Interaction Design primer

Spring 2015

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Design

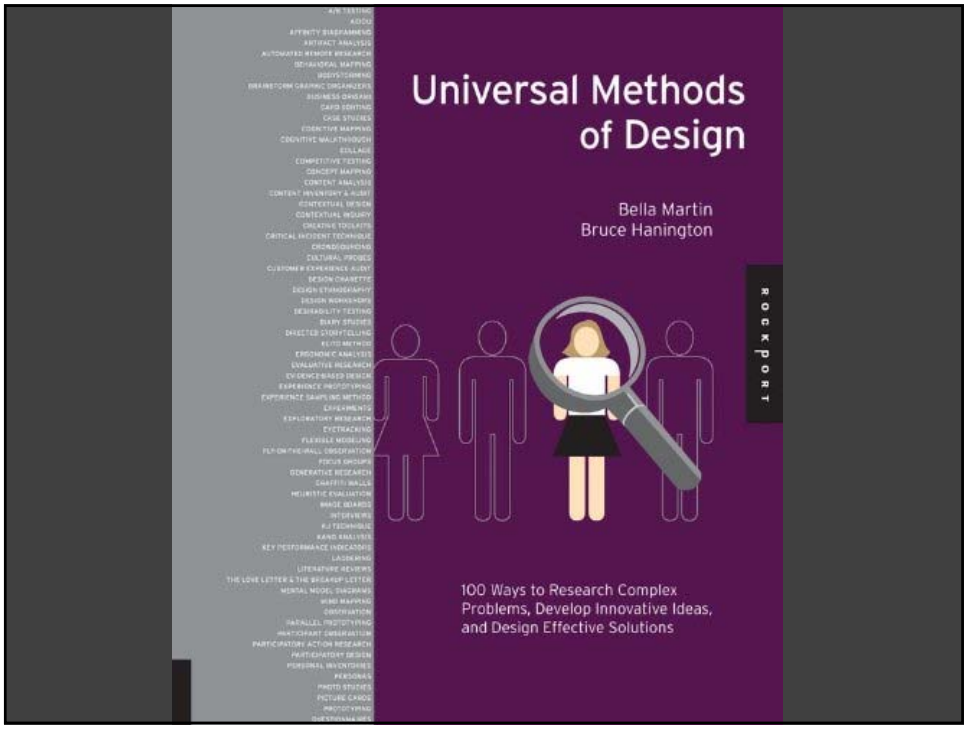
What is design?

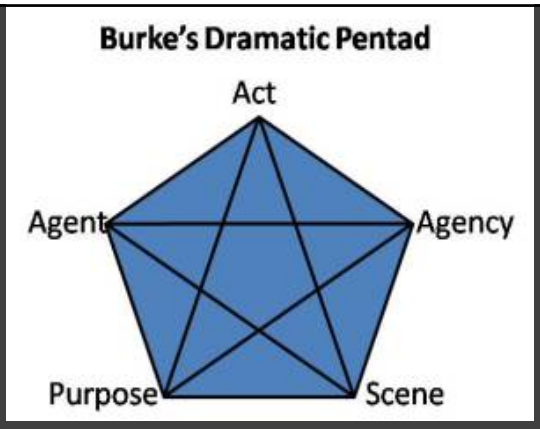
Herb Simon:

activity that seeks to Change Existing Situations Into Preferred Ones

Hot Topics in Design

Human-Centered Design
Community-Centered Design
Service Design
Interaction Design





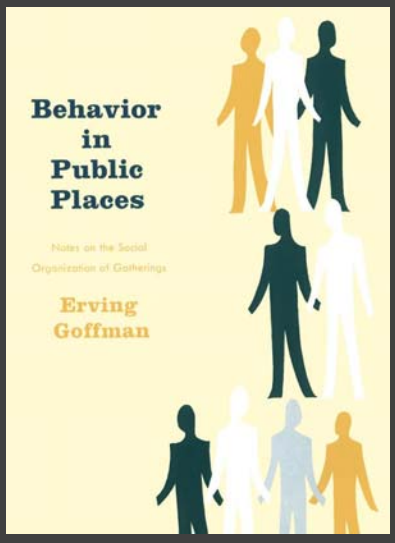
ACT	What is being done
AGENCY	Mean by which an action occurs
AGENT	Person doing the act
SCENE	Setting/background for action
PURPOSE	Reason or rationale behind action

