

Process Improvement 17-8.01-K

KNOW the process improvement tools that are used to generate ideas and identify opportunities for improvement, as presented in the E-PME Study Guide.

Process Improvement

To effectively improve processes, as many people as possible should be involved in the improvement efforts. People who contribute to a change are more likely to be excited by it and supportive of it. One way to get people involved in change is to gather their ideas about how to effect that change.

There are several process improvement tools to gather new ideas. These tools include:

- Brainstorming
- Why technique
- Contingency diagram
- Affinity diagram
- Force field analysis

Brainstorming

Brainstorming is a group idea-generation technique, which relies on the non-judgmental generation of ideas. As a result brainstorming promotes:

- Creative thinking
- Enthusiastic participation
- Avoidance of “analysis paralysis”

Although there are different types of brainstorming sessions, they are generally all conducted in the same way.

*How to Conduct a
Brainstorming
Session*

1. Post the problem or topic where all participants can see it.
 2. Write all ideas on the board and do as little editing as possible.
 3. Solicit ideas using one of these brainstorming techniques:
 - Structured brainstorming
 - Unstructured brainstorming
 - Silent brainstorming
 4. Reduce the list to the most important items.
 5. Combine similar items.
 6. Discuss each item, in turn, on its own merits.
 7. Eliminate items that don't apply to the original issue or topic.
 8. Give each person one final chance to add items.
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**Structured
Brainstorming**

To gather ideas using structured brainstorming:

1. Solicit one idea from each person in sequence.
2. Participants who do not have an idea at the moment may say "pass."

Structured brainstorming has an advantage and a disadvantage.

Structured Brainstorming	
Advantage	Disadvantage
Each person has a chance to participate regardless of rank or personality.	Lacks spontaneity and can sometimes feel rigid and restrictive.

**Unstructured
Brainstorming**

To gather ideas using unstructured brainstorming, participants simply contribute ideas as they come to mind.

Unstructured Brainstorming	
Advantage	Disadvantage
Participants can build off each other's ideas. The atmosphere is very relaxed.	The less assertive or lower-ranking participants may not contribute.

Silent Brainstorming

To gather ideas during a silent brainstorming session:

1. Have participants write ideas individually on post-it notes or small slips of paper.
2. Collect the papers and post them for all to see.
3. Best used in combination with other brainstorming techniques.

Silent Brainstorming.	
Advantages <ul style="list-style-type: none">▪ Prevents individuals from making disruptive "analysis" comments during the brainstorming session.▪ Provides confidentiality.▪ Can help prevent a group from being unduly influenced by a single participant or common flow of ideas.	Disadvantage <p>Group loses the synergy that comes from an open session.</p>

Why Technique

The Why Technique is a technique used to discover the root cause(s) of a problem. By repeatedly asking the question "Why?" you peel away layer after layer of "symptoms" to get to the real heart of an issue. You may never know exactly how many times you'll have to ask why.

You can use the Why Technique to:

- Identify the root cause(s) of a problem
- See how different causes of a problem might be related

How To Do It:

1. Describe the problem in very specific terms.
2. Ask why it happens
3. If the answer doesn't identify a root cause, ask "Why" again.
Note: You know you have identified a root cause when asking "Why" does not yield any more useful information.
4. Continue asking "Why" until the root causes are identified. This may take more or less than five "Whys."

Points to Remember:

1. Always focus on the process-aspects of a problem, rather than the personalities involved. Finding scapegoats does not solve problems.
 2. The answers to each successive "Why" may require the additional gathering of data.
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Contingency Diagram

The Contingency Diagram is a technique for generating ideas concerning an issue or concern that capitalizes on negative thought. Think of all the ways to cause a problem to get worse or continue unchecked. Then develop an action plan to overcome these barriers.

