DESIGN THINKING

AT THE INTEGRATED DESIGN LAB

Generating Ideas | Introduction

Generating Ideas | Introduction

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DESIGN THINKING – GENERATING IDEAS

- Human-Centered Design
- Creating Project Definition
- **Generating Ideas**
- Rapid Prototyping
- Integrating
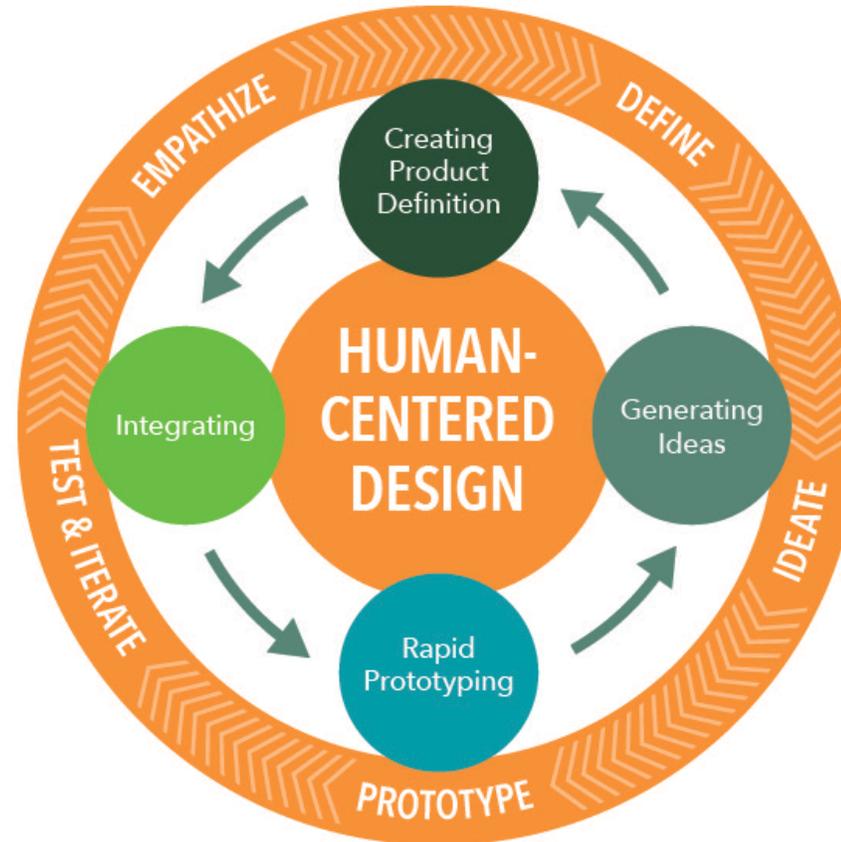
DESIGN THINKING – GENERATING IDEAS

Upon completion of this module the student will be able to:

- Use strategies for generating a wide variety of ideas

- Apply methods for thinking critically and outside the box

- Demonstrate awareness of divergent and convergent thinking in the design thinking process

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DESIGN THINKING – GENERATING IDEAS

Building upon the **Creating Project Definition** phase, the **Generating Ideas** phase is where team members generate as many ideas as possible, moving through *divergent* to *convergent thinking*.

All sessions should be free from judgment and personal attacks. The beginning of this phase is a time when improbable, impossible, even gloriously-bad ideas are welcome.

Quantity over quality is the mantra for ideas. The **Generating Ideas** phase is when creative collisions occur.

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DESIGN THINKING – GENERATING IDEAS

- During this phase, the team needs a designated space preferably with white boards, Post-It notes, markers, and snacks.

- During this phase it is important to inject some humor and levity into the sessions.

- Mobile phones and other distractions should not come into this team space, and usually a two-hour time limit or less is recommended for these sessions.

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SUCCESSFUL IDEATION MINDSET

- Ideation requires purposefully adopting certain characteristics, whether they are natural or whether they need to be encouraged and learned.

- We all fall into the trap of sticking to patterns and familiar ground and tend to use the same recipes for solving problems, as this reduces the cognitive load required.

- See the **Module 3 Supplementary Document** for some ideas for how to **Adopt New Characteristics** for thinking outside of your usual box.

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Tool – Divergent Thinking Strategies

At the start of this phase, *divergent thinking* is used to generate a wide range of possible solutions that can be evaluated later.

