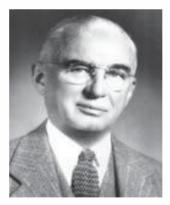# Brain Storming

BRAIN STORMING

What is Brainstorming?

Brainstorming is a group technique for generating new and useful ideas.

It uses a few simple rules for discussion on a subject matter that contributes to originality and innovation.

Brainstorming is not part of the seven tools of problem solving. However, it forms a very integral part of problem solving. In fact, this technique is used at many stages in the problem solving journey. The technique is stunningly simple, useable byall (from top management down to grass root level employees) with ease, and yet can generate highly creative as well as logicalideas in a short span of time.

Alex Osborn of USA developed this technique in 1950s to tackle advertising and marketing problems. Now its use has spread across all walks of life, including quality problem solving, productivity improvement problems, waste reduction problems etc.

Alex Osborn coined the word "Brainstorm". According to him, in his own words, "Brainstorm means using the **brain tostorm** a creative problem and to do so in a commando fashion, each stormer audaciously attacking the same objective".

A structured brainstorming produces numerous creative ideas about any given "Central Question". Osborn noticed that "many of us can work much better creatively when teamed up". He recognized that a team is superior to any one individual in the team and human activities have increasingly become a group process. He combined many of these ideas in formulating the concept of brain storming.

Creativity and Logical Thinking

As mentioned earlier, brainstorming can be used for generating logical as well as creative ideas.

What are the differences between logical and creative ideas?

Logical thinking can help us to develop ideas in a systematic way. It can be deduced through rational reasoning, throughcause and effect analysis, through data analysis, through previous experience etc. Generally logical thinking leads to ideas that are practical and down to earth. Through a process of logical analysis, we deduce solutions and converge to one solution. Hence logical thinking is a systematic thinking based on certain rules and can be reproduced by any one. For example, if an LCD projector is not working and shown to different knowledgeable technicians, then all will arrive at almost one solution after checking the defective projector.

Creative ideas on the other hand come to us as hunches and show a new way or new idea. They may be untested and untried. Very often, they may not even be immediately applicable.

Further, for the same problem, number of solutions may emerge. Consider the following table.

CHILD	DRUM
DOG	SEX

People were asked to remove one item which does not belong to the group and give reasons. It was amazing to find the number

of answers and the reasons given. Some of them are listed below.

1. Drum has to be removed because the other three deals with animate things, where as drum is an inanimate thing.
2. Sex has to be removed because in all the other three words the letter "D" is there and it is not there in the word "sex".
3. "Dog" has to be removed because the other three items do not bark.
4. Child, dog and sex can be male/female where as there is no such possibility for "drum". Hence it has to be removed from the group.
5. A group policemen responded by suggesting to remove "sex" because, according to them, they can beat a child, a dog and a drum but cannot beat "sex"!

In fact, there can be many more answers!!

All the above answers are correct. In other words, there is no single right answer. This is the uniqueness of creative ideas.

While solving problems, we really need a blend of both logical and creative ideas. Usually breakthroughs are achieved by creative thinking, where as practical, achievable results are obtained through logical ideas. In reality, very rarely we get totally new ideas. A new application for an existing item or a novel use of existing ideas in a new situation is also no small accomplishment. It also comes under creative idea. Thus in a real life situation, we need a blend of both logical and creative ideas. That is, systematic as well as creative approach. Brainstorming enables us to achieve this objective.

Factors influencing Creativity

J.P.Guilford

J.P.Guilford was a famous American psychologist. He had conducted extensive research on factors influencing creativity. He found that the following five factors are the basic elements that enhance creative thinking.

They are:

1) Fluency
2) Flexibility
3) Originality
4) Awareness
5) Drive

Let us examine each factor in detail:

Fluency:

Fluency is the ability to think of maximum number of ideas within a short time or given time. It is the rate of flow of ideas. It is measured in terms of number of ideas per given time.More the ideas, the better. Why this emphasis on quantity of ideas rather than the quality of ideas? Here is a possible explanation. The brain has two halves; the left and the right. Neurologists tend to believe that data based logical inputs are processed as well stored inthe left brain, whereas creative ideasare processed and stored in the right brain. Whenever a refreshingly different or new idea comes out, it is believed to

come from the right brain. Spontaneous, uninhibited suggestions or ideas fall in this category. Such ideas should be recorded immediately because very quickly the left brain starts to analyse the suitability or applicability or the acceptability of the new ideas in terms of the data or information available in the left brain. The left brain might simply come to the conclusion that the idea is not that great. In order not to give time and room for such left brain processing, the emphasis is laid on the speed of the ideas. More ideas in a shorter time are an indication of more right brain creative thinking activity. It has been found by Mr. Guilford when large number of ideas are generated in a short time, chances are that many creative ideas have been generated leading to a better solution of the problem and hence, this emphasis on quantity and rate of flow of ideas. However, it should be noted that normal logical ideas will also be generated in the short run. Only the probability of getting creative ideas increases.

