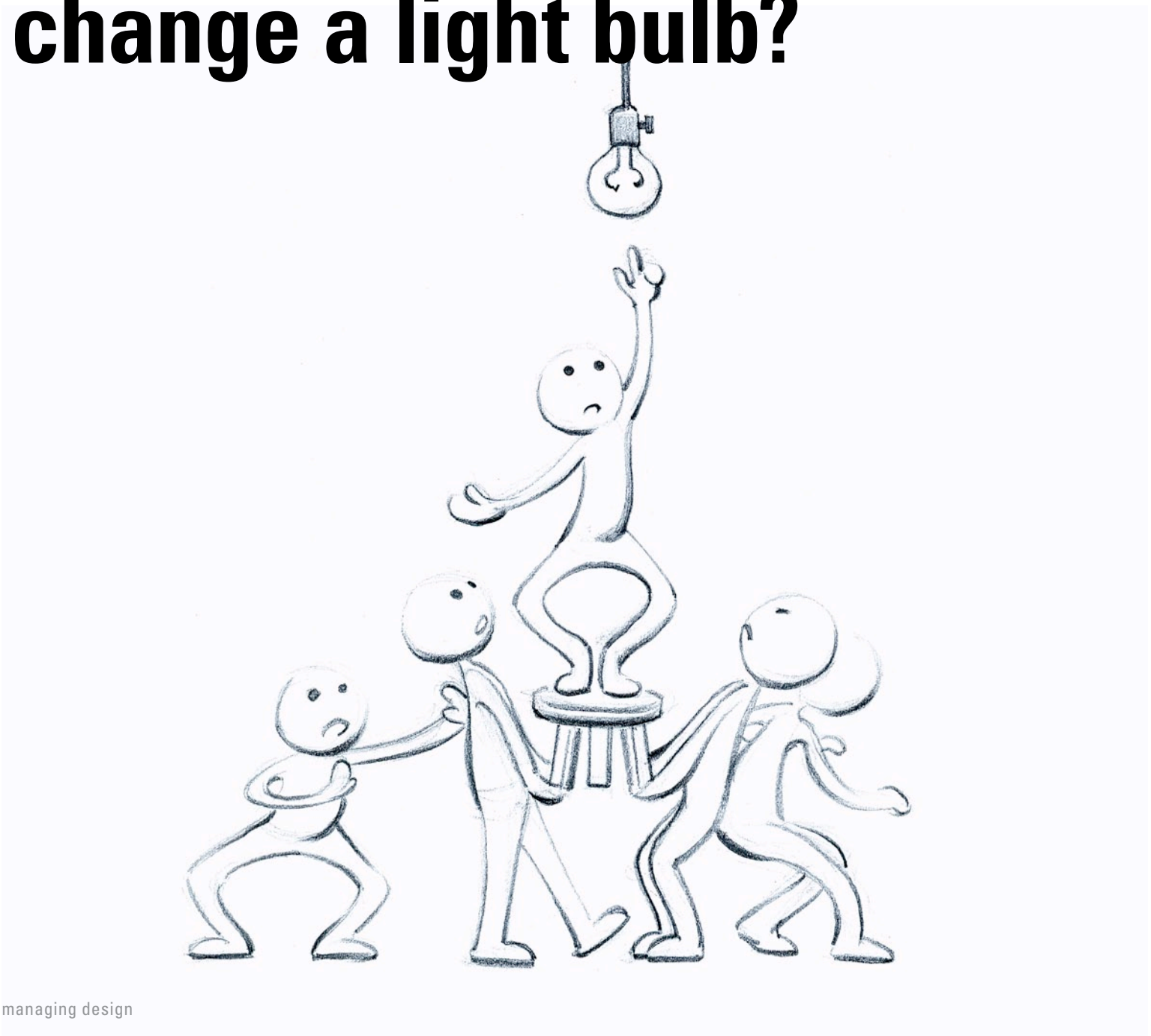
MBA 290T / ENG 290
Haas School of Business
UC Berkeley
23 April 2012

Models for managing design

Hugh Dubberly
Dubberly Design Office

How many designers does it take to change a light bulb?



How many designers does it take to change a light bulb?

Why does it have to be a light bulb?

What is design?

What is design?

Art and aesthetics?

Science and problem solving?

Politics and rhetoric?

A definition of design:

"In most people's vocabularies,
design means veneer.
It's interior decorating.
It's the fabric of the curtains and the sofa.
But to me, nothing could be
further from the meaning of design.
Design is the fundamental soul
of a man-made creation
that ends up expressing itself
in successive outer layers of the product or service."

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

Herbert Simon argued that the professions share a fundamental core; that, at heart, they are about design:

– Engineering
– Law
– Medicine
– Business

"Everyone designs,
who devises courses of action aimed at
changing existing conditions
to preferred ones."

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

Is that problem solving?

A → B

or

A → B → C → D → E

or perhaps

10 → 3 → 1

or even

A → B → C → A …

Not all problems are created equal.

Simple problems:

The goal is specified.

Complex problems:

We must agree on the goal.

Wicked problems:

We *cannot* agree on the goal.

Criteria for identifying wicked problems:

1 No definitive formulation
2 No stopping rule
3 Solutions are not true-or-false but good-or-bad
4 No immediate and no ultimate test of a solution
5 Every solution is a “one-shot operation”
6 The set of potential solutions cannot be enumerated
7 Essentially unique
8 A symptom of another problem
9 Choice of explanation determines the resolution
10 The planner has no right to be wrong

— Horst Rittel & Melvin Webber, *Dilemmas In a General Theory of Planning*, 1972

Principles for taming wicked problems:

1 Diverse backgrounds are required
2 Maximize involvement
3 Every step is a judgment
4 Reasons for judgments should be made explicit
5 The process cannot be “objective”
6 The planner is a facilitator
7 Casting doubt is a virtue
8 Activism and optimism are required
9 Risk should be shared widely
10 The process is argumentative

— Horst Rittel, *On the Planning Crisis*, 1972

*"There is a **symmetry of ignorance** among those who participate, because nobody knows better by virtue of his degrees or his status."*

*"Dealing with wicked problems is **always political**."*

— Horst Rittel

Taming wicked problems requires reframing — finding a new frame which can encompass previously competing points of view.

That is, having your cake and eating it, too — not accepting a tradeoff of competing variables.

*"**Generative metaphor** produces a selective representation of an unfamiliar situation that sets values for the system's transformation.*

*It **frames the problem** of the problematic situation and thereby **sets directions in which solutions lie** and provides a schema for exploring them."*

—Donald Schön, *The Design Process*, 1990

The generative metaphor is an insight—
a hypothesis, a product of abduction.

It grows out of observation and emersion.

It requires experience and preparation.

Generative metaphor is an academic term.

Business people talk about product concept or positioning statement or value proposition.

Defining the metaphor / concept / position / value is a key responsibility of product management.

Product management = setting a vision
(AKA brand management)

Program management = managing dependencies

Project management = managing resources
(time + money + people)

Product management—
the art of making a successful product—
is rarely taught in design schools
or business schools.

Product management should be taught in both design schools and business schools.

People who make products don't agree on how to do it.

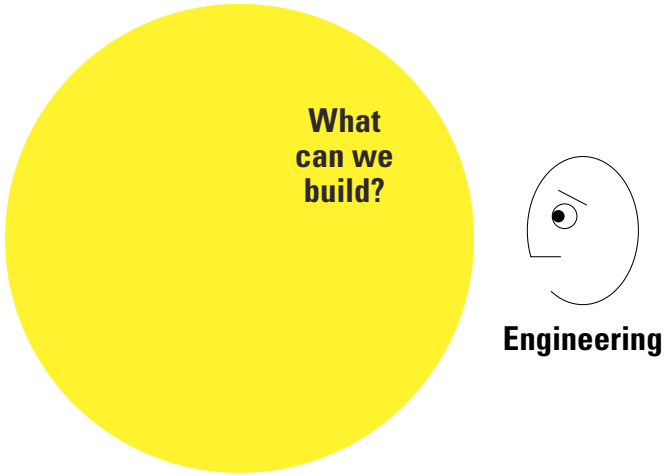
– Who manages the schedule and the budget?

– How do you determine requirements?

– Who owns design? Who owns the spec?

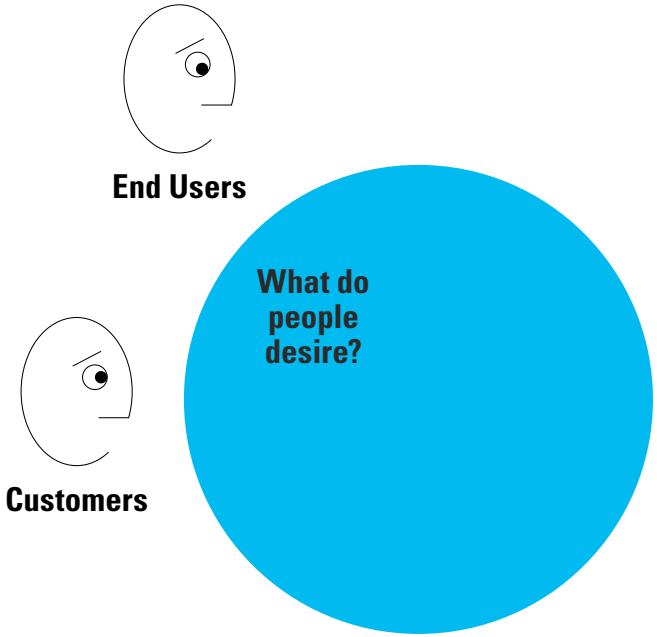
– Who can say, "No"? Who can say, "Yes"?

Engineers tend to focus on technology.

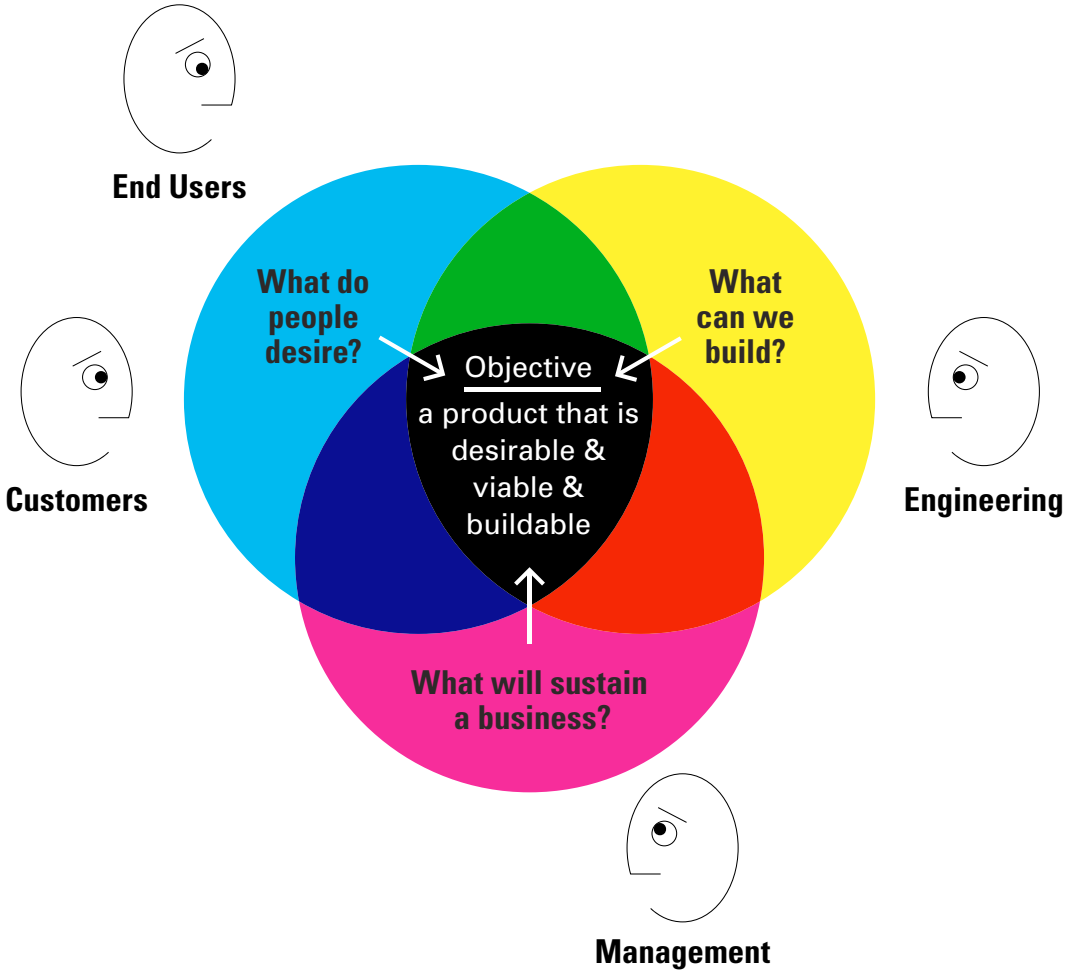


Managers tend to focus on making money.

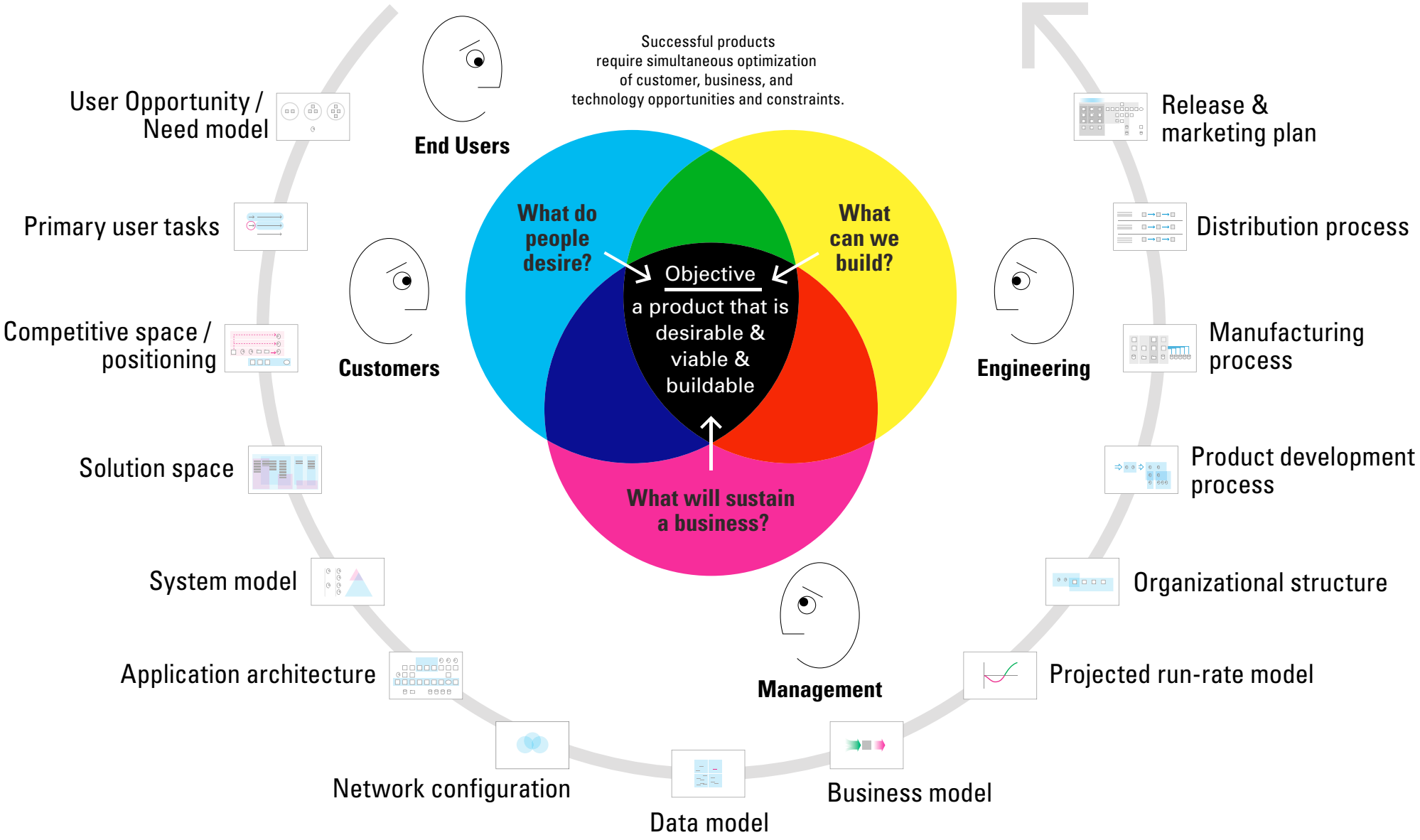
Designers tend to focus on users and their goals, taking a "user-centered approach" to their work.



