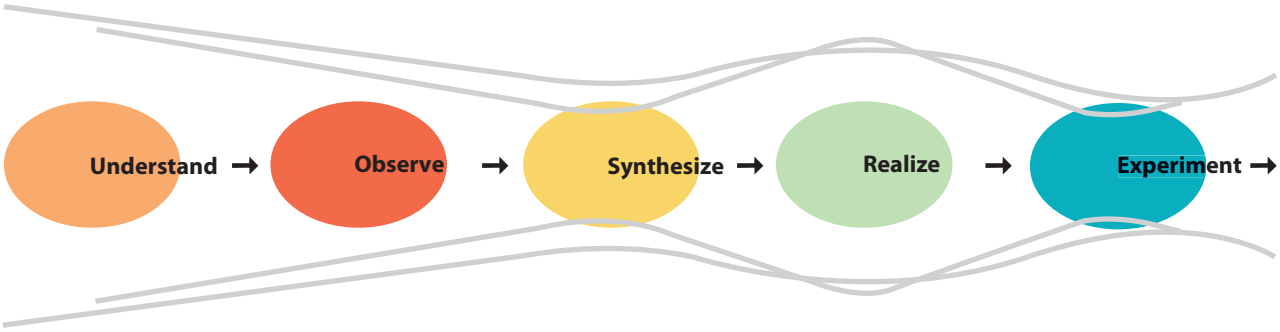
Problem Finding Problem Solving

Fall, 2010



University of California
Berkeley
Haas School of Business

University of California
Berkeley
Haas School of Business

A Note from the Dean

Dear Class of 2012,

Congratulations on having completed your first half-semester at Haas.

Did you know that your Problem Finding, Problem Solving class was initiated at Haas to capture a particular opportunity? In my first two years as Dean I was struck by how many times I heard from CEOs and other business leaders that "yes, we will always need problem solvers, but what we really need are people who can also lift their heads up and think more deeply about what the right problem or opportunity is, and how to frame it." This kicked off our efforts last year to prototype the class you just finished. We will continue to evolve it. Thanks in advance for your help in doing so. This is an important element in our effort to develop more innovative leaders.

This class is, to the best of my knowledge, the first in the core curriculum of any top school that is aimed at capturing the opportunity above. You'll have more chances to apply these "real world" tools in your BILD experiential learning classes, starting in the spring semester.

We are giving you this copy of the toolkit in the hopes that you will refer to it often, use it in your study teams, in your other classes at Haas, and outside Haas as well. We're also developing an on-line site that will capture these tools as well as additional tools you'll use in your other classes, and will include examples of their application to real-world problems, as well as inputs and feedback from others who are using the tools.

We look forward to continuing to work with you to further develop your problem framing and innovative leadership skills.

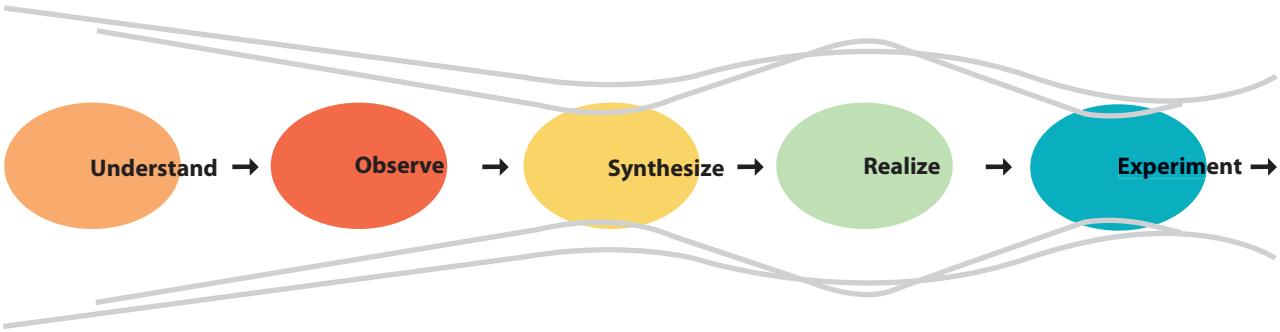
Best regards,

Rich Lyons

Problem Finding, Problem Solving

Table of Contents

The Problem Finding, Problem Solving Process



Understand

- Define the problem, challenge or opportunity space in which you want to work.
- Learn as much as you can about what is already known in that space from subject matter experts and other sources.
  - Trends
  - New technologies

Observe

- Collect information firsthand through
  - asking open•ended questions
  - seeing (watching) people and processes
  - engaging participants in co•creation activities to uncover new patterns of behavior

Synthesize (and analyze)

- Recognize patterns and anomalies from both secondary research and observation
- Develop insights around which to generate new concepts

Realize

- Ideate solutions based on the insights gleaned
- Select a small number of the solutions to take forward

Experiment

- Embody selected solutions in artifacts or use other means to communicate them
  - To share research findings with others in the organization
  - To get feedback from other stakeholders
- Develop meaningful measures to validate solutions against identified needs
- Refine solution prototypes for higher chances of success

University of California
Berkeley
Haas School of Business

Achieving Dynamic Balance between Diverging and Converging

Understand
Observe
Synthesize
Realize
Experiment

The Problem Finding, Problem Solving process involves multiple cycles of divergence and convergence. In each phase of the process, you may diverge and converge multiple times. Managing the dynamic balance between the two is important to a successful, creative outcome.

You cannot diverge and converge at the same time. The rules for diverging and converging are quite different. So, it is important for your group to be clear about when you are in diverging mode and when you are in converging mode.

Here are the ground rules for diverging and converging:

1. **Diverging Rules:** the purpose of diverging is to generate as many options as possible.

a) Defer judgment: avoid premature evaluation and closure

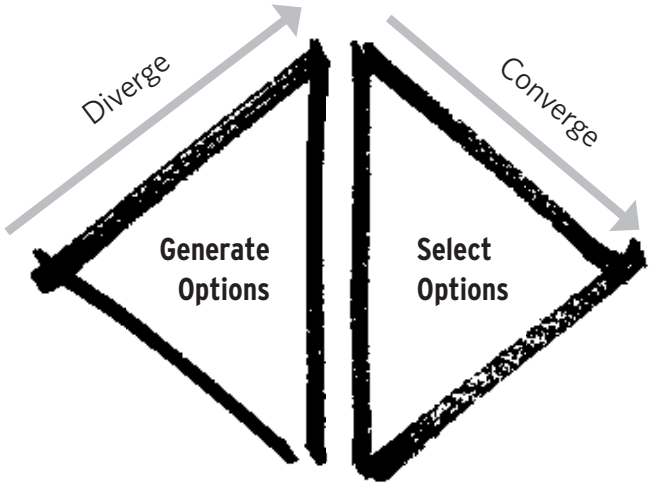
b) Strive for quantity: "quantity yields quality"; generating more options creates more "good ideas" in the end

c) Seek wild and unusual ideas: it is easier to make a wild idea more acceptable than to make a basic idea wilder

d) Build on the ideas of others: innovation rarely starts in a vacuum; the best ideas often build upon existing ones

e) Be visual: express options visually when possible; a picture paints a thousand words

The Dynamic Balance: Diverging and Converging



Remember: you can't diverge and converge at the same time.

University of California
Berkeley
Haas School of Business

2. **Converging Rules:** the purpose of converging is to not only make choices, but to work on the various options to make them stronger and thus end up with the best overall option

a) Be affirmative: evaluate options by considering what may be good first rather than going directly to the negative

b) Be deliberate: avoid fast decisions; put aside your assumptions and biases to give options a fair chance

c) Check your objectives: remember your original purpose and evaluate against that purpose

d) Improve ideas: while converging, it is possible that new options or combinations of options will emerge or you will find ways to make ideas more appealing. Write them down and include them in your diverging options.

e) Consider novelty: give your options a chance. It is easy for groups to be conservative during the convergence phase; remember that you need creative options to solve wicked challenges.

In the sidebar to the right, you will find a chart summarizing the rules. You may want to assign a team member to be in charge of making sure that you are following the correct set of rules at any given time.

