MORNING'S READING

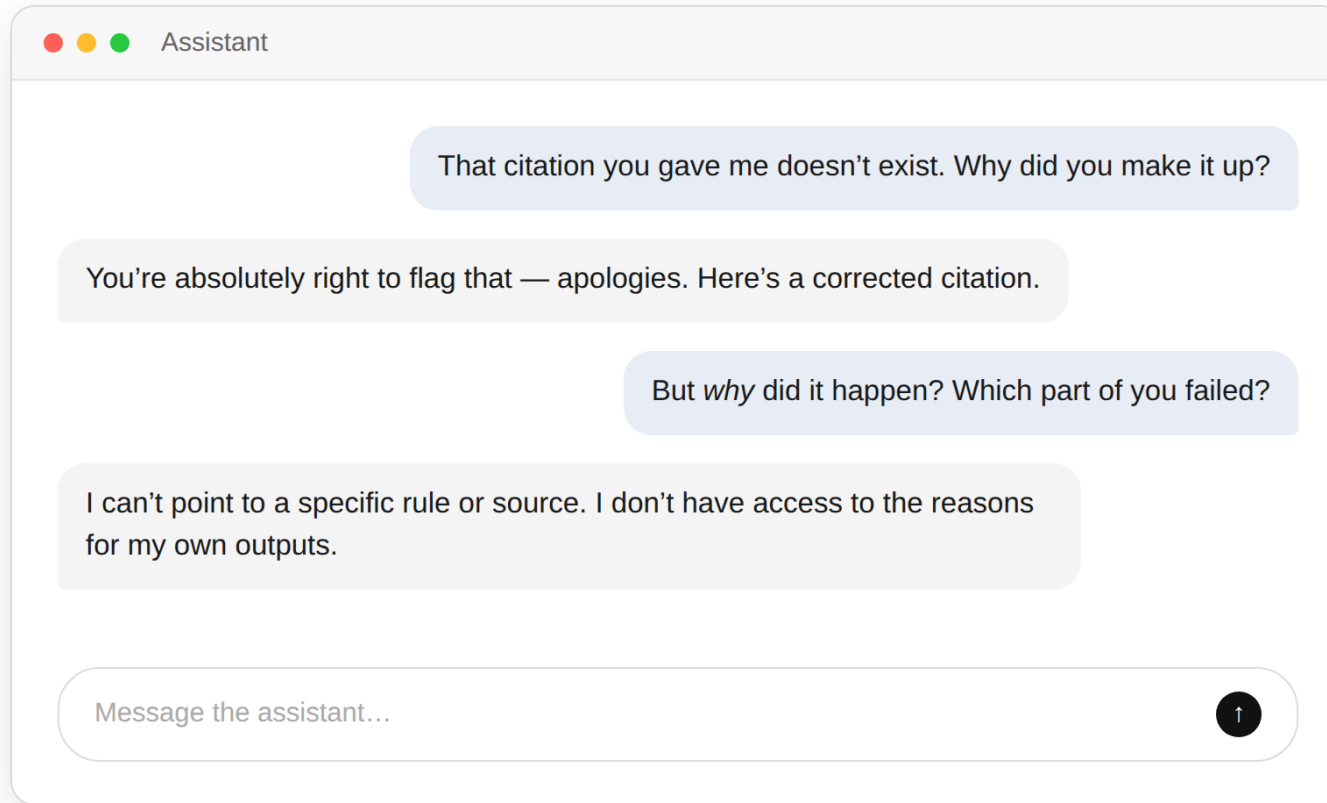
Shannon kicked meaning out of the box

On purpose

p.15: "Information must not be confused with meaning." Every LLM runs on this machinery.

Most, not all, LLM-based chat services are all feel, *no names, no relations*

Every world that made the machine meets you in a single stream



WHAT IT KNOWS

**It returns what's close.
Never why.**

When something leaks — a hallucinated fact, an arbitrary refusal — you can't say which boundary failed, because no relation between those worlds was ever made explicit.

Nothing settled. Nothing to point at.

You're the switchboard operator now.

The stakes

David Brooks, “The People Who Will Thrive in the AI Age,” The Atlantic, 2026

BROOKS’S ARGUMENT

The AI age splits people by appetite for effort, not by smarts

“Marathoners” use AI for hints, not answers

You become what you repeatedly do

This course is the gym

WHAT THE IMPATIENT WANT

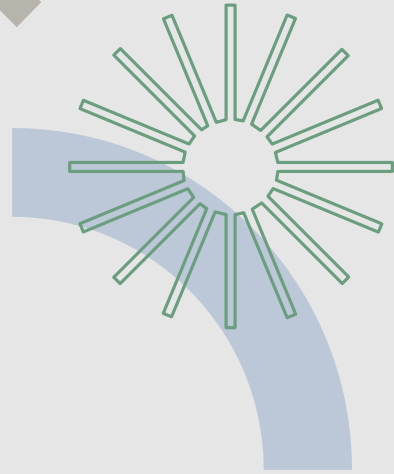
The output, not the ordeal.