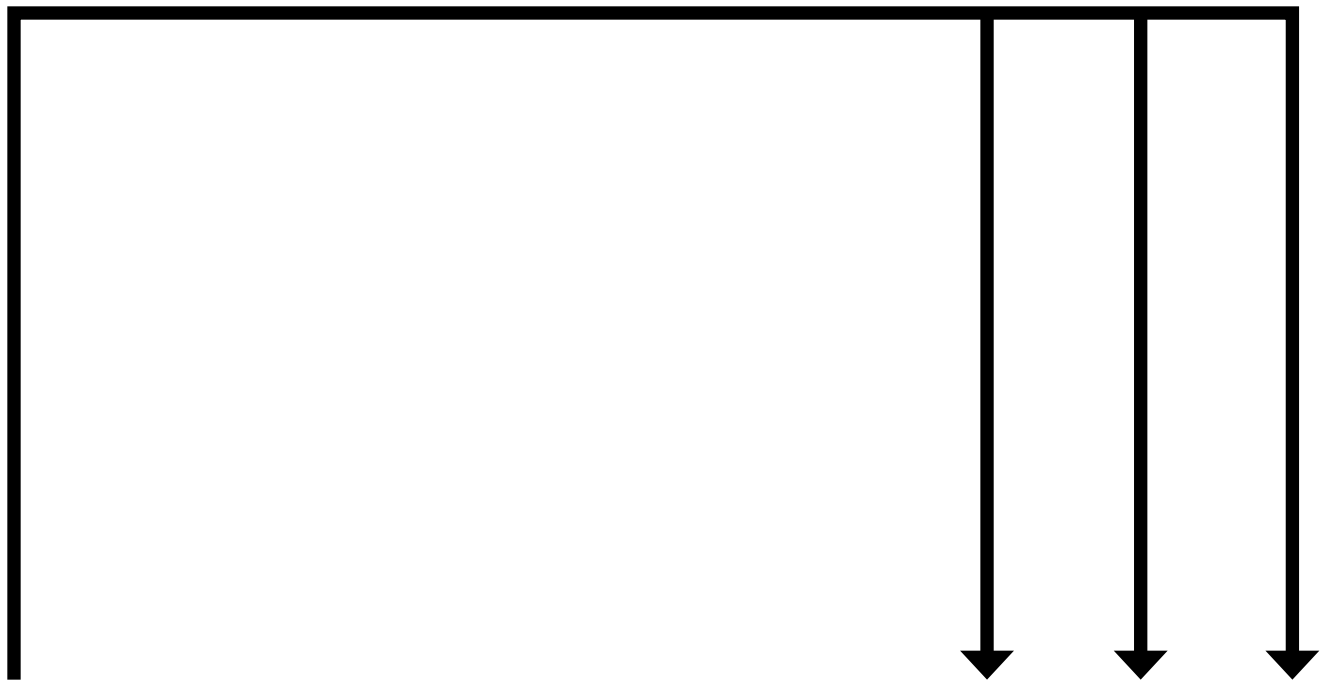
Successful products meet several criteria:



Each criteria suggests a series of models.



Designers bridge the gap between

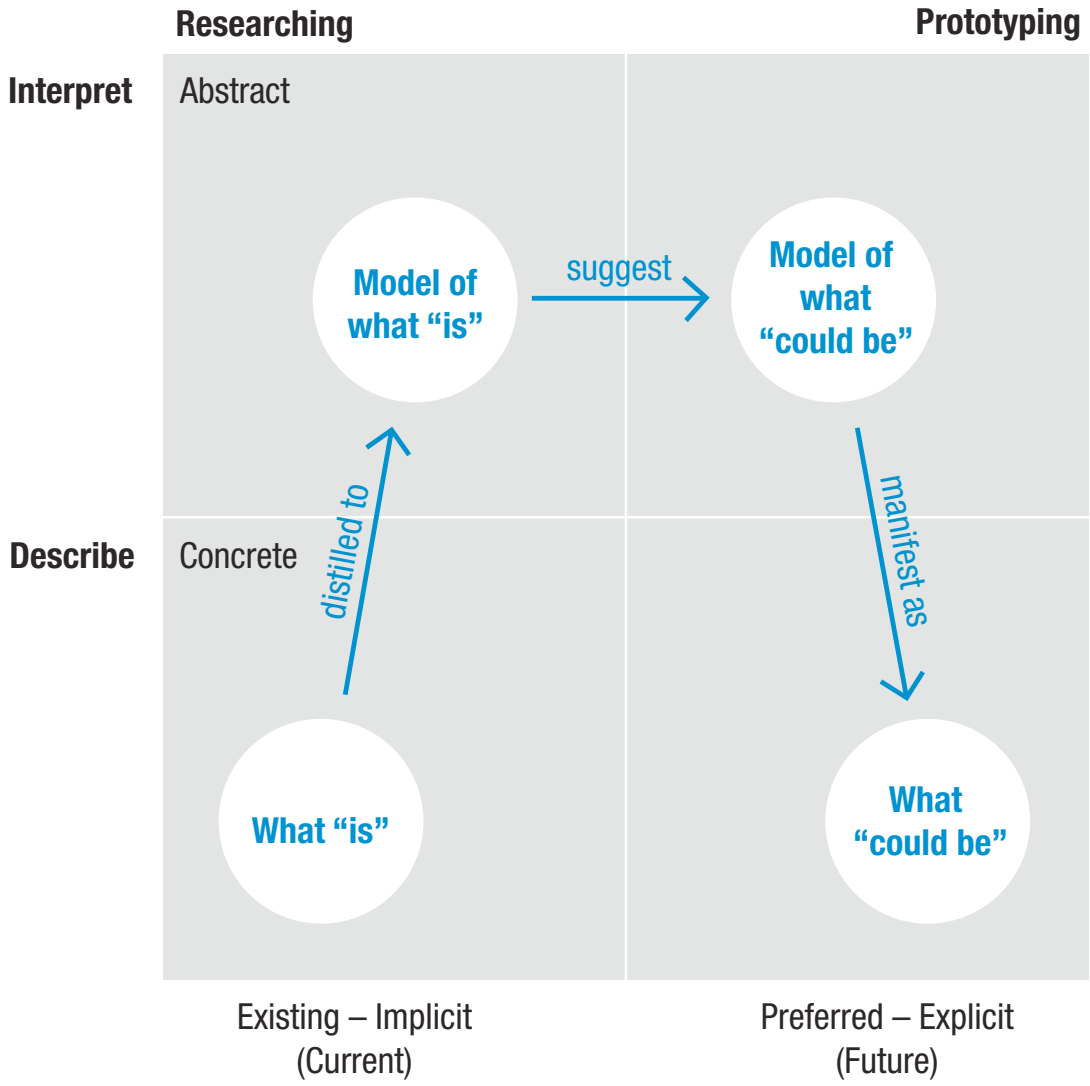


what “is” & what “could be”

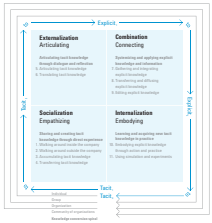
or “should be”

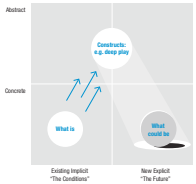
Models are the tools designers use to bridge between what is and what should be.

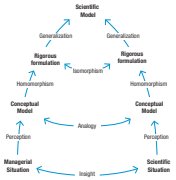
Analysis-Synthesis Bridge Model
Dubberly, Evenson & Robinson (2008)

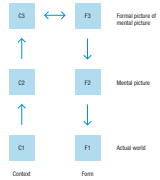


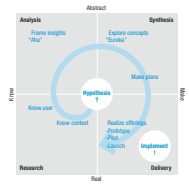
The bridge model has many variations and is shared by many others.

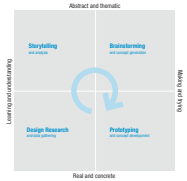


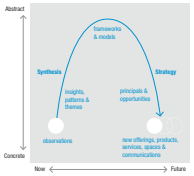


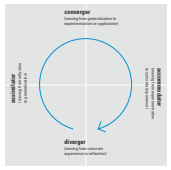


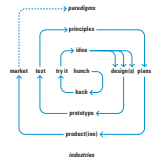


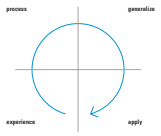


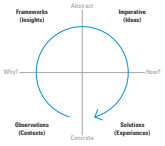




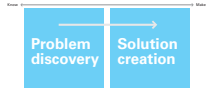




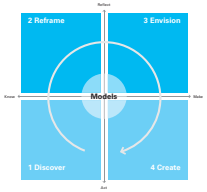




Icremental improvement

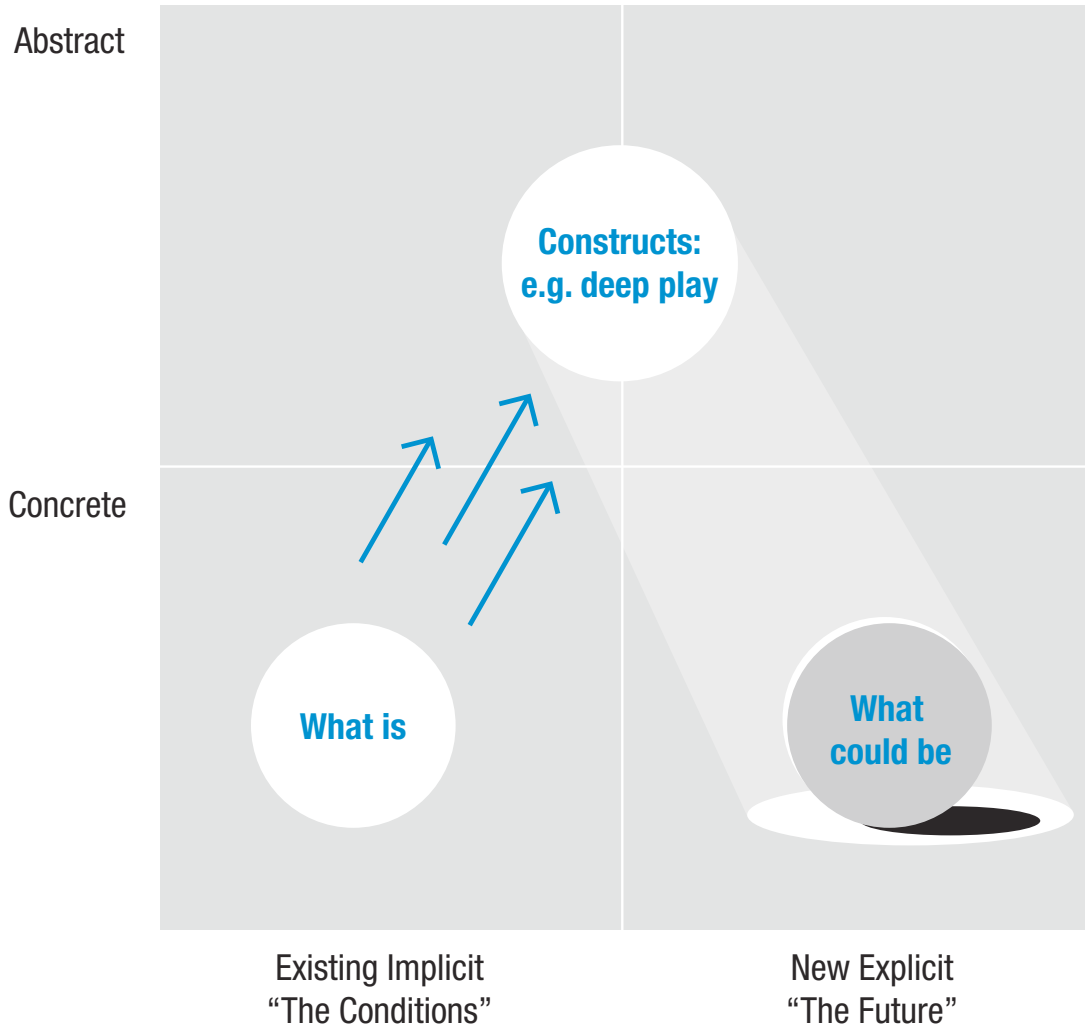


Differentiation



1

Robinson Model
Rick Robinson
(2005)



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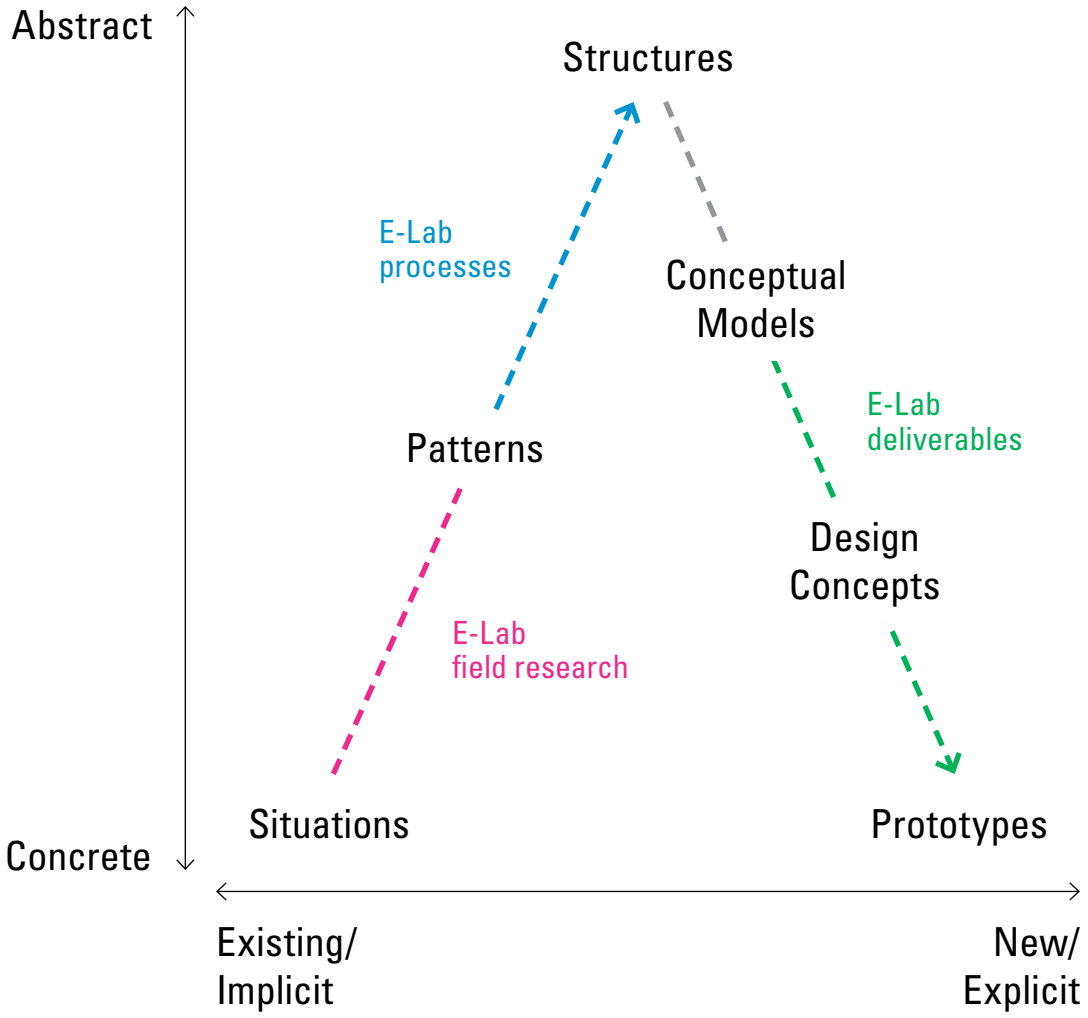
Design Research Process
Rick Robinson & John Cain, E-Lab
(1993)