Pentad Activity

- Pick one research question, brainstorm a specific experiment
- Fill out all 5 Pentad categories
- [5 minutes]

The Cycle of Engagement

Allocation of Involvement
Face engagement
Acquaintanceship
Engagements among unacquainted
Communication boundaries
Regulation of mutual involvement
Uncontained participation
Situational Proprieties
Tightness and Looseness



Tang, Approaching and Leave-Taking

John Tang, Approaching and Leave-Taking: Negotiating Contact in Computer-Mediated Communication

Openings consist of:
contact initiation: mutually recognizing an attempt to initiate contact
greetings: establishing each person's identity and that a conversation has started
topic initiation: introducing the first topic

Closings consist of:
topic termination: mutually recognizing that the topic discussion has ended
l*eave-taking*: reaffirming each other's acquaintance before breaking contact
contact termination: ending the connection that was enabling the conversation

Tang, Attention Commitment

Table I. Comparing and Contrasting How Openings and Closings Are Accomplished

	Openings			Closings		
	Contact Initiation	Greetings	Topic Initiation	Topic Termination	Leave-Taking	Contact Termination
Face-to-face	On approach	1st exchange	1st or 2nd exchange	2nd to last exchange	Last exchange	Withdrawal
Telephone	Dial, ring, answer	"Hello", 1st exchange	2nd exchange	2nd to last exchange	Last exchange	Hang up
IM	Buddy list selection, IM pop-up	1st response	IM exchange	2nd to last exchange	Last exchange	Close window
DCP	Menu pick, shared text interface	Text exchange	Text or video exchange	2nd to last exchange	Last exchange	Close window
Montage	Menu pick, video glance fade-in	1st exchange	1st or 2nd exchange	2nd to last exchange	Last exchange	Close window
Awarenex	Contact List/ Contact Preview	Contact Preview/1st response	Contact Preview/IM exchange	Last exchange	"Goodbye" interface	Timeout, window closed

Grey: attention commitment onset

Engagement Design Activity

- Pick *another* research question, imagine a specific experiment
- Fill out every engagement phase with at least one vignette
- [5 minutes]

DiSalvo, Buchanan and design

Carl DiSalvo:

The special role of Architecture and robotics…

DiSalvo: formalizing Product

Four dimensions:

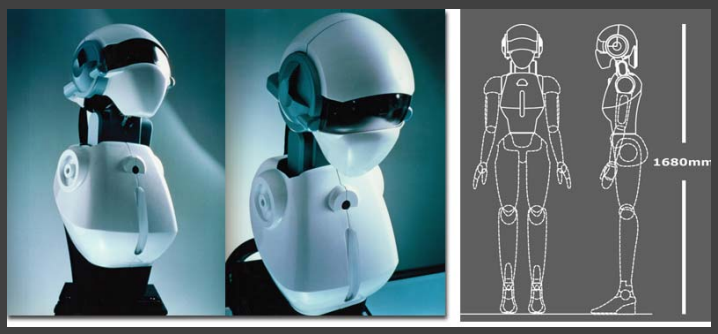
- Materiality
- Expression
- Function
- Form

DiSalvo: formalizing Product

Materiality

DiSalvo: formalizing Product

Expression – Tatsuya Matsui



DiSalvo: formalizing Product

Expression

DiSalvo: formalizing Product

Expression

"Today, we are using technology to further an agenda of destruction and violence, which is why—more than ever—we need to rethink its role in our society and make sure that it is only used to better humanity. By creating Posy, I hope to unleash a weapon of peace—a reminder that one small robot's step is a giant leap toward a peaceful and equitable future for all."
—Tatsuya Matsui

