

# Design?

**an exploration of  
design theory**

**by Jessie Richards**

The book is a culmination of my readings, experiences, thoughts and models from Hugh Dubberly's course on Design Theory — a seminar course that consists of two weekend-long workshops and the dissection of selected readings on design. The following pages contain representations of concepts from studies on communication, process, theory, among many other ideas.

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**Workshop**

Workshop 1

Following are notes on lectures from Hugh Dubberly over the course of our first workshop. Our class participated in a discourse on mapping, modeling and design. We were introduced to theories of design, and urged to uncover how we think about what we design.

notes

concept mapping

nodes + links  
terms + prepositions  
noun + verb + noun

necessary & sufficient  
least means, maximum effect  
similar form — similar content

Clear	Mutually
If	Exclusive
Previously	Collectively
Understood	Exhaustive
CIPU	MECE

sign = signifier & signified

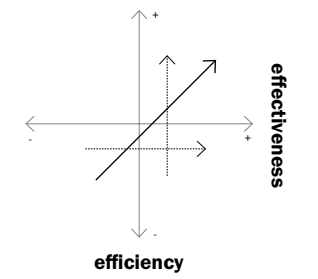
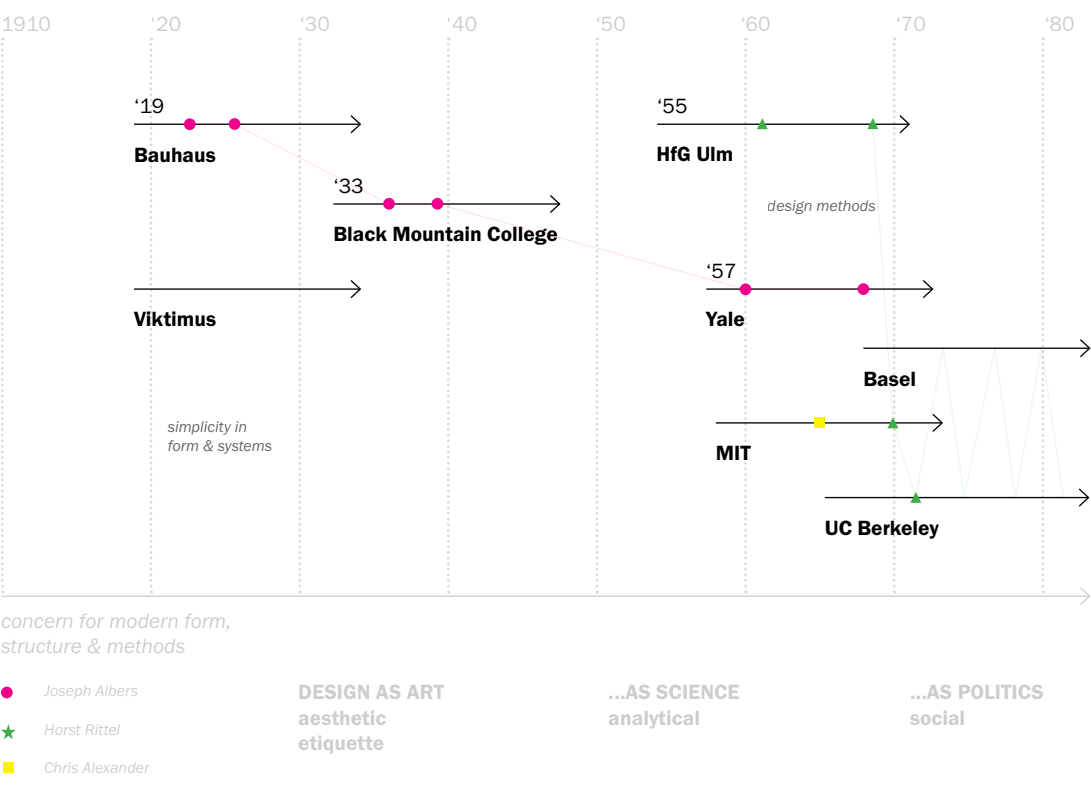
sign : something that stands for something to someone

models are signs

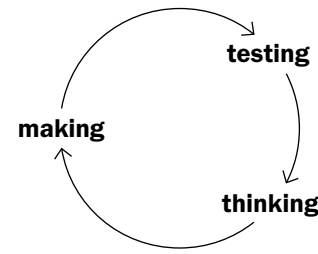
design = learning  
involves conversation about ideas in network

design school timeline

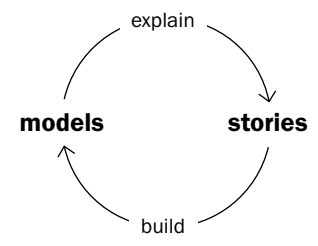
notable figures in the development of design theory



design choices can be made to increase either effectiveness or efficiency, but will ideally address both characteristics



design is a process that resembles a feedback loop  
refer to pages 20, 24 & 32



models and stories are tools for thinking and discussion  
refer to pages 20, 24 & 30

Workshop 2

This meeting was a further explication of our readings leading up to this second workshop and preparation for our final project poster. We had a guest lecture by Paul Pangaro concerning design and conversation. Our discussions focused on the goals of design the occurrences of interaction.

March 19 — 20, 2016

notes

On Paul Pangaro's presentation on Design as Conversation —

Conversation is the engagment of participants using a shared language in a given context.

Designers should ask themselves, how can we speak the same language as our users?

Before a transaction occurs, an agreement needs to be reached, which requires an exchange, that requires a shared language among participants.

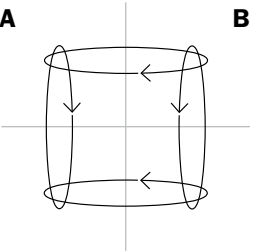
Participants begin an exchange with goals that require means to be accomplished. Settling upon these means creates new goals and so on.

Conversation in design happens in our personal internal dialogue, but also with managers and users, other stakeholders in the process.

The power of the conversation depends on who is in it.

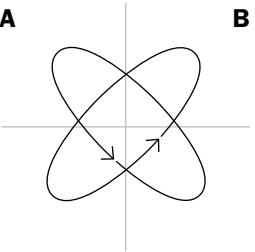
collaboration

exchanges of goals & means



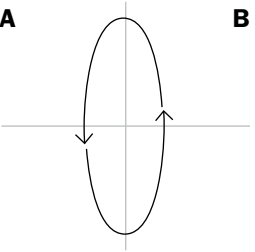
participants have a conversation about their goals and carry out separate means to achieve them

talk about going out to eat, drive separate cars to the same restaurant



participants cooperate to achieve a goal with different but complementary means

being dance partners



participants act as a single entity working together to achieve their goal

talking about what to eat for dinner, buying the groceries and cooking together

tame problems

direct causality

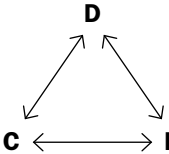
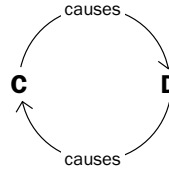


These problems can be solved by mechanical means. Christopher Alexander suggests we attack issues by synthesis of form

refer to pages 26

wicked problems

systemic causality



★ Horst Rittel was a notable figure in design theory and is mostly known for coining the term “wicked problem” refer to pages 34

