Creative techniques handbook 2014

Stein, Suzanne and Aydemir, Mehnaz and Centeno Garcia, Hector and Chai, Shengquan and Cooke, Leiane Olive Marie and El-Khateeb, Tarik Mohammed Saed and Fienberg, Elliot Andrew and Han, Yutong (Klaudia) and Jennings, Tatiana and Ji, Chen and Ji, Yushan and Jones, Kristina Laura Lee and Kee, Jessica Hayati and Li, Tianjiao (Jenna) and Murakami, Sachiko Kristine and Olsen, Michael Christopher and Pillai, Harish and Power, Tegan Mary Glenna and Rabbani, Rida and Saimaldahar, Daniah Osama and Sturgeon-Reed, Hart and Virtue, Monica Lynn and Vu, Phuong Ha and Wright, Laura Ann and Zhang, Yikai and Zheng, Xiangren

Credit for this work also goes to Smriti Shakdher, Graduate Student in the Strategic Foresight and Innovation program, for her design work and general chaos management.

CREATIVE DIGITAL FUTURES TECHNIQUES HANDBOOK

SUZANNE STEIN
Associate Professor,
Innovation Digital Futures
T: 416 977 6000 4651
M: 416 315 1896
F: 416 977 6006
E: sstein@faculty.ocadu.ca
Twitter: @Suzzle

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What is a Creative Technique?

Prof. Suzanne Stein

A creative technique is a tool that may be used by groups of creative practitioners to move from a broad concept to a defined idea for implementation. Indeed, they may help a group find or frame a problem to solve and they are intended to give shape and form to the intended solution or offering.

This text is divided into two sections for two types of Creative Techniques: Conceptual Techniques and Creative Elicitation exercises.

Conceptual Techniques are the most recognized in a design thinking process. They help with cycles of divergent and convergent processes through out the progression of idea development – these may help to open or close options forward for a group.

Creative Elicitation exercises aid in group's ability to perform a design thinking process; they may encourage lateral thinking, level a group's hierarchy or encourage group cohesion.

Some Creative Techniques certainly qualify in both categories but the distinction helps us remember that Creativity is not merely procedural: selecting the right tools at the right time for a given problem; it is also about opening up the space for kinetic, group dialogue and high, team performance.

The techniques in this text have been co-authored by Graduate Students in the Digital Futures program at OCAD University. We have created this as a reference of the techniques we chose to explore together and may be of use for practitioners exploring new Creative Techniques for their toolkits.

Authors are:
Mehnaz Aydemir, Hector Centeno, Shengquan (Frank) Chai, Leiane Olive Marie Cooke, Tarik Mohammed Saed El-Khateeb, Elliot Andrew Fienberg, Yutong (Klaudia) Han, Tatiana Jennings, Chen Ji, Yushan (Cynthia) Ji, Kristina Laura Lee (Lee) Jones, Jessica Hayati Kee, Tianjiao (Jenna) Li, Sachiko Kristine Murakami, Christopher Michael (Chris) Olsen, Harish Pillai, Tegan Mary Glenna Power, Rida Salman Rabbani, Daniah Osama Saimaldahar, Hart Sturgeon-Reed, Monica Lynn Virtue, Ha Phuong Vu, Laura Ann Wright, Yikai (Glen) Zhang and Xiangren (Gary) Zheng

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CREATIVE ELICITATION

Brainstorming

Rida Salman,
Mehnaz Aydemir

"We are all students of creativity, and what a path we walk! Best wishes to one who share's my grandfather's belief that each of our creative gardens can be grown in this soil of life." — John R. Osborn

Overview

Brainstorming is a group or individual creativity technique by which efforts are made to find a conclusion for a specific problem by gathering a list of great ideas spontaneously contributed by its members.

Background

The exact background of brainstorming is not recorded and this is due to the fact that brainstorming is a creative technique and comes to people quite naturally. However Alex Osbourne put forward the name in 1940's as he decided that the conventional methods of overcoming obstacles and creating new ideas were not conducive enough to real creativity. It is also interesting to not Osbourne who was an advertising executive coined the term as the 'think up' process.

With regard to an understanding of the principles behind CPS, Osborn stresses the importance that "we should hold back criticism until the creative current has had every chance to flow" (Osborn, 1952b, p. 264). He later introduces ground rules for group brainstorming: judicial judgment is ruled out; wildness is welcomed; quantity is wanted; and combination and improvement are sought. These four guidelines provide the power behind the use of divergent thinking. Osborn mentions that "not only in business but in every line, the quality of leadership depends on creative power" (p. 307). This notion that creativity drives leadership is why CPS has become a process that can promote real change in any organization through a group of empowered individuals.

*This is when 'think up' started forming into brainstorming as an art form.

Since its initial publication in 1953, Applied

Imagination has become one of the most widely known textbooks on the subject of creativity. In 1998 alone there were 25 citations of the before mentioned book by other authors (Institute for Scientific Information, 1998). Chapter eight introduces the CPS process depicting three distinct components: fact-finding, idea-finding and solution-finding (Osborn, 1953/1979). Chapter ten discusses the concept of deferred judgment and quality yielding quantity. The book also discusses exercises to enhance key points discussed in each chapter. The fact alone that the original copyright is 46 years old points out that this "classic" still has its place in the emerging field of creativity and innovation.

Osborn (1955) introduces the concept that provides "optimum opportunity for creative thinking and for judicial thinking is to divide a conference into two sessions" (p. 1). This notion of two separate sessions where the first session allows for ideas to flourish is counterbalanced with a second session where decisions are made on the ideas produced. Osborn stresses that "when it comes to thinking, let's try to act as if we were two people – at one time, a thinker upper, a producer of ideas; at another, a weigher of ideas" (p. 3).

Purpose

The goal of the initial 'think up' process would be to come up with as many ideas as possible and nowadays companies across the globe benefit from brainstorming in many departments including the marketing department, advertisement campaigns, management methods, strategies and many more.

Goes By

The initial coined term 'think up' is pretty much summed up in his quote " It is easier to tone down a wild
idea then to think up a new one" as it is a method of thinking up solutions. However Osborne in his book describes the method as using the brain to storm a creative problem, from there it was only a small step to the term brainstorming.

Variations

Brainstorming is similar to mind mapping in that, it requires thoughts to start flowing. It should require no filtering of ideas. Idea generation requires combining and modifying of ideas and there is no right and wrong way
of doing it, rather finding what works best for you. However while brainstorming is a group activity which
an be also done by an individual. Mind Mapping is where an individual uses a diagram to link ideas with words
and images. They both have similarities as mind mapping allows individual to create images and figures to help break points of thinking to be memorable better
and stronger.

Using the technique

The way this technique works is to start creating ideas around a situation or scenario without filtering or defining. This should be followed after a description of the topic and a very well framed problem. If the created frame is not clear and stable it will lead the group out the pathway, it can still be done but wouldn't be effective enough as the technique will fail to get you to creating the right design.Then you list down a list of solutions for the problem, this stage is followed by creating new ideas which are still just ideas but are ideas that from the solutions of the problem and finally a list of ideas devised from the previous and this is your term quite literally implies using the brain to storm a creative problem. The rules are there are no right and wrongs and no judgment from the part of the group. This technique is usually termed trigger response and was founded by George Muller as a part of the Ford Motor company to come up with as many possible ideas
to a solution.

There are several types of brainstorming techniques available:

Different applications:

Do not tell method:

Do not tell the problem to the group, but direct the conversation toward the problem without divulging it. ex- How can we break the chair?

Reverse brainstorming:
When it is hard to create
When there is a judging and convergent preferences problems
When people have more strongly analytic than creative preferences.
Use it as a different method for idea creating, to get even more ideas.
When you are able to conceptually reverse the problem.

How to:
Change the wording of the problem on which you are working from how to solve it to how to cause it. The input in this case would be a scenario or the problem at hand for which the solutions need to devised. In the case of our classroom activity we gave them a situation and they had to come up with the ideas.

Component	Attribute	Ideas
Body	Weight?	Make super light
	Shape?	Wafer size & shape
	Style/Colour?	Imitate clothing, accessories
Lens	Interchangeable?	All-in-one zoom
	Filters?	Built-in filters
	Lens Hood?	Built-in
Film	Type?	Preloaded film backs
View Finder	Type?	Ease of focus: use bright, contrasting colours for focus
Case	Purpose?	Protect camera; more useful if integral with camera; waterproof, shock-proof
		Imitate clothing, accessories; like a pocketbook
	Appeal?	Contains a miniature Tripod
	Added value?	Multiple length; variable functions: wrist, arm, neck
		Theft-resistant, personally identifiable
Strap	Flexibility?	Imitates clothing, accessories
	Added value?	

Trigger Response:

Found by: George Muller Ford Motor Company
Aim: To create as many ideas as possible to achieve the solution

Trigger response is a distinctive variation on brainstorming developed by George Muller, director
of design at Ford Motor Company. Groups of eight to twelve people are set up. Each group defines the problem
it will work on. The groups may work on the same problem or on separate problems. Once the problem is defined, the group must agree on the desired solution.

Here is how it works;
1. Each group draws the graphic above on a piece of paper;

2. Each group starts fill ing the first column with ideas to solve the problem without judging, criticizing. This takes eight to ten minutes.

3. A group member reads the list

4. All other groups strike out duplications. At the same time, they write down in column two any new ideas that triggered by the reading of the list.

5. The process is repeated to fill column three.

6. After each group has competed the process, the lists are collected and discussed with all participants to see if any other thoughts occur. These are recorded.

7. The final lists then given to executives to discuss.

Going Solo:
Brainstorming is by definition a group activity. However, it is possible to borrow from the brainstorming spirit in order to generate ideas on your own. Give yourself permission to list wild ideas without self-censorship or evaluation. Jot them down or use a tape recorder, if you prefer. Set a limit and don't go beyond the limit.

Checklisting:
Checklisting is a method of extending the intuitive idea supply by:

Providing solution possibilities
Stimulating the production of new ideas beyond the list itself
The checklist is a series of questions that help focus intuitive, creative thought, encouraging the creation of combination of ideas that are not immediately apparent or habitual.
Fallows by these titles; Modify, Adapt, Magnify, Minimize, Substitute, Rearrange,

Reverse, Combine
Processing and running down a checklist of questions under each title how to product to be used, to be adjusted, blended or interchanged by its opposites, and writing down all the answers.

Attribute Listing:
This technique is for focusing brainstorming sessions by first listing the basic characteristics or attributes of a product and then brainstorming to generate new ideas relating to these attributes. Below is the example how it can be visualized;

1. Listing attributes of and characteristics of the product in questions

2. Brainstorming on this list in order to develop modifications, variations, changes, variations, additions, subtractions, and innovations.

3. Evaluating the resulting suggestions after brainstorming is done is concluded.

Morphological Analysis:
Attribute listing can get more complicated by designing creative sessions to visualize and analyze all possible combinations of variables relating to a product concept. The idea is to combine two or more variables in multiple ways, then look at the results to see if any viable new product ideas have emerged.

This can include at least three variables such as;

1. Material: hardboard, plywood, plastic
2. Colour: oak, pine, birch
3. Surface: textured, matte, grained

These variables alone can create more than 50 combinations.

Next steps after exercise:
Brainstorming, just like the many idea flowing techniques, does not require a particular stage at which needs to be done. You can always come back to getting ideas generated whether it is at the initial stage right before prototyping or at a stage where scenarios or a situation does not fit. You can always revisit this process to have ideas flowing for new and innovative solutions.

Other points of note:
It is really important to have the situation at hand while starting the brainstorming session whether it is individually or collectively having a starting goal in a defined parameters. It is extremely important although no idea is wrong or too general, having clear rules what the activity requires is essential. In this day and age it is important to structure and create rules so that people using this technique do not get lost in the abstract nature of the ideas. What we achieved after our presentation activity, although the situation was comprehendible
a few people got confused because of creating a not-firm-enough frame around the problem to start with. In order to create results that can be referred to later,
the problem needs to be addressed clearly and limitations of design should be defined in a good frame to give the group a narrative with its clear limits to start experiencing brainstorming.

Other case studies and examples:
Please read below article and check the website for further explanation to a real life situation to brainstorming which is done by using Reverse brainstorming technique;

*Luciana is the manager of a health clinic and she has the task of improving patient satisfaction.

There have been various improvement initiatives in the past and the team members have become rather skeptical about another meeting on the subject. The team is overworked, team members are "trying their best" and there is no appetite to "waste time" talking about this.

So she decides to use some creative problem solving techniques she has learned. This, she hopes, will make
the team meeting more interesting and engage people
in a new way.

Perhaps it will reveal something more than the usual "good ideas" that no one has time to act on.

To prepare for the team meeting, Luciana thinks carefully about the problem and writes down the problem statement:
"How do we improve patient satisfaction?"
Then she reverses problem statement:
"How do we make patients more dissatisfied?"
Already she starts to see how the new angle could reveal some surprising results.

At the team meeting, everyone gets involved in an enjoyable and productive reverse brainstorming session. They draw on both their work experience with patients and also their personal experience of being patients and customers of other organizations. Luciana helps ideas flow freely, ensuring people to not pass judgment on even the most unlikely suggestions.

Here are just a few of the "reverse" ideas:

- Double book appointments.

- Remove the chairs from the waiting room.

- Put patients who phone on hold (and forget about them).

- Have patients wait outside in the car park.

- Discuss patient's problems in public.

**MindTools.com. (2011). Rebuilding Morale. [Online]. Available from: http://www.mindtools.com/pages/article/morale.htm. [Accessed: August 12, 2011].*

Card Sorting

Chris Olsen
Hart Reed
Tarik El-Khateeb

Overview
In the online counterpart of his book "The Encyclopedia of Human-Computer Interaction, 2nd Ed.", William Hudson states that the term card sorting "applies to a wide variety of activities involving the grouping and/or naming of objects or concepts. These may be represented on physical cards; virtual cards on computer screens; or photos in either physical or computer form." (Hudson,2013)

Card sorting is a simple technique where participants are guided by a facilitator to create some kind of categorization or hierarchy of elements. By analyzing the statistical results of many rounds of sorting designers can evaluate which elements the average user of their product or service expects to find grouped together.

Background
Card sorting dates back to the ancient Greeks who used it for categorization, with Aristotle "providing the foundations for the categorization scheme that we use today for plants and animals (Sachs, 2002, as cited in Hudson, 2013)".

Inkblots or Rorshach tests were used in psychology nearly 100 years ago, they were originally designed to create a profile of people with schizophrenia but later on used as a projective measure of personality (Framingham, 2011).

Printed playing cards have also been used for a variety of experiments in psychology, as have blank cards on which researchers would write words to be categorized by the subjects, as observed by Jastrow in 1886 and Bergstrom in 1893 (Hudson, 2013).

Early card sorting activities focused on the speed of sorting cards to establish the characteristic of subjects as an indicator of:

Mental processes and reaction time (Jastrow, 1886; Jastrow, 1898, as cited in Hudson, 2013).

Memory function (Bergstrom, 1893; Bergstrom, 1894, as cited in Hudson, 2013).

Imagination - using inkblots on cards (Dearborn, 1898, as cited in Hudson, 2013).

In the chapter on card sorting, Hudson notes that this technique was also used in other practices such as "criminology (Galton, 1891), market research (Dubois, 1949), semantics (Miller, 1969) and as a qualitative tool in the social sciences (Weller & Romney, 1988; Bernard & Ryan 2009)." (Hudson, 2013).

With the arrival of the World Wide Web in the 1990's, card sorting "was applied to the task of organizing information spaces (Nielsen & Sano 1995)" (Hudson 2013).

Goals and benefits of card sorting
Card sorting is a fast, cheap and flexible technique. It helps provide organizational information to the design process. It facilitates creating a high level structure for the information contained within the subject. Furthermore,
it helps illicit categories to group particular data together, this makes it very useful for UI and UX design.
(Spencer, 2004)

The act of labeling cards and sorting is an easy to do and simple process. The facilitator should observe the participants while they are involved in the exercise as valuable insights and statistical data can be extracted to help further inform the design process. (Hudson, 2013).

Variants of card sorting:

Open card sorting:
Participants create their own names for the categories.
Open sorting is generative; it is typically used to discover patterns in how participants classify, which in turn helps generate ideas for organizing information. This technique is good for determining how a majority of users will expect a product or service to be organized.

Closed card sorting:
Participants are provided with a predetermined set of category names. They then assign the index cards to these fixed categories. Closed sorting is evaluative; it's a good way to see how you should group content so that its organization makes logical sense.

Reverse card sorting:
Users are given tasks and are asked to complete them by navigating a collection of cards. Each card contains the names of subcategories related to a category, and the user should find the card most relevant to the given task.
Reverse card sorting is evaluative; it is typically used to judge whether a given set of category names provides an effective way to organize a given collection of content. It could be a good way to see if titles on a menu will make sense to users.

Here are some examples of the techniques:

Exercise 1: Closed Card Sorting
Overview
Card sorting can be used as an elicitation by presenting a group of individuals with a task and providing them with a set of cards to trigger ideas and create connections within a specific theme. In closed card sorting, participants are given a theme and a task and have to collaborate together to fulfill the given a task by using the provided cards.

Goals and Aims
This exercise is used as an introduction to closed card sorting.

Can be used as an ice-breaker between strangers in a specific gathering by using a theme or topic that is related to the purpose of the gathering or by using a general theme.

Preparation
Facilitators of the exercise choose a theme that they want to engage the participants with.

Once a theme is chosen, the facilitators create a task that they need solved. A set of cards are created based on the task and the theme. The number of the cards depend on the number of participants or the size of the exercise.

A tabloid size sheet of paper is created for the participants to sort the cards on. It can have text, images and/or graphs to assist the participants in the sorting process. The content of the paper is dictated by the given task and what the task requires from the participants. For example: if the exercise requires that the cards are sorted into 3 different categories, the sheet of paper can have 3 distinct areas on it for the cards to be place on.

Tools and Inputs
Tabloid-size sheet of paper.
Set of cards.

Running the Game
Participants are split into groups. The number of groups and individuals per group depends on the number of participants and the requirements of the task.

Groups are briefed with the goal of the exercise.

Each group must discuss the theme and fulfill the requirements of the given task by using the cards, within a set duration. This duration depends on the requirements and complexity of the given task.
End of Game Discussion:

After the completion of the duration, each group should select a member, to present to the collective, the choices they made as a group in their card sorting.

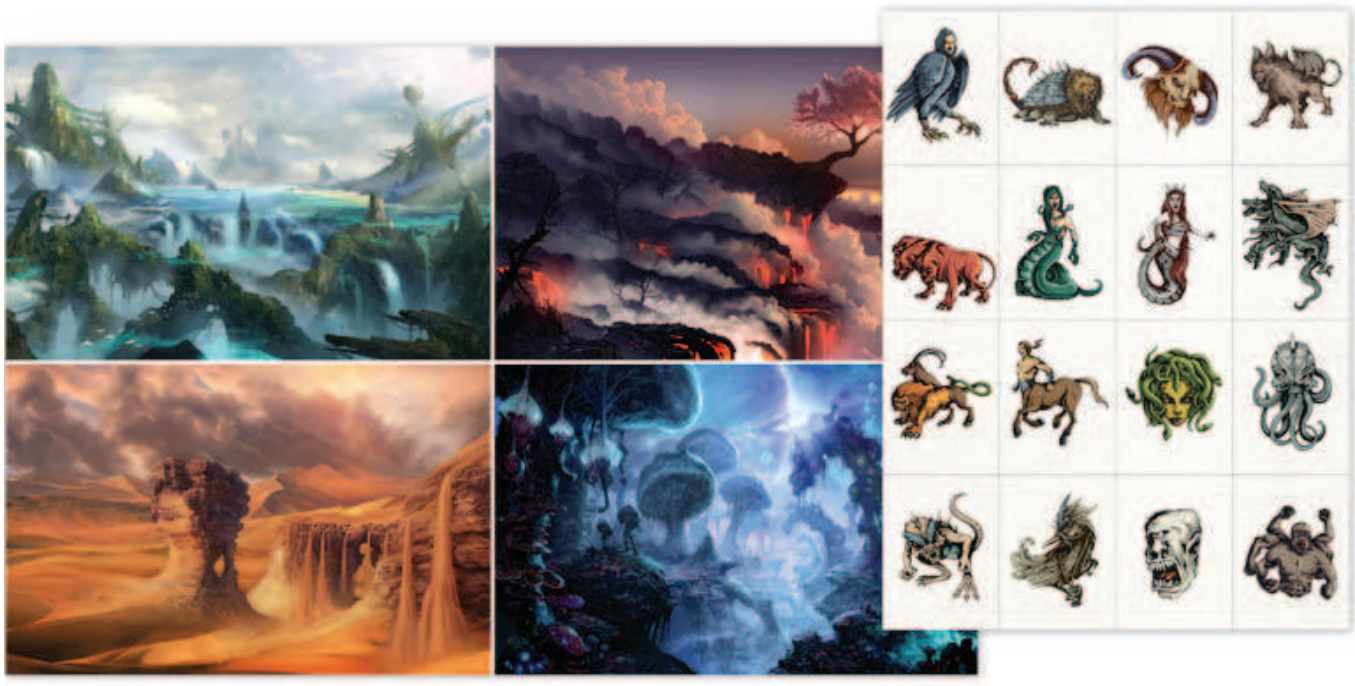
The facilitator can opt to engage all participants in a discussion about the choices they made and

present different solutions (if there are any) or ask the participants on how they would have tackled the task had they been given a different theme, different tasks or a different set of cards.

Case Study on Exercise 1:
A classroom of 25 students, under the supervision of 3 facilitators, were split into 4 groups of 5 and each group given a set of 16 cards featuring mythological creatures and a single tabloid sized sheet with 4 fantasy landscapes/habitats printed on it.

Their task was to pair each mythological creature with the habitat that they thought suited it best.

A fantasy landscapes tabloid sheet (left) and 16 mythological creature cards (right).



The students were split into 4 groups of 5. They were asked to discuss and work together to find the solution to the given task within 6 minutes. While the students were engaged with their task, the facilitators were on hand in case any group needed more information or guidance.

After the activity the facilitators took digital photographs of each completed set. While 2 of the facilitators engaged the students with a discussion about the given task, the third facilitator analyzed the results of the exercise to find similar choices between the different groups.

Students engaged in the card sorting exercise.

Each group was asked to chose 2 creatures and share with the rest of the class the rationale behind assigning each mythological creature to the habitat they chose.

After the end of the discussion, the facilitators presented the class with the analyses of the collected data, showcasing the most commonly paired creature/habitats.

Exercise 2: Open Card Sorting
Overview
In an open card sorting elicitation exercise, participants are only given a task instead of a task and a theme. The participants have to collaborate within their own groups to sort the cards into a theme of their choice within the outlines of the given task.

Goals and Aims
This exercise is used as an introduction to open card sorting.

Can be used as an ice-breaker between strangers in a specific gathering by asking them to collaborate in creating a theme for the given task(s).

Preparation
Facilitators of the exercise choose only a task that they want to engage the participants with - unlike closed card sorting in which the facilitators chose a task and a theme.

A set of cards are created based on the task. The number of the cards depend on the number of participants and/or the size of the exercise.

A tabloid size sheet of paper is created for the participants to sort the cards on. It can have text, images and/or graphs to assist the participants in the sorting process. The content of the paper is dictated by the given task and what the task requires from the participants.

Tools and Inputs
Tabloid-size sheet of paper.
Set of cards.

Running the Game
Participants are split into groups. The number of groups and individuals per group depends on the number of participants and the requirements of the task.

Groups are briefed with the goal of the exercise.

They are asked to come with up a coherent theme that connects the cards within the context of the task.

Each group must come up with a theme and fulfill the requirements of the given task by using the cards, within a set duration. This duration depends on the requirements and complexity of the given task.

End of Game Discussion:
After the completion of the duration, each group should select a member, to present to the collective, the choices they made as a group in their card sorting.

The facilitator can opt to engage all participants in a discussion about the choices they made and present different possible themes, or ask the participants how they would have tackled the task had they been given different tasks or a different set of cards.

Case Study on Exercise 2:
A classroom of 20 students were split into four groups of five and each group was given a set of 40 cards featuring cooking ingredients and a single tabloid sized sheet with a dinner table and three empty plates printed on it.

Their task was to create a three-course meal using the given ingredients, and come up with a theme to connect the courses. The theme could be related to a particular cuisine (such as Italian, Chinese… etc) or an occasion (wedding, breakfast... etc) or any other theme that the group collectively chooses.

They were asked not to use the same ingredient more than once and to use at least 5 ingredients per dish.

They were asked to discuss and work together to come up with a theme and 3 dishes within ten minutes.

After the completion of the duration each group was asked to present their culinary theme and 3-course menu to the rest of the class.

A dinner table tabloid sheet (left) and 40 ingredient cards (right).

Outputs from both creative elicitation exercises:

Increased creativity

Team cohesion and collaboration

Entertainment and ice-breaking

Students engaged in the card sorting exercise, creating a vegan menu.

Response and Conclusions

The census of the feedback from the students was that they enjoyed the open card sorting elicitation more than the closed one, as it had the additional challenge of creating their own themes rather than simply sorting cards into existing categories. They also noted that the collaboration and discussion was more energetic and interactive in the open card sorting exercise.

The level of the students' enjoyment of the open card sorting elicitation was also evident in the creative themes that they created such as a vegan three-course meal as well as an Asian-fusion inspired culinary spread.

