

How should education prepare designers for a future of change?

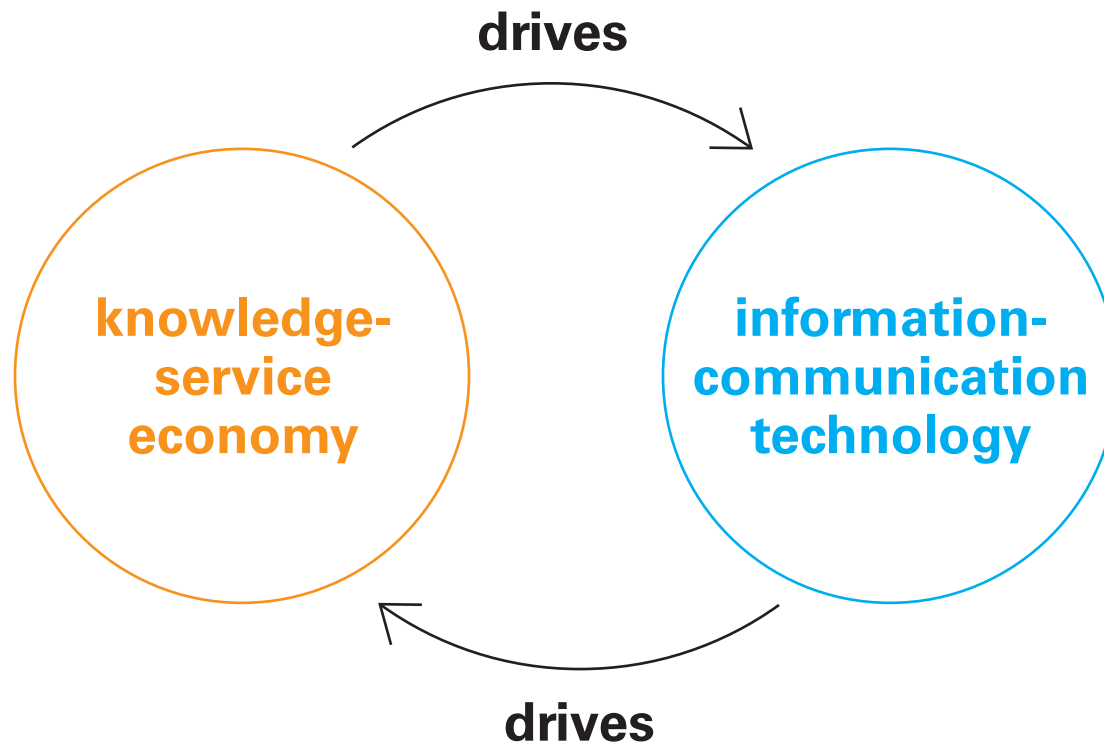
AIGA Next Conference

October 13, 2007; v0.8

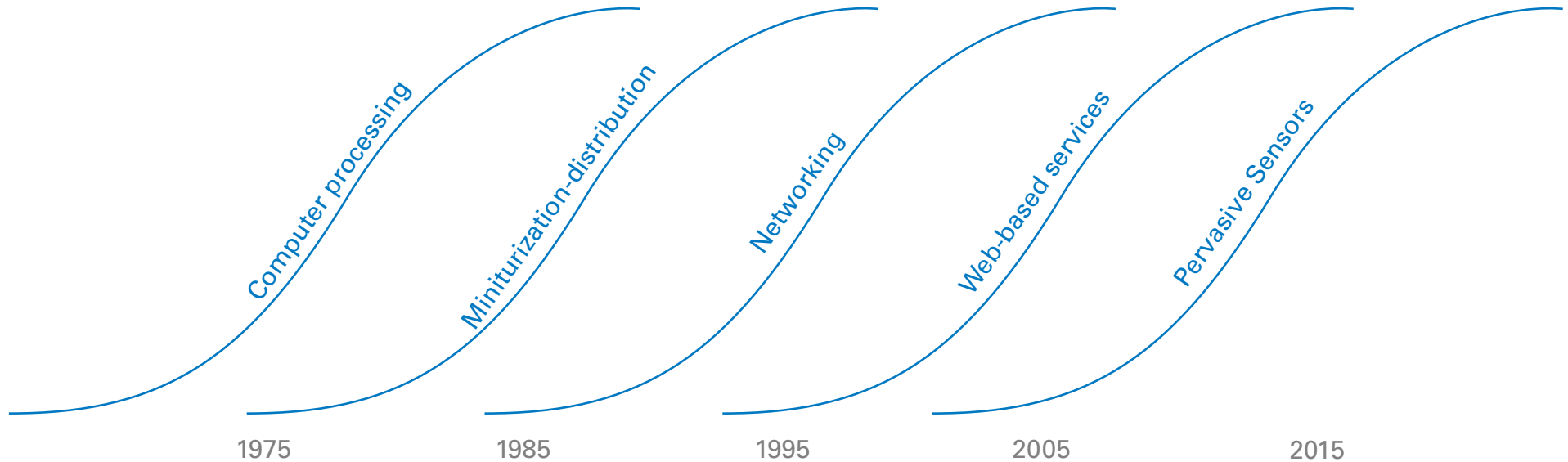
Hugh Dubberly

Sources of change

Growth of one fuels growth of the other



Five waves of technology are contributing to a new generation of integrated systems.



Sensors: the next revolution



How should education prepare designers for a future of change?

Characterizing the change

**“Flows become more
important than resources.
Behavior counts.”**

—Kevin Kelly

Changing scientific paradigms

After Austin Henderson

	<i>Newton</i>	<i>Darwin</i>
<i>Metaphor</i>	Mechanism	Organism
<i>Control</i>	Top-down	Bottom-up
<i>Development</i>	From outside	Self-organizing
	Rigid	Pliant
	Fragile	Robust
	Regular	Particular
	Coherent	Responsive

Increasing Customization

After Larry Keeley

	Era 1	Era 2	Era 3	Era 4
	Selling 1930s	Marketing 1950s	Positioning 1970s	Tailoring 1990s
<i>Key Goals</i>	Support sales	Develop brands	Appeal to segments	Appeal to individuals
<i>Innovations</i>	Styling	Packaging Corporate ID	Specialization methods	Integrated programs Strategic prototyping
<i>Program</i>	Harvester Frigidaire	Nabisco Coca-Cola	JCPenney American Airlines	???

Changing relationships between designer and audience

After Liz Sanders

<i>Era</i>	<i>Past</i>	<i>Current</i>	<i>Emerging</i>
<i>Design Paradigm</i>	Expert-driven	Human-centered	Facilitated
<i>Audience role</i>	Customer	User	Participant
<i>Activity</i>	Consume <ul style="list-style-type: none">- Shop- Buy- Own	Experience <ul style="list-style-type: none">- Use- Interact- Communicate	Co-create <ul style="list-style-type: none">- Adapt/Modify/Extend- Design- Make

What is the user's role?

After Austin Henderson

Follow

Design *for* users

Provide input

Provide feedback

Participate

Design *with* users

Combine expertise

Combine values

Lead

Design *by* users

Scripting languages

Open systems

Construction sets

The end of incrementalism

After John Rheinfrank

From (escape the past)

Mechanistic world view

Landscape depletion

Surface novelty

Detached expert

Tangible assets

Consolidation

To (invent the future)

Ecological—evolutionary world view

Landscape renewal

Evocative structures

Collaboration

Intangible assets

Flow

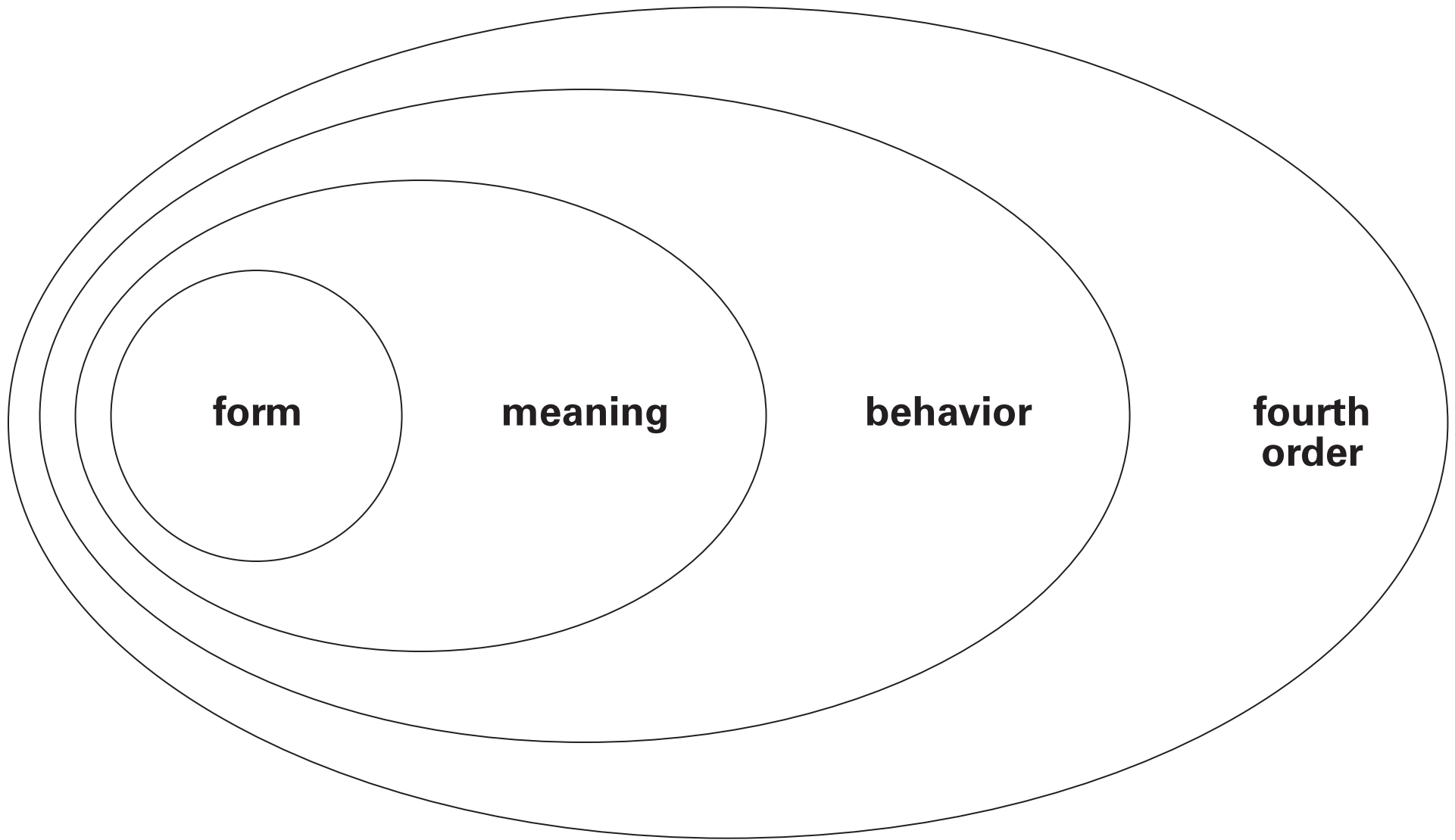
Changes in planning methods

After Shelley Evanson

	<i>Product</i>	<i>Service</i>
<i>Era</i>	Planned	Emergent
<i>Focus</i>	Find right strategy	Understand customers
<i>Growth</i>	Top-Down	Organic
<i>Method</i>	Sequential	Parallel
<i>Delivery</i>	Internal	Co-produce