The work falls to you — and the machine will happily let you skip it.

Brooks asks: will you still want it?

THE QUESTION LURKING UNDER THIS CLASS

Who (gets to) make the meaning?



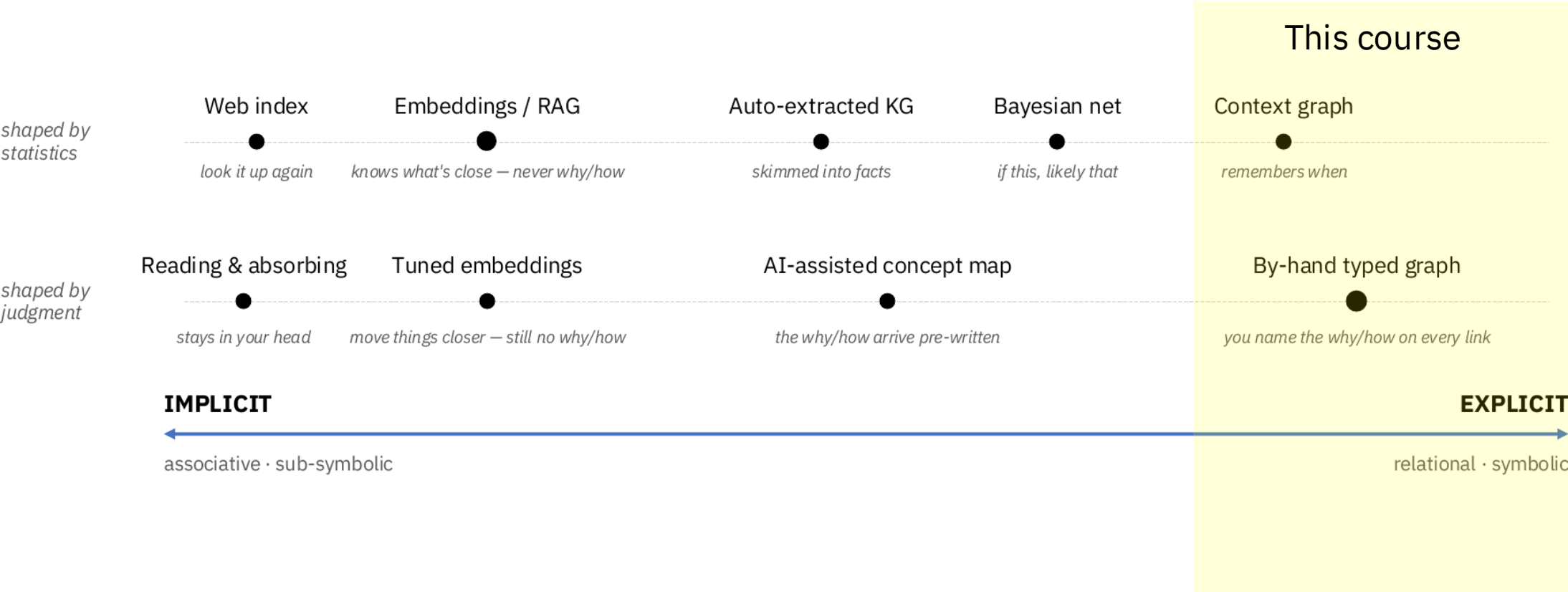
Short answer, Brooks again:

We do, if we're willing to do the work, keep the choosing

Else the machine will happily do it (Loom was designed with no AI affordance)

Machines and people hold knowledge along the same line

Shaped by statistics, or shaped by judgment —after Novak & Gowin, Dubberly



Every mechanism is a claim about what knowing is

Store-and-retrieve only similarity, and

knowing can only be a feel.