Imagination Box

Yushan(Cynthia) Ji
Xiangren Zheng (Gary)
Tianjiao.Li (Jenna)
Yutong Han (Klaudia)

Overview

Imagination Box is a typical creativity stimulating game though the ideas and performances of other players to inspire players' imagination. It is a simple, playable, practical and entertaining game. It is also a game that can be used as a method to generate creative ideas and innovations. The basic rule of this game is to keep receiving and passing an invisible box, which may contain any object imagined by players.

Background

Derived from the course "Gorilla Futures" in Strategic Foresight and Innovation in OCAD University, instructor Stuart Candy introduced this creative practise on class. Target at forming an in-depth understanding regarding the emergence of new possibilities in future, It may provide positive solid information for both scientist and designers to visualize the world from a human-centered perspective and thus to develop a better world ideally.

Future though is seemingly out of control, would be evolved within the existing ecology logically and this fits in the conception of causality which derived from Buddhism in which believers believe what will come in the future will be affected by the present or the past. What we've imagined through this practise though weren't representative enough and may also could be interpreted as irregularity, that subconsciously give clues regarding our past.

In human cognitive development, the conception of past is developed gradually. Information are being received and retrieved along the natural physical process in human development which more often refer to as the growth. In this way our knowledge would be able to expanded and further elaborate into what we have always envisioned, the past. People could guess out a word's meaning approximately when they have no idea of this new word just by retrieving information from their knowledge or more broadly, the past. Within this knowledge, one could say that the future it does exist today in somewhere.

Without concentrating on the unpredictability of the future which is more narrative and humanized, the future of technology or design could be demonstrated partially according to Rebecca H. Holman, "the person who is highly creative has an active imagination and is thus likely to be capable of producing many different scenarios of the future when asked to do so. This individual may also delight in envisioning futures that have not been conjectured before."(Rebecca H. Holman 1981). The future we could imagine theoretically is fragmentative and discontinued. These imaginary segments ensure the validity of the new possibilities though with fluctuations, directions of what would adhere to the future in design and technology aspects could be established experimentally and thus may flourish the society afterwards with favourable innovations.

Goals

This exercise is played in order to:
Develop imaginations
Collect inspirations
Understand futures
Help analyze users' needs
Discover desirable functions
Realize players' characters

Preparation

At the very beginning, one of our facilitators would demonstrate the gameplay and procedures of "Imagination Box" and then we come into the formal preparation.

Before the running of the "Imagination Box", we could like to closed the curtain in order to set up a quiet and peaceful vibe to relax and let players concentrate on the game as well as turn on the soft light in the room. A camera will be set up and adjusted at this time.
Recording will start immediately if the camera has been set up properly.

After the vibe has been built successfully, one of our facilitators would distribute tools that will be needed in this game (black-painted boxes, pens and sticky notes).

Details of Exercise

Duration: Around 15 minutes.

How many can play / configuration of players: At least 8 players should be participated into this game in order to get a more throughout look about this game.The figure could be up to however should not exceed 15. (According to the testing on class by over 20 people, the game doesn't work very well.)

Roles needed:
Number of Facilitators: At least two facilitators would be needed during the running.Their duties would be distributed from the overall control to addressing issues aroused during the running process.

Group Reporter: No requirement in group divisions. Players would participate as one group and exchange boxes with whoever the wants among all the players.

Scribe / Capturer: Only one scribe will be needed in this game. He or she would be assisted by a recorder to script players' reflections regarding the game.

Other Support: Additional one photographer will be needed to record the process of the running of the game and thus to depict a more exhaustive picture about landscape on players' behaviour.

Inputs
15 black-painted paper box provided for players to seal their "Imagination" at the end of the game.

Sticky notes for all participants to document their ideas at the end of the game.

At least 5 pens for all players to script final outputs along with the sticky notes.

Other Supplies
Camera.
A sound recorder to document players' thoughts.

Running the Game
Imagine you have a nonexistent thing you deadly want

Try hard to think detailed features of it, shape, size, weight, functions, etc.

You have this item contained in an invisible box

Find another player, use body language to perform the features of your box to each other

Exchange your boxes

Imagine the content of the box you get from the other

If you don't like it, exchange it until you satisfied with the one you get

Write down the features of the item you get finally on the green paper, put it in the black box we provided.

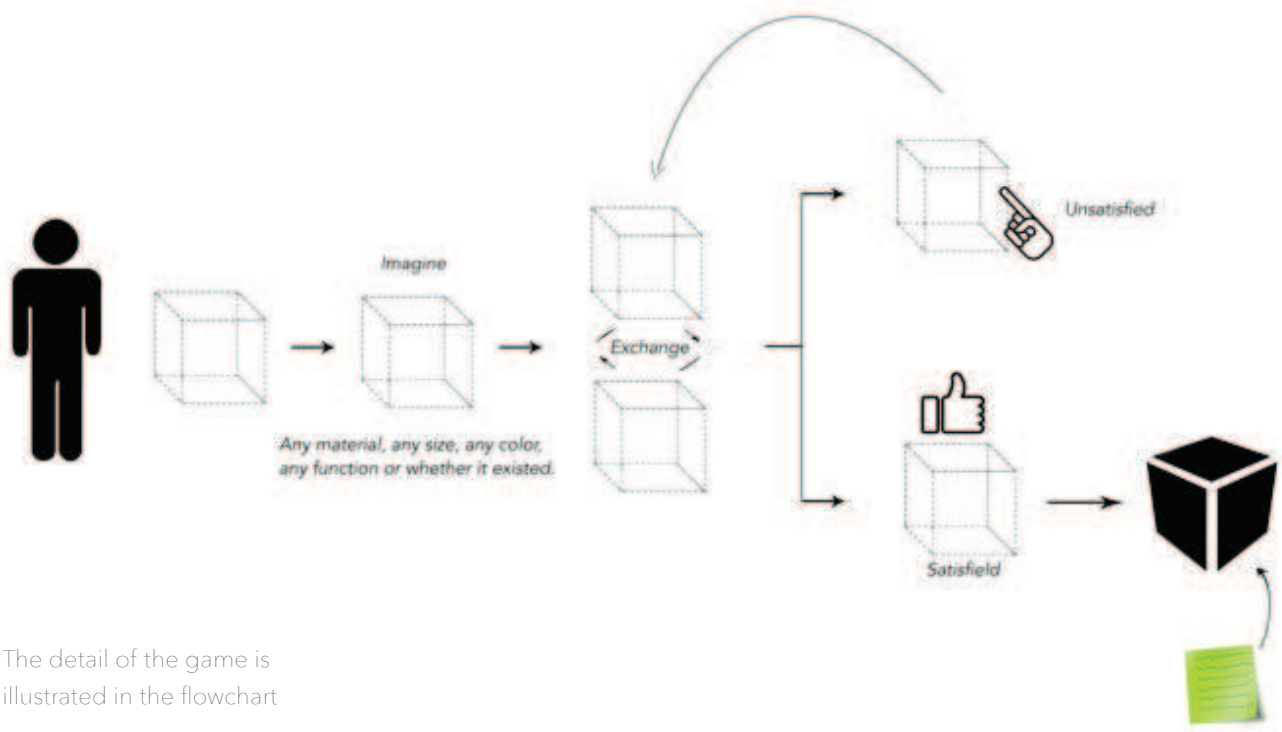
After all the players finish writing, open the box and read your green paper

To meet the goals

First of all, in order to help players to reach the goals of the game, facilitators have to make sure every players have already fully understood the rule of the game. Players can only engage and use the practise to help them during a standard design process when they absolutely understand the rules of the game without
any confusion.

Second, a good guide is necessary in this game to help players to understand the imagination process and idea development process. A good way to accomplish this is through asking questions regarding participants' feelings, thinkings and how do they come up with the final outcome. Make sure the question is simple, understandable, meaningful and direct. (see "Discussions")

Third, to make this game beneficial in a design process, players have to think about what need to be improved in their daily life at the very beginning which a direction would be formed that would be helpful for participants to discover alternative possibilities or approaches regarding improvements of specific product.



The detail of the game is
illustrated in the flowchart

End of Game

Outputs:

The game is open-ended, so there is no certain result after the game.

New ideas: Providing inspirations for inventions.

Discussion: Players share their game experience with each other by discussing. There are some questions prepared to guide players to think about what they learnt in the game.

Discussion:

How do you come out your objects?

Why do you select that object and its function?

Is there any clue of other players help you imagine your object?

Did you find any thing need to be improved in future during the game?

In what kind of situation you meet the barrier of your imagination?

What makes you stop to exchange with other players?

How do you find the final object?

Next Steps after Exercise:

How to put the final ideas into practice in the future?

How to improve existing products by using your idea?

How to evolve the things that you are not satisfied during the game?

Imagine how the world will develop in the future?

Put into Design Practice

The practise could be utilized and integrated into a real design process as the very beginning which could be identified as the discovering phase. With or without an agenda, this practise could be demonstrated as beneficial for designers. Derive from the concept of futurology, this practise would provide ideas regarding what would fit in the future design within the existing ecology.

However, this practise should not be limited as a procedure that could only applied at the discovering phase. Designers who with questions along the way could possibly find solutions that would improve the current design.

Reflections

Like almost students in the class, I felt confused when I played this game at first time. So the result can be predicted in a certain extent even though we have modified it several times.

There were two points that made me confused, the first one is the form of this game. It was like a guessing
game instead of imagining game for me because of the excessive performance. In next version of this game, the performance was limited, avoiding misleading participants.

The second point is how to put the output into practice. In my opinion this game is like a method to find out customers' needs by imagining and sharing the contents of the boxes they got. Although understanding users' needs is a adjunctive function of this game but not the main purpose.

Except the negative points, there are positive influence after play this game. First, after played several times, I found every time my final box was totally different and much better than the original one. By exchanging the box I can find out what I really want step by step. It's not always obvious before you comparing the final idea with the first one.

Second, it provides a chance that force participants to focus on imagining without many suggestions and hints. "Since the future can never be experienced directly, it is wholly imaginary."(Holman, 1981, IMAGINING THE FUTURE section). Imagining a non-existent thing about future without any experience is much more difficult than guessing the content of the box by others' performances. That's why we need Imagination Box to improve imagine capacity. - By Jenna(Tianjiao Li)

As the most significant value of this game, players are forced to imagine all the time without any limitation. Some insights, which may never come out without this kind of stimulation, will just spark and hopefully become concept or even rudiment of future products. Inevitably, players have tendency to provide information and desire of future products from themselves which is original resource of users requirement.

We are unconsciously forming a loop of developing a concept into a mature idea of a product which may truly concentrate on users. That is the importance of imagination.

"To imagine the future in terms of innovation means, most fundamentally, to imagine change in terms of new ideas, and to think of life as an array of individual experiments and choices. It is to ask how we might best encourage innovation, how we might allow the best innovations to flourish (and the worst to be rejected), and how new ideas allowed to thrive can alter human life." - Levin, Y. (2004). The New Atlantis. Imagining the Future, winter (4), 48-65.

Considering this game run by our group, the good thing is that all the players were fully participating during the game because everyone was creating and performing. Although they were mostly confused at the beginning of the game, they still finished the whole process and some of them had amazing stuff in their final "imagination boxes".

Fortunately, we have had ideas about how to make progress of our game from the feedback of the players by inquiring their concerns, confusion and doubts.

As one of the runner of "Imagination Box", I have played this game several times before running it in class. At the first time I enrolled in this game, it was hard for me to have direct sense of the purpose of this game, furthermore, I focused on the entertaining perspective of it instead of trying to figure out what I got from others and what I should present mine to others. Consequently, I understand that almost the whole class got confused at first during playing the game. I believe it is necessary to provide some guidance and even illustration like pre-playing as that player get aware of what they should seek and recognize during the process of playing.

As for how to optimize our game, the very first task is to make sure players understand the purpose of this game. It may be tricky because we are not supposed to interference the players while we have to clarify the mission about improving ideas. As a result, it seems difficult to define the boundary between providing crystal clue of our purpose and limiting players' thoughts.

A pre-playing as guidance is necessary. We should make sure everyone knows how this game functions by showing them previously. Additionally, the whole process was recorded, which provides evidence of where your idea came from, how it formed and even why you improved it like that, etc. I believe that players are unconsciously present their own needs which they possibly forget after finishing the game.

Just like Yuval Levin said in his journal "Imagining The Future, "For better or worse, the future will be shaped by the innovations and advances of the present: by what we develop, what we build, what we learn, what we discover, what we try and test and deem worthwhile." (Levin, Y, 2004) We definitely need this kind of inspiration to explore the generalities and specialities about our needs of future products, which largely heralds the opportunities of manufacturer innovating, technological improving and new product developing. - By Cynthia(Yushan Ji)

Final Notes from Facilitator

After the game played on the class, we got some valuable feedbacks from players. The most important part of game is to lead the users to find the way of how do they figure out what inside of the box. By understanding of how do they come out the imagination to help them to design a better product or plan a better future. From the testing of the game, when we asked about how do they figure out what inside? One of the comment by the testing player is:"I tried to find something need to be perfect when I was trying to imagine the object". This is the exact way of practicing this game.

In the presentation on the class, the discussion was mislead by the confusion of the classmates. And nobody answer the questions instead of critique the game's rule. They didn't find the way of why do they imagine the object. Therefore, this presentation only reach parts of the goals of the game.

After the presentation, we studied to improve the game. First of all, make sure everyone has a paper to write on their final object on their hand before playing this game. Second, to indicate the important part of the game is to discussion of the imagination process, tell players the game is not end. Answering the question is a part of the game. Third, do not ask them about their final object before answering the question to make sure the integrity of the game.

Variations on the Game

This game could also be applied in a way that all the players would pass only one box and give a brief description of what it is through gesture and behaviours.

Players who feel satisfied about the content they've imagined should step out of the exchanging pool and let the rest to continue. The game should be ended when each participant feel gratified about his or her imaginary object.

This game could be adapted into design and optimization phrase of specific product. Designers could take potential clients' position to provide a better sketch or improve the user experience of their product through such similar process.

Designers could come up with ideas that may assist through multiple exchanging. However, ideas generated through such process would be need further evaluation later to ensure the liability of the product.

Mindfulness

Hector Centeno,
Leiane Cooke,
Sachiko Murakami

Overview

Sitting, walking or during everyday activities, mindfulness focuses the mind on the task at hand or on a simple concentration exercise, such as following and counting the breath, mindful attention to the feelings on the soles of the feet while walking slowly, or indiscriminate and attentive listening. Because of its effects in the human mind, mindfulness meditation may be adopted by organizations as a way of improving the productivity, concentration, health and well being of their members and employees.

Background

The earliest written records of meditation practice come from the Hindu and Vedanta traditions dated back to 1500 BCE. Meditation has been adopted by many spiritual and religious traditions since. Buddhism in particular emphasizes meditation practice as a way of achieving spiritual realization by discovering the true nature of our existence. Meditation is used as a technique to re-educate the way our mind works in order to "clean" all the false concepts and ideas that prevent us from seeing what is already there.

In some Buddhist traditions, meditation is considered a concentration technique (i.e. Zen). By persistent and disciplined training and focusing our concentration (the concentration subject varies among traditions), we are able to stop the constant internal mental discourse (concepts, views, thoughts, reactions to feelings, etc) and achieve a state of mind that reflects reality in the present moment. This state of pure mind is known as the "Buddha nature" (Buddha means enlightened being). Through this state of mind an individual can have a deep insight into the interconnected nature of everything and also into the true nature of mind, realizing that transient thoughts and feelings are not our essence and what defines us.

Meditation may be familiar to some in its contemporary secular incarnation as the buzzword "mindfulness", which is broadly identified in social science research as "being attentive to and aware of what is taking place in the present" (Brown & Ryan, 2003). Erik Dane (2011) offers a useful chart

(see Fig. 1) for differentiating mindfulness from other states of awareness:

Note that mindfulness is differentiated from absorption by its wider attentional breadth.

Initial investigations inquired into its benefit in clinical interventions for mental health, particularly stress, (Kabat-Zinn, 1982); since then, the role of mindfulness in emotional regulation (Brown & Ryan, 2003; Archa & Craskea, 2006; Corcoran et al. 2010) has been heartily explored. In most recent years the research is turning to the role of mindfulness in enhancing areas of life such as job performance (Dane & Brummel, 2014); academic performance

Figure 1
Differentiating Mindfulness From Other States of Attention

		Attentional Breadth	
		Relatively Wide	**Relatively Narrow**
Present Moment Orientation	**High**	*Mindfulness*	*Absorption Flow*
	Low	*Mind Wandering*	*Counterfactual Thinking Prospection Fantasizing*

(Mrazek, M.D et al., 2013); job satisfaction (Hülsheger et al, 2013); and creativity (Ostafin & Kassman, 2012). Advances in neuroscience and medical imaging has allowed scientists to study the effects of mindfulness on the brain, finding that meditation practice can actually change brain structure in areas such as the hippocampus, which is associated with emotion regulation (Lazer et al. 2005; Hölzel et al., 2011); in the right hemisphere, associated with attention (Tang et. al, 2012); and the lower brain stem, which associated meditation with parasympathetic effects, and accounted for its positive cognitive, emotional, and immuno-reactive effects (Vestergaard-Poulsen et. al 2009).

Meditation and mindfulness has become the focus of attention by all kinds of people in corporate, tech, athletic and artistic circles including its controversial use in the military (Hochman, 2013). It has even been included as part of complete corporate training programs like Google's "Search Inside Yourself" <http://www.siyli.org/>

The benefits seem to be real and-- perhaps most importantly for corporations-- measurable. General Mills started its voluntary program in 2006. Among participating senior executives, 80 percent said the program made them better decision makers, while 89 percent said they had become better listeners. Further explanation is available in Gelles, D. (2014, August 24).

There may even be a benefit to the bottom line. Aetna found that within two years of offering meditation to employees, the company was able to reduce employee health benefit costs by 7 percent. Further explanation is available in Young, J. (2013, June 6).

Given that the World Health Organization estimates that stress-related issues-- from absenteeism to health care costs to lower productivity-- cost American businesses an estimated $300 billion a year, it should come as no surprise that Wall Street and Main Street are embracing meditation too (as cited in Martin, J. 2012).

Studies have shown that meditation can also improve the level of compassion or empathy towards others (Desteno, 2013).

Some organizations, like the The Center for Contemplative Mind in Society offer meditation retreats to small organizations or corporations to help "increase productivity, reduce absenteeism and inspire greater creativity" (Bush, 2013).

Goals

Other than its ultimate spiritual goal, meditation has many important byproducts that include: a general feel of peace and well being, clarity of mind, significantly lower stress levels and an improved concentration capacity (Goleman, 2014). If practiceddaily it can lead to a general improvement of physical and mental health. These benefits can be of great help to a work team to stimulate individual creativity, to strengthen interpersonal relationships and minimize adverse feelings such as anger and resentment. It also helps the individual to become more grounded in the present moment and to be able to see a problem more for what it is rather than what he/she thinks it is.

In workplaces or teams, meditating together can help to invite calm into a busy and demanding environment. The benefits of open, non judgemental awareness that mindful meditation produces makes the beginning of a project, during a stressful period of development excellent times to consider practicing meditation in a group. Daily meditation at the beginning of the work day may help set a more compassionate tone for the day.

Preparation

These meditation/mindfulness exercises should be performed in a quiet environment with dim or bright light (not in darkness).

Depending on what is practical with the number of participants, the arrangement can be with all sitting in a circle or in rows, and with the facilitator sitting either as part of the group or in front of it.

Participants can sit on chairs or in a cross-legged position on the floor or a cushion.

Details of Exercise
Duration: 10 to 15 minutes. It can be extended to up to 25-30 depending on participant experience. Beginning practitioners may find 10-15 minutes challenging; this discovery may be part of the post-meditation discussion.

How many can participate / configuration of participants:
There is no limit to the number of participants.

Number of Facilitators: 1 or 2. The first facilitator provides instructions and guidance for the exercise to the whole group. A second optional facilitator can be useful for assisting on a one-on-one basis with posture correction before or during the exercise.

Inputs:
A timer with silent alarm
Chairs and/or meditation cushions
A small bell or gong (optional)

Running the Exercise
Instruct participants to turn off their computers and mobile devices.

Once the participants and facilitators are situated in their positions and properly seated the facilitator leading the exercise should give verbal instructions in a relaxed but clear way.

Ask the participants to perform some simple body stretches to promote relaxation.

Ask the participants to assume the correct posture: If sitting on a chair, the participants should sit on the edge of the chair without resting on the back (unless is not possible due to physical disability). The back should be kept naturally straight without any tension. The chin should be slightly tucked in as if an imaginary string is gently pulling the body up from the crown of the head. The hands can be placed on the lap in a relaxed way, with fingers interlaced. Eyes should be kept open, gazing at the front in an angle perpendicular to the tip of the nose (thus naturally having the eyelids half-way closed) . The eyesight can remain unfocused. Shoes can optionally be removed if sitting on a chair but must be removed for crosslegged position.

Ask the participant to relax and concentrate their attention on their breathing without interfering with its natural flow. Mention that even though they are relaxed, they must be alert and awake at the same time and not sleepy or blank-minded.

After approximately one minute, instruct the participants to mentally count down from 5 to 0 each time they breath out and give an example out loud.

Tell the participants that if their attention deviates they should simply go back to counting starting from 5 without worrying about it or giving it any thought.

Tell the participants that they should try to keep their concentration in their breathing/counting but without actively trying to block other random thoughts. Instead if a thought arises, he/she should let it pass without lingering or clinging to it.

Start the timer and optionally ring a bell or meditation gong (slowly, 2 or 3 times). The facilitator should also meditate but keep the timer in eyesight.

Allow the participants to continue on their own for the rest of the session.

During the meditation, a second facilitator may walk around, slowly and silently to gently correct the posture of the participants without using any verbal instructions. If this is to be performed, alert the participants at the beginning of the exercise so they are not surprised.

At the end of the meditation period (10 to 25 minutes), gently tell the participants to slowly start coming out of their meditation and silently stretch their bodies. Optionally ring the bell or gong (slowly, 2 or 3 times) before giving this instruction.

After about 2 minutes, the facilitator can ask the participants to share any experiences or to ask any questions.

At the end tell the participants to make this meditation exercise part of their daily routine to experience its deeper benefits.

End of Exercise
Outputs
A taste of mindfulness practice...

Discussion
Meditation does not benefit from deep analysis or rationalization since that could work against the experiential nature of the technique, where a open mind free of conceptualizing is the goal. Any discussions or comments are better left after the end of the practice.

Some questions to pose on the participants:
Did you notice a change in the quality of your mind before and after the exercise?
Were you able to return to the exercise after getting distracted?
What was the biggest difficulty you experienced during the exercise?

Next Steps after Exercise
The participants should try to maintain the same quality of mind after meditation and into their everyday life activities. It is also recommended to practice regularly, at least 10 to 20 minutes, daily, to gain the benefits of meditation.

Variations on the Exercise
These are only two of the multiple variations:

Instead of counting the breath, ask the participants to pay attention to any sound coming to their ears without judging, filtering or cataloging it. Any sound should be allowed to develop while concentrating on it and without discriminating other simultaneous sounds.

Instead of remaining seated, ask the participants to line up and very slowly and mindfully walk circling around the room. The facilitator should lead the line setting the pace. Ask the participants to concentrate on the sensation of the floor on their feet as they walk (participants should have at least their shoes removed). They can also count from 5 to 0 each time they step with the right foot. Their eyesight should remain low to the ground and hands can be place on their chest or belly with fingers interlaced.

Notes on Class Experience
One immediate benefit from the exercise was the disconnection of individuals from their technology in class. Once computers and devices were put away, they remained put away for the remainder of the exercise, creating a culture of attentiveness within the classroom that is often compromised by the constant partial attention our screens encourage. Five minutes of mindfulness at the beginning of a class or a meeting with screens closed and off could help set the tone for engaged participation and discussion.

Mind Mapping

Tatiana Jennings,
Monica Virtue,
Laura Wright

Overview

Mind mapping is a process of creating a visual representation of connections between thoughts, concepts and ideas that are related to one central topic.

A mind map is a node and link diagram arranged around the main concept. It combines the visual and the verbal in an alternative presentation to generate, structure, and classify ideas and to allow overall vision to help with organizing information, solving problems, studying and creative thinking. (Collias, n.d.)

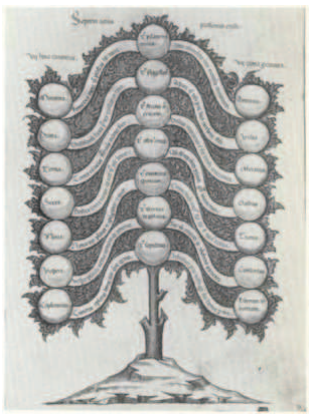
Background

Roots of visual mind mapping

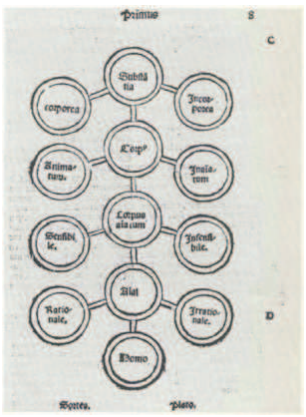
The earliest examples of visual thinking and the use of representational visual diagrams could be found in antiquity. The first time such diagram is mention is in relationship to a greek philosopher Porphyry of Tyre who lived from c.233 to c.309, C.E. and is credited for graphically visualize categories of Aristotle. ("Roots of visual mapping - The mind-mapping.org Blog," n.d.) Although no examples of such diagram survive, many following similar attempts used similar principles.