DiSalvo: formalizing Product

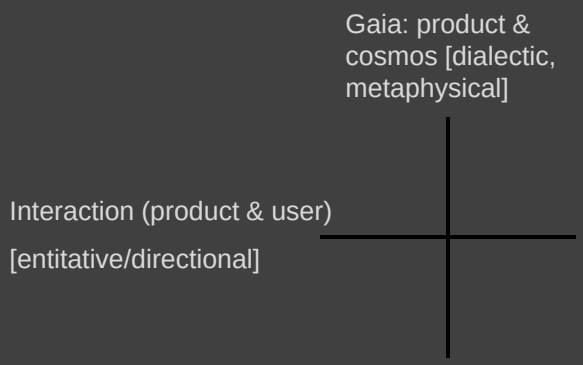
Function

DiSalvo: formalizing Product

Form as organization of all other dimensions

An Analytical Cross of Interaction

Prof. Dick Buchanan, from Burke, Barnlund, etc.



Cross Activity

- Pick your third research question. Imagine a robot and experiment.
- Fill out all four cross categories.
- [5 minutes]

IDEO Create process

H C D

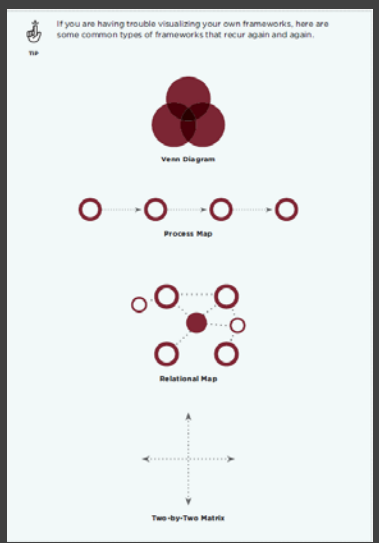
CREATE: GOALS

To move from research to real-world solutions, you will go through a process of synthesis and translation. This requires a mode of narrowing and culling information and translating insights about the reality of today into a set of opportunities for the future. This is the most abstract point of the process where concrete needs of individuals are transformed into high-level insights about the larger population and system frameworks are created.

With defined opportunities, the team will shift modes into a generative mindset to brainstorm hundreds of solutions and rapidly make them tangible through prototyping. During this phase, solutions are created with only the customer Desirability filter in mind.

Goals of the Create Phase are:
- Making sense of data
- Identifying patterns
- Defining opportunities
- Creating solutions

Frameworks and Brainstorming



If you are having trouble visualizing your own frameworks, here are some common types of frameworks that recur again and again.

TIP

Venn Diagram

Process Map

Relational Map

Two-by-Two Matrix

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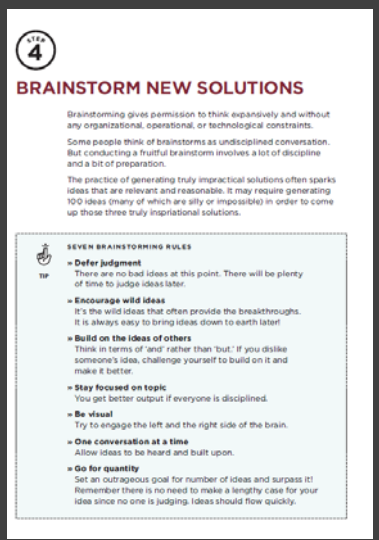

STEP 4

BRAINSTORM NEW SOLUTIONS

Brainstorming gives permission to think expansively and without any organizational, operational, or technological constraints.

Some people think of brainstorms as undisciplined conversation. But conducting a fruitful brainstorm involves a lot of discipline and a bit of preparation.

