Brainstorming

Presented by:-

Mohammed Hamed Ahmed Soliman

Quality Tools for Problem Solving

Problem

PARETO

Solution

CHECKSHEETS

BRAINSTORMING

PROCESS MAPPING

CAUSE & EFFECT

HISTOGRAM

CONTROL CHARTS
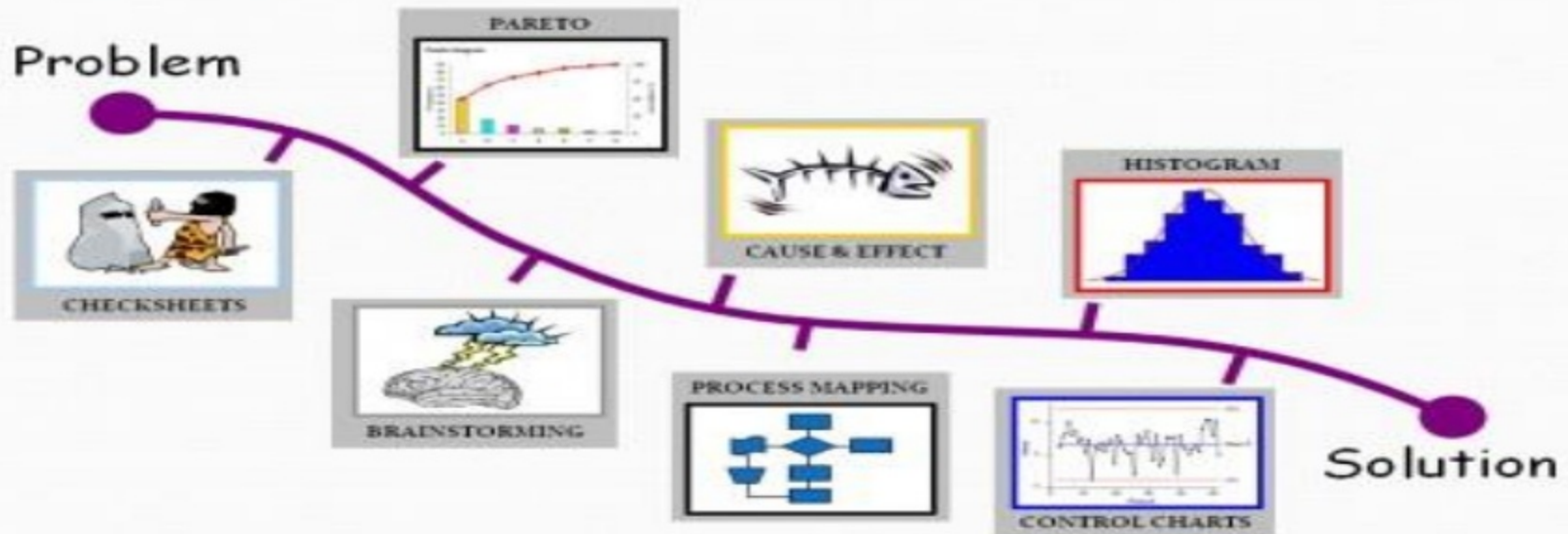
Brainstorming- A Downpour of Ideas

Brainstorming is a well-known technique for generating a large number of ideas in a short time period. It serves as a tool for identifying problems and causes.

To encourage ideas, no idea should be critiqued or commented when offered. Each idea should be listed and numbered, exactly as offered on a flip chart.

Expect to generate at least 50 to 60 ideas in a 30 minutes brainstorming session.

Brainstorming helps to collect the data needed for any
Total Quality Management Process

Brainstorming rules:

1. Do not comment on, judge or critique ideas as offered.
2. Encourage creative and offbeat ideas.
3. A large number of ideas is the goal.
4. Evaluate ideas later.

> When the brainstorming session is over, the ideas should be reviewed, similar ideas combined, and ideas that do not seem to fit eliminated.

Brainstorming is a group problem-solving method. It taps people creative ability to identify and solve problems, and brings out a lot of ideas in a very short time. Because it is a group process, it help builds people as human beings. For example, brainstorming encourages individual members to contribute to the group and to develop trust for the other members.