The Great Stemma, a chronological chart, was created before 472 CE by an unknown author represents a progression of generations mentioned in Bible from Adam and Eve to Christ. Historian Jean-Baptiste Piggin re-assembles sections into a continuous chart: (Piggin, 2013).

Source: Taylor-Pearce, 2007



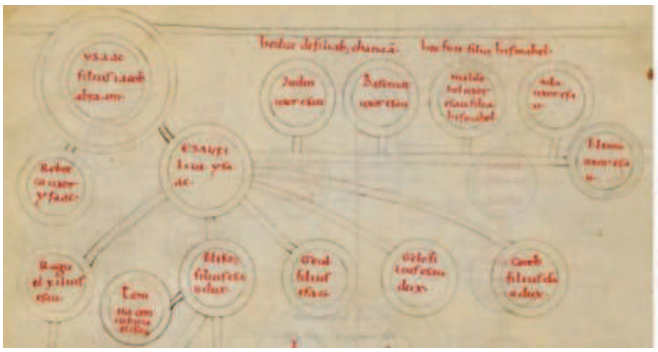
Source: DeVarco, Clegg, 2010

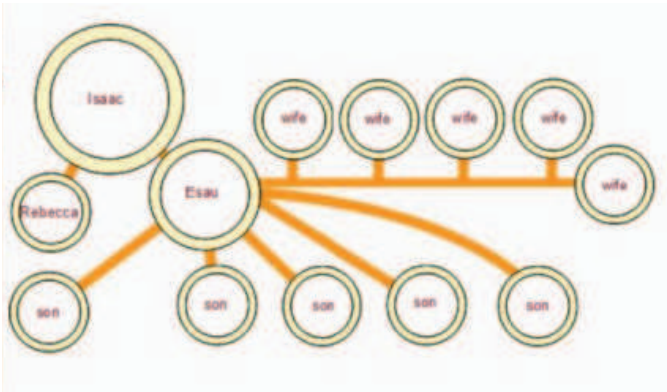


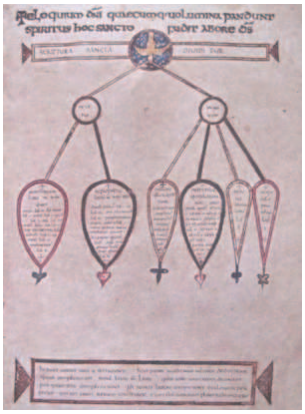
Cassiodorus, a Roman statesman and a writer from 562 CE is credited with producing this outline of the bible, which later made it into 692 CE Bible from Anglo-Saxon kingdom of Northumbria (Saint Paul's church, 2014).

n 1909, American philosopher and mathematician Charles S. Peirce proposed "existential graphs" - a form of graphical notation that he called "the logic of the future." (Russell, 2010)

In 1956, Richard H. Richens developed “Semantic Nets” for the use in computing at the Cambridge Language research unit (Norman, 2014). This concept was further developed by cognitive scientists Allan M. Collins and M. Ross Quillian (Collins, 1969).







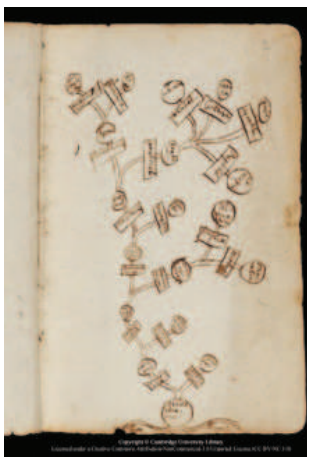
Some other early examples of visual layout of thinking belong to Isaac Newton and John Bunyan (“Roots of visual mapping - The mind-mapping.org Blog,” n.d.)

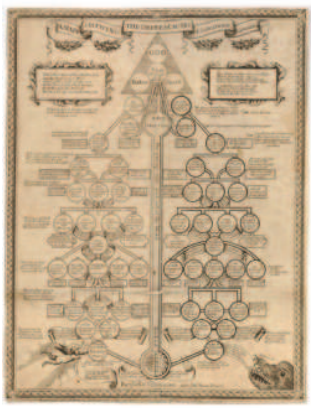
Mind mapping in popular culture

Mind Mapping entered popular culture following the 1974 BBC television series "Use Your Head," which starred popular psychology author Tony Buzan. The series was based on Buzan's best-selling book of the same name, which focused on both mind mapping and mental literacy. (ThinkBuzanBlog.com, 2014)

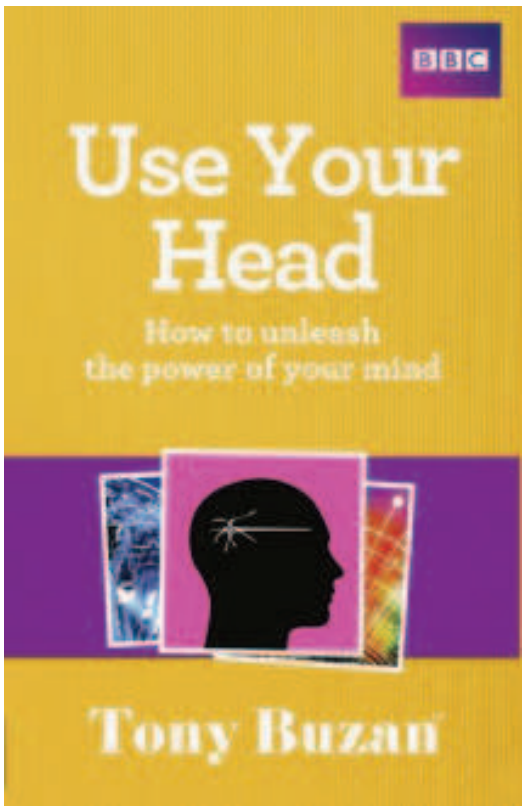
While Buzan may not have invented mind mapping, he did develop a method that could easily be used by the masses. Buzan's method combines a radial tree with diagramming key words in a colorful, radiant, tree-like structure. (Buzan, 2011)

Source: Gee, n.d.





Source: ThinkBuzanBlog, 2014



Watch:
Use Your Head, 1974 (Episodes 2 & 4)
http://vimeo.com/109352835

Now 72-years old, Buzan has built an empire around mind mapping and memory retention, having written over 100 books. He's become a professional speaker, international business and educational consultant. His web site, tonybuzan.com, offers digital mind mapping software for purchase (Buzan, 2011). Buzan holds, or has previously held, trademarks on the phrase "mind map" in the context of self-improvement educational courses in the USA (United States Patent and Trademark Office, 2005), UK (Gov.uk, 1993) and Germany (German Patent and Trademark Office, 1992), and markets himself as the "inventor of the mind map."

Source: IndiansInKuwait.com, 2013

While Buzan may not have invented mind mapping, he did develop a method that could easily be used by the masses. Buzan's method combines a radial tree with diagramming key words in a colorful, radiant, tree-like structure. (Buzan, 2011)

Goals
This exercise is performed in order to:

Classify, structure and generate ideas on any topic.

Make decisions, solve problems.

Link concepts together.

Provide an overview of a large amount of information.

Incorporate words, images, numbers and colours, which is much more effective for remembering information. Provide a universal key to unlock the potential of the brain.

Harness the full range of cortical skills – word, image, number, logic, rhythm, colour and spatial awareness – in a single, uniquely powerful manner. (Buzan, 2011)

Preparation
According to Tony Buzan, there are seven steps to creating a proper mind map:

1. Start in the centre of a blank page turned sideways, to give the brain freedom to spread out in all directions and to express itself more freely and naturally.

2. Use an image or picture for the central idea, to help with imagination.

3. Use colours throughout, to add extra vibrancy and life to the mind map.

4. Connect the main branches to the central image and connect the second- and third-level branches to the first and second levels, etc. Buzan contends that the brain works by association, and likes to link two or more things together in order to remember things more easily.

5. Make your branches curved rather than straight-lined, to keep the brain from becoming bored.

6. Use one key word per line, to give the mind map more power and flexibility.

7. Use images throughout. Why? "Because each image, like the central image, is also worth a thousand words. So if you have only 10 images in your Mind Map, it's already the equal of 10,000 words of notes!" (Buzan, 2011)

Source:
ThinkBuzan.com, 2014

Details of Exercise
Duration: example: 10 minutes
How many can play / configuration of players:
12-36 players, organized into four groups.

Roles needed
Number of Facilitators: 1
Group Reporter: One per table = 4
Scribe / Capturer: One scribe per table = 4
Other Support: Photographer

Inputs
Your Brain
Your imagination!

Other Supplies
Blank unlined paper
Coloured pens and pencils

Running the Game
A step-by-step account of the mind mapping exercise is as follows:

1. Split the class up into the groups.

2. Supply the four groups with large paper and colouring pencils/markers.

3. Give each group a separate topic to map out.

4. Set the time limit to 10 minutes.

5. Encourage the groups as they work to use colour, images, text, numbers.

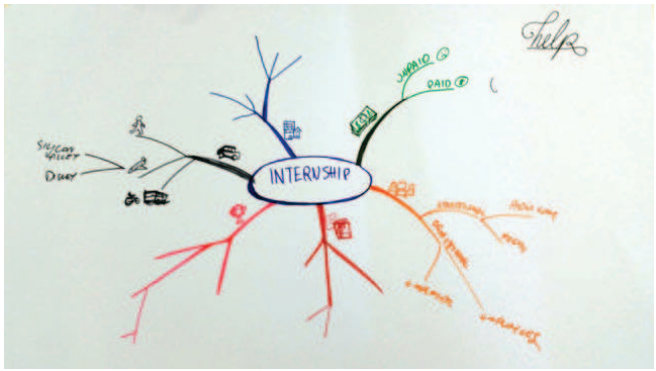
6. Encourage the groups to make new branches on their
map for new concepts/ideas.

7. When the time is up, review the experience of creating the mind maps as a class.

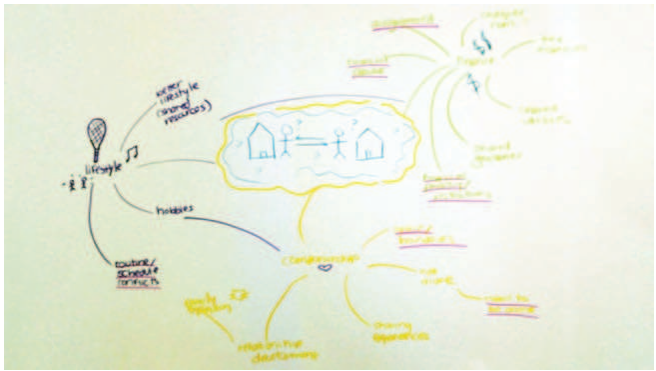
The topics assigned to the four groups were:

a. Should I move to New York?

b. Should I do an internship this summer?



c. Should I move in with my significant other?



d. Should I buy a house/apartment in Toronto or keep renting?

End of Game

Outputs

Each group will end up with a mind map with a colourful, rich content about the given topic.

Discussion

Questions posed to the class after the exercise:

What are your thoughts on the exercise you just did?

Did you find it helpful? if yes, in what way?

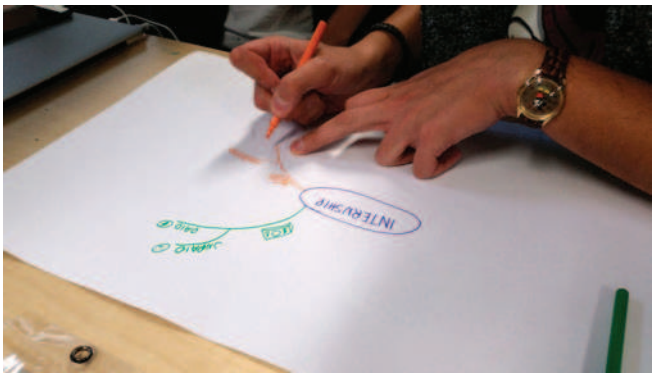
Did you dislike any part of the exercise? If yes, which parts and why?

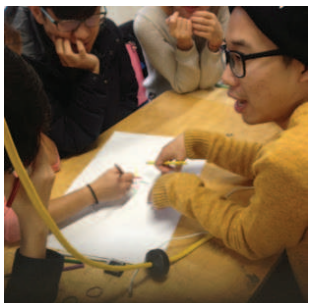
Final Notes from Facilitator
The group work went well, and generating four mind maps that were similar in style to the Buzan technique.

Some groups ended up having one leader organizing the effort, while other groups had less of a hierarchy.

One group wasn't happy with the question they were given, and found it a challenge to mind map it at the beginning of the activity. However, by the end of the activity the group's mind map looked quite similar to that of the other groups.

Another group complained that the Buzan technique didn't allow for changes to the mind map after their thoughts had been committed to paper. It was suggested that writing ideas on individual pieces of paper, and then moving the pieces around during the activity, would better allow for changes.





Variations on the Method
There are many variations of mind mapping, including:

Concept Map
A concept map is a node-link diagram showing the semantic relationships among concepts.
Linking phrases in concept maps can represent any forms of relationships (for example, temporal, procedural, functional, subset, superset, causal, etc) (Schwendimann, 2013)

The theoretical framework of is based on David Ausubel's assimilation theory of learning. (Young & Whitehead, 2008)

This is an example of a concept map by the author Jamie Sheffield, who created it to map out the world of his protagonist. (Sheffield, 2013)

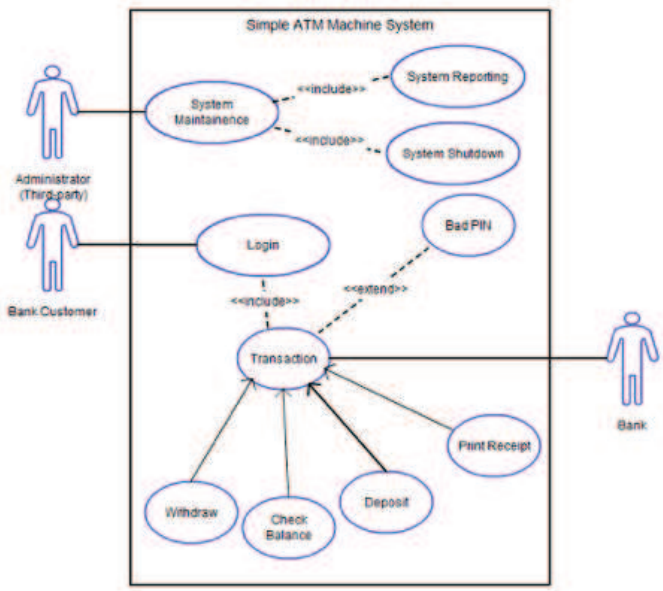
Flow Chart

Flow charts, first presented by engineer Frank Gilbreth in 1921, show the intermediate steps between input (e.g.problem) and output (e.g. solution) of a system. Flow chart connections are usually ontologically of the same kind, for example information, energy, time, or material. (Schwendimann, 2013)

Unified Modeling language diagrams

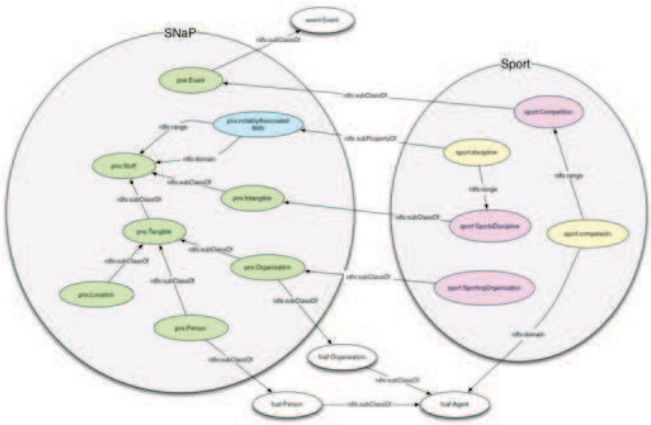
A unified modeling language diagram is a general-purpose modeling language in the field of software engineering, which is designed to provide a standard way to visualize the design of a system. It was created and developed by Grady Booch, Ivar Jacobson and James Rumbaugh at Rational Software during 1994–95 with further development led by them through 1996.

In 2000 the Unified Modeling Language was also accepted by the International Organization for Standardization (ISO) as an approved ISO standard. ("Unified Modeling Language," 2014)



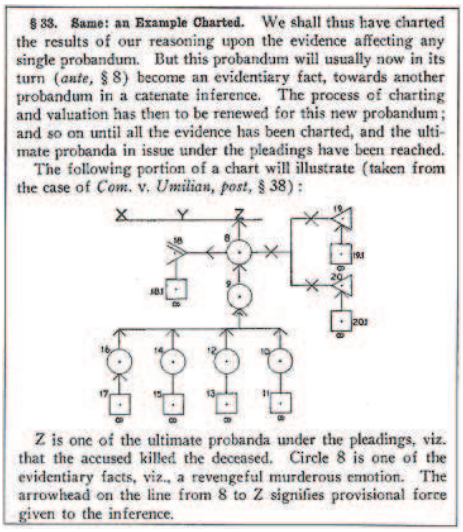
Ontology Building

Ontology building is a knowledge engineering methodology. Organizing things belonging to one domain into classes, subclasses and so on. Ontology building was first defined by Tom Gruberwho who is an American computer scientist in the context of Artificial Intelligence (Noy, n.d.).



Argument Map

An argument map is a visual representation of the structure of an argument. It includes the components of an argument such as a main contention, premises, co-premises, objections, rebuttals, and lemmas. Typically an argument map is a "box and arrow" diagram with boxes corresponding to propositions and arrows corresponding to relationships such as evidential support. Argument maps are commonly used in the context of teaching and applying critical thinking. The purpose of mapping is to uncover the logical structure of arguments, identify unstated assumptions, evaluate the support an argument offers for a conclusion, and aid understanding of debates. (Van Gelder, 2009)



§ 33. **Same: an Example Charted.** We shall thus have charted the results of our reasoning upon the evidence affecting any single probandum. But this probandum will usually now in its turn (*ante*, § 8) become an evidentiary fact, towards another probandum in a catenate inference. The process of charting and valuation has then to be renewed for this new probandum; and so on until all the evidence has been charted, and the ultimate probanda in issue under the pleadings have been reached.

The following portion of a chart will illustrate (taken from the case of *Com.* v. *Umilian*, *post*, § 38):

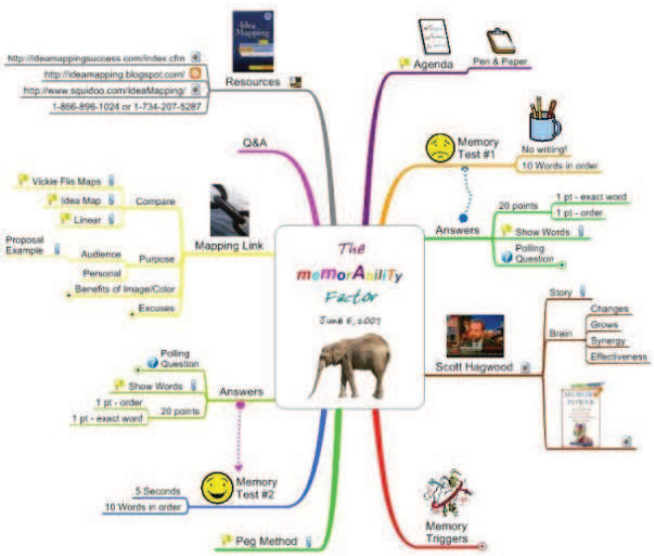
Z is one of the ultimate probanda under the pleadings, viz. that the accused killed the deceased. Circle 8 is one of the evidentiary facts, viz., a revengeful murderous emotion. The arrowhead on the line from 8 to Z signifies provisional force given to the inference.

Digital mind mapping tools

There are dozens of types of computer-assisted mind mapping programs. These programs are useful when visualizing large amounts of data. They are also useful if you want to save your mind map for later, share it online, and organize your maps. According to an informal poll on the popular website Lifehacker (Henry, 2013), the most popular mind mapping tools are:

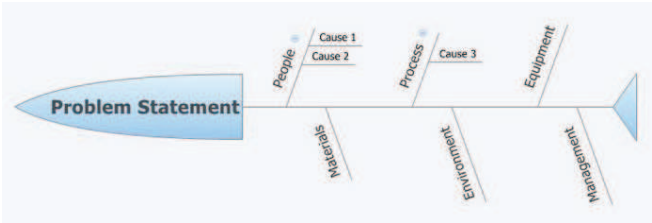
Mindjet

This program is well-suited for project management with large groups, and it also works well for individual use. It integrates with common software such as Microsoft Office. It has a monthly subscription fee.



XMind

Similar to MindJet, XMind is a useful tool for project management. It has a variety of formats to choose from, from simple mind maps to fishbone-style maps. Users can add images and links, as well as use the built-in Gantt chart creator to plan out a project. It is also free to use and open-source.



Coggle

Coggle is a free online mind mapping tool that can be used with Google accounts. It has an easy drag-and-drop interface and it automatically colours the branches on your map as you go along. It is also shareable, and others can view or edit your map.

Contemporary use

Mind mapping is a useful way to visualize information. It can be used to classify, structure and generate ideas on any topic. It can also be useful for studying, making decisions, and solving problems.

Mind mapping has been proven to be more effective than other kinds of brainstorming or note-taking (Pinola, 2013). This is because mind maps combine text, images and colour. They also show links between concepts more clearly, which can help when generating ideas.

Dan Woods is a consultant and a chief technology officer at Evolved Technologist, a research firm. He wrote about how he uses Mind Mapping tools in Forbes. In his job, he collaborates with dozens of people, often on one document. His company was using wikis and Google Docs, both of which force the user to scroll down dozens of pages to add

comments. " It doesn't take long for paging up and down to become frustrating and exhausting, like running up and down flights of stairs to do your work," he says (Woods, 2009). They were also running into the problem of slogging through pages and pages of notes when it came time to put an idea together.

They began using mind mapping technology, and it greatly improved their organization and output. "I can capture ideas from an interview or a design for a book in a mind map, and I don't feel frustrated or fatigued. Going from a linear view to two-dimensional space allows me to move around quickly and put an idea in the right place in the hierarchy by sailing right there with my mouse, expanding and contracting the level of detail as needed. Because this is quick and easy, I capture more ideas and restructure them faster, meaning my mind map better reflects my understanding," he says (Woods, 2009).

The combination of text and images is also proven to be about six times more effective when remembering information, called the "picture superiority effect" (Nelson, 1976). Research on this effect show that humans remember information dramatically better when a picture, not just text, is involved. "When information is presented orally, after 3 days, people will only remember 10% of it. But if pictures are added, memory recall improves to 65%," says the study (Nelson, 1976).

Sound Ball

Lee Jones,
Phuong Vu,
Daniah Saimaldahar

Overview
Sound ball is a warm up activity that involves improvisation and thinking on your feet. In the game you pass around an invisible ball while making noises that the person you pass to must repeat (Plattner, 2012).

Background
Sound Ball started in improvisational theatre as a warm-up activity (Faste, 1992). In the past decade, "improv" approaches have been incorporated into businesses to help increase agility, flexibility and adaption. The idea being that the faster your team can learn and adapt, the greater the advantage over your competitors. "Improv" games have become one way to increase innovation (Hackbert, 2010).

The first known use of the sound ball game in an academic setting as a creative technique tool was done by Alain Rostain, Yale graduate student and the founder of a strategic innovation consulting firm (Rostain, 2004).

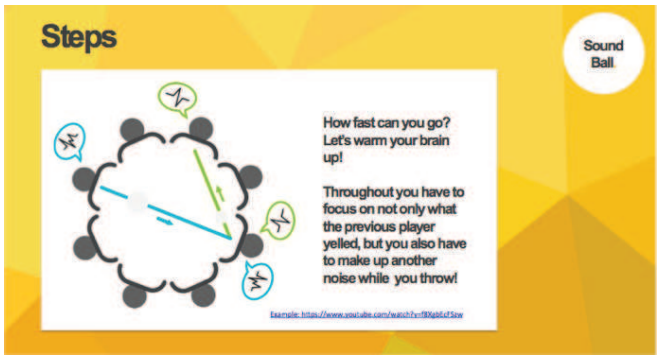
Goals
This exercise is played in order to:
Warm up / wake up
Increase spontaneity
Increase participation
Get people to listen/pay attention to one another

In terms of team dynamics, sound ball exercise helps to increase "the trust, familiarity, enthusiasm and social skills that are needed to overcome inhibitions that often stand in the creative process" (Hackbert, 2010) (Plattner, 2012).
Preparation

No preparation needed. Sound Ball is a game meant to start off the day or to start off a session.