**Theory**

Language

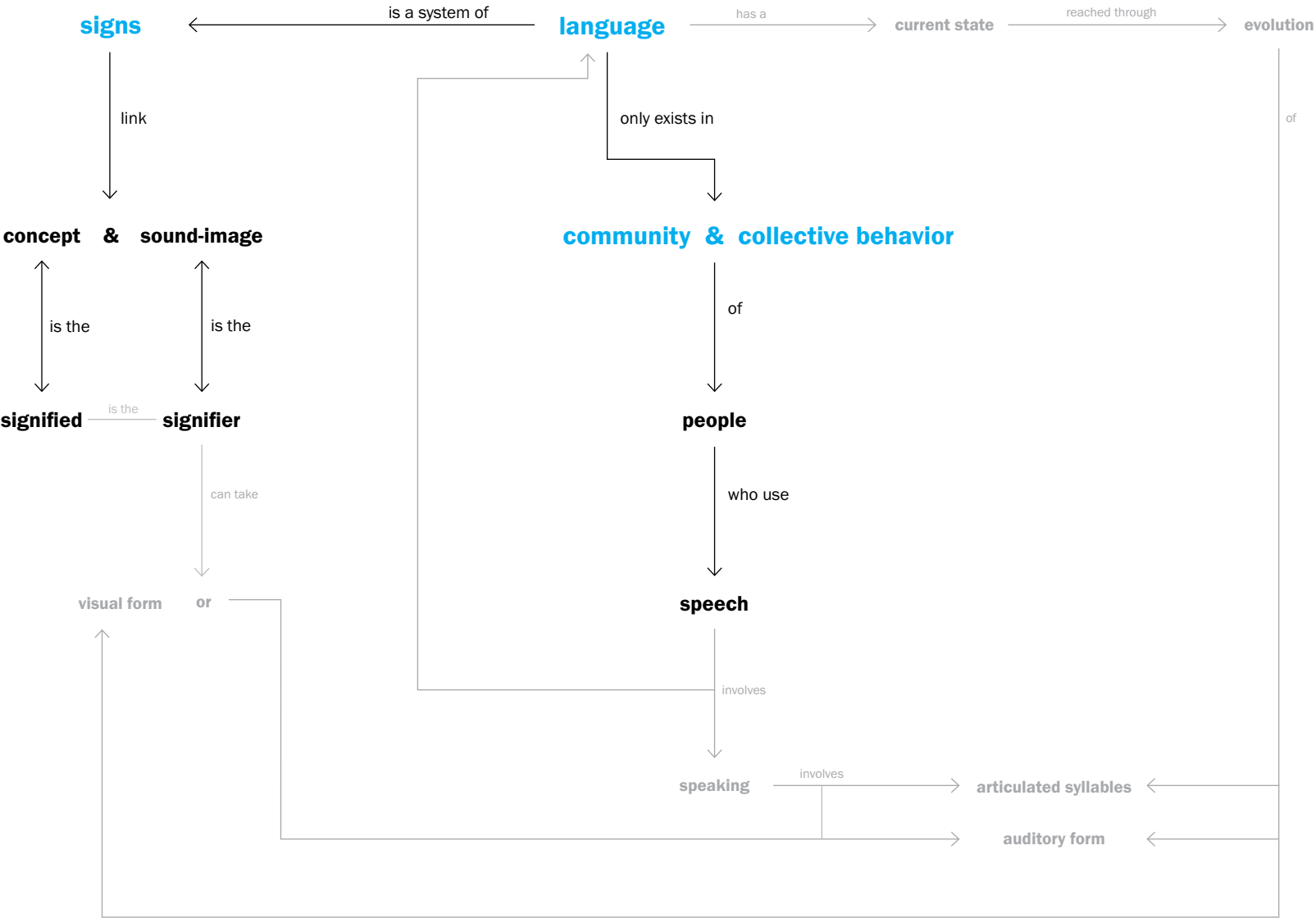
Saussure

Generally signs are thought of as the “names” of ideas, but Saussure suggests we can't separate an idea from its name, a concept from its sound-image. Sound-images are agreed upon by a community who uses them to communicate the concepts they signify.

“If we could embrace the sum of word-images stored in the minds of all individuals, we could indentify the social bond that constitutes language.”

“In fact, every means of expression used in society is based, in principle, on collective behavior...”

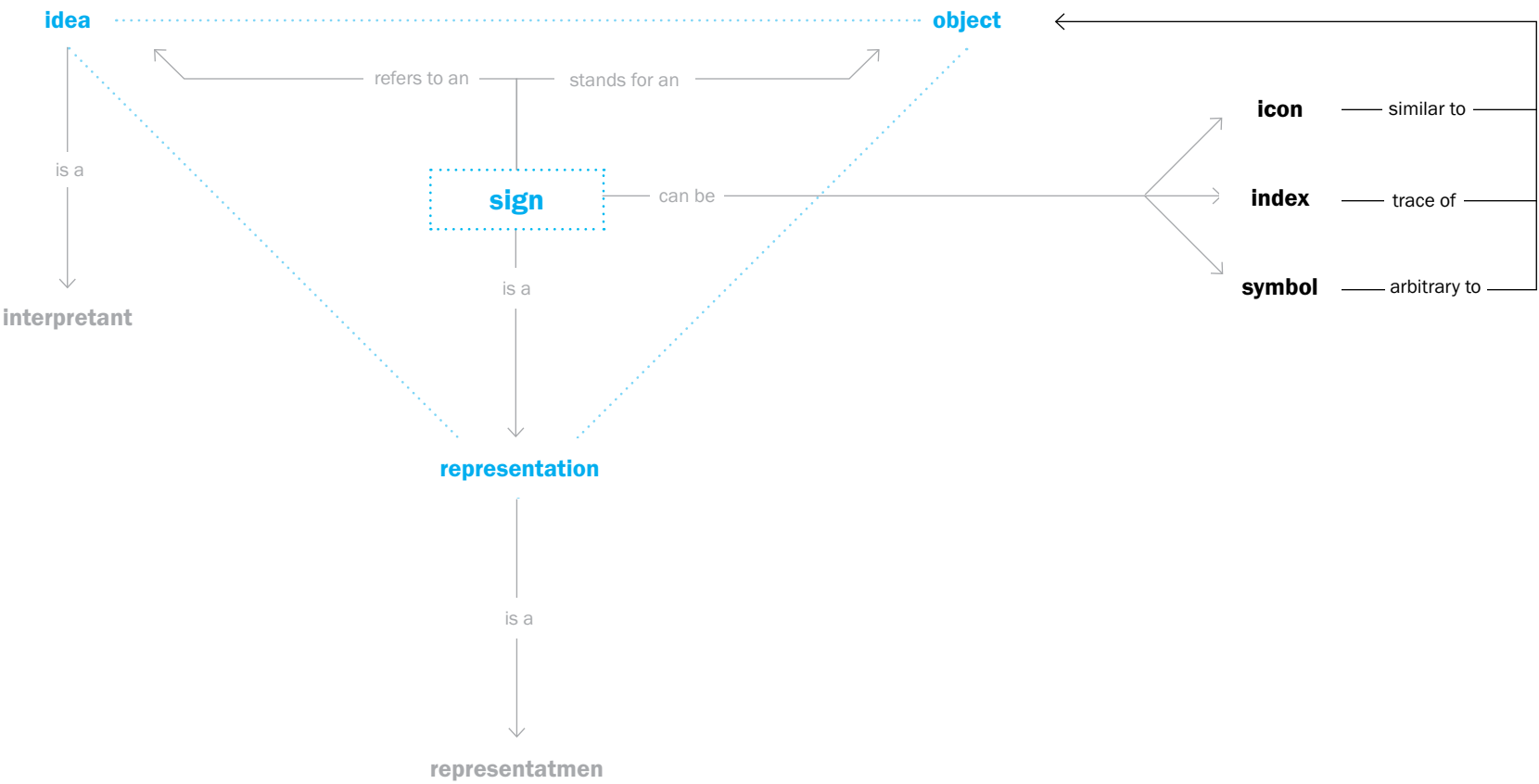
“Course in General Linguistics.” Ferdinand de Saussure.