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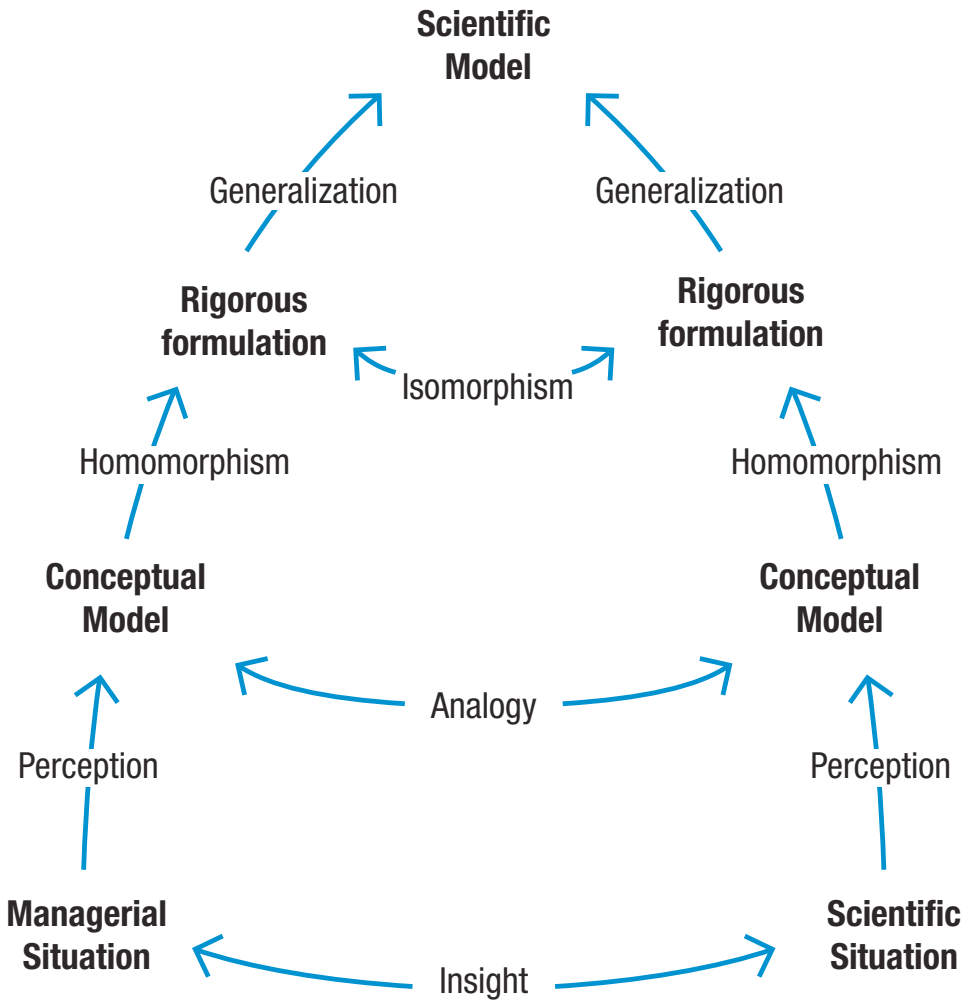
Beer Model
Stafford Beer
(1966)



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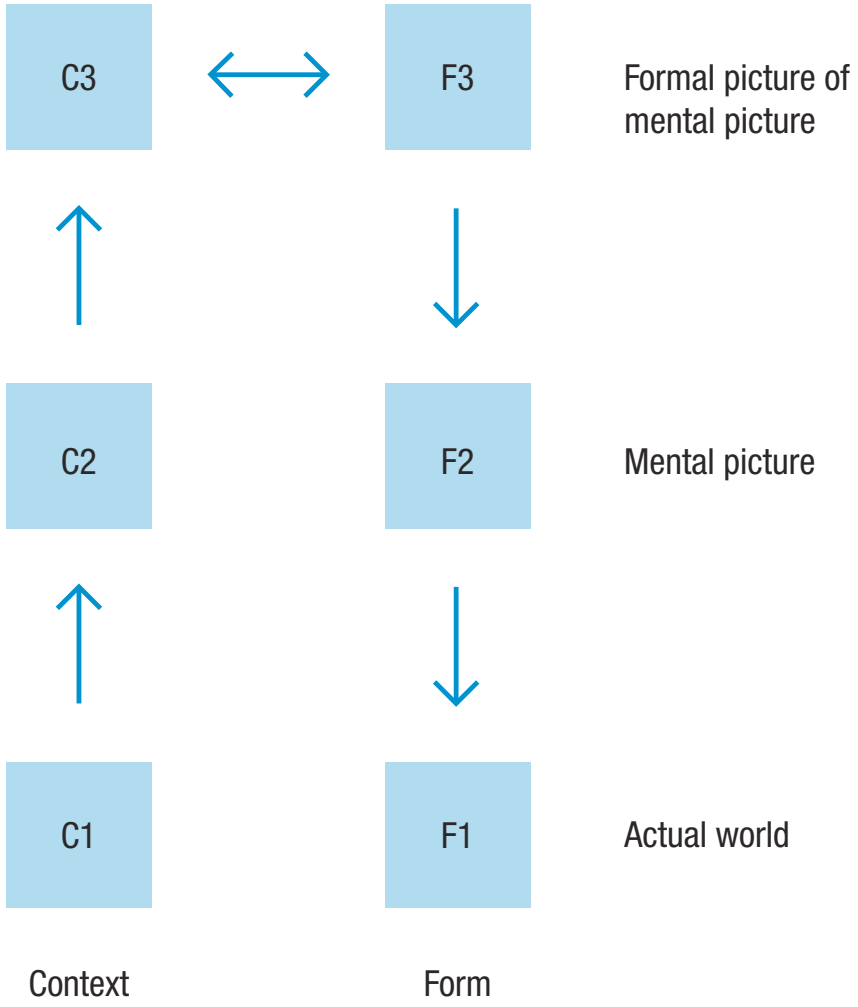
Alexander Model
Christopher Alexander
(1964)



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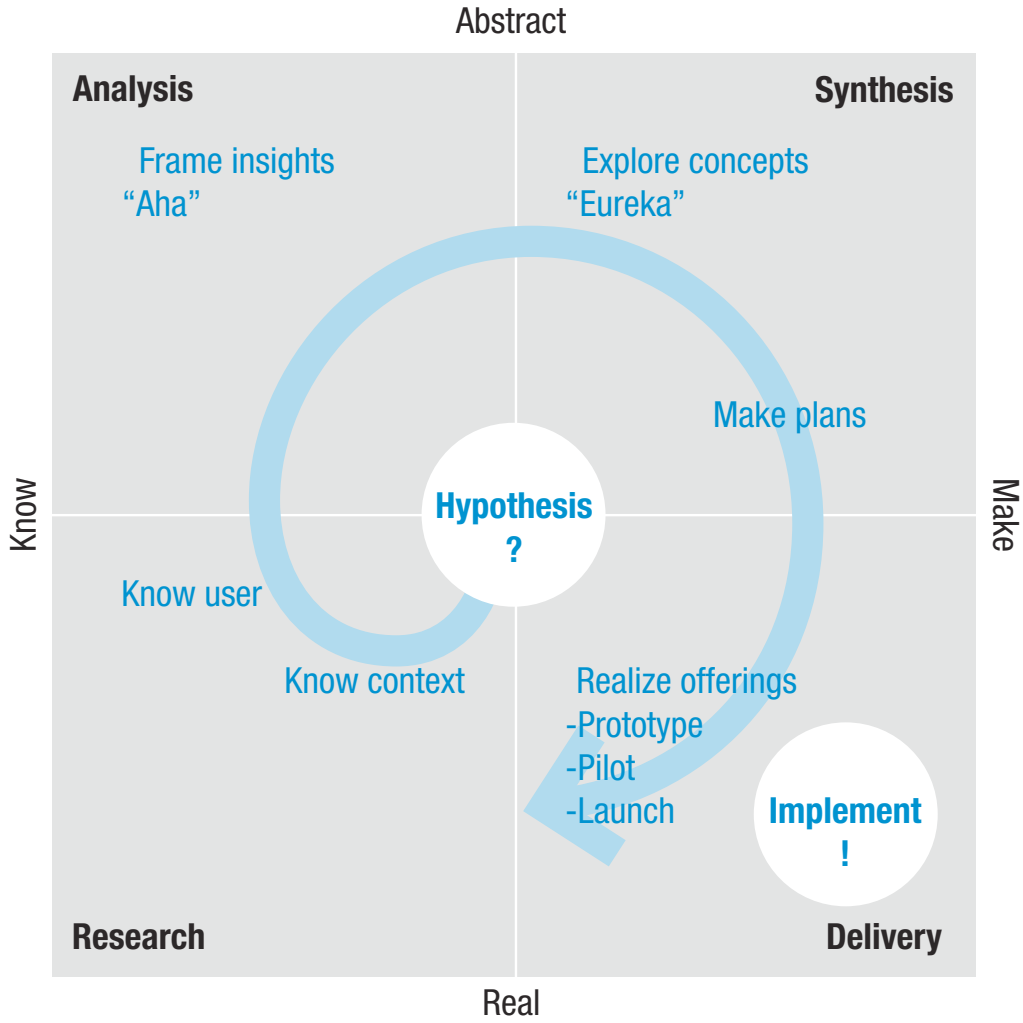
Kumar Model
Vijay Kumar
(2003)



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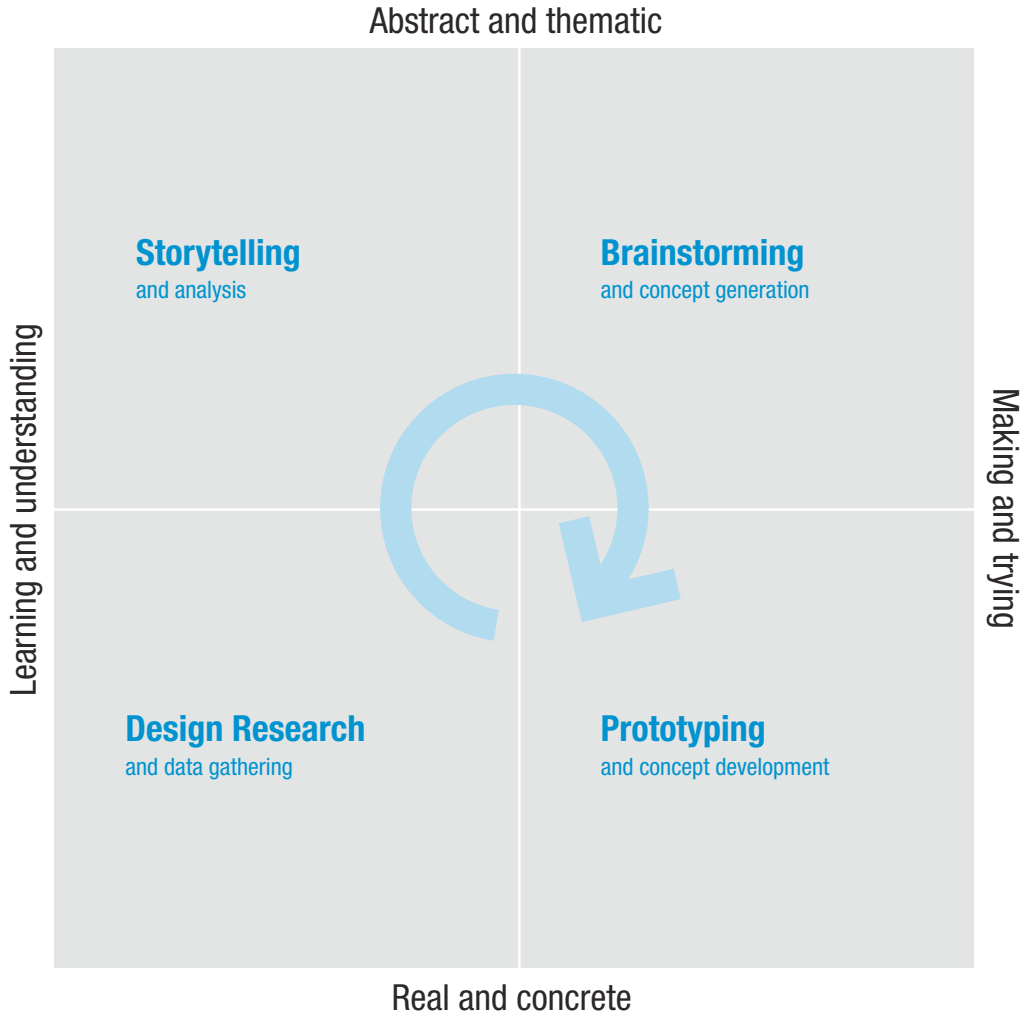
Kaiser-IDEO Model
Kaiser Innovation Center + IDEO
(2004)



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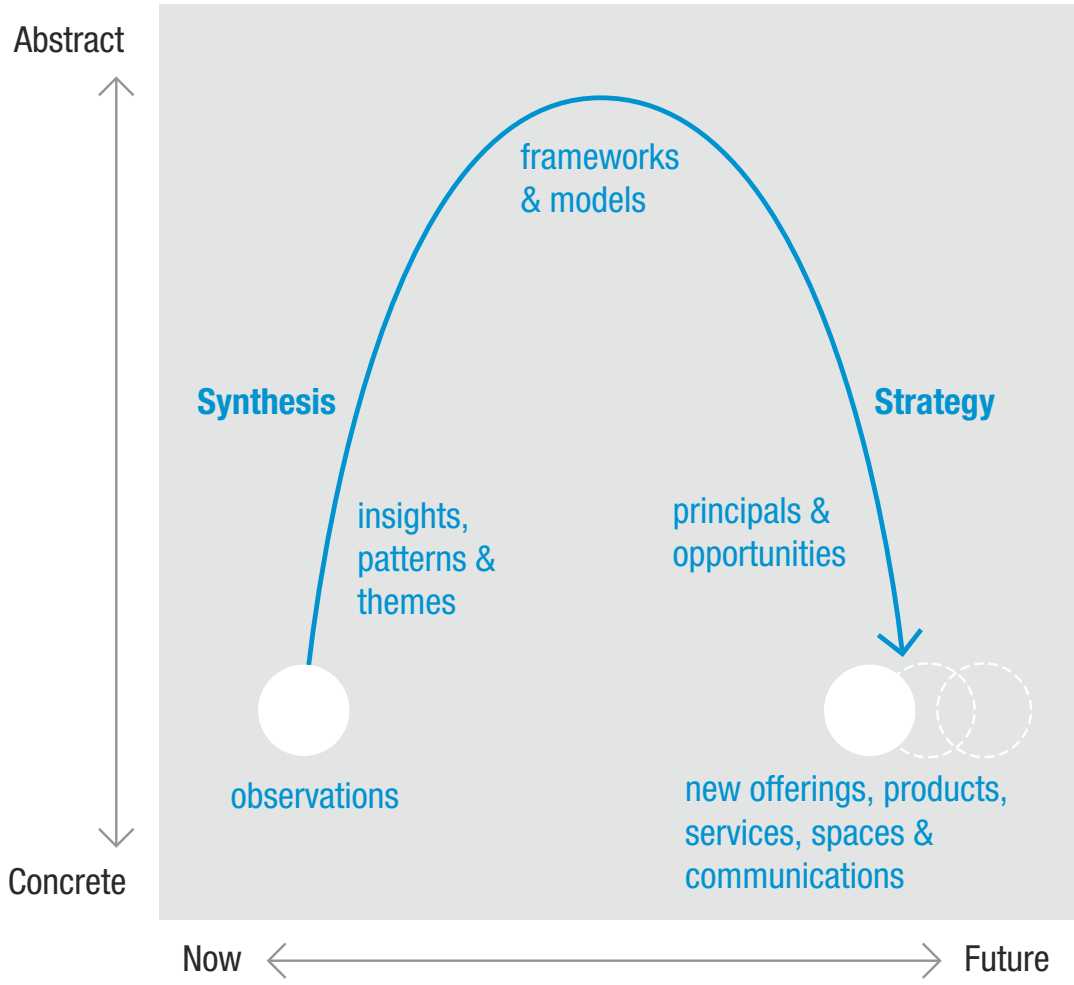
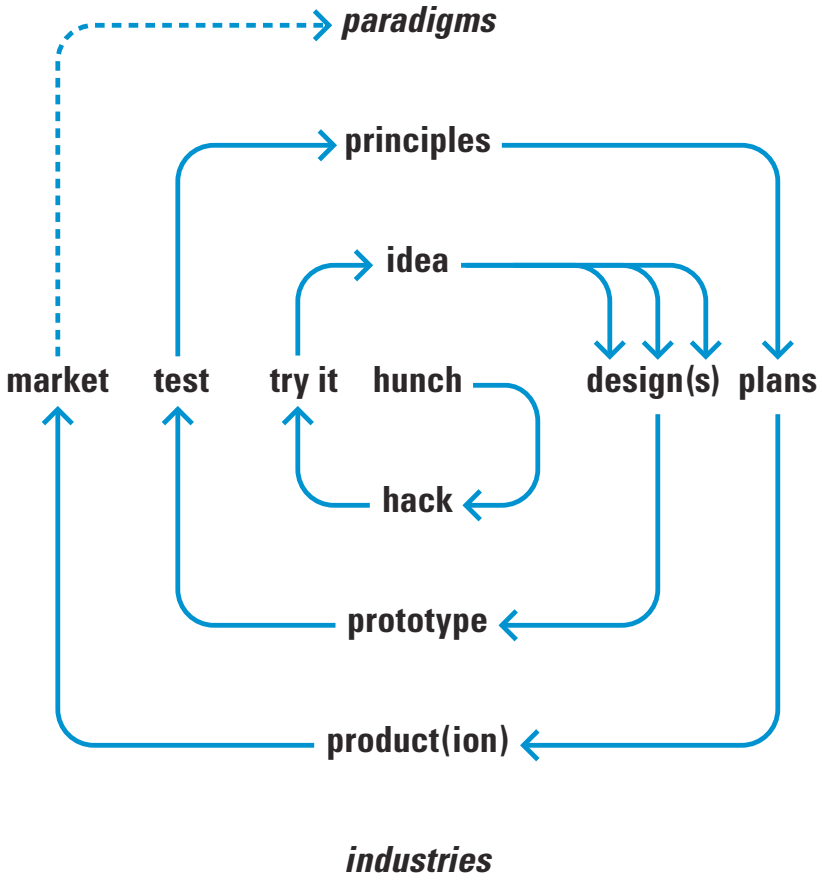
Suri-IDEO Model
Jane Fulton Suri
(2006)