Changing focus of designers

After Golsby-Smith / Buchanan

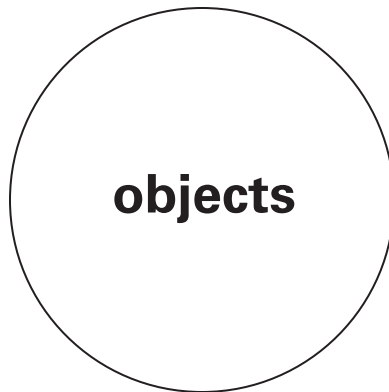


After: Tony Goldsby-Smith and
Richard Buchanan

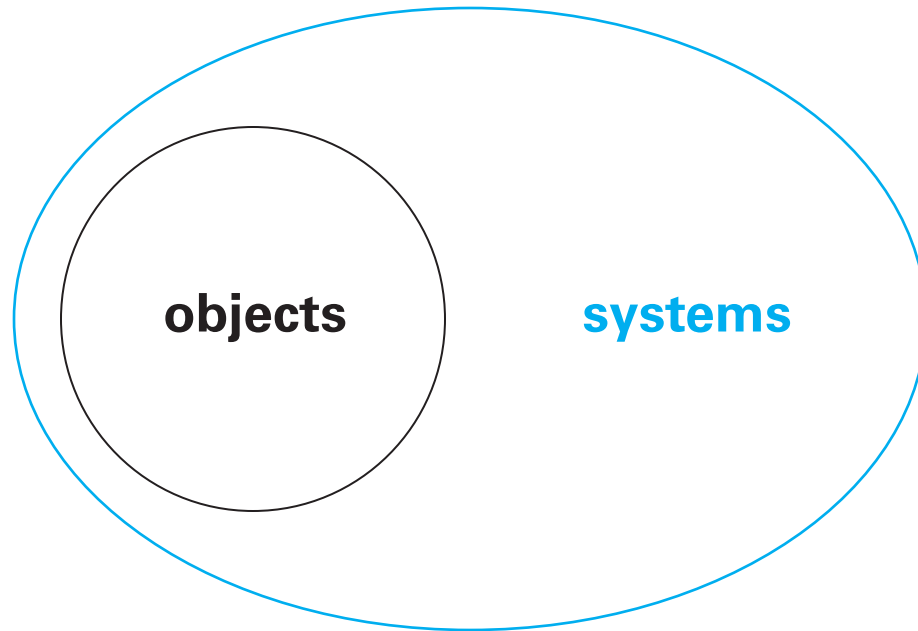
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What does change mean for designers?

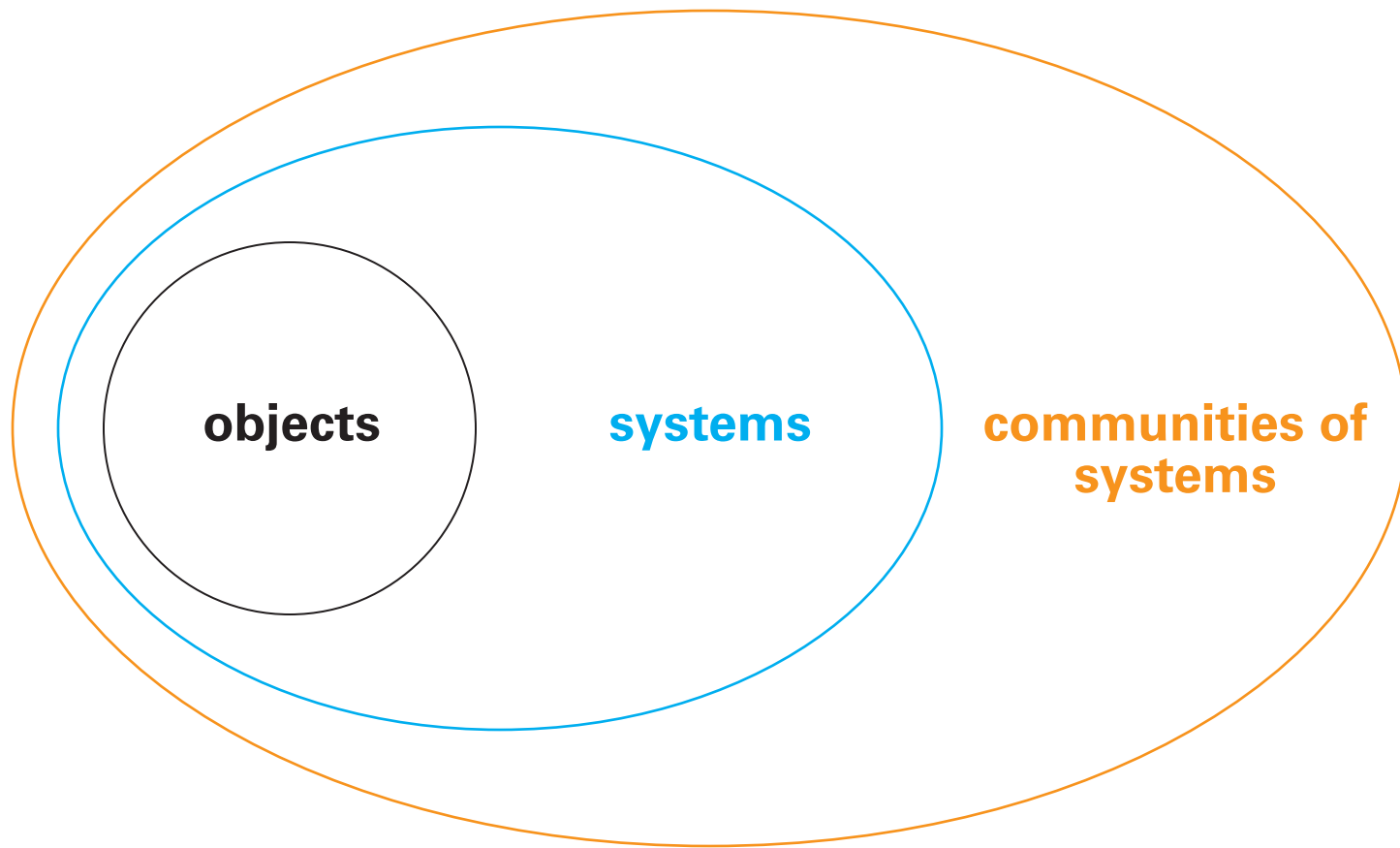
Changing context of design



Changing context of design



Changing context of design



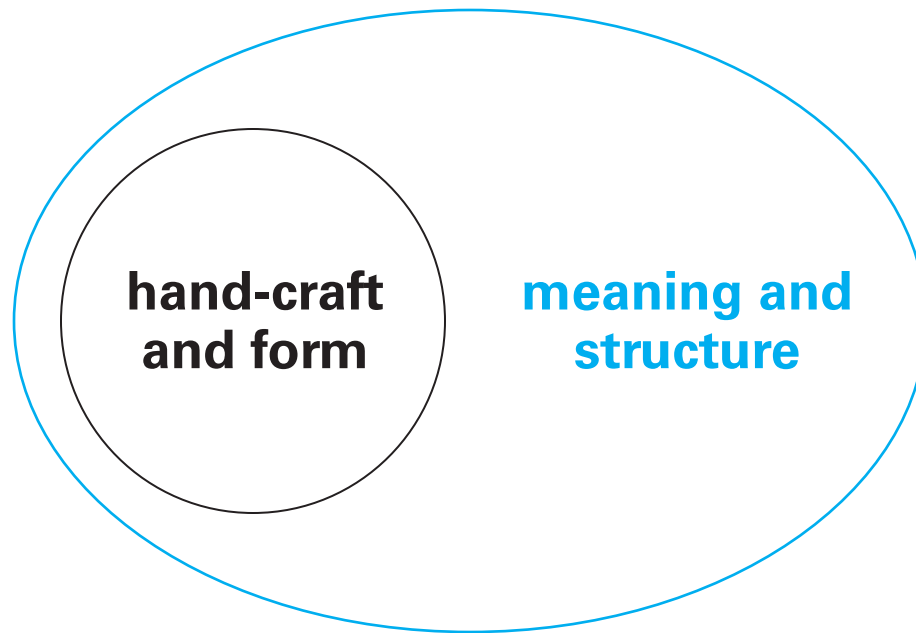
Changing context of design

	<i>Industrial era</i>	<i>Electronic era</i>
<i>Focus</i>	Objects	Systems
<i>Values</i>	Seek simplicity	Embrace complexity
<i>Designer's role</i>	Deciding	Facilitating
<i>Stopping condition</i>	Almost perfect	Good enough for now
<i>Result</i>	More deterministic	Less predictable
<i>End-state</i>	Completed	Adapting or evolving
<i>Relation to time</i>	Editions	Continuous updating