Ground Rules for Converging:

- Be affirmative
- Be deliberate
- Check objectives
- Improve ideas
- Consider novelty

Ground Rules for Diverging:

- Defer judgment
- Strive for quantity
- Seek wild and unusual ideas
- Build on other ideas
- Be visual

"The significant problems we face cannot be solved at the same level of thinking we were at when we created them."

– Albert Einstein

Analysis of Competing Hypotheses

Understand
Observe
Synthesize
Realize
Experiment

Purpose:

To examine all the compelling hypotheses and understand which better helps diagnose the challenge

Steps:

1. Identify the possible hypotheses to be considered. Use a group of analysts with different perspectives to ideate the possibilities.
2. Make a list of significant evidence and arguments for and against each hypothesis.
3. Prepare a matrix with hypotheses across the top and evidence down the side. Analyze the "diagnosticity" of the evidence and arguments--that is, identify which items are most helpful in judging the relative likelihood of the hypotheses.
4. Refine the matrix. Reconsider the hypotheses and delete evidence and arguments that have no diagnostic value.
5. Draw tentative conclusions about the relative likelihood of each hypothesis. Proceed by trying to disprove the hypotheses rather than prove them.
6. Analyze how sensitive your conclusion is to a few critical items of evidence. Consider the consequences for your analysis if that evidence were wrong, misleading, or subject to a different interpretation.
7. Report conclusions. Discuss the relative likelihood of all the hypotheses, not just the most likely one.
8. Identify milestones for future observation that may indicate events taking a different course than expected.

(con't)

Source: https://www.cia.gov/library/center-for-the-study-of-intelligence/csi-publications/books-and-monographs/psychology-of-intelligence-analysis/art11.html

Looking at all possible solutions:

Most of us choose the first solution to an intelligence problem that seems satisfactory instead of looking at all possible solutions to pick the best one. When we try to arrive at a judgment, we usually pick our favorite hypothesis. Often we do this on the basis of our gut feeling. Then we look at our information to see whether or not it supports our judgment. If the information seems to support our judgment, we say "great!" and don't look further. If our information doesn't, we reject the information as bad, or we pick another judgment and go through the same process until we find a judgment and evidence we think match.

Source: http://www.speroforum.com/wiki/default.aspx/SperoWiki/CompetingHypothesisAnalysis.html

University of California
Berkeley
Haas School of Business

Analysis of Competing Hypothesis (con't)

Outcome:

Tentative conclusions about the nature of the challenge; a sense as to which hypotheses can be eliminated, and which require further exploration

Example of Grid with Content:

	Hard spy who passed classified info	Was performing job honestly	Was storing intellectual property for next job
Exhibit A	Neutral	Consistent	Inconsistent
Exhibit B	Inconsistent	Inconsistent	Consistent
Exhibit C (!)	Very Consistent	Inconsistent	Consistent
Exhibit D	Very Consistent	Very Consistent	Very Consistent
Exhibit E	Inconsistent	Neutral	Neutral
Exhibit F	Inconsistent	N/A	N/A

Source: http://competinghypotheses.org/

Sample Grid:

	Hypothesis	Hypothesis 2	Hypothesis 3	Hypothesis 4	Hypothesis 5
Evidence 1					
Evidence 2					
Evidence 3					

Source: PFPS Class Session, Haas School of Business

Affinity Diagram aka Highlighting

Understand
Observe
Synthesize
Realize
Experiment

Purpose:

1. To make sense of a lot of data (at least 20 pieces) at the beginning of the process. Can be particularly useful to create common knowledge when every team member has different knowledge and expertise
2. To summarize all the data from the understand and observe phases of the process and create insights
3. To better understand the essential insights after an ideation session and to help narrow down the areas of interests.

Steps:

1. Capture the information you have gathered on Post-it notes.

   a) Include just one item per Post-it

   b) Write with a pen that can be read from 6 feet away

2. Share the information, post it on one or more easel sheets, and cluster using one of these two processes:

   a) Random placement and silent clustering:

   - Place the Post-it notes randomly on the wall or paper

   - Without talking, engage all participants in silent clustering. Each person moves Post-it notes around to place them with other notes with which they fit. If one participant does not agree with the position in a cluster, he/she can move the note. If the disagreement persists, the information can be duplicated on another Post-it note and be then clustered in two places.

   Tip 1: Clustering silently helps speed the process and makes it more efficient by avoiding over-rationalization

   Tip 2: Do not try to fit everything in large clusters; smaller more specific clusters and loners are useful.

Outcome of a typical affinity diagram generally contains five to ten clusters with a summary sentence.

Source: http://baran-systems.com/Products/Affinity%20Diagram%20for%20Excel/index_concept.htm

University of California
Berkeley
Haas School of Business

b) Discuss placement in the clusters as you share. Avoid extensive conversation, however.

3. Create a name for each cluster that summarizes the essence of it

a) If the cluster is composed of data, identify insights that show a deep understanding of the situation, user needs or pain points.

b) If the cluster is composed of ideas, identify the core or essence of the idea

c) Create a title that is interesting and memorable: think about a book title or the headline of a newspaper or magazine article

- For example: rather than "saving water" use "tap water is the new coke"

- Or rather than "older people are scared of using a computer" write "overwhelmed by technology"

d) Shift post-its among clusters, combine clusters or create new clusters as you discuss the labels

Tip 1: If there are too many clusters and time is short, focus on a few either via discussion or with a vote if necessary.

Tip 2: Use several charts or a long piece of butcher paper to be sure you have enough space.

4. Optional: When done, you may want to create a summary of the clusters on a clean sheet. If you do so, however, keep the old papers with the details on them as you may want to refer back to them or use them in another way.

"Don't be afraid to take a big step when one is indicated. You can't cross a chasm in two small steps."

- David Lloyd George, Welsh Statesman

Mind Mapping

Understand
Observe
Synthesize
Realize
Experiment

Purpose:

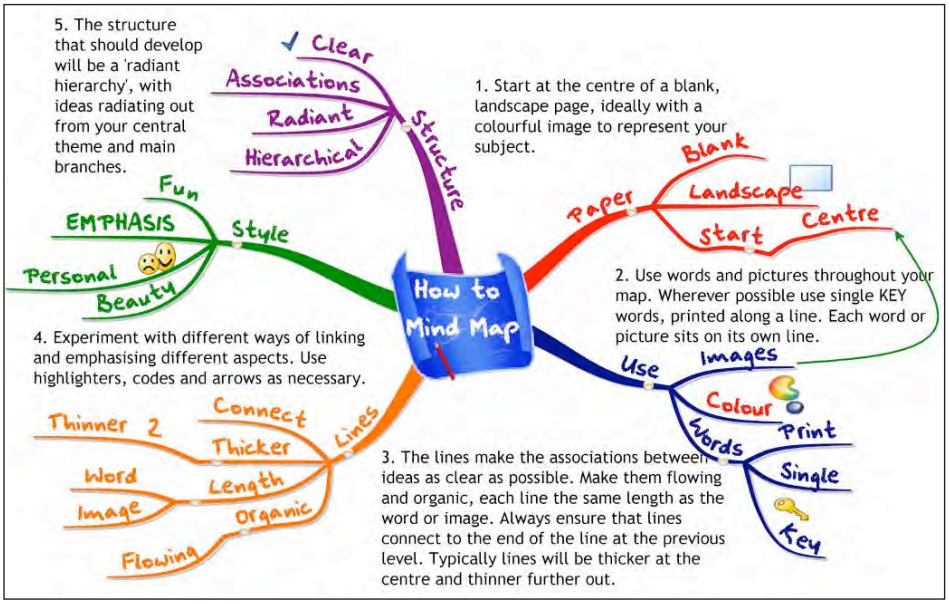
Organize information by creating associations and connections among thoughts using words and imagery

Use it when you want to:

- tease out what's inside your head
- get through mental blocks
- find unexpected connections
- discover you know more than you think
- support individual creativity
- capture notes on something you are listening to

Steps:

1. Write the topic in the center of a large piece of paper (easel paper or butcher block paper). Start with a word or an image that symbolizes what you want to think about.



