

Zitate

- “Have no fear of perfection, you’ll never reach it” – Salvador Dali
- “If you hear a voice within you say, ‘You cannot paint,’ then by all means paint, and that voice will be silenced” – Vincent Van Gogh
- “Curiosity about life in all of its aspects, I think, is still the secret of great creative people” – Leo Burnett
- “Creativity is more than just being different. Anybody can plan weird; that’s easy. What’s hard is to be as simple as Bach. Making the simple, awesomely simple, that’s creativity” – Charles Mingus
- “Originality is nothing but judicious imitation” – Voltaire
- “Creativity is contagious, pass it on” – Albert Einstein
- *If I had an hour to solve a problem I’d spend 55 minutes thinking about the problem and 5 minutes thinking about solutions.*
 - - Albert Einstein -

Concept Development Course

Ideation

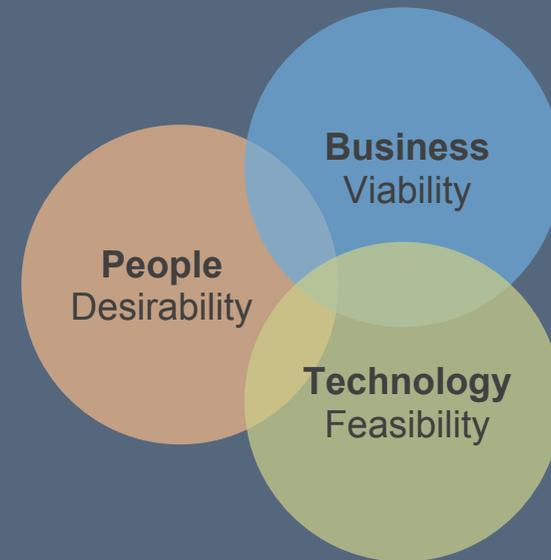
Marin Zec, TU München

Veronika Gamper, CDTM

A few words about me

Marin Zec

- A huge fan of **Human Centered Design Thinking**
- Educational Background
Computer Science (LMU, TUM, University of Augsburg, MIT),
Economics (TUM, FUH)
& **Philosophy** (LMU)
- **PhD student** & Research Assistant
at TUM in the area of **Knowledge Work and Collaborative Creative Complex Problem Solving**
- **Freelance Consultant & Engineer**
Goethe Institut, Volkswagen, ProSiebenSat.1, MIT, Siemens, ForceFive,
Waldburg-Zeil Kliniken and more than 30 SME and startups



Course Overview

User Research, Data Analysis

Week 1

Today

Today: Generate & Refine Solution Ideas based on your User Research and Transform them into Stories

1. Creativity & Creativity Research

2. Creativity Techniques

- Divergent Thinking
6-3-5- Method, Analogies and Morphological Analysis
- Convergent Thinking
SCAMPER, Dotmocracy