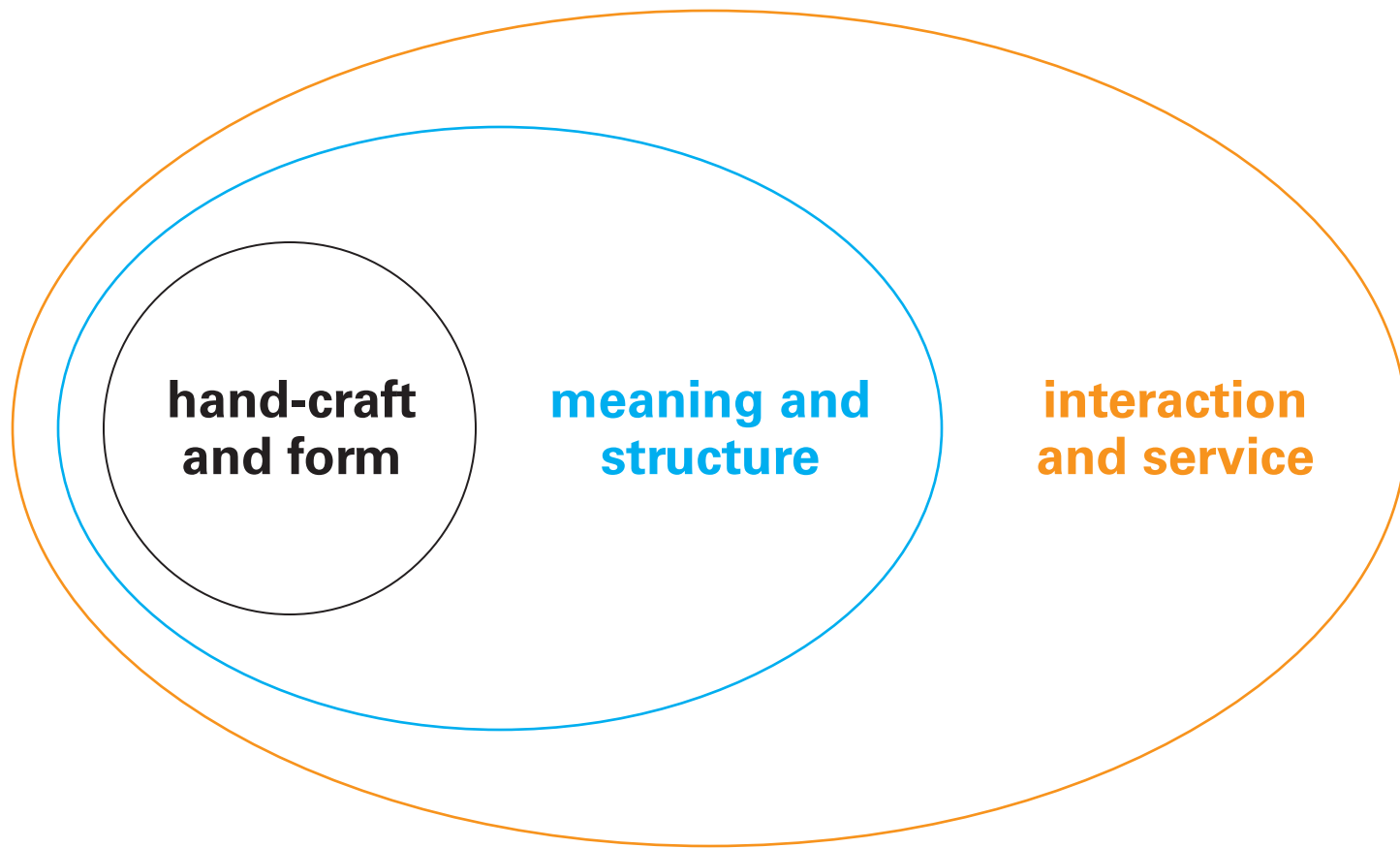
Changes in design practice



Changes in design practice



Changes in design practice

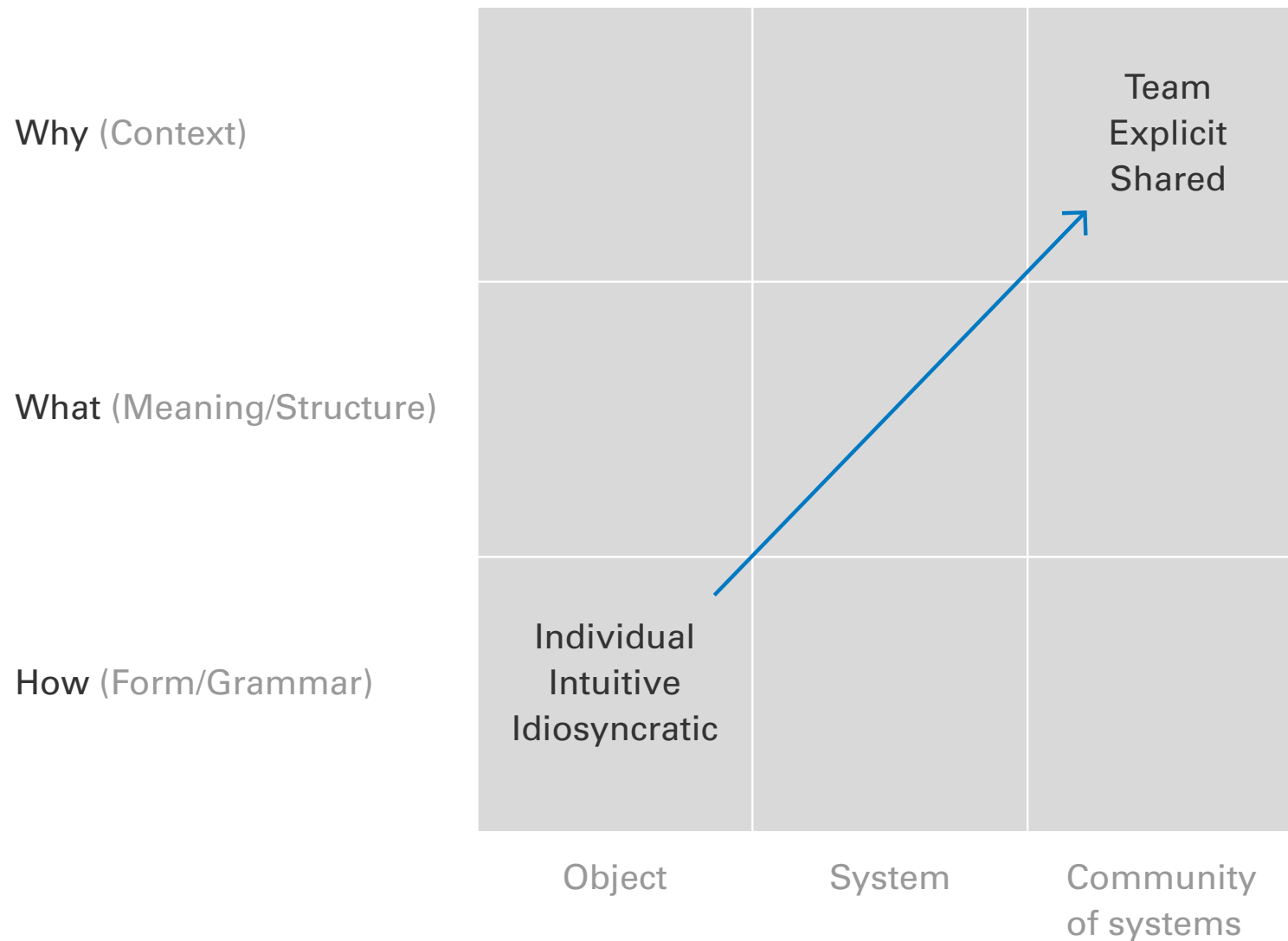


Changes in design practice

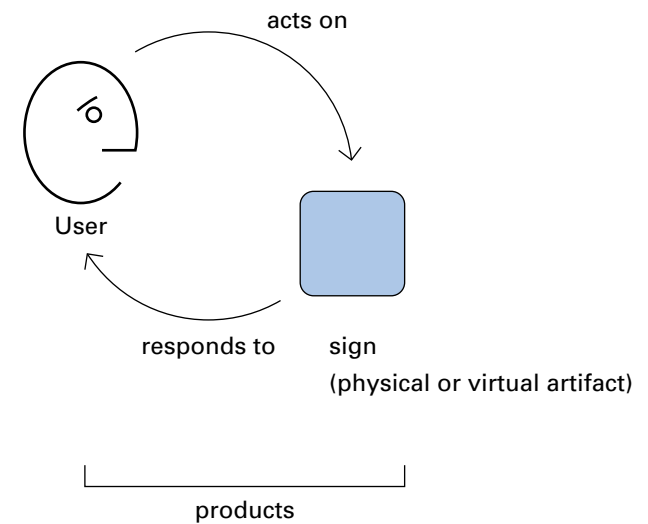
	<i>Hand-Craft</i>	<i>Service-Craft</i>
<i>Subject</i>	Things	Behaviors
<i>Participant(s)</i>	Individual	Team
<i>Thinking</i>	Intuitive	Reasoned
<i>Language</i>	Idiosyncratic	Shared
<i>Process</i>	Implicit	Explicit
<i>Work</i>	Concrete	Abstracted
<i>Construction</i>	Direct	Mediated

