

## Methods to come up with ideas

**Type 1.** Use previous experiences and extracting a rule out of the data in order to come up with ideas.

The Checklist Method:

From a limited data or observations, try to find a rule or law to apply it to the similar cases. The rule can be modified or added depending on cases. This method refines the original idea to be more useful. The followings are the checklists:

- Are there other ways to use it?
- How can it be adapted to the other situation?
- What if we modify / rearrange it?
- How do we expand (increase) / shrink (reduce) it?
- What if it is substituted with something else?
- How do we reuse the idea under different conditions?
- What if we combine it with something else?
- What if we make it up side down / reverse it / eliminate it?

The TRIZ method:

This method also has a checklist and each one is more in detail with 40 items.

- 1) Segregate it.
- 2) Separate it.
- 3) Modify the part of it.
- 4) Make it asymmetric.
- 5) Combine with others.
- 6) Generalize it for other use.
- 7) Put something inside.
- 8) Balance it.
- 9) Use energy (force) before hand.
- 10) Predict it before hand.
- 11) Protect the important part.
- 12) Put it at the same height /potential.
- 13) Reverse it.
- 14) Rotate it.
- 15) Adapt it in the environment.
- 16) Make it simpler.
- 17) Use the other dimension.
- 18) Use vibrations / other external movement.
- 19) Perform / repeat it periodically.
- 20) Perform it continuously.
- 21) Perform it quickly.
- 22) Extract positive factors from negative results.
- 23) Undo it to the original level / position / value.
- 24) Mediate it.
- 25) Operate it by yourself.
- 26) Copy it / substitute it.
- 27) Make an inexpensive / a crude product instead of expensive and durable one.
- 28) Use other system.

- 29) Use fluids.
- 30) Use thin films.
- 31) Use porous materials / use space.
- 32) Change colors.
- 33) Use uniform media / materials.
- 34) Eliminate / recycle it.
- 35) Change parameters.
- 36) Change shapes / phases.
- 37) Expand it thermally.
- 38) Dense it.
- 39) Use inactive materials.
- 40) Use different types of materials.

**Type 2.**      Compare, decompose, modify, and categorize the data to generate new ideas.

The KJ Method:

- ①. Write down one item on each card associated with the theme. Make the card as many as possible.
- ②. Group the cards with your own interpretation. Label each group.
- ③. Associate each group by drawing lines.
- ④. Determine the group to start with and pick up one card from each group along with the nearest one; and then, make sentences (a story) with the cards you picked up.
- ⑤. If the previous step does not work well, go back to step ③ and rearrange the group configuration.

The Tear-Down Method

- Compare with good products (e.g. vehicles, software, etc.) and extract the effective or advantageous aspects to utilize them for your products / ideas.

**Type 3.**      Utilize the similarities to get ideas.

The Synectics Method

- Step 1: Define the problem, such as “How to reduce the processing time.” More concretely, specify origin of the problem, the background / history, the previous solutions or trials, etc. (This should preferably be analyzed by an expert.)
- Step 2: Come up with a number of wishful / provocative / speculative solutions. They can be quixotic.
- Step 3: Select the interesting ideas from the previous step.
- Step 4: Restructure the problem setting. Enumerate the keywords to restart solving the genuine problems.
- Use analogies (direct analogy, someone’s analogy, symbolic analogy) to discuss the solutions.
- Select a proper analogy to address the solution discussed above. Try to specify it in detail to give the practical solution.
- Finalize the solution.

### The NM Method

- ①. Find the agenda / keywords / what to solve
- ②. Find the analogy from ①.
- ③. Find the background of ①.
- ④. Conceptualize the related factors from ② and ③.
- ⑤. Discuss them and finalize the solution.

### The Equivalence Exchange Method

- ①. Determine the theme.
- ②. Select an equivalent but a different object from which you find in ①.
- ③. Develop and extend the object from ② to have an idea.
- ④. Go back to the original theme, ①, and discuss it with the idea in ③.

### **Type 4.**      Use sense and emotion in order to obtain ideas.

Utilize fantasies, dreams, pictures, sounds, music, feeling, etc. These can be used directly or indirectly. The image can also be conceptualized to come up with further ideas.

### **Type 5.**      Apply coincidence to obtain ideas.

#### The Brainstorming Method

Connect random items. Distort or disorder the items to have ideas coincidentally.

- ①. Define the theme or prepare the information the related people need.
- ②. Facilitate a comfortable environment so the member come up with ideas / suggestions
- ③. Encourage them to say anything they come up with even through their ideas are ridiculous / absurd. No criticism. Try to compliment. Write the ideas on a board. Let everybody say something.
- ④. Out of the collected ideas, choose best ones, and then connect them to have further ideas / themes.

*☆ Note that some experiment suggests that it is not effective when many people try to solve the problem together without preparation. Rather, each person should consider the possible solution as homework, and then discuss the problem with others. This turned out to be more effective.*

#### Gordon's Method with Brainstorming

- ①. The leader selects a theme by himself / herself.
- ②. The leader makes the topic more generalized (more abstract) and gives it to the members to have ideas with brainstorming.
- ③. The leader tells them the original theme.
- ④. Discuss the ideas collected in ② by associating with the original theme to obtain further ideas / solutions.