

# research design design research

Shashank Mehta

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## Research

Re + Search

- Careful or diligent search
- Studious inquiry or examination
- Investigation or experimentation aimed at the discovery and interpretation of facts
- The collecting of information about a particular subject  
(Britannica Webster's 1999: unpagged)
  - To look into or over carefully or thoroughly in an effort to find or discover something
  - To read thoroughly
  - To look at as if to discover or penetrate intention or nature
  - To uncover, find, or come to know by inquiry or scrutiny
  - To make painstaking investigation or examination
- Systematic investigation into and study of materials and sources in order to establish facts and reach new conclusions  
(Oxford Dictionaries, 2013a)

Research is the 'methodical search for knowledge'

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## Research

Research is systematic enquiry whose goal is communicable knowledge

- systematic because it is pursued according to 'some plan;
  - an enquiry because it seeks to find answers to questions;
  - goal-directed because the objects of the enquiry are posed by the task description;
  - knowledge-directed because the findings of the enquiry must go beyond providing mere information;
- and
- communicable because the findings must be intelligible to, and located within some framework of understanding for, an appropriate audience.

The Nature of Research; Bruce Archer  
Co-design, interdisciplinary journal of design; January 1995

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The Scientific Revolution has not been a revolution of knowledge.  
It has been above all a revolution of ignorance.

The willingness to admit ignorance has made modern  
science more dynamic, supple and inquisitive than any  
previous tradition of knowledge.

Sapiens: A Brief History of Humankind  
Harari, Yuval Noah

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"...the idea that science is an empirical endeavor in which all the participants, including a new student like myself, could come up with alternative theories, as long as they found empirical ways to test these theories, opened up a new world to me. "

"experiments are like microscopes or strobe lights. They help us slow human behavior to a frame-by-frame narration of event, isolate individual forces, and examine those forces carefully and in more detail. They let us test directly and unambiguously what makes us tick. "

Predictably Irrational  
Dan Ariely

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*· There is an irresistible drift towards the exact sciences –defined as 'exact' by their use of mathematical tools.*

*· Statistics courses are now part of the basic requirements not just in physics and biology, but also in psychology, sociology, economics and political science*

Sapiens: A Brief History of Humankind  
Harari, Yuval Noah

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What is enlightenment?

It consists of "humankind's emergence from its self-incurred immaturity"

Enlightenment's motto is "Dare to understand!"

Its foundational demand is freedom of thought and speech.

Immanuel Kant

Enlightenment Now: The Case for Reason, Science, Humanism, and Progress  
Pinker, Steven

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Psychologists have long known that the human brain is infected with motivated reasoning (directing an argument toward a favored conclusion, rather than following it where it leads),

biased evaluation (finding fault with evidence that disconfirms a favored position and giving a pass to evidence that supports it),

and a My-Side bias (self-explanatory).

We don't believe in reason; we use reason

Enlightenment Now: The Case for Reason, Science, Humanism, and Progress  
Pinker, Steven

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The culture of science

Its signature practices, including open debate, peer review, and double-blind methods, are designed to circumvent the sins to which scientists, being human, are vulnerable.

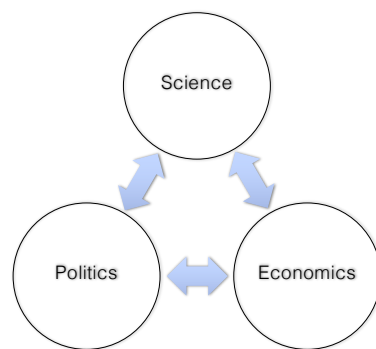
The first principle of science is "that you must not fool yourself—and you are the easiest person to fool."

- Richard Feynman

The lifeblood of science is the cycle of conjecture and refutation: proposing a hypothesis and then seeing whether it survives attempts to falsify it.

Enlightenment Now: The Case for Reason, Science, Humanism, and Progress  
Pinker, Steven

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Practice

- creating new works - of literature, drama, music, etc.
- performing existing works - of drama, music, etc;

Scholarship is essentially comprehensive knowledge of a particular field in a particular discipline.

- Development of knowledge in person
- knowing the content, authorship, history and categorization of works

Research in that discipline consists in finding new things to know, or in identifying new ways of knowing them, or in refuting previous commentary on existing material.

- Rigorous production of knowledge or insights that can be effectively shared

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Research has goals quite different to those of practice...

Research asks a question, selects appropriate methods, tests the question, analyses the results, and disseminates the conclusions unambiguously...

.. it lays down reliable knowledge that future researchers may follow, and methods that may be repeated if necessary

(Durling, 2002: 81).

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Applied Research

Systematic enquiry directed towards the acquisition, conversion or extension of knowledge for use in particular applications.

Action Research

Systematic enquiry conducted through the medium of practical action calculated to devise or test new or newly imported, information, ideas, forms or procedures and generate communicable knowledge

Fundamental Research, Strategic research, Option Research

The Nature of Research; Bruce Archer  
Co-design, interdisciplinary journal of design; January 1995

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'knowledge is power'

The real test of 'knowledge' is not whether it is true, but whether it empowers us.

Scientists usually assume that no theory is 100 per cent correct.

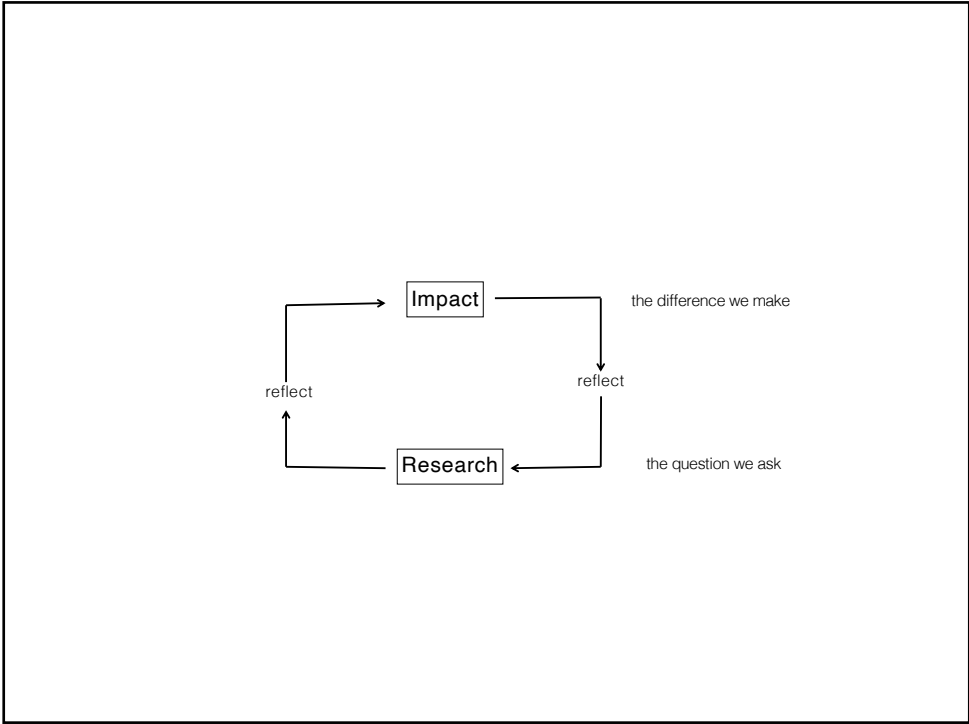
Consequently, truth is a poor test for knowledge.