Sign

Peirce

Pierce explores the different forms a sign can take and their relationship to the signified. Similar to Saussure, Pierce believes a sign is both the concept, the thing, and the way its represented. Signs don't exist without a community that needs to have a conversation about, interpret and represent their environment.



“For language is not complete in any [one] speaker; it exists perfectly only within a collectivity.”

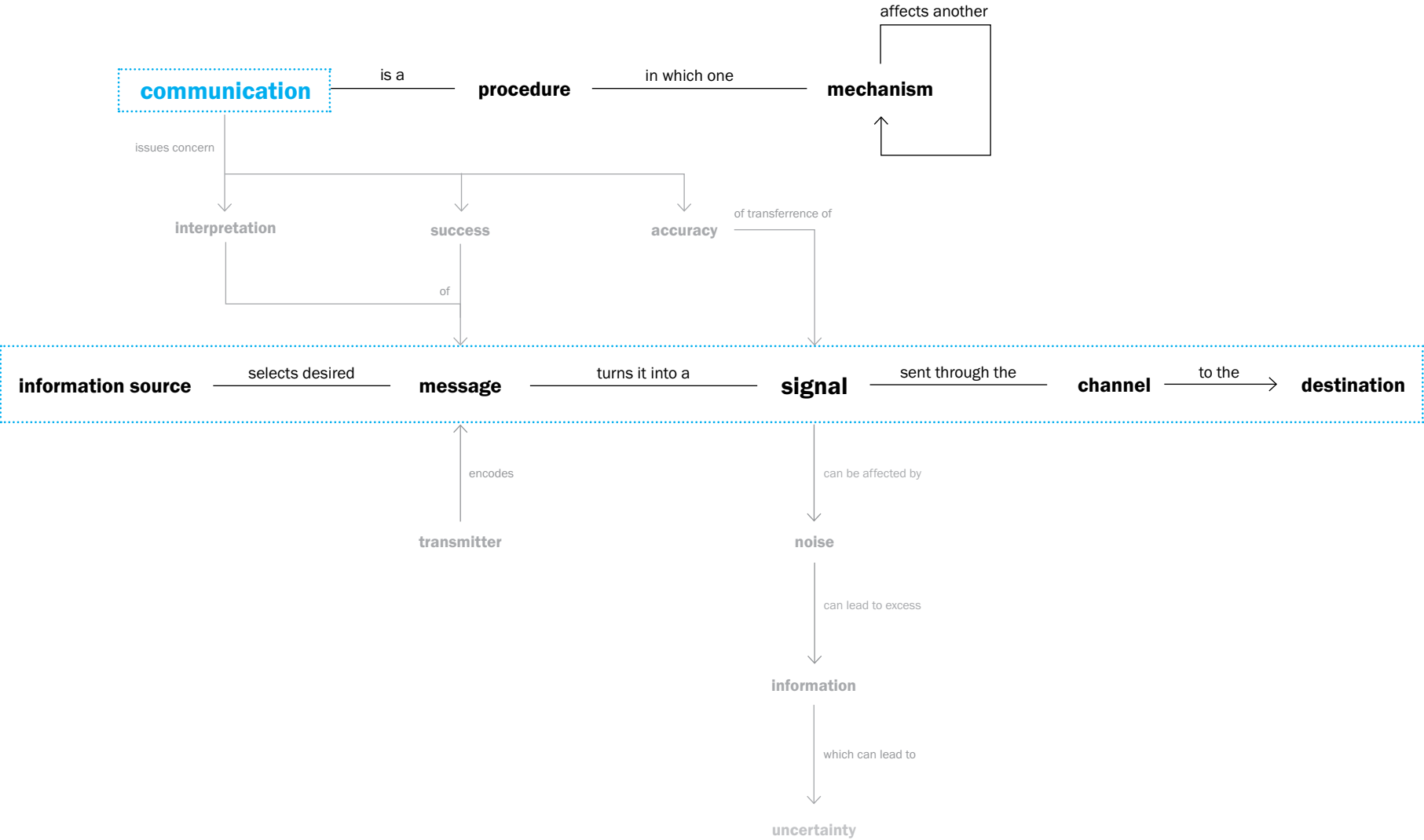
"Logic As Semiotic : The Theory of Signs." Charles S Pierce.



Communication

Shannon

Shannon's model of communication, a channel used to relay messages from source to destination, was made in the context of telephone wires that were mechanically prone to noise. Yet this model can be applied to any conversational context. It is important to note the information source's role in choosing a message and their increasing lack of control along the channel and of interpretation at the destination.



“The fundamental problem of communication is that of reproducing at one point either exactly or approximately a message selected at another point. [...] The significant aspect is that the actual message is one *selected from a set of possible messages*”

“The Mathematical Theory of Communication.” Claude E. Shannon & Warren Weaver.

“Not only is ethics a form of designing, but designing is a form of ethics. One aspect of the designer’s creativity and responsibilty is to devise ethical courses of action that navigate the moral dilemmas of practical life.”

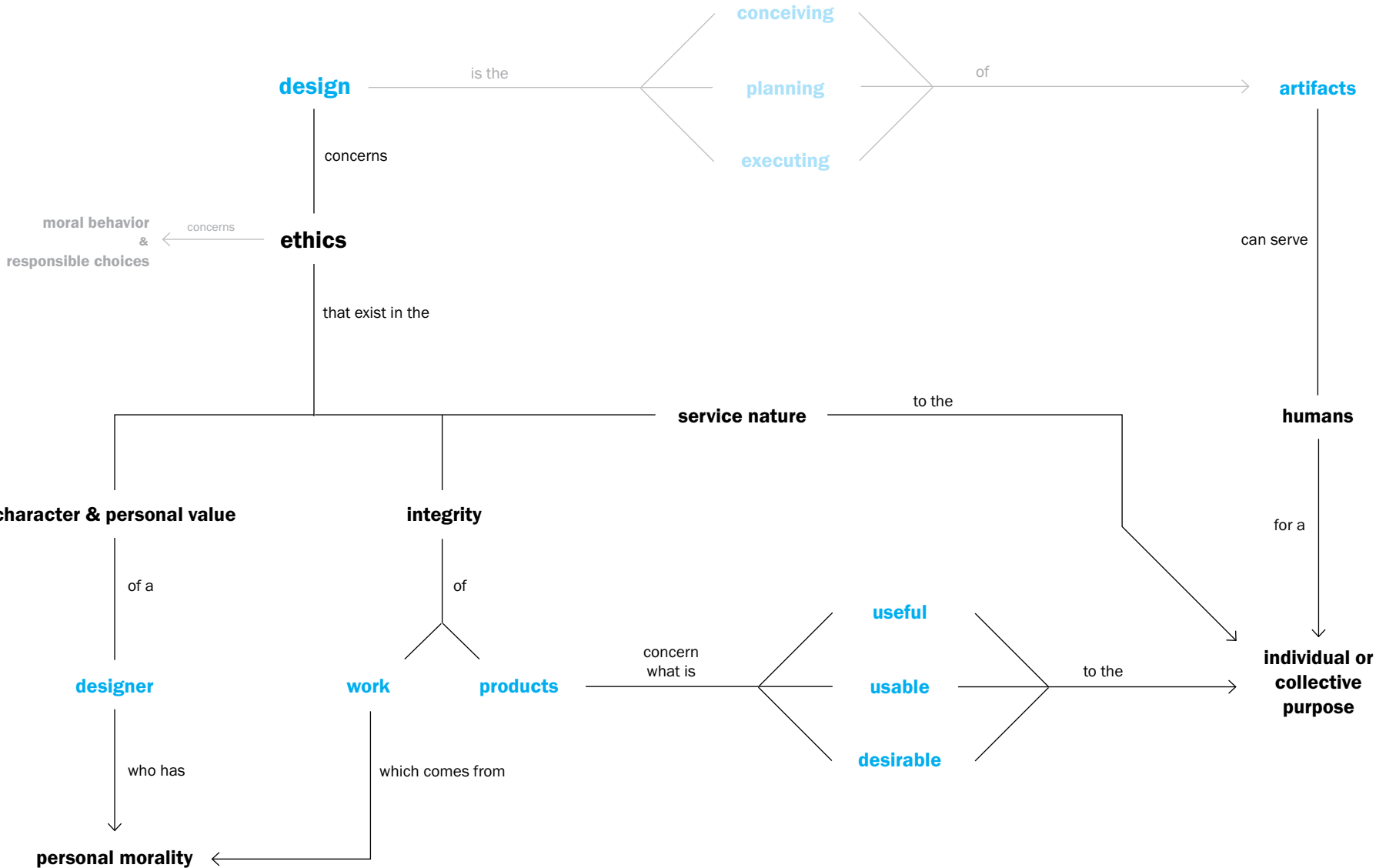
“What is the moral significance of the particular purposes that designers are asked to serve? [...] What consequences will products have for individuals, society, and the natural environment in the short and long terms?”

