

**Social Innovation in Industry 4.0**  
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**Lecture 26**  
**Creativity Tools and Techniques (Part 2 of 4)**

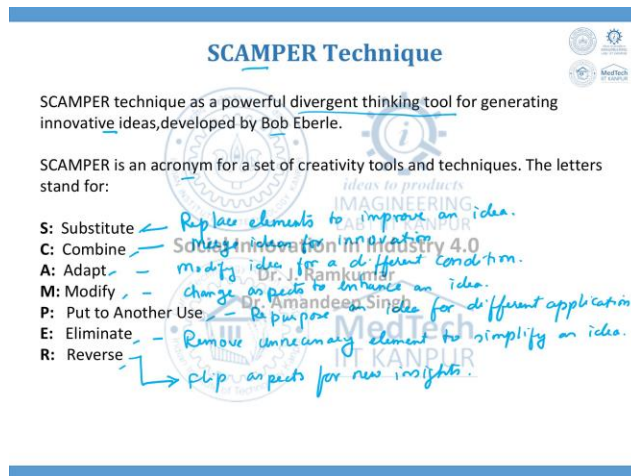
Welcome to the next topic of discussion, Creativity Tools and Techniques.

**SCAMPER Technique**

SCAMPER technique as a powerful divergent thinking tool for generating innovative ideas, developed by Bob Eberle.

SCAMPER is an acronym for a set of creativity tools and techniques. The letters stand for:

- S: Substitute - Replace elements to improve an idea.
- C: Combine - Solve a problem for multiple purposes.
- A: Adapt - Modify idea for a different condition.
- M: Modify - Change aspects to enhance an idea.
- P: Put to Another Use - Re-purpose an idea for different application.
- E: Eliminate - Remove unnecessary element to simplify an idea.
- R: Reverse - Flip aspects for new insights.

The slide features a blue header with the title 'SCAMPER Technique'. Below the title, there is a paragraph explaining the technique as a divergent thinking tool developed by Bob Eberle. A second paragraph states that SCAMPER is an acronym for a set of creativity tools. The core of the slide is a list of the seven letters of the acronym, each followed by a brief description and a handwritten note in blue ink. The notes provide specific examples: 'Replace elements to improve an idea' for Substitute, 'Solve a problem for multiple purposes' for Combine, 'Modify idea for a different condition' for Adapt, 'Change aspects to enhance an idea' for Modify, 'Re-purpose an idea for different application' for Put to Another Use, 'Remove unnecessary element to simplify an idea' for Eliminate, and 'Flip aspects for new insights' for Reverse. The slide also includes several logos: the Indian Institute of Technology Kanpur logo, a gear icon, and the MedTech Kanpur logo.

So, the next one is a SCAMPER Technique. SCAMPER technique is an acronym from various words. So, SCAMPER technique is a very powerful divergent thinking tool for generating innovative ideas, which was developed by Bob. See, if you do not have a brain, if you are working on a solution which talks about moon where there is no gravity, we do not know how the surface looks like. So, completely it is out of air, nothing is known.

So, then how will you go ahead solving a problem? Very difficult right. So, there here what it says is? So, for that, what I do is, I aid you through a tool, use this tool such that, you can try to develop innovative or creative thought process or divergent ideas. So, SCAMPER is an acronym for a set of creativity tools and techniques. Acronym means, you try to either take the first word or the second word or a group of words such that, you can try to do it.

So, that is how you try to develop and many a times, we used to do acronym for a subject to type paper in the examination, if there are 20 points. What we do is, we just quickly make an acronym saying that M square C square B square D or if it is D square E. So, square means, there will be 2 points, where the point starts with the keyword of M,

keyword of C, keyword of B, keyword of D and one keyword of E, some word you can set. So, in the examination, all you will do is, you will try to remember this word and try to write this acronym and looking at this acronym, you start expanding the point. This is how I have been doing it in history papers, civics papers and also in physics papers where they talk about functionality of something, I have been doing it, this gives a good yield.