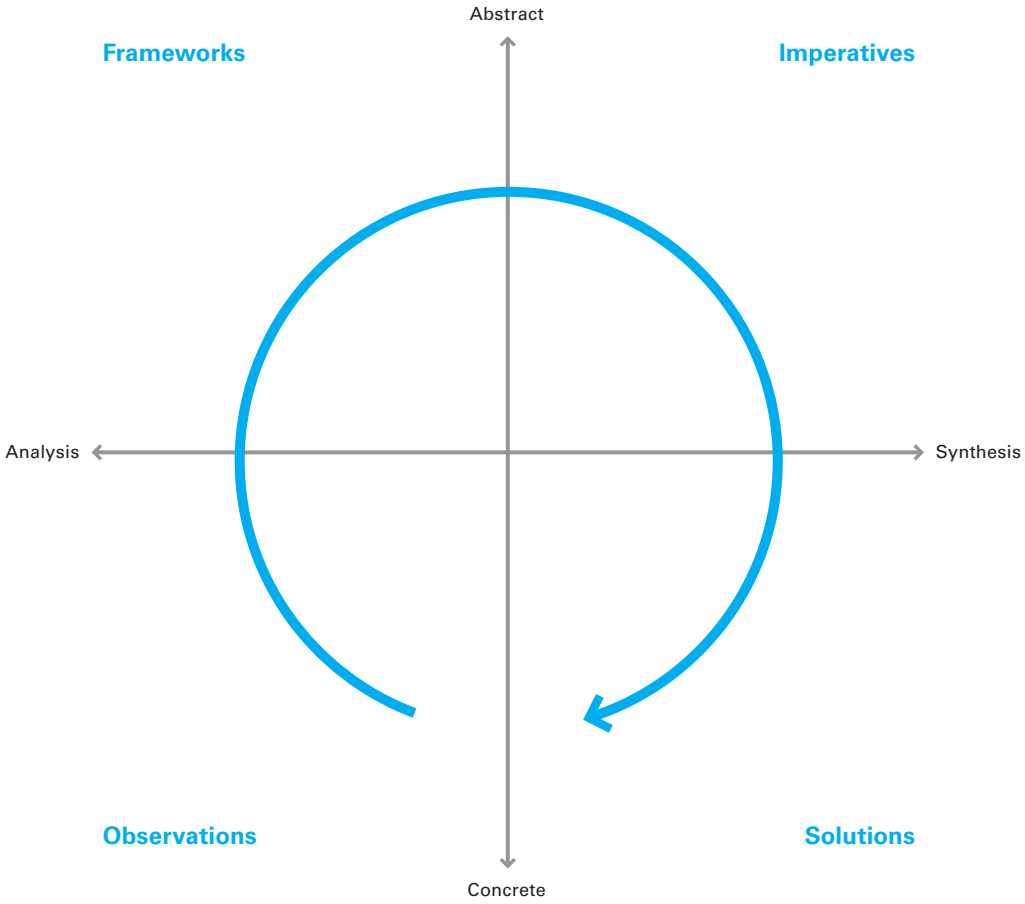
8

Verplank's Spiral
Bill Verplank
(2000)



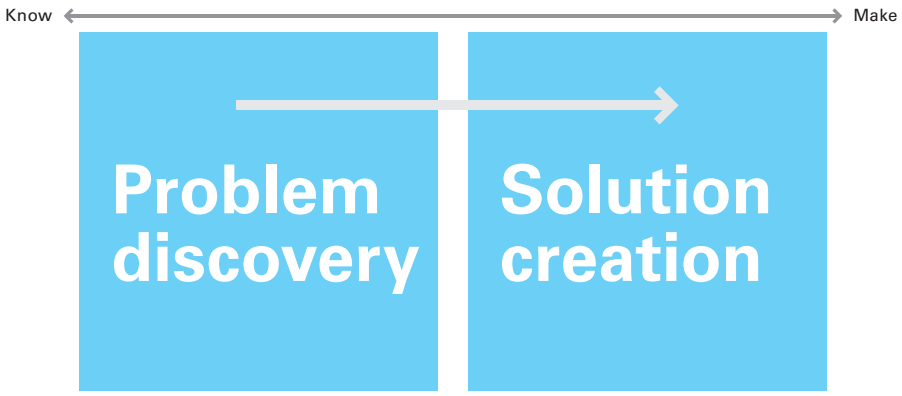
9

The Jump Explore Process
Colleen Murphy, Jump Associates
(2009)

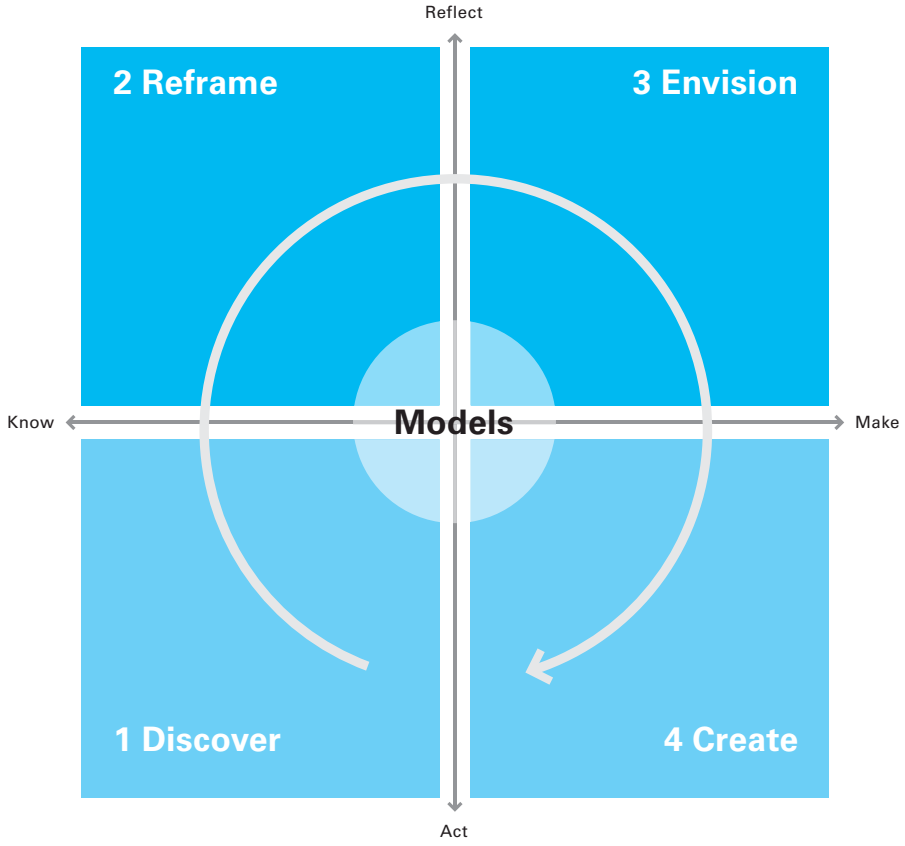


10

Differentiation Model
Joanne Mendel
(2010)



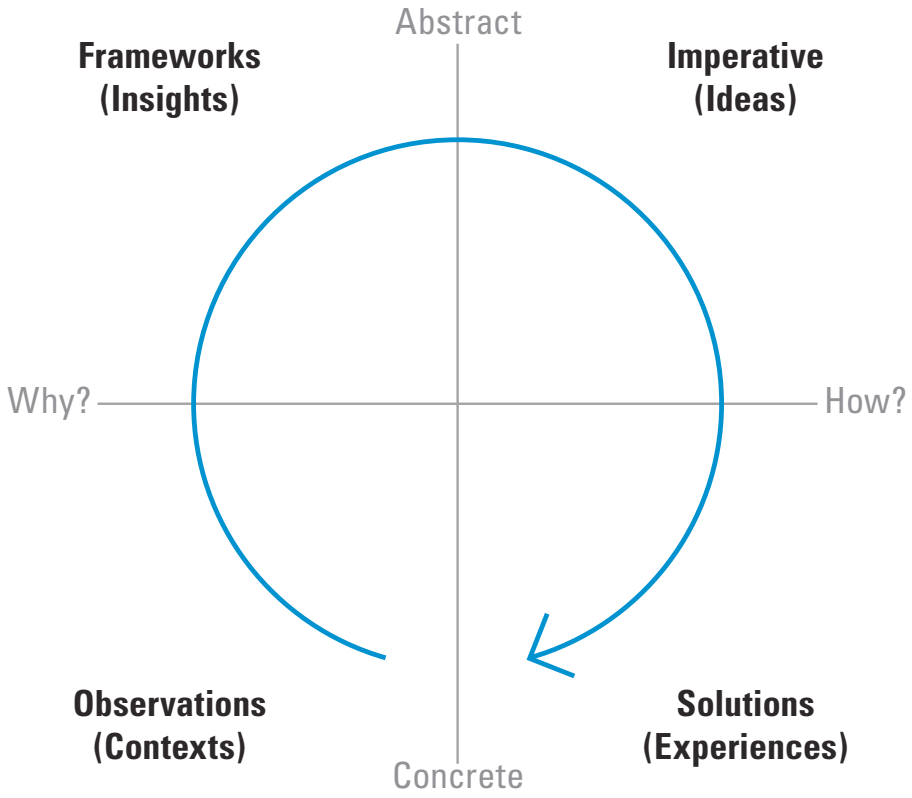
Incremental improvement



Differentiation

11

Design Process
Sara Beckman
(2010)

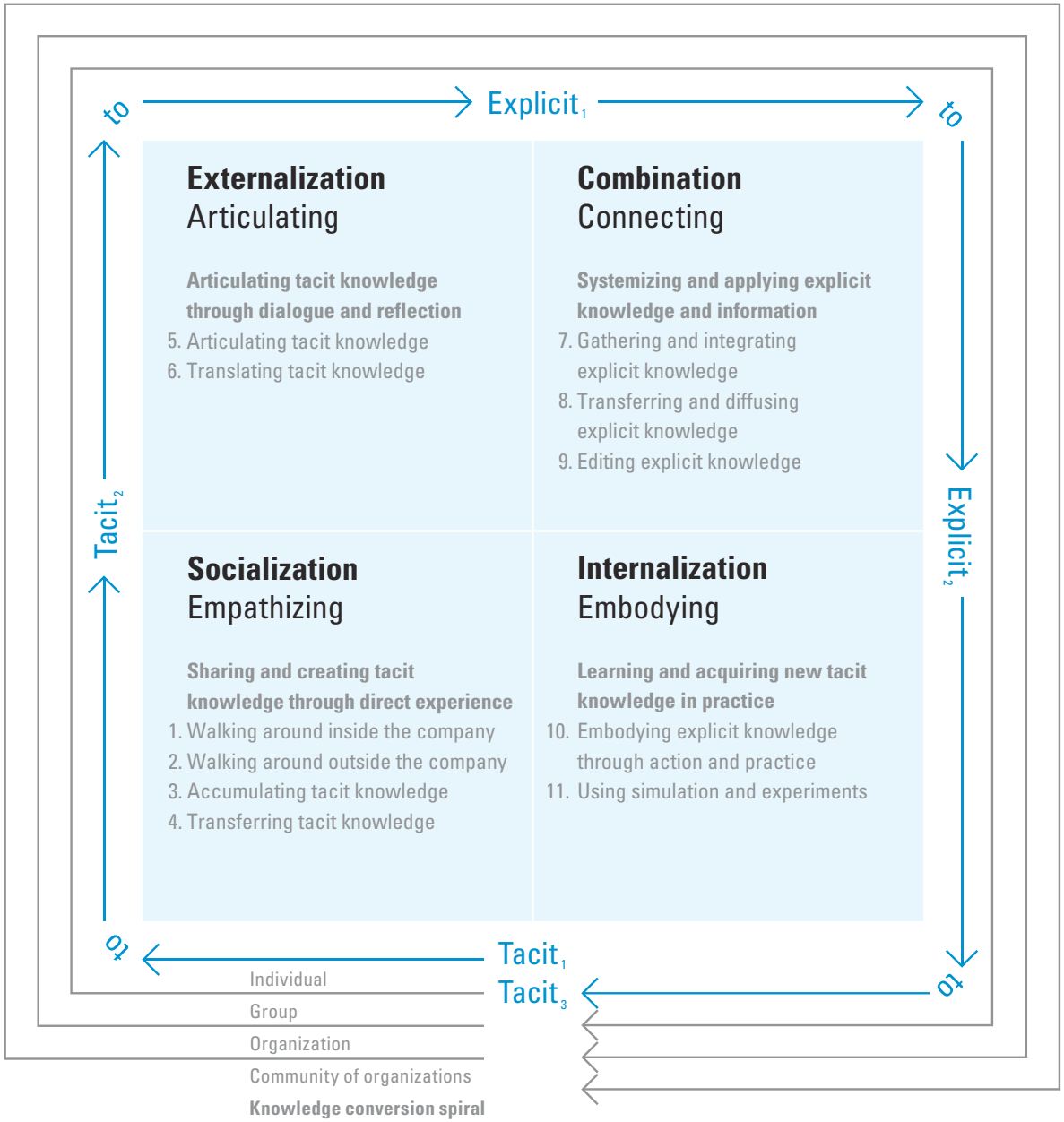


Learning bridges the gap between

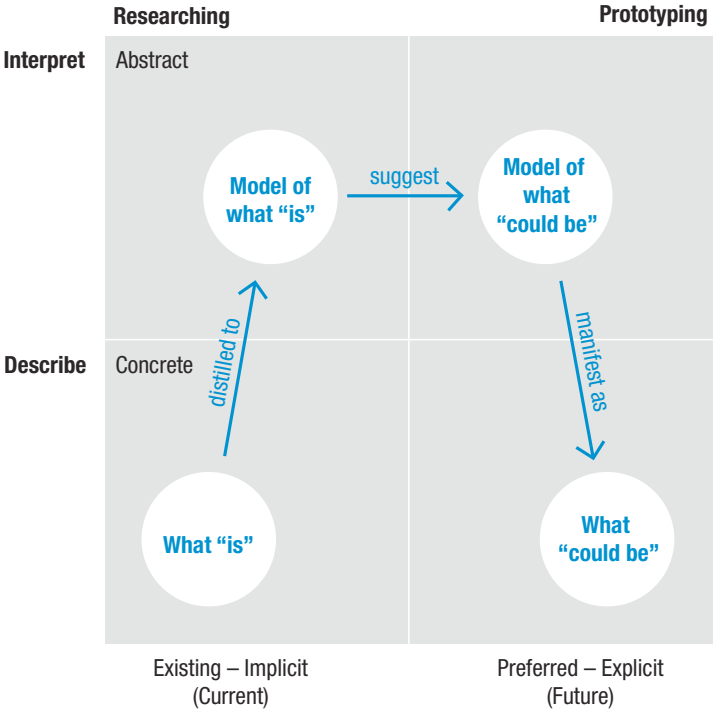
tacit & explicit

This model describes the learning process.

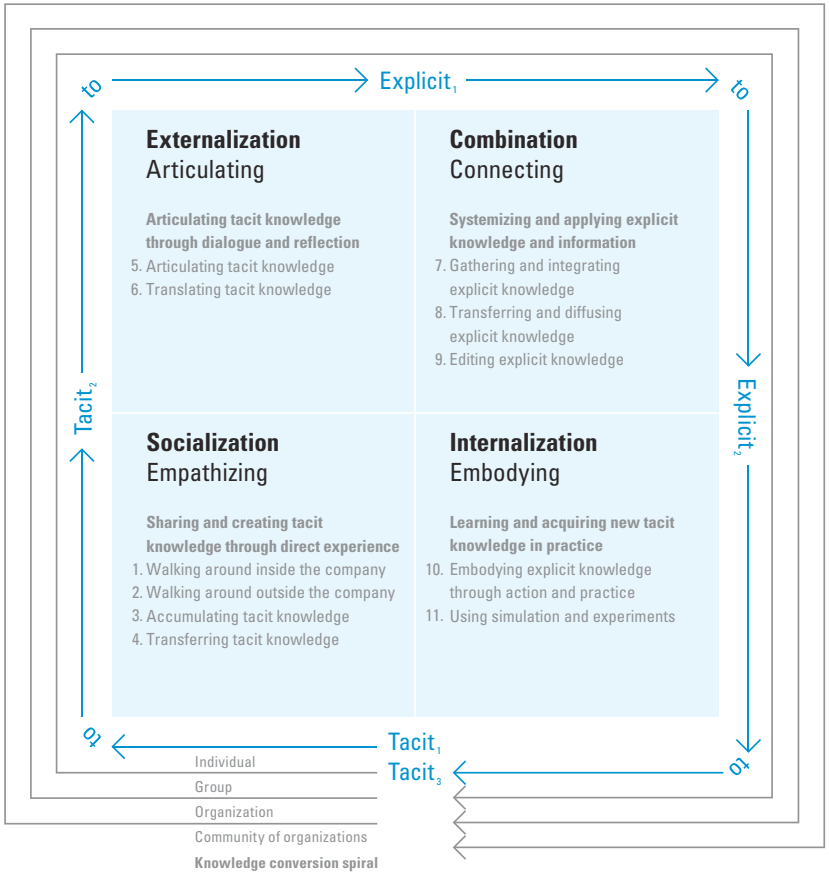
SECI model of knowledge creation
Ikujiro Nonaka
(1995)



Designing is analogous to learning.