Changing nature of design engagements

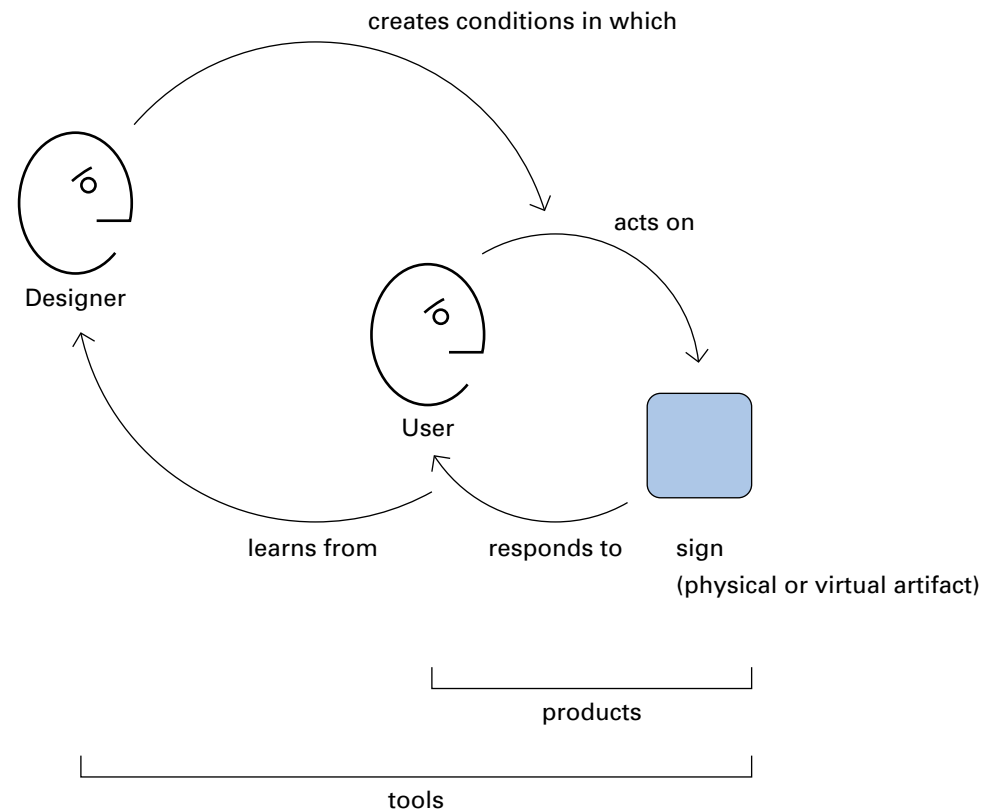
After Joy Doblin and Charles Morris



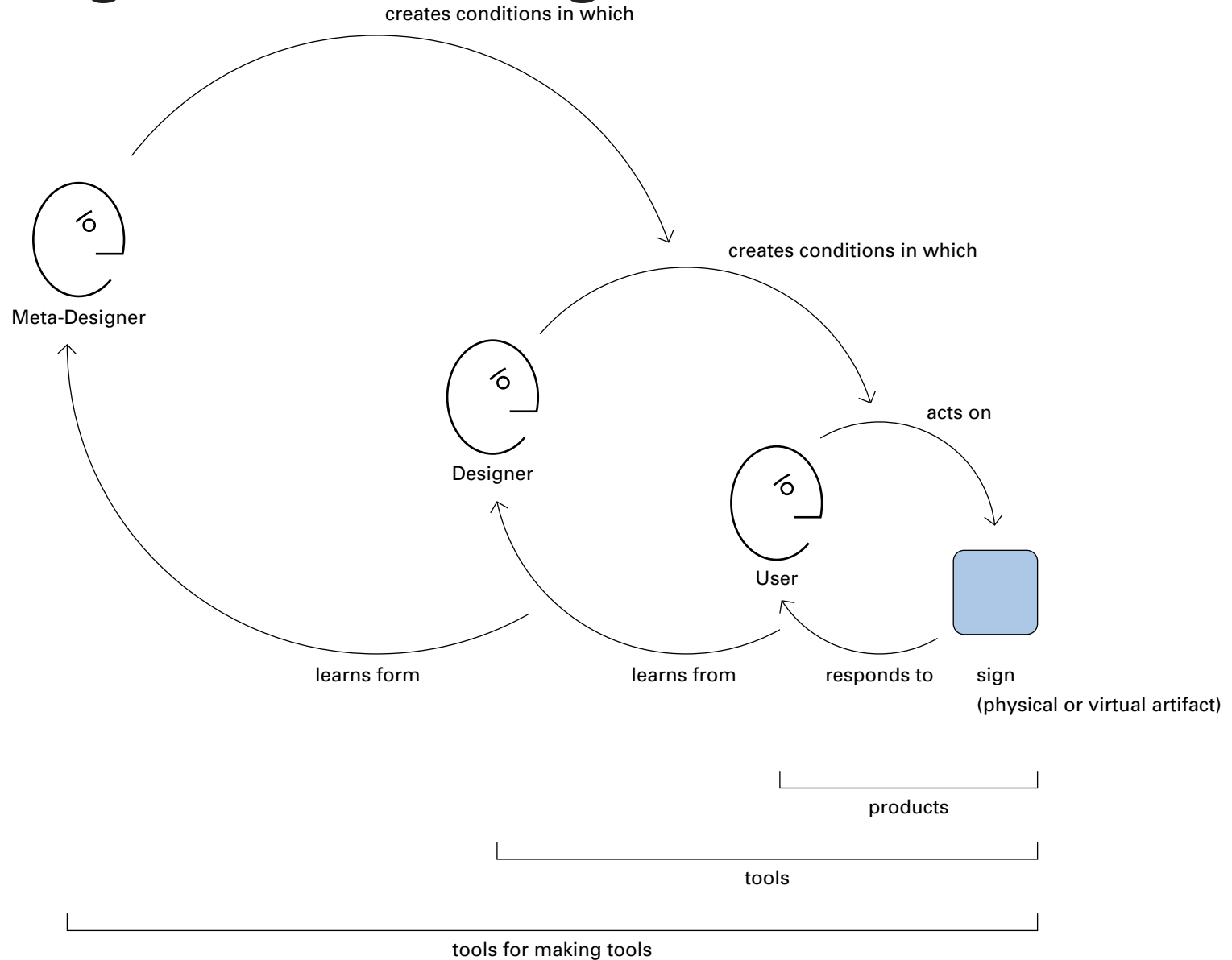
User interacting with artifact



Designer interacting with (User interacting with artifact)



Meta-Designer interacting with (Designer interacting with...



Summary

Era	Focus
19th century	Hand-skills
Early 20th century	Form
Mid-1950s	Methods
Mid-1970s	Meaning
Mid-1990s	Interaction
Late-2000s	Services

Summary

Era	Focus	Role	Activity
19th century	Hand-skills	Individual craftsman	Designing and making tightly coupled (production systems)
Early 20th century	Form	Individual designers	Designing precedes manufacturing (identity systems)
Mid-1950s	Methods	Planning teams	Planning precedes designing (military systems) (first generation)
Mid-1970s	Meaning	Corporate design department	Manufacturing moves toward tailoring (product semantics) (language systems)
Mid-1990s	Interaction	Development teams	Continuous beta replaces periodic editions (electronic systems)
Late-2000s	Services	Facilitators / tool builders	Co-creation (emergent systems)

An emerging theme, with five variations

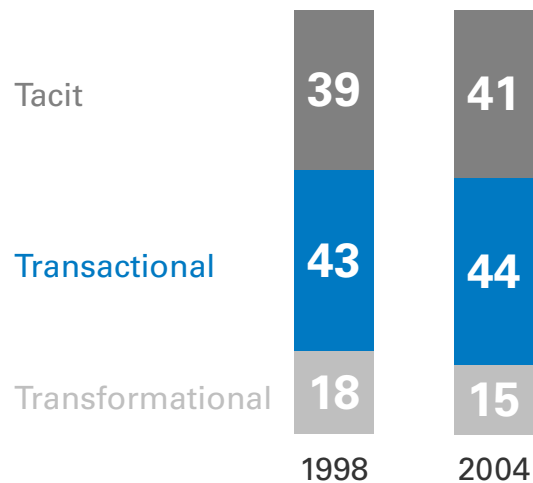
- Participatory design
- Design for evolution
- Design for service
- Integrated systems of products and services
- Platform design

**The shift to a service economy
suggests designers must begin to
design for service**

Recent McKinsey data illustrates a shift in job types

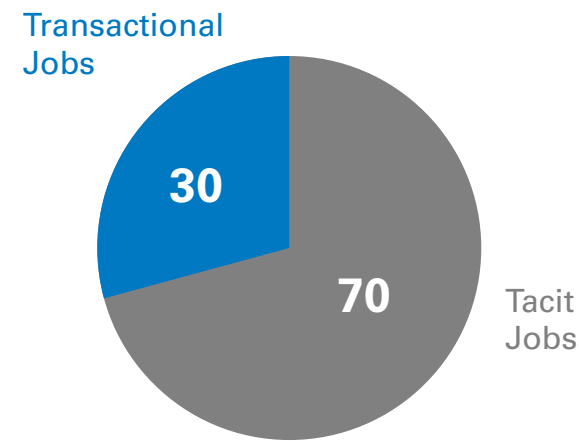
Total U.S. Employment

Number of employees in millions, %



New jobs in the U.S., 1998–2004

100% = 6.4 million



Source: Johnson, Mayika and Lee, Next Revolution in Interactions, McKinsey Quarterly 2005 Number 4

In 2002, IBM bought
Price Waterhouse's IT
consulting business

In 2004, IBM sold its
PC business to Lenovo

In 2005, service was 35%
of IBM's income

In 2007, Philips sold its chip division.

Philips then acquired Health Watch Holdings and Lifeline Systems, another health services company.

Potential for growth

In research (investment in Germany)

Product development	€3,121 / employee / year
Service development	€ 67 / employee / year

— Birgit Mager, KISD

In developing economies

80% of the U.S. GDP is in service
39% of China's GDP is in service
— Mary Jo Bitner, ASU

Ways of thinking about service:

Pine & Gilmore—stage experience

coffee beans > coffee > coffee shop > Starbucks

Commodity



1¢–2¢ Per Cup

Beans

Goods



5¢–25¢ Per Cup

Roasted and ground

Service



75¢–\$1.50 Per Cup

Brewed and served

Experience



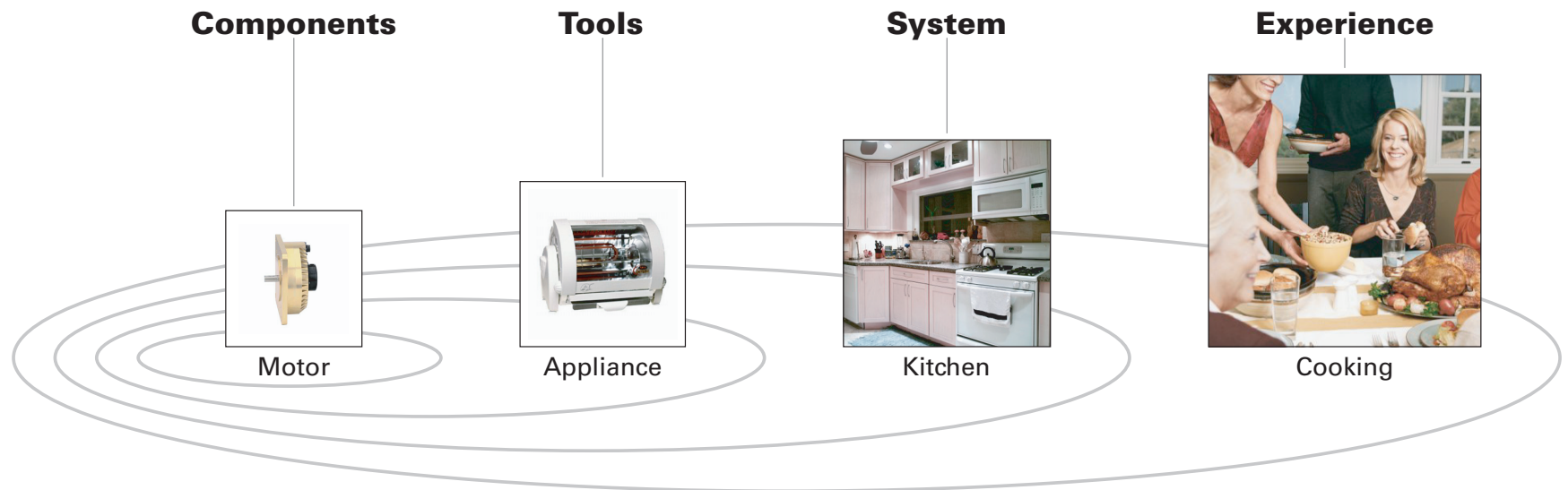
\$2–\$5.00 Per Cup

Treating yourself
to something special

Ways of thinking about service:

Rheinfrank—define marketspaces

motor > blender > kitchen > dining experience



Contrasting Goods and Services

After Lusch

Goods Dominant Logic

Goods

Tangible

Operand Resources

Asymmetric Information

Propaganda

Value Added

Transactional

Profit Maximization

Service-Dominant Logic

Service(s)

Intangible

Operant Resources

Symmetric Information

Conversation

Value Proposition

Relational

Financial Feedback

**Stand-alone products
may soon be impractical.**

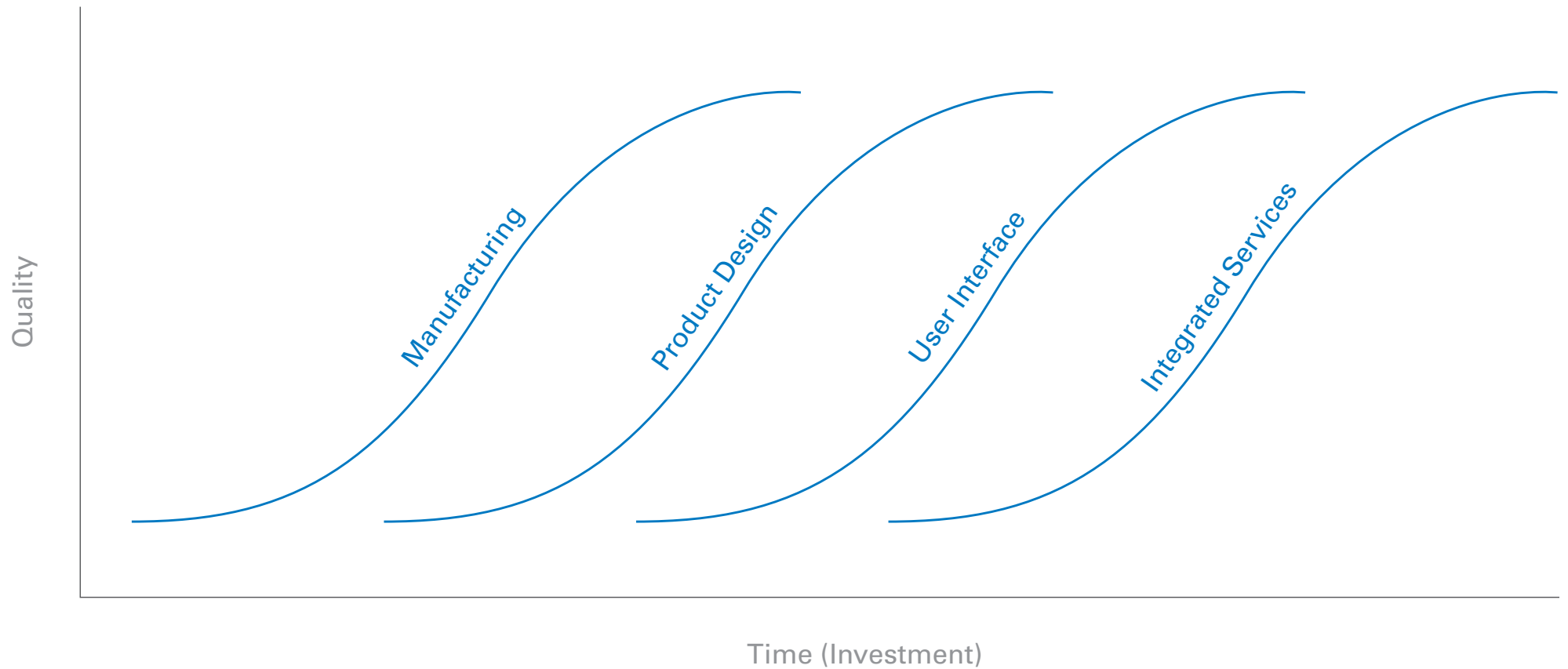
Products already require support services.