So, in the similar way, trying to make a acronym for the technique or the acronym word is CRAMPER. So, S stands for Substitute, C stands for Combine, A stands for Adopt, M stands for Modify, P stands for Put to another use, E stands for Eliminate, R stands for Reverse. Substitute means, you try to change for example, if this particular component is made out of metal, try to replace it with polymer. If this is a practice, why do not I turn the practice to this, which is been very popular in food industry, which is very popular in agriculture industry, which is very popular in education industry. So, trying to do it.

So, Substitute material, idea whatever it is, Combine when there are 2 good ideas. Now, what do I do? I try to see, whether I can combine this idea such that, I can try to have an innovative thought process combined. Adopt change with time, change with the availability of resources, that is Adaptability. Modify, say modify is you change, say for example, you have a rectangle, a rectangle is a special case, square is a special case. So, I modified a rectangle into a square, that is modified right.

Then, next is put to another use. So, I have been using this ear buds gentlemen, ear buds are not used for cleaning ears. These ear buds are used for cleaning instruments and keyboards. So, when somebody used it to clean all these intricate parts, this one another gentleman came and found out this ear bud also can clean ear. So, now what was used for cleaning the keyboards or intricate parts, the cotton bud on the one side is used to clean your ears on the other side.

So, you see that you are you putting it into another use. A stapler pin device, which was used for stapler ring is now used as a paperweight. So, put to another use. Then, eliminate whatever is thing not necessary and you try to reverse the sequence or whatever it is. So, let me write down some more key points so that, you will remember.

So, substitution means, you replace elements to improve an idea combined. So, you merge or try to merge ideas for innovation. For example, I have been telling you for replacing bed sheets in the government hospitals or in private primary health care centers, trying to replace the bed sheets, because you have 500 foot falls, every shift coming to a government medical hospital in India. 500 is a normal number you get. So, if they are admitted to the bed.

So, then you have to replace when the patient leaves, maybe on a daily basis. You have to buy once in 2 days, you have to keep changing it. So, now I said cleaning is a challenge. So, now I have to look for an idea. So, what do I do is, I try to take an idea from a table dispenser tissue papers.

Nowadays, what they do is, on a table, they always try to put a paper which is a tissue paper, long sheet. This is laid on top of a table and once somebody finishes eating, the entire paper is discarded, which is a biodegradable paper. So, now can you take an idea from there? Can you take an idea from automobile? Can you take an idea from newspaper industry? So, that is merging ideas for innovation. Adapt is modify idea for a different condition. Then it is modified.

So, it is change aspects to enhance an idea is modified, adding a color to it, adding a joint to it, adding a music to the instrument, adding more applications to the software, all these things are modified. Put to another use is repurpose an idea for different application. This is another thing, put to another use then eliminate.

Eliminate is remove unnecessary things, unnecessary elements to simplify an idea. First one is reverse, it is flip aspects for new insight. So, these are the important keywords, where a acronym is made as SCAMPER which is used for developing innovative and creative ideas or solutions.

## Random Word Association

Random word association is a divergent thinking technique that can be used to stimulate new

- Connections
- Associations

It involves generating a list of random words and then using those words to trigger new ideas

Process to use random word association:

1. Generate a list of random words
2. Choose one word from the list
3. Think of as many associations as you can for that word
4. Repeat steps 2 and 3 for each word on the list.
5. Evaluate the results.

Image source <https://images.app.goo.gl/6t/YS2n794c7w7>

Next is Random Words Association Trustworthy and Essential Process. So, these are two keywords which I have developed. Now, what do I want is, I wanted to name my company such that, I bring out all these words. So, what do I do is, I try to take Tr from here and essential from here.

So, it is Tressent. So, what do I did is, I randomized combined to in naming or giving a name to my trustworthy essential software or process. I made it into Tr trustworthy Tr and essential I made Tressential. So, I can make it like. So, that is, you try to Random Word Association to form a keyword and then look for ideas. So, Random is more of cognitive skill, which is not so easy also, it is little tricky, but we try to use it.