The Buzan approach:
Buzan created the mind-mapping process and has very specific rules to follow (check Tony Buzan's video at http://www.youtube.com/watch?v=MIabrWv25qQ)

Source: http://www.mind-map-ping.co.uk/make-mind-map.htm

Mind Mapping (con't))

2. Draw branches from the main topic starting with what stands out the most

   a) Start making connections and adding sub-branches representing sub-topics.

   b) Use colors, different thicknesses of markers, etc. to differentiate and highlight ideas and connections

   c) Put down all ideas without judgment or evaluation; don't get hung up on appearance

   d) Think fast as your brain works best in 5-7 minute bursts

3. Work in all directions
4. Add visuals if possible
5. Continue until you have exhausted all the dimensions related to the issue; look for patterns

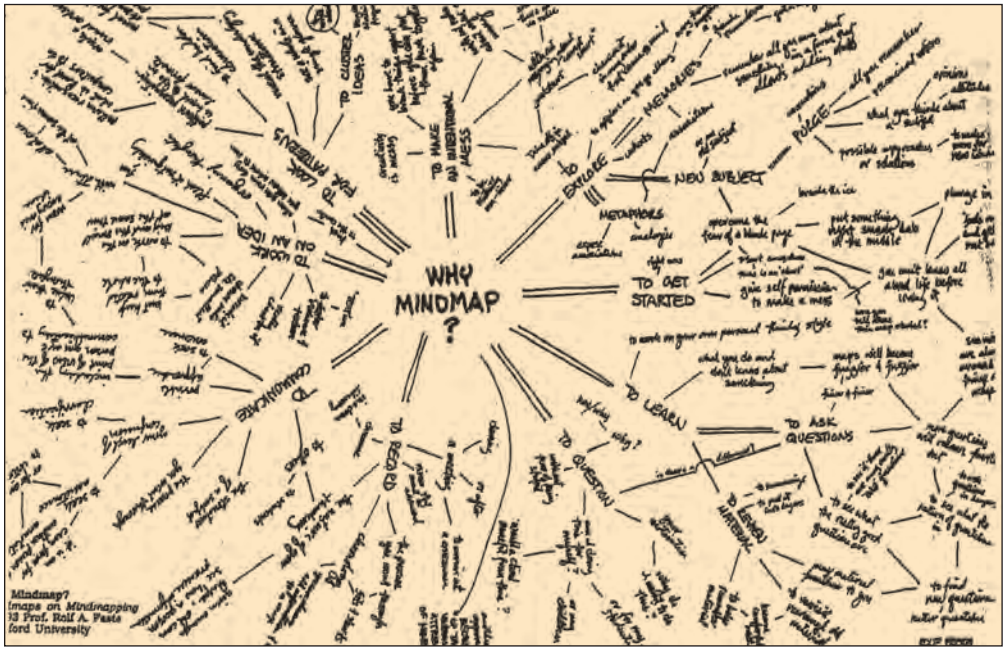
Source: Buzan (1993). The Mind Map book

What benefits do people get from using Mind Mapping? The biggest benefit that people cited was clarity of thinking, and the second was managing information overload. Third was improved productivity and being better organized.

Source: s3.amazonaws.com/nova-mind/pdf/value-of-mind-mapping.pdf

Outcome:

A map including all your key thoughts organized by themes



Source: Rolf Faste, Stanford University

Understand
Observe
Synthesize
Realize
Experiment

Empathy Map

Understand
Observe
Synthesize
Realize
Experiment

Purpose: Assemble and analyze the data from customer and user needs research and develop relevant insights

Steps:

1. Create a template that looks like the matrix to the right on a paper or an easel
2. Optional: Use the template to take notes during your observation research. "Say" and "do" notes can be taken directly from what you see and hear. "Think" and "feel" require you to interpret the user's rational and emotional states of mind. The four categories in which to capture data are:

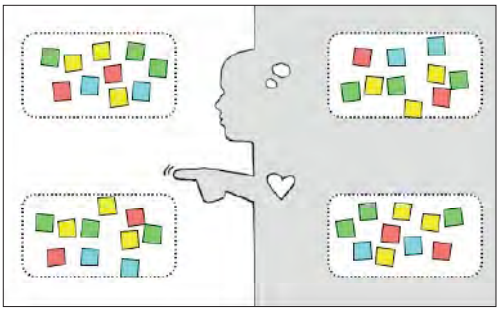
   a. *Say:* What did the users say to you or to others they interact with? Highlight key quotes

   b. *Do:* What did you see the users do? What actions and behaviors did you notice? You may use pictures or videos to illustrate

   c. *Think:* What may the user(s) have been thinking yet not saying? What does this tell you about his/her beliefs?

   d. *Feel:* How do you think the users may have felt? What emotions may they be feeling?

   Tip: non-verbal information plays a critical role in helping you interpret behaviors and beliefs so pay attention to body language and tone of voice.
3. Review all the data from your research (written notes, videos, etc). Capture that data on Post-it notes, one idea per note. Then cluster the Post-it notes into four categories: say, do, think, feel.



Source: d-school bootcamp bootleg

Empathy Map (con't)

4. Review all the data on the Empathy Map and identify salient customer or user needs. Write them down on post its on the side of the Empathy Map

Needs are verbs, not nouns, that represent activities or desires with which your user could use help; they are not solutions.

Tip: looking at gaps between what customers or users say and what they do is useful to identify needs that are often not articulated

5. Identify insights and write them on the side of the Empathy Map

Insights often come from asking why and understanding gaps and pain points

Outcome: All the data organized in the four categories, needs and insights generated from the map

Source: d.school boot camp bootleg

Source: PFPS Class Session, Haas School of Business

Note that this approach takes a different point of view from the one described in the Osterwalder book (p.130-131). This Empathy Map is used for helping with user observation and analysis while the book focuses on profiling customer groups and creating personas.

em·pa·thy
–noun *1. the intellectual identification with or vicarious experiencing of the feelings, thoughts, or attitudes of another.*

AEIOU

(Activities, Environment, Interactions, Objects, Users)

Understand
Observe
Synthesize
Realize
Experiment

Purpose: Capture and analyze data from customer and user needs research

Steps:

1. Conduct your ethnographic research. You may want to use the AEIOU categories to help you observe or interview. You can also take the form with you into the field and fill it out as you are doing the observation.
2. Review all the data from the research (written notes, videos, etc.) and start characterizing the information in the following categories. Here you are working from the global level, combining the data from all your observations.

"The question is not what you look at, but what you see."

- Henry David Thoreau

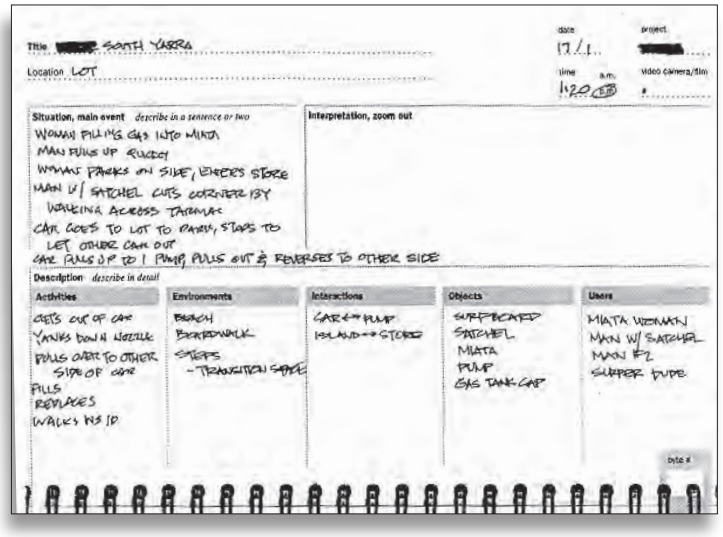
Activities: what are the goals that people want to accomplish? *Example: listening to music in the morning, drinking coffee, dancing...*