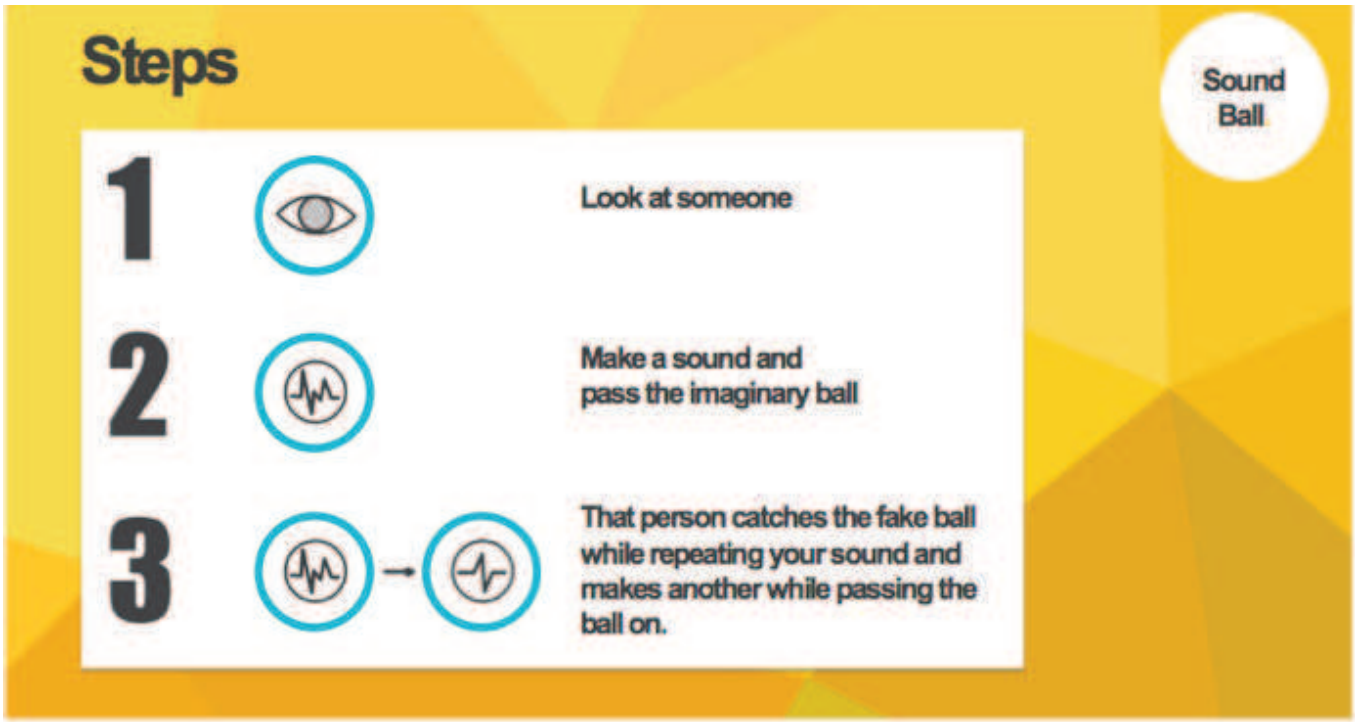
Details of Exercise
Duration: 5-10 min
How many can play / configuration of players: 5-10 People

Roles needed
Number of Facilitators: One
Facilitator's role is to make sure everyone gets passed the ball and no one gets left out (Burgeret,n.d).



Inputs
You only need your teammates and some space and that can fit your whole group.

Running the Game



End of Game
Outputs:
At the end of this exercise, the team members should be more cohesive, be more comfortable with each other, become more jelled together. Their focus is brought back into the room.

Discussion:
Debrief questionnaire
What did it feel like when catching/passing the ball?
What did you find difficult while playing this game?
What did you find delightful while playing this game?
Do you think this game enhance your creativity? And why?

Next Steps after Exercise:
Now that you're warmed up, the team is ready to generate ideas (brainstorming, bodystorming, etc).

Final Notes from Facilitator
Sound Ball was a good activity for our group, but could be a potentially uncomfortable one for other groups such as those in more formal settings. It is very good for icebreaking and getting people to talk to each other.

Reflections
When Not To Use Soundball:
When each individual is not willing to play the game or does not feel comfortable participating the game.

Be tactful and don't use sound ball when someone is upset, or for conflict resolution. Turning to the game of sound ball might come off as flippant and ignoring their concerns (Hackbert, 2010).

Variations on the Game
Word Ball: Instead of using sounds, you choose words, and the person you throw to comes up with another word based on your choice.

Rhyme Ball: Same as word ball, but the word choice is based on rhyme.

Alphabet: In this version, the word choice is based on the next letter in the alphabet. For example, someone says a word that starts with a, the next person must say a word starting with the letter b.

Last Letter – First Letter: In this version, the word choice is based off of the last letter in the word someone chose. The next person would have to choose a word that starts with the last letter of the previous participant.

Relevant Studies on the Impact

Besides theatre, improvisational techniques have been used to enhance creative thinking and action in other disciplines, such as: education (Willdorf, 2000; Kelley, Brown & Crawford, 2000; Lobman, 2002), dance (Banes, 1980), and business (Kanter, 2002; Lubins, 2007). The use of improvisational techniques, in general, has shown its effectiveness in enhancing creative, innovation thinking and personal advancement for participants (Lemons, 2005).

Storyboarding

Jessica Kee
Tegan Power

Background
Story Boarding is a graphical way of sequentially organizing any type of interactive experience. It is about expressing a concept or idea showing action, or thinking a problem through from start to finish can be done through storyboards. Story boarding can be abstract or concrete but the focus is on the process of developing the idea and communicating it visually.

This visual problem solving skill is used in many fields, both technical and creative. In the workplace environment, it is a planning and communication tool that facilitates communication amongst project team members or peers on interdisciplinary platforms.

This tool develops ideas and processes as well as explains and shares ideas. Visual communication may include numbers, words, drawings, prototypes, 3D model, and statistics. The storyboarding process, in the form it is known today, was developed at Walt Disney Productions during the early 1930s

Definition
"A series of panels showing clearly, using pictures, numbers and words, important changes, in order of occurrence, that taken together tell an interesting story" (Forsha, 1995).

Purpose
Story Boarding helps develop visual problem solving and communication skills.

The uses for Storyboards are to:

Stimulate creative thinking -Collect and develop ideas

Plan a project

Communicate a concept -Illustrate a briefing

Understand the big picture

Variations

Brainstorming

Might include a series of features for a new product or several alternatives to the development or look of the product

Planning

Might document the development stages of the product that can include team members, timeline, resources and tasks at each stage.

Creating Commercials

Storyboard is the most common primary visual aid used to plan our or prepare a television commercial or film. It organizes sequences that include visual elements, dialogue, and actions of characters.

http://www.youtube.com/watch?v=LgDwNxGIuCQ
Storyboarding can help you plan for special effects, testing complicated ideas on paper first versus testing it out at the film location, and also validating continuity.

It can be drawn in a sketchbook, or broken down to pieces to collectively move around visuals in a meeting or group setting.

Storyboards for commercials can also be done with real life images either put together on the computer or physically printed. Doritos commercial done this way:
http://www.youtube.com/watch?v=p_mjCj7nUaA

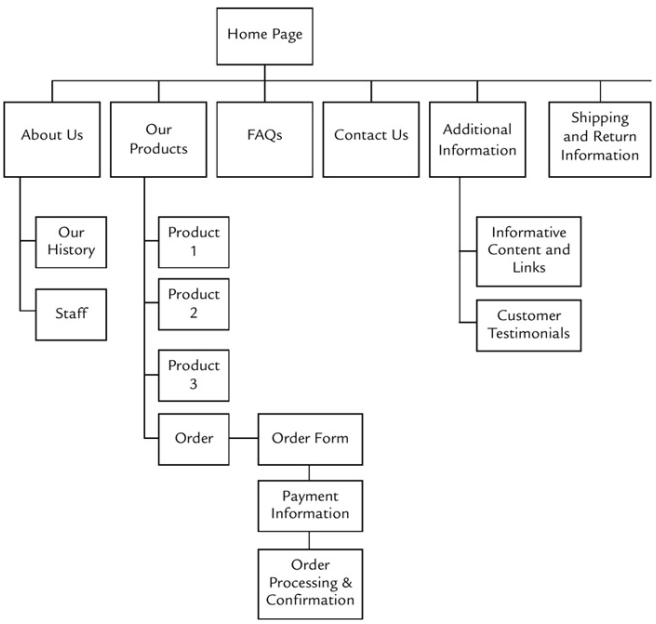
Creating Websites

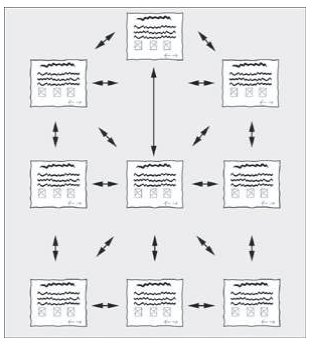
This could be essential to the effective and efficient creation of a website. It facilitates the ease of understanding the structure of a site, how the information is to be presented, and what information is to be presented. The keyword is efficient, because not so good storyboards will make the web designer waste time trying to interpret what is really meant instead of actually working on the creation of the site and graphics.

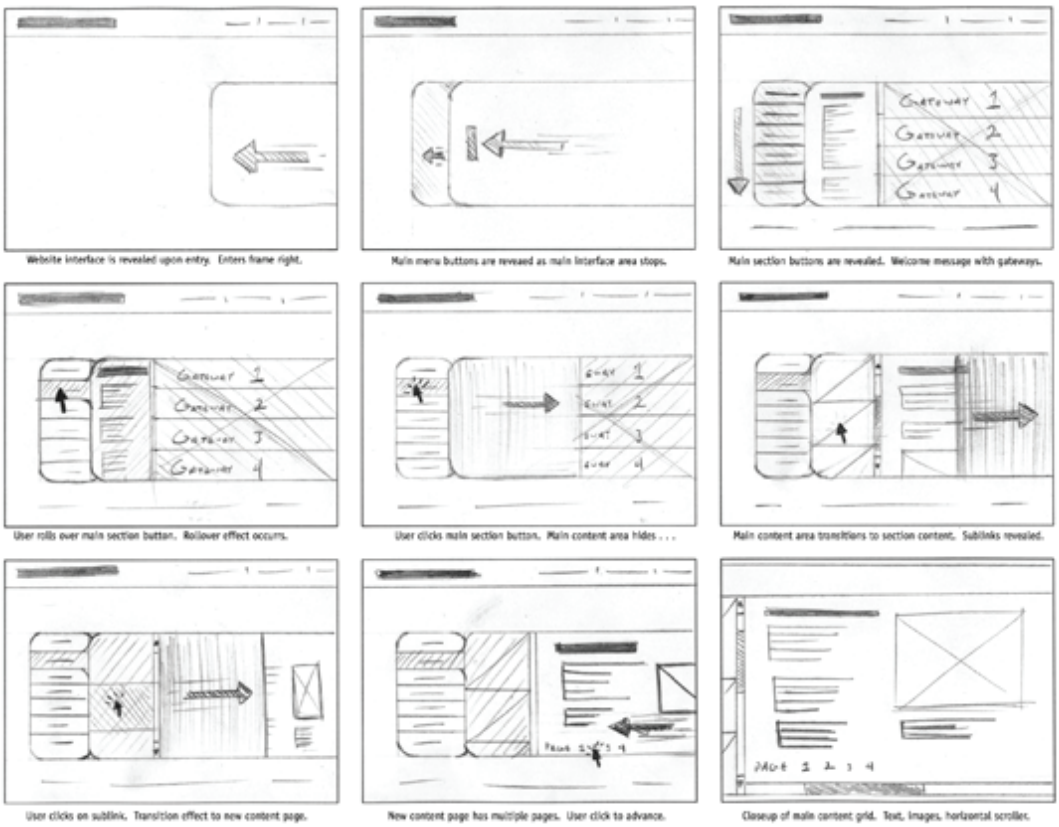
Storyboard for websites consist of two different visuals – Site Map and a Plan Layout

Site maps are to organize structure and where you want your content going. You start off with one rectangle to represent your home page. Beneath you draw other similar rectangles that will be linked to that home page. Examining each second level page, think about more connections you may want to add and create as many subheadings as needed. Draw lines between rectangles to show how they are linked to one another.

Plan layouts are more like thumbnails illustrating the design layout of your webpage. By drawing boxes and lines to represent banners, graphics, navigation, and text, you create a series of pages for each link in the website.







These two components will provide the web designer and graphic designer with a clear idea of how you want your website to look like. This can save lots of time and money just by making sure this storyboarding stage is done as clearly as possible.

Using the technique

Preparation

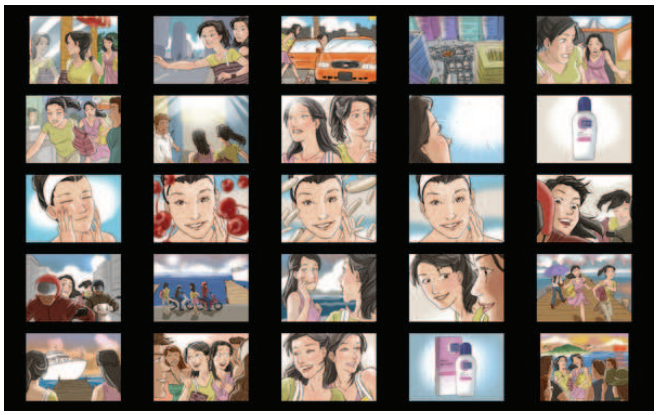
Preparation for story boarding can include multiple conceptual techniques to generate initial ideas, such as brainstorming. You must decide what is the purpose for your storyboard, and further expand what content and how you want it to be presented. Remember that the storyboard is used to communicate ideas to the production team, whether you are doing a commercial, developing a product or a website, certain elements must be highlighted.

Performance

Start drawing! Use your sketchbook, print outs specifically for story boarding, digital software, or draw on Post-Its so you can rearrange on a board. For commercials, determine how many scenes are needed. For websites, determine sizing so you can focus on important features like text.

Reflection

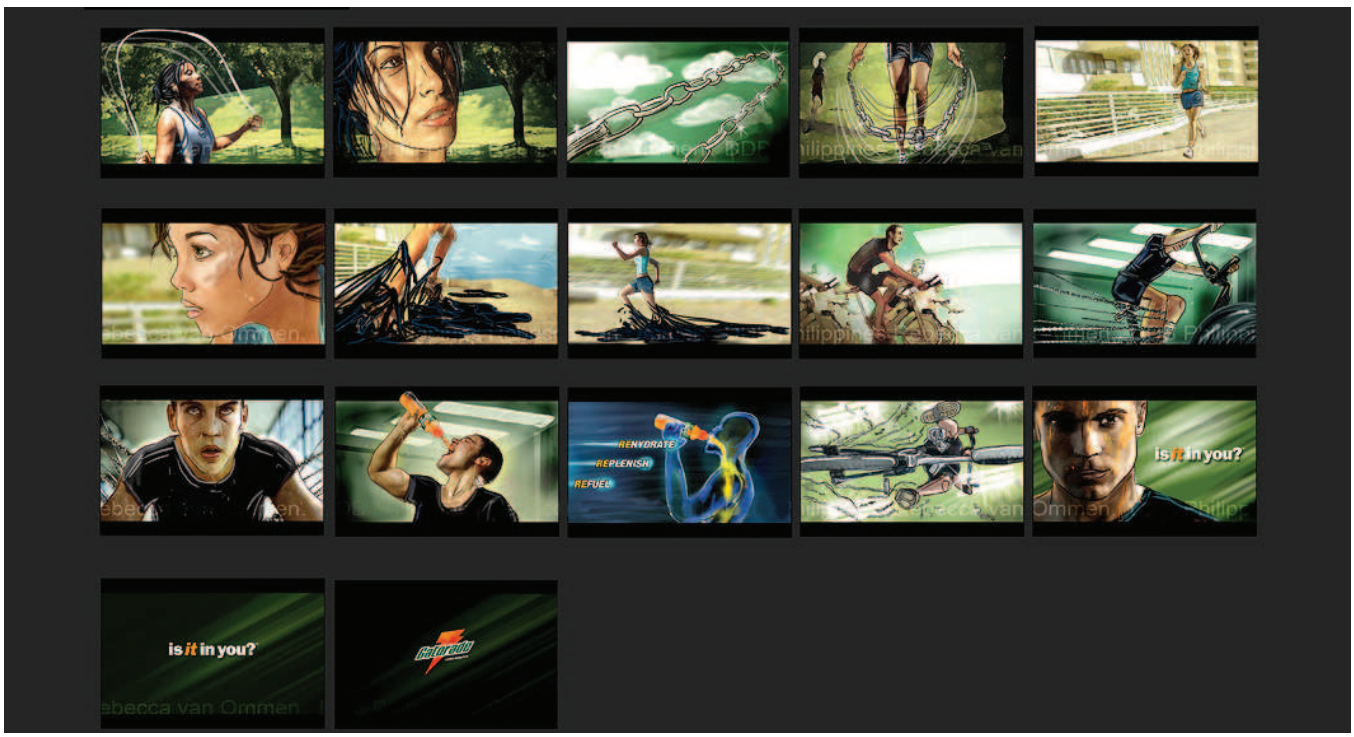
The end goal is to have a sequence of events laid out so you can help developers understand the process and further develop the product from here. Communicate with your colleagues. You will probably need to add things, take out things, or rearrange sequences.



Activity

A good tactic to understand storyboarding is to give the students a series of images individually separated and mixed up, and have the students put them together to create a sequence that encapsulates the story.

As a group, we compare their storyboards created, to the actual storyboard, and also show the final produced commercial as the visual reference.



Yes, Let's

Yikai Zhang (Glen)
Chen Ji
Shengquan Chai (Frank)
Harish Pillai

Overview
"Yes, let's" is a group game in learning what kind of offers or ideas inspire your fellow players. (Merlin, 2008)
In this game, every participant offers a behavior/action by saying "Yes, let's". Then, every participant responds "Yes, let's" and performs improvised behavior spontaneously.

Background
The original idea of applying these types of games is to provide a smooth progression of increased experience at
brainstorming and firsthand insights into its psychological underpinnings. (Faste, 1992)

Goals
This exercise is played in order to get your creativity going and increases your team members' engagement with each other. This activity not only increases energy but also requires each person to actively engage, listen, think, and do.

Preparation
One empty room maybe required so that the game will not disturb others.

Details of Exercise
Duration: 5-10 minutes
How many can play / configuration of players: The number of people between 4-20.

Running the Game
Everyone walk around the room randomly, and then one person can make an offer: "Let's act like we're all at a cocktail party," "Let's be baby birds," or "Let's act like we don't understand gravity." Then everyone should shout in unison the response, "Yes, let's" and proceed to take the directive by acting it out. At anytime someone else can yell out the next offer. The answer is always, "Yes, let's!"

End of Game
Outputs:
"Yes, let's" is an activity which can help teams loosen up and become mentally and physically active. It can be used when energy is wavering, to wake up in the morning, to launch a meeting, or before a brainstorm. (Plattner, 2012)

Discussion:
Any ways to modify or apply games in different areas?
How to utilize this game to other conceptual techniques?
How to use this game to resolve conflicts in groups?

Next Steps after Exercise:
Keep the activity brief and active so you can jump into your design work after.

Final Notes from Facilitator:
Although some participants complain that the game is not suitable for adults and they feel a little embarrassing , other participants really enjoy playing the game because it is a game people can play together and do some physical exercise.

Variations on the Game:
Category, category, die!
Line folks up.
Name a category (breakfast cereals, vegetables, animals, car manufacturers).
Point at each person in rapid succession, skipping around the group.
The player has to name something in the category. If she does not, everyone yells "die!!" and that player is out for the round. (Plattner)

CREATIVE TECHNIQUES

Bodystorming

Lee Jones,
Phuong Vu,
Klaudia Han

Overview

Bodystorming is one process for coming up with ideas based on actually experiencing a situation to see what users will go through. This can be done through improvisation and play, using a prototype, or actually going out into the environment. Through going through the motions we get a better understanding of how a process, product, or place works. We get a better understanding of the actual challenges that either are creating barriers, causing confusion, or are just not easy to use.

Background

Idea generation through actually experiencing a situation is something we do naturally and quite often. If you've ever gone shopping for a major piece of furniture with someone, you've probably both tried it out, sat on it, made sure it was comfortable, and discussed which one you preferred and why.

The formal process of bodystorming, as well as its name, was first written about in the 1994 paper presented at the Conference on Human Factors in Computing Systems (CHI) in Boston, "Actors, hair-dos and videotape: information design; using performance techniques is multi-disciplinary, observational design" (Burns et al.,1994). In this paper a research team from Interval Research Corporation in Palo Alto describes how they developed a "small-scale hair studio" while designing computer workstations for hairdressers, and in particular for one hairdresser who insisted a computer "would not help her to run her business." (Oulasvirta et al, 2003, p. 126). The goal of designing a small scale hair studio was so they could physically emulate and role play situations where a computer station could aid a hairdresser.

Through doing this exercise, they were able to find issues and opportunities through the physical environment. They were able to examine questions such as: How would a hairdresser use the computer? Where would they use a computer? What would the process be for using the computer?

As the study states "By designing in an enactive way, we were able to build an increased empathy for the people that we had identified as the users we were designing for" (Burns et al., 1994). Overall, before experiencing the hairdresser's situation they would have been able to examine the issue through assumptions and research, but through actually experiencing what the hairdresser goes through they were able to develop much more informed and usable designs.

Purpose

Bodystorming has a variety of purposes:
Creating Empathy: Bodystorming is a great way for creating empathy for your users. By going through the process you get a better understanding of the difficulties they are dealing with and what they are going through (Burns et al., 1994).

Defining Needs or Areas for Improvement: In their paper "Understanding contexts by being there: Case studies in bodystorming", Burns et al. state that "bodystorming is essentially, simply brainstorming conducted 'in the wild'" (Oulasvirta et al, 2003, p.127). It involves going out and actually experiencing how users use your product, or by creating a small model in order to simulate that experience. Bodystorming can be used both before the prototype and after. For example, if you want to improve upon an item that already exists, then you can use bodystorming to figure out how to do so. You can also use bodystorming to act out a process or system.

Uncovering subtleties: Body storming is a great way to get to problems directly. We could research for days, but unless we go through the process we won't notice certain subtleties of the experience (Oulasvirta et al,
2003, p. 126).

Validating a product: Bodystorming is a great way to identify whether a product, or system, actually works (Oulasvirta et al, 2003, p. 126).

Goes By

Bodystorming has also been called "experience prototyping" (Oulasvirta et al, 2003, p. 126), which is a great way of thinking about it in terms of project lifecycle. You're acting out the process that they are going through and therefore prototyping their experience.

Variations

Bodystorming is similar to user testing. In user testing, instead of the designer going through the process and coming up with ideas, the actual user goes through the process and then is asked questions about their experience. In both cases, going through the motions
of using the prototype will reveal subtleties about the user experience.

Bodystorming is also similar to brainstorming, but rather than discussing just ideas, you discuss ideas while walking through a process or environment.

Using the Technique
Bodystorming is a tool that helps us to discover problems and possible solutions through what we perceive and our experience. By going through bodystorming we can translate this knowledge into idea generation and subsequent prototypes. By working together to go through the experience of bodystorming we create empathy for the user, understand subtleties of the user experience, and are better able to visualize possible solutions.

Traditionally, bodystorming fits into all phases of the innovation process.
Understand-"Where to look" – pin-pointing issues
Observation- "Re-creations" – re-creating scenes of experiences
Visualization- "Bodystorming" – prototyping to find new issues or inconsistencie
Evaluation and Refinement- "Debugging" – Similar to user testing, going through the process to discover how the process needs to be fixed of improved
Implementation – "Informance" – Using play or acting out to discover more about a process (Kachur, n.d.).

Steps to Consider
1) Domain - What is your design questions? What do you want to analyze or look at?

2) Venue – If you can't be in the environment, recreate it

3) Session – Bodystorming works best with multiple viewpoints. Here are things to keep in mind.
Everyone should be involved and have a role
Use props, take notes, or use post-its
Have a narrator who records and facilitates.
Be inclusionary when people voice their opinions "Yes, and . . . " rather than "No, but . . . "

4) Record – Based on the discussion, the group would write down ideas as scenarios, depicting the user, a problem and solution to problem in a story-like format with drawings and written text (Bodystorming, n.d.)

Inputs:
Can be very early stages for idea generation or can be once you have a prototype.

Outputs:
This exercise helps to create the generation of ideas or recommendations around an envisioned scenario. Scenarios or recommendations could be around organizational situations or behaviours.

Next Steps after Exercise:
Bodystorming can take place at various times in the design process. Here are the next steps to take depending at where you are:

1) Discovery Stage: ideas generated by bodystorming are collected, selecting ideals to practice into design after bodystorming.

2) User Experience Stage: body storming is the tool that can put us into users shoes and help us check out our findings, which really helpful when we are trying to narrow down our ideas and have a proper definition of the challenge.

3) Prototype Stage: Body storming is wildly used in prototype as we can actually test different ideas and see the feedback immediately. After this stage you would work on perfecting the prototype.

4) Presentation Stage: Instead of passing a pile of report full of forms and diagrams to client, it is much more clear and memorable to deliver a play or a film to show our outcomes (ACT IT OUT, n.d.).

Other Points of Note
It's important to consider the physical ability of your team, or whether members have disabilities, when doing bodystorming. If members of your team aren't physically able to do the activity, or may have difficulty, you may want to choose a different route, such as getting user feedback.

At the same time, physical disabilities can be very helpful in bodystorming, not only for discovering what difficulties they may have with an item, but also for thinking about different types of users, and designing for the wide range of possible users.