You can use a contingency diagram to:

- Develop action plans to overcome ways that will cause problems to get worse or continue
- Deal with negative people

How to do it:

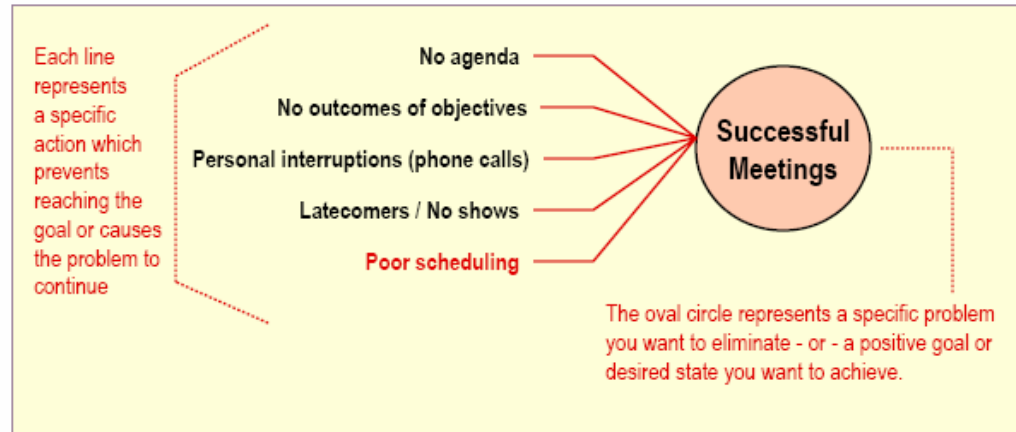
A Contingency Diagram can help you generate ideas from which you can develop specific actions necessary to eliminate a problem or make an improvement. You use it by following these steps:

1. Select a situation (either a goal or problem)
2. Draw a contingency diagram (see example)
3. Brainstorm: *What will cause this situation to get worse or continue?*
Think of things that will prevent your desired state.
4. Enter each action down on the Contingency Diagram
5. List specific actions to prevent these obstacles
6. Use this list to develop an Action Plan

This can be a very powerful idea and solution generating tool. The key is to follow the rules of brainstorming. Once the group has exhausted its ideas on the topic, discuss and clarify the list that has been created.

The Contingency Diagram allows you to tap into the power of brainstorming and provides a convenient framework to organize your ideas. It also allows you to prioritize and generate further action based on those barriers to your desired state which you have creatively discovered.

Below is an example of a completed Contingency Diagram and the Prevention Checklist / Action Plan it generated.



A **Prevention / Action Checklist** can be developed by taking each obstacle identified and brainstorming ways to prevent it from happening. Below is an example using only one of the items identified above.

Obstacles	Corrective Actions
1. Poor scheduling	<ol style="list-style-type: none"> 1. Publish agenda in advance 2. Check everyone's schedule in advance. 3. Hold members accountable for schedules.

Another good technique is to take each of the items you identified as a barrier and put it into the oval and complete a separate Contingency Diagram. This allows for some specific action items and generates a tremendous number of ideas.

Affinity Diagram

An Affinity Diagram is a technique for organizing verbal information into a visual pattern. An affinity diagram starts with specific ideas and helps you work toward broad categories. This is the opposite of a Cause and Effect Diagram, which starts with the broad effects and works toward specific causes. You can use either technique to explore all aspects of an issue.

You can use the Affinity Diagram to:

- Organize and give structure to a list of factors that contribute to a problem
- Identify key areas where improvement is needed

How To Do It:

1. **Identify the Problem:** Post the problem or issue in a location where all team members can see it.
2. **Generate Ideas:** Use index cards or sticky-back notes to record ideas.
3. **Cluster your Ideas (on cards or paper) into Related Groups:** Use questions like, "Which other ideas are similar?" and "Is this idea somehow connected to any others?" to help group the ideas together.
4. **Create Affinity Cards:** For each group, create a card that has a short statement describing the entire group of ideas.
5. **Cluster related Affinity Cards:** Put all of the individual ideas in a group under their affinity card. Now try to group the affinity cards under even broader groups. You can continue to group the cards until your definition of "group" becomes too broad to have any meaning.
6. **Create an Affinity Diagram:** Post all of the ideas and affinity cards. Draw outlines of the groups with the affinity cards at the top of each group. The resulting hierarchical structure will give you valuable insight into the problem.

An example of an Affinity Diagram is depicted on the next page.