Environment: what did you notice around the people you interviewed or observed? *Example: in their home, work, train, friend's house, coffee shop*

Interactions: what types of interactions did you notice between the people you interviewed or observed and other people, animals, nature elements, etc? *Example: student getting coffee at Starbucks, student making coffee at home with the coffee maker*

Objects: what objects did you see around the people you observed or interviewed? *Example: iPhone, coffee maker, ballet shoes*

Users: who did you see? *Example of users: student, secretary, ballet teacher, Starbucks employee*



An example of an AEIOU chart filled in during field work

Source: Point Forward

University of California
Berkeley
Haas School of Business

AEIOU (con't)

3. Supplement observations with photos or video tapes
4. Review AEIOU data to identify needs and create insights

Outcome: Data organized in the five categories

Variations:

Here are a few other variations on ways to observe and alanyze customer and user needs data:

Spradley's 9 Dimensions	A (x4)	Sotirin	POSTA	POEMS
Space	Atmosphere	Territory	Situation	Environment
Actors	Actors	People	Person	People
Activities	Activities		Activity	
Objects	Artifacts	Stuff	Objects	Objects
Acts		Talk		Messages
Events				
Time			Time	
Goals				
Feeling				
				Services

Source: http://palojono.blogspot.com/2007/07/recording-ethnographic-observations.html

"We realized that these are tools that we can artfully use to advance our thinking. If our quest is to see what we couldn't see before, then these tools will be helpful. But they are not the stopping point –just the starting point."

- Clark Kellogg

"A Day in a Life" aka Customer Journey Map

Understand
Observe
Synthesize
Realize
Experiment

Purpose:

Visualize and analyze the journey on which a customer or user embarks around the use of a product or service. You might also create a product journey map, an employee journey map, etc. depending on what you are studying.

Steps:

1. Review all your data from the observation or interview of a particular individual. You may work on building this while in the field.
2. Create a timeline for a day (or other period of time corresponding to an activity of interest such as going to a movie or purchasing a new car) by going through all of the steps associated with that activity. Write down all of the steps in chronological order

   Tip: be comprehensive since you do not know yet what may be meaningful
3. Identify needs, gaps and pain points
4. Do the same with other users
5. Alternatively you may not want to map each user, but instead collect data across users to build the map. You could build a different one for each customer segment.
6. Compare and contrast. Look for patterns and anomalies across the maps

"It's about the journey, not the destination"

Making a Customer Journey Map with simple materials: markers and big sheets of paper.

Source: http://sarahdrummond.wordpress.com/2010/01/06/choruses-from-the-rock/

University of California
Berkeley
Haas School of Business

"A Day in a Life" aka Customer Journey Map (con't)

Outcome:

A timeline describing the steps in a day (or other time period)

Variation:

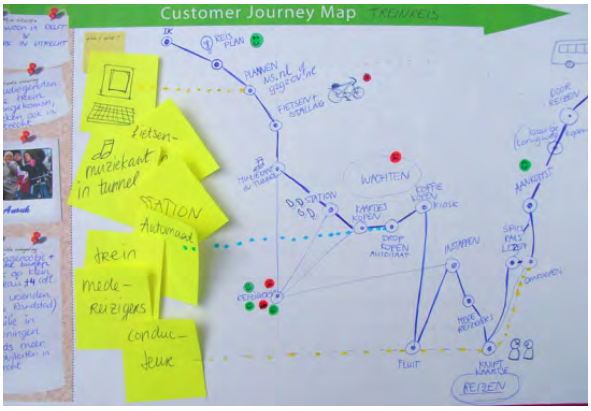
Apply the same steps to other specific events that need to be mapped chronologically to better understand them.

Journey Map from Project Runway

Airline Customer Journey Map

Source: Government Communications Network/UK Civil Service

The Trainride



Source: Service Design Tools. http://www.servicedesigntools.org/tools/8

Building a customer journey implies the observation of the user experience and the representation of that experience through its touchpoints. This is a rough sketch used for the construction of a customer journey map. The starting point is the identification of the touchpoints as the elements of the service interface that establish the relation between the user and the organization. The touchpoints can be physical, virtual or human. The user experience is obtained by connecting the different touchpoints in a sequence. (From Service Design Tools http://www.servicedesigntools.org)

- Understand
- Observe
- Synthesize
- Realize
- Experiment

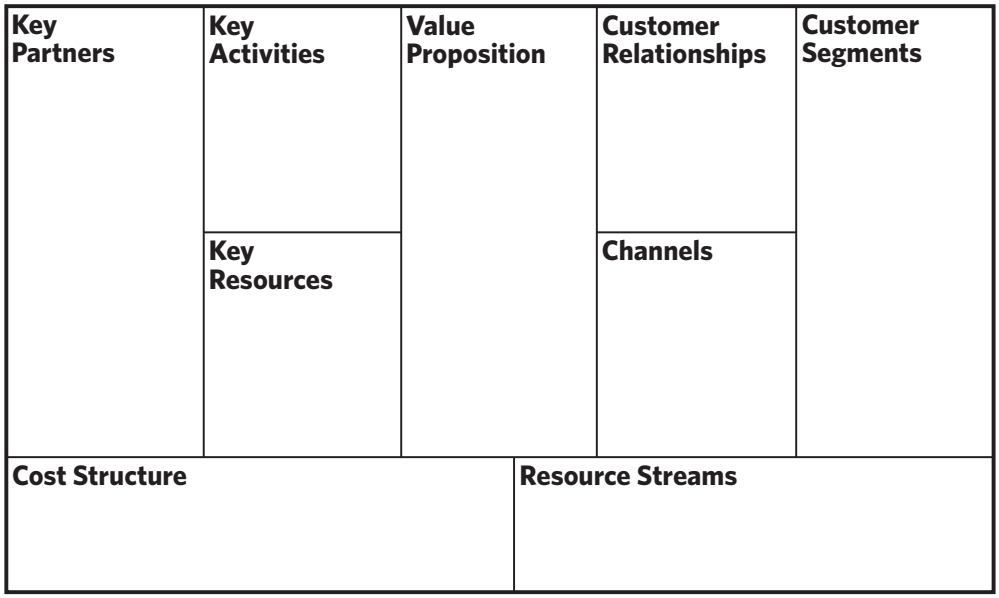
Business Model Canvas

Understand
Observe
Synthesize
Realize
Experiment

Purpose: Capture the essence of an organization's business model in a visual fashion that encourages play and generative thinking around how that business model might evolve.

Steps:

1. Draw the outline of a business model canvas, such as the one pictured below, on a large piece of paper.
2. Identify all of the Customer Segments served by the organization, and write them down, one per Post-it note. Place the notes in the Customer Segments box. (You may want to use a different color Post-it for each different customer segment served.)
3. Identify all of the Channels through which those Customer Segments are served. Write them down, one per Post-it note. Place the notes in the Channels box. (Again, you may want to use a different color Post-it for each different customer segment served.)
4. Identify all of the types of Customer Relationships (e.g., self-service, co-creation) you have with those Customer Segments. Write them down, one per Post-it note. Place the notes in the Customer Relationships box. (Again, you may want to use a different color Post-it for each different customer segment served.)
5. Identify the Value Propositions offered to each of the Customer Segments. What value is the organization providing, what problem is it solving, what benefits is it providing? Write them down, one per



Source: Business Model Generation by Alexander Osterwalder & Yves Pigneur

University of California
Berkeley
Haas School of Business

Post-it note. Place the notes in the Value Proposition box. (Again, you may want to use a different color Post-it for each different customer segment served.)

6. Identify the Key Activities that are performed to deliver those Value Propositions to the customers. Write them down, one per Post-it note. Place the notes in the Key Activities box.

7. Identify the Key Resources required to execute the Key Activities. Write them down, one per Post-it note. Place the notes in the Key Resources box.

8. Identify the Key Partnerships the organization has with others for delivering its Value Proposition. Write them down, one per Post-it note. Place the notes in the Key Activities box. Write them down, one per Post-it note. Place the notes in the Key Partnerships box.