“Design Ethics.” Richard Buchanan

Ethics

Buchanan

Designers are responsible for the creation of the range of human artifacts. Buchanan argues a designer's choices in ideation and execution are influenced by their personal values. He also argues that designers have an ethical responsibility to think about the wants and needs of a community and possible effects of a designer's choices.

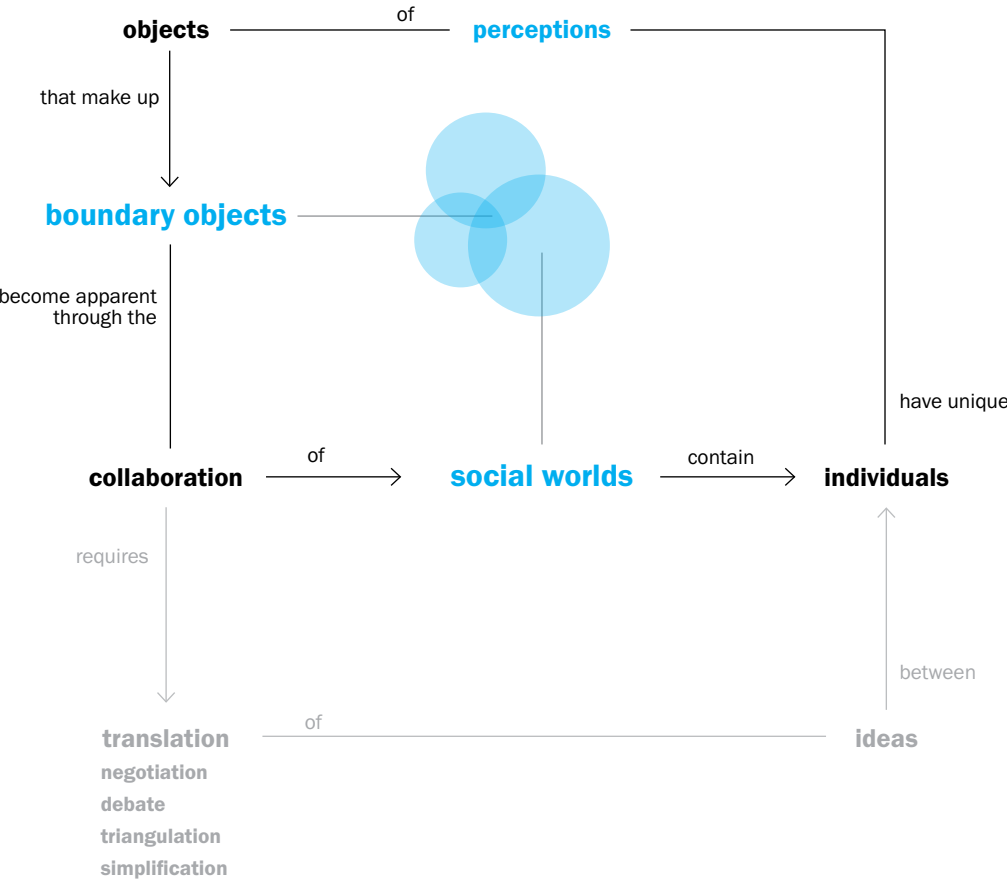


Perception

Star & Griesemer

The authors studied the collaboration of actors connected to the Museum of Vertebrate Zoology at the University of California Berkeley.

The cooperation of these actors required translating their viewpoints, which the authors argue is made possible by the development of boundary objects and a standardization of methods to relate them. Boundary objects are shared representations of our world, they can come in many forms and be perceived differently from varying vantage points.



“The creation of new scientific knowledge depends on communication as well as on creating new findings. But because these new objects and methods mean different things in different worlds, actors are faced with the task of reconciling these meanings if they wish to cooperate.”

"Institutional Ecology, 'Translations' and Boundary Objects: Amateurs and Professionals in Berkeley's Museum of Vertebrate Zoology," Susan Leigh Star & James R. Griesemer.

Affordance

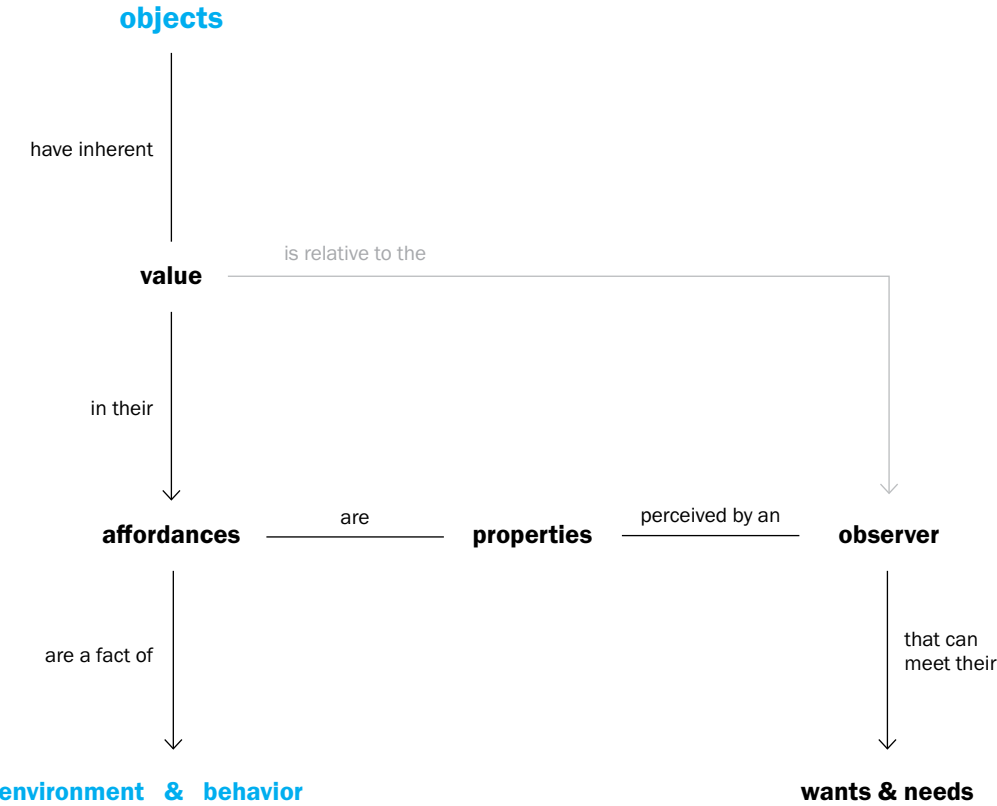
Gibson

Our environment is filled with artifacts that have some meaning and value to us based on our needs. The behavior we as observers can enact on an object in our environment is an affordance the object provides through stimuli we can choose to recognize, and are more likely to, if it provides us some benefit.