3. Storyboarding

- Storytelling
- Storyboards

Week 2

Mid Presentation, Prototyping, Final Presentation

Agenda

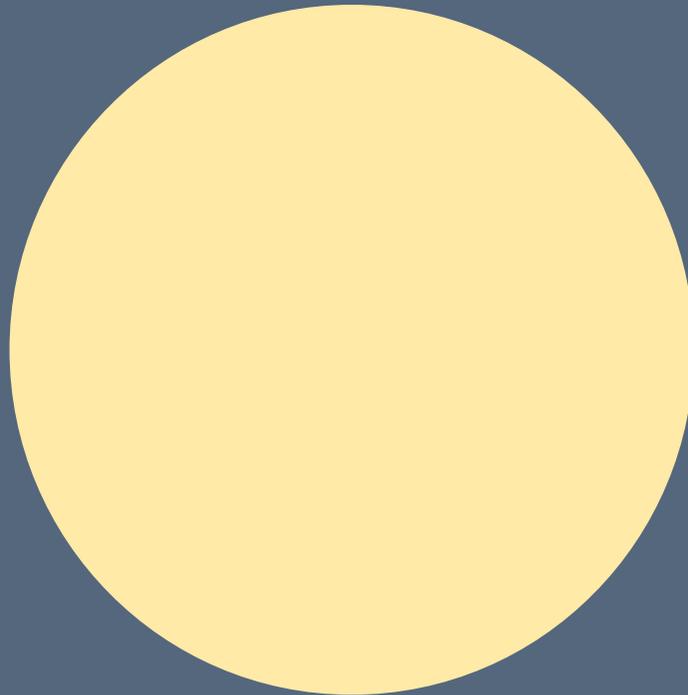
09:15 – 10:00	Introduction	Lecture Hall
10:00 – 10:30	Divergent Thinking	Lecture Hall
10:30 – 12:00	6-3-5 method, Analogies	Breakout Rooms
12:00 – 12:45	Lunch Break	
12:45 – 13:15	Convergent Thinking	Lecture Hall
13:15 – 14:15	Dotmocracy, Idea Refinement	Breakout Rooms
14:15 – 14:30	Short Break	
14:30 – 15:00	Morphological Analysis & Storyboarding	Lecture Hall
15:00 – 16:00	Storyboard Ideation	Breakout Rooms
16:00 – 16:45	Storyboard Design	Breakout Rooms
16:45 – 17:00	Summary & Closing	Lecture Hall

1

Cold Start

A 10 minute crash course on creativity techniques

Take a pen and paper. You have 50 seconds.



50s

Let's agree on some ground rules

Aim for **Quantity**

Search for **wild ideas**

Combine with and improve on existing ideas

Defer judgment

Take a pen and paper. You have 50 seconds.

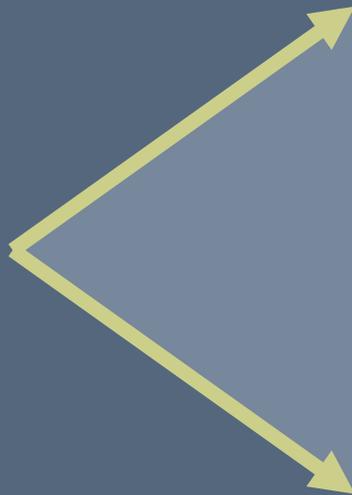


50s

Key Insight from Creativity Research

Divergent Thinking

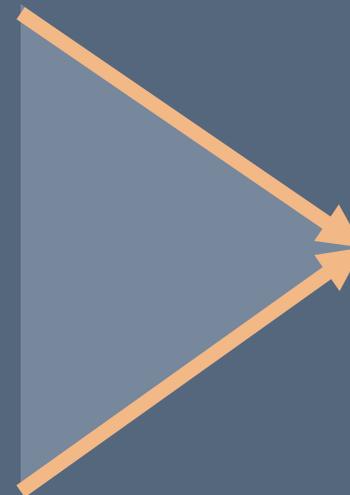
Issue



Aim for **quantity!**

Convergent Thinking

Solution
Idea



Aim for **quality!**

Ground Rules



Divergent Thinking

Aim for **quantity**!

Defer judgment

Search for **wild ideas**

Combine with and improve on existing ideas

Convergent Thinking



Aim for **quality**!

Think **positive** (potentials rather than problems)

Act **consciously and thoroughly**

Keep the **goal** in mind

Aim to **improve ideas** (ideas are not solutions)

2

Examples of Creativity

Age verification

Age Verification

This Website requires you to be 15 years or older to enter. Please enter your Date of Birth in the fields below in order to continue:

January ▼	01	1989	Submit
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Separate faucets (UK)



Separating egg whites



3

Creativity and Technique

This course is about creativity techniques.
But wait. Isn't this a paradox?

What is Creativity?

figure 1

There are various definitions and notions around the concept of *creativity* or *creative*

figure 2

Definition of Creativity

Sternberg & Lubart, 1999

[...] *the ability to produce work that is both novel (i.e., original, unexpected) and appropriate (i.e., useful, adaptive concerning task constraints)*

figure 3
noun creativity
krē-(i)ā-'ti-və-tē, |krē-ə\

figure 4

What is a Technique?