S.C.A.M.P.E.R—Substitute, Combine, Adapt, Modify, Put (to another use), Eliminate, Rearrange ideas

Other tools include brainstorming, sketching, and more. See the **Module 3 Supplementary Document** for more details.

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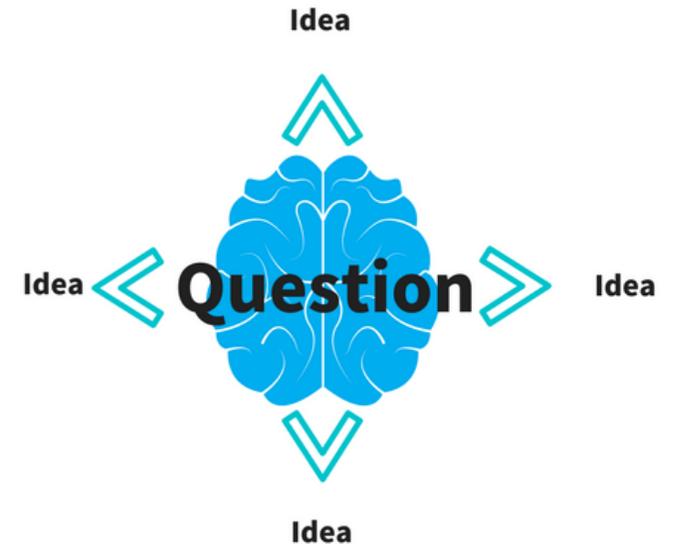
Tool – Convergent Thinking Strategies

Once a sufficient number of ideas have been explored, **_convergent thinking_** can be used to vet ideas into potential viable solutions.

Four Categories is useful for making sure the team carefully goes through all of the ideas generated.

CONVERGENT THINKING

Fact

Fact > **Answer** < Fact

Fact

Four Categories Method

Most rational | Most delightful | Darling | Long shot

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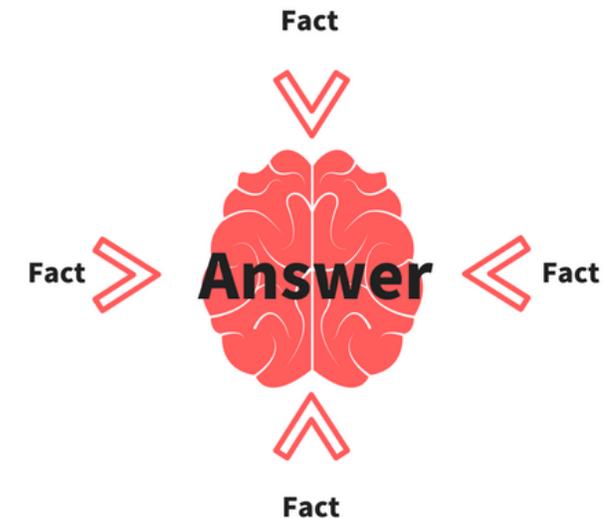
Tool – Convergent Thinking Strategies

Idea Affinity Diagrams allow you to cluster similar items together to reveal themes that may contain the solution.

The Six Thinking Hats Technique requires you to apply different thinking styles when considering a problem. This allows you to assess your ideas from multiple viewpoints.