9. Identify the primary elements of the Cost Structure of the organization, particular as driven by the Key Activities, Key Resources and Key Partnerships with which the organization engages. Write them down, one per Post-it note. Place the notes in the Cost Structure box.

10. Identify the primary means by which the organization generates Revenue Streams. Write them down, one per Post-it note. Place the notes in the Revenue Streams box.

11. Examine the Business Model Canvas for:

a) Gaps: missing information

b) Patterns: e.g., in color of Post-it notes that indicate the way in which different Customer Segments are served with different Key Activities and Key Resources

c) Relationships: ways in which the building blocks interact with one another, e.g., which Key Activities are critical to deliver the Value Proposition

Source: PFPS Class Session, Haas School of Business

SWOT

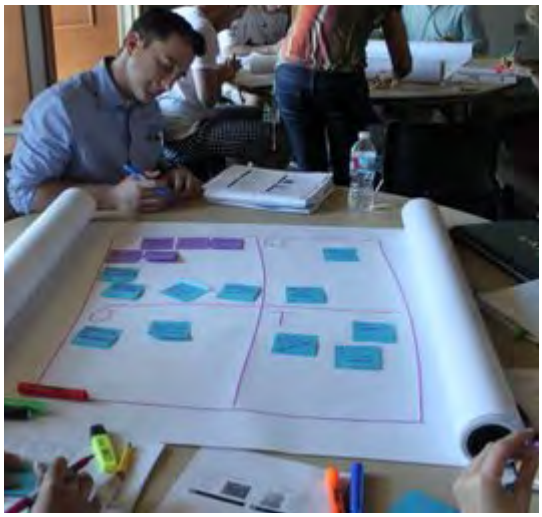
(Strengths, Weaknesses, Opportunities and Threats)

Understand
Observe
Synthesize
Realize
Experiment

Purpose: Analyze the strengths and weaknesses of an organization as well as the opportunities and threats posed to it by external forces. Use the output of the SWOT analysis to generate ideas that allow the organization to leverage strengths or opportunities, or overcome threats or weaknesses.

Steps:

1. Identify the internal strengths of the organization. Capture them on Post-it notes, one per note.
2. Identify the internal weaknesses of the organization. Capture them on Post-it notes, one per note.
3. Identify the external opportunities that are apparent for the organization (e.g., trends that are favorable to the organization's positioning, gaps in the competitive landscape). Capture them on Post-it notes, one per note.
4. Identify the external threats posed to the organization (e.g., trends that are not favorable, legal restrictions that may apply, competitive moves). Capture them on Post-it notes, one per note.
5. Create a grid such as the one pictured to the right. Place the Post-it notes on the grid.
6. If you have individually created your SWOT Post-it notes, you may wish to do some clustering of like ideas as you place the Post-its on the grid. If you do create clusters, label them appropriately.
7. Select the most important strengths, weaknesses, opportunities and threats around which to build statement starters (see the Statement Starter tool). For example,



Source: PFPS Class Session, Haas School of Business

SWOT (con't)

a) How might we leverage our strength in capability x to penetrate new markets?

b) How could we take advantage of the opportunity presented by trend y?

c) In what ways can we overcome our weakness in capability x?

d) How might we better protect ourselves against threat z?

8. Generate ideas to answer the question posed, and then select a few of them on which to take further action.

Outcome: A 2x2 matrix highlighting the strengths and weaknesses of the organization and the threats and opportunities posed for it by its external environment. A list of statement starters, a set of alternative concepts, and a selected few to take forward.

Source: Osterwalder & Pigneur, p.216-22

http://www.excelsia.ch/htmlgb/blog/

The generic format of a SWOT diagram.

http://www.pnla.org/institute

SWOT diagrams can be done in almost any format. A SWOT analysis "unpacks" a topic in a way that allows for deeper insight and clarity around the four dimensions.

2X2 Matrix

Understand
Observe
Synthesize
Realize
Experiment

Purpose: To sort, make sense of data or options, create insights and highlight opportunities

Steps:

1. Create a 2X2 matrix on an easel sheet or butcher paper by drawing a vertical and a horizontal line on the paper
2. Decide on two dimensions or criteria that are relevant to sort out the data or options

   a. You may ideate on a list of dimensions then select two that the team believes are most relevant

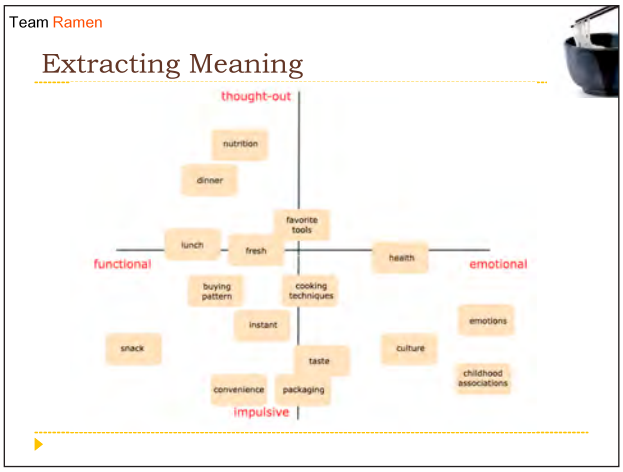
   b. Or just select two that are core to your challenge
3. Define two opposites on the first dimension and write them down on the left and the right of the horizontal axis (e.g., "cook from scratch" vs. "never cook", "own a home" vs. "rent a home", "beach lover" vs. "mountain lover", "cheap" vs." expensive")
4. Define the opposites of the second dimension, and write them down on the top and bottom of the vertical axis
5. Write your options or data on post-its and place them on the matrix. Compare and contrast and move if need be
6. Draw conclusions on the data or select options based on your objectives and the respective positions of the options
7. If necessary, redo the exercise with two other dimensions or criteria

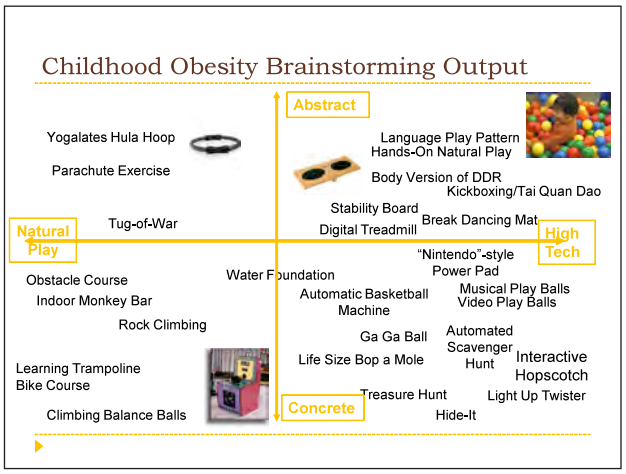
Outcome:

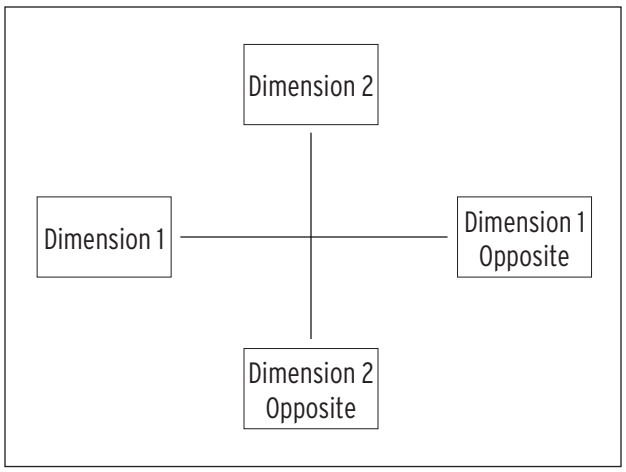
Data or options organized relative to each other on the two dimensions

2X2 Matrix (con't)

Examples:







Web of Abstraction aka Webbing

Understand
Observe
Synthesize
Realize
Experiment

Purpose: Reframe a challenge at the appropriate level of abstraction

Steps:

This tool allows you to increase or decrease the level of abstraction with which you are examining a situation. To be exhaustive in the process you may want to explore all the dimensions of the web by increasing and decreasing the level of abstraction as well as exploring alternative statements at the same level of abstraction.