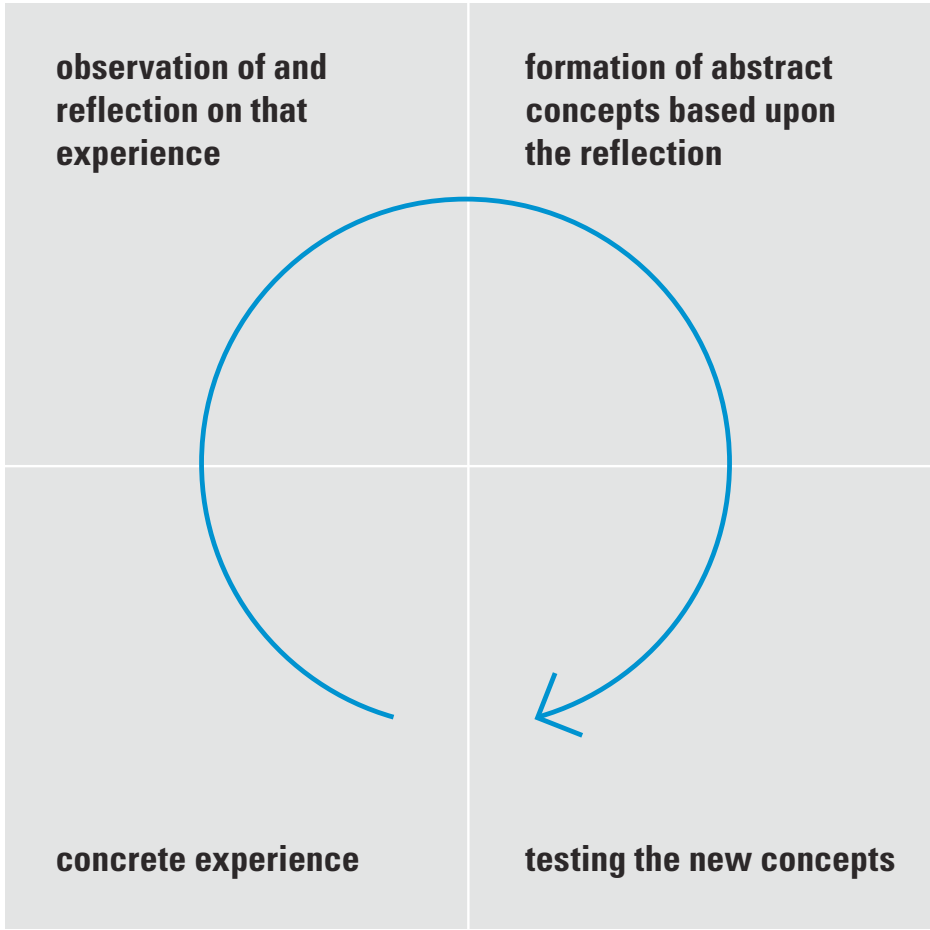
Analysis-Synthesis Bridge Model
Dubberly, Evenson & Robison (2008)



SECI model of knowledge create
Ikujiro Nonaka (1995)

12

Experiential Learning
David Kolb
(1975)



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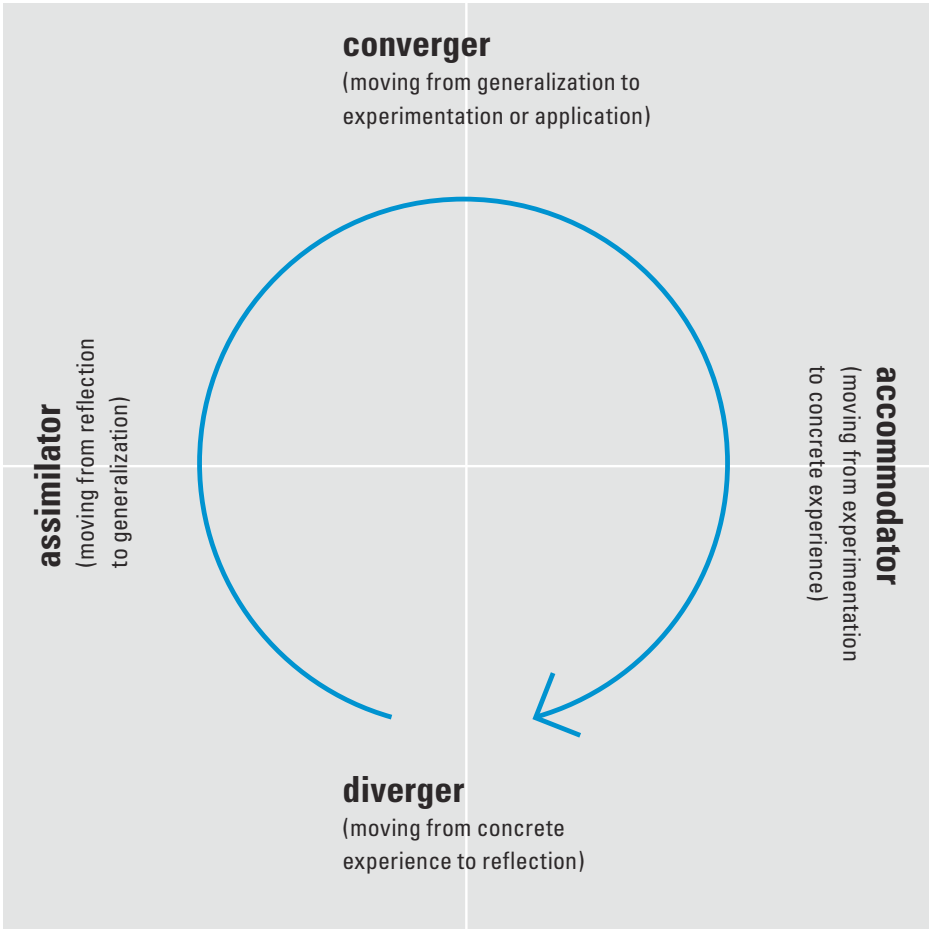
Learning Styles
M. Tennant
(1997)



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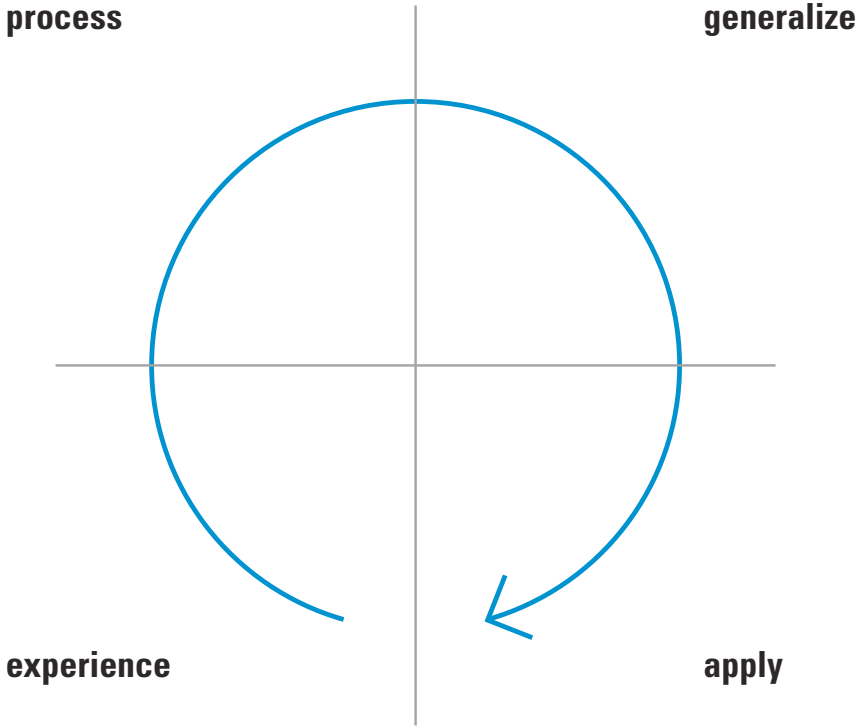
Experiential Learning Cycle
McCaffery
(1986)



What is design?

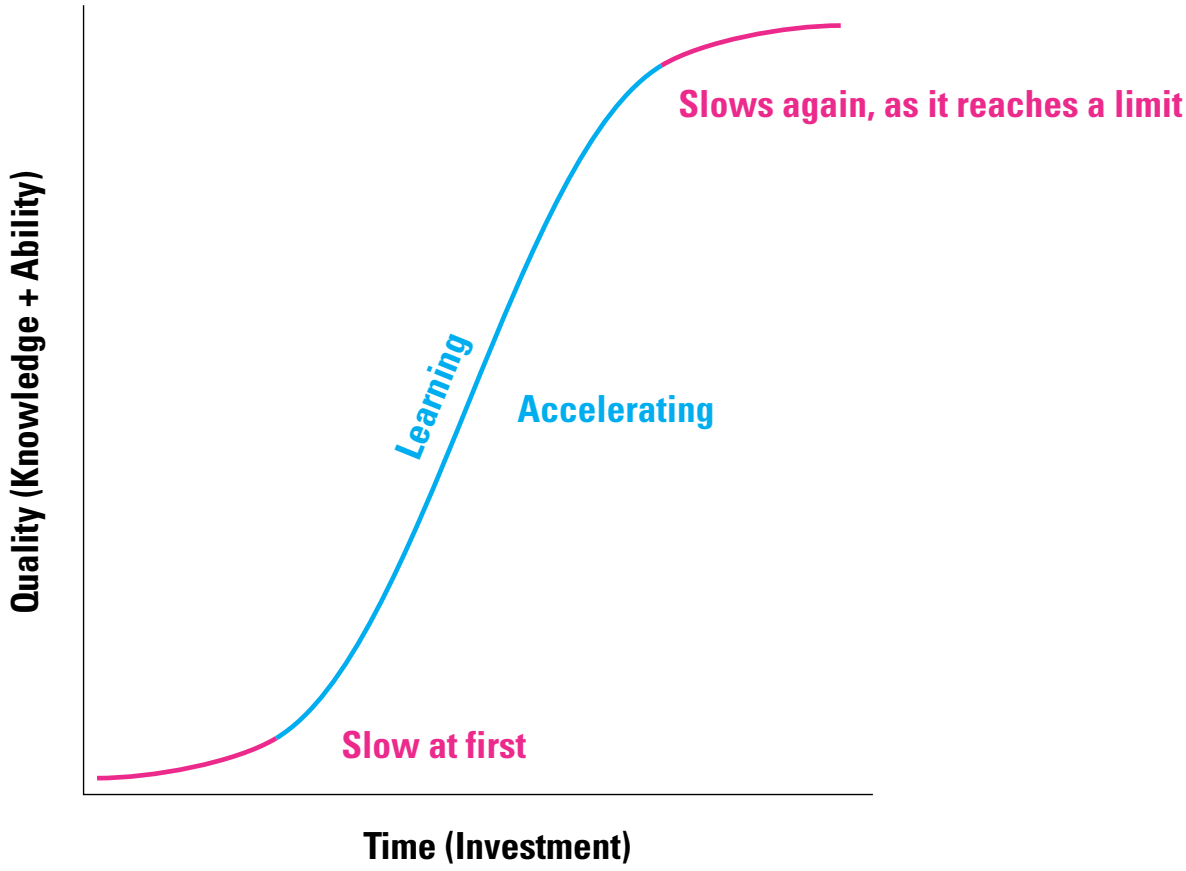
Art and aesthetics?

Science and problem solving?

Politics and rhetoric?

Learning and knowledge creation?

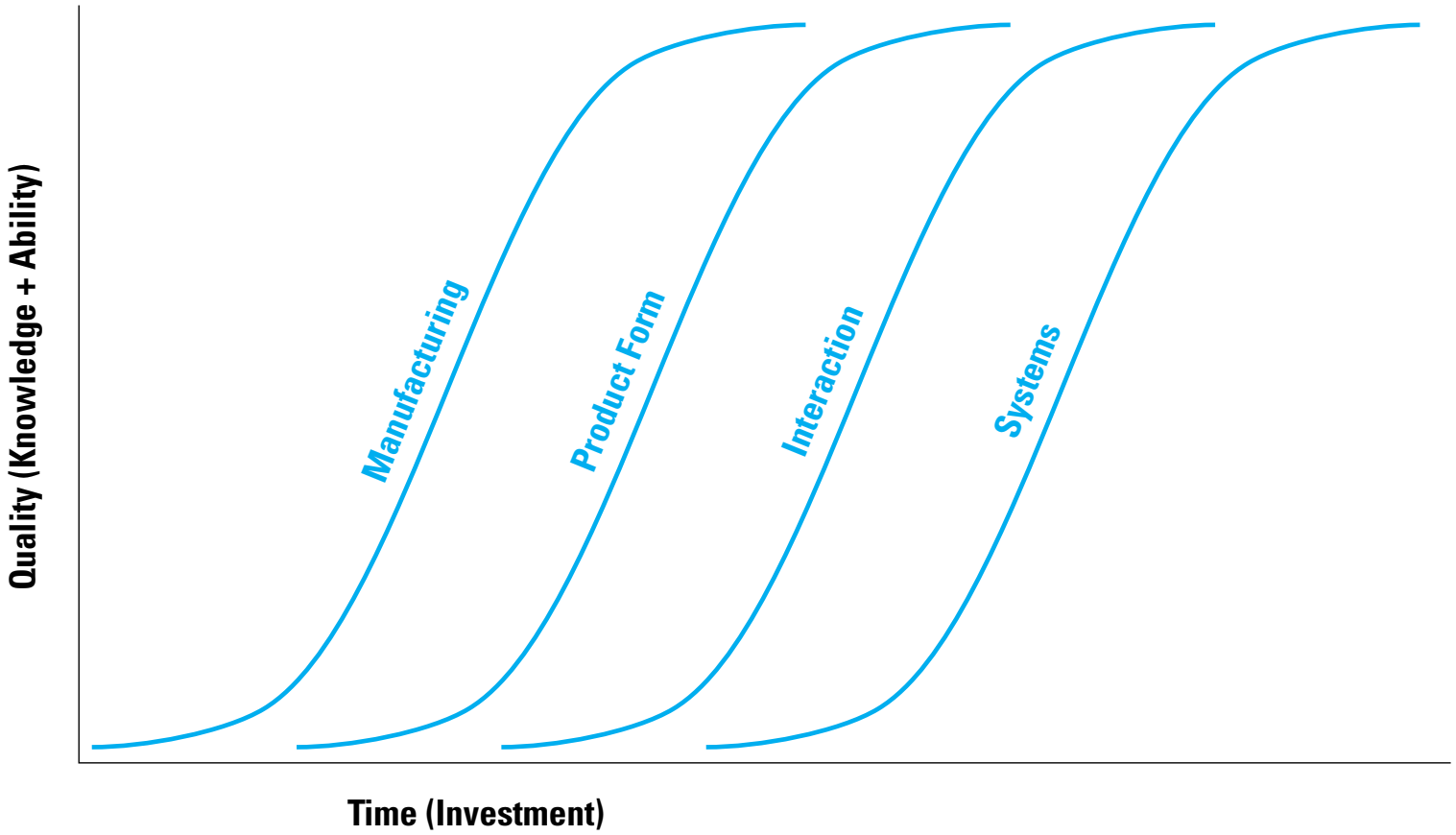
At first, a new wave offers competitive advantage but waves have limits. Eventually, new skills become a competitive necessity—a cost of entry.



Learning happens at different scales—small + large.

- Individuals have insights, which they refine and share with colleagues, building support within an organization or discipline.
- Companies that master new skills first gain a lead over their competitors, but competitors soon copy success and catch up.
- Eventually, knowledge becomes distributed throughout an industry—and innovative practices become standard operating procedure.

Over the last 30 years, product innovation has occurred in 4 waves.