Only in "fluency" the quantity plays a more important role than quality.

Flexibility:

The second factor that influences brainstorming is flexibility. This is the ability of the mind to move or jump from one area to another quickly. Another gain is that, in a group, people think divergently. Thinking power of an individual either lies in his memory, perception about the situation, creativity, imagination etc. Flexibility is measured by the number of categories of ideas generated.

Originality:

This is the ability to identify uncommon ones. Originality is a rare commodity. In fact, in many cases ideas need not be totally new or original. A new way of looking at the old data or a new interpretation given to an already existing problem, also qualify to be called as original idea. But getting original ideas is generally rare. But once some original idea is obtained, the benefits arising out of this could be very significant. Some of the rules of brainstorming such as no hindrance or analysis of

ideas just when an idea is spelt out is aimed to encourage original thinking.

Awareness:

The next important factor is awareness. Awareness is the ability of the mind to see and imagine beyond immediate facts to a larger reality that the facts may reflect. In other words, ability to see the "big picture" while trying to resolve the current problem is awareness. The greater the awareness of the group/team members, more number of creative ideas will get generated. Ultimately, the sum total of the total awareness of the group will determine the quality of the solution to the problem in hand. Because of this reason, quality circles areencouraged to invite outside experts to participate in brainstorming exercise, as and when required.

Drive:

The last, but not the least, important factor is drive. The team members should be fully motivated. They should have the perseverance, determination and zeal to solve the problem in hand.Drive refers to the feeling "we will do it and show". It is this spirit that brings out many new creative ideas.It is the willingness to contribute and achieve the end goal without fear of failure. Removal of the fear of failure is a very important factor during brainstorming. Many seemingly unimplementable ideas get implemented by concentrated efforts and "drive" of the team members.

Essential Guidelines for Brainstorming

Brainstorming is a group technique. So to get the best results, the group has to follow the following important and essential guidelines:

1) No idea, however silly or irrational it may seem, should be criticised. Such an act will discourage participants to give their ideas. By the same token, no idea should be

praised or endorsed also. In other words judgment of ideas should be deferred till all ideas have been noted down.

2) Unconventional, imaginative and outlandish ideas must be encouraged.

3) Emphasis should be given to getting large ideas in ashort time. This will reduce the analysis and criticism ofideas given by members.

4) Hitch-hiking is permitted. This means teams can build on others' ideas and thus expand the scope and meaningof the ideas. This is a very important guideline. As soonas an idea is given, it becomes the property of the whole group. Irrespective of the originator of the idea, the others can legitimately hitch-hike, modify and expand the idea.

The above simple guidelines will certainly enhance the output of the brainstorming session.

Methods of Brainstorming:

Brainstorming can be done in four ways. Normally we are aware of three methods, but a fourth one is added as this is being used to get observations and views of many more persons.

1) Round Robin or Structured Method
2) Free Wheeling or unstructured method
3) Slip Method
4) Through e-mail / SMS

The Round Robin Method or Structured Method:

This is the most popular method used by members of Quality Circles or Quality Improvement Teams (QIT) teams or any other small group activity teams. Its objective is to get

maximum number of ideas on a selected topic at a given time. Here, a method is devised to make every person participate and contribute. Also enough care is taken to minimize criticism of any idea or praising of any idea. Let us see how it is done practically. The following steps are involved.

1) Collect a group of people who will participate in the group brain storming. In the case of quality circles, mostly it is the circle members.
2) Find a meeting place with all required facilities. Usually a flip chart or white board or a black board is required to record all the ideas.
3) Select a leader for the group. The leader is the person who will conduct the proceedings in an orderly fashion. He will also act as a moderator, so as to ensure no criticisms are made against any idea. The leader may himself write the ideas on a board or ask some member to do it.
4) Prior intimation should be given to all the participants about the problem, so that they would have done sufficient "individual brain storming" before coming to the meeting. This makes all the members to get tuned to the problem in hand.
5) Before starting the meeting, the leader should also clarify any doubts of the members. The problem is written on the board for everyone to see.
6) Some time must be given to each member to think individually on the problem and gather his/her thoughts and points. Any group activity starts with individual efforts first.
7) The participants are made to sit in a circular fashion, so that they can see each other. Every person is asked to give one idea each at a time. Each idea is noted on the board by the person who is recording.