To increase your level of abstraction and make the question broader or more meaningful:

1. Identify the original challenge, ideally stated as a question.
2. Ask the question "why?" Why is the challenge you have set forth a challenge? Why is it important?
3. Rephrase the answer to the question as a new question. (You may want to use the "Statement Starters" to help you rephrase.) Write the new question just above the initial one with an arrow connecting the two (see example).
4. Go back to the initial challenge and ask "why else?" Add the new questions alongside the others, repeating this step one or two more times.
5. For each of the new questions generated, ask "why?" again and generate another set of questions, writing them above the last set.
6. Continue to extend the web until it becomes obvious that the question is too broad and abstract to be valuable (e.g., how to be happy? how to save the world?)

"One way to understand webbing is to look at Spider-Man. Similar to how this superhero uses webs to move from building to building, practitioners can use webbing to move from question to question, leading to an ever-changing perspective of the world, or process. Webbing can help practitioners better understand why things are the way they are, or to look for a leverage point for future actions. Every question should provide insight into assumptions or details that can help practitioners understand a task more clearly – sometimes more objectively – and reach their target faster and with less effort.

- Uwe K. Kaufmann and Hector Ramo

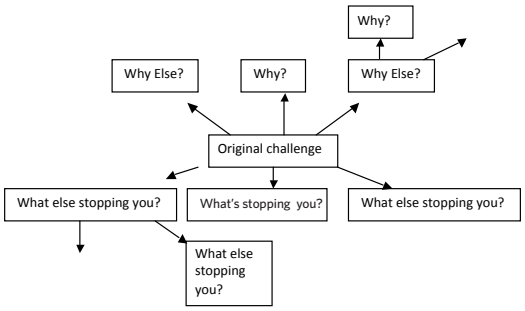
University of California Berkeley Haas School of Business

Web of Abstraction (con't)

To narrow the question your team is addressing, or make it more concrete:

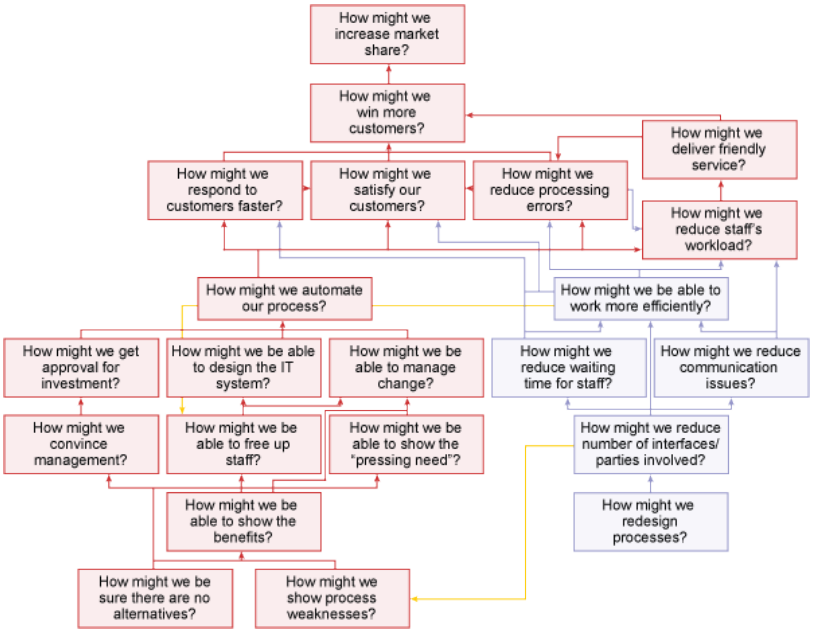
1. Identify the original challenge, ideally stated as a question.
2. Ask the question "What's stopping you?". Phrase the answer to that question as a new question (using the "Statement Starters" if needed), and write it just below the initial question with an arrow connecting the two (see example).
3. Return to the initial challenge and ask "what else is stopping you?" Repeat this step one or two more times as needed.
4. Now take the new questions generated in the last step, and repeat the process, generating another layer of questions below the last one. Continue to extend the web until it becomes obvious that the challenge is too basic to require a creative answer (e.g., how to decide between two manufacturers? how to contact a vendor?)
5. Look at the list of questions generated and select one around which to move forward

Basic Principle:



Sources including chart above: Basadur (1995), Isaksen, Dorval, Treffinger (1994), Switalski & Switalski (2008)

Outcome: list of questions that may be selected to start ideating



An example of a Web of Abstraction chart dealing with the "Web" around Automating Processes (Abbreviated) from "Reveal Assumptions and Find Root Causes with Webbing" By Uwe K. Kaufmann and Hector Ramos.

Source: http://www.realinnovation.com/content/c091005a.asp

Information Map

Understand
Observe
Synthesize
Realize
Experiment

Purpose: Show complex relationships between information chunks and investigate the causes of a particularly complex problem

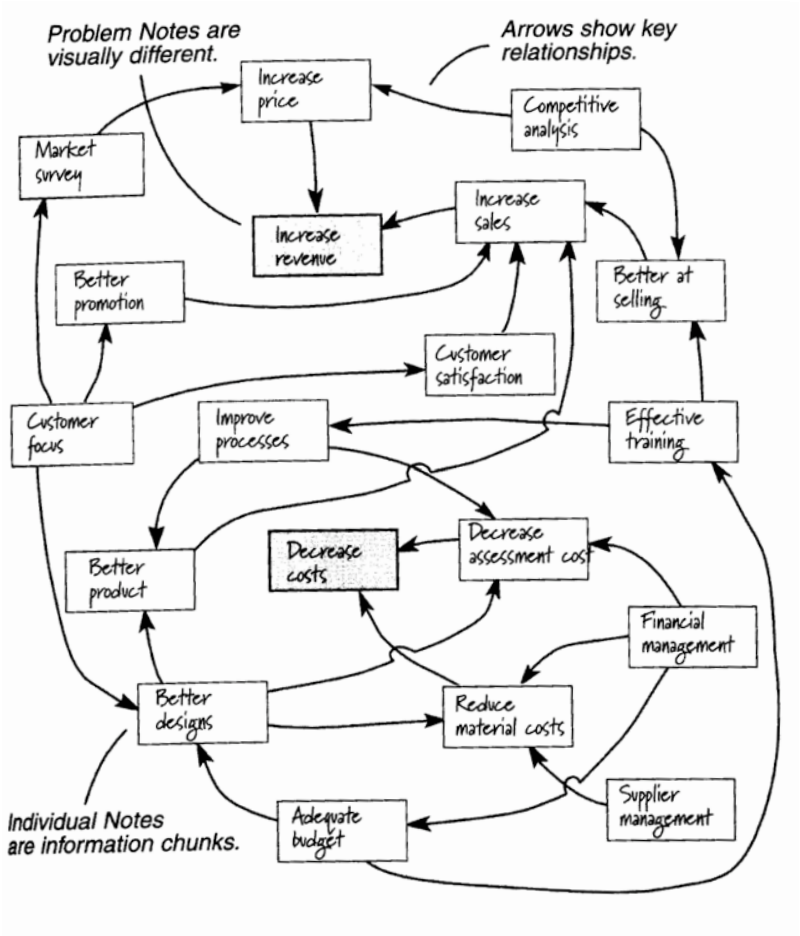
Steps:

1. Identify an objective (e.g., find the main cause of printer failure)
2. Identify mapping guidelines : for example use an arrow to indicate direct relationships between two elements. Those relationships may take the form of "causes" (i.e., one element causes the other), "belongs to" (i.e., one element belongs to the other), or "is near" (i.e., one element is near the other)
3. Identify the center note (or notes) around which the map will be built (e.g., printer failure)
4. Identify related notes and place around the center note
5. Add arrows to show relationships
6. Interpret the completed map
   a. Chains of notes have one arrow between each, so you can go to the end of the chain to find the "root" cause
   b. Bottlenecks occur when many arrows flow out of a note
   c. Sources exist with arrows only flowing out of a note
   d. Sinks are notes with arrows only flowing into them
7. Use the information to create insights or generate a powerful question

Outcome: a map that indicates relationships

Information Map (con't)

Information Map Example:



Statement Starters

Understand
Observe
Synthesize
Realize
Experiment

Purpose:

The use of questions rather than statements is a great way to start ideation. It is also a good way to express your concerns about something, as it creates more positive energy around resolving those concerns.