Other Case Studies and Examples
Example 1 – Bodystorming for Visualization (Role and Improvisation)
Location: Intuit Innovation Catalyst
Video: http://vimeo.com/27642530

Intro: The body storming session conducted Tom Maiorana, who was a Principle Interaction Designer at Intuit's Design Innovation Group. Currently Tom is a lecturer at Hasso Plattner Institute of Design at Stanford University (i.e. the D.School) and as well as the founder/designer of several business like Red Cover Studio and Hummus Apparel (Maiorana, 2014).

Situation: In this video the Intuit team uses bodystorming to get a deeper understanding of a system. In this example they bodystorm how to make coffee. Each person on the team is a part of the process. In this case, they take the roles of coffee grounds, scoop, water, coffee maker, stirrer, and filter. They wear labels identifying what part they are and physically act out how coffee is made. Throughout, someone makes notes of what people are suggesting.

Result: By going through the process they identify how to improve the coffee-making process through design (such as, adding swivels, making the product easier to use). It brings the team all on the same page and brings about new ideas.

Example 2 – Bodystorming for Prototyping
Case study: Design a gesture based media controller for automobile.
Collaboration between industry partner and Helsinki University of Technology. (Nieminen M. 2010). In this body storming session, one of our group members, i.e. Phuong Vu, was the facilitator. The session was carried out at Helsinki University of Technology Computer Science building's premises.

Screenshot from Bodystorming Video by Intuit Innovation Catalyst - team acting out how to make coffee

Location: Helsinki University of Technology
Video:
https://www.youtube.com/watch?v=Hf9MLGMZs6s

Goals
The solution shall fulfill three basic requirements:

1. In term of functionalities, able to cover most of basic features for media center equipped in automobile

2. Easy to use

3. Above all, safe to use

Gesture Based Media Controllller for Car's Accessories by Phuong Vu

We have tried 2 major types of screen-based interactions: touch based and motion tracking. In which we opted for motion tracking typed of controller (Nieminen, 2010).

Rationales:
1. Touching screen while driving is dangerous, relate this to texting while driving.

2. With motion tracking, user can keep their eyes on the road while controlling car's media center, hence, less distracting and safer to use.

To familiarize ourselves with gesture-based technology and facilitate the ideation process, we have done several body storming sessions with different Kinect games (e.g. Kinect sport and Kinect adventure), trying various gestures (Nieminen, 2010).

Computer setup
The setup for our body storming on "Gesture based media controller for automobile" consisted of:
2 projectors used for overlaying two video sources – one for displaying the driving game and the other acting as head up display on the windshield of the car, a driving wheelfor playing the game, any driving game, and a Kinect for recognizing the gestures (Nieminen, 2010).

Challenges
Several challenges arose during the bodystorming session:

Setting up the environment, i.e. hi-fidelity prototype that recognizes hand gestures and translate them to computer actions

Technical issues as the bodystorming session involved the use of computers and projectors

Steering participants' actions so that they only brainstorm features that were relevant to the system in question

From these sessions, we were able to derive set of easy, yet distinctive gestures, for controlling automobile's media center. An early prototype was created based on the findings. The same prototype was used in further bodystorming sessions, used for generating more ideas, evaluating them critically, and finding alternatives (Nieminen, 2010).

Conclusions & Reflections
Facilitator must clearly present the design problem and what he/she wants to achieve after the session because without making them, i.e. design problems and goals, clear, participants may feel uncomfortable, awkward, and less engaged.

Facilitator must find a way to engage participants and keep them engaged throughout the whole session

Grounded Theory

Laura Wright,
Monica Virtue,
Hector Centeno

Overview
Grounded Theory is an approach to collecting, coding, and interpreting data with the intent to develop theory. Instead of starting with a hypothesis, Grounded Theory researchers begin by collecting data on a theme. From that data, they develop codes which are taken directly from their data. Codes are then grouped into concepts to make sense of the data. From the concepts, categories are formed, which are the basis for theory development, which can be described as a reverse-engineered hypothesis.

The technique is mostly used for qualitative data collection and analysis. It is most often used for studying interpersonal relations and relations between individuals and larger social processes. It's useful for studying motivation, personal experience, emotions, identity, attraction, prejudice, interpersonal conflict and cooperation.

Its purpose is for "building theory from the ground up."

It bridges interpretive analysis with positivist assumptions:

Interpretive analysis: attempts to describe, explain and understand the lived experience of a group of people. Relies on knowledge from "the inside," from the point of view of the experiencing person (Charmaz, 2003).

Positivist assumptions: studies from "the outside." This relies more on the observer's concerns and interpretations of research participants' behaviour (Charmaz, 2003).

"Being a grounded theory researcher can be likened to solving a puzzle," says one proponent of the technique, Dr. Antoinette McCallin. "If you enjoy doing puzzles you might well be a good Grounded Theory researcher." She says that, "Being a Grounded Theory researcher can also be likened to being a detective, to finding out what is really going on in the background – not what is obvious, but understanding what is not obvious." (McCallin, 2009)

Distinguishing characteristics:
Kathy Charmaz (Charmaz, 2003), one of the leading thinkers about Grounded Theory, writes that there are several distinguishing characteristics for the technique:

1. Simultaneous involvement in data collection and analysis phases of research
This blurs the line between data collection and data analysis, but data collection becomes more focused as you analyze your emerging data.

Why do this?
The data collection becomes more focused as the research continues, and the researcher can collect data around emerging themes. This also avoids the pitfall of gathering a ton of data that can be overwhelming and not necessarily useful.

Ex. The researcher can follow up on topics from interview A in interview B.

2. Creation of analytic codes and categories developed from the data, not from preconceived hypotheses

"Each idea should earn its way into your analysis." (Charmaz, 506)

This forces the researcher to pay close attention to their research subjects' own words. It is very important for grounded theorists to not force preconceived ideas and theories directly onto their emerging data. They instead follow the leads that come out of their data.

Doing line-by-line coding of the data leads to developing categories that are again based on the research subjects' own words. In order to use research subjects' own words, recorded interviews are very important. The researcher should record and transcribe the interviews themselves in order to be very acquainted with the emerging data.

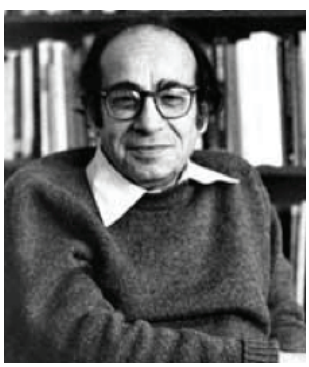
3. Development of middle-range theories to explain behaviour and processes
This can be challenging with qualitative data because the researcher must find themes across their data (ie. multiple interviews).

Ex. Charmaz was studying how people with chronic illness experience time. In her interviews, she found many people used the terms "good days and bad days." This has an implied meaning that can differ from person to person. In order to get more specific information about what that means, she asked more specific questions, such as, "what does a good/bad day mean to you?" This allowed her to use her own words and themes to describe what her research subjects told her.

4. Memo-making, ie. writing analytic notes to explicate and fill out categories, the crucial intermediate step between coding data and writing first drafts of papers
Memo-making is the process of looking for patterns in the line-by-line coding and themes. The researcher looks for patterns in their codes that are similar across all of the data. They then write some conclusions.

5. Delay of the literature review
Instead of doing an extensive literature review before conducting research, the grounded theory researcher will do this after they have a significant amount of coded data with emerging themes. By doing this, they find material that supports their research. This avoids the issue of having preconceived notions before they even begin data collection.

Grounded Theory can and should be used throughout the project's lifecycle.



Background
This technique was developed in the 1960's by sociologists Barney Glaser and Anselm Strauss while they were doing research with terminally ill patients in California hospitals. The original research resulted in a 1965 book titled, "The Awareness of Dying," and a second book, published in 1967 titled, "The Discovery of Grounded Theory."

During this time period, new techniques for social science analysis were becoming popular. These techniques, based on scientific logic, objectivity and truth led to categorizing qualitative data as quantitative. It divided theory generation with the actual research.

According to Charmaz, Glaser and Strauss challenged this trend because it:
1. Divided theory generation and research.

2. Relegated qualitative research to a second-class status. Qualitative research at the time was considered useful just for preliminary purposes, and was not considered as rigorous as quantitative methods.

3. Qualitative data analysis methods were considered unsystematic and impressionistic.

4. Many assumed that qualitative data could only produce descriptive case studies, not develop theory.

"Grounded theory offers systematic approaches for discovering significant aspects of human experience that remain inaccessible with traditional verification methods. Because grounded theory methods are designed to study processes, these methods enable psychologists to study the development, maintenance, and change of individual and interpersonal processes." (Charmaz, 2003)

Purpose
This technique is performed in order to develop theory based on the researcher's collected data about a particular topic. The theory developed is grounded in observation.

Grounded Theory is a general research method, and therefore is a particularly useful tool when a broad theory or explanation of a process is required. (Scott, 2009)

It can be especially helpful when current theories about a phenomenon are either inadequate or non-existent. (Creswell, 2007)

Similar Techniques
Grounded Theory is a qualitative research technique. As such, there are other qualitative techniques that share some common procedures:

Ethnography: It has as an objective to study a whole culture, being the culture of a population in a specific geographical location or the culture of a business or other types of groups. In Ethnography, the researches looks to get completely immersed in the culture being studied. As in Grounded Theory, a corpus of field notes is generated and there is no certainty as of what will be the final emerging theory.

Phenomenology: A research method that has an emphasis on people's subjective experiences and interpretations of the world.

Field Research: The researches goes to the field to witness the phenomenon in its natural state or in situ. The notes taken on the field are also coded and analyzed as in Grounded Theory. (Trochim, 2006)

Using the Technique
"The goal of grounded theory is to generate a t¬heory that accounts for a pattern of behaviour which is relevant and problematic for those involved. The goal is not voluminous description, nor clever verification."
(Glaser 1978:93)

Steps:
Identifying > Data Collection > Open coding > Memoing > Selective coding > Sorting > Categorizing > Theory Forming

1. Identify your substantive area: The area of research to which the general question, "what's happening here?" will be asked.

2. Collect data: This includes any kind of quantitative or qualitative data in any form pertaining the substantive area of study: face-to-face interviews, indirect interviews, past archived records, images, audio, government reports, news (printed, TV, online), surveys, etc.

3. Open code the data: Create labels that summarize what is seen to be happening in chunks of data, without using existing theories. The coding of data is done simultaneously to the collection of data. From this coding the core variable is found: the main concern and how it is being resolved or processed. An example of open coding the data obtained from one question in an interview (Gallicano, 2013):

4. Write memos throughout the process: Throughout the whole process, the development of the theory is registered in the form of memos (which could be marginal notes). These memos are theorizing writings about the codes and how they could potentially relate to each other. These memos will eventually constitute the final theory.

5. Selective coding and theoretical sampling: Following the definition of the core variable, selective codes (codes focused only on this core) are generated from the data. New data samples are also be obtain based on the developing theory.

6. Memo sorting and axial coding: The memos are sorted to facilitate finding the theory that explains the main concern and to help create connections between concepts. If new ideas emerge from the sorting, new memos are added. Connections between the codes are found (axial coding) and they are grouped into similar concepts. From these concepts, categories are generated that will constitute the basis of the final theory. The categories are filled with new concepts until they are saturated (no more concepts can be formed from the existing or new data).

7. Read literature: Once the theory is well formed, integrate the available literature selecting only what is related to the core category (selective coding, as in step 5).

8. Write the theory

The steps outlined above are not performed in a linear way. The diagram below shows the parallel and spiraling trajectory of the Grounded Theory process:

Research question: What irritates or upsets Millennials when receiving feedback on their work?
Open codes

Inputs:
Requirements to start the Grounded Theory research process:

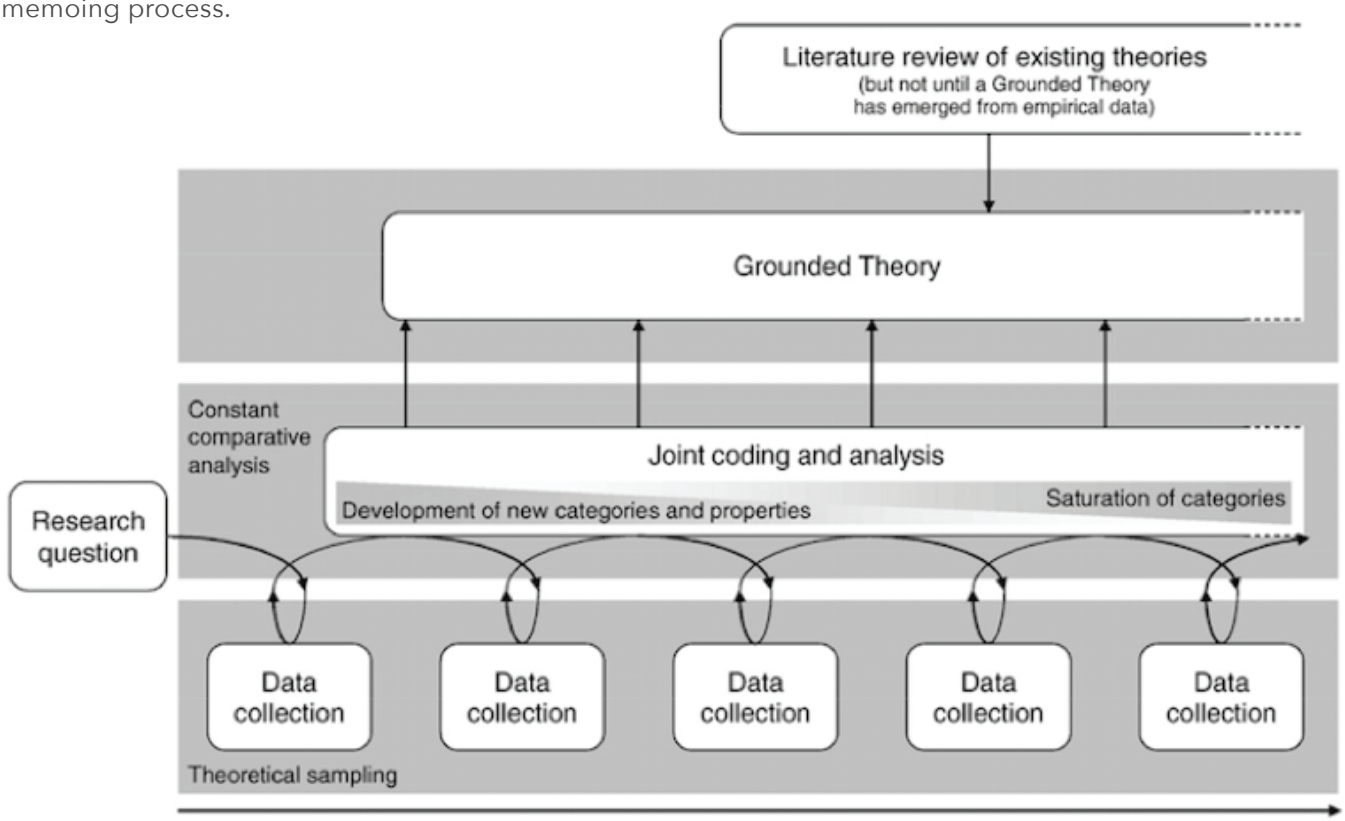
The chosen area of study (substantive area).

An open mind approach to the related data without departing from other theories or hypotheses.

An initial corpus of data to begin the coding and memoing process.

Outputs:
A theory grounded on the data.

Other Points of Note
Alternate Approaches:
There are three predominant Grounded Theory approaches or designs that have arisen since the technique was developed:



from Wagne, Lukassen, Mahlendorf, 2010

1) Emerging design (Glaser, 1992)
This approach focuses on letting a theory emerge from the data instead of using specific, preset categories. This design was the original, pioneered by Glaser and Strauss during the 1960's.

2) Systematic design (Strauss & Corbin, 1998)
This approach emphasizes the use of the data analysis steps of open, axial and selective coding, and the development of a visual picture of the theory generated. This approach uses specific, preset categories during the coding phase, as well as constant comparative data analysis.

3) Constructivist design (Charmaz, 2006)
This approach focuses on the importance of meanings that individuals attribute to the focus of the study. The researcher looks at the participants' thoughts, feelings, values and viewpoints, rather than gathering facts or describing acts.

Criticisms:
Grounded Theory has been criticised for a number of reasons, including its claims to develop and use inductive knowledge. Some researchers have claimed that it is impossible to free oneself of preconceptions during the collection and analysis of data in a way that is necessary for the technique to work. (Thomas, 2006)

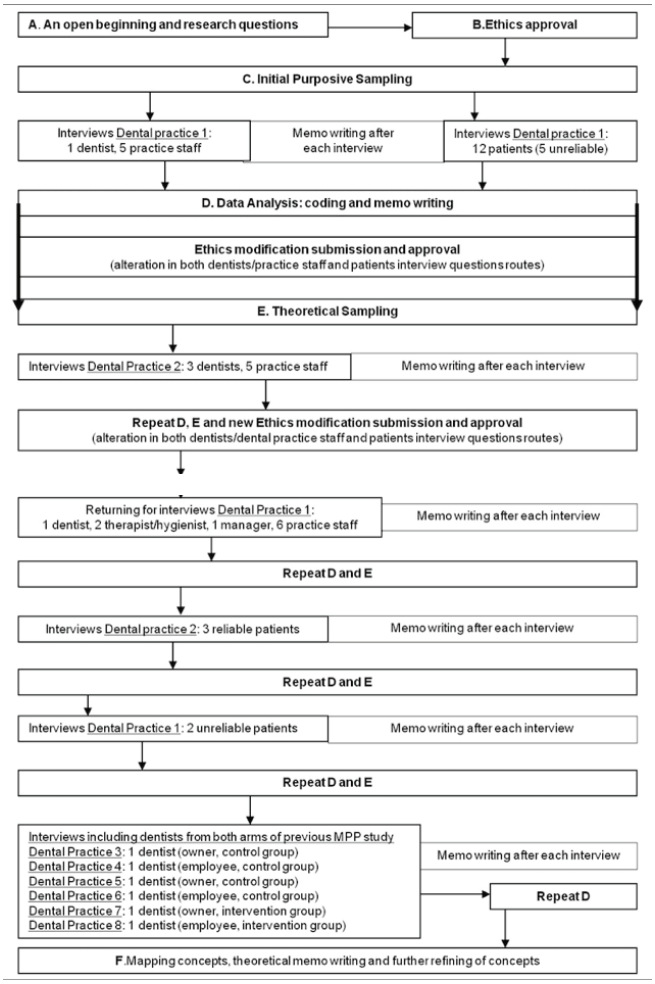
Other Case Studies and Examples
EXAMPLE 1:
A Grounded Theory Study of Dental Practices by Alexandra Sbaraini, Stacy M Carter, R Wendell Evans and Anthony Blinkhorn. 2011.

The study was conducted to find out why dental health preventive measures were not being followed by dental practitioners. The study looked to answer the questions:

What was the process of implementing (or not-implementing) the protocols (from the perspective of dentists, practice staff, and patients)?

How did this process vary?

Chart of the method (Sbaraini, Carter, Evans, Blinkhorn, 2011):



EXAMPLE 2:
Kathy Charmaz - Using Grounded Theory to study chronic illness sufferers' experiences with time

Charmaz interviewed chronic illness sufferers about how they experience time. Many patients referred to having "good days and bad days." This might seem obvious to many people, but to a researcher, the meanings must be made explicit so that she can build on the research.

For example, Charmaz asked her interview subjects questions such as, "what does a good day mean?" and, "What does a bad day mean?"

Through these questions, she discovered that "good days" mean minimal intrusiveness of illness, maximal control over mind, body and actions, and greater choice of activities…"Had I not followed up and asked respondents about the meanings of these terms, their properties would have remained implicit." (Charmaz, 505).

Having this information - analyzing it as she gathers it - led her to ask the next participant more focused questions about their experience with time and chronic illness.

Example of the coding process:

Raw data	Initial coding	Focused coding	*Theoretical coding*
Q. What did you take into account when you decided to buy this new technology?	Deciding to buy based on cost, reliability	**Seeking out evidence**	*The process of making sense of evidence and construction of knowledge*
What did we... we looked at cost, we looked at reliability and we sort of, we compared a few different types, talked to some people that had them.	Talking to dental colleagues on internet sites	**Gathering and comparing peers' evidence to reach a conclusion**	
Q. When you say you talked to some people who were they?	Comparing their experiences		
Some dental colleagues. There's a couple of internet sites that we talked to some people... people had tried out some that didn't work very well.	Looking at literature		
Q. So in terms of materials either preventive materials or restorative materials; what do you take in account when you decide which one to adopt?	Doing my own little research		
Well, that's a good question. I don't know. I suppose we [laughs] look at reliability. I suppose I've been looking at literature involved in it so I quite like my own little research about that, because I don't really trust the research that comes with the product and once again what other dentists are using and what they've been using and they're happy with. I'm finding the internet, some of those internet forums are actually quite good for new products.	Not trusting research that comes with commercial products Talking to other dentists about their experiences		

Example of a memo from the study:

Memo written after interviewing a practice manager
This was quite an eye opening interview in the sense that the practice manager was very direct, practical and open. In his accounts, the bottom line is that this preventive program is not profitable; dentists will do it for giving back to the community, not to earn money from it. I am so glad we had this interview; otherwise I am not sure if someone would be so up front about it. So, my question really is, is that the reason why dentists have not adopted it in other practices? And what about other patients who come here, who are not enrolled in the research program, does the dentist-in-charge treat them all as being part of the program or it was just an impression from the interview and what I saw here during my time in the practice... or will the dentist continue doing it in the next future?
I definitely learned that dentistry in private practice is a business, at the end of the day a target has to be achieved, and the dentist is driven by it. During the dentist's interview, there was a story about new patients being referred to the practice because the way they were treating patients now; but right now I am just not sure; I really need to check that... need to go back and ask the dentist about it, were there any referrals or not? Because this would create new revenue for the practice and the practice manager would surely be happy about it. On the other hand, it is interesting that the practice manager thinks that having a hygienist who was employed few months ago is the way to adopt the preventive program; she should implement it, freeing the dentist to do more complex work. But in reality, when I interviewed the hygienist I learned that she does not want to change to adopt the program, she is really focused on what she has been doing for a while and trust her experience a lot! So I guess, the dentist in charge might be going through a new changing process, different from what happen when the MPP protocols were first tried in this practice; this is another point to check on the next interview with the dentist. I just have this feeling that somehow the new staff (hygienist) is really important for this practice to regain and maintain profit throughout the adoption of preventive protocols but there are some personality clashes happening along the way.

Mobile Dairy

Xiangren Zheng (Gary)
Chen Ji
Tianjiao Li (Jenna)
Shengquan Chai (Frank)

Overview
Mobile Diary is a way of gathering specific participants' information. It is a hybrid method that incorporate many of the creative and playful aspects. It is generally used with a group of one to 10 identified individuals. A range of different analog and digital technologies are used that allow participants to post and share on various aspects of their daily life. Researchers would capture users' reflections that they could not be able to access this type of personal and private data through interviews or observations.

Background
In the early stages of design, rather than evaluate or validate specific user requirements or priorities, we are interested in exploring possibilities. As the opening quote suggests, we seek to engage with the various stakeholders the design project may eventually affect and gain an understanding of the unique design situation from their perspective. In 2004, Zimmerman's framework for discovering and extracting knowledge during the design process, this is known as the Discovery phase of design. Mobile Diary is the field method that can be used in the early stages of design to immerse into people's everyday life.

So much of our lives are routinised and automatic, it is not until we are asked to document or consider certain activities that we are able to identify key junctures in our own understanding of a topic or a behaviour.

Purpose
This technique is performed in order to:
Identify stakeholders and their relationships.
Assess desirability of the concept.

Capturing data and insights from an individual or group to assess actions, activities, timing of events, habits, behaviours and emotions.

Enables participants to:
Self report by gathering their own date over a period
of time
Allows for self-reflection and possible change.
Create and share in the richness of their lives.
Capture moments in real-time.
Document actions, behaviours and emotions.

Enables researchers to:
See personal and private aspects they would not be able to access through interviews or observations.
Uncover additional context(individual and group).
Identify areas of focus opportunity and unmet needs.
Gauge reactions.
Tell a story with qualitative data.
Deep immersion into the lives of the participants.

Variations
Questionnaires and semi-structured interviews are two frequently used approaches similar to mobile dairy in data collecting and analysing. However, these two method though ultimately aim at getting as solid as possible in terms of information collecting, the way to demonstrate are different.

Questionnaires are more focus on researchers' side. Question are designed around a certain topic that researchers are particularly interested. Participants may or maynot be engaged into the investigation process and the subconscious behaviour could disturb potential the outcome. However, one of the advantage of questionnaires over mobile dairy is that this method is easy to practise and could efficiently gather tons of information in a rather short of time. The same problem occurs in semi-structured interviews. Semi-structured Interviews are used to gather focused, qualitative textual data. This method offers a balance between the flexibility of an open-ended interview and the focus of a structured ethnographic survey.

Using the Technique
This technique would be generally applied at the very beginning of the research however, the limitation should not set up so stiff since there will be variation according to each specific research. The basic purpose for why researcher would like to apply such approach as a way to gather information and form an insight or reflection accordingly in a more sensitive direction. This technique could be applied whenever researchers feel needed. Below are the detailed procedure for this technique.

Set the theme, focus area, goals and objectives.

