Four Phases

- **clarify**
  - observations
  - insights
  - Reframe

- **ideate**

- **develop**

- **implement**

**problem**
Innovative Problem Solving and Design Thinking for Health Course Summary

Linda A Cyr
lcyr@hsph.harvard.edu

Srikant M Datar
sdatar@hbs.edu
Innovation | Its Relation to Operations

rules * routines * rational
TQM * procedures *
decision making

curiosity * speculating *
connection making *
developmental thinking *
experimenting
Innovation | Approaches to Problem Solving

Traditional Approach...

...focuses on deciding among known solutions.

Innovative Approach...

...seeks the best solution possible given available resources, time, and team competencies.

Clarify | Achieving Deep User Understanding

WHAT
AEIOU

STRUCTURE
Journey Maps
Empathy Maps

HOW
Look-Ask-Try

To Identify & Explore…

DESIGN PRINCIPLES

Pain Points

Insights

Personas

© S.M. Datar
<table>
<thead>
<tr>
<th>Identify</th>
<th>Good Design Research</th>
</tr>
</thead>
<tbody>
<tr>
<td>What People</td>
<td>Reveals Knowledge</td>
</tr>
<tr>
<td>Say &amp; Do</td>
<td>Explicit</td>
</tr>
<tr>
<td>Think &amp; Feel</td>
<td>Implicit</td>
</tr>
<tr>
<td>Value &amp; Dream</td>
<td>Meaning</td>
</tr>
</tbody>
</table>
Problem Framing Tools

• “How Might We” Question Starters. HMW…
  – …Accentuate the Positive?
  – …Minimize/Remove the Negative

• Webbing the “How might we”
  – What’s Stopping You? What’s Stopping You? What’s Stopping You?

• Point of View Statement
  – Defines the design challenge and guides future ideation.
  – Encompasses your users, their needs and the insights that come from observation.
Four Phases

1. Clarify
2. Ideate
3. Develop
4. Implement
The best way to have a good idea is to have a lot of ideas.

-- Linus Pauling
Ideate | Two Approaches

Systematic Inventive Thinking

Divergent Approaches
A set of tools used to channel the ideation process to generate progressive sets of ideas.

Applying “function follows form” in a “closed world” forces a thinker to transcend cognitive fixednesses that typically impede innovative thinking:

- Functional (e.g. Flat Tire)
- Structural (e.g. Jockeys and Horses)
- Relational (e.g. Parallelogram, Surgeon)
Ideate | Systematic Inventive Thinking

Existing Situation

Manipulation (apply tools)

Virtual Product

Identify benefits, advantages, markets

Identify challenges

Adaptations

… and Create VALUE

Source: SIT 2012
# Task Unification

Assign a new task (i.e. function) to an existing element (i.e. resource) of the product or its environment.

# Multiplication

A multiplication (or addition) of components already existing in the product along with a required adjustment (i.e. a qualitative change).

# Division

Dividing a product, process, or business model into its component parts and rearranging them to form a new product or brand promise.

# Subtraction

To improve a product you remove attributes – sometimes even ones deemed indispensable – rather than adding new features or attributes.

# Attribute Dependency

To create, change or eliminate dependencies between variables of a product or a system (internal attributes) and its environment (external factors).

# UDP – Undesired Phenomenon

Breaking the chain of Undesired Phenomenon (why, so what) by applying Task Unification or Qualitative change.
<table>
<thead>
<tr>
<th><strong>Ideation Tools</strong></th>
<th><strong>Divergent Thinking</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2 x 2 Frameworks</strong></td>
<td>A tool for identifying tensions in a problem space and the gaps that represent opportunities for innovation.</td>
</tr>
<tr>
<td><strong>Alternate Worlds (Parallel Universe)</strong></td>
<td>A tool for identifying and using perspectives from different industries, organizations, or disciplines to generate fresh ideas about a problem.</td>
</tr>
</tbody>
</table>
| **Brainstorming** | An in-person, problem-solving technique that harness the collective creativity of the group. Done right, it follows a specific set of “rules:”  
1. Defer judgment  
2. Encourage wild ideas  
3. Build on ideas of others  
4. Stay focused on topic  
5. One conversation at a time  
6. Be visual  
7. Go for quantity |
<table>
<thead>
<tr>
<th><strong>Nominal Group Technique</strong></th>
<th>Structured method that encourages ideas from everyone by: 1. Ideating alone 2. Reviewing ideas together 3. Discussing ideas together</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Round Robin</strong></td>
<td>A structured way to generate, critique, and develop an idea through group authorship.</td>
</tr>
<tr>
<td><strong>Attribute-Value Mapping</strong></td>
<td>A tool for understanding whether and how the attributes of your innovative concept actually support the values you seek to provide for your user.</td>
</tr>
<tr>
<td><strong>Impact-Difficulty Matrix</strong></td>
<td>A structured approach to evaluating several ideas to select one or two for further development.</td>
</tr>
<tr>
<td><strong>Creative Matrix</strong></td>
<td>A structured tool for generating ideas to achieve desired design principles.</td>
</tr>
</tbody>
</table>
Develop | Making the Concept Tangible

Research > Develop > Launch

Make in Order to Learn

Source: LUMA Institute 2012
Feel it. Your hands is wiser than your head ever gonna be.
Develop | Prototyping