**And soon everything will be connected
to the internet.**

For new technologies, services often drive adoption



Services offer opportunity for differentiation



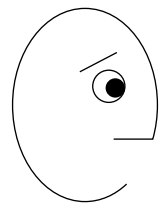
Service examples



Marketplace Networked Service Software iPod = Hardware

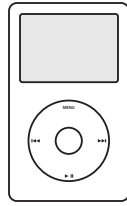


Elements of an integrated system



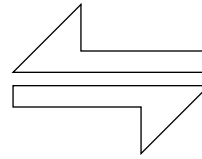
Person

+ Interface



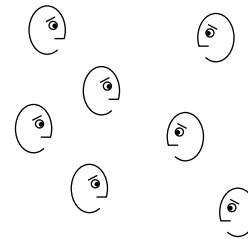
Product

+ Interface



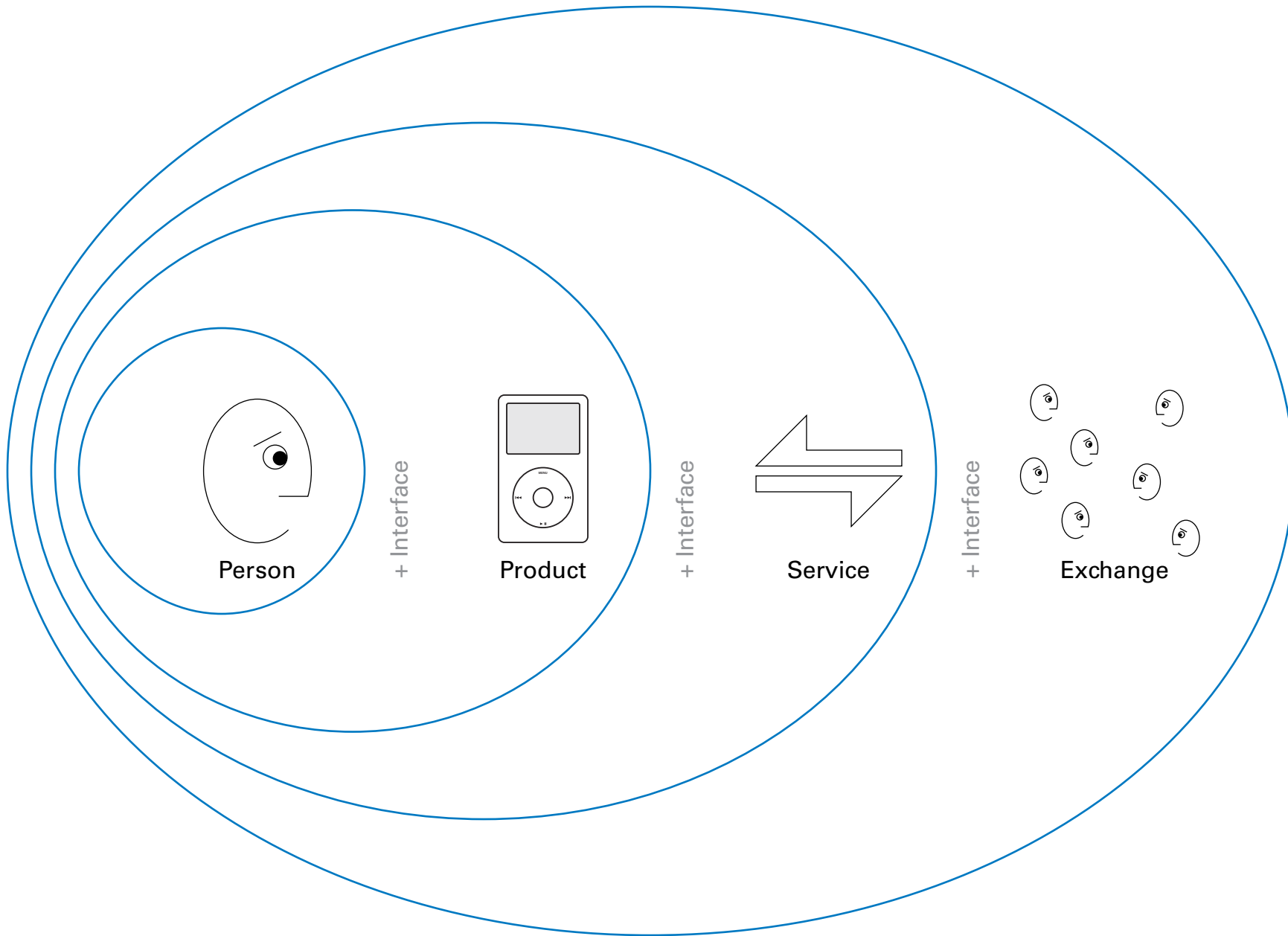
Service

+ Interface

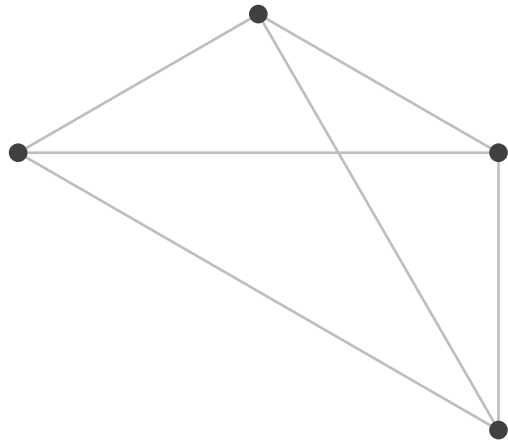


Exchange

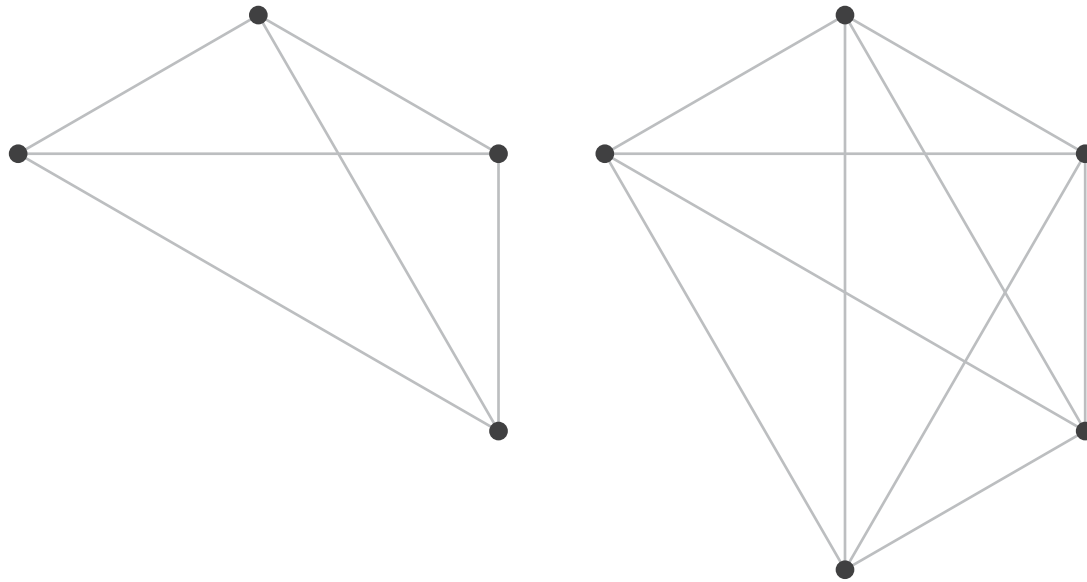
Each step expands our potential



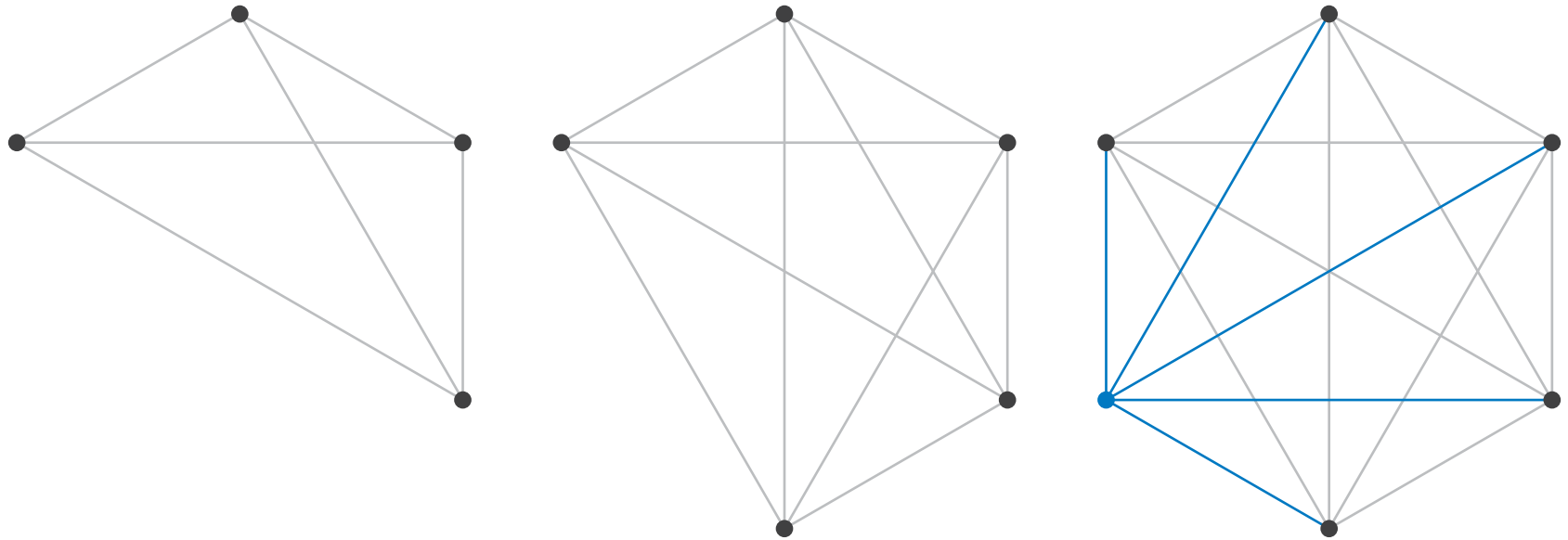
Integrated Systems take advantage of network effects.



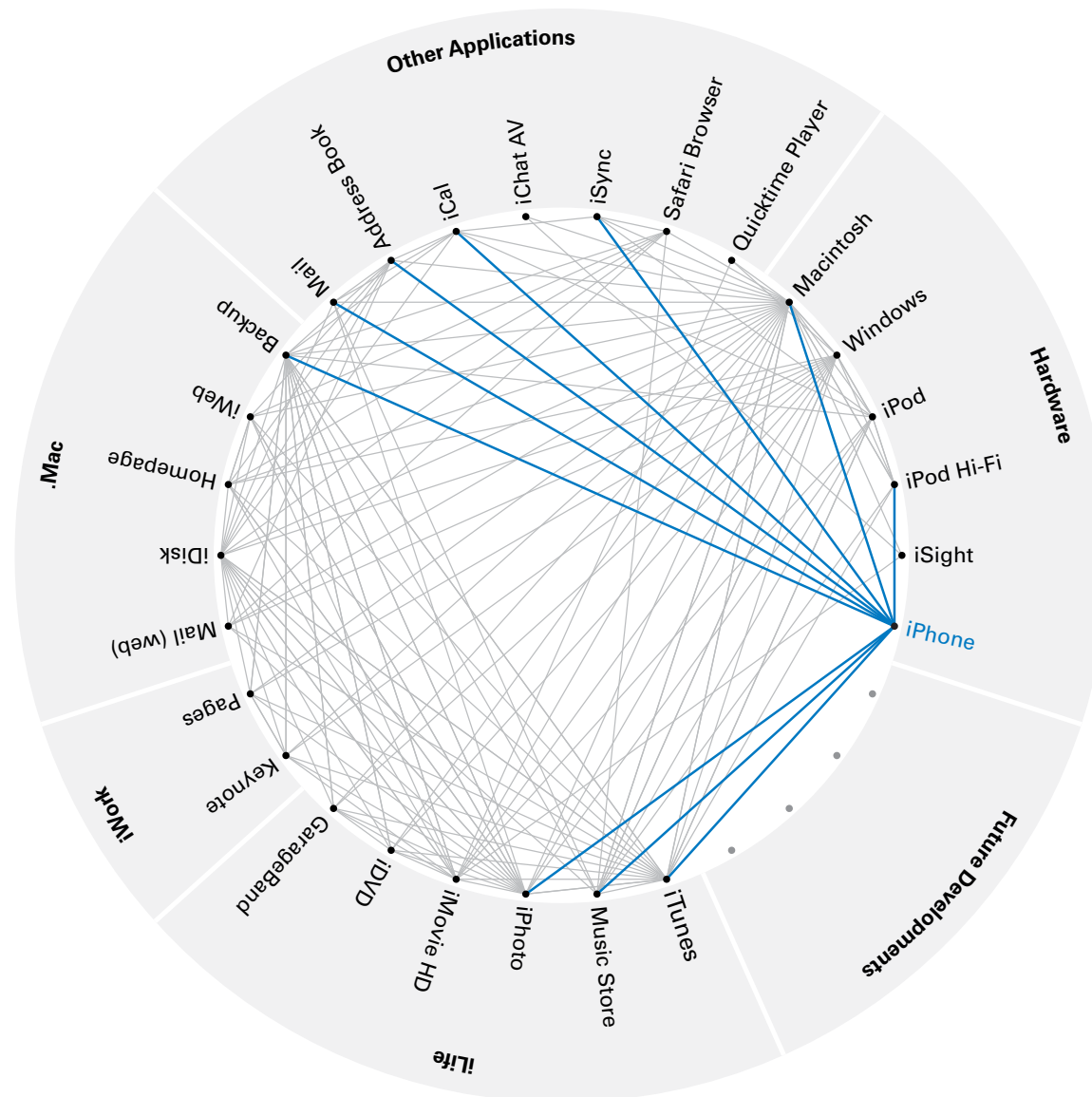
Each new participant provides value to the existing participants.



Each new system enhances the value of the existing Systems.



The iPhone connects with Apple's existing system of systems.