6 Thinking Hats

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CONVERGENT THINKING

Fact

Fact > Answer < Fact

Fact

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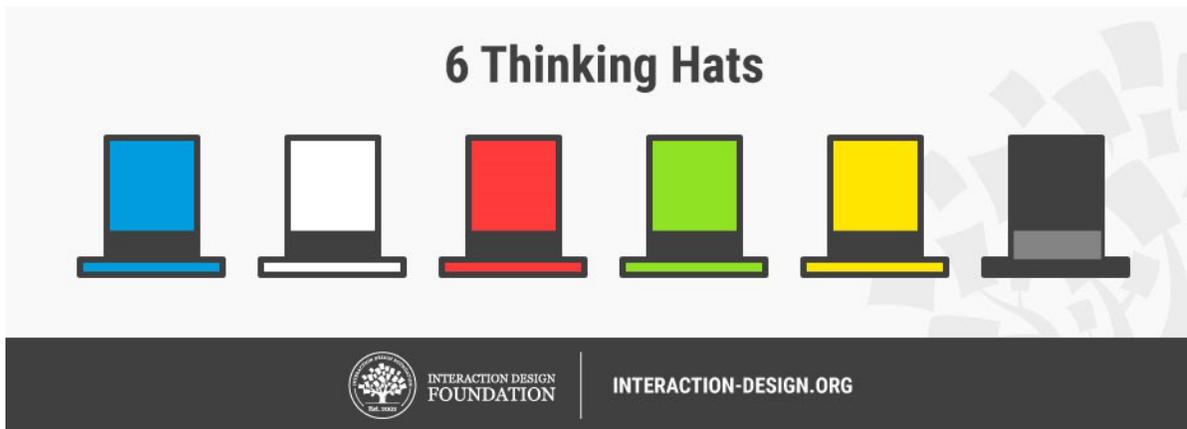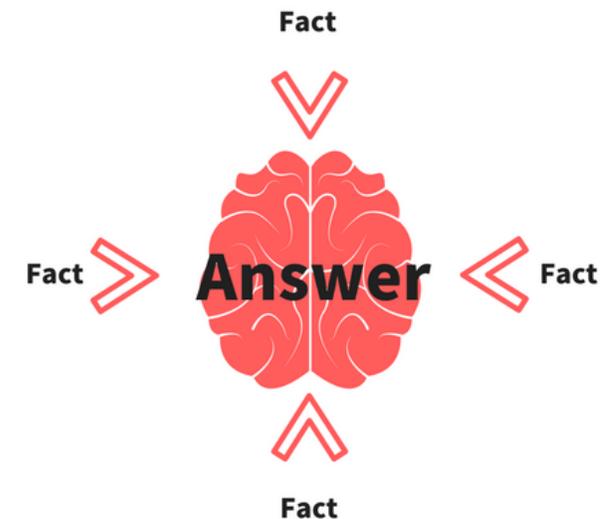
Tool – Convergent Thinking Strategies

- See the **Module 3 Supplementary Document** for more details about these **Divergent** and **Convergent Thinking Strategies.**

- **Remember** that the list is not complete and should always be adapted and expanded based on the dynamics of the team and the problem addressed.

MORE DETAILS

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ASSESSING IDEAS

- After using convergent thinking strategies, you should have a few ideas that have made it through elimination exercises.

- Ask the following questions to see which ideas provide the best solution to all requirements, challenges, questions, needs and goals.

Does it fit with people's needs?	Is there demand?	How does it meet the goals set initially?	Does it meet the requirements in our problem statement?	Does it answer 'How might we…" questions in a satisfying way?
Is it different enough to add value?	Is it feasible within the budget provided?	Is the technology available?	Will you be able to roll it out within the timeline?	Can you get approval from decision makers?

See the **Module 3 Supplementary Document** for the entire rubric.

SUMMARY: A client will give the designer data about what is feasible and what is not.

The designer's role is to brainstorm with an open-mind.

ideate

"We can't solve problems by using the same kind of thinking we used when we created them."
- Albert Einstein

"You can't use up creativity. The more you use, the more you have."
– Maya Angelou

"What would you do if you weren't afraid?" – Sheryl Sandberg

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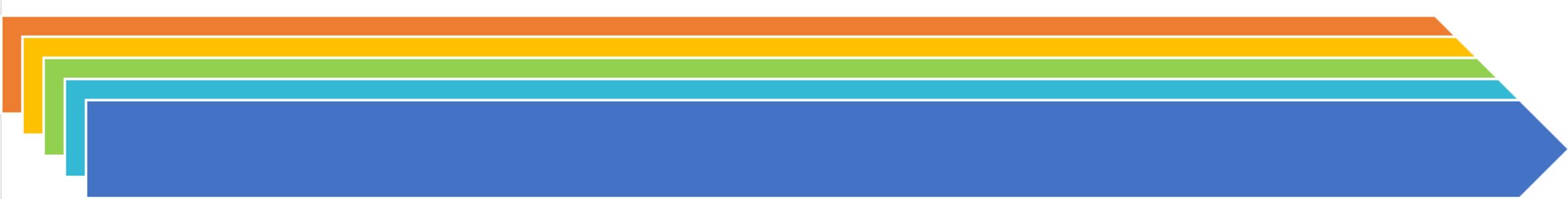
DESIGN THINKING

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You've completed Generating Ideas | Introduction

Next: Generating Ideas | CASE STUDIES

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Module 3 Supplementary Document—Generating Ideas

SUCCESSFUL IDEATION MINDSET

You must **Adopt New Characteristics** to allow yourself to think more critically or in a more open-minded way.