1 QUESTION
What question are you trying to answer or assumption are you trying to prove?

2 PROTOTYPE
What can we make and show to people in order to test this?

3 EVIDENCE
What will we measure or observe to answer our question?

Source: IDEO
<table>
<thead>
<tr>
<th><strong>Tools</strong></th>
<th><strong>Concept Development &amp; Evaluation</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Concept Poster</strong></td>
<td>A tool for quickly fleshing out concept details – identifying benefits &amp; key assumptions to test.</td>
</tr>
<tr>
<td><strong>Design Critique</strong></td>
<td>A structured forum for people to give and receive constructive feedback.</td>
</tr>
<tr>
<td><strong>Rose-Thorn-Bud</strong></td>
<td>A technique for identifying things as positive, negative, or having potential.</td>
</tr>
<tr>
<td><strong>Six Thinking Hats</strong></td>
<td>A structured approach to evaluation and concept development.</td>
</tr>
<tr>
<td><strong>Prototyping</strong></td>
<td>Designing experiments to test critical assumptions. Includes usability testing, paper prototypes, role playing, etc.</td>
</tr>
<tr>
<td><strong>Design Heuristics</strong></td>
<td>Rules of thumb that help you keep the end users’ experience top of mind while you design.</td>
</tr>
</tbody>
</table>
## Tools for Implementing and Communicating Behavior Change

<table>
<thead>
<tr>
<th>Stakeholder Analysis</th>
<th>Identify stakeholders, assess where they are and where they need to be for innovation.</th>
</tr>
</thead>
</table>
| **Everett Rogers’ Factors of Innovation** | 1. Relative advantage  
2. Trialability  
3. Observability  
4. Simplicity  
5. Compatibility |
| **Jobs’ Approach – Communicating Behavior Change** | 1. Curiosity before Content  
2. Options before Solutions  
3. Demonstrate to Communicate  
4. Make it Personal  
5. Psychological comfort and ease of use. |
| **Elephant & Rider Model** | Behavior change requires engaging the emotional side (i.e. elephant), providing clear direction (i.e. attending to the rider) and managing context. |
| **Fogg Behavior Model** | B=mat: Behavior is a function of Motivation, Ability and Trigger. |
Leading Innovation
Individual Behaviors to Break Unproductive Interactions and Foster Team Cohesiveness

- Assume value (in others’ ideas)
- Assume positive intent (in others’ actions)
- Paraphrase (others’ ideas to confirm understanding)
- Credit, acknowledge, and build (build on ideas)
- “Yes, and….” (rather than “Yes, but…”)

Social Environment | Fostering Team Innovation
Generating Ideas
Go for quantity
Encourage wild ideas

Respect for Others
Defer judgment
Build on the ideas of others
Be visual

Focus on Task
One conversation at a time
Stay focused on the topic
1. Innovation comes from anywhere
2. Focus on the user
3. Aim to be ten times (10X) better
4. Bet on technical insights
5. Ship and iterate
6. Give employees 20 percent time
7. Default to open processes
8. Fail well
9. Have a mission that matters
Community First, Company Second: Leading a Village

Sources: https://www.youtube.com/watch?v=JowmBdx4nFw (1:08 – 3:48)
Innovative Leaders...

...Reject the Default.

Some men see things as they are and say why, I dream things that never were and say why not.

— Robert F Kennedy

Talent hits a target no one else can hit; genius hits a target no one else can see.

— Arthur Schopenhauer
Innovative Leaders...

...Inspire Higher Purpose.
Innovative Leaders...

...Accept Uncertain Challenges.

There is little point in setting out for a place that one is almost certain to reach.

— H.W. Tilman

What we gain too easily, we esteem too lightly.

— Dick Bass

Courage is doing what you are afraid to do. There can be no courage unless you are scared.

— Eddie Rickenbacker
Innovative Leaders…

...Keep Open...

- **Minds** – to challenge assumptions.
- **Hearts** – to be vulnerable and truly listen.
- **Will** – to let go of pre-set agendas and see needs and possibilities.

*Source: Scharmer & Kaufer, Leading from the Emerging Future*
Innovative Leaders…

…Face Failure with Resilience.

*It is not the critic that counts; not the man who points out how the strong man stumbles, or where the doer of deeds could have done them better. The credit belongs to the man who is actually in the arena, whose face is marred by dust and sweat and blood; who strives valiantly; who errrs, who comes short again and again, because there is no effort without error and shortcoming; but who does actually strive to do the deeds; who knows the great devotion, who spends himself for a worthy cause; who at the best knows in the end the triumph of high achievement, and who at the worst, if he fails while daring greatly, knows that his place shall never be with those cold and timid souls who know neither victory nor defeat.*

— Theodore Roosevelt
Our greatest glory is not in never failing, but in rising up every time we fail.

— Ralph Waldo Emerson

I have not failed. I've just found 10,000 ways that won't work.

— Thomas Edison
Innovative Leaders...

...Continuously Self-Reflect and Learn.

He who day by day finds out where he is deficient, and who month by month never forgets that in which he has become proficient, may truly be called a lover of learning.

— Confucious, Analects XIX-V

He who knows best, knows how little he knows.

— Thomas Jefferson
Innovative Leaders...

...See and Cultivate Value in Others.

There is nothing in a caterpillar that tells you it is going to be a butterfly...

Every block of stone has a statue inside it and it is the task of the sculptor to discover it.

― Michelangelo
Innovative Leaders…

• Reject the default.
• Inspire higher purpose.
• Accept uncertain challenges.
• Face failure with resilience.
• Maintain open minds, hearts and will.
• Continuously self-reflect and learn.
• See and cultivate value in others.
We always overestimate the change that will occur in the next two years and underestimate the change that will occur in the next ten. Don't let yourself be lulled into inaction.

-- Bill Gates
THANK YOU!

“May the road rise up to meet you, may the wind be ever at your back. May the sun shine warm upon your face and the rain fall softly on your fields. And until we meet again, May God hold you in the hollow of his hand.”

-- Irish Blessing
END