Product as object

Service system

Possesses

Delivers

Visceral

Connected

Immediate

Takes longer to develop

Rapidly judged

Takes more effort to unseat

Physical

Supporting

About components

About relationships

Node

Links

More Static

More dynamic

**A platform is a system
with clear rules for its extension.**

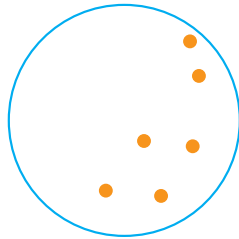
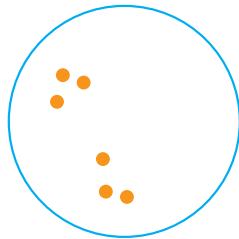
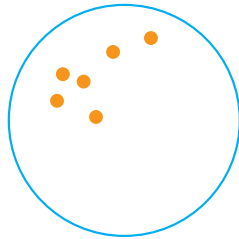
**A platform is a system
with clear rules for its extension.**

**The range of possible extensions
can be narrow or wide.**

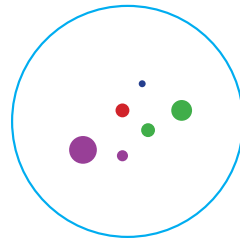
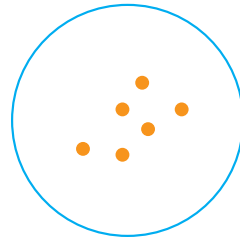
**Extensions can be created by
the original author or by others**

A platform can be extended in three ways

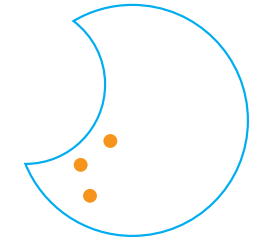
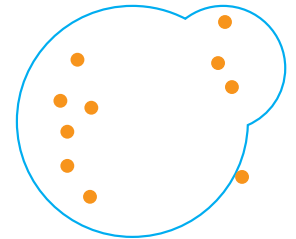
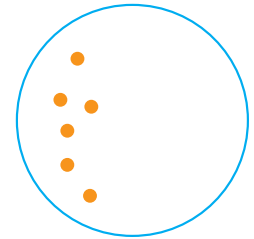
1. Rearrange



2. Modify



3. Add/Delete



Rearrange



Transformers

How should education prepare designers for a future of change?

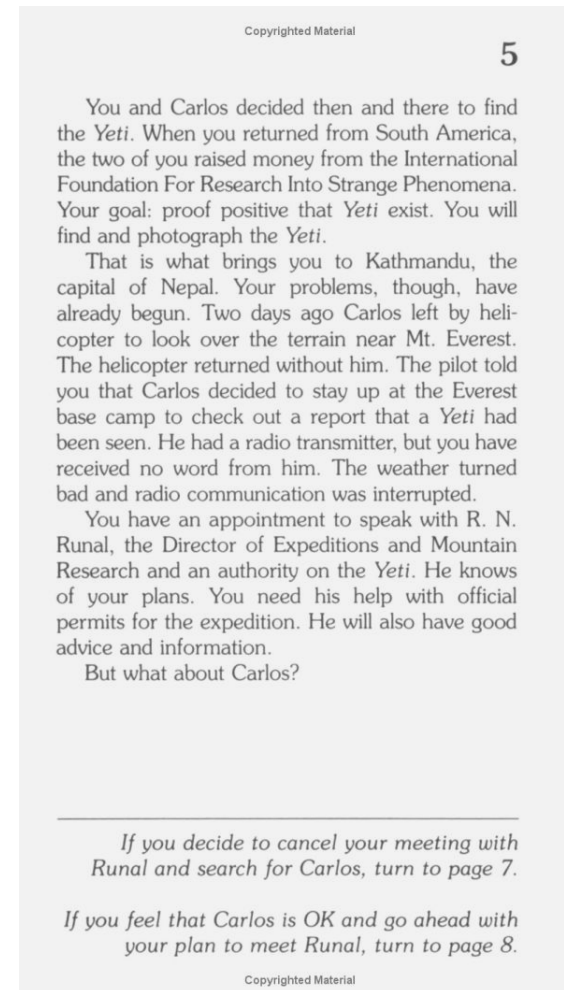
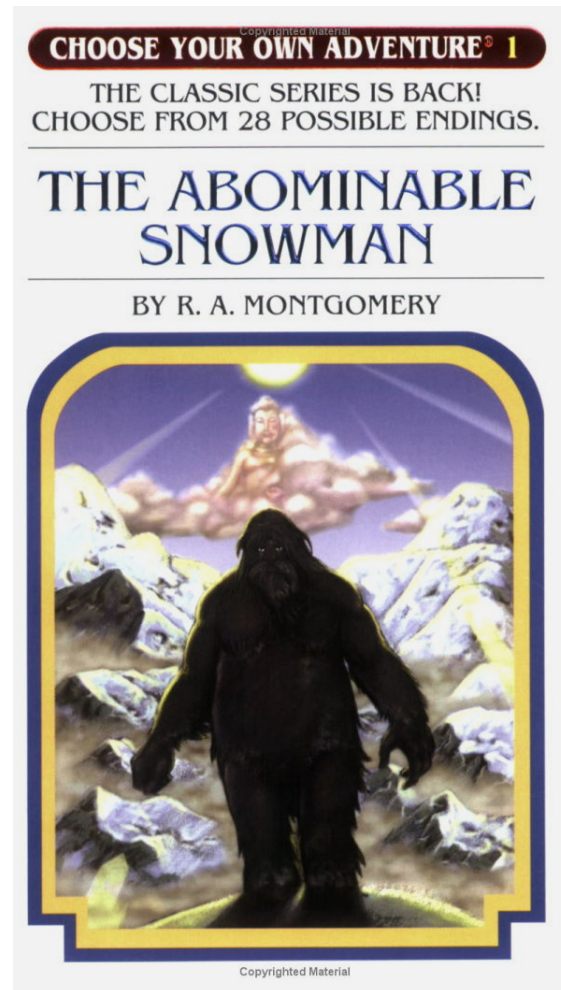
Rearrange



Flap sofa

How should education prepare designers for a future of change?

Rearrange



Choose Your Own Adventure Novels

Modify



Mini Cooper (Color Options)

How should education prepare designers for a future of change?

Modify



Nelson Daybed (Color Options)

How should education prepare designers for a future of change?

Add/Delete



Bugaboo

How should education prepare designers for a future of change?

Add/Delete



Lego

How should education prepare designers for a future of change?

Add/Delete



SmartCubes Shelving

How should education prepare designers for a future of change?

Add/Delete



iPod

How should education prepare designers for a future of change?

Platform Types

	Before manufacture or release	After manufacture or release
For Design	Theme + Variation eg. Grid systems	(Design) languages components and grammars kit of parts + rules for integrating
For Configuration	"choice" by line extension	Personalization Customization Re-use by re-configuring

Platform Types

Before manufacture or release

After manufacture or release

For Design



For Configuration



Platform for design (before manufacture or release)

Theme and variations

- in music
- in architecture
- in fonts
- Masons's marks
- symbol systems

Grid systems

Size systems

- S M L XL XXL
- shoe sizes

Surface systems

- color, pattern, texture, material (e.g. blonde maple)

Platform for configuration (before manufacture)

Body variation on a standard frame

- Model T
- Burritos and other wraps or Asian noodles or soups

Detail variation

- Mini Cooper
- ordering furniture “to build”
- ordering sandwiches or burgers
(e.g. with lettuce and tomato, without onions)
- “Have it your way.”

Platform for configuration (after manufacture)

Personalization (pushed by the supplier)

- classic direct mail, based on previous purchases
- collaborative filtering (e.g. Amazon's recommendations)

Customization (pulled by the user)

- choosing news sources (e.g. configuring MyYahoo)
- skins
- decals (applied detail)
- adding condiments (e.g. extra mustard)

Platform for design (after manufacture or release)

Language (to create “new” ideas)

- components and grammars

Standard building blocks

- letters (also to create new ideas)
- construction sets (bricks, Legos, TinkerToys)
- moveable type
- board games, playing cards

Open source projects

- OED
- Linux
- Mozilla

For design – “expert tools”

Programming languages

- Java

Construction kits

- IDEs (Integrated Development Environments)
- version control systems (e.g. CMS systems)
- blog platforms (Blogger, WordPress, JotSpot)

Operating system platforms

- CPM, DOS, etc.

Mash-up platforms

- network OS API's
- Google, Yahoo, eBay

For design – “end-user programming”

Virtual worlds / God games

- The Sims
- Second Life

Plug-in platforms

- Photoshop

Mark-up languages / stylesheets

- HTML
- CSS

Scripting languages

- Hypertalk
- Javascript
- Flash

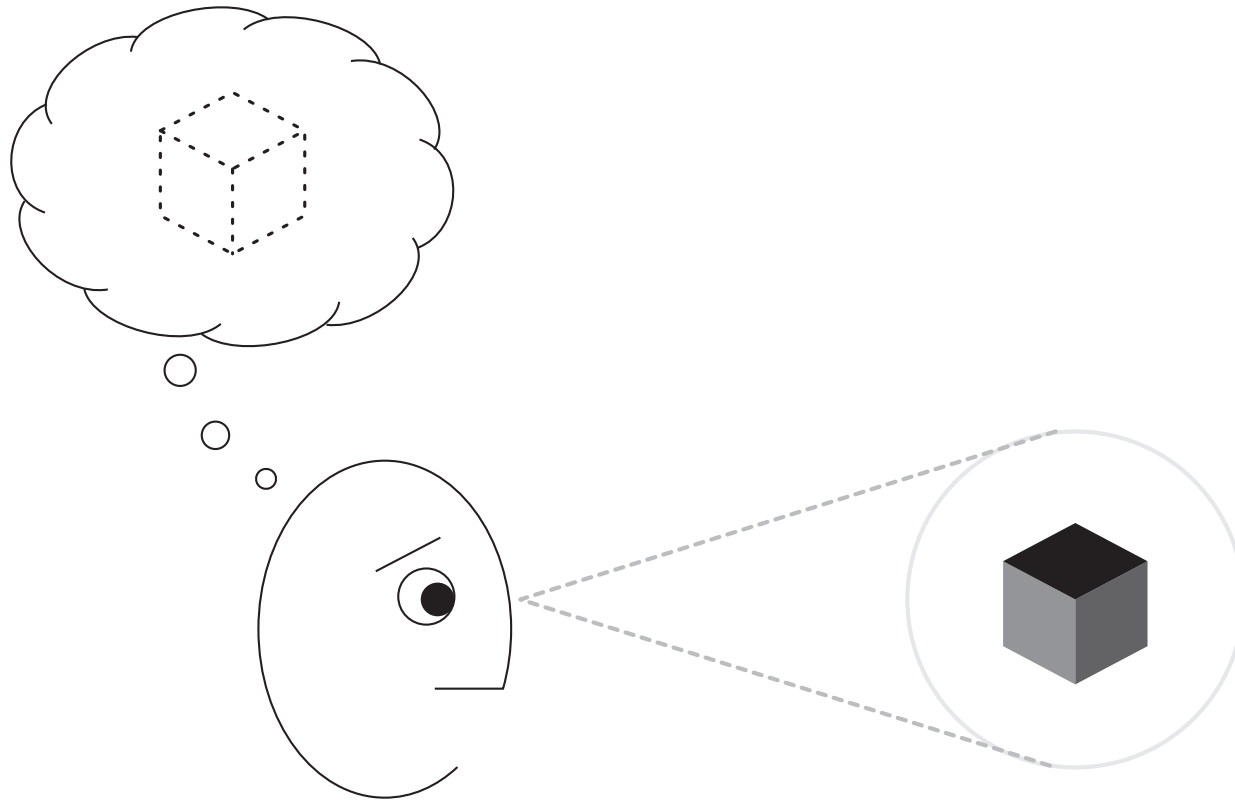
What skills do designers need to deal with change?