There are two kinds of research method, formal and open-ended. The difference is about research result, the result of formal research is focus on a certain area, while the other's result is open-ended with more flexibility.

Create the profile of participants.

Classifying the participants into different group for further research. Here are some typical aspects as examples: age, gender, location, technology use.

Determine the length of the study (typically 1–3 weeks) and number of participants (1–10).

Determine the types of data to solicit from participants, such as text (i.e., thoughts, questions and quotes), photographs, sketches, voice recordings, video, quotes, etc.

Determine the platform, such as Facebook, Instagram and some other individual blog or social network site.

Researchers start a topic on the platform they chose to rise discussion about it.

Participants send collages, mind maps, videos and blog messages by mobile devices, and also receive prompts, questions and reminders.

At the same time, researchers collect participants' activities and schedule for the duration of the diary posting, responding with new questions or digging deeper into particular areas, and potentially redirecting the focus of the study as a result. The analyzing should start when the data is shared, and give responses in near real-time.

Interaction:
Researchers can interact with participants to have a further research, that makes the research method more flexible. For example, researchers can use #Hashtags to attract participants join into a certain topic and then collect new post. It can ensure the quality of the post because under a certain hashtag, the content always related to the topic so it makes researchers easier to filter data. Here is a chart shows the relationship between researchers and participants, and how the data flow in the research method system.

Summary:
According the process, step 1-5 are researchers' preparation stage, and the last three steps are the real research. Researchers will get a mount of data by collecting but some of them may be useless even interfered, so researchers have to extract useful data from the collection and summarize.

Inputs
Preparation:
For researcher:
The themes, focus areas, goals and objectives of the particular project.
Information of the participants.

For participant:
The content of post. For example, text (i.e., thoughts, questions and quotes), photographs, sketches, voice recordings, video, quotes, etc.
Time and frequency of the post.
Location of the post.
The social network of the post.
Other elements related on certain research.

Device requirements:
Mobile phone
Camera
Voice recorder
Notebook etc.

Outputs
The final output of Mobile Diaries is an insight of participants' lives which is more sensorial and experimental. Information or data provided by participants through posts from social media platform such as self blog etc. would help researchers understand the sample of participants day-to-day life more thoroughly. And these information would be useful for the further investigation as the researching goes deeper. To reach such an insight there will be data collected and organized which would fit in the whole landscape and help to generalize the insight.

Participants' life schedules
Participants use their mobile devices to record their life through the whole day, researchers can "experience" their lives. It's immersive and let researchers get closer to participants' everyday lives. Some information may not be retrieved by traditional could be reflected in an more in-depth descriptive accounts of events and surroundings from the participant's perspective.

Participants' emotions
Researchers can also track how participants' emotions, feelings and inner thoughts change in this process through posts which sometimes inaccessible to a design researcher. Posts by participants have formed an intimacy storyline. These personal stories bring us closer to the participant's world creating a sense of intimacy and proximity to the participants which is difficult to

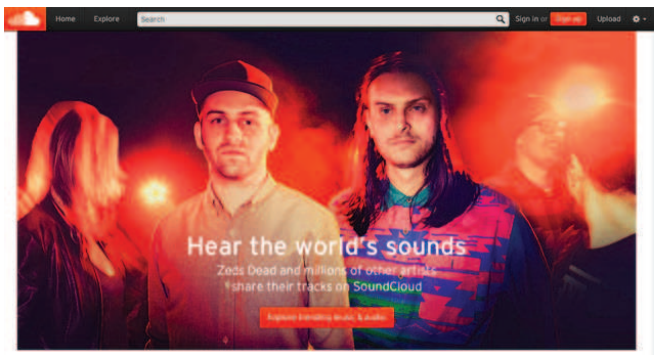
replicate in a one on one interview, discussion group or even during participant observations.

Self-reflection
Recording the daily life of themselves can lead a self-reflection. By review their own experiences they can find questions from their behaviors and choices, and look for new possibilities. The content of the Mobile Diary packs and the nature of the questions included can provoke new realisations and possibilities and also particularly provocative at revealing emotional and infrastructural barriers to behaviour change.

Next Steps after Exercise
Mobile Diaries reveals aspects of participants everyday lives through visual, tangible artefacts. These become shared resources that help researchers to understand current practices, provide a spring-board for ideation and allow us to envision how any future design might be taken up within the existing ecology of the participants life. On the researchers' side, the nature of the material allows for more active interpretation traditionally not possible with written materials. On the participants' side, the process of doing the Mobile Diaries means they are better equipped to reflect on and analyse their own practices. Also significant value in creating opportunities would appeared for co-interpretation of the material by users and other researchers which is a more effective use of the material than simply 'handing off the research'. Besides the value of Mobile Dairy is greater than its role as data collection process. A more broad connection would display as the method applying and could possibly pose a effect on themselves on self-improvement.

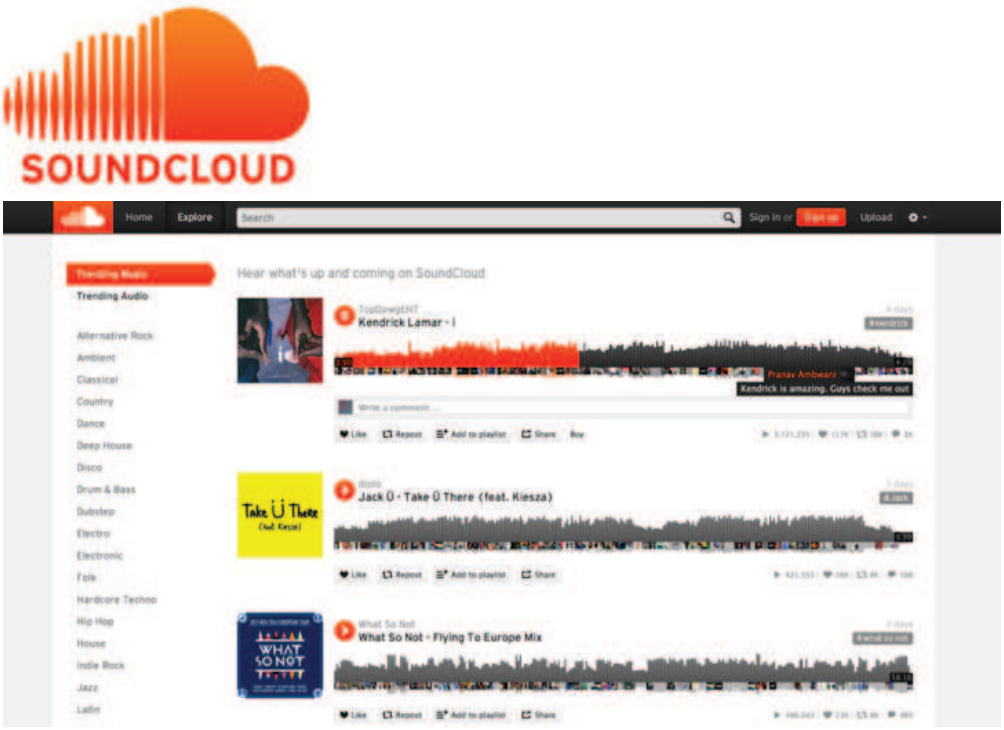
Other Case Studies and Examples
Research target: SoundCloud
A platform to discover new, original music and audio, to build audiences, and to share online and mobile.

SoundCloud is an online audio distribution platform based in Berlin, Germany that enables its users to upload, record, promote and share their originally created sounds. In July 2013, it had 40 million registered users and 200 million listeners.



The research organization calls on device research. On Device Research uses the mobile Internet to gain access to consumer opinion at any time or location.

Mobile-only audiences
Emerging / growth markets
In-the moment research
Advertising effectiveness



The Challenge

Missing market insights

(Although Souncloud has tones of data, all the big data didn't tell the specific market situation - how people interact with audio, who are the competitors and how Soundcloud grow beyond the early adopters.

Therefore, the research goal is to find out the differences of existing users with mainstream audiences and to understand the wider audio market, attitudes, channels and competition.)

Solution

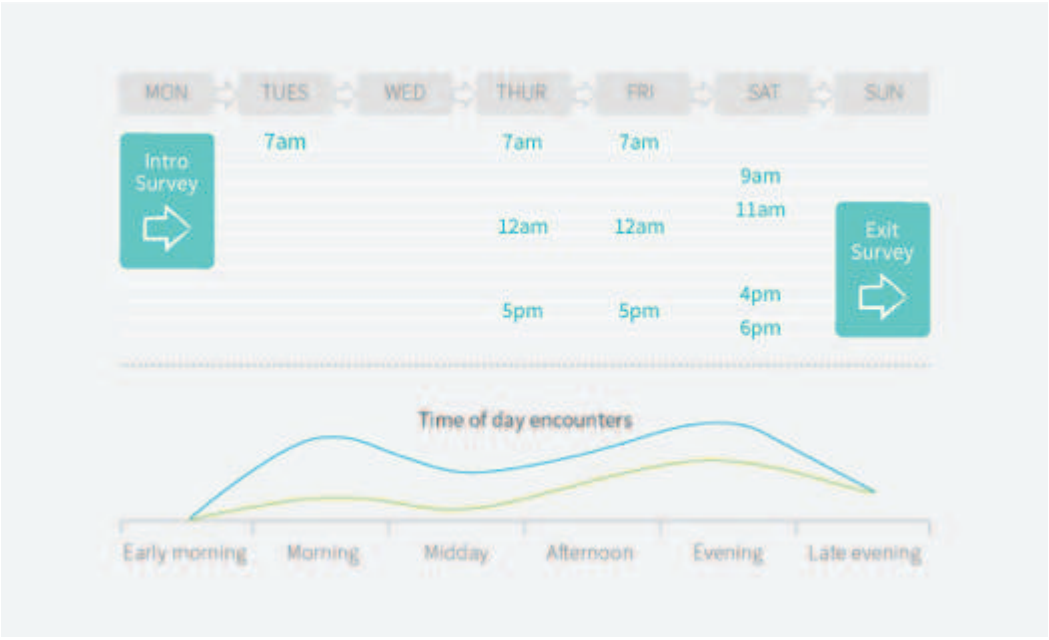
Created 2 groups to participate the survey

One is 350 SoundCloud users.

One is 350 non-users with mobile devices.

Built the statistics which record every "check in" of SoundCloud users over 2 weeks.

According to the specific time, participants of the second group were asked to answer the questions like "Who are you with?" and "Why are you listening to it?".



Results
Here's how mobile diary data helps SoundCloud:

Future product roadmap decisions are based on user and market data, not gut feeling

Vital input into SoundCloud's user segmentation project

Understanding usage patters helped pinpoint new user acquisition campaigns on social media

Insight gleaned from the mobile diary was passed on to top creators on the platform to help them better understand and engage their own audiences

Playful Triggers

Chris Olsen
Harish Pillai
Hart Reed
Tarik El-Khateeb

Overview:
This technique was first presented by Daria Loi in her 2005 paper "playful triggers as keys to foster collaborative practices and workspaces where people learn, wonder, and play"(Loi,2005). It is a continuation of her previous work on reflective and primitive probes, both of which influenced the design of this technique. Reflective probes are cultural probes specifically designed to elicit reflection on a participant's activities, while primitive probes are designed to provide simple materials that allow users to create or customize their own probes (Loi, 2007).

As a technique, playful triggers combines visualisation and collaborative creativity (Fischer 2000, as cited in Akama, n.d.). By visually representing a concept or plan a group can help illuminate previously unforeseen data. For some problems or datasets, visual representation is one of the only way to further elaborate on the available information (Corner 1999, as cited in Akama, n.d.).

Playful triggers can be used for many different kinds of visualization including understanding relationships,exploring structures, and formulating chronologies (Akama, n.d.).

Definition
Playful triggers are commonly found objects used to access, interpret, visualise, articulate and communicate implicit knowledge through facilitated conversations (Loi, 2005).

Purpose
This technique is performed in order to:

Establish a collaborative space, where all participants can voice their ideas (Loi, 2005).

Encourage an atmosphere of play and experimentation, where unusual, eccentric, and intuitive ideas are able to come to the forefront (Loi, 2005).

Understand the complex interactions that occur within projects by encouraging participation, interaction, visualization, reflection and communication (Akama, 2007).

Variations
This technique is a modification and extension of cultural probes, which were developed by Gaver, Dunne and Pacenti in 1999 (Loi, 2005). The probes are small packages that can include any sort of artifact (a map, postcard, camera or diary) along with evocative tasks.
The probes are given to participants to allow them to record specific events, feelings, or interactions. The aim is to elicit unfiltered, intuitive responses from people in order to understand their culture, thoughts and values (Akama, 2009).

Using This Technique:

Preparation
The first step is to clearly define the goals of the project, and figure out what the exercise should explore. Participants can also be interviewed to discover their current feelings and expectations for the project. Care should be taken to select interesting, "eccentric" objects which are colorful and varied in form and texture. If the project is localized in some fashion, the facilitators should try and bring that sense of shared space into the exercise.

Exercise
The participants are brought together and the objects are distributed. The facilitator clearly defines a problem for the team to solve, and then steps back to allow the group to "play" with the objects and begin visually demonstrating their ideas to each other. The group should all know exactly how much time will be allotted to the exercise

Reflection
After the exercise is completed, the facilitator should lead the group in a discussion about the process. Questions can be asked about how the objects affected the process. Did they help create easy dialogue? Did they help anyone come up with ideas that surprised them? Did they actively hinder the process? This feedback is useful for improving object selection the next time the facilitators wish to carry out the exercise.

Conclusions
What was the final plan? Help tie together the ideas presented and make sure that all participants feel that the exercise produced clear goals and insights. Also make sure to evaluate the technique itself. If participants didn't feel like the exercise helped, it may be that playful triggers simply isn't the best choice for this kind of brainstorming. Alternatively, feedback can help alter the structure of the exercise so that it works better next time. The playful triggers technique is well suited to the Discover, Define, and Conceptualise phases of a creative project because

triggers technique is well suited to the Discover, Define, and Conceptualise phases of a creative project because it can help to stimulate creative and lateral thinking as well as evaluate social, collaborative, or synchronous aspects of a system. As with all creative techniques, playful triggers are not always appropriate; one commonly cited complaint was that not all participants feel comfortable playing with toy-like objects. In general, playful triggers are best suited for situations where social, collaborative solutions are desired. (Akama & Ivanka, 2010)

Example Activity - Zombie Invasion:
Form
The goal of the exercise is to have groups collaboratively formulate a complex plan and then present that plan to the whole class using objects to visually represent the steps, actors, and locations. The exercise explores social use of space as well as collaborative, goal-based conceptualization.

Tools
Groups are given:
A map of the Toronto islands

Foam shapes, rubber bands, wooden cubes, plastic figurines, plastic straws... etc.

Introduction
Groups must formulate and present their plan of response to a zombie apocalypse. You are all stuck on the Toronto islands, and a ferry full of zombies has just arrived. How do you survive the night? Represent your plan visually using found objects. The objects can represent anything you choose, but must contribute in some way to presenting your plan to the class.

Photos of Activity in Progress

Reflection
Overall, we felt the in-class exercise was a success. While running the exercise, we found a few insights worth mentioning. Firstly, always give very clear instructions before handing out the supplies and trigger objects. This prevents participants from getting distracted by the objects themselves so they understand the actual purpose of the exercise. Choosing the objects can be tricky, try to find obscure objects, roughly in the same scale as each other, this helps make them even more ambiguous. To make the process relevant to the person running the exercise, documentation is key. Often subtle, nuanced information can be gleaned from the observation of the interaction between participants, a video camera would be best, off to the side so not to distract.

Reflection Questions:
How easy was it to collectively decide on one plan?
Groups responded with praise that the technique made it easy to decide on one solution.

What motivated your decision? Did certain objects "speak" their use to you?
Participants mentioned certain objects did indeed suggest their use via form. One example of this was the use of a small cork to represent a distillery.

Did using the objects make formulating your plans collectively easier or harder?
Participants responded positively to the exercise: they that by using the objects to describe abstract ideas it was easier to collaborate between members.

Did everyone feel comfortable with assigning certain objects to specific roles?
Some participants preferred to use certain trigger objects over others, however, in the spirit of creative thinking this did not create issues but rather gave way to compromise or agreement. We think this is due to the more relaxed form of thinking that the technique promotes (Loi, 2005).

CASE STUDY:
Service Design Melbourne
Twenty residents from a farming community were brought together and tasked with collectively designing a plan to deal with fire response plans as part of a workshop.

Playful triggers were used to elicit a collaborative response from the participants. The exercise allowed participants to easily demonstrate their ideas and come up with a collaborative version of their response plan. Many of the neighbors knew nothing about each other, and a secondary benefit of the project was increased awareness and communication between community members.

Outcomes
Increased fire awareness in the community

The project created an inviting dialogue through the use of visual and intuitive cues

Increased communication between neighbours

The project highlighted the need for increased awareness of surrounding properties

Prototyping

Rida Salman,
Mehnaz Aydemir

Overview:
A prototype is a model on which something is based on or formed. It can be an early sample, model, release of a product built, to test a concept or process or to act as a technique to be replicated or learnt from.

It is a term used in variety of contexts; this includes semantics, design, electronics and software programming and this method is often adopted in user centric design process to meet user needs and expectations.

Background:
In a nutshell, "prototyping" has always existed and probably, for most of human history, has been more important than it's opposite, orderly science and planning. But the differentiation of the functional system of science and art and the strong differentiation between experts and lay people in high modernity has obscured existing forms of prototyping. Only since the late 1960s, as part of the "revolt of the audience" as Jürgen Gerhards has called it (Gerhards 2001), *has it become possible to acknowledge prototyping as part of western society. Such a claim rests on the notion of prototyping as the development of first forms or first strikes. This is known as the doing culture which is based on a mode that is tentative and requires user involvement and an ongoing process of change and improvements of products or practices rather than an expert in a closed lab who turns out a finished product to be used by a unknown user which is termed as open innovation.

*Prototyping became known for the development of first forms as beta versions of products. It became recognized around 1970's. Aligned on one side with the west, with science, experts and scientific methodologies that produce working results on the other side there was un-methodological working and bricoleur. For Levi Strauss the term "bricolage" was still the "savage mind" as opposed to the openness of the engineer. However these assumptions were reversed as the notion of prototyping was identified with participation and a lab imagined to being a symbolization of

narrow-mindedness.

Prototyping is not simply understood as the development of "first forms" or "first strikes" as beta-versions of products as in industrial design, but as a more general mode of doing culture: a mode that is tentative, based on bricolage, user involvement and ongoing change and improvements of products and practices, as "open innovation", rather than on an expert in a closed lab who turns out a finished product to be used by a unknowing user. *That is the part which explains how it has become possible to acknowledge prototyping as part of western society. It has created itself in western culture, as well as eastern culture, as part of the life and habits, such as creating a fruit peeler; in its cultural context when it comes to research for such a product design and even before creating its prototype, at the research level, cultural behaviours and habits come to the scene. As an addition to this example; women from eastern side of the world in many cultures are tend to peel fruits and vegetables from bottom to top as western women usually act in opposite way from top to bottom..its cultural attachment to behaviour and life of individuals, prototyping created its journey with the need in science and for seeing quick applicable results to researches.

The thesis, that proto-typing in this sense has always existed but was not recognized until some point around 1970, relies on a discourse that came with the establishment of modern science. It aligned on one side, in the west, with science, experts and scientific methodologies that produce working results and on the other side, with lay people, un-methodological working and bricolage. For Lévi Strauss, who introduced the term "bricolage" the social sciences, the bricoleur was still the "savage mind", the mind of the primitive in a closed world as opposed to the openness of the "engineer" with his scientific mind (Lévi-Strauss 1962:19 ff.). But with the changes of the 1970s, these assumptions were thoroughly reversed, and the notion of prototyping as used in this conference testifies to this reversal: now bricolage is identified with the supposed openness of lay participation, and product development in labs is imagined to be a sign of closure and narrow-mindedness.

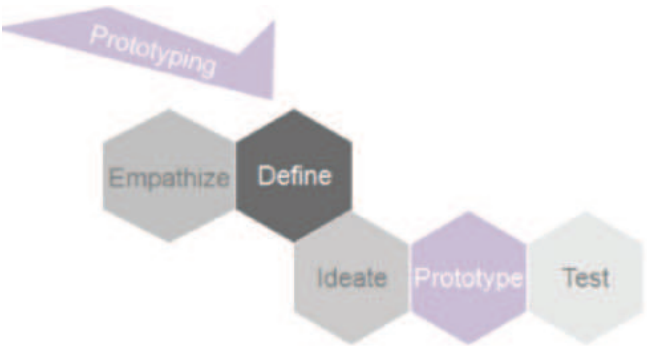
A well-known version of this thesis is Bruno Latour's book "We Have Never Been Modern" (Latour 1993). He argues that the modern differentiation between science and the rest of society rests on an unwarranted but constitutive assumption that science produces objective truths while other forms of knowledge do not. Latour's focus is on the side of the experts and science: he wants to prove that they are indeed messy bricoleurs as well.

Purpose:
The purpose of prototyping can be summed up by the two basic prototyping categories as for why they are done:

The proof of principle Prototype (Model) - is used to test the intended design without attempting to simulate the exact visual appearance in order to identify which design options will work or whether further development and testing is needed before making the final design.

Form Study Prototype (Model) - allows designers to explore the feel, look size of the product without simulating the actual functions or exact appearance and saving on the cost and time.

Or both can be experienced together.



Goes by:
The word prototype derives from a Greek word which originally means primitive form as in the first impression before the final product or design.

Variations:
Prototyping is similar to other techniques used in production design such as mockups, wire framing and simulations as they are representations of the design before high production cost and materials and refinement to the design can be added hence you can say these are rough or plans of prototyping. They are considered the blue prints and backbone of the final design and allow users and designers to test their interaction in terms of design and usability with the interface.

Rapid Prototyping in Product Design:
As experts in rapid prototyping, Mack Prototype, Inc. continues to adapt to advancing technologies. They specialize in Stereolithography (SLA), Fused Deposition Modeling (FDM) and CNC Machining. These three technologies vary greatly in use and end part results. For about five years, Mack Prototype offered Stereolithography (SLA), which uses a vat of liquid ultraviolet curable photopolymer "resin" and an ultraviolet laser to build parts' layers one at a time. For each layer, he laser beam traces a cross-section of the part pattern on the surface of the liquid resin. Exposure to the ultraviolet laser light cures and solidifies the pattern traced on the resin and joins it to the layer below. A complete 3D part is formed by this layering process. After being built, parts are immersed in a chemical bath in order to be cleaned of excess resin and are subsequently cured in an ultraviolet oven.

Fused Deposition Modeling (FDM) technology is a powerful Stratasys-patented additive manufacturing method. FDM builds concept models, functional prototypes and end-use parts in standard, engineering-grade and high-performance thermoplastics. It's the only professional 3D printing technology that uses production-grade thermoplastics, so parts are unrivaled in mechanical, thermal and chemical strength. For these reasons, Mack Prototype President Ric Perry explained their move away from SLA, using FDM as their 3D print technology of choice.

A couple of years ago wireframes, prototypes and mockups were exactly the same thing and described as a sketch representation of the idea. However the problem of user experience lacking in the design representation differentiated the terms in terms of the features and the communication.

A wireframe is a low fidelity representation of the design whereas a prototype is a high fidelity representation of the final design which can simulate interaction and experience. Hence mockups and wire framing is often done in the initial stages of designing while a high fidelity prototype is often used to test out interactions to resemble the final product.

Using the technique
Engineers and prototyping specialists seek to understand the limitations of prototypes and simulate the characteristics of their intended design. It is a practice by which experiences, services and products can be understood before proceeding with the design process.

However the technique in itself has different stages and types:
It starts by understanding the problem, having a clear idea of what needs to be designed and the function it will be performing that needs to be defined, which gets translated into ideating the process into a prototype and finally testing it. This can be performed and repeated many times until the designer or the engineer is satisfied with the prototype and can be developed on a high fidelity prototype from a low fidelity prototype by defining and adding details to the design.

New services and applications are making the process of communication and interaction with the interface straightforward and tangible. Some of examples of such software's include:

Prototyping on Paper which is a mobile application to transform hand drawn wireframes into interactive prototypes.

InVision is also another tool which reflects on web and mobile prototyping at an earlier level of the designing stage and is a fast an effective tool of getting feedback.