Steps:

Four of the commonly used starters used to generate ideas include:

1. How can we...? (e.g., how can we double the size of the company in the next 18 months?)
2. How might we...? (e.g., how might we deliver this product through a direct sales channel?)
3. In what ways might...? (e.g., in what ways might we more regularly interact with our customers?)
4. What might be all the ...? (e.g., what might be all the ways we can apply our company's resources to generate revenue?)

Examples:

Rather than writing the statement "we wish our company could be in the black next year" write "what might be all the ways to be in the black in 2011?"

Rather than writing "our marketing department wants to identify a new segment to expand our product line" write "how might we expand our product line?"

Rather than writing "this option will take too much time to develop" write "how might we develop this option within 18 months?"

Rather than writing "our plant manufacturing costs are not competitive anymore" write "in what ways might we improve the productivity at our plant by 10%?" or "how might we continue manufacturing at our plant and still be competitive?" or "what might be all the ways to stay competitive?" (see Web of Abstraction tool for details on identifying the most meaningful questions.)

Source: PFPS Class Session, Haas School of Business

Source: Miller, Vehar, Firestien (2001). Creativity Unbound

University of California
Berkeley
Haas School of Business

Business Model Canvas (page 3 of 3)

12. With additional input from other analysis (e.g., SWOT analysis, Customer Empathy Map), generally in the form of Statement Starter question, use the Business Model Canvas to generate new ideas for the organization.

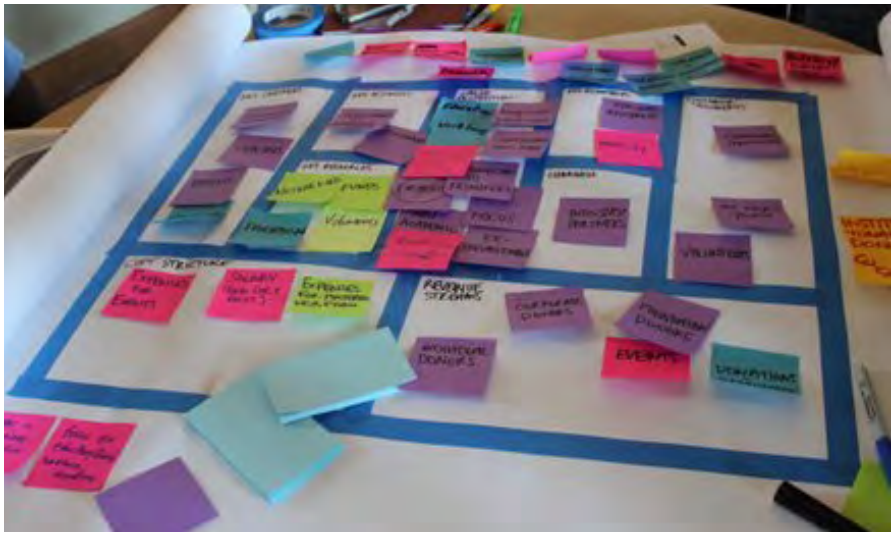
a) E.g., in what other ways might the organization's key resources be applied to increase Revenue Streams?

b) E.g., what additional customer segments might the organization serve, and what are the implications for Key Activities performed?

c) E.g., what alternative Revenue Streams might the organization consider, and through what Channels would it have to operate to capture those Revenue Streams?

Outcome:

An "as-is" business model canvas, as well as "proposed" business model canvases that show the core elements of the business and how they interact with one another.



Source: PFPS Class Session, Haas School of Business

Post-it® Note Option Generation aka Post-its Brainstorming

Understand
Observe
Synthesize
Realize
Experiment

Purpose: Quickly generate and capture many options or alternatives

Steps:

1. Obtain post-it® notes and thin, but visible markers

   a) You may wish to use different color post-it notes and/or different color pens to distinguish different phases of the process, feedback from different people or customers, different types of inputs, etc. Doing so can make it easier to visualize patterns, progress over time, the focus of the group's thinking, etc.

   b) If using this approach for concept generation, use large post-it notes or half-sheets of paper. (See the "Half-Sheet" tool.)

2. Remind the participants about the diverging rules
3. Write the starting question or topic where everyone can see it (e.g., on the whiteboard, on a piece of flipchart paper)

   a) The "Statement Starters" tool may provide a useful way to think about phrasing the topic or question.

4. Give the participants a chance to write down all the options they can come up with to respond to the starting question or topic.

   a) Insist on quantity, perhaps by using quotas (e.g., create 30 options in 5 minutes, generate 2 more options per person, create 150 options total for the team)

   b) You may want to work silently for the first few minutes, letting each individual get his or her ideas documented before opening discussion to the larger group

5. Share the post-it® notes with the group, posting them on the wall or flipchart as you do so.

   a) Encourage everyone to share all of his or her options, even if they feel that someone else has already shared a similar or even the same option.

University of California
Berkeley
Haas School of Business

Post-it® Note
Option Generation
aka Post-its Brainstorming (con't)

6. Decide whether or not to continue with another round of option generation using the same tool or a different tool

a) Check your progress against your objective. Do you have enough options? Are they creative enough?

b) If you have not met your objectives, you may want to try another tool that allows you to generate options from a different perspective e.g.,

i. SCAMPER
ii. Forced Connections
iii. Analogy

c) If you have met your objectives, then you will likely want to move to a converging phase using the converging rules and a concept selection tool e.g.,

i. Dot voting

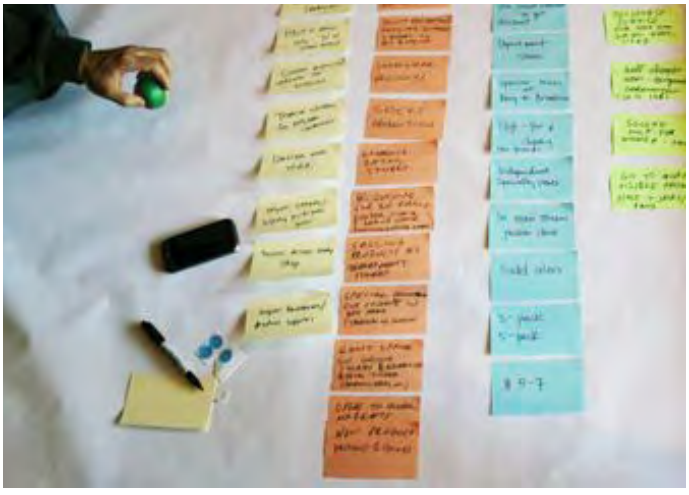
"To swear off making mistakes is very easy. All you have to do is swear off having ideas."

- Leo Burnett

Outcome: a collection of individual ideas

Variation:

Brainstorming:
In this technique, all the participants share their options aloud, one at a time, and they are recorded by one person on a chart as they are shared.



Source: PFPS Class Session, Haas School of Business

Half Sheet Concept Capture

Understand
Observe
Synthesize
Realize
Experiment

Purpose:

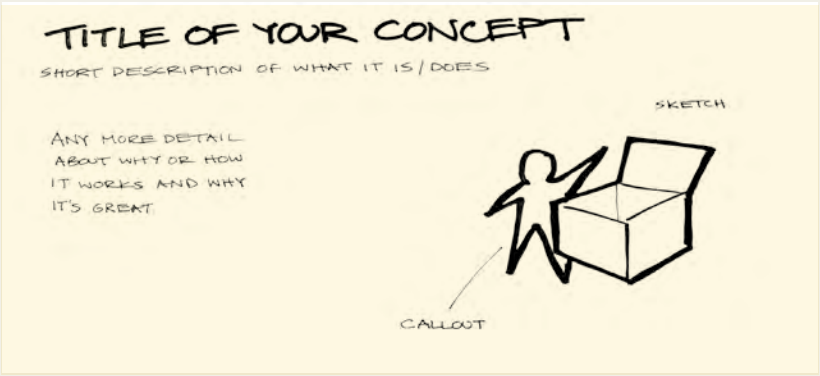
Create short descriptions that summarize an option and can also be used for getting outside feedback.