- A **technique** is a way of doing something by using special knowledge or skill.

Definition of Technique

noun tech-nique \tek-^hnēk\

Merriam-Webster

[...]

- 2 **a** : a body of technical methods (as in a craft or in scientific research)
 b : a method of accomplishing a desired aim

But how do they fit together?

- On the one hand, striving for **creativity** we are looking for **novel** and appropriate **ideas** and solutions
- On the other hand, **techniques** are basically **stable and predetermine** how certain things are supposed to be done

Creativity Techniques

- We have to avoid a **common misconception** about the aim of creativity techniques:

“Creativity techniques are a foolproof way to systematically produce creative output”

- **No!** Creativity techniques **do not** “produce” creative results. People do! Creativity techniques **cannot enforce creative output.**
- Rather, creativity techniques **aim to decrease mental block** and promote an open environment that **fosters divergent thinking** such that creative thoughts are more likely to surface

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Creativity in Groups

Groups are more creative, right?

Group Creativity



Sometimes teamwork is **indispensable**, e.g. in team sports such as Volleyball

At other times, teamwork is not mandatory, but **we expect that a group performs** better than individuals, e.g. in Brainstorming

Are we correct?

Everyone knows Brainstorming(?)

“A bunch of people gather together to generate a list of spontaneous ideas around a certain issue”

- Originally proposed by Alex Osborn in 1939
- Probably the **most popular and most misused** creativity technique
- In practice, there is a broad range of variations. Thus, brainstorming is actually a **class of more or less similar creativity techniques.**

Osborn's Brainstorming

(Isaksen et al, 1998)

- Brainstorming is a creative conference for creating a **checklist of ideas** which can be **subsequently evaluated and further processed**
- Group session was designed to **supplant individual ideation**
- 4 basic guidelines
 1. Criticism is ruled out
 2. Freewheeling is welcomed
 3. Quantity is wanted
 4. Combination and improvement are sought
- Osborn recommended a **trained facilitator** and **recorder**
- **5-10 participants** selected based on the nature of the problem

Brainstorming Research

Key claim of Osborn

Brainstorming in a group leads to the generation of more and better ideas than would be obtained individually

Is this true?

Brainstorming Research

What is the correct comparison condition?

1. Interacting Group vs. Individual

- ✓ An interacting group, on average, generates more and better ideas than an individual



2. Interacting Group vs. Non-interacting Group

- An interacting group, on average, generates more and better ideas than a non-interacting group?



Real Group

Group members work on the same task and interact with each other

Nominal Group

Group members work on the same task but do not interact with each other

Results

(see Mullen, Johnson & Salas, 1991)

- In all experiments, **interacting groups hardly ever produced as many ideas as non-interacting groups**. In fact, in most cases they generated significantly less ideas.
- The deficit is **not compensated by increased quality**. On average, interactive groups did not create more creative or more practicable ideas than non-interacting groups.
- Countermeasure
Brainwriting instead of Brainstorming

Why do real groups sometimes perform worse than nominal groups?

- Framing
- Production Blocking (e.g. Diehl and Stroebe 1987)
- Groups often prefer (even incorrect) solutions proposed by the majority (e.g. Torrance 1954; Smith, Tindale & Steiner 1998)
- Social Loafing (e.g. Latané et al. 1979)
- Dispensability effect (e.g. Kerr & Bruun 1983)
- Sucker effect (e.g. Kerr 1983)

...