“What we perceive when we look at objects are their affordances, not their qualities.”

“There is only one environment, although it contains many observers with limitless opportunities for them to live in it .”

"The object offers what it does because it is what it is."



"The Theory of Affordances." James J. Gibson.

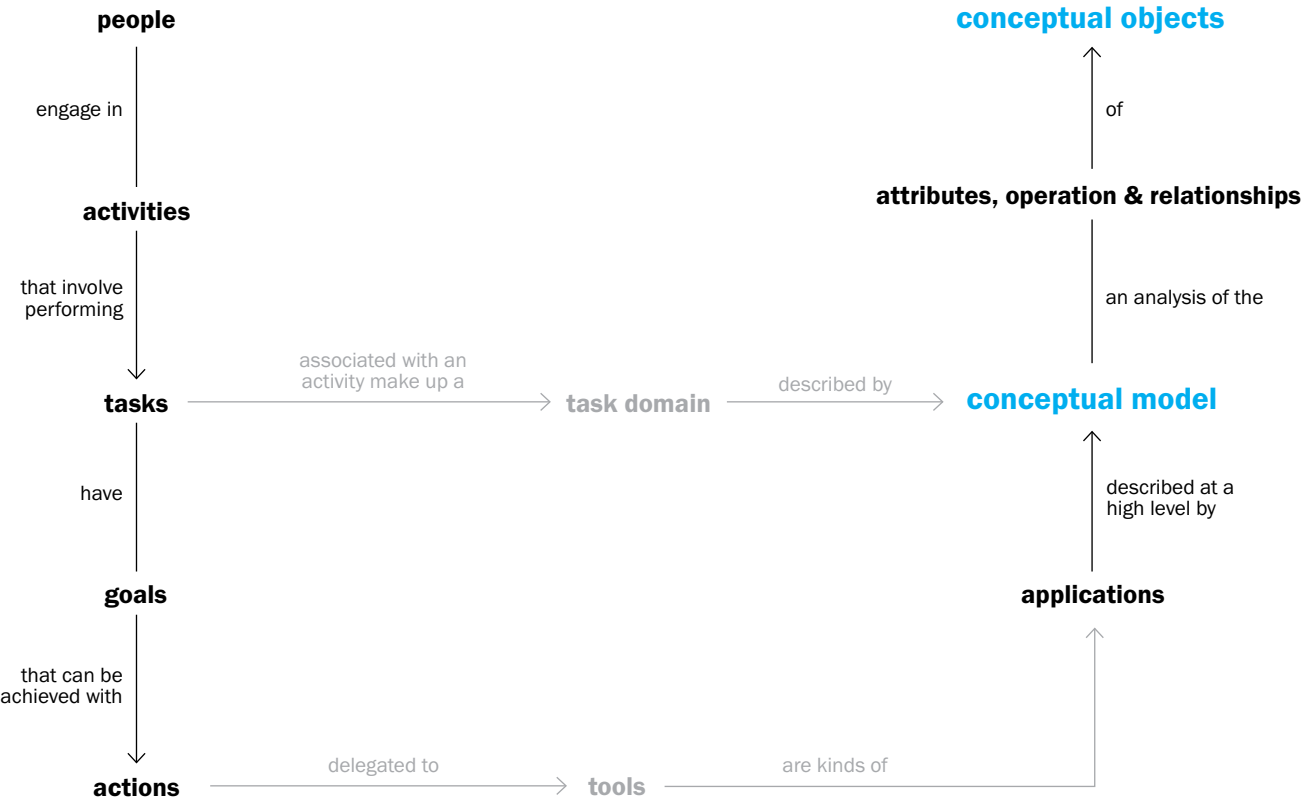
Concept

Johnson & Henderson

The design of interaction goes deeper than an interface and into all concepts a user can encounter during the use of an application. Conceptual models describe the structure of application tools, their tasks and implementation. Johnson & Henderson argue that conceptual models are at the heart of good design, as they enable a preferred work flow by analyzing the relationships of these concepts in terms of people using the application.

“To use an application, a user must have some understanding of it. Such an understanding is called a ‘mental model’ because it is in the user’s mind.”

“The goal is to keep a product’s conceptual model: 1) as simple as possible, with as few concepts as needed to provide the required functionality; and 2) as focused on the users’ tasks as possible.”



“Conceptual Models: Core to Good Design.” Jeff Johnson & Austin Henderson.

Form

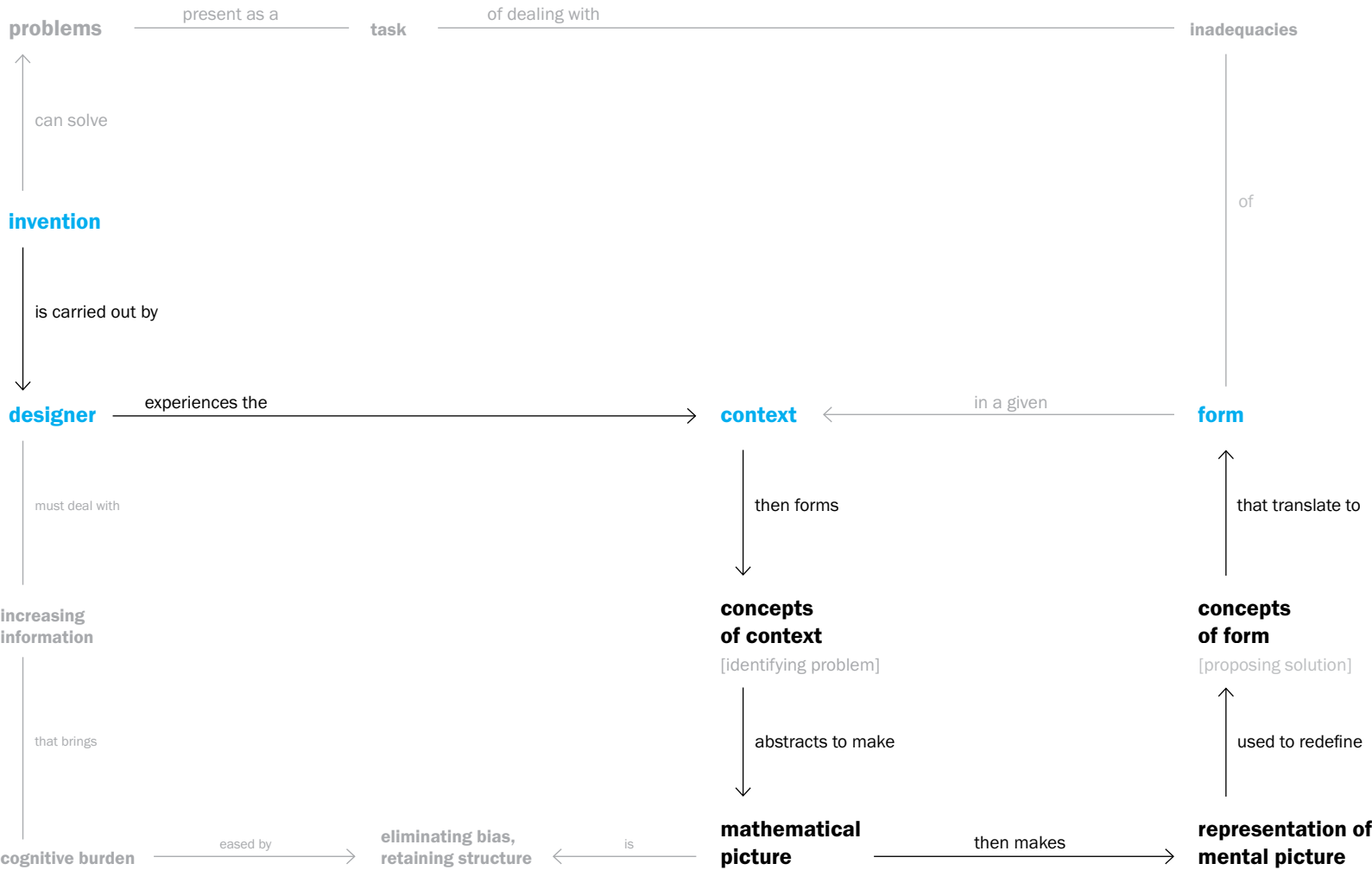
Alexander

Alexander rationalizes a reorganization of the way a designer thinks about the problems the precede creation of forms. He proposes a systematic, mathematical approach to design, analyzing facets of a problem, so they may be tackled independently, making increasingly large problems easier to address.