The real test is utility.

A theory that enables us to do new things constitutes knowledge.

The New Instrument: a scientific manifesto; Francis Bacon

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**industrial economy**  
**knowledge economy**  
**innovation economy**

*... a creative economy*

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*the world is understood through the hand, not the mind -  
the hand is the cutting edge of the mind.*

Bronowski

*it is the hand allied to the senses and the mind that forms the  
coordinated trinity of powers by which human beings have asserted  
ever-greater control over the world.*

John Heskett  
Design; A Very Short Introduction

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*to move beyond an accumulation of pragmatic experience into the  
realm of ideas as abstractions...*

*...abstraction enables capacities to be separated from specific  
problems, to be generalized, and flexibly adapted to other problems.*

John Heskett  
Design; A Very Short Introduction

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**One-stop solution for all flower requirements: gifting, arrangement**

**Features**

- Online delivery services
- Wide range of Products
- Floral decoration in weddings, corporate events and parties.
- Within stipulated time schedule
- Throughout 32 Indian cities & 4 Countries
- Wide presence on internet
- Online delivery services
- Reliable and cost effective

**Ferns n Petal**

NEED – Express feelings through gift  
Time, Type, Place, Way, After sales

Saves Effort  
Saves Time  
Provides access - Multiple Touch Points  
Strong Networks  
- Chat online with care

Reliable  
Skill

**Customization and Personalization (control to customer)**  
Building relationships (gift advisor & personal account)

- ING

Act of giving, Offering something to someone for his benefit!  
Can't have ownership  
Can't be stored  
May involve tangibles like product and/or intangibles like experience  
Itself an intangible

**UNDERSTANDING OF SERVICE**

**Dropbox**  
Web-based file hosting

Lean practice | Viral Marketing | Analytics

A service deals with people to make their life more efficient, while offering some unique features to add value to peoples life for which they would be willing to use the service and pay for it.

**Burson-Marsteller**

Public image | Client | Crisis management

**Business Model**

Out sourcing | Strategic | Measurement monitoring | Research | Social audits | Case Study

A service is managing the given resources through the appropriate usage and vast coverage in the given context.

**Service Characteristics**

- Invisibly intangible
- Perishable
- Heterogeneous
- Inseparable
- Indivisible
- Inalienable
- Non-storable
- Non-transferable
- Non-excludable
- Non-rivalrous

**Nature of Service**

Service is a process of providing value to the customer by using resources. It is a process of providing value to the customer by using resources. It is a process of providing value to the customer by using resources.

**Strategy**

1. First, exponentially growing
2. Diversify, Diversify, Diversify
3. Very few paid employees, many volunteers

**Students' classroom assignments**

Write the most important characteristics of service. How do you think service is different from other products? How do you think service is different from other products? How do you think service is different from other products?

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So she said "Ask him, how much alum to how much water?"

So I asked.

Mohammedbhai laughed and said, "Oh she can see what I am doing."

She watched. Again she said, "Please ask him, if he puts too much alum then he'll get deep red and if he puts less then he'll get bright red."

So I related this to Mohammedbhai and said this is what she is asking.

He said "Well, now she has framed her question rightly. Now I will answer her question."

He stirred the solution, put a little bit of it on his tongue and said something that could be from the Upanishads, "As I savour the taste of alum on my tongue, I visualize the shade of red that I will get."

Towards a Space and Identity for Craftspeople in India; Jyotindra Jain  
Indian Crafts in a Globalizing World

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“हम पहले मशीन बनाते हैं,  
फिर उसकी ड्राइंग बनाते हैं”

the design approach as described by one of the product developer at  
Ludhiana

Design at the Doorstep  
Shashank Mehta

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*... indigenous innovations*



Cutter (slicer) for garlic.

Crushing garlic, chaichi, etc.

Being used as a slicer or cutter for soft fruits like banana.

Green-chilly cutting.

'katori' as a peeler.

reflection through design

Students' classroom assignments

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*...indigenous innovations*



To make 'dosa' on a pan.



As a mould for rice, sweets like sheera, etc.



As a pattern maker for poories.

*"The simplicity of the product made me study it's innovative uses by the Indian housewives. The uses (affordances) might not even have been thought of, before it's manufacture...."*

*....The simpler the product, the more it is useful, in other words, the less is more."*

- Amit Patankar, Product Design, 2004.

Students' classroom assignments

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Theory  
Practice  
Theory

"practice [is] informed by theory, and theory informed by practice"

(McCullagh in Dudley and Mealing, 2000)

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Source: Drawn from D.A. Kolb, *Experiential Learning: Experience as the Source of Learning and Development* (New Jersey: Prentice-Hall, 1984); an earlier Y. Kolb and David A. Kolb, *The Kolb Learning Style Inventory—Version 3.1: 2005 Technical Specifications* (Hay Group, 2005).

"experiential learning theory"

Learning - "the process whereby knowledge is created through the transformation of experience,"

Learning process - applying the four steps of experiencing, reflecting, thinking, and acting in a highly iterative fashion.

Kolb, 1984

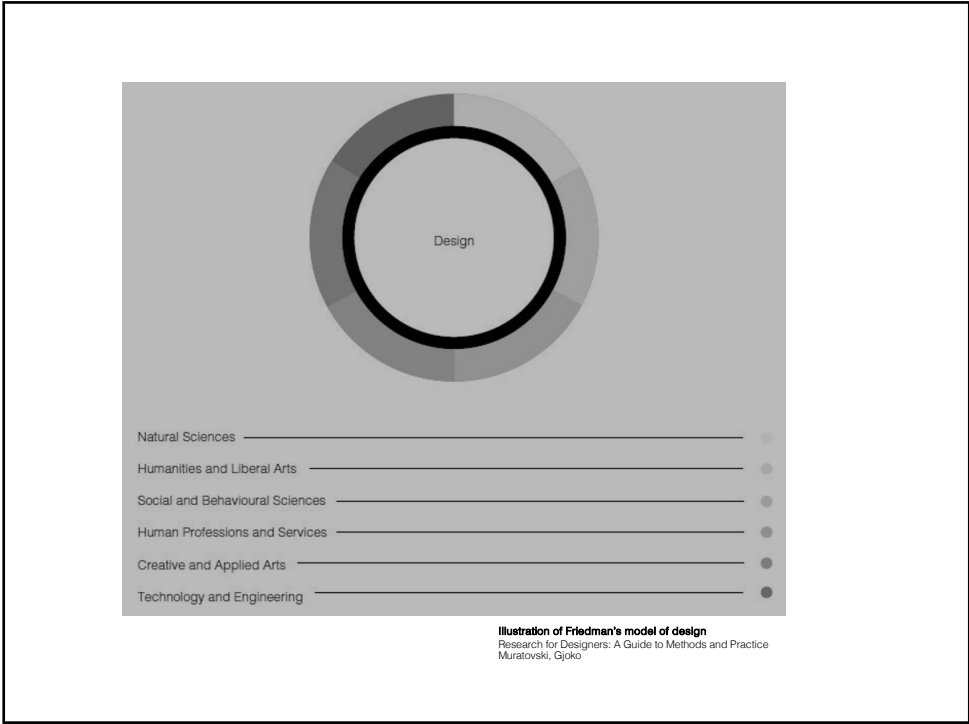
Innovation as a Learning Process: Embedding Design Thinking  
Sara L. Beckman, Michael Berry