8) No criticism of any idea, however impractical or irrelevant it may sound, should be allowed. Similarly, no idea should be immediately endorsed as a great idea. The purpose of this action is to encourage people tocome out with their ideas in an unhindered and un-intimidated way.

9) When all the people have contributed once, a second round has to be continued.

10) If any person is not having any idea at a given point of time, he should say "pass". He can catch up by the time the next round comes.

11) Encourage people to develop on other people's ideas, or to use others' ideas to create new ones. This process is known as **hitch-hiking.**

12) Ensure that no train of thought is followed far too long. It is essential to generate sufficient number of different types of ideas.

13) Some fun during the deliberations is OK. If necessary a break can be taken.

14) Some specialists or facilitators can be invited for the session to give their ideas.

15) Please ensure to record all ideas almost as stated by the members.

16) Follow piggy backing if brain storming seems to slow down. The leader may suggest piggy backing. This is nothing but building on others' ideas.

17) Another technique is to suggest opposites. Members should try to give opposite suggestions to whatever ideas that might have been gathered on the selectedtopic. This may generate a good number of "for' and "against" suggestions which may be very valuable.

18) Yet another technique is to try quick association. The leader may suggest a word and the members respond

as quickly as possible with their ideas connecting the word and the selected topic. For example, the word "training" might trigger responses such as "training manual, "operator training, books, faculty, visual aids, training hall etc.

What next?

If you have followed the above guidelines and conducted a good brain storming session, you would have collected a good number of ideas. The next step is to process these ideas.

a) Group the Ideas: The first thing to do is to group similar ideas. Any modification in statements can be made at this stage to make them more meaningful and crisp.

b) An evaluation criterion has to be evolved. Based on this criterion, the ideas can be evaluated and ranked for acceptance or implementation. A healthy debate at this stage about the veracity of the ideas is not considered harmful as the idea generation process is already over. Now, it is for the combined wisdom of the group to take the essence out of this discussion without any favor or prejudice.

Advantages of Round Robin Method:

1) Everybody is compulsorily given a chance to give out an idea. Thus total participation of all the members is ensured.
2) Dominance of the most vocal person is eliminated, thus making the process a balanced one.
3) Good number of ideas are collected within a short time.

Free Wheeling or Unstructured Method:

In this method, also, a topic is written on a board. A leader or his representative will note down the ideas.

In this method anybody is free to express his ideas at random. The same person is allowed to give as many ideas as he can.

In such a situation, generally what happens is one or two dominant and vociferous participants will overshadow others. The shy participants may not participate in the brainstorming process at all. This type of brainstorming is generally resorted to in case of some emergencies where some quick ideas to fire fight or overcome the urgent problem in hand are required. However, here also, the veracity of the ideas should not bediscussed as they are being spelt out. Since it is free for all, quite a few people might talk at the same time creating some noise and confusion. Also people may stay away from the main point. Some people may not participate at all.

Notwithstanding some of the negative points, the freewheeling method may be able to generate spontaneous and creative ideas. Also, others can expand on the idea given, enabling hitchhiking.

The success of freewheeling method depends on the tactfulness of the leader in handling people. If he is able to analyse and moderate the group and also able to identify the shy, nonperforming members and encourage them to participate, good results can be achieved.

Slip Method:

As the name suggests, the members are asked to give their ideas on a slip of paper and handover them to a coordinator or leader. Only one idea per slip should be given. One may give any number of slips. Also, it is not required to write one's name. This anonymity will encourage people to come out with creative ideas. The leader or coordinator will arrange the slips (ideas) according to different heads.

The advantage of this method is that it encourages everyone to participate.

The disadvantages are:

a) It is a slow process.
b) Hitch hiking or building on other's ideas is not possible.

c) If the hand writing is not legible, it is difficult to trace back to the idea giver and seek clarification.

Some groups display the slips on a board kept in a central place. The members can modify or add ideas on seeing others' ideas. Further, even non members can see the slips and add one or two of their ideas. This way, there is scope for getting more ideas. However, as mentioned earlier, it is indeed a slow process.

Through E-Mail / SMS:

The fourth method adopted now a days is through the electronic media. Here, the slip is replaced by an e-mail or SMS. The problem is first circulated to likely participants. The participants are requested to send their ideas to a central coordinator, within a given time through email or SMS. The members accordingly think on the problem and send their ideas
/ suggestions. The coordinator groups them, analyses them and ranks them.

The advantage of this method is, that the participants can be anywhere and take part in the brain storming exercise. This is very useful for organisations which have multi unit, multi location plants / branches. A wider cross section of people can participate in brain storming. This method will help even the shy to participate because there will not be any direct evaluation of the idea.

However, hitch hiking is not possible. After receiving all the ideas, the coordinator will prune them.