The practice of generating truly impractical solutions often sparks ideas that are relevant and reasonable. It may require generating 100 ideas (many of which are silly or impossible) in order to come up those three truly inspirational solutions.

TIP

SEVEN BRAINSTORMING RULES

- **Defer judgment**
  There are no bad ideas at this point. There will be plenty of time to judge ideas later.
- **Encourage wild ideas**
  It's the wild ideas that often provide the breakthroughs. It is always easy to bring ideas down to earth later!
- **Build on the ideas of others**
  Think in terms of 'and' rather than 'but.' If you dislike someone's idea, challenge yourself to build on it and make it better.
- **Stay focused on topic**
  You get better output if everyone is disciplined.
- **Be visual**
  Try to engage the left and the right side of the brain.
- **One conversation at a time**
  Allow ideas to be heard and built upon.
- **Go for quantity**
  Set an outrageous goal for number of ideas and surpass it! Remember there is no need to make a lengthy case for your idea since no one is judging. Ideas should flow quickly.

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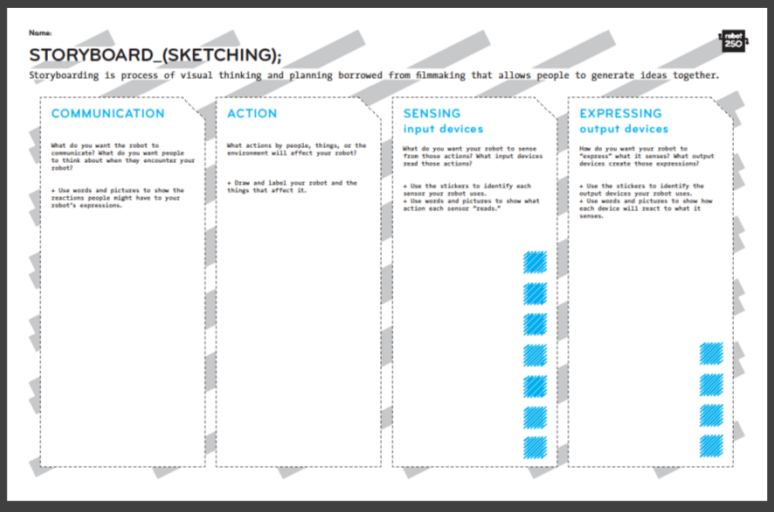
Brainstorming Practice

- Pick your favorite research question.
- Choose a framework, draw your context (3 minutes)
- Spend 5 minutes brainstorming at least 20 totally different experiments.

Storyboarding / Sketching -*Robot250*



Storyboarding Practice

- Pick one of your ideas
- Using the Robot250 Storyboard template questions, fill out all four columns **with pictures only**.
- [5 minutes]

Design Patterns – Kahn et al.

"Light on two sides of every room."

Alexander Design Patterns

1 Patterns should be at the ideal level of abstraction

Alexander Design Patterns

2 Patterns as part of a pattern language (compositional modularity)

Alexander Design Patterns

3 Hierarchical nature of patterns

Alexander Design Patterns

4 Patterns are abstraction representations of human physical, morphological interaction with the world.

Alexander Design Patterns

HRI versions…

The Initial Introduction: convention, acknowledgment

Didactic Communication: minimal responsiveness option

In Motion Together: physical synchrony

Personal Interests and History: from didactic to substantive relational

Recovering from Mistakes: maintain social affiliation

Reciprocal Turn-Taking: timing, awareness of fairness

Physical Intimacy: “will you give me a hug?”

Claiming Unfair Treatment or Wrongful Harms: “that’s not fair”

Systems Engineering

- Needs Gathering
- Requirements Definition
- Risk Identification
- **Risk Retirement**

Warning: The 'Wicked Problem'*

Problem Identification

Every solution exposes new aspects of the problem.

Satisficing

There is no clear stopping criterion nor right or wrong.

Uniqueness

Each problem is embedded in a distinct physical and social context making its solution totally novel.

**Horst Rittel*