When designing platforms
or designing for evolution
or creating opportunities for participation
**designers need to think
in terms of systems.**

That means thinking conceptually.

That requires models.

**A model is an idea
about how part of the world works**



**We do most of our thinking with models...
And these models are our voodoo dolls.” –Alan Kay**

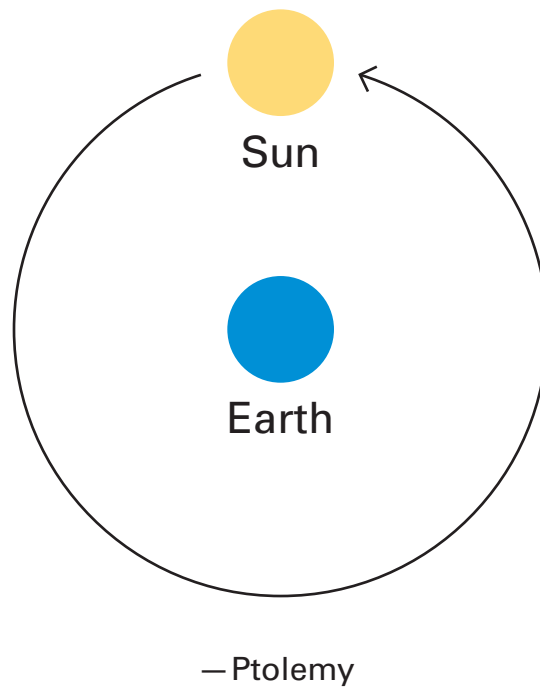


**For example, we see the sun rise in the east
and set in the west...**

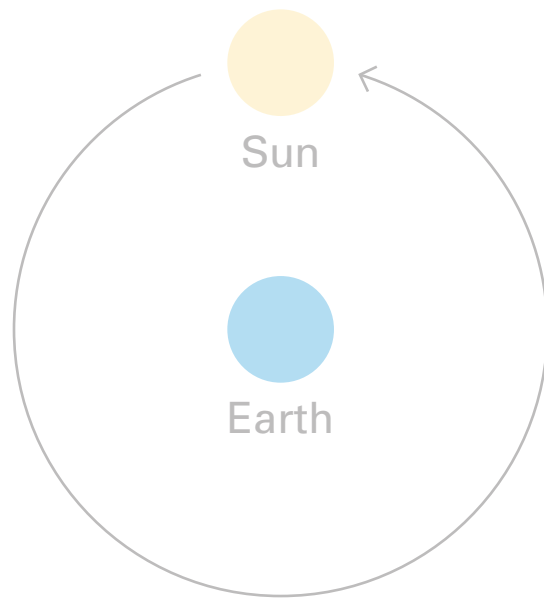


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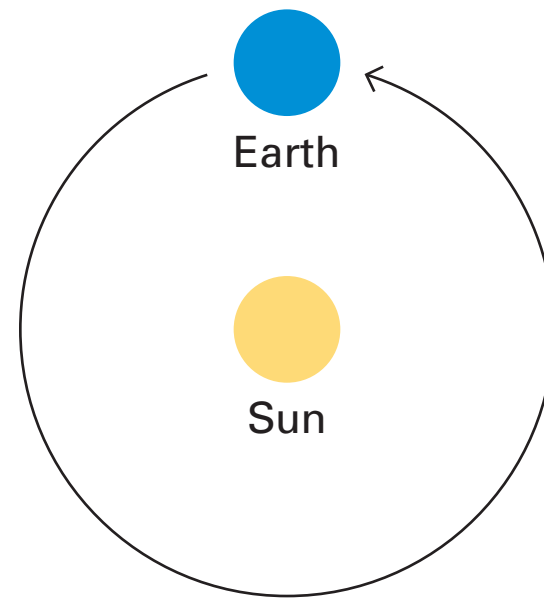
The apparent motion of the sun suggests this model



**Despite what we see everyday,
we think of the earth as revolving around the sun.
Why? What observations support this model?**



— Ptolemy



— Copernicus

**Mars sometimes appears to travel backwards;
both Ptolemy and Copernicus explain Mars' retrograde motion,
but the Copernican model is much simpler**



**Another example, this x-ray photo taken in 1952
by Rosalind Franklin...**

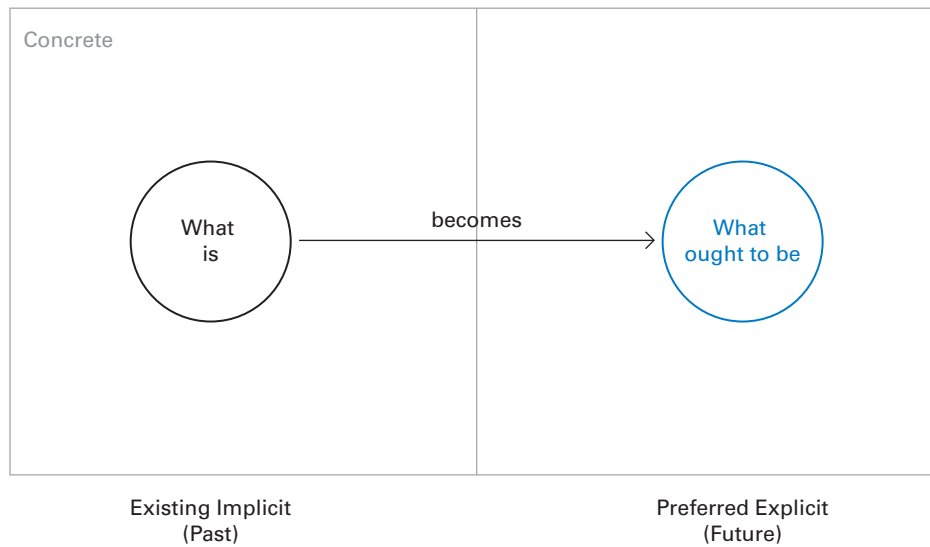


Another example, this x-ray photo taken in 1952
by Rosalind Franklin...
aided the development of our model of DNA

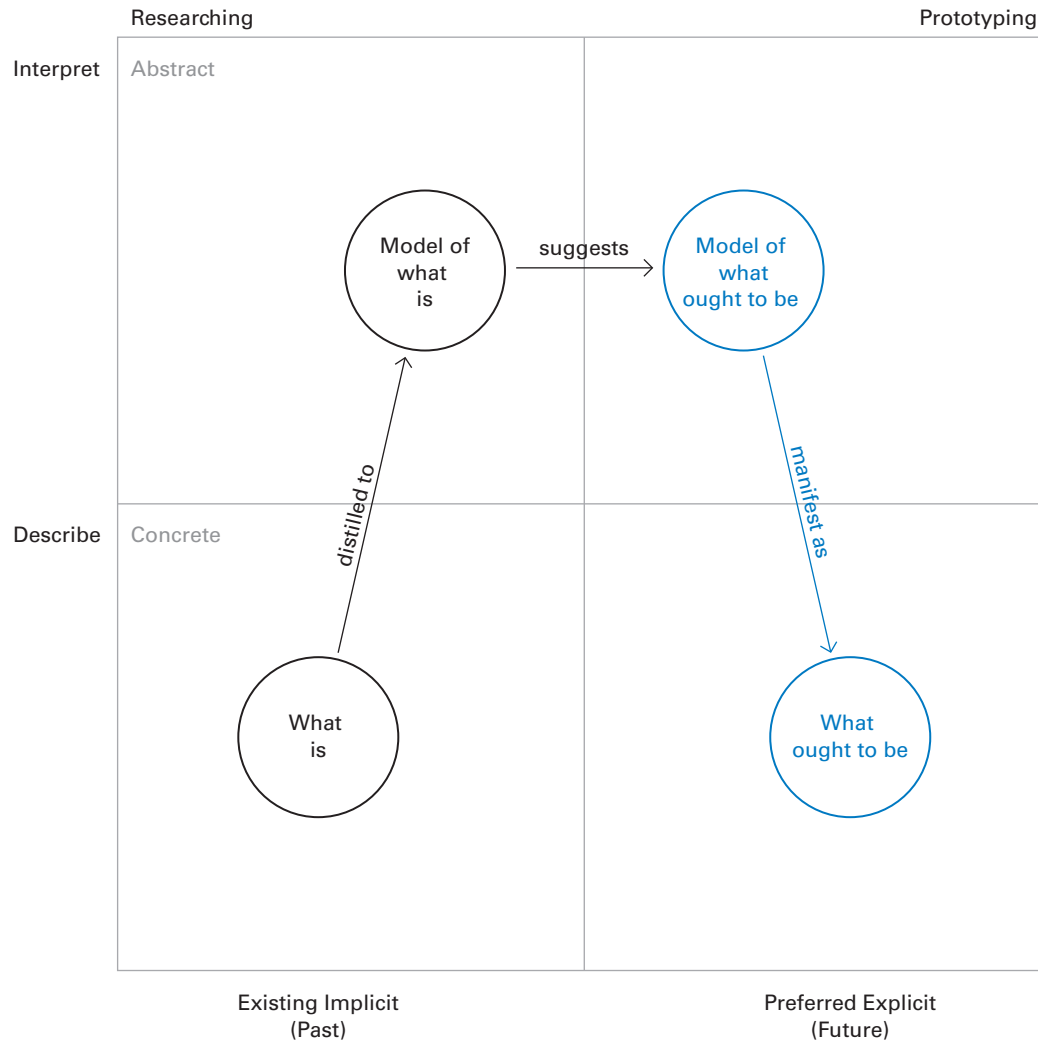


How should education prepare designers for a future of change?

Design is rarely direct making



Most design requires mediation— modeling



new opportunities
new practices
thus a need for
new tools
new methods
new language
and more conversation

Thank you.