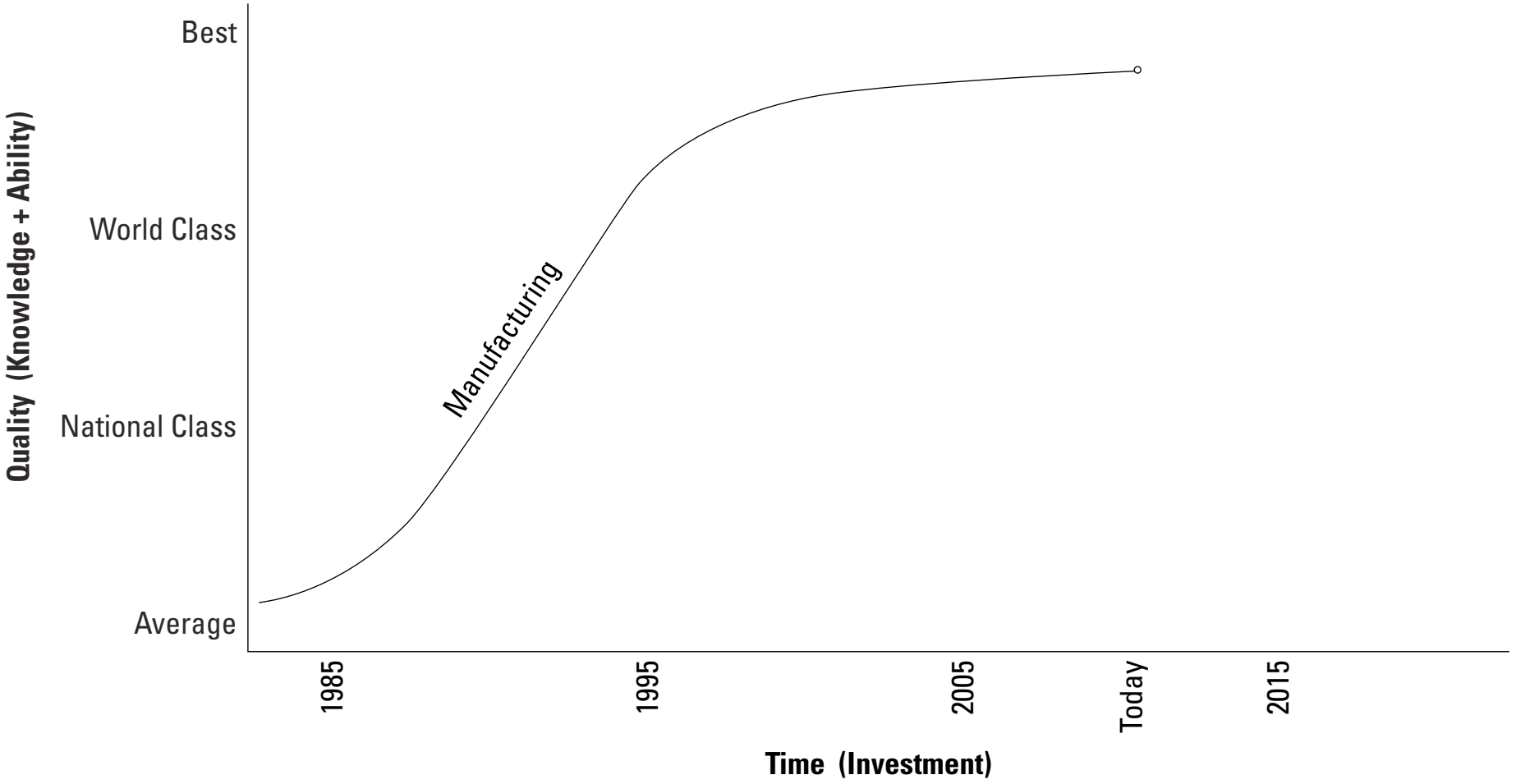


CURVE 1

Improving manufacturing quality.

– Statistical Process Control (SPC)
– Total Quality Management (TQM)
– Six-sigma
– Fit and Finish
– Craftsmanship

In the late 1980s, Samsung focused on improving manufacturing quality; now they make 30nm DRAM.



CURVE 2

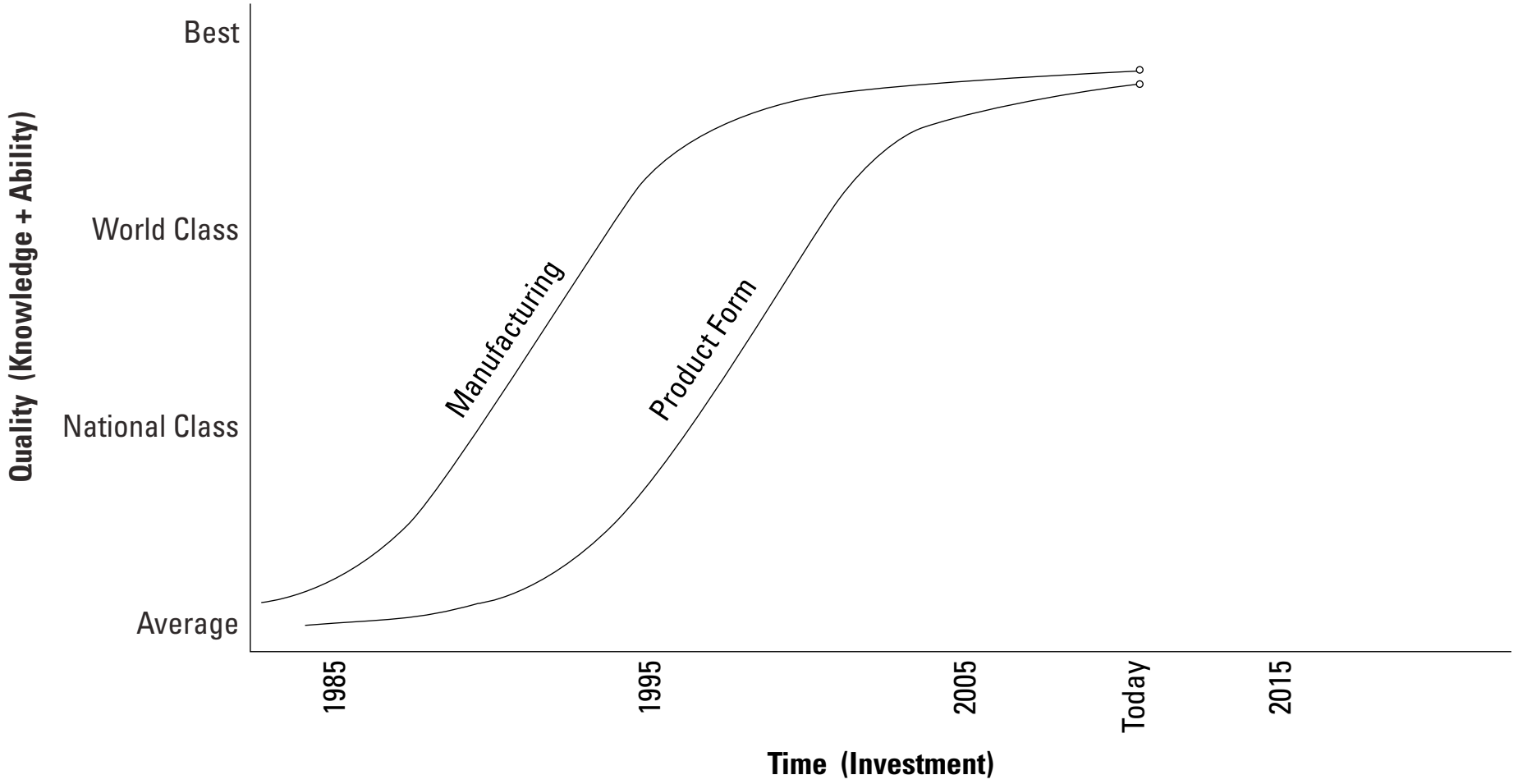
Improving product form.

– **Immediate connection**
"This looks interesting."

– **Clear communication**
"I understand what this does."

– **Emotional resonance**
"This is really great."

In the 1990s, Samsung improved product design; now they win as many design awards as Apple.



CURVE 3

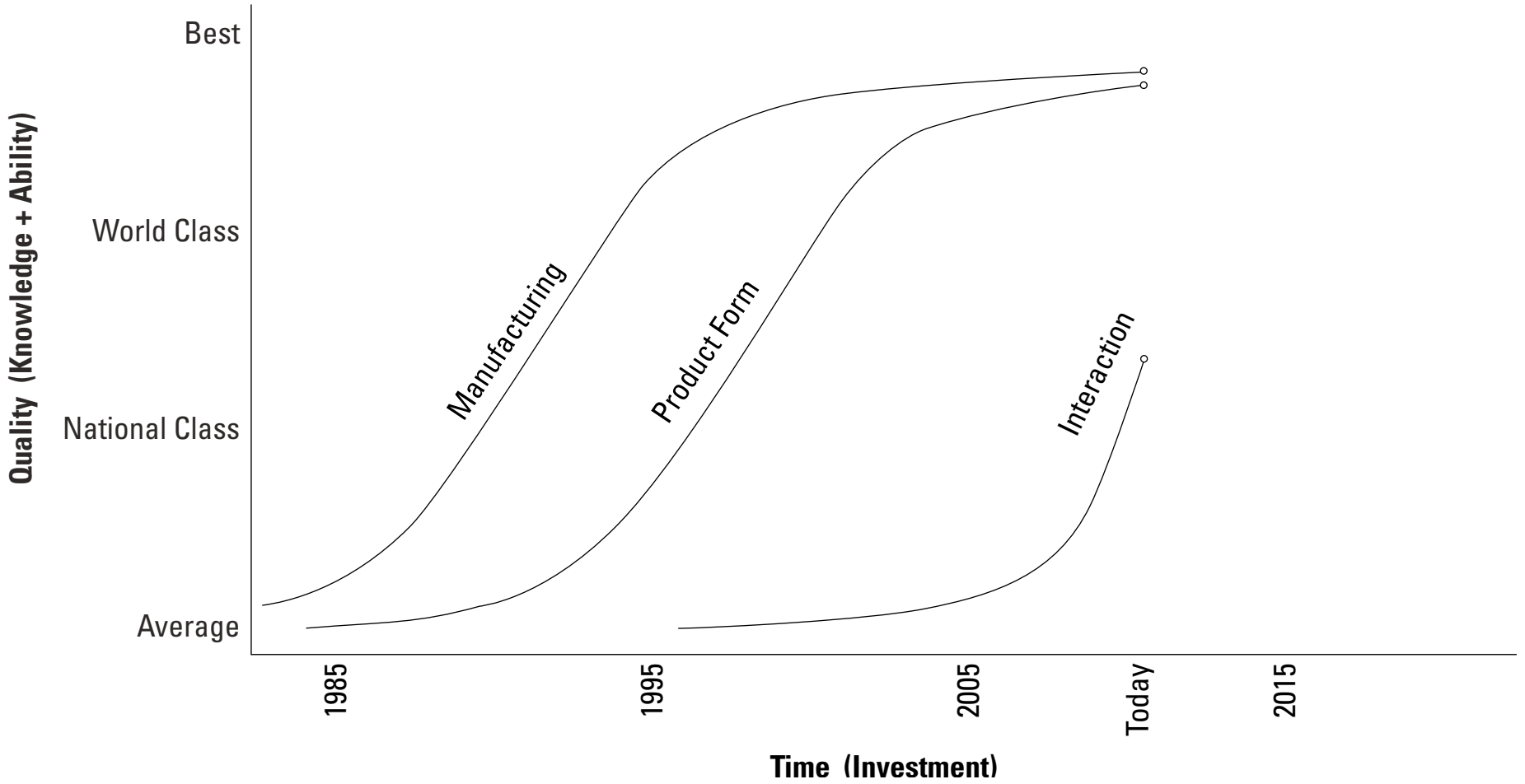
Improving user interaction.

– **Minimizing learning time**
"This is easy."

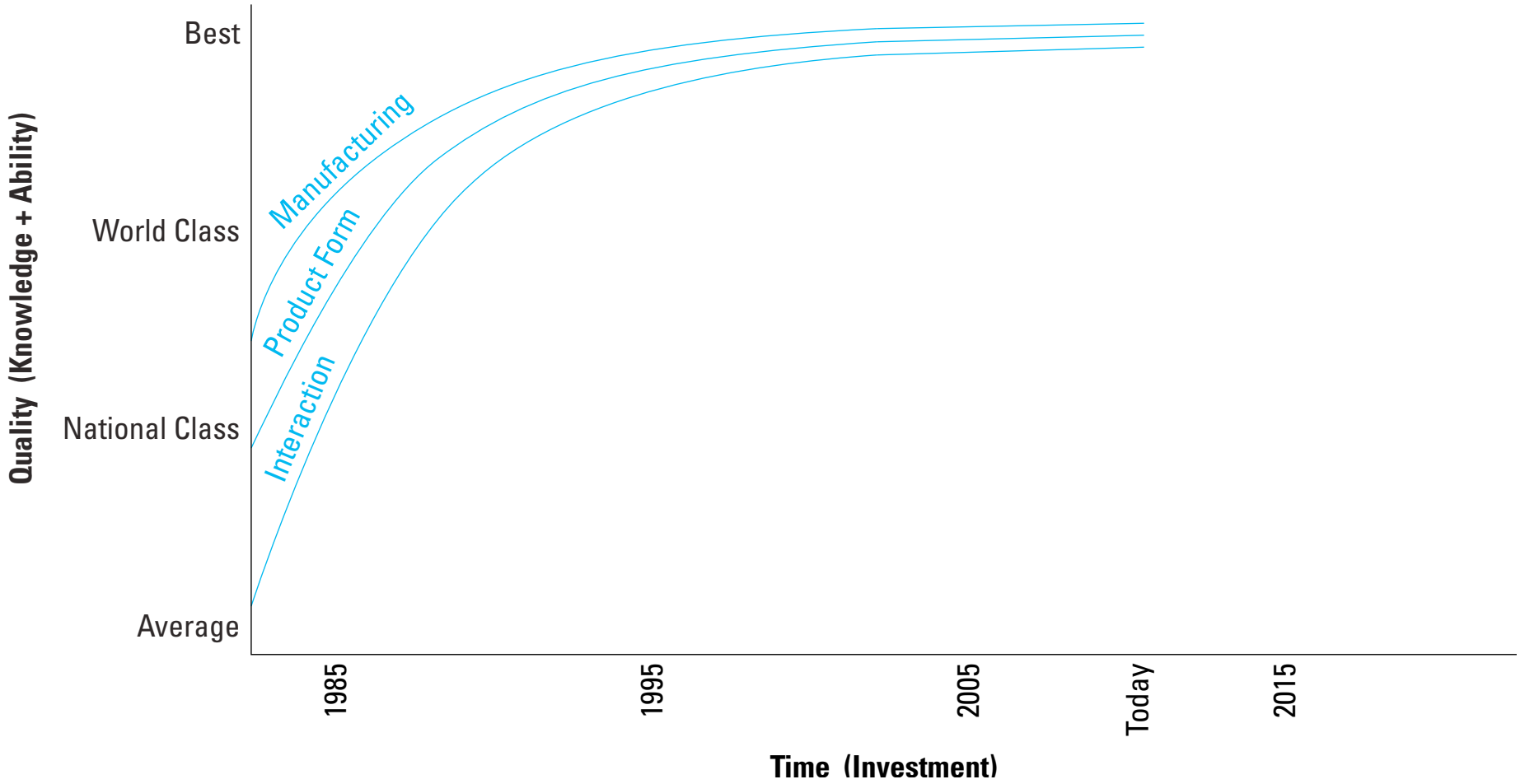
– **Efficient, effective, delightful operation**
"This is fun."

– **Creating unexpected opportunities**
"Look what I can do now."