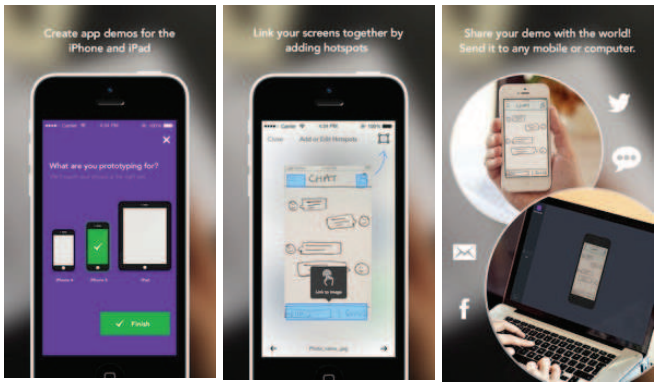
Axure and Justinmind are two other tools which provide users with high fidelity prototypes, by either

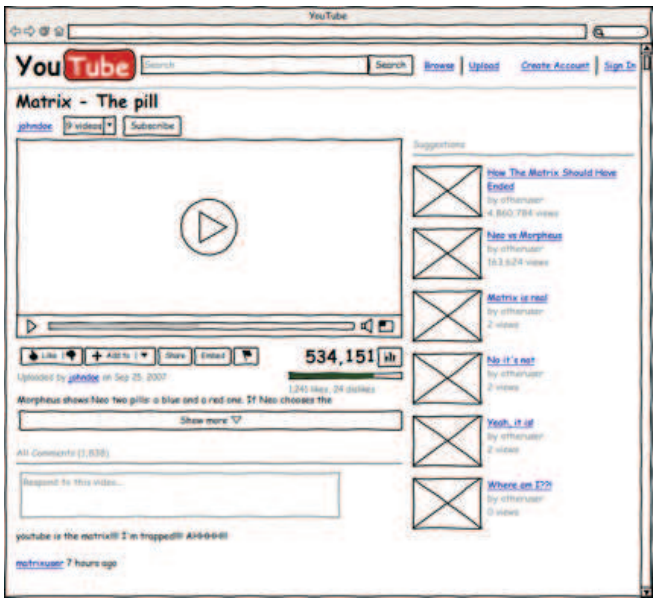
providing demos of the application or delivering fully interactive prototypes.

Mobile App Prototyping:

Description:
Definition of prototyping expands with new technologies and by centuries. Companies such as The Marvel iPhone app turns simple sketches on paper into interactive, tappable prototypes that allow you to demo your app ideas and share with others. This information brings and keeps changing its definition and it makes prototyping a living and expanding technique, stretching and forming accordingly with the technology and user needs.

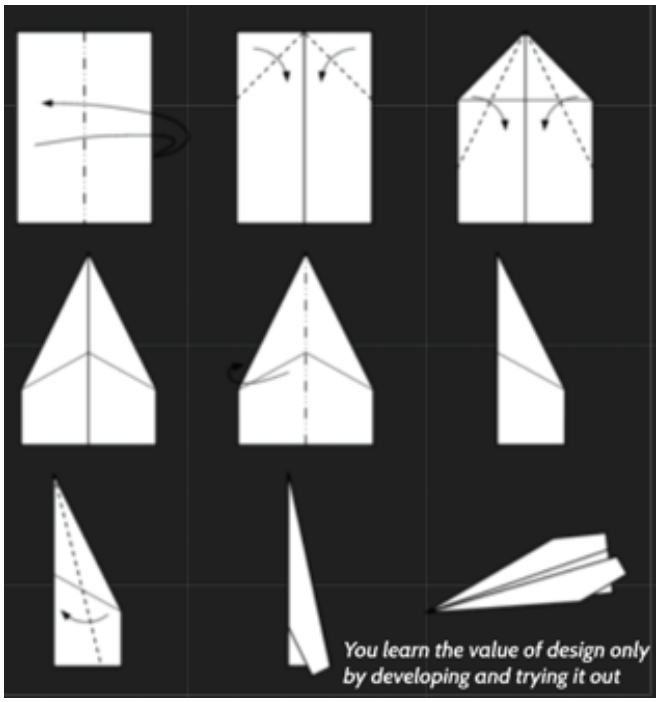
***Is wireframe a prototype?**
A Wireframe can be identified as a prototyping tool, which explains the flow and how the related program would take action in the limited created frame. WireframeSketcher is a wireframing tool that helps designers, developers and product managers helps designers, developers and product managers quickly create wireframes, mockups and prototypes for desktop, web and mobile applications. It's a desktop app and a plug-in for any Eclipse IDE.





Inputs:
Usually the input in the case of prototyping is the ideas that are generated from previous tools and techniques which are being translated onto the process. After that, finding solutions of the final design. These can be in the form of post, or a mockup of previously executed design.
The simplest paper prototype is the paper airplane; it requires some folds before its ready for take-off. By creating an activity in groups of fives, we had an interactive prototyping process, and also in this case, it was an actual working prototype as the material of the model was the original product material. So we can call paper airplane prototype a real working prototype or functional prototype.

Outputs:
A paper prototype or a representation of how the design will look when it is finally implemented without using final materials and technologies. The results of the paper airplane will be judged on the basis of how to recreate a faster flying airplane, what makes it faster, how would time contribute to making it better and what are the changes you will make. These criteria's will be judged on the basis of each group and paper plane that flies the fastest.



Next steps after exercise:
The purpose of the prototype is to validate the hypothesis proposed thereby actually providing the experience to the users. A well executed and successful prototype is measured by the level of interaction the users have with it rather than the final cut or how efficient it is. These interactions and feedbacks translated into an improved design which can then be termed successful, in terms of serving its purpose.

High fidelity prototyping can then be executed after it is finalized using resources and materials that would best represent the design or the interaction of the interface with the user which needs to be improved can be recognized and worked on in order to save time and money on the final execution.

Other points of note:
Despite being a close replica of the product, prototypes still need to be understood and communicated well within the group. By embracing each stage of processing is essential as the final product needs to be planned out with the resources which will be best work with.

Other case studies and examples:
Mack Prototype Inc wanted to go above and beyond the options and choices under one roof hence their range of expertise especially in rapid prototyping allows them to adapt to advancing technologies and experience with variety of markets. Their customer base comes from various industries hence Mack prototype focuses on each part in every project sent to them, deciding on the proper approach for each individual part.

Autodesk is an American multinational company that makes softwares for the architecture, engineering construction and manufacturing industries. Sunkist Research is an example of such industry which uses Digital Prototyping and Product Design Suite to meet their customer's need for new machines that efficiently pack oval fruits, such as lemons and avocados, which have historically been packed by hand.

"Collaboration makes the customer a part of the project. We look at their needs. It's not just us designing for them. Product Design Suite showcases our talent as an engineering group."—Alex Paradiang, Director of Engineering, Sunkist Research

Semiotic Analysis

Leiane Cooke,
Sachiko Murakami

Overview

In recent years, the multidisciplinary field of semiotics has extended to touch the field of design. Semiotics is the study of signs and how they produce meaning. Design may be seen as the practice of encoding products with signs which users then decode; or as Mihai Nadin stated in his seminal essay, "Interface design: a semiotic paradigm" (1988):

Design principles are semiotic by nature. To design means to structure systems of signs in such a way as to make possible the achievement of human goals: communication (as a form of social interaction), engineering (as a form of applied technical rationality), business (as a form of shared efficiency), architecture, art, education, etc (Nadin, 1988)

With such a semiotic paradigm in mind, one may see semiotics at play in the design process with the designer as a sender; the product as a sign vehicle; and the user as a receiver as seen in Figure 1 (Kawama 1987).

In order to create effective design - that is, for example, to communicate value or to direct user experience - designers at work eliminating ambiguities, accounting for connotative possibilities, and leveraging users expectations are in fact engaging with semiotics whether or not they are cognizant of it.

The practice of applying semiotics to diverse fields such as cultural studies was popularized by Roland Barthes, who stated that 'semiology aims to take in any system of signs, whatever their substance and

limits; images, gestures, musical sounds, objects, and the complex associations of all of these, which form the content of ritual, convention or public entertainment: these constitute, if not languages, at least systems of signification' (qtd in Chandler, 2014); design process
can be seen as such a system of signification. The work
of Umberto Eco, whose broad definition, "semiotics is concerned with everything that can be taken as a sign" (qtd in Chandler, 2014), also paved the way for the application of semiotics to diverse fields, including design.

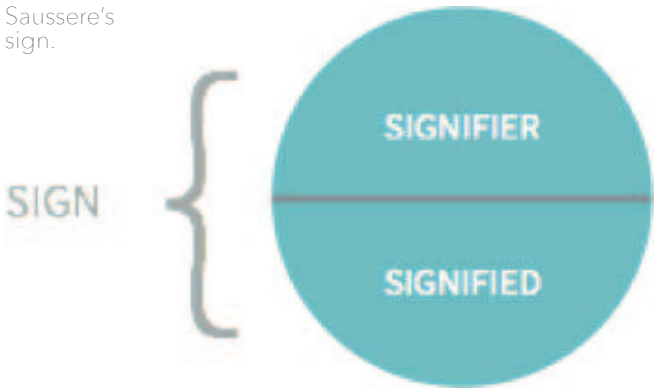
Semiotic analysis, or the inquiry into the systems and particularities of meaning production in a given set of signs, may be useful for designers in offering insight into the design product at several phases of the design process: during definition (what are we making, and how will it mean that?); design (how will we communicate what it means?); implementation (in quality assurance: how well have we communicated what it means?); and, particularly, as evidenced by the case studies, in evaluation (where did we go wrong?)

Background

Semiotics developed in the twentieth century following in particular the development of the theories of American pragmatist Charles Sanders Pierce and Swiss linguist Ferdinand de Saussure.

Central to semiotics is the notion of the sign, which Saussure saw as a dyadic composition consisting of a signifier (that which stands for something else) and a signified (that which is referred to)

Saussere's sign.



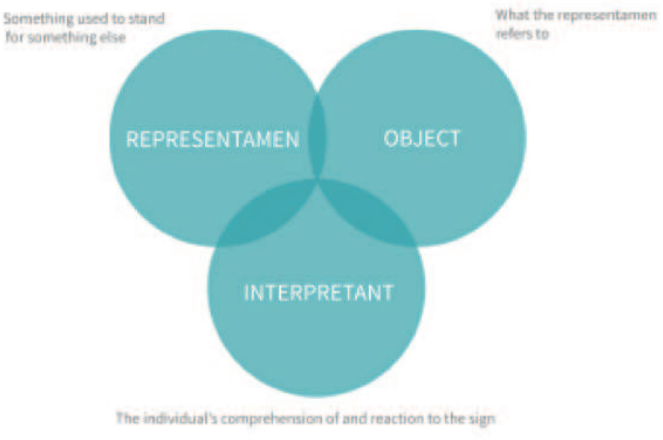
A signifier may be the sounds produced by the letters F-L-O-W-E-R, and its signified would be an actual flower.

A sign may be an image of a button on a screen or a logo that stands for the company or brand. The relationship between signifier and signified, however, is not so straightforward.

Pierce's triadic relationship between the sign or representamen (that which represents), the object (that which the sign represents) and the interpretant (s/he who performs the decoding) (Fig 2) may be useful one for designers considering the relationship between the above-noted triadic

relationship between designer as sign-encoder, the product as sign-vehicle, and the user as the decoder of the signs.

Pierce's semiosis.



Studying how meaning is produced in this relationship between sign, what it represents, and who is interpreting it, is the basis for the the semiotic analysis exercise prepared below.

A semiotic analysis consists of questions that unpack what and how signs mean for a given 'text' (for our purposes, a product) such as:

What are the important signifiers, and what do they signify?
What is the system within which these signs make sense?
What tropes (e.g. metaphors and metonyms) are involved?
Does it allude to other genres?
How does it compare with treatments of similar themes within other genres?
What cultural assumptions are called upon?
What seems to be the preferred reading?
How do people differ in their interpretation of the sign?
On what do their interpretations seem to depend? (Chandler, 2014)

Purpose

The purpose of semiotic analysis within design process is to examine the processes by which signs are encoded into a design product, address the possible connotations (wanted and unwanted), ultimately to best prepare the design product for its encounter with an interpretant/user, ensuring its message is clear, its function is unambiguous, and its value is clearly articulated.

Example

The word "vanilla" is a good example of how one word can represent different things. If you look up "vanilla" in the dictionary, the definition refers to the tropical plant that produces an extract used in food and perfume. But what does "vanilla" signify to people? To many, "vanilla" is synonymous with "plain" and "boring."

A recent Cadillac TV commercial played with this, suggesting that choosing other SUV brands was the equivalent of choosing a vanilla soft-serve ice cream.

The "tastier" option, the commercial suggests, is to buy a Cadillac.

Here, the advertising campaign is challenging another perception-- that Cadillac signifies a fuddy-duddy vehicle that's favoured by an aging demographic. And given that Cadillac hasn't been a top-selling luxury car in the U.S. since 1997, that's a perception that the automaker would understandably want to change. Further explanation is available from Kessler (2014, September 23).

Exploring the semiotics of cars is also interesting since a vehicle can represent different things to different cultures. In contrast to how Detroit carmakers are perceived by many North Americans, a recent New York Times article said that Chinese car buyers "increasingly favor American brands, which have a reputation for safety, youth and international flair." (Bradsher, 2014) Buick, of all things, is perceived as a luxury brand in China.

Further examples and explanations are available from Jacobs & Century (2011, November 14).

Variations

Semiotic analysis can be used to design a product. It can also be used to reframe a product to market it to a different group. And finally, it can also be used to gain insight into a target audience. What is important to them? What are their core values? Are there words or images that evoke these core values? These words or images can be used around a marketing campaign to win over consumers.

Case Study

In 2007, Wrigley decided it needed a reboot. The company, founded in 1891, has been making gum for more than a century with a roster of famous products including: Juicy Fruit, Big Red, Extra, Orbit and Eclipse. But sales were lagging. And given that teens and young adults chewed one third of the gum in the United States, the company decided that it needed to target that market. Wrigley wanted a gum that would reflect young buyers' core values and turn the product into something teens would want to buy and share with friends.

The company that designed the packaging put it this way: "Teens… are constantly seeking opportunities to experience something out of the ordinary..." (Baker, 2013).

Based on that, the new brand and everything around it-- from the packaging to the advertising--ultimately presented gum as an experience. The new gum was called 5, referring to the five senses. The tagline was "Stimulate Your Senses" and the TV commercials were tagged "How it feels to chew 5 gum." The packaging was black, a colour that signifies exclusivity to some consumers (think of the American Express Black card, which is invitation-only). The flavours of peppermint, spearmint and cinnamon were renamed as "Cobalt," "Rain" and "Flare." In TV commercials, chewing gum was equated with an adrenaline-filled experience. And tellingly, the name of the venerable company was de-emphasized, underscoring that this was a new, youthful product, one that is miles away from the venerable old brand.

The result? In under three years, 5 was the brand was on its way to earning $500 million globally. Further examples and explanations are available in Baker (2013, August 29).

In describing the project, Joe Gottschalk, Senior Director of The Wrigley Company said that "semiotics was the 'key' that unlocked the consumer insight around which our entire concept is now based" (quoted in Arning, n.d.)

Using the Technique

As noted above, in an semiotic analysis, one proposes a series of questions regarding the signs and the sign systems coded within a design product. Designers may find these familiar questions often already addressed in the design process.

Exercise

Duration: 10 minutes.
Groups are formed so that teams of 4-6 people can work together.

Input

Distribute a clear image of a popular vehicle, one per group.
Slips of paper with value statements ('singifieds') such as:

LUXURY
EXPENSIVE
AGGRESSIVE
GAS GUZZLER
ECONOMICAL
CHEAP
OLD-FASHIONED

BORING
HIP
RESPONSIBLE
COOL
PRESTIGIOUS
SMART
FAMILY-FRIENDLY
CLUNKY
SLUGGISH
SAFE
INNOVATIVE
SLEEK
SPEEDY
NERDY
RESPONSIVE
WELL-BUILT

QUALITY
COOKIE-CUTTER
ADVANCED
CRAMPED
FUN
CUTE
UNFRIENDLY
FRIENDLY
HOT
EXCITING
FUNNY
WEIRD
AFFORDABLE
SENSIBLE
ENVIRONMENTALLY
FRIENDLY

Running the Exercise
Begin with a brief introduction to semiotics, including Pierce's model and the relationship of coding/decoding to the design process.

Groups perform the semiotic analysis by answering the following questions:

What does the vehicle currently signify? (Use the provided words to get your ideas flowing.)
What users might interpret the vehicle this way?
What are the negative connotations that need to be dealt with?
What positive connotations should be emphasized?

Next, participants are asked to integrate the outcome of their analysis into design and marketing changes. Groups are asked integration questions:

What design elements might communicate the values you chose and speak to your target users? Images are powerful signs. What images encoded with the positive values you chose could be included in marketing campaigns?

Output
By the end of the exercise, groups should have a clear sense of what the car signifies and what they might do to change consumers' perceptions in order to broaden the car's appeal.

Discussion
Discussion after the exercise can help participants see the value in semiotic analysis in the design process.

Is it easy or hard to change what the car represents?

Are these questions you already ask yourself as designers?

Can a small tweak be made to the vehicle or advertising?

Or is a major overhaul needed to address the negative associations conjured up by the car?

What techniques have actual car companies used in real life to shape how a car is perceived?

Next Steps

After applying semiotic analysis, it's important to reconsider the potential target audiences. If a product is launched across a country or around the world, a product design or a marketing campaign may need to be reevaluated. Different audiences could read the imbedded signs in an entirely different way.

Other Points

While many people are unfamiliar with the term "semiotic analysis," consumers tend to be aware that images and text are manipulated to market products and ideas. Participants in a recent group discussion were very aware that ads are designed to push a user's buttons. But instead of being impressed that a company understood its target audience, some participants raised concerns over this manipulation. One person framed it a type of "propaganda." Given that, users of semiotic analysis should be aware that their audience is sensitive to the embedded signs in any product.

Semiotics is proving a useful tool in human-computer interface design as digital creation relies entirely on sign systems in order to convey meaning. Further exploration of semiotics applied in this context may be found in Goguen (1999) Anderson (2001) and de Souza (2013), all excellent starting points.

SWOT Analysis

Glen(Yikai) Zhang
Cynthia(Yushan) Ji
Daniah Saimaldahar

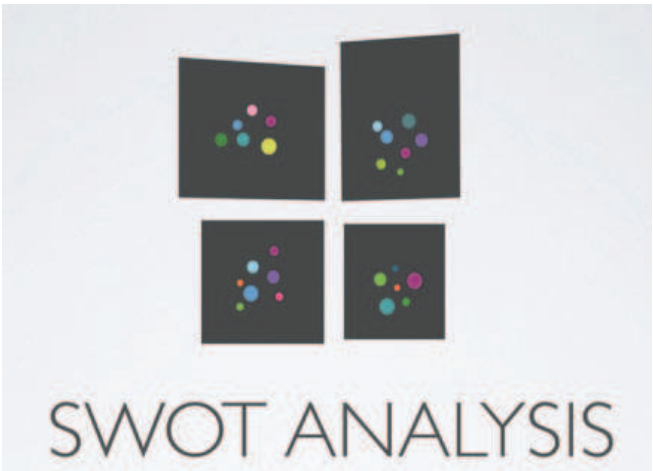
Overview
A SWOT analysis is a useful technique used to evaluate the strengths, weaknesses, opportunities and threats involved in a business context.

The technique is credited to Albert Humphrey who led a research project at Stanford University in the 1960s and 1970s using data from leading companies involved in long range planning processes.

Background
SWOT analysis came from the research conducted at Stanford Research Institute from 1960-1970. The background to SWOT stemmed from the need to find out why corporate planning failed. The research was funded by the fortune 500 companies to find out what could be done about this failure. (Humphrey, 2004)

Researchers began the system by asking what is good and bad about the present and the future. The good side in the present is called Satisfactory, good in the future is an Opportunity; bad in the present is a Fault and bad in the future is a Threat. This was called the SOFT analysis.

When this was presented to Urick in 1964 at the Seminar in Long Range Planning at the Dolder Grand in Zurich Switzerland they changed the F to a W and called it SWOT Analysis.



The process has been used successfully ever since. By now, this system has been fully developed, and proven to cope with today's problems of setting and agreeing realistic annual objectives without depending on outside consultants or expensive staff resources.

Purpose
A SWOT analysis can offer helpful perspectives at any stage of an effort. It can be used to:
Explore possibilities for new efforts or solutions to problems.

Make decisions about the best path for your initiative. Identifying your opportunities for success in context of threats to success can clarify directions and choices.

Determine where change is possible. If you are at a juncture or turning point, an inventory of your strengths and weaknesses can reveal priorities as well as possibilities.

Adjust and refine plans mid-course. A new opportunity might open wider avenues, while a new threat could close a path that once existed.

SWOT also offers a simple way of communicating about your initiative or program and an excellent way to organize information you've gathered from studies or surveys.

Organisations undertake SWOT analyses to help understand themselves and where they fit in the wider environment. The intention is to identify strengths and weaknesses, which they can be determined by looking in at the organisation. Opportunities and threats largely arise from the external environment, which they require a systematic review of the environment in which the organisation operates. Organisations do not exist in isolation, however, in an environment which may provide opportunities but is also likely to impose threats.

Variations
This technique is also called:
TOWS Matrix, SLOT Analysis, and/or WOTS Analysis.

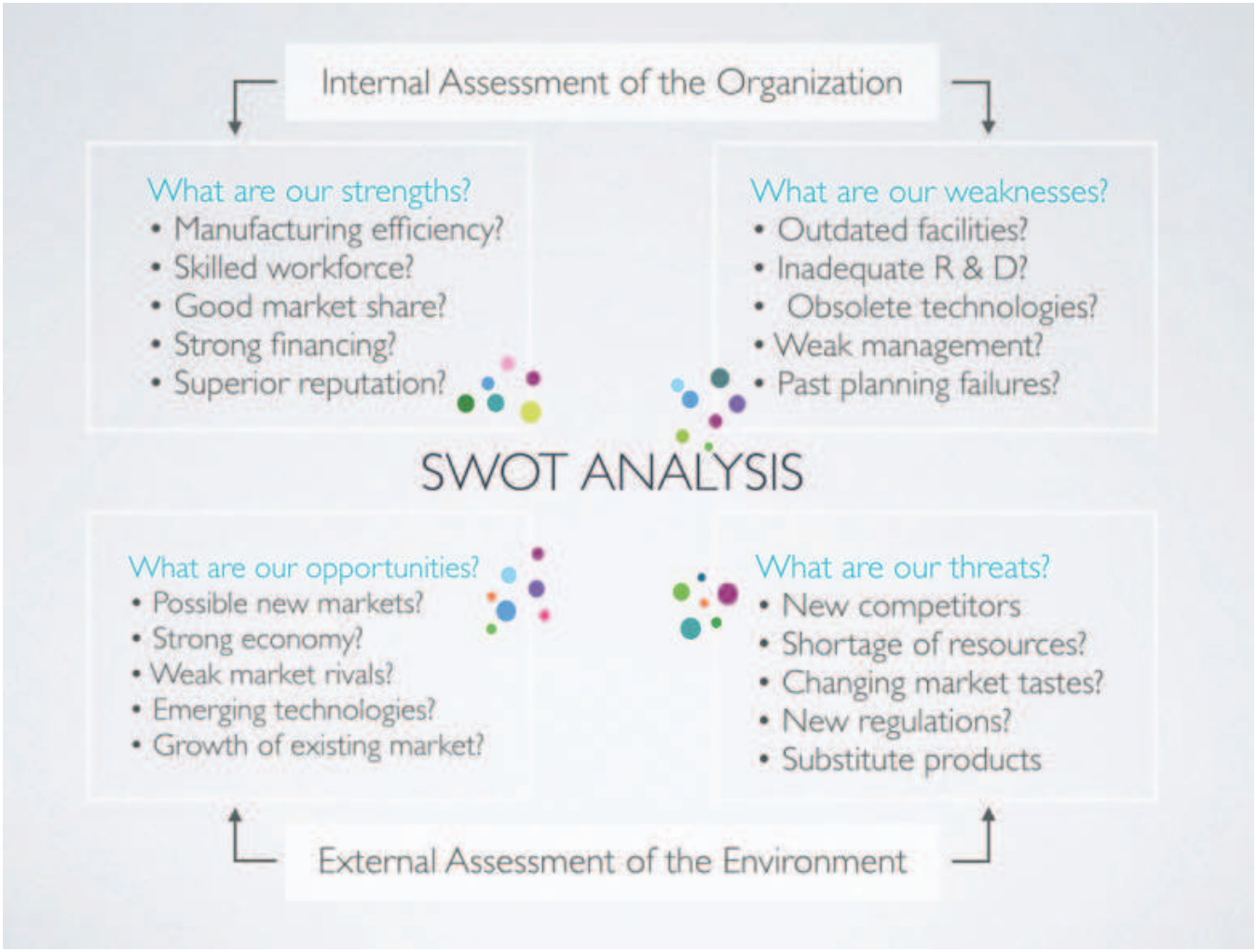
TOWS Matrix:
TOWS is another term of the SWOT Analysis. They both share the same four basic grid and they offer similar results. However, TOWS matrix requires a certain order starting with threats and opportunities and then they are followed by strengths and weaknesses; this has an impact on the direction of the research. According to Michael Watkins (cofounder of Genesis Advisers) " that focusing on threats and opportunities first helps lead to productive discussions about what is going on in the external environment rather than getting bogged down in abstract discussions about what a company is good at or bad at" (Hamel, Media).

Other similar techniques:
PEST analysis and Porter's Five Forces model.

PEST analysis:
PEST analysis stands for political, economic, social and technological influences. PEST and SWOT analysis can both be used in the strategic planning stage of a project or a company, but PEST analysis focuses more on the external environmental factors that affect the business while SWOT covers both internal and external. (Kokemuller, Media).

Using the Technique
SWOT analysis is best suited for the early stages of a project planning. The first step starts with classifying the internal strengths and weaknesses of the project. Then followed by listing the external opportunities and threats that might have an impact on the corporation. Bullet points will be helpful at this stage. The most critical step is reviewing the factors to determine the points that are relevant to the area of interest. Brainstorming will be the best option to follow this analysis in order to create an action plan.