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***The ten innovation elements as personas rather than tool reminds us that innovation is a full time endeavor for all modern organizations.***

- The Anthropologist
- The Experimenter
- The Cross-Pollinator
- The Hurdler
- The Collaborator
- The Director
- The Experience Architect
- The set designer
- The Caregiver
- The Storyteller

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Design ...

**outcome  
process**

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*making sense of things*  
Krippendorf and Heskett

*to organize, manipulate, prune and filter  
gathered data into a cohesive structure for  
information building*  
Kolko, 2007b

*Good designers can create normalcy out of Chaos*  
Veen, 2000

*Fieldwork, theory and evaluation data provide  
systematic input to the process,  
but do not by themselves provide the necessary  
whole.*

## Design

*For the latter, there is only design*  
Fallman, 2003

*..the product of thought and deliberate action  
that is composed by intentions and imagination  
and its effects are refined by iterative explorations  
and supported sensitive judgments and convictions  
where actions come before the provision of proof of  
concept.*  
Ranjan 2014

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## Design

*..humility  
..sensitivity  
..empathy*

Charles and Ray Eames

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# Design

*Design is essentially a human-centred activity. It strongly believes in a holistic approach with an emphasis on generating new opportunities, improving standard of living and preserving the values of traditional society.*

*..www.shashankmehta.com*

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# Design

*'Design is a way of inquiring,  
a way of producing knowing and knowledge;  
this means it is a way of researching'*

*Design Research  
Peter Downton (2003: 1)*

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*"Frankly, one of the great strengths of design is that we have not settled on a single definition. Fields in which definition is now a settled matter tend to be lethargic, dying, or dead fields, where inquiry no longer provides challenges to what is accepted as truth."*

Richard Buchanan, 2001

*"... try to kind of define it, it's like trying to define a butterfly.*

*As soon as you pin it down, it dies"*

*- John Thackara on innovation (but the same can be said of design)*

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**design** is to **design** the **design** of a **design**.

1

a general concept,  
policy

2

an activity

3

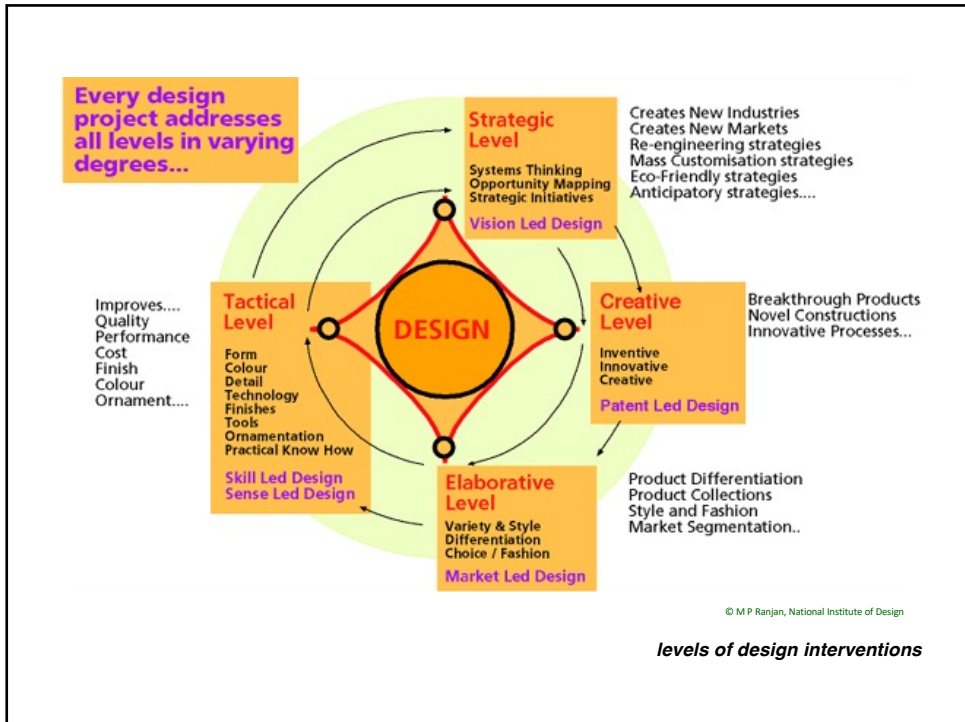
a plan or intention

4

a finished outcome,  
a product

Source: Prof. John Heskett

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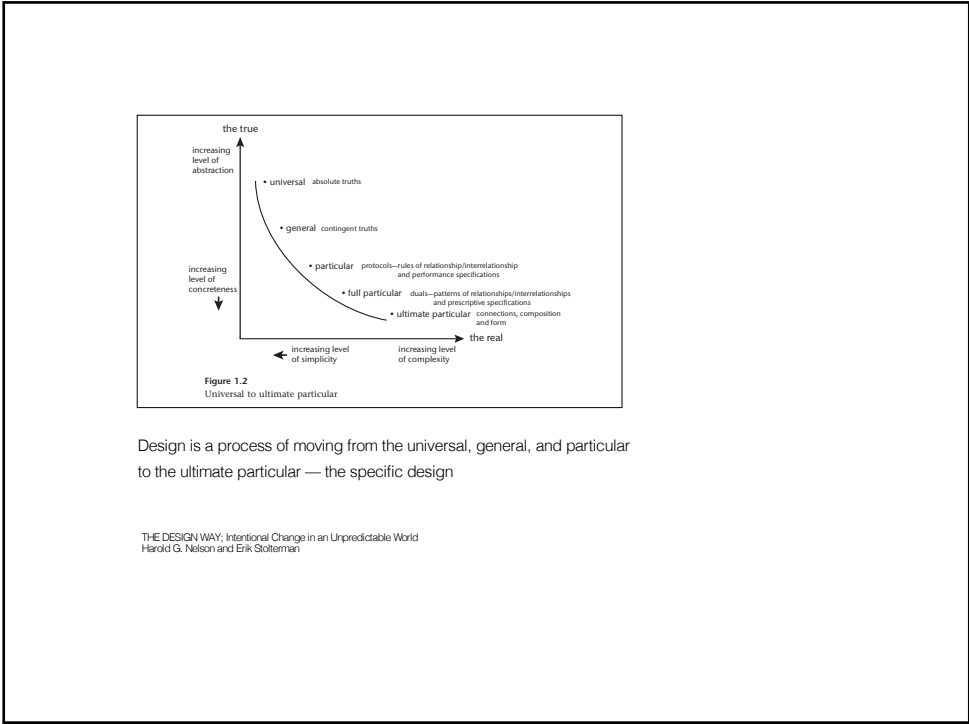