Adapt:
Be able to switch how you see, understand, and extend thinking as new input gets generated.

Connect:
Be able to connect seemingly unrelated concepts, attributes or themes in order to create new possibilities.

Flip:
Turn dead-ends or deadlocks into opportunities by flipping them over or rapidly changing direction towards greater viability.

Experiment:
Be open and curious enough to explore possibilities and take risks; be willing to test out ideas and eager to venture into the unknown.

Disrupt:
Be able to overturn commonly held beliefs, assumptions or norms in order to re-think

Curiosity:
Be willing to ask uncomfortable, silly or even crazy questions. Be willing to explore and experience, in order to understand and learn something new and different.

Recognize Patterns: Seek to spot common threads of meaning, and ways of seeing, doing and behaving; be able to recognize attributes or shared values across a spectrum of influence and input; and finally, be able to utilize these commonalities to build solutions.

Dream and Image:
Be able to visualize a new picture of reality by turning abstract needs into tangible pictures or stories, thereby allowing the space required for inventing bridges to that reality.

DIVERGENT THINKING STRATEGIES

These are **Strategies for Expanding and Discovering New Ideas** and can help your team to generate as many ideas as possible during this phase. The list is far from complete and you should always be prepared to adapt and expand you approaches based on the dynamics of the team and the problem you are working to solve.

S.C.A.M.P.E.R.

Substitute	Combine	Adapt
Swap one element for another. ie. Change wood to steel, paint to stain, electric to mechanical.	Combine two or ideas together. ie. High-tech and retro, soft and angular	Which ideas could I modify, copy, or borrow from existing projects/products?
Modify	**Put (to another use)**	**Eliminate**
What can be removed, added, exaggerated, or toned down?	How else can it be used? How would a child use it? What can a hacker do with it?	How can I simplify it? Can I reduce time or components?
Rearrange		
Can I interchange components, the pattern, or the layout?		

1

Brainstorming – The team throws out all ideas in a judgment-free time and then starts to build the good ideas from all ideas. Can also be called mind storming.

Brain walking –Similar to brainstorming, but written instead of verbal. In this approach, team members use Post-It notes to place on a whiteboard while walking around the space.

Sketching – This is also called sketch storming to use sketches to build upon mind mapping. These sketches don't need to be good, in fact they should be terrible. The focus is on quantity not quality.

Storyboarding – This technique is to take all the sketches and make them into a story on a whiteboard or white paper to show how the flow of problem solving could work for the situation.

1 https://www.interaction-design.org/literature/article/learn-how-to-use-the-best-ideation-methods-scamper

Challenging assumptions – This technique helps uncover new perspectives on a problem. Sometimes it is necessary to challenge existing beliefs and assumptions about problems. Play Devil's Advocate and argue against accepted wisdom.

Developing analogies – This technique is used to draw comparisons to other situations. Analogies help us understand the underlying pattern and character of a topic by linking it with other known things.

CONVERGENT THINKING STRATEGIES

The **Four Categories Method** is useful for making sure that the team carefully goes through all of the ideas generated to identify those that may be viable solutions.

Four Categories Method

Most rational | Most delightful | Darling | Long shot

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Idea Affinity Diagrams are another strategy for ensuring that all ideas are considered. Write each idea on a Post-It note and then, as a group, make sense of all of the different ideas by clustered ideas that are similar together, remove any similar or duplicate idea, and start to identify themes that may contain the solution.

Affinity Diagrams

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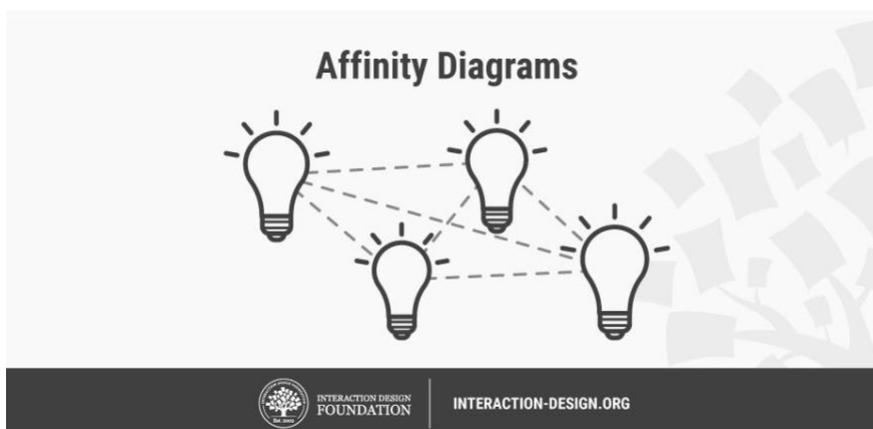
The **Six Thinking Hats Technique** provides a range of thinking styles to apply to idea selection. It involves purposely evaluating and considering ideas through various mindsets so as to uncover the widest range of possible angles on the ideas being assessed. It helps break participants out of their set styles of thinking and forces them to look at the ideas being assessed from multiple viewpoints and assessment criteria.