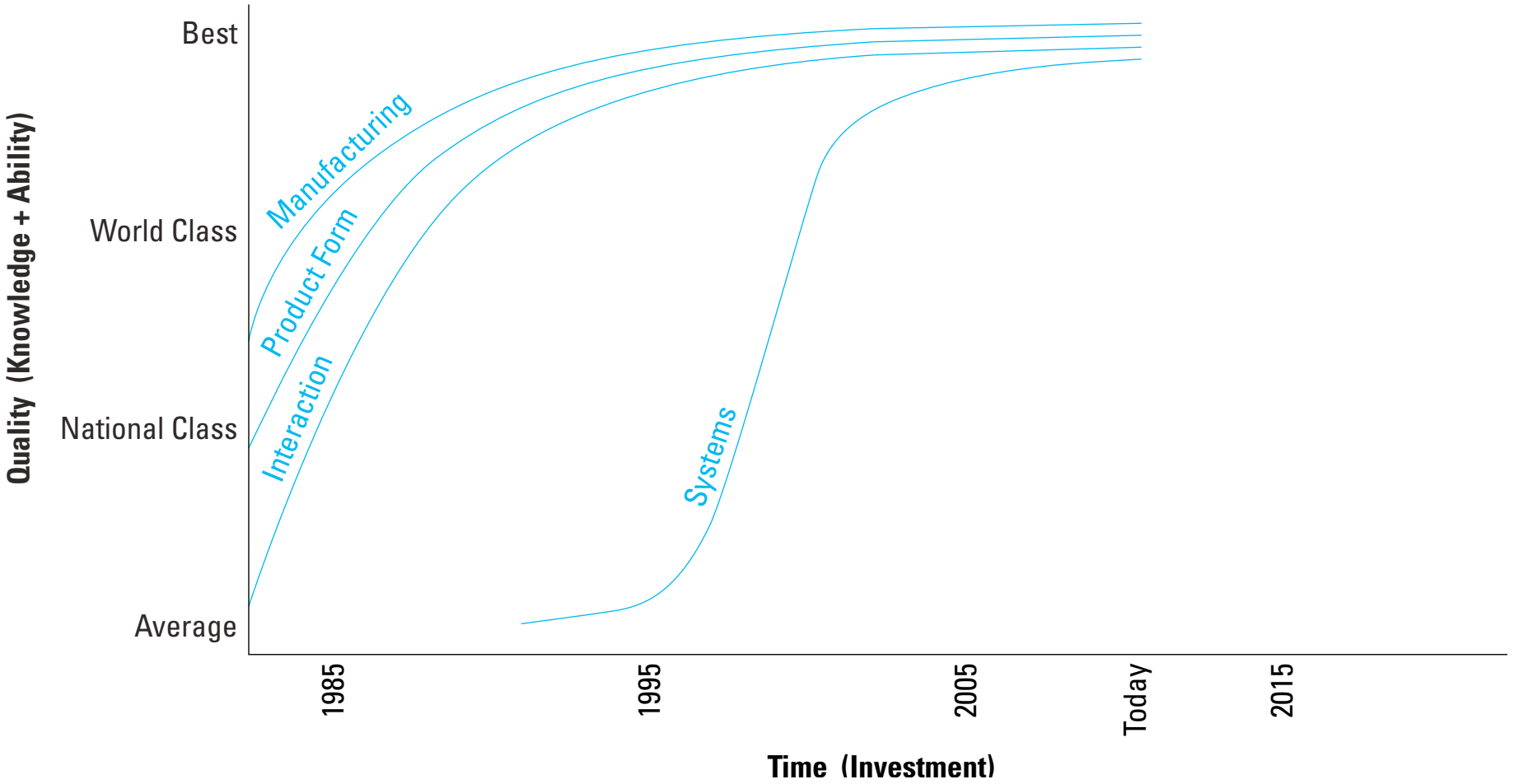
Recently, Samsung began to climb a third curve, improving the quality of its user interfaces.



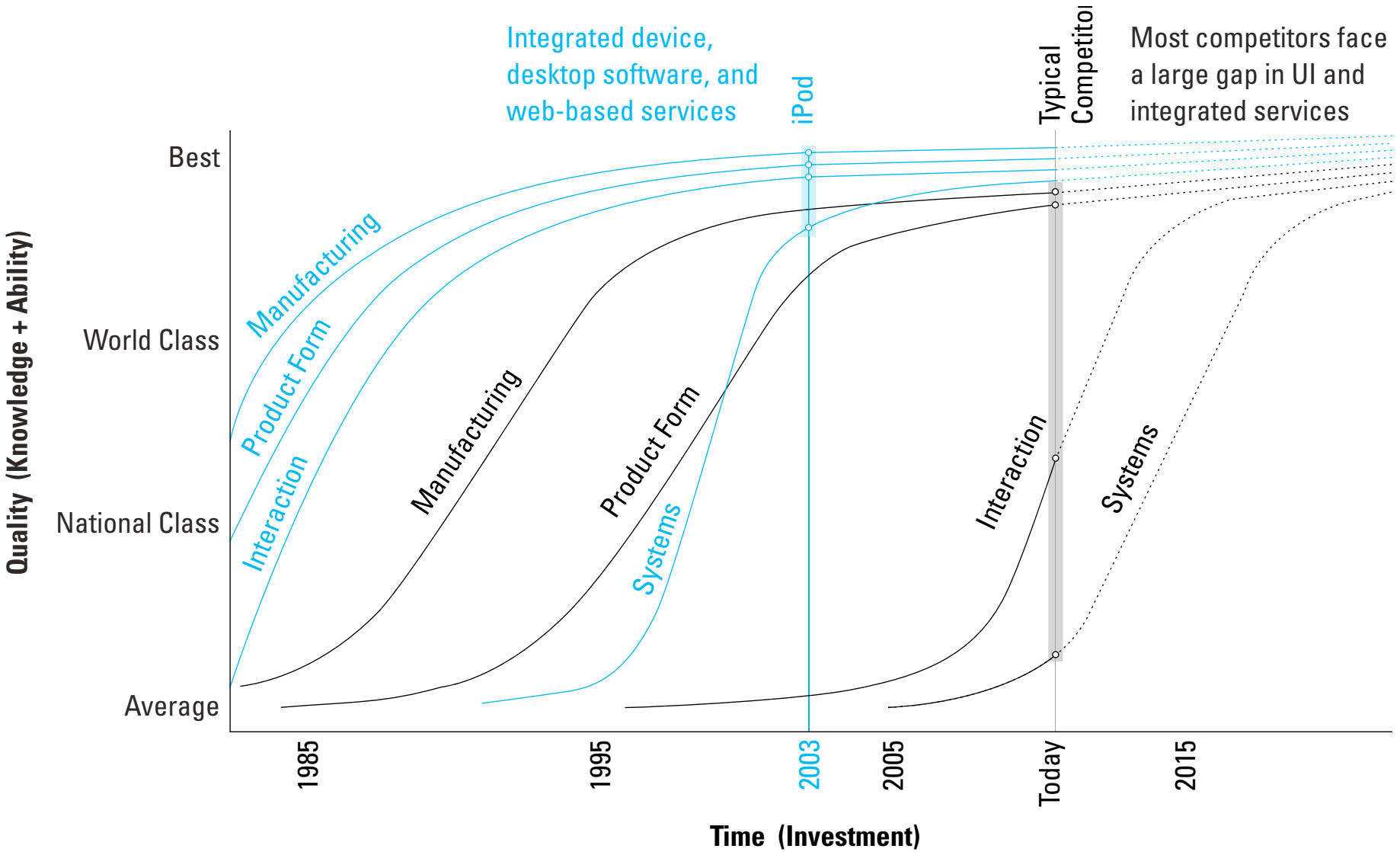
But Apple achieved world-class manufacturing, product design, and user-interfaces, years ago.



More recently, Apple has focused on integrating its products into sophisticated services.



The success of iPod is more than product design; it depends on all four measures of product quality.



CURVE 4

Thinking in terms of systems.

– **Looking at whole systems, not individual products**
roadmaps, product lines, platforms, APIs

– **Enabling feedback**
goal-action-measure-compare loops

– **Adopting metaphors from nature**
ecology, evolution, conversation, bio-cost

Systems affect many dimensions of design.

- Creating and managing (networked) services
- Connecting products + services
- Integrating across products
- Building a seamless brand experience
- Communicating with consistency
- Creating a sustainable business (green design)
- and building relationships (CRM) by managing "big data"

What is design?

Art and aesthetics?

Science and problem solving?

Politics and rhetoric?

Learning and knowledge creation?

Design education focuses on the form of objects; much of practice does likewise.

How are we making it?
Form/Grammar
Syntactic

Object
Component

Form is governed by meaning and structure, though they are also affected by form.

What are we making?
Meaning/Definition
Semantic

How are we making it?
Form/Grammar
Syntactic

Object
Component

Meaning + structure are governed by context; context is also affected by meaning + structure.

Why are we making this?
Context/Need
Pragmatic

What are we making?
Meaning/Definition
Semantic

How are we making it?
Form/Grammar
Syntactic

Object
Component

Objects are often embedded in systems.

Why are we making this?
Context/Need
Pragmatic

What are we making?
Meaning/Definition
Semantic

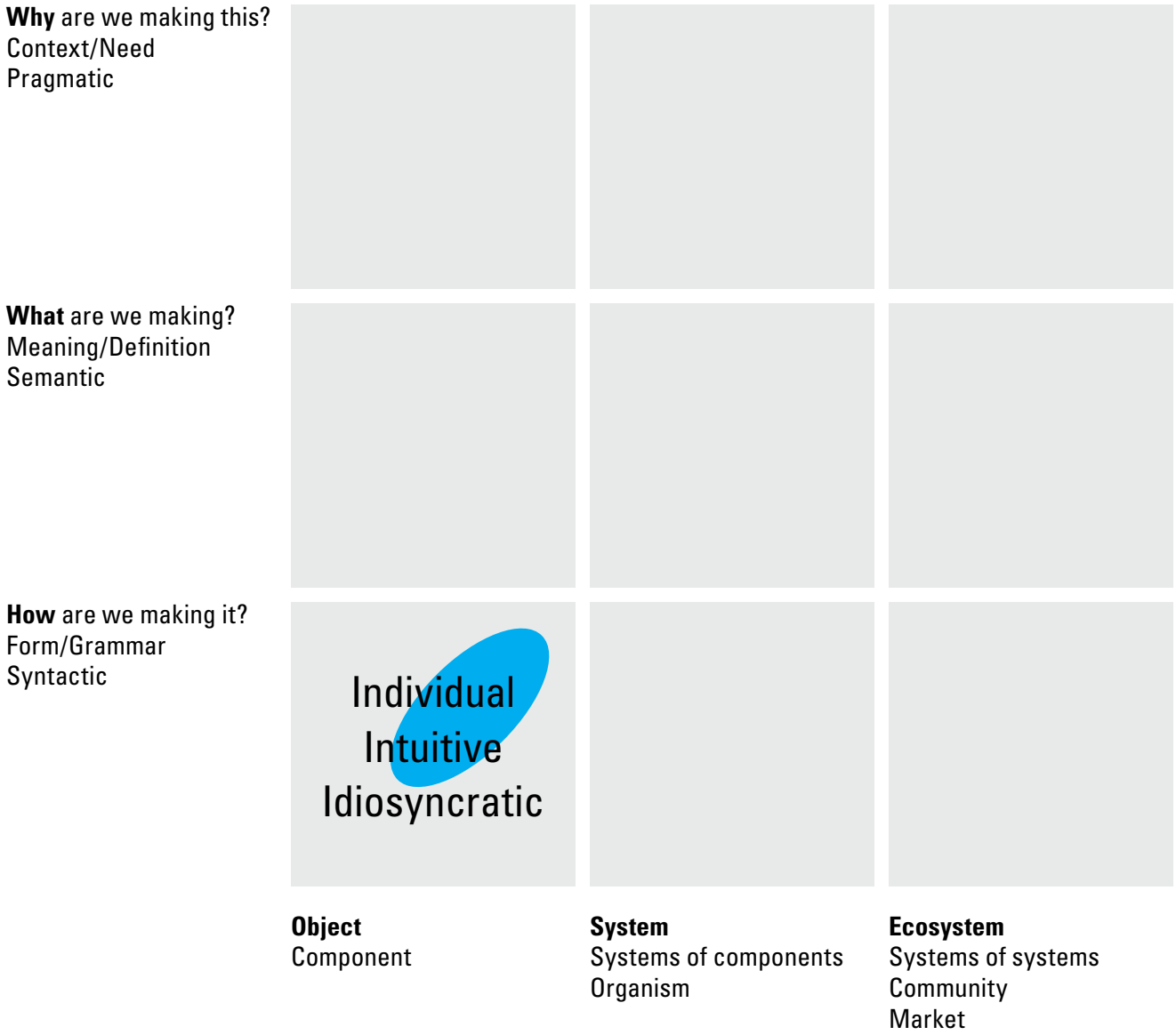
How are we making it?
Form/Grammar
Syntactic

Object
Component

System
Systems of components
Organism

Systems are often embedded in ecologies—communities of systems.

Practice focused on the form of objects can be direct and unmediated.

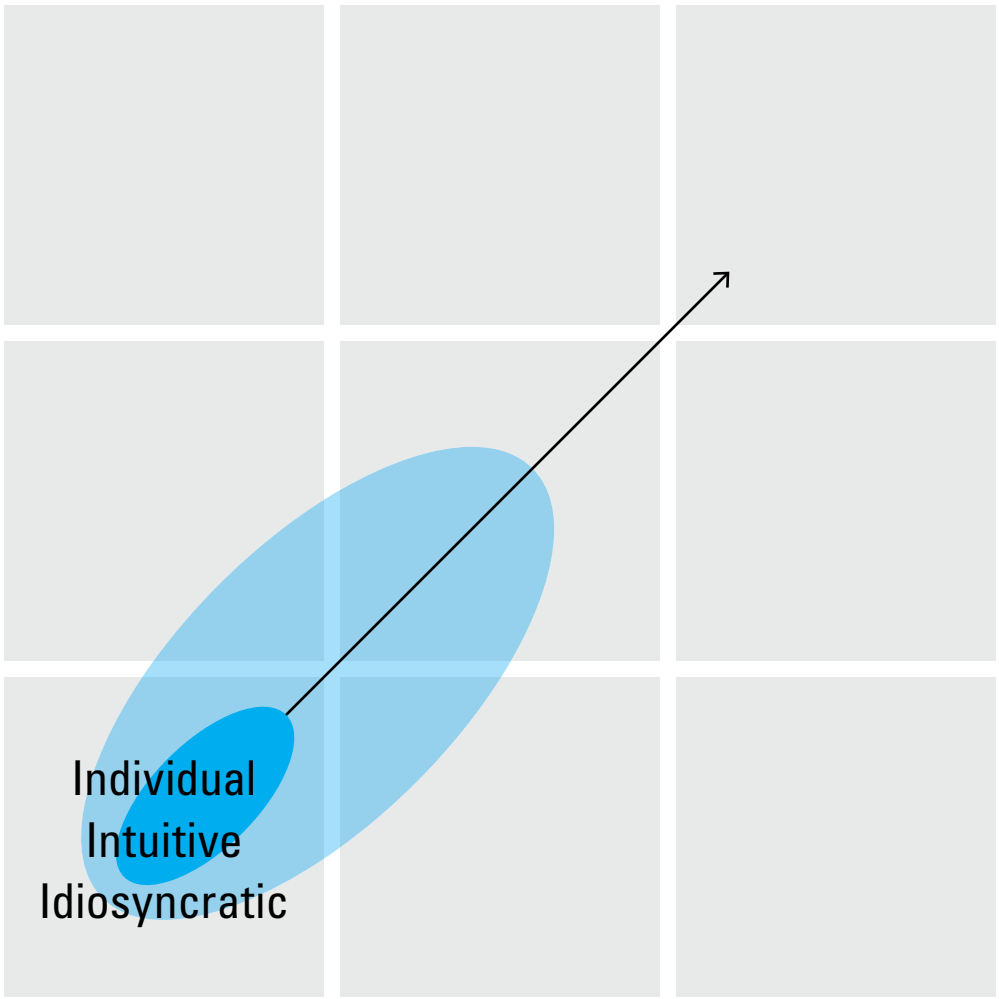


As practice expands, it becomes more complex.