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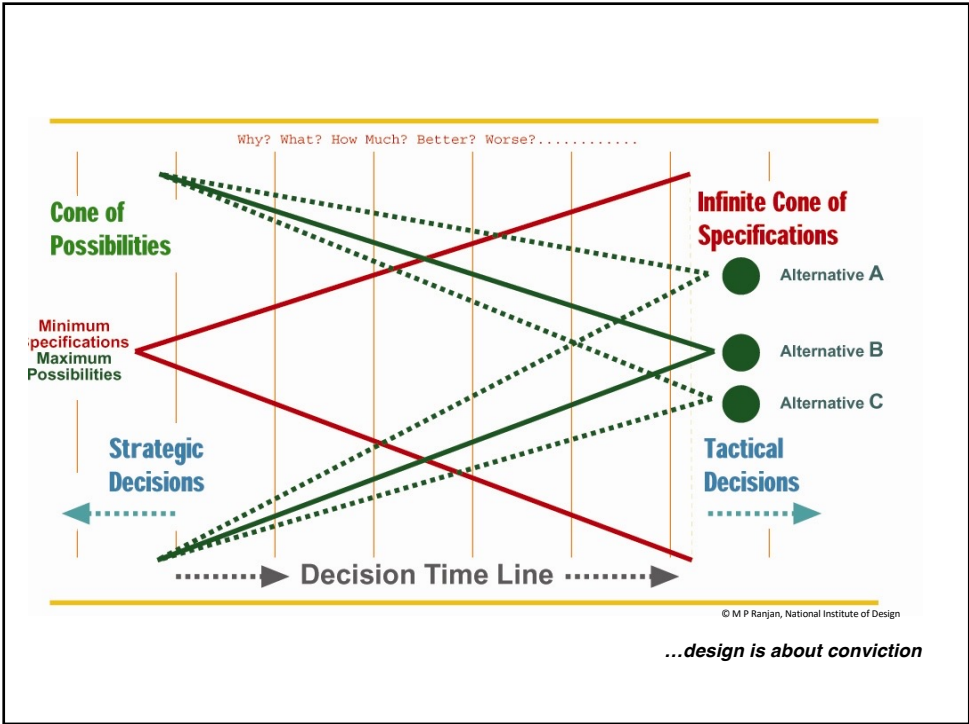
Design, in a certain sense, is research done backwards.  
 Research starts with the particular and moves towards the general.  
 Design starts with the general and works towards the particular.

The Nature of Research into Design and Design Education  
 Bruce Archer

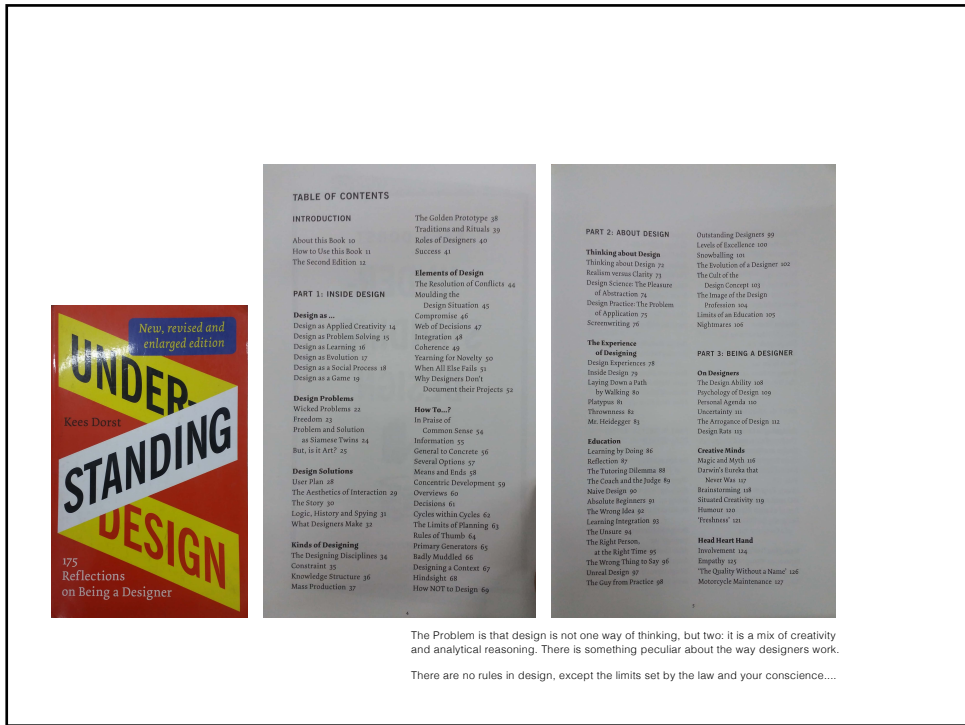
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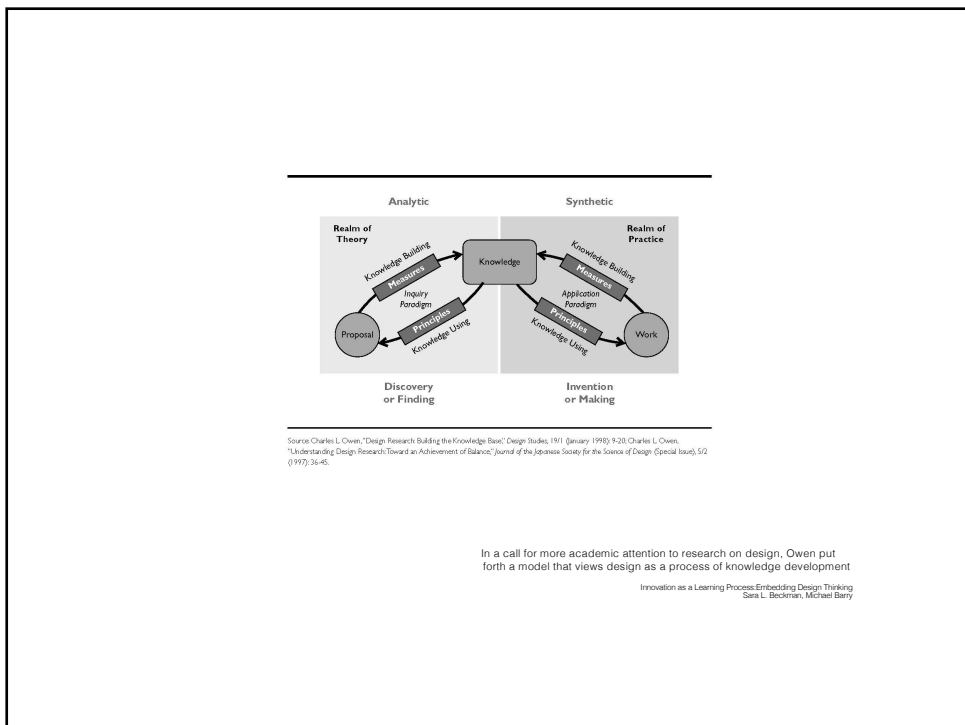
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The Problem is that design is not one way of thinking, but two: it is a mix of creativity and analytical reasoning. There is something peculiar about the way designers work.  
There are no rules in design, except the limits set by the law and your conscience....