What is needed for brainstorming?

1. A group willing to work together

You may feel it is impossible that the group you work with will never be a team. However, brainstorming can be a key to build a team! Furthermore, it is a great tool for the group which is already working together.

Who should be included in the group?

Everyone who is concerned for the problem for two reasons: the ideas for everyone who concerned with the problem will be available for the brainstorm. Second, those people can take an active part in solving the problem. In that way they can be got to support the solution.

2. A leader

The main roles of the leader are:

- Provide some guidance so that brainstorm will produce ideas
- Control over the group to keep them on track.
- Encourage people's ideas and participation.
- Put the personal goals aside for the benefit of the group.

3. A meeting place

A place where there is no interruption or distraction. In some plants, groups use a foreman office, an area on the production floor, or even a conference room.

4. Equipment

Flipcharts, markers, and white boards.

How does a brainstorm work?

- Choose a subject for the brainstorm.
- Make sure that everyone understand what the problem or the topic is.
- Each person is to take a turn an express one idea. If someone can't think of anything, he or she says "pass". If someone thinks of an idea when it is not his turn, he may wright it down on a paper and use it at his next turn.
- Write down each idea exactly as expressed.
- Make sure to write all ideas and don't reject any.
- Encourage wild ideas, they may trigger someone's else thinking.

- Hold criticism until after the session.
- The main goal is quantity and creativity.
- A little laughter is fun and healthy but don't overdo. It is O.K to laugh with someone but not at them.
- Allow few hours or days for further thoughts (if needed). The first brainstorm on a subject will stimulate people to start thinking, but an incubation period allow mind to release more creative ideas and thoughts.

Example: Conducting a Brainstorming Session

Brainstorming the Causes of a Defective Capacitor

This group include five people: Samy, the leader; Farouk; Mohammed; Gamal, the recorder, and Ahmed. Since they have been meeting for only a short time and the members have not had much experience with brainstorming, the leader has to do most of the work of keeping them on track. As the group gains experience, other members should begin to share the work of the leadership.

Samy: I think it's time to brainstorm for causes of defective capacitors. Gamal, since you are good at flip chart, could you help us there?

Gamal: Yes of course.

Samy: Let us put a 15 minutes time limit on the session. And don't forget the rules: We will go around from person to another, one idea at time. Don't worry if your idea sound strange. After all, even if your idea is a wild one, it may stimulate somebody else. No evaluations. We will have plenty of time afterward to look at the ideas. Ok are you ready? (Everybody agrees.)

Farouk, your turn.

Farouk: Vendor (Gamal writes down, VENDOR).

Mohammed: I have seen dents in some of them. And I think that a dent on the outside means something breaks or gets squeezed or some how messed up inside.....

Samy: Mohammed, you are saying "dents". Is that right?

Mohammed: No, I mean dents show us there is a problem inside.

Samy: Can we abbreviate it to read: "Dents show inside problem"?

(Mohammed nods "O.K"

Samy: Gamal, it's your turn.

Gamal: I think I will pass this time.

Ahmed: The leads to the capacitor sometimes don't get soldered well. So that makes it look like a defective capacitor.

Gamal: How do I write that? "Soldering of leads"?

Ahmed: Yup that's O.K.

Samy: My turn. I will build on Farouk's idea of "vendor". May be its only on of them that is really the problem and not all of them. Gamal write "One Vendor"

Farouk: Seems to me the shape of AX12's is the problem. They remind me of the toilet seats cover. (Much Laughter).

Samy: Let's get back to the subject. Farouk, may have something there. So Samy write "Shape of AX12's".

Prodding Techniques

Sooner or later the downpours of ideas in the brainstorm dries up. What do you do to get it going again? Or what do you do with the silent member who doesn't participate?

Encouraging ideas: priming the pump again

If the brainstorming session seems to slow down, the leader may suggest *piggybacking*. Piggybacking is building on others' ideas. For example, if one of the team members has suggested the vendor as a cause of the problem, another one might say "one vendor" not all of them could be the reason of the problem.