“But the selfconscious designer works entirely from the picture in his mind, and this picture is almost always wrong.”

“[...] make a further abstract picture of our first picture of the problem, which eradicates its bias and retains only its abstract structural features; this second picture may then be examined according to precisely defined operations, in a way not subject to the bias of language and experience.”

“Notes on the Synthesis of Form,” Christopher Alexander.



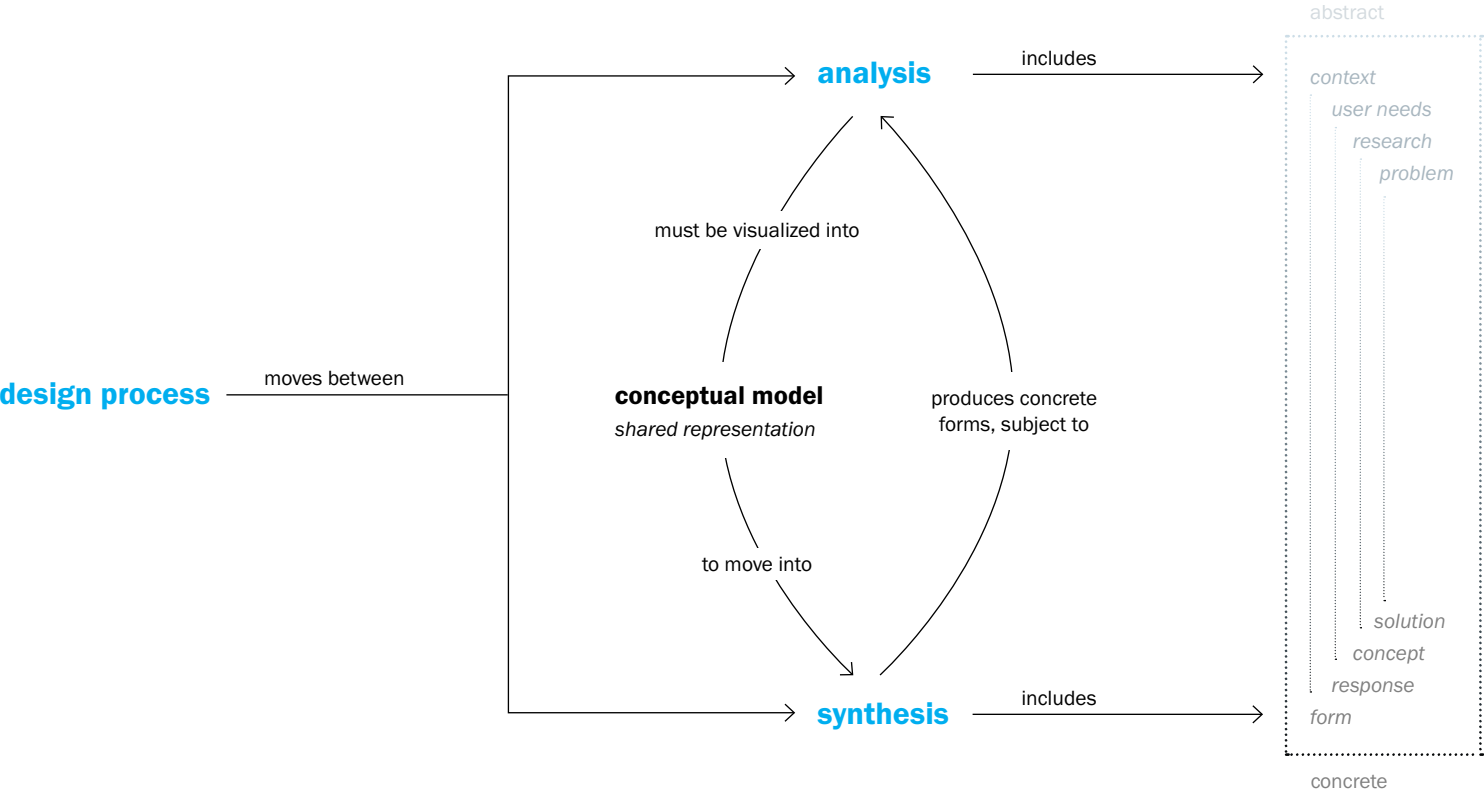
“The process of coming to a shared representation externalizes individual thinking and helps build trust across disciplines and stakeholders.”

“Explicitly modeling also helps scale the design process. It enables designers to develop larger and more complex systems and makes the process of working with larger and more complex organizations easier.”

Model

Evenson & Dubberly & Robinson

The authors of the Bridge model discuss how the two phases of design, analysis and synthesis, connect through modeling. The documentation and visualization of a designer's analysis — a model of what "is", can suggest a model of what "could be" that can manifest into preferred conditions.



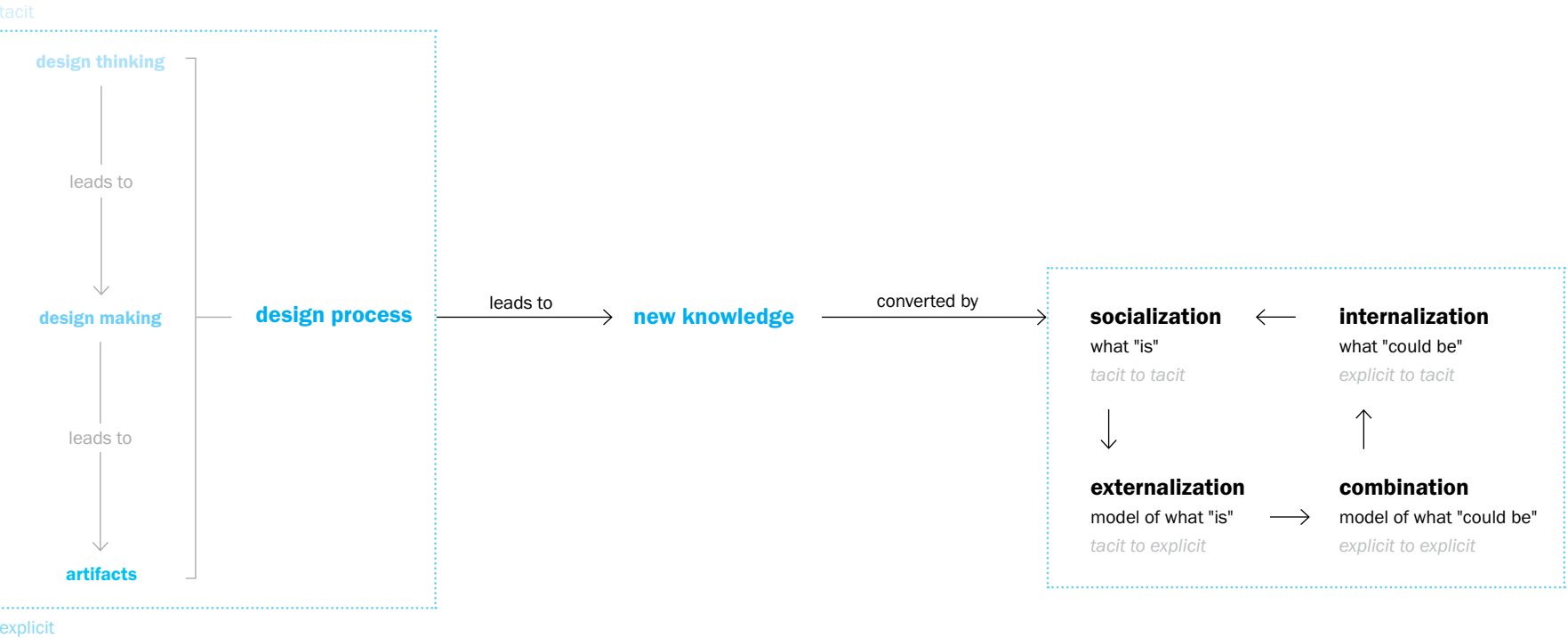
"The Analysis-Synthesis Bridge Model." Hugh Dubberly, Shelley Evenson & Rick Robinson