6 Thinking Hats

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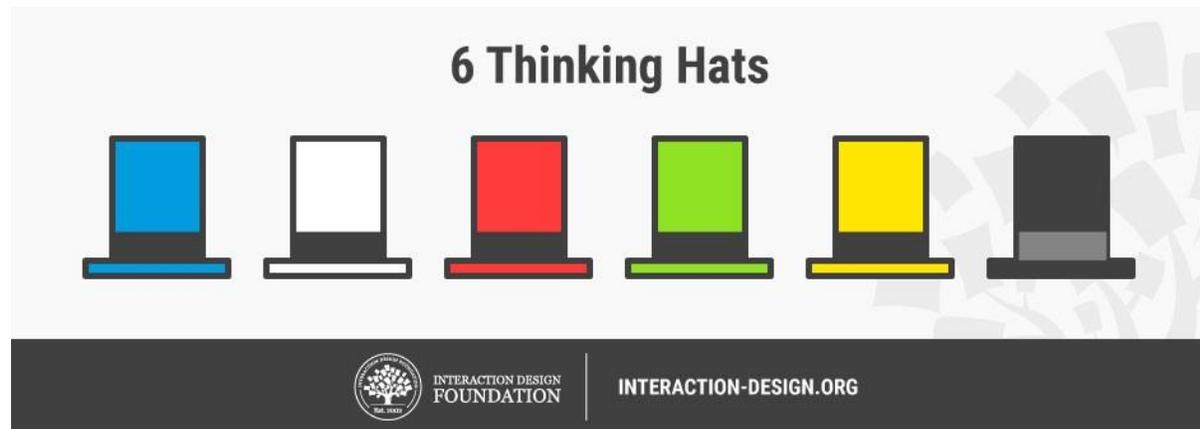
- **White Hat:** The White Hat calls for information which is *known* or *needed*. It's all about the facts, and nothing but the facts.

- **Yellow Hat:** The Yellow Hat symbolizes *optimism, confidence, and brightness*. Under this hat, you explore the positives and probe for value and benefit.

- **Black Hat:** The Black Hat is all about *judgement*. When you put on this hat, you're the devil's advocate where you try to figure out what or why something may *not* work. It's now your job to spot the difficulties and dangers and ask where things might go wrong. This is probably the most powerful and useful of the hats, but it's a problem if you overuse it.

- **Red Hat:** The Red Hat calls for *feelings*, *hunches,* and *intuition*. When you use this hat, you should focus on expressing emotions and feelings and share fears, likes, dislikes, loves, and hates.

- **Green Hat:** The Green Hat focuses on *creativity*: the possibilities, alternatives, and new ideas. It's your opportunity to express new concepts and new insights.

- **Blue Hat:** The Blue Hat is used to *manage* the *thinking process*. It's your control mechanism that ensures the Six Thinking Hats guidelines are observed.

RUBRIC FOR ASSESSING IDEAS

Question	Definitely Not				Definitely Yes
Does it fit with people's needs?	1	2	3	4	5
Is there demand?	1	2	3	4	5
Does it meet the goals set initially?	1	2	3	4	5
Does it meet the requirements in the problem statement?	1	2	3	4	5
Does it answer the "How Might We" questions in a satisfying way?	1	2	3	4	5
Is it different enough from what already exists to add additional value?	1	2	3	4	5
Given limited budget or resources, is there enough to implement the idea even partially?	1	2	3	4	5
Is the technology available?	1	2	3	4	5
Will you be able to roll it out with the available timeline?	1	2	3	4	5
Can you get approval from decision makers?	1	2	3	4	5