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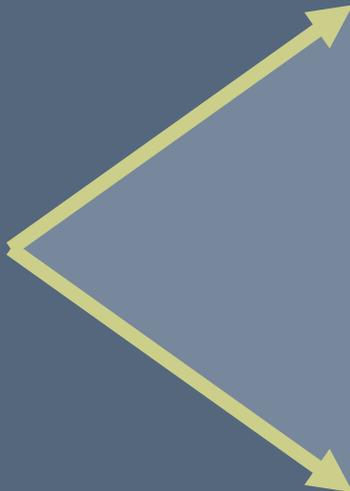
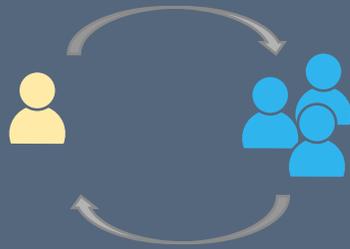
Summary

Summary

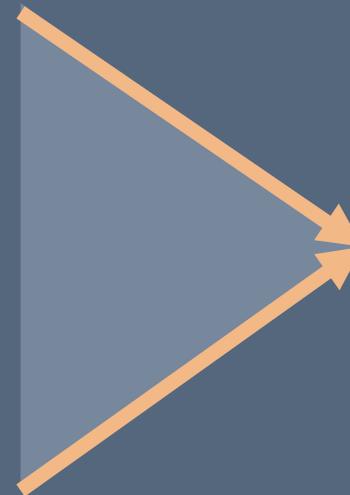
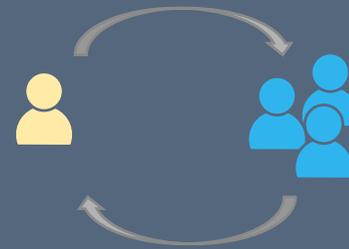
- Ideation involves two complementary modes of thinking: **divergent and convergent thinking**
- Creativity techniques aim to **decrease mental block and foster divergent thinking**
- A large body of research has shown that **groups do not necessarily perform better in creative problem solving tasks**

Key Takeaway

Divergent Thinking



Convergent Thinking



Next steps

6-3-5 Method & Analogies

6-3-5 Method

Structured brainwriting for groups

▪ Input

- A concise but open problem statement (e.g. How might we increase employee safety?)

▪ Process

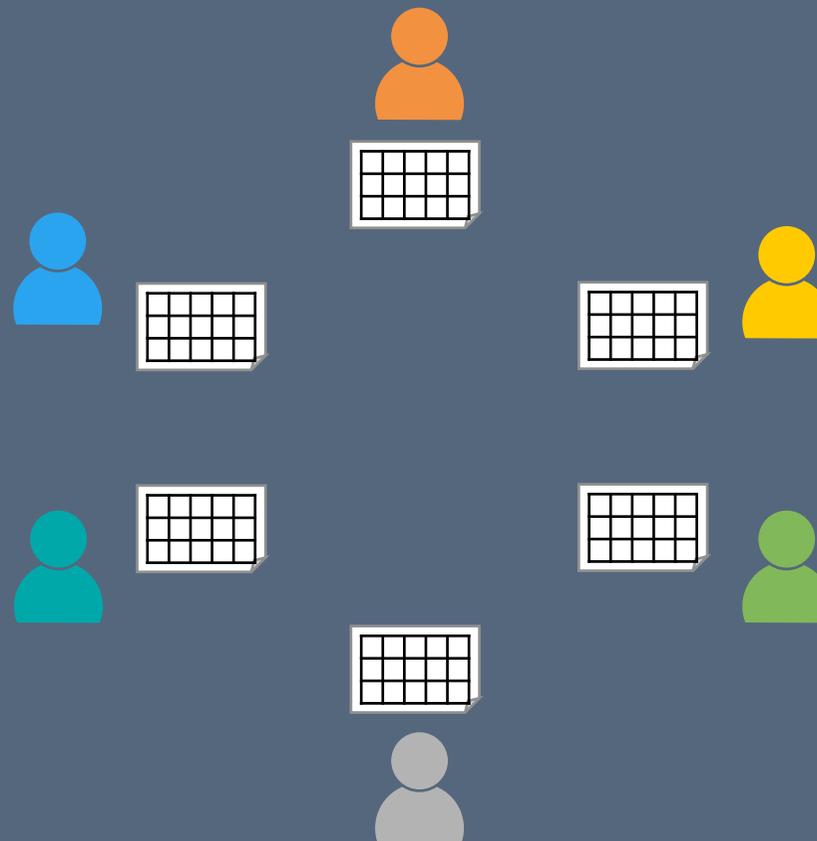
- Each team member is handed out an empty 6-3-5 template
- One run consists of **6 rounds** (# rounds = # participants)
 - In each round of **5 minutes** duration, every team member **silently** generates **3 ideas** and **writes them down in the specified area on his/her worksheet**. Team members should build on the ideas of others but can also decide to ignore them.
 - After each round, team members **pass on their worksheet** to the team member at their right.
- Conduct another run if desired