Knowledge

Evenson & Dubberly

This reading presents the SECI model of knowledge creation authored by Ikujiro Nonaka, which is isomorphic to the aforementioned Bridge model.

Socialization and externalization occur in the present, while internalization and combination are concerned with the future. This process is iterative, translating tacit knowledge to be explicit and applying it in acquiring new tacit knowledge.



“We might characterize learning as a form of designing. That is, the process of observing, reflecting and making (and iterating those steps) may aid learning.”

“A designer looks at aspects of what is and imagines combining them with other things that he or she has experienced or imagined.”

“Each design iteration and implementation leads to new knowledge.”

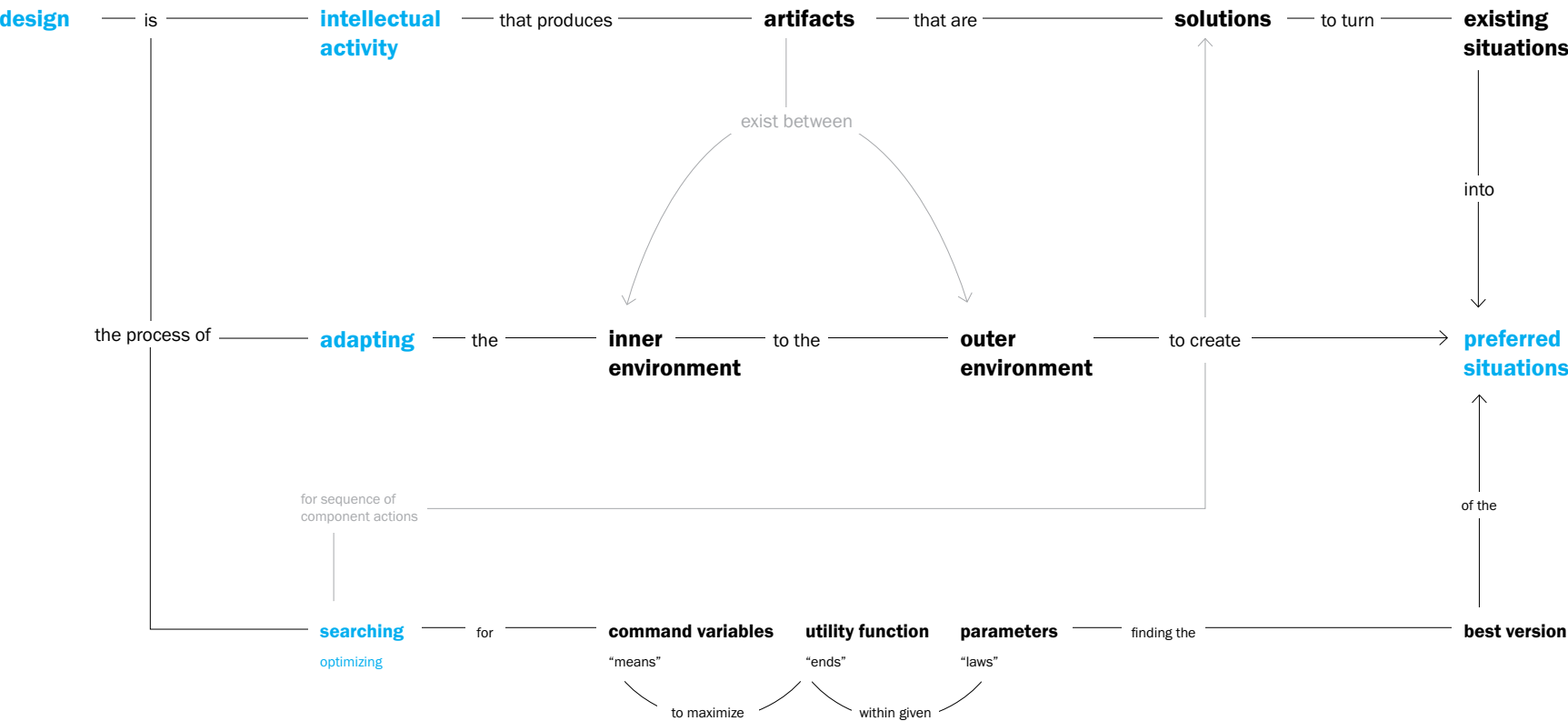
“Design as learning — or ‘knowledge creation’ — the SECI model.” Shelley Evenson & Hugh Dubberly.



Adaptation

Simon

Design is universal to anyone attempting to alter an existing situation and create preferred situations, this ranges from architects, engineers to doctors. Simon argues that design is a process of optimizing a situation in a logical, mathematical way. He encouraged this view as a means to increase the ability of computers and artifical intelligence to aid in the design process.



“[...] solving a problem simply means representing it as to make the solution transparent.”

“Thus search processes may be viewed [...] more generally as processes for gathering information about problem structure that will ultimately be valuable in discovering a problem solution.”

“The Science of Design: Creating the Artifical.” Herbert Simon.