All the above four methods are useful for Quality Circles, QIT teams and SGA teams though the round robin method is more popular.

At what stages Quality Circles use brain storming?

1. Quality Circles start their activity by brain storming. They use this method to select a name for their Quality Circle.

2. They use brain storming for listing and identifying problems related to their work place.

3. They also use brain storming to classify the problems into A,B, & C categories.

4. They use brain storming without fail while drawing cause and effect diagram and root cause analysis.

5. Finding solutions is the next stage where circles rely heavily on brain storming.

6. Predicting possible resistance during implementation is another area where brain storming is used.

Some deficiencies / pitfalls connected with brain storming

Brain storming is not a replacement for data. After getting the ideas and sifting through them, the teams should collect relevant data and analyse them to proceed further.

Some members may be too difficult to handle. They may dominate the whole discussion thereby deflecting the group towards their ideas or points of view. The leader has to play a very effective role in such situations.

Six Thinking Hats

In order to enhance the output of brain storming and make it more complete, Dr. Edward De Bono, the famous exponent of "Creative Thinking" added quite a few new ideas to the process of "thinking" and brain storming. He introduced the concept of "Six Thinking Hats".

Dr. Edward De Bono

Brain storming and problem solving is done by quality circles, Quality Improvement Teams, Six Sigma green & black belts etc. Traditionally, many successful groups deal with problems in a rational and positive way. But they fail to see the problems from emotional, intuitive, creative and negative points of view. Dr. Edward De Bono introduced these elements into the processof brain storming. Let us see how.

Six Thinking Hats Technique

The idea is to make the team members wear imaginary hats of 6 colours, each colour representing a specific thinking. The six hats represent six modes of thinking and are directions to think rather than labels for thinking. Each thinking hat is a different style of thinking.

1. **White hat thinking**

   The white hat thinking refers to thinking (and discussing) with facts, figures, data and information. The leader can say that "we now do white hat thinking". This signals all the members to think and give ideas only based on factual data in an objective way. Questions normally addressed with "white hat" thinking are:

   What data do we have?

What information do we want?

What is missing?

What is the trend likely to be? Etc.

"I think we need some white hat thinking at this point"means "let us drop arguments and look at the data collectedin an objective way".

2. Red Hat Thinking

The red hat covers intuition, feelings, hunches and emotions. Wearing the red hat allows you to put forward your feelings and intuitions without the need for justification, explanation or apology. Some examples are:

"My gut feeling is that this will not work".
"I don't like the way this is being done".
"This proposal is terrible".

The red hat allows feelings, as such, to come into discussion without pretending to be anything else. It is always valuable to get feelings out in the open.

3. Black Hat Thinking

When using black hat thinking, look at things pessimistically, cautiously and defensively. Try to see why ideas and approaches might not work (worst case scenario).It allows you to eliminate the weak points in your plan of action and alter your approach or prepare a contingency plan to counter problems that might arise. A word of caution! Used too early in the problem solving process can easily kill creative ideas with early negativity.

4. Yellow Hat Thinking

The yellow hat is for optimism and logical positive view of things. Yellow hat thinking allows you to look for benefits, feasibility and how some things can be done. Questions one might ask when wearing the yellow hat include:

What are the benefits of this option?
Why is this proposal preferable?

How can we make it work?

Yellow hat thinking is a deliberate search for the positive. Every creative idea deserves some yellow hat attention.

5. **Green Hat Thinking**

The Green hat is for:

Creative Thinking
Additional Alternatives
Interesting proposals
Putting forward possibilities and hypothesis
New approaches
The green hat makes time and space available to focus on creative thinking. Even if no creative ideas are coming, the green hat asks for the creative effort.

6. **Blue Hat Thinking**

The blue hat is for organizing and controlling the thinking process, so that it becomes more productive.

The blue hat is for thinking about thinking.

Wearing your blue hat, you might look not at the subject itself, but at the "type of thinking" that has gone about the project. This thinking sets the agenda for the type of thinking. It is used to develop summary, conclusion & decision.

Blue colour symbolizes the sky or sea and its vastness and coolness, applicable to human thinking process.

Note:

All the members of a team are asked to think of one hat simultaneously at any given time. It is not that one man thinks white hat, one man black hat and so on. Further all are allowed to contribute under all hats. So, no individual will be branded as positive or negative or pessimistic or creative.

In other words everybody is factual, everybody is critical, and everybody is pessimistic and everybody is creative etc.

Benefits of Six thinking hats method

1. Improves focused thinking
2. Allows to say things without risk, fear or favor.
3. It is a convenient mechanism for "switching gears"
4. Improves decision making
5. Leads to more creative thinking