Steps:

1. Split a sheet of paper in half or use large Post-it notes
2. Write a description of your idea including the following elements: title, visual, description
3. Optional: it is often useful to explain why your concept is meaningful and to explain how it works
4. Use a converging tool to narrow down the options either internally or by getting user feedback.

Outcome:

A title, visual and description of an idea which can be useful to get feedback in the experiment phase



Source of graphic: Jump Associates, Inc.

Half Sheet Concept Capture

Understand
Observe
Synthesize
Realize
Experiment

Purpose:

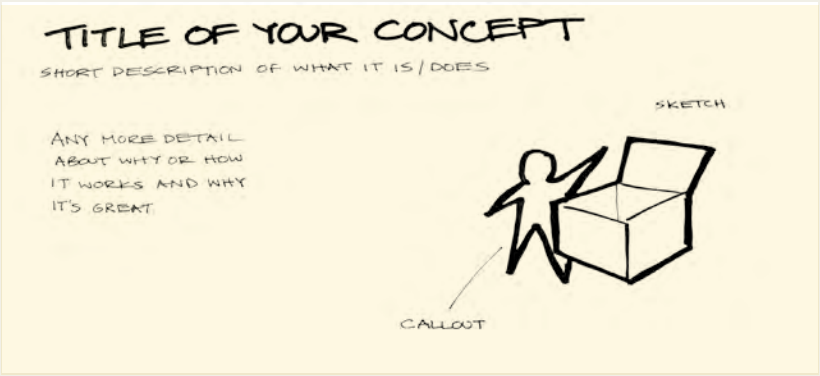
Create short descriptions that summarize an option and can also be used for getting outside feedback.

Steps:

1. Split a sheet of paper in half or use large Post-it notes
2. Write a description of your idea including the following elements: title, visual, description
3. Optional: it is often useful to explain why your concept is meaningful and to explain how it works
4. Use a converging tool to narrow down the options either internally or by getting user feedback.

Outcome:

A title, visual and description of an idea which can be useful to get feedback in the experiment phase



Source of graphic: Jump Associates, Inc.

Dot Voting/Multi-voting

Understand
Observe
Synthesize
Realize
Experiment

Purpose: narrow down the number of options being considered at any stage of the process

Steps:

1. Give a fixed number of stickers (e.g., dots, stars) to each participant

   Tip: Give a small number of stickers (around 3-4) to each participant when you want to converge to just one or two options in the end. Provide a larger number (6 to 9) of stickers if you want to force some convergence, but leave a number of options for further clustering and analysis.

2. Review the criteria you will use for affixing dots to concepts.

   Tip: You may have to use a diverging and then converging cycle to get at the criteria, first generating them and then selecting the ones you wish to use. Make sure you check the criteria you've chosen versus the overall objectives for your project.

3. Have each participant place his or her stickers on the options for which they would like to vote based on the criteria

   a. Have participants place just one sticker per option if you are seeking a larger number of remaining options.

   b. Allow participants to place more than one sticker per option if you wish to converge on a smaller set of options

4. Select the options you would like to retain moving forward

   a. Option A: Keep all the options that have been marked at least by one dot as you move on to clustering

   b. Option B: Keep only the one or two options with the most votes

Source: http://www.innovationtools.com

Dot Voting/Multi-voting (con't)

Tip: You want to leave this process with the best options, not just the most popular. You may want to mix and match elements of the options to develop a better set of options overall.

Outcome: a short list of selected options

Variations:

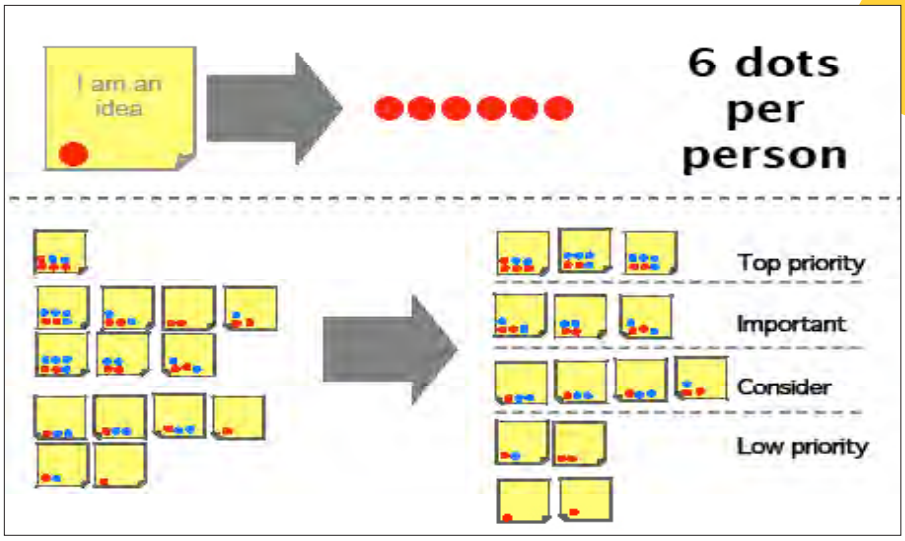
The "Gold Star." Give an additional special dot or star for the wildest option if you are interested in keeping more innovative ones (Research shows that participants tend to vote conservatively).

Special Votes. Create your own selection criteria: for instance one vote for the "smart choice", one vote for the "holy grail", one vote for the "darling" and one vote for the "most unexpected" (source: d.school)

There is always an easy solution to every human problem – neat, plausible and wrong.

– H.L. Mencken

Dot Voting Schematic:



From "10 Tools from an Experience Strategist's Toolbox,."Sarah B. Nelson, Hot Studio

Source: hotstudio.com

Card Sort

Understand
Observe
Synthesize
Realize
Experiment

Purpose: compare and rank elements (e.g., challenges, questions, ideas, criteria) to select a smaller number of them

Use it when: you have between 6 and 15 options.

Steps:

1. Write each option on a 3" x 5" card or post-it
2. Count the number of options, N
3. Identify the criteria for rating. You may use the general rules of converging or brainstorm a list of criteria and select a few.
4. Select the least liked option and number it with the last number, N
5. Select the most preferred option and number it 1
6. Select the least liked option among those remaining and number it N-1
7. Go the most preferred option among those remaining and number it 2
8. Continue alternating between least preferred and most preferred until all the options have been ranked

   Tip: you can do this by rating the options individually first, and then having a group discussion about the rankings or you can do the rating as a group from the start, but this works best if there is a limited number of options and a small group within which to build agreement.
9. When you start with individuals completing the rankings on their own:
   - Complete the individual rankings
   - Create a matrix with individuals down the side and options across the top to capture the individual results

(con't)

Card Sort (con't)

- Calculate the total score for each item by summing the columns
- Discuss the results paying particular attention to places where the individual rankings differed significantly
- Adjust the rankings per the discussion to arrive at a final ranking

Outcome: ranked options

	Option 1	Option 2	Option 3	Option 4
Participant A	2	3	1	4
Participant B	1	3	2	4
Participant C	3	2	1	4
Participant D	4	2	3	1
Totals	10-#2	10-#2	7-#4	13-#1

Other versions of this include the concept screening and concept scoring matrices described in Ulrich and Eppinger, Pugh concept selection matrices, etc.

Source: Puccio, G. & Switalski L. (2008), Miller, Vehar, Firestien (2001)
Adapted from Moore, C.M. (1987) Group Techniques for idea Building