Random Word Association is a divergent thinking technique, that can be used to stimulate new connections and associations. We try to make connections and associations. Connections means one to one is connection. Association means, you are trying to link these two with some another thing which is an Association. It involves generating a list of random words and then using those words to trigger new ideas.

For example, if you are trying to show shampoo container, I would like to put the keywords like beauty, elegant, smart and should attract me when it is kept in between so many things. Then, I should say, after using the shampoo or using the scent, I should always try to have a crave for using it. So, these are the random words which you should write it down before thinking of a packaging for your shampoo or for a scent or room freshener whatever it is. So, that is what it involves, generating a list of random words and then using those words to trigger new ideas. Process to use Random Words Association is generate a list of random words.

For example, beautiful, attractive, elegant, cheap, economical. There can be same word, but you are just writing down all the keywords. Then, cost effective, then color distinction, unique, breakable. So, all these things are words, which are adjectives or

words are keep putting. Process to use is Random Word Association is generate a list of random words, which are closely associated with the problem statement right.

Then, choose one word from the list. In the list of 50, you pick one word out. So, here also, it is a group even. So, you put lot of people, put the problem statement, ask them to generate words. So, choose one word from the list.

Think of as many associations as you can for that word. If I say, beautiful like a cat, like a dog, like peacock, like some character, like some Mona Lisa. So, you are trying to associate all these things with the think of as many associations as you can for that word.

Then repeat step 2. So, out of 50 minus 1, now you have 49. Pick up another word, start putting that and gentlemen try to have your focus towards the problem statement, the need statement and to the product whatever you have in mind do this.

So, repeat step 2 and 3 for each of the word then, till you saturate with many ideas, keep doing it. It is time consuming and you keep. Now, you have for every word, you would have 10 different associated words or sentences, whatever it is words are encouraged. So, then you will have 50 into 10, you will have 500 possible solutions or ideas, which has got evaluated.

Then finally, it is like, evaluate the results and pick the best one. This we do in our childhood days, we take a story book and then we just open a page and then in that page, we always say, in this page, you pick up 2 words and make a sentence. For every sentence, you make, you get 1 point, then the opponent pulls it. So, it can also be a group event it can also be 2 players or it can be multiple players. So, this is Random Word Association, very interesting.

## Random Word Association

Example 1: Coffee & Spaceship

Pairing Coffee + spaceship may trigger ideas like  
Caffeine-fueled interstellar exploration  
or Zero-gravity coffee brewing  
for astronauts.

Example 2: Cloud & Guitar

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may lead to concepts like Sonic sound  
scapes inspired by atmospheric phenomena  
or "Cloud-Connected smart guitar effects".

So, a Random Word association is Coffee and a Spaceship. Having coffee and spaceship may trigger ideas like caffeine fueled interstellar exploration or zero gravity coffee brewing for astronauts. I am just thinking a very wild idea. So, now if we try to write for cloud and guitar cloud and guitar what can it be cloud is as light as possible, it changes color as and when say, it can be gray in color, it can be white in color, it can change color. So, same way, you can have a guitar, which can change in color.

You can change a guitar shape to be random. So, all these things are there, cloud and a guitar. So, combining cloud and guitar may lead to concepts like sonic soundscapes inspired by atmospheric phenomena or it can lead to cloud connected smart guitar. Guitar or guitar effects is not it completely in our cloud and guitar look at it right. So, these are some of the Random Word Association.

This is little complex compared to that of your SCAMPER and that compared to that of your Brainstorming session, but this also helps in creating new ideas out of the box.

## Mind Mapping

Mind mapping as a visual divergent thinking technique to visualize

- Connections
- Relationships
- Associations between ideas.

It allows for the organization and exploration of ideas in a non-linear and associative manner.

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Dr. J. Ramkumar

Process to create a mind map:

- Start with a central idea (Write a phrase, image that represent the topic)
- Brainstorm related concepts (write them down on the branches of your mind map)
- Connect the concepts
- Add details
- Color code your mind map (to visualize the different concepts & relationship)

One is going to be Mind Mapping. Mind mapping as a visual divergent thinking technique is used for visualization. Here we talk about connections, we talk about relationship, we talk about association. A to B relationship, how the distance or see A to B connection, how is this connected with B to C relationship and associating A to B and B to C with some ideas.