▪ Output

- Up to **108 ideas in 30 minutes**

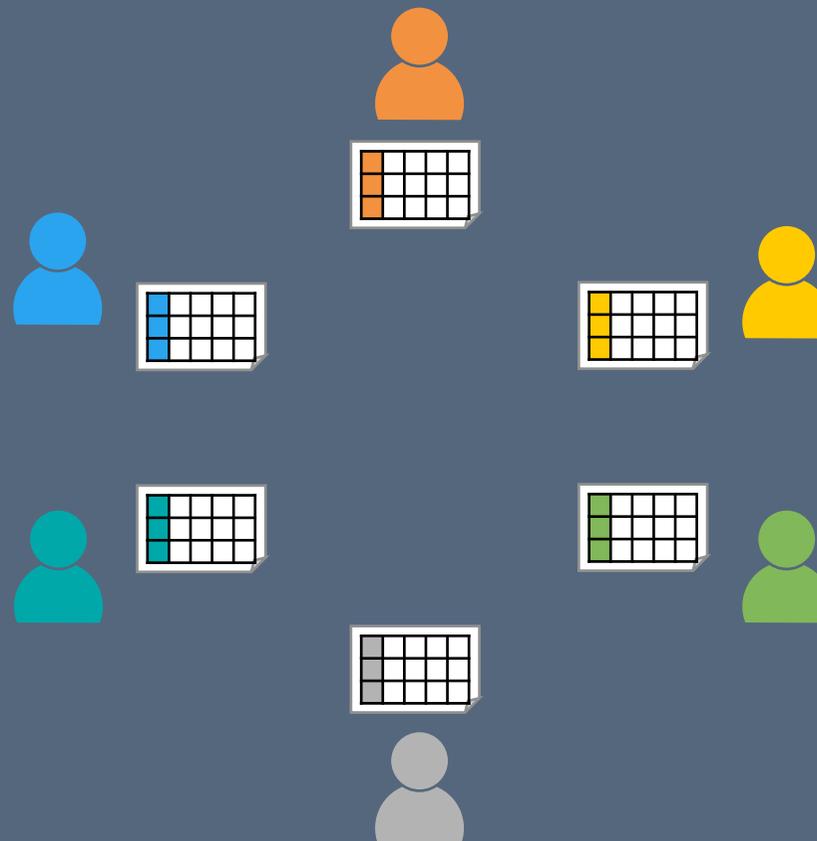
6-3-5 Method Example

How might we increase employee safety?