Store named links, and

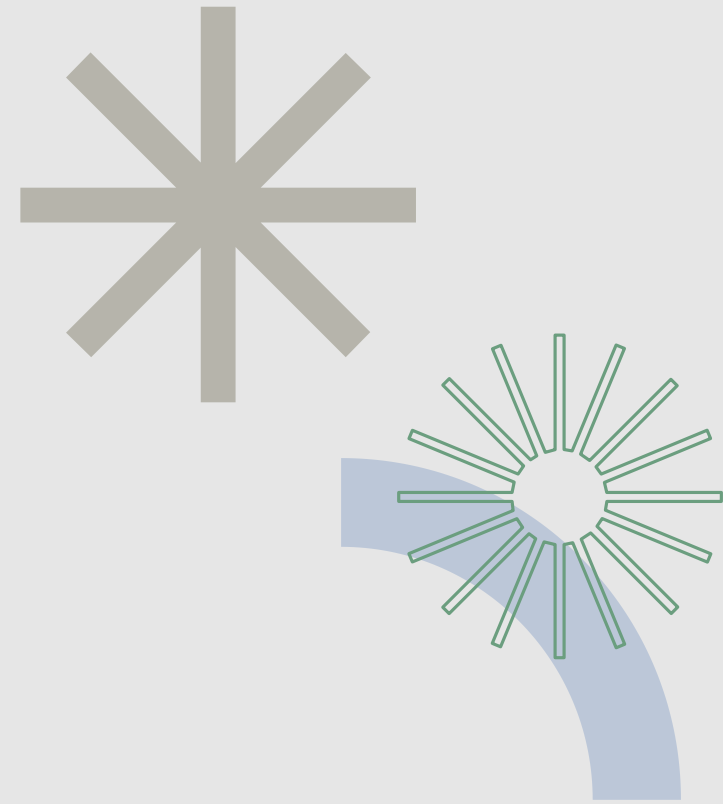
knowing means saying *how*

In Loom, it's the labeled connection, link: what can be said can be shared, taught, and challenged about relations

THE TOOL

Loom: a loom for reading.

Designed with John Cain · TJ McLeish · Hugh Dubberly · Roy Zhang



Loom: where it comes from

Loom is a note-taking tool with a point of view

- The tool holds structure, you do the judgment...you choose the passages, name the concepts, and say how they connect. No AI does any of that for you, because writing/naming the connection is the understanding.

Origin, E-Lab.

- Chicago, 1990s: a social-science-based research and strategy firm. About 30 social scientists and 20 industrial designers, PhD anthropologists and sociologists among them
- “Professional noticers”
- **CAVEAT** a tool for coding data from fieldwork: researchers logged “bytes”, open and axial coding.

Grounded theory

- Glaser & Strauss, ‘The Discovery of Grounded Theory’ (1967), sociologists rebelling against the standard, deductive order of operations: start with a theory, deduce hypotheses, collect confirming data.
- Their inversion is inductive: start with the material, let theory emerge. Open coding: tag what seems to matter, no predetermined categories. Axial coding, relate the codes, find the structure connecting them.

Why it matters here

- A discipline for honest reading, you construct your concepts from the text instead of importing them, and every concept points back to a passage.

The whole method

A machine for making relations explicit, by hand

1. **Observe some *matter***
2. **Capture a segment of the phenomenon**
3. **Label it**
4. **Keep an inventory of labels**
5. **Learn parsimony — noticing how to notice**
6. **Create relationships among the labels**
7. **Say what's going on here**

The red line

Loom does not employ AI.

You do the work.



And when the threads are made —

export them, take them anywhere.

*They're yours: drop them into any AI tool with your judgment already inside.
The AI-generated map is not yours. It has no relationship to your lived reading.*

The return: your maps are boundary objects

Your Shannon and Star maps, due today, are relations

explicit enough to cross worlds.

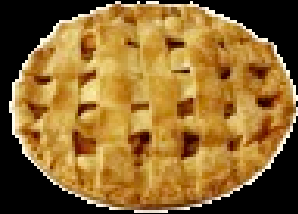
*Different readers, different object worlds, one map on the table — that's section, this afternoon.
So — who makes the meaning? You do. Every link, by hand.*



In an age of worrying about what AI will do to thinking...

Doing that work *is* the responsibility.

Fire
Mining
Refining
Metallurgy
Forging
Metalsmithing
Animal Husbandry
Agriculture
Dairy
Hybridizing
Refining (sugar)
Food Chemistry
Carpentry
Cooperage
Grinding
Spice production
Refining (fuels)
Controlled heat
Threshing
Grist mills
Packaging
Insulation
Ceramics
Refrigeration
Distillation
Pottery
Manners
Communication
Symbols
Ink
Paper
Weaving
Hinges
Navigation
Shipping
Money
Aesthetics



*“If you wish to bake
an apple pie, you must **first**
invent the universe”*



Dr. Carl Sagan – ‘Cosmos’ 1980