It allows for the organization and exploration of ideas in a non-linear and associative manner. In mathematics, we always learn about associative rules. In the similar way, in mind mapping, we can have these associations. The process to create a mind map is going to be start with a central idea such as word, phrase, image that represent the topic right. Just put a picture of a flower, try to say the smell is very good or you say that it is very nice or it gives a feel good factor fragments, word beautiful.

So, anything you can do right then, brainstorm related concepts. Here, what you do is you write them down on the branches of your mind map. You will see that of your mind map is brainstorm related concepts then, you connect those concepts. Now, you add detail to that concept finally, use color code your mind mapping to visualize the different concepts and relationship. For example, even in brainstorming session, when you write your ideas you can put it in green color sheet or red color sheet or yellow color sheet.

So, then green can have all design concepts, red can have all business concepts whatever it is for that particular problem statement, you just put it. So, why is that because it will try to visualize and give you what are the different ideas? How many ideas are there and what is the link between that ideas? So, Mind Mapping is very interesting. Mind Mapping is something which can which can go non-linear over time period within a fraction of a second, it can slip down to few 10 years in the thought process. So, using mind is a bigger challenge and people are working on it for a long.

# Mind Mapping



Examples of Mind Mapping:

- Project Planning
- Note-Taking

*\* Use a mind map to outline project guide/goals, break them down into tasks and identify dependencies between different components.*

*\*\* Summarize & organize lecture notes, capturing key ideas and their relationship in a visual & structured manner.*

So, let us take an example for Mind Mapping. So, project planning in Mind Mapping. Project planning is we use a mind map to outline project guide or goals break them down into tasks and identify dependency, identify dependencies between different components. That is Project Planning. Next one is Note taking or Note Making is very important. So, here you summarize and organize lecture notes, capturing key ideas and their relationship in a visual and structured manner. So, that is note taking.

So, the examples of Mind Mapping can be outlining the project goals and organizing lecture notes or capturing key ideas and presenting it in mind map. So, we have seen three techniques in creative thinking. The three techniques are going to be Brainstorming, Mind Mapping, SCAMPER and Random Word Association. All of them have their own advantage and disadvantage. I have been exhaustively using Brainstorming and SCAMPER.

SCAMPER I have used in for redefining the product architecture. I have been using SCAMPER technique and for need statement and bringing out with lot of ideas. I have used Brainstorming.



## Summary

- Creativity is a skill that can be developed and nurtured.
- Divergent thinking is a key component of creativity.
- There are a number of different creativity tools and techniques that can be used to generate new ideas.
- Some popular creativity tools and techniques include brainstorming, SCAMPER, random word association, and mind mapping. (X 10 Lectures)
- Incorporating these creativity tools and techniques will help us:
  - Unlocking innovation
  - Overcoming creative blocks
  - Enhancing problem-solving

To summarize this lecture, we have seen creativity is a skill that can be developed and nurtured. Divergent thinking is a key component of creativity. There are a number of different creative tools and techniques that can be used to generate new ideas. Some popular creativity tools and techniques include Brainstorming, SCAMPER, Random Word Association and Mind Mapping.

Each one can be dealt for at least 10 hours of lecture. It can be done if you go in detail. So, you have to read to master the art of Brainstorming, SCAMPER, Random Word Association and Mind Mapping.

The incorporating these creativity tools and techniques. This will help us to unlock innovative ideas, overcome creativity blocks and enhance problem solving. So, as part of assignment, try to find out a solution to a problem which you face every day or every week or every season related to your health. So, you first identify a problem, then try to develop solutions and you try to develop minimum 10 solutions to 3 problems.

You face and try to do this activity as a group activity. So, that you can enjoy and use the tools of creativity very efficient. These are the references which I have used. Thank you very much for your patience here.