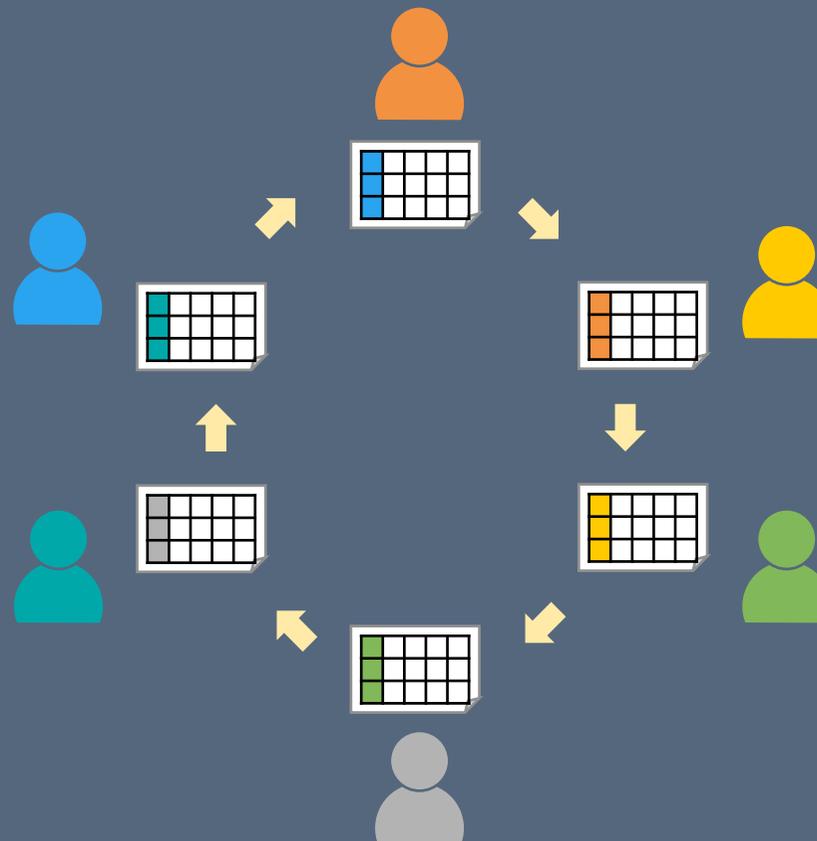
6-3-5 Method Example

How might we increase employee safety?



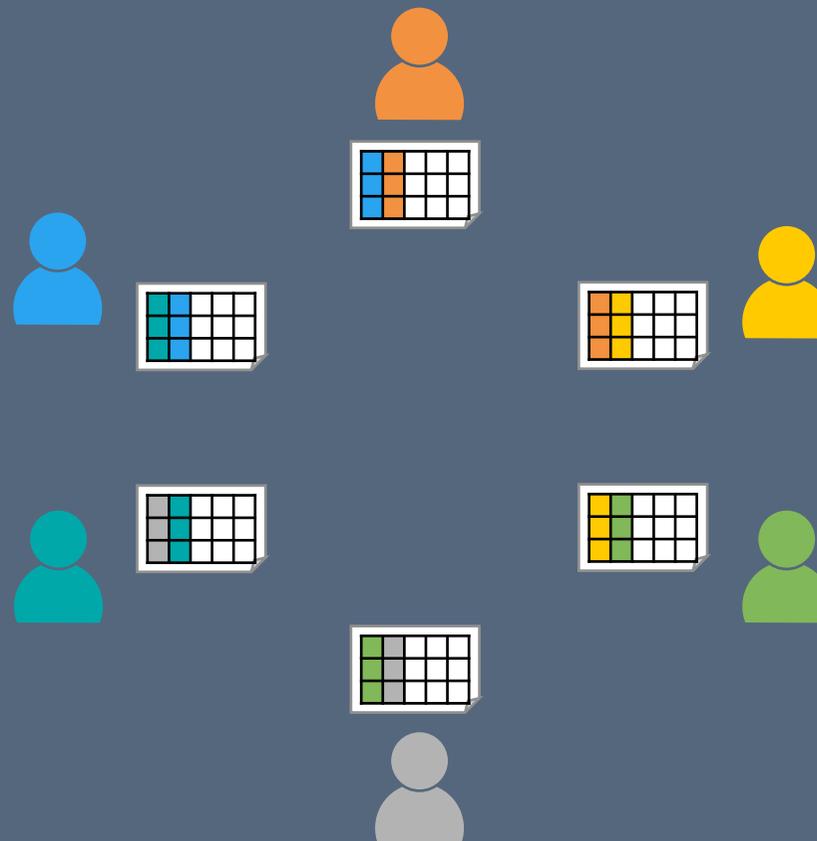
6-3-5 Method Example

How might we increase employee safety?