Problem

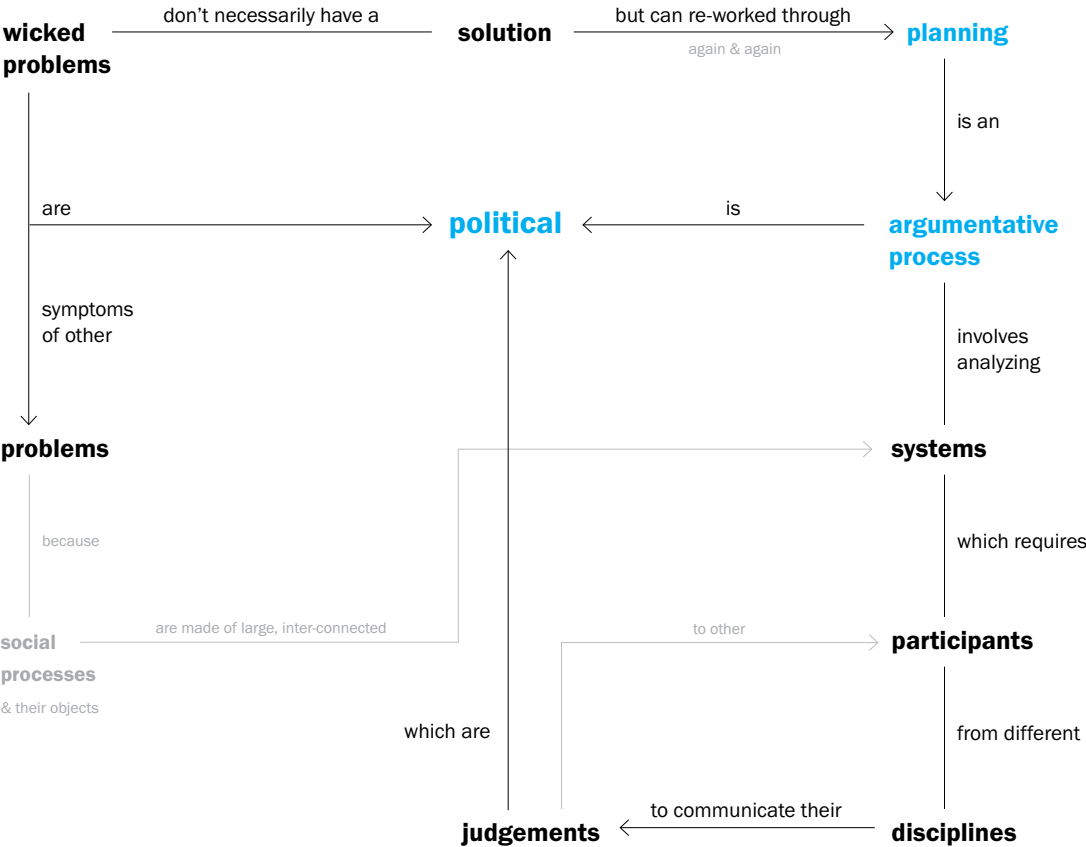
Rittel

There are tame problems with simple solutions — I am thirsty so I take a drink, but how do we solve this problem if there is no access to water? This is a wicked problem, systemic in nature, with no defined source or single solution.

Horst Rittel is known for making this differentiation in problems. He believes we can move toward improving upon wicked problems through a planning process that takes into account the inter-connected systems in which these problems occur. This process is argumentative in nature due to the differing opinions of all actors in the system.

“Problems can be described as discrepancies between the state of an object as it is and the state as it ought to be.”

“The analyst’s ‘worldview’ is the strongest determining factor in explaining the discrepancy and, therefore, in resolving a wicked problem.”



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

"Dilemmas in General Theory of Planning." Horst Rittel & Melvin M. Webber

Conversation

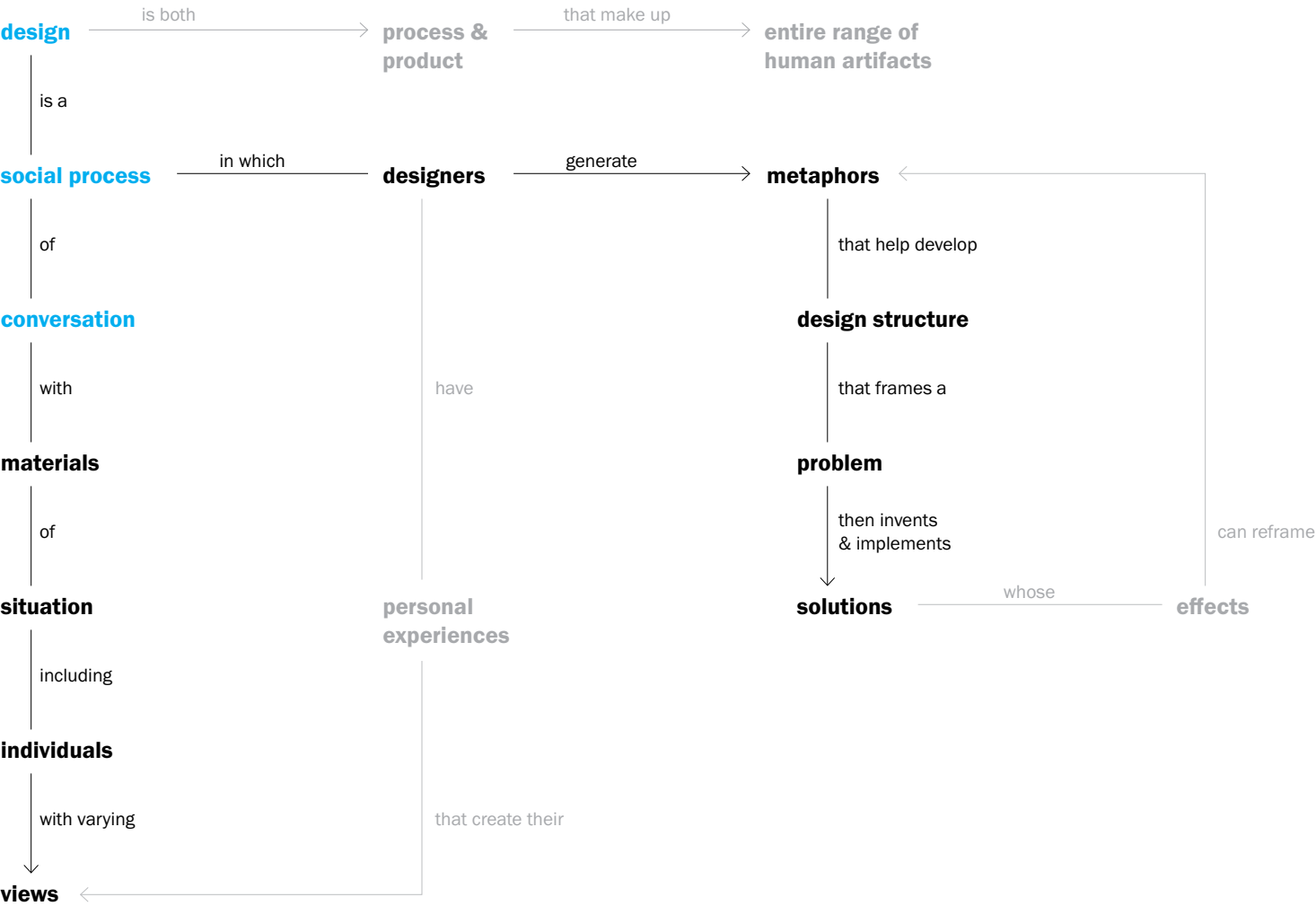
Schon

Schon reasons that a designer's unique way of framing a design situation is the product of their personal views. In designers' attempts to gain objectivity from their ideas and think about a situation more rationally, it becomes harder to do so. Instead of making snap decisions, we think further out into the network of the situation, the system of connected ideas, objects, people, and services. This is why design is a social process, that allows us to understand others' personal views through conversation.

“[...] designing is usually a social process, a dialogue among individuals in which different views of designing and different ways of framing design situations are pitted against each other.”

“Here, the focus is on problem setting, as well as problem solving.”

“The Design Process.” Donald A. Schon



**Final**

For Social Good

Jessie Richards

This piece is a collection of ideas gleaned from readings and a guest lecture during our workshop. These concepts are intertwined with my personal idea of a preferred design structure that begins from a positive place with intention of facilitating improvement. I hope to bring to light the importance of conversation between designers and communities.

Click poster to visit full PDF



## My New Knowledge

My interactions with the materials of this course — our professor, our readings, my colleagues, our discussion — have formed new connections in my mind and reframed my picture of design. I feel a new sense of importance in the clarity of intent and meaning, in our exchanges and in our work. This course solidified my thoughts on the inter-connectedness of the world in which we exist, what we think, our behavior, how we communicate and ultimately what we design.

- 12“Course in General Linguistics.”  
Ferdinand de Saussure.
- 14“Logic As Semiotic : The Theory of Signs.”  
Charles S Pierce.
- 16“The Mathematical Theory of Communication.”  
Claude E. Shannon & Warren Weaver.
- 18“Design Ethics.”  
Richard Buchanan
- 20“Institutional Ecology, ‘Translations’ and  
Boundary Objects: Amateurs and Professionals  
in Berkeley’s Museum of Vertebrate Zoology.”  
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“Dilemmas in General Theory of Planning.”  
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- 36“The Design Process.” Donald A. Schon