In a call for more academic attention to research on design, Owen put forth a model that views design as a process of knowledge development

Innovation as a Learning Process: Embedding Design Thinking  
Sara L. Beckman, Michael Barry



**The Ultimate Particular**

true  
↓  
real → ● → Design  
↑  
ideal

**Figure 1.5**  
Design inquiry: an emergent compound

**The Ultimate Particular**

Designs of Inquiry and Action			
	the real	the true	the ideal
ends	that-which-is	that-which-can-be	that-which-is-desired-to-be
		that-which-needs-to-be	that-which-should-be
			that-which-ought-to-be

**Figure 1.7**  
Outcomes of inquiry for action

• conscious knowing	— reason
• unconscious knowing	— intuition
• subconscious knowing	— imagination
• conscious not-knowing	— design thinking

**Figure 1.8**  
Design knowing

...design inquiry is, in actuality, an emergent, compound form of inquiry that is inclusive of the real, the true, and the ideal.

When used together, the resulting approach to knowledge acquisition is much more synergistic, comprehensive, and integrative than the individual approaches taken in summation.

THE DESIGN WAY: Intentional Change in an Unpredictable World  
Harold G. Nelson and Erik Stolterman

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design knowledge

A set of visions, proposals, tools and reflections: to stimulate and steer strategic discussions, to be applied in a variety of specific projects, to help understand what we are doing or could do.

This knowledge has to be explicit (to be clearly expressed by whoever produces it), discussable (to permit the exchange of opinions among many interested interlocutors), transferable (to be applicable by other designers) and possible to accumulate (to form a reservoir of design knowledge that could be the starting point for producing further knowledge by other researchers)

(Manzini, 2009: 9)

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# Design

- *Bringing Order*
- *It is not just an Art but a Service*
- *Ability to view the problem from a holistic angle*
- *It tries to understand the User especially in the area of Functional Use of the Product*
- *Enhances the Quality of Life*

*...role of design*

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# Designer

- *The ability to understand the context or a circumstances and framing Problems in the unique and insightful ways*
- *Working at multiple levels of abstraction*
- *Modeling and visualizing outcomes despite incomplete information*
- *Creating and evaluating multiple alternatives*

- *Maintaining or even adding to value as elements are brought together to form an integrated solution*
- *Establishing meaningful relationships among elements and between a solution and its context*
- *Using form and visual languages to embody ideas and to communicate*

*...competencies of the designer*

Design Management review Spring 2004

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- *Designers have the right skills and mindset that make them comfortable dealing with unfamiliar concepts, fuzzy problems and high level of ambiguity*
- *Designers are not afraid of experimentations*

## Designer

- *Willing to challenge the status quo*
- *Holistic vision*
- *Unique focus on quality*
- *Special understanding of consumer needs*

*...competencies of the designer*  
Design Management review Spring 2004

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**Design Process**  
**Design**  
**Design Thinking**

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# Design Thinking

*..a creative approach to problem solving that starts with people and ends with innovative solutions that are tailor made to suit their needs*

*..human-centered design; IDEO*

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Design thinking relies on our ability to be intuitive, to recognize patterns, to construct ideas that have emotional meaning as well as functionality, to express ourselves in media other than words or symbols.

design thinking is fundamentally an exploratory process

The evolution from design to design thinking is the story of the evolution from the creation of products to the analysis of the relationship between people and products, and from there to the relationship between people and people.

The mission of design thinking is to translate observations into insights and insights into products and services that will improve lives.

design thinking is neither art nor science nor religion. It is the capacity, ultimately, for integrative thinking.

The tools of the design thinker—getting out into the world to be inspired by people, using prototyping to learn with our hands, creating stories to share our ideas, joining forces with people from other disciplines—are ways of deepening what we know and widening the impact of what we do.

Design thinking starts with divergence, the deliberate attempt to expand the range of options rather than narrow them. - divergent, synthesis-based methods design thinking demands.

Change by Design: How Design Thinking Transforms Organizations and Inspires Innovations  
Tim Brown

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**RELATED DESIGN MOVEMENTS**

YEAR	DESIGN MOVEMENT	DESIGN APPROACHES	PEOPLE
2010s	Design Thinking	Experience design	David Kelley
		Creative class	Tim Brown
			Roger Martin
			Bruce Nussbaum
			Rolf Faste
2000s	Service Design	Human Centered Design	Lucy Kimbell
1990s	Process Methods	Meta Design	Ezio Manzini
			William Rouse
			Richard Buchanan
1980s	Cognitive Reflections	User Centered Design	Don Norman
			Donal Schon
			Nigel Cross
			Peter Rowe
			Bryan Lawson
1970s			Robert McKim
1960s	Design Science	Participatory Design	Horst Rittel
		Design Methods	Herbet Simon
			Bruce Archer
1950s	Creativity Methods	Brainstorming	Alex Osborn

the world of design evolved from studying things to studying humanity

from a technical profession, design evolved to become an academic discipline in its own right.