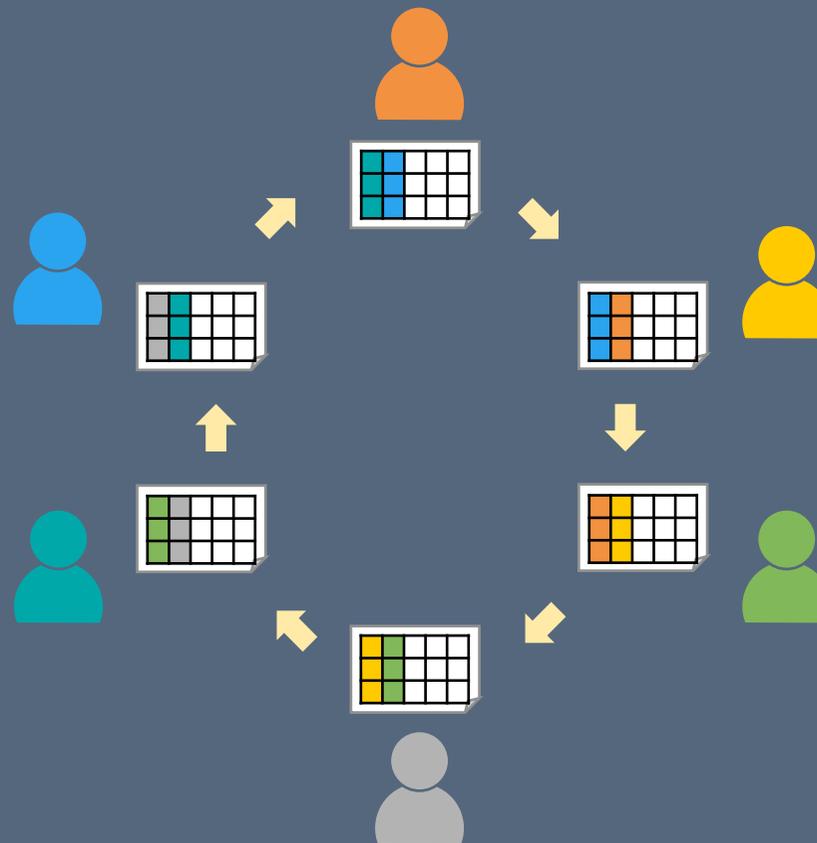
6-3-5 Method Example

How might we increase employee safety?