Another technique is to suggest opposites. For example, too much & too little.

Dealing with the silent member

When a member of the group doesn't speak up, the best way to deal with this is to be patient.

Sometimes a person will be quite for a meeting after meeting then he will open up. It will be then very exciting, so give this persons a time. May be he/she will be quite, but will serve the group with some other ways.

A simple effective method to bring the silent member, is to remind the whole group that when each person's turn comes in the brainstorm, he or she just says "Pass" if not ready with an idea. That gets people of the hock but it also breaks the sound barrier. They hear their own voices and participate by saying "Pass."

The direct question is another method, but you must use it with care.

Something like" Mohammed, you know the process well, do you have a suggestion or input here?"

The second session

After the initial brainstorm and sometime for further thinking, it's a good idea to have another session to capture more ideas. These ideas come into mind as the group member think about the problem and consider what was said in the first session.

Two ways to handle the second session:

1. Gather all group together and give them a time limit of 10-12 minutes for additional ideas. The same rules applied as in the first session.

2. Post the brainstorming sheets in the area of the workplace so that it will allow people who work in the same area to contribute even if they are not a regular members of the problem-solving group. In that way they feel they are not left out.

Completing a brainstorm

How do you make sure that brainstorming has covered all possible causes of a problem?

Sometimes the solution lies in a search lab, where only a high trained expert has a chance of digging it out. Often, so, the solutions are right on your doorstep.

Even if you don't solve the problem right away, you can make sure that you have covered all the general areas of possible causes. Make a list of the general areas, and make sure that your group or team has examined every one of them.

Such a list would include a number of subjects. There are some major factors that go into an operation: machine, method, material, environment, and people.

Machine include: the type of the machine, the maintenance, and the setting.

Materials are the elements that come to the process, whether they are raw material, sub-assemblies, components, or partially processed materials.

Method concerns the process itself.

Environment is important too, humidity, dust, and other climate problems that may affect the process.

Finally, the **Person** doing the job. Factors connected with the person could be training, eyesight, and level of skills.

Other general areas may also apply to the problem. Such as money, management, and other errors.

Difficulties with brainstorming and what do you do with them

You are stepping on my turf!
It will be hard for one of the group members to be suspected that he is the reasons of this problem. For example, the design engineer is attending the session, and the cause of the problem came out to be in the design process.

Train your team, and develop them. It is necessary to explain that we are not here to blame anyone. And we are sometimes blind with our problems so we need others to look on it. We tend to see only a part of the problem that's why the causes may be hidden. It is a matter of prospective.

Criticism

Build a positive environment in the group. Criticize problems not people. Make sure that ideas not persons are evaluated. Make sure that mistakes are not publicized and never appear in anyone personal life.

The difficult member

Some members are difficult to deal with in the group. They talk too much, they get off track, they criticize people not ideas or they shoot down ideas. How do you deal with him?

Be firm but friendly. Talk to him privately and explain how his way is distracting the group work. Give the difficult member a special job to do for the group. Don't fight him. When he gets the group off track, re back the conversation to the normal topic gently.

Usually difficult members became the strongest support of the group, or they leave.

Fault-Tree Analysis

Is a method to increase the reliability of the product and find the potential causes of a problem to prevent the product failure.

Building a fault tree analysis FTA

1) Identify a top failure
2) Brainstorm basic contributors to failure
3) Link contributors to the top failure
   - ❑ Determine which combination of contributors is needed to cause the top failure. (Ask: How many of the inputs are needed to cause the top failure?)
   - ❑ Link the contributors to the top failure.
   - ❑ Each contributor (cause) can be given a weight depend on the occurrence so we would know which failure is likelihood to occur.

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Thank you!

Eng. Mohammed Hamed Ahmed Soliman

The American University in Cairo
Email: mohammed@personal-lean.org
        m.h.ahmed@ess.aucegypt.edu
https://eg.linkedin.com/in/mohammedhamed
Tel: +201001309903