Strengths
Strengths are the descriptions of the positive attributes, which are internal to the business. Basically, they are under your control. You should ask yourself the questions below if you want to do analysis of your own organization: What do you do well? What resources do you have?What advantages do you have over your competition? It is an unprecedented opportunity for you to review the value of your business and once you have recognized your strengths, they are going to help developing the positive aspects which you should take into consideration about think and make them a competitive advantage of your own business.


Internal Assessment of the Organization
What are our strengths?
• Manufacturing efficiency?
• Skilled workforce?
• Good market share?
• Strong financing?
• Superior reputation?
What are our weaknesses?
• Outdated facilities?
• Inadequate R & D?
• Obsolete technologies?
• Weak management?
• Past planning failures?
SWOT ANALYSIS
What are our opportunities?
• Possible new markets?
• Strong economy?
• Weak market rivals?
• Emerging technologies?
• Growth of existing market?
What are our threats?
• New competitors
• Shortage of resources?
• Changing market tastes?
• New regulations?
• Substitute products
External Assessment of the Environment

Weaknesses
Weaknesses are those features which reflect some possibilities your business is in danger of being less competitive. They may be the obstacle for you to maintain continuously successful though they may be in your control. They are areas you might need to improve. Weaknesses are easy to place you at a competitive disadvantage due to which you are required to enhance them in order to have considerable advantage among your competitors.

Moreover, weaknesses might occur due to lack of expertise or technology support, inadequate resource, or failed market locating of your business. The weaknesses are under your control, but for various of reasons, result from failing to achieve your marketing goals effectively.

The more accurately you locate the weaknesses, the more efficient SWOT will be for your assessment.

Threats
Threats are features indicating that your marketing strategy, or your business itself, may at risk. Once you have conquered them, you may benefit from having contingency plans in advance to deal with them even if they occur.

A threat is a potential danger created by an unfavorable trend or development that may cause deteriorating revenues or profits. The better you are at identifying potential threats, the more possible you can locate yourself to proactively plan for and respond to them. You are required to look back by times at your threats during creating your contingency plans.

Opportunities
Opportunities stand for the obvious attractive factors which represent the possibilities for your business to improve and prosper. Self-inquiring like what opportunities exist in your market, or in the environment, from which you hope to benefit? Opportunities basically reflect the potential chances you can detect through assessing your marketing strategy. They may consequent from market prospering, lifestyle changing, resolution of issues relevant to current environment, positive market perceptions about the business you are running, or the possibility to add greater value that will create an increasingly value for your business.

"Opportunities are external to your business. If you have identified "opportunities" that are internal to the organization and within your control, you will want to classify them as strengths." (Berry,)

Output
In-class case study
Chinese crepe in Toronto

Overview
Analyzing the possibilities of the Chinese crepe success in Canada.

Goals
Using a hypothetical case study to learn how to use SWOT tool to identify strengths and weaknesses of companies and help companies understand themselves and where they fit in the wider environment.

Preparation
Students were given a brief introduction about the project. Students split into four groups each group cover only one of the four aspects of SWOT.

Duration: 10 minutes.
After the completion of the duration, each group talk about their part.

End of exercise
Feedback
The class evaluated the strengths, weaknesses, opportunities and threats involved in a introducing the Chinese Crepe to the Canadian market.

Here is an example of the Strengths and Weaknesses.

1) Strengths
The Chinese crepe shows to have great strengths in the Canadian market because of the flexibility of the ingredients and the fast service. The crepe itself is easy to make and it does not require a lot of preparations at the same time the flavors can be adjusted based on the liking of consumers. People can either have it for breakfast, lunch or dinner. Also, the fast paced life in Toronto demand having easy, delicious, nutritious, and clean places to eat from, and the Chinese crepe covers almost all of these criteria.

2)Weaknesses
The fried sticks inside the crepe are considered a critical part of the crepe identity. However, the sticks might be greasy for some consumers who are not accustomed to heavy breakfast meals. Also, the crepe must be eaten fresh otherwise the taste of the fried stick will lose the crispness, compromising the quality of Crepe. In addition, the fermented beans spread might be not well liked by the consumers because of the unfamiliar taste.

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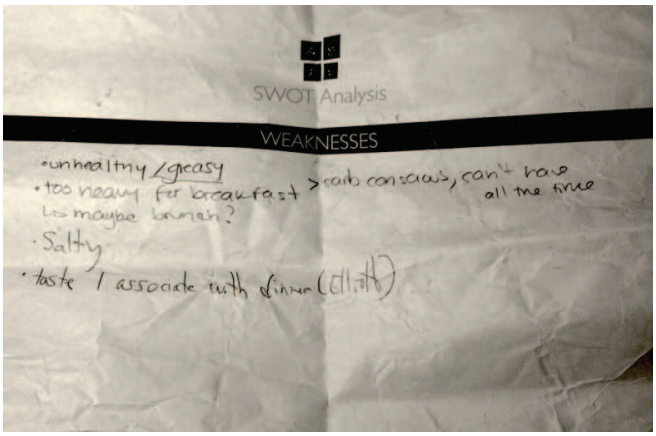
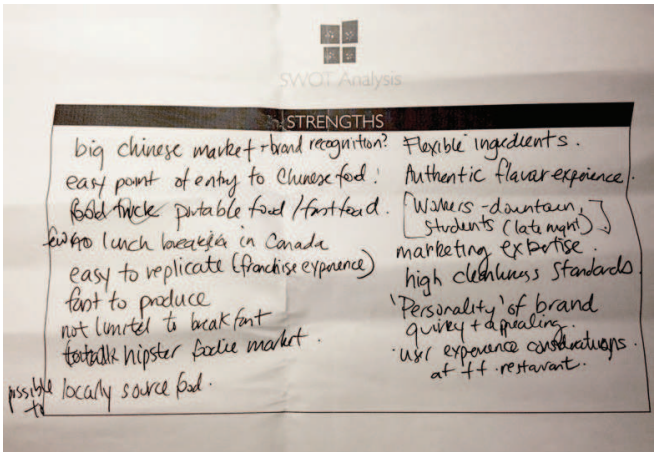




Analysis

The feedback from the class were mostly positive showing the Chinese crepe possibility of success in the Canadian market.

In some situations it can be tricky to distinguish weaknesses from threats and this will require more in-depth research and analysis.

Some of the points pointed out by the group were based on their preferences showing the tendency of the SWOT analysis to be subjective.

Other Points Of Note

Limitations and challenges of SWOT Analysis:

SWOT analysis can oversimplify the situation. Also, there is no emphasis on important points that shows the significant each item is to the organization. Moreover, SWOT analysis can present a great deal of information, but they are not always useful.

Sometimes having a longer list of strength against a shorter list of threats may imply that the organization is doing well, when in fact the threats are more significant than its strengths (Symes, Media). The most downside of the SWOT analysis is that it can be subjective.

Tips for Successful SWOT Analysis:
Keep the list brief and simple.

Do not add unnecessary details to the list but don't forget to include important factors.

It is important to list the results of the SWOT to uncover the most crucial factors that affect the organization to the least.

SWOT analysis require a team with multiple perspectives in order to be successful.

Using SWOT for a specific issue is much more affective.

Use goals and objectives from your overall business plan

Think Aloud

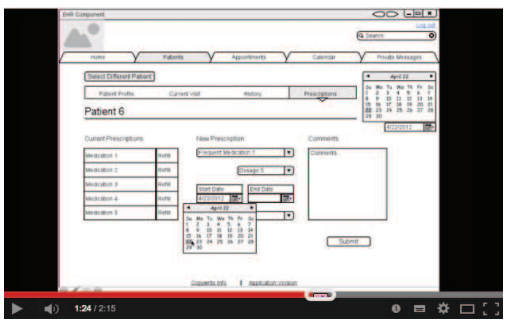
Tegan,
Elliot Fienberg,
Jessica Kee

Introduction:
Think Aloud is a creative problem solving technique. It can be used to elicit feedback on a design, or it can be helpful when simply working on a difficult task. Most commonly used during the development stage of any creative process, it is most effective in testing the user's interaction with a designed product or designed experience. The user will think aloud as they perform tasks associated with a designed product. They are observed and notes are taken to pinpoint flaws in the design. This technique is also useful in determining the psychology of any given user and how the design can be modified to better suit said psychology. Some of the people credited with developing the technique are computer scientists Allan Newell & Herb Simon, as well as Clayton Lewis (IBM).

How it works:
Subjects are given a task to work on. They are instructed to speak what is on their mind as they work through each process.

Alternatively, when not used as a research method, the user literally 'thinks aloud' as they go about a difficult task. This helps because it gets the ideas out of their head and into the real world.

Purposes:
Observing the user experience with a design.
Identifying specific points in the process that need rectifying.
Observing the psychology of a user in relation to a design.
Documenting issues that need to be addressed as the design process continues.



Think-Aloud Walkthrough for Usability Test

Applications:
Think Aloud can be used to help test and develop all kinds of designed outputs:
websites
everyday products
games (video games)
film, tv etc.
interactive design
designed experiences (galleries, events)
Think Aloud can also be used without an audience or documentation to work through specific tasks.

Pros:
The benefits of think alouds allow subjects to verbalize their thought process. This stimulates the subjects memory, helps them work through problems, and generates more ideas. In a social setting, it encourages others to speak up, hence enriches group discussion. From a teacher's or evaluator's perspective, they are able to understand how subjects are solving through their problems. This comprehension is important to mitigating problems that have arose from user interactions with products or finding out information that developers haven't thought about. This is very critical data that could save a lot of time and money from a developing standpoint. Other advantages is that feedback is immediate. Unlike tests conducted over email, you would find better quality responses through facetoface interaction that involves the think aloud strategy.

Cons:
The pitfalls include difficulty in generating evaluation techniques. Projects can vary across many platforms, and every individual is unique. For example, introverted people may not feel as comfortable sharing thoughts as others. Subjects may also find it exploiting or invading of one's privacy.

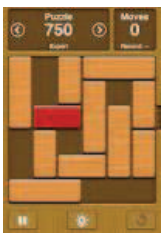
Possible Uses:
Identifying problems with any type of usercentric design Getting more indepth feedback on a prototype Programming a difficult application Generating ideas

Case Study:
In the following video, Maverick Innovation Lab and Price Engineering conduct a think aloud session to test the effectiveness of a GPS system for automobiles. Maverick uses think aloud testing with various clients in the business sphere, with positive feedback from clients.

Overview of Game:
Rush Hour is a game that involves critical thinking and planning ahead. The objective of the game is to work through a puzzle to slide out a specific block. It sounds easy, but it is tricky as there are other blocks of different sizes blocking the block you need to come out.

Variations of the Game:
There are a few variations of this game with the same concept. For iOS and Android, there is an app called Unblock Me. It works the same way, with the objective being to slide out the red block to the far right.
The physical version is called Rush Hour. You choose a card depending on the difficulty level you'd like, and manually arrange the cars to start off.

Implementation of the game:
Going around the group, each person will have one opportunity to slide a car while verbalizing their thought process as they work through the problem. The goal is to unjam the cars and get the red car out of the traffic jam. This informs future move makers their reasoning for why they moved where they did.



With each person making a move while keeping in mind the previous persons' reasoning, and making their own reasoning, this should make solving the puzzle easily attainable. This is a good example of think aloud. It helps determine the usability of the product which is the physical game and also allows the designer or developer to observe the types of interactions that occur.

Observations from Class Exercise:
Playing the Rush Hour game with the class allowed us to gain some firsthand experience with this technique. It was an easy way to get people started with the concept of think aloud the game is easy to explain and it can be passed around quickly. However, even if participants spoke loudly, it would be very hard for someone sitting in another part of the room to keep up with the status of the puzzle. A suggested improvement would be to make sure that everyone has easy access to see the progress of the game, most likely with the aid of projection or by using a mobile network.

This exercise could help a team work through design problems because it encourages verbal communication and reporting the status of where each participant is at. Where it lacks for achieving this goal is that if not well executed, engagement with the group can be low.

Unfocus Group

Elliott Fienberg,
Tatiana Jennings

Overview

Unfocus group as a design research method was originally introduced by IDEO, a groundbreaking international design firm which focuses on consumer experience. The method is an innovative new take on the focus groups technique, in which a group of potential users of a product or concept are assembled for the goal of gaining better insight into possible improvements that can be made.

Another way of thinking about the unfocus group, is a gathering of individuals in a workshop or open discussion forum where they have access to a wide range of creative triggers to stimulate interaction and creation. (Anthrostrategist, 2011)

The main differences between unfocus and focus groups are in the selection process of candidates and the facilitation of the session itself.

Background

Some of the first focus groups were conducted in the early 1940s by Robert Merton. He was involved in a study of radio audiences, and after tests were conducted he asked people to remain present afterwards and discuss in greater detail what they liked or didn't like about the programming in question. (Shavel, 2003). Robert Merton also used this technique to investigate the American GIs attitudes toward the fascist enemy and the possibility of inculcating a greater willingness to fight. At that time the technique became known as "Focus Interviews". Merton traced the origination of Focus Interviews to the interviews he conducted with Boston-area homeless men in the 1930s.

By the mid-1950s, this research method made its way into the commercial sphere and became known as "Focus Groups". Robert Bales, a sociologist from Harvard, contributed to the now traditional setup (one-way mirror and a group of experts) with his "Special Room" experiments. (Lemov, 2012). Since then, conducting focus groups has become a widely accepted practice in business, scientific research and social studies.

However, reliability of focus groups findings have also faced criticism. One of the main negative issues associated with focus group research method is Confirmation Bias, also called myside bias, which is the tendency to search for, interpret, or prioritize information in a way that confirms one's beliefs or hypotheses. (Plous, 1993)

Another criticism is that focus groups are susceptible to the Hawthorne Effect, whereby participants modify their behavior and answers in response to their knowledge of being observed. The lack of nuanced insight and limited interpretation of data had also been cited as an issue. As consumers get smarter and more connected, it is more difficult to keep focus groups unbiased. (Balakrishnan, Bapna, Bhatt & Sachitanand, 2014).

The unfocus group method emerged in response to shortcomings such as these, by rethinking the selection process of candidates and modifying the circumstances in which the sessions are conducted.

Purpose
The purpose of conducting an unfocus group is to:
Gain better insight into whether or not a concept is going to be effective (early stage)

Identify dysfunctions, shortcomings or any possible improvements of a product (later stage)

The Special Bales Focus Group room. 1950
Britannica Book of the Year

Source: (Chicago, Encyclopedia Britannica, Inc., 1950), p. 633.

Uncover perceptions, emotional ties, values and shared meaning, as well as activities and processes of use (Anthrostrategist, 2011)

Variations
There are two distinct variations, which are applied to facilitating an unfocus group.

The first variation is based on the selection of the participants, choosing candidates at the edge of the distribution curve vs the centre of the distribution curve. (Roberto, 2010). This is a method advocated by IDEO.

The participants are selected based on their knowledge of the product including extreme users, passionate fans, opponents and non-users. Although facilitating a session like this could be more difficult, with the skillful moderation it can give deep insights into the use of the product as well as uncover unforeseen applications and issues.

The second variation is based on changing the setting and the facilitation method in order to elicit more organic, unscripted creative response. One of the companies using this variation is Drawn, a brand design company based in Oregon. (Robertson, 2014). It seemed to be an organic evolution of the facilitation strategy as a response to the evolving societal norms and culture. Both methods could be applied together.

There are also various related techniques, which could be anything under the umbrella of eliciting feedback: Interviews, questionnaires, workshops, inquiries and user tests. As such, design teams can apply the concept of 'unfocus' to these tools for greater impact.

Using the Unfocus Group Technique
Selection of the participants
Choose Diverse Participants Who:
1. Are unlikely users of a product
2. Have no use for a product
3. Are extreme users of the product
4. Have a tangential connection with the product
5. Don't like a product
6. Have a vested interest in the impact of the product (Roschuni, 2010).

Using the Unfocus Group technique proposed by the IDEO the participants are selected from the tail end of the distribution curve. In the case of extreme users, we're essentially relying on those most passionate to provide insights into the audience at-large. Their passion defines these individuals. It's something real and pronounced, and they are, consequently, more capable of articulating their thoughts and ideas. (Holmer, 2010). In his book "Change by Design", Tim Brown, IDEO's current CEO describes the examples of selecting the participants for unfocus group researching an innovative shoe design. Among the others the group included someone who was a dominatrix and someone who has a shoe fetish.

IDEO also used this method working on the concept of the car for drivers over 65 (Pink, 2003), where they invited an 80 year old racecar driver to be one of the participants of the unfocus group session. (Kelly, 2009). Another highly publicized example of the successful use of the IDEO unfocus group methodology, the company helped to redesign a lingerie shopping experience for Warnaco, a fashion company in New York. In the two unfocus groups, IDEO invited the women -- about eight to a group -- to talk about their good and bad experiences, which amounted to very few in the first category and a long list in the second, then the groups broke up

into smaller units to build their ideal underwear-shopping experience. (Reeves, 2003)

Changing the setting and the facilitation method
Preparation
Setting up the location is pivotal to the success of this research format. Instead of using a conference table and a two-way mirror, common to the focus group set up, the goal of unfocus group set up is to produce a more natural setting to strike a balance between a living space and a professional space. The optimal set-up is to use two rooms, one where the "pre-discussion" will occur and another that will be used for the majority of the session.
In both rooms, furniture should be soft and result in collective interaction, meaning a mix of sofas and chairs. Floor lamps should dominate the room (not overhead lighting) and colors should reflect a home-like atmosphere. The idea is to create the kind of environment that facilitates conversation rather than a corporate or laboratory-like setting.

Instead of a traditional hidden camera and a two-way mirror the cameras are addressed and used openly as an expression of honesty and the information is broadcasted to the clients/viewers. (Anthrostrategist, 2011)

Facilitation
Facilitation is done using a dual moderator method, where one moderator ensures the session progresses smoothly, while another ensures that all the topics are covered. In addition to ensuring all the material is covered and questions addressed, the dual moderator process helps maintain the conversational tone by shifting the power dynamic of the group. Rather than a single person leading and everyone following, the second moderator (seated among the participants) breaks up the dynamic and redirects the exchange of information. Opening up the information exchange process means having an opportunity for more open and honest disclosure and discussion in a setting where participants are validated.

The facilitator uses a set of ground rules to move the discussion forward:
1. Test assumptions and inferences
2. Share all relevant information
3. Use specific examples and agree on what important words mean
4. Explain your reasoning and intent
5. Focus on interests, not positions
6. Combine advocacy and inquiry
7. Jointly design next steps and ways to test disagreements
8. Discuss undiscussable issues
9. Use a decision-making rule that generates the degree of commitment needed

(Human Resources, Iowa State University, 2012)

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(Human Resources, Iowa State University, 2012)
The Follow Up
The final step is to close the session. After the session is over, participants are actively encouraged to spend 20 minutes or so talking with the moderators. The first step is to turn the camera off. The key point is that the end of a focus group

represents an opportunity that is all too frequently overlooked. Keeping the participants for a post-discussion phase often captures pieces of information that go unspoken or unarticulated during the main discussion. (Anthrostrategist, 2011)

Conclusion

Changing the structure of the focus group can be uncomfortable for both those moderating and those watching it. It appears much less structured than traditional methods because the focus is getting the target audience to open up and give real answers, not perform for the camera. The goal of this research method is to put participants in a state of mind where they feel in control, instead of simply telling the moderators what they want to hear. Changing the format to a more relaxed, expansive session means worrying less about data and more about generating creative thinking.

Also by looking at the needs of people at the edge of the distribution curve allows us to find insights that can be applied to the big markets in the center. People on the edges of the normal distribution curve are often very passionate about the product and have specific insights about the features they look for as they make purchase decisions. However, in order to use the unfocus group research technique effectively, the companies have to be able to make sure that the new product ideas that emerge remain accessible to the mainstream consumer. (Roberto, 2010)

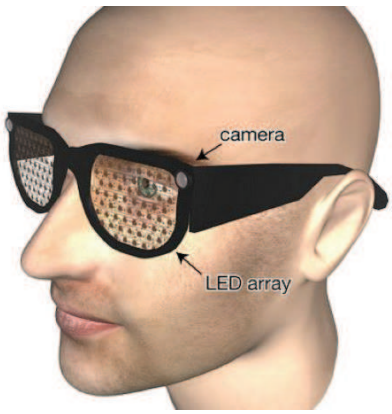
Some criticism has been voiced in regard to unfocus group method. Sometimes the group is too diverse to allow a controlled discussion on the phenomenon.

There is also a "background noise" (recent or cumulative personal or professional events related to environmental, economic, or social forces), which might reduce the ability of the group to productively discuss the proposed subject. (Franz, 2011)

In-class exercise

Source: (Mahin, 2013)

In an exercise part of our presentation we worked with our classmates on creating an unfocus group for the purpose of designing a smart eyewear product. First we discussed the possible applications for the product and defined target users. With this in mind we created two imaginary groups: a traditional focus group and an unfocus group.



In the first group we included most likely users and early adopters, such as business executives, computer experts, MIT graduate students and technologically savvy individuals.

In the unfocus group, the students proposed a variety of interesting choices of participants, whose views could benefit the discussion and bring interesting insights into the conversation.

The group included a visual artist, a 12-14 year old child, an educator, visually impaired person and a person who strongly objected to the product on the basis of violation of privacy.

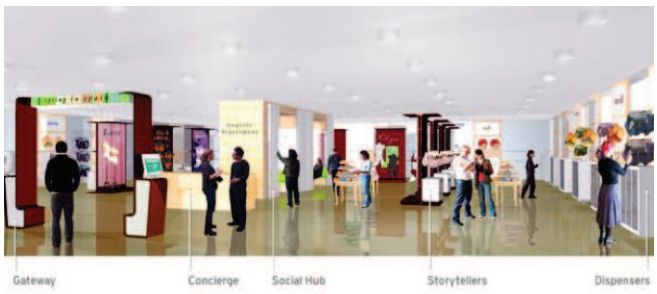
The exercise led to the discussion about the benefits and insights, which could be gathered from including participants on the edge of the distribution curve into the design process. Some of these were possible unforeseen uses of the product, proposed adjustments and functions based on real world situations and unexpected issues (as well as objections) that the use of the product could trigger.

Case study
Retail Experience Redesign for Warnaco.
Project date: 2004
Source: (Reeves, 2003)

Warnaco, a fashion company in New York City that is primarily in the business of under-garments, employed a suite of IDEO research methodologies to improve the lingerie buying experience for women. Among the IDEO methodologies was the unfocus group.

In the two unfocused groups, women talked about their good and bad experiences, which amounted to very few in the first category and a long list in the second. Then women were divided into two groups and reenacted their shopping experience. One group, acting as customers expressed a desire to be advised and reassured by the women acting as salespeople. And those salespeople responded as instructed, leaving everyone satisfied and, at least in this fantasy world, purchasing an expensive undergarment or two.

The end result: Warnaco was able to gain a better understanding of the shopping motivations of its customers, and implement changes that addressed their needs. (Reeves, 2003)



Case study:
Designing a Gillette Guard, a low-cost razor for India and other emerging markets. Company - Procter & Gamble, division Gillette Global.

Project date 2008
Source: (Daily Mail Online. 2013)

The following story highlights a major flaw in the traditional focus group model.

In 2008 Gillette conducted a focus group study at MIT testing their new razor designed for India and emerging markets. Although the study was considered successful and the participants were impressed by the new product, the sales were low after the product was launched in India. A group of Gillette executives traveled to india and spent 3000 hours with more than 1000 consumers in their homes and in small informal group discussions during which they asked participants what their aspirations were and why they wanted to shave and how often. The information gathered during those informal small group discussions revealed a stark difference in the physical environment and cultural attitudes in India vs western society, which were entirely missed in the previous focus groups studies. One of the most obvious factors, missed in the first study was the lack of running water. Also, Indian men spend much longer time shaving, grip the razor differently and try hard to avoid cutting themselves.

As a result such factors as the handle design, one blade vs multiple blades and price played a major role in the following redesign of the razor.

The company's strategy work extremely well and Gillette's market share for razors and blades in India has grown to 49.1 percent. (Daily Mail Online, 2013)

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Mindfulness:

A note on 'mindfulness devices':

Devices such as Interaxon's Muse headband [http://www.interaxon.ca/products.html] are gaining media coverage. The Muse headband can sense, via EEG sensors, when the mind has wandered, and gently sends a reminder (such as the sound of a wave) to bring the practitioner back to the moment. This seems to be counterproductive to mindfulness meditation's benefits, in which the realization and work of the practitioner is to notice when the mind is wandering and bring focus back to the moment. The Muse headband may be likened to the Zen monitor, who unexpectedly whacks meditators with a stick in order to suddenly bring them back to the present moment; what is the Muse but a constantly whacking stick?

While the intersection of technology and meditation may appeal, we believe that the practitioner benefits because of her/his reliance on his/her own resources - a skill that meditation develops, and Muse takes away. Further research must be done before we will be convinced that this technology assists in meditation.

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Figure 1
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Figure 2
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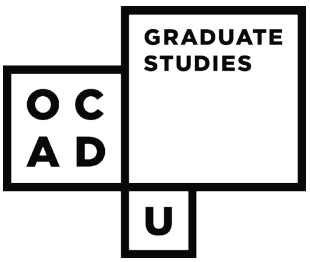

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100 McCaul Street,
Toronto, Canada
M5T 1W1
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