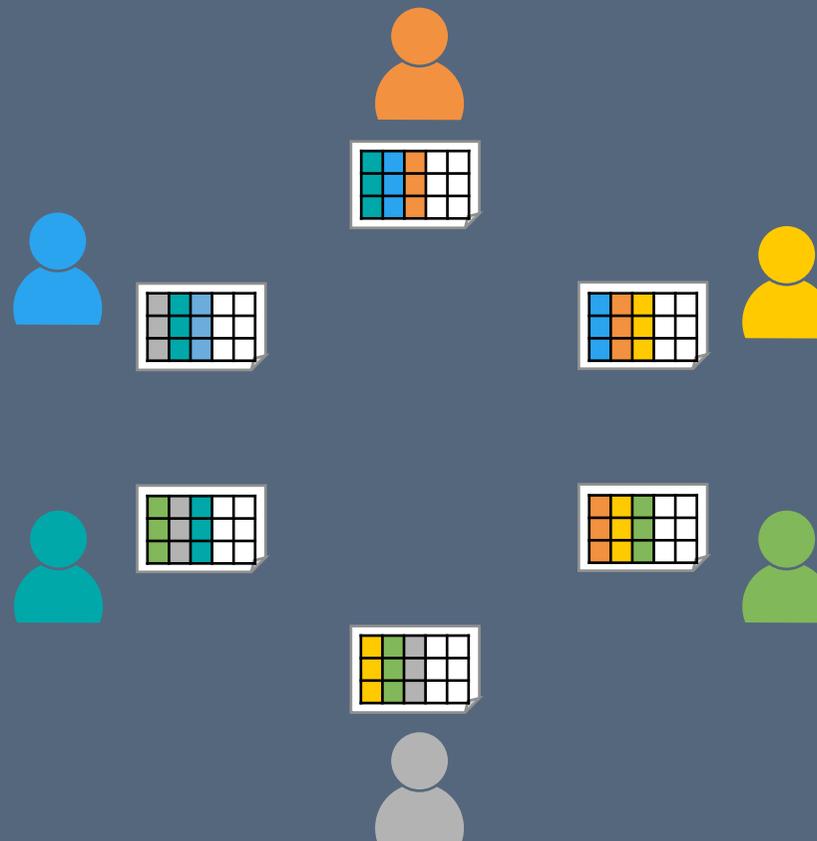
6-3-5 Method Example

How might we increase employee safety?



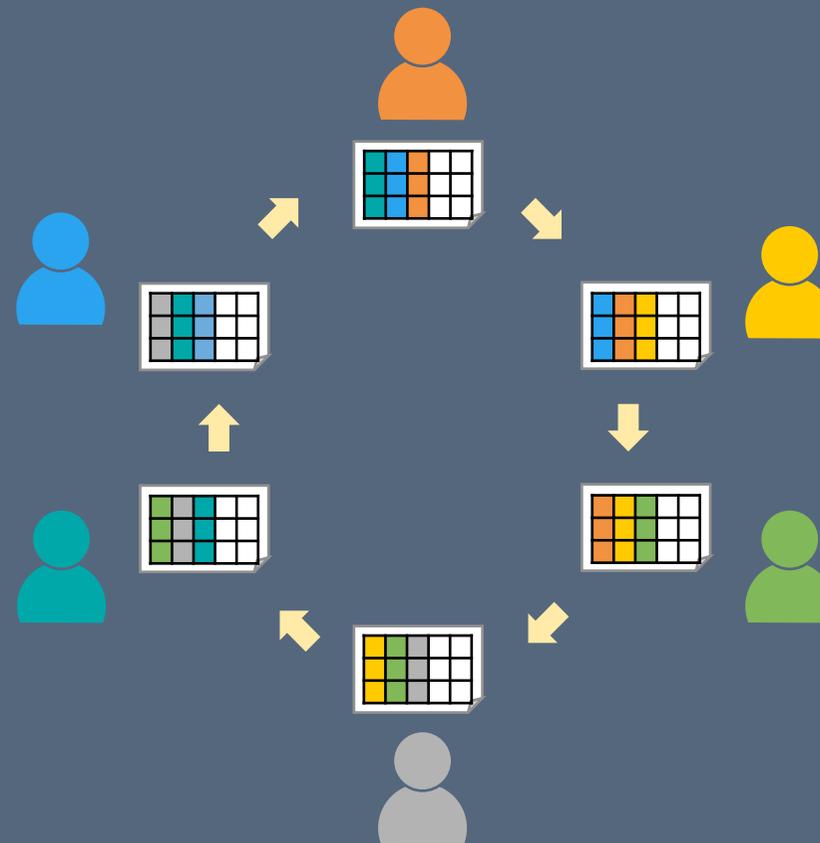
6-3-5 Method Example

How might we increase employee safety?



6-3-5 Method Example

How might we increase employee safety?



and so forth...

Analogies

Transfer solutions from other fields

- **Input**

- A concise but open problem statement
(e.g. How might we increase employee safety?)

- **Process**

- The team generates a list of (structurally) similar areas and how the analogous problem is solved in that area
- For each identified analogy, the team generates ideas by mapping solutions in the similar area to the situation at hand

- **Output**

- A list of solution ideas that are analogous to successful approaches in other areas

Analogies

Example

How might we increase employee safety?

Similar Area	Solution		Analogous Solution
Traffic	Police Traffic lights Airbags	➔	Security officer Warning lights Cushion on machines
Mountains	Safety ropes Route ratings	➔	...
Skiing	Avalanche warnings	➔	...
Paragliding	Training Safety parachute	➔	...
...