Research for Designers: A Guide to Methods and Practice  
Muratovski, Gjoko

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The most basic design process may be seen as the famous squiggle drawn by Damien Newman of IDEO, which captures the essential quality of a project that moves from a state of messy questions to a state of polished answers

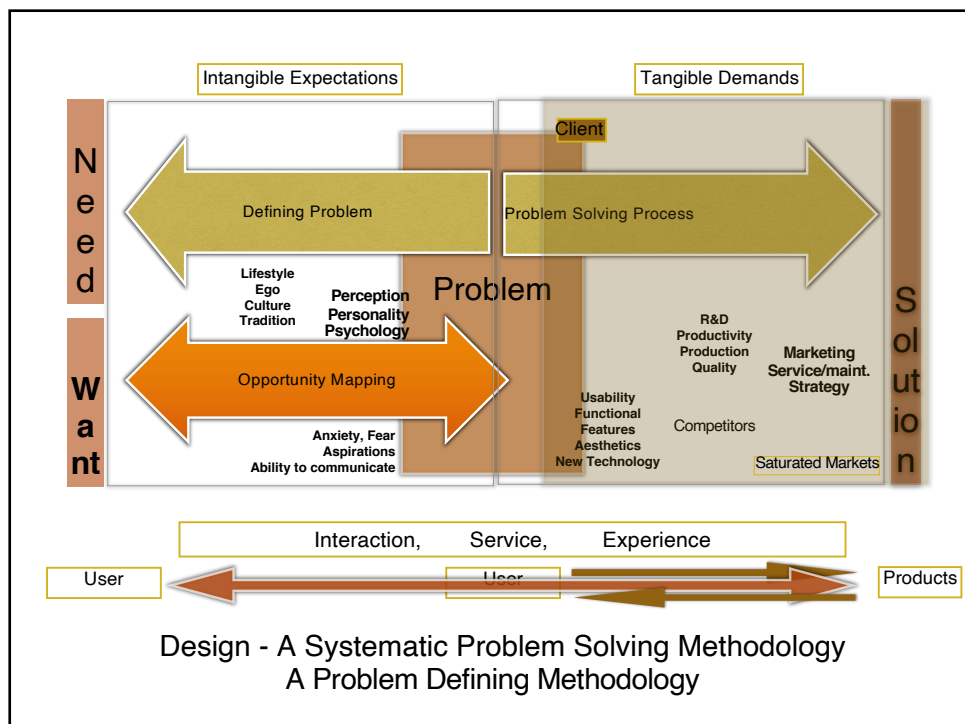
<http://www.thinkinc.com/blog/squiggles-and-diamonds-and-sprints-how-interdisciplinary-teams-visualize-design-process/>

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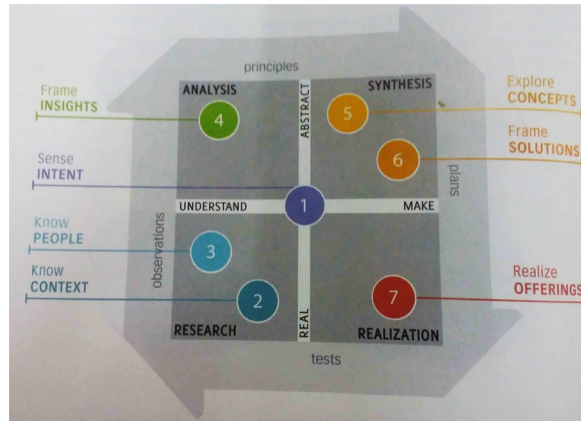
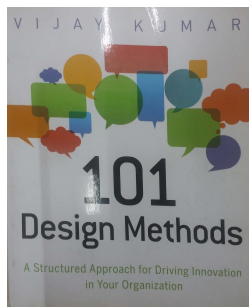
# Design

*..a Systematic Problem Solving Methodology*

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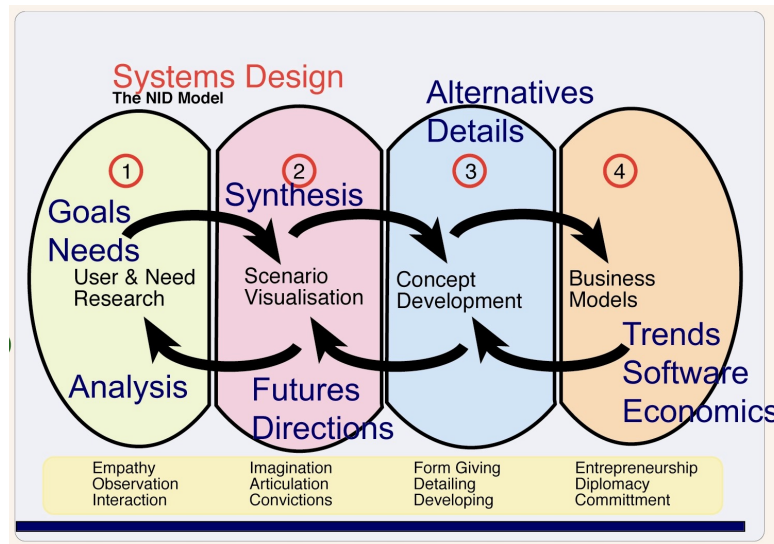


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A Model of the Design Innovation Process

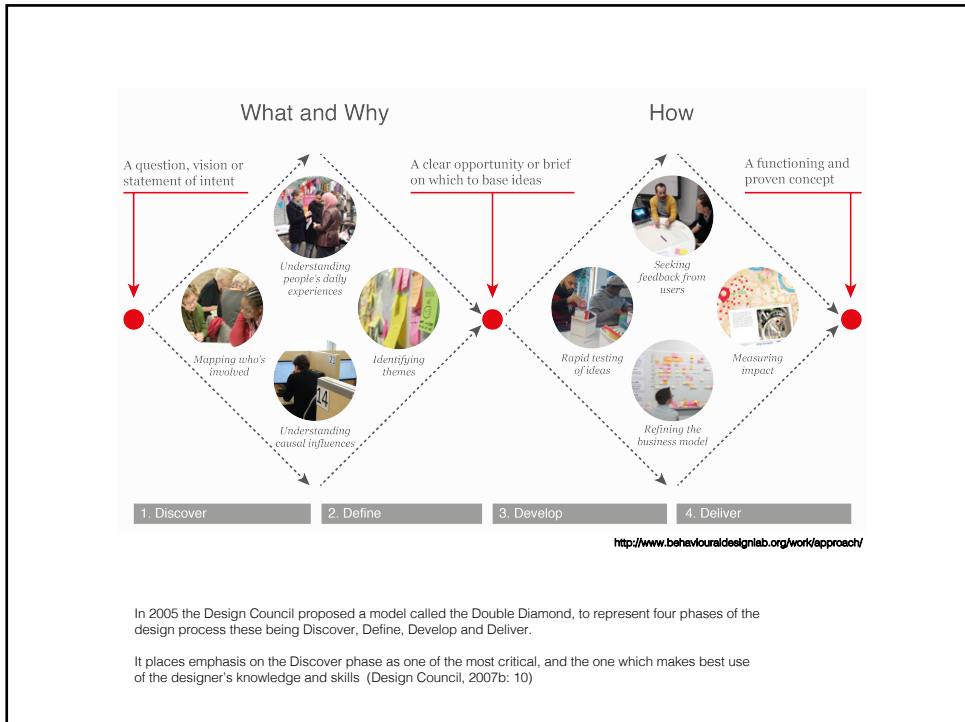
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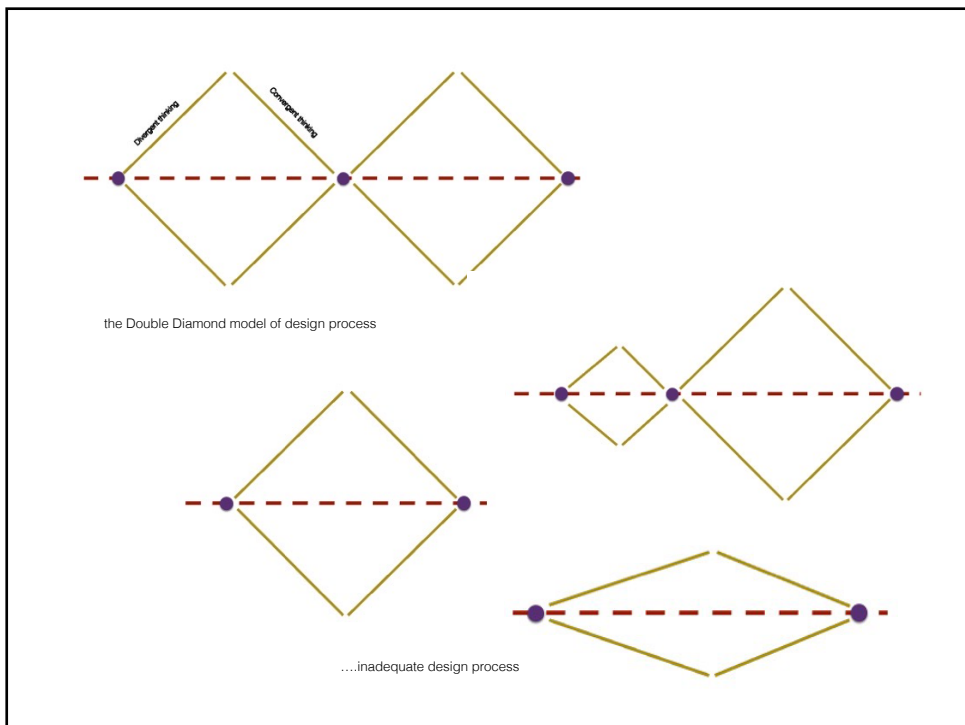
© M P Ranjan, National Institute of Design