Why are we making this?
Context/Need
Pragmatic

What are we making?
Meaning/Definition
Semantic

How are we making it?
Form/Grammar
Syntactic

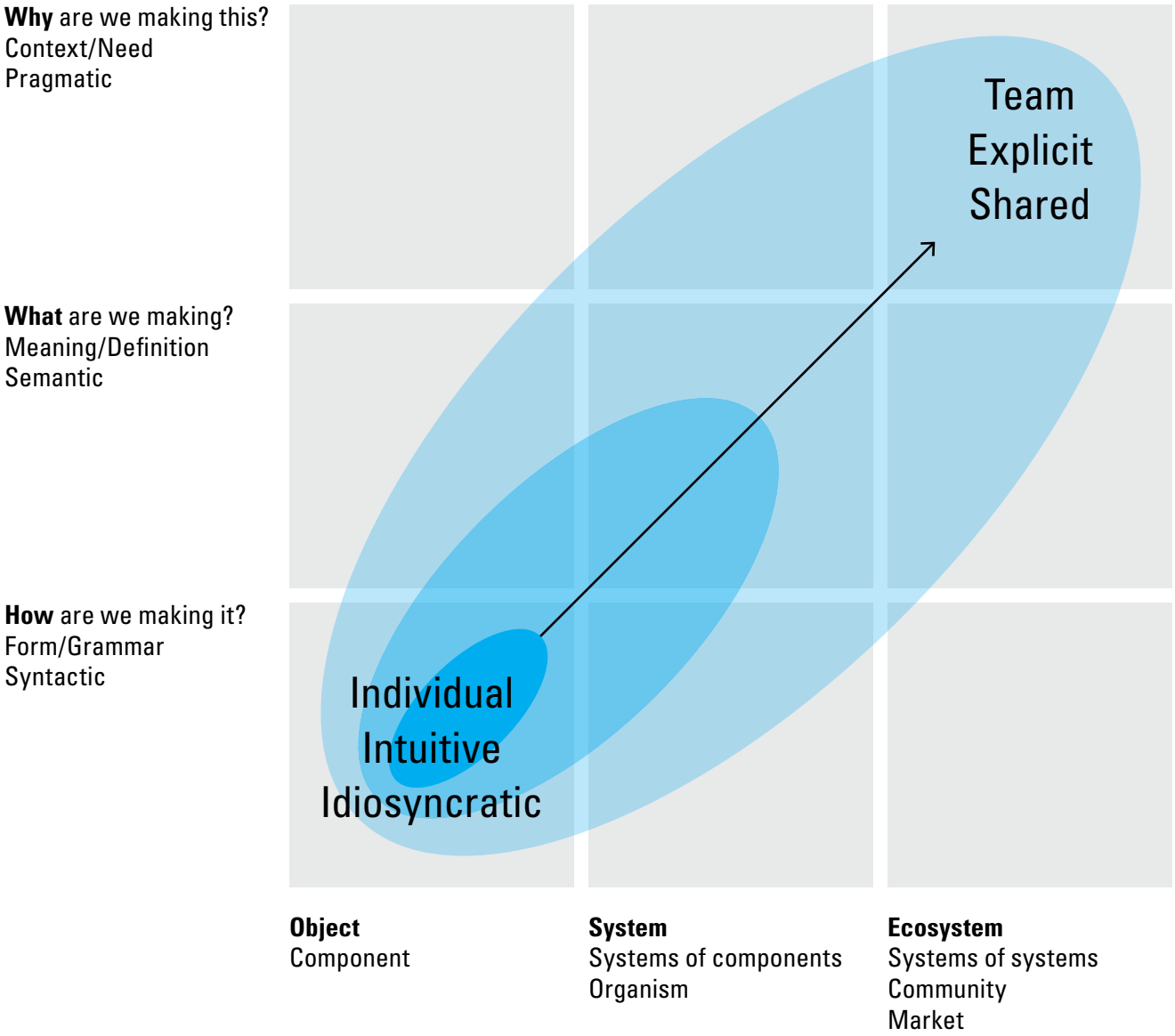


Object
Component

System
Systems of components
Organism

Ecosystem
Systems of systems
Community
Market

When practice also concerns context + ecologies, it requires shared methods.



What is design?

Art and aesthetics?

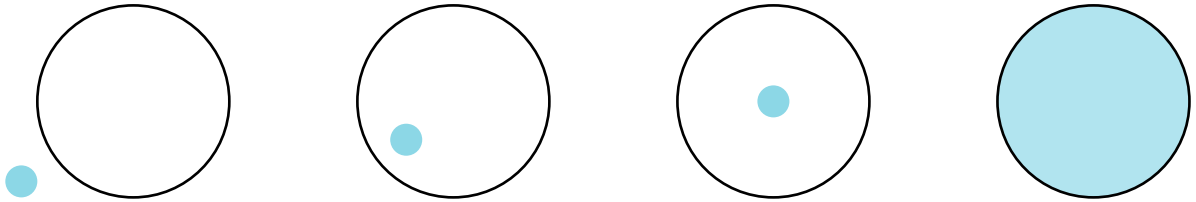
Science and problem solving?

Politics and rhetoric?

Learning and knowledge creation?

Conversation and collaboration?

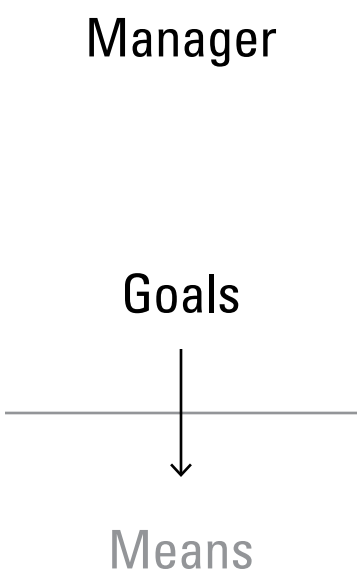
Possible relationships between a design function and the organization that it supports.



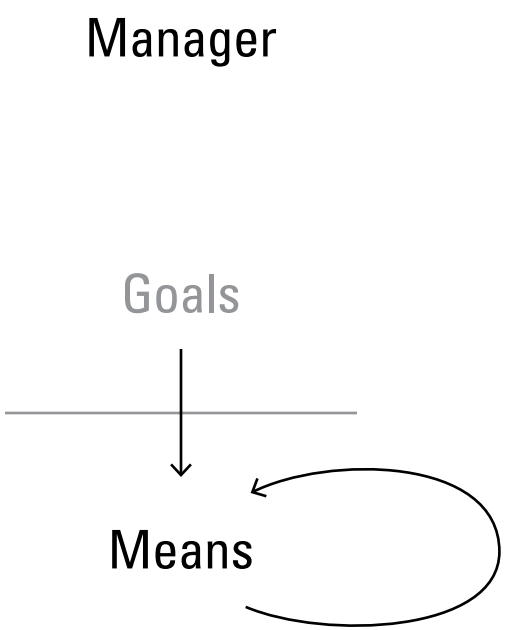
Separate	Peripheral	Central	Integrated
Design as external resource	Design as part of the organization	Design at the core of the organization	Design integral to all aspects of the organization
Design thinking and methods have no continuous presence in the organization.	Design thinking and methods practiced somewhere within the organization.	Design thinking and methods are highly visible and take a central position.	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.
They are add-ons, limited to traditional problems: form, communication, function.	They apply to specific products and services.	They unify products and services across an organization; apply to corporate design and brand strategy.	

— Sabine Junginger, 2009

We often have conversations with ourselves.

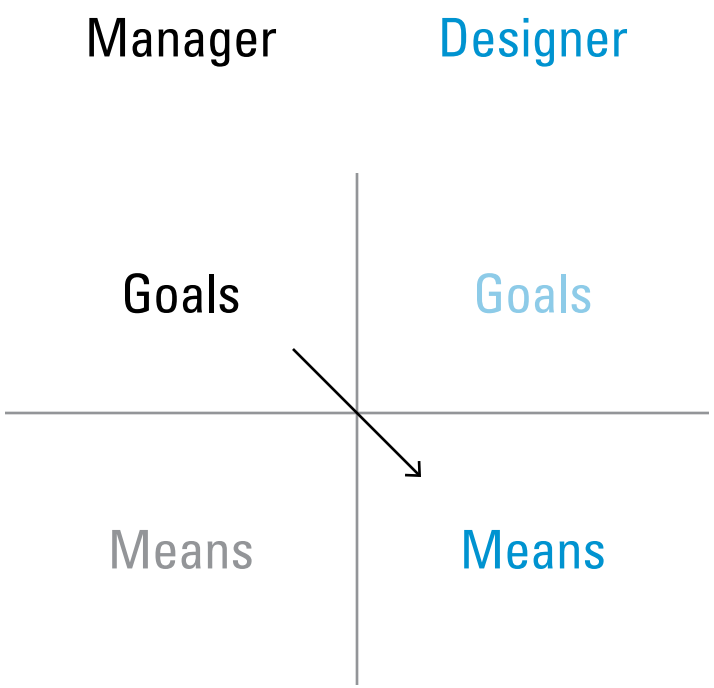


Reflecting:
Individual considers possible goals.

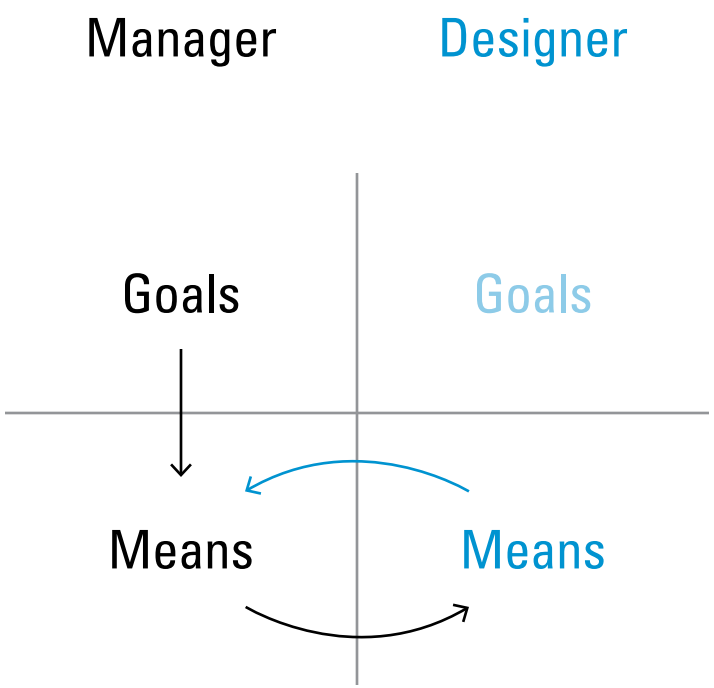


Reflection in action:
Individual considers possible means while executing

Traditional management is often hierarchical.

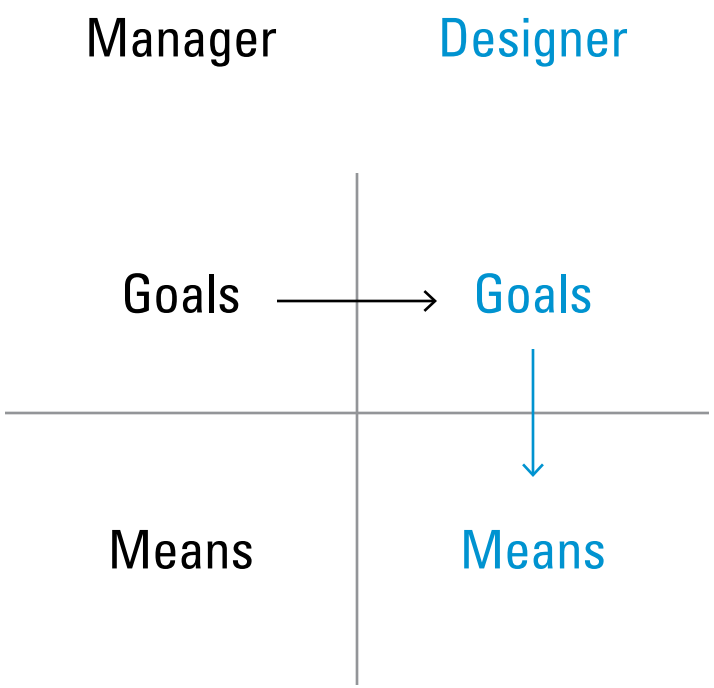


Controlling:
Manager tells designer what to do + how to do it; designer executes.

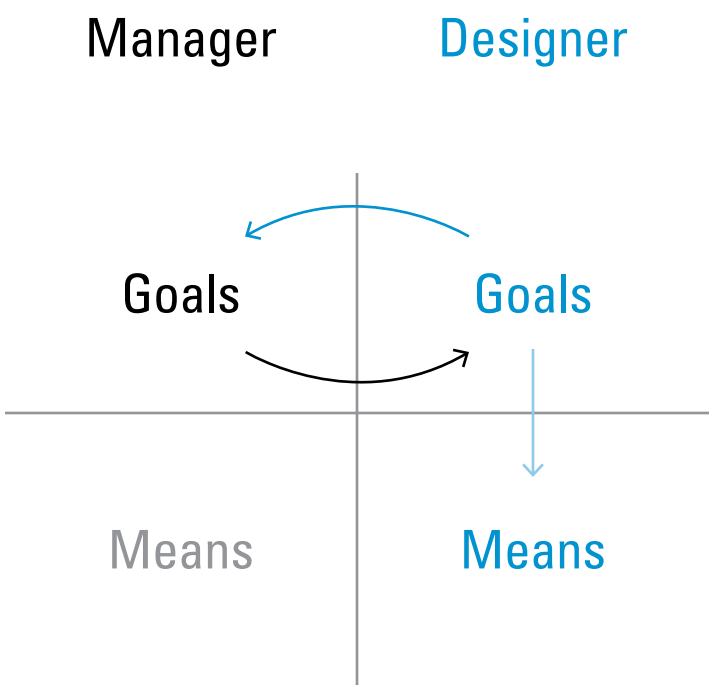


Mentoring:
Manager sets goals but discusses means with designer.

Information age management must be collegial.



Delegating:
Manager sets goal but leaves means to the designer.

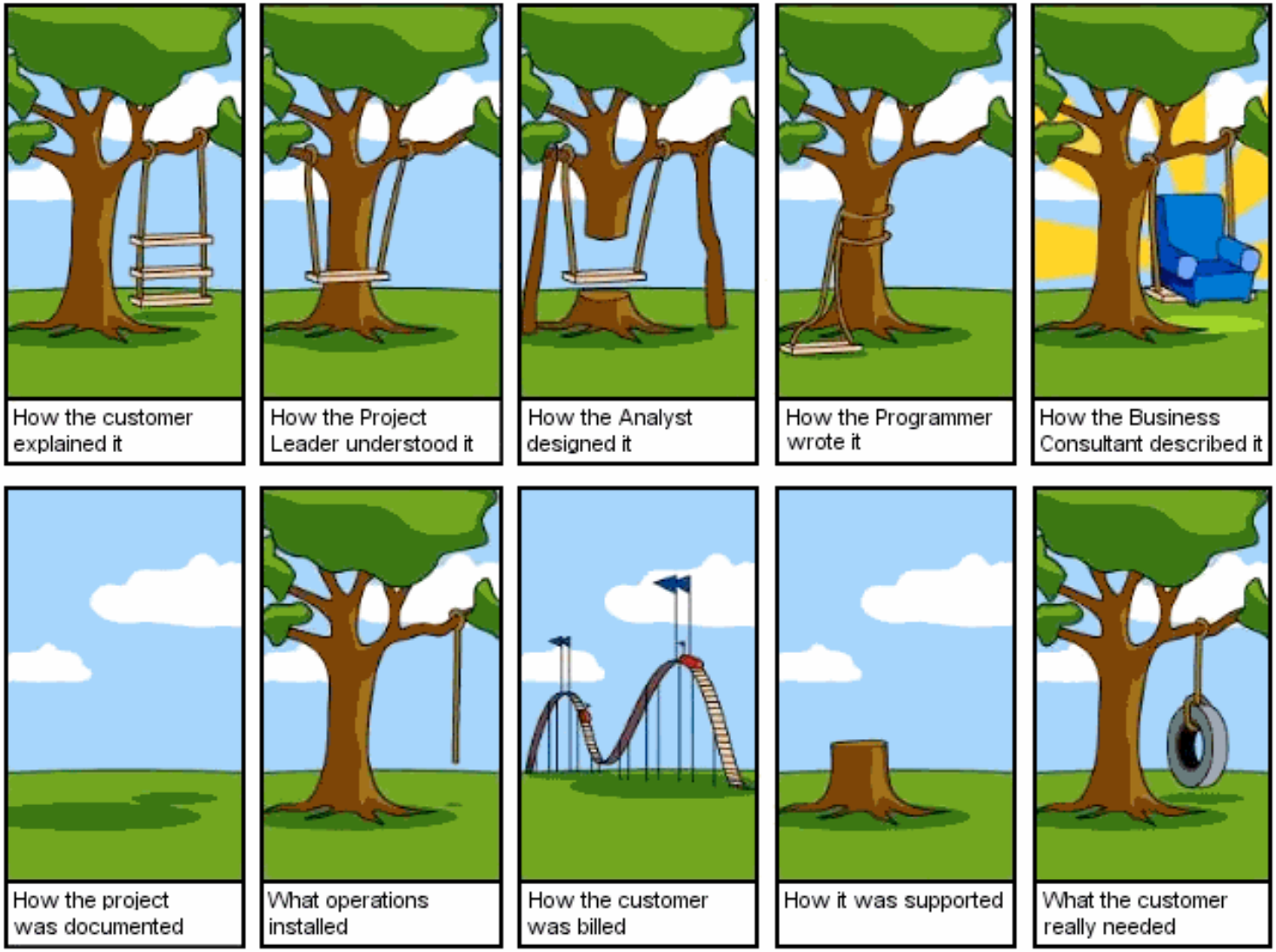


Collaborating:
Manager and designer set goals together.

Great design, sustained over time, is the product of conversations that build relationships and trust.

Steve Jobs + Jonathan Ive	= Apple
Ed Catmul + John Lasseter	= Pixar
Tom Watson, Jr. + Eliot Noyes	= IBM
Walter Paepke + Herbert Bayer	= Container Corp.
Adriano Olivetti + Marcello Nizzoli	= Olivetti
Artur & Erwin Braun + Dieter Rams	= Braun
Max Dupree + George Nelson	= Herman Miller
William Paley + William Golden	= CBS
Frank Stanton + Lou Dorfsman	= CBS
Hans Knoll + Florence Schust	= Knoll
Martha Stewart + Gael Towey & Eric Pike	= Martha Stewart

Delighting customers requires special conversations. It's easy to have the wrong conversations.



— Alex Gorbatchev

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