...design is an attitude

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## Design Research...

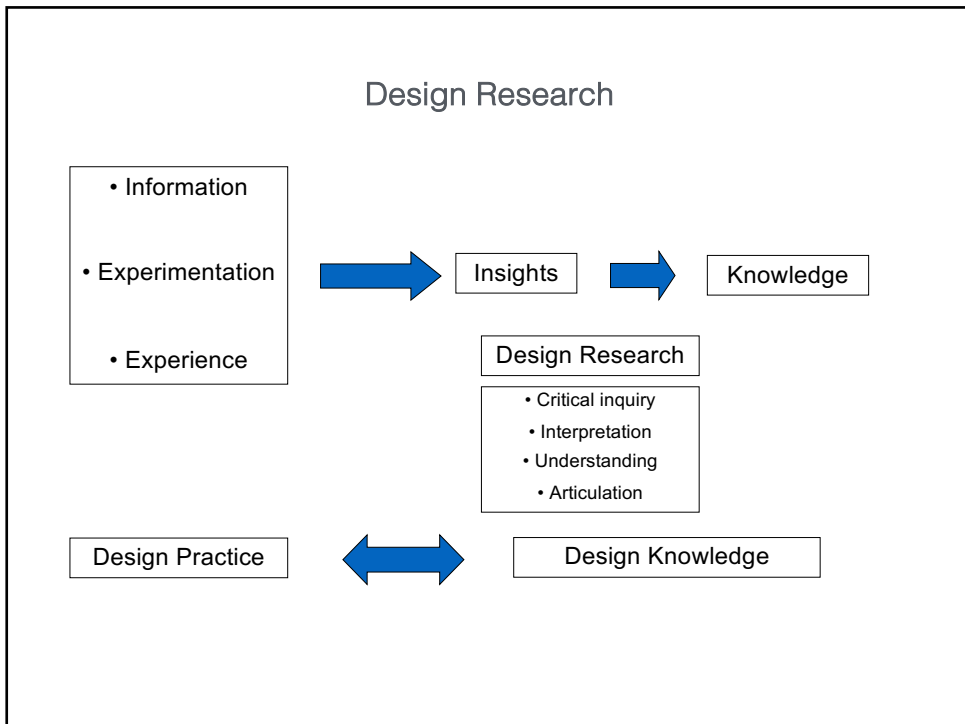
**tools  
methods  
methodology**

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## Design Research...

- *Design research constitutes systematic and methodical inquiry into practice*
- *Producing knowledge for, about and through design.*
- *Research carried out, using the tools of design ...Manzini (2007)*
- *Systematic creation of purposeful design knowledge. ... (Alpey)*

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three types of design research:

- research into design
- research through design
- research for design

Christopher Frayling

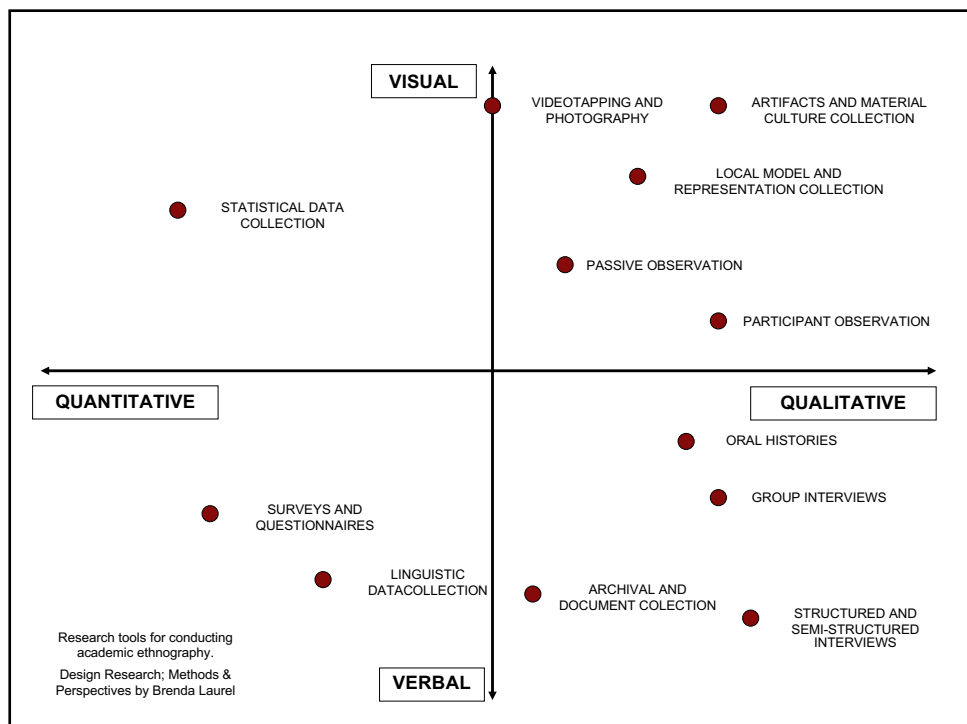
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the right approach is finding a balance between research and practice

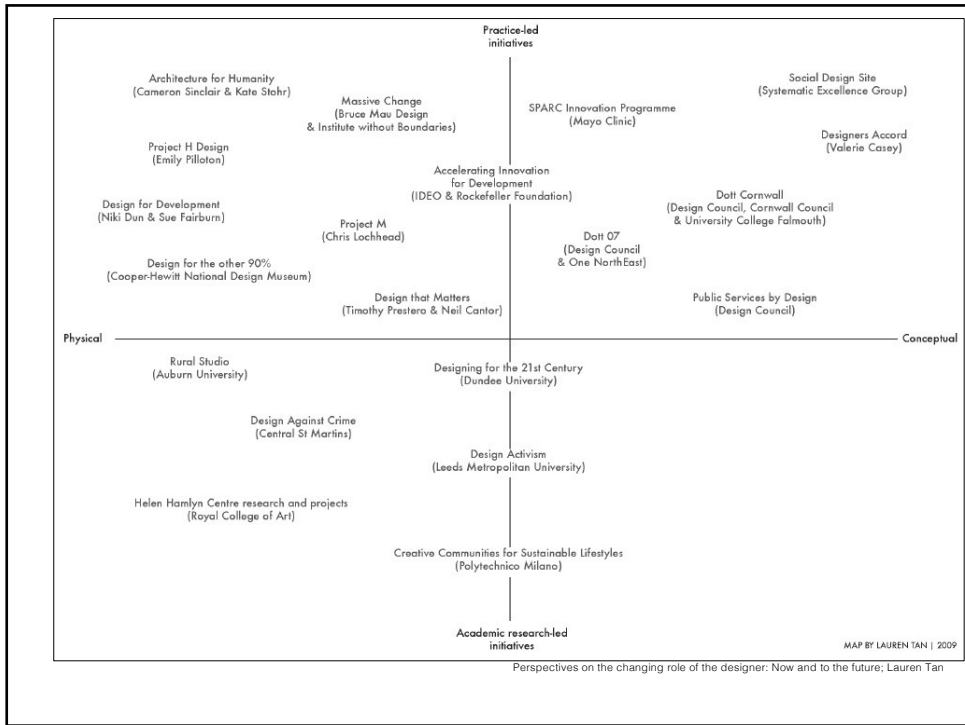
the strength of design research is not in developing theory alone, but in developing the proper relationship between theory and practice.

Buchanan (1999)

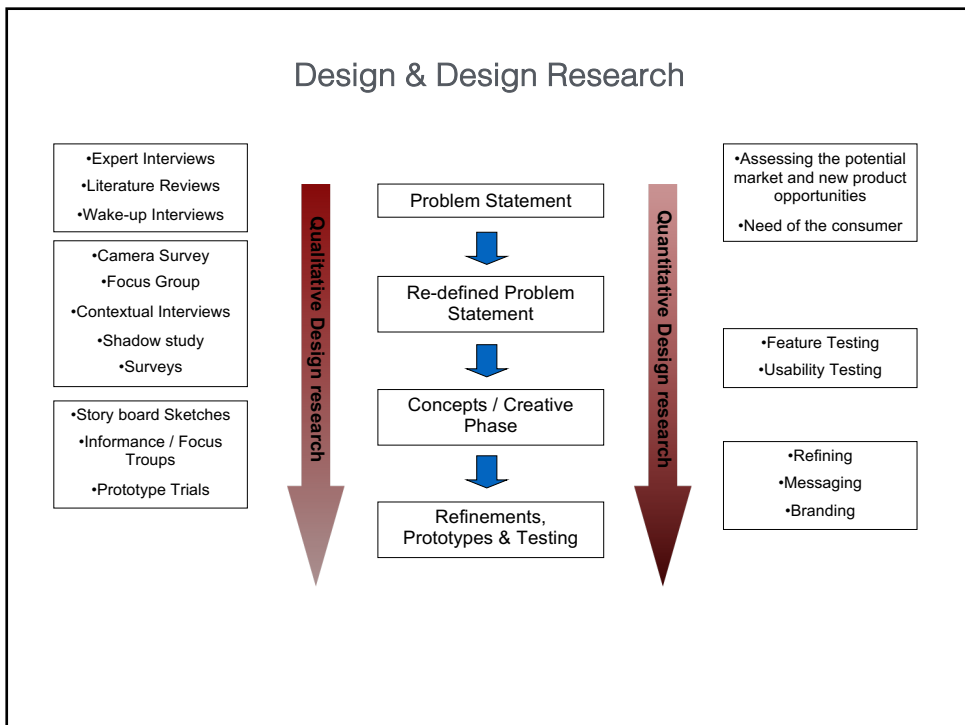
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- design process - a set of actions, or methods, to be carried out in series, or in parallel" (Jones, 1971/1992: xxvi).
- A design method is any action one may take while designing (Jones, 1971/1992: xxv).
  - different tools designers' use as they move through the design process.
  - 'a particular procedure for accomplishing or approaching something' (Oxford Dictionaries)
- design methodology - the study of the principles of practices and procedures of design in a rather broad and general sense (Cross, 1984: vii; Cross, 2002).
  - all the activities a designer undertakes while designing including the approaches, process and methods of design
  - a toolkit
  - 'a system of methods used in a particular area of study or activity' (Oxford Dictionaries).
- The words 'methodology' and 'methods' are often used interchangeably
- The relationship between design process and methods is that the design methods populate the process.

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"I've disassociated myself from the field. There is so little in what is called 'design methods' that has anything useful to say about how to design buildings that I never even read the literature anymore. I would say forget it, forget the whole thing"

(Alexander, 1971 in Cross, 2007)

"I reacted against design methods. I dislike the machine language, the behaviourism, the continual attempt to fix the whole of life into a logical framework"

(Jones, 1977 in Cross, 2007).

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the brief is a **set of mental constraints** that gives the project team a framework from which to begin, **benchmarks** by which they can measure progress, and a **set of objectives** to be realized

A well-constructed brief will allow for **serendipity, unpredictability, and the capricious whims of fate**, for that is the creative realm from which breakthrough ideas emerge.

The project is the vehicle that carries an idea from concept to reality.

The **bounds of a project** may appear as unwelcome constraints. But the mark of a designer is a willing embrace of constraints.

Change by Design

a **hypothesis** is a logical supposition, a reasonable guess, an educated conjecture to the research problem

hypothesis provides a **tentative answer** to the research problem

a **research question** does not offer a **speculative answer** to the research problem.

Leedy and Ormrod, (2010: 4)

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thank you !!!

**Shashank Mehta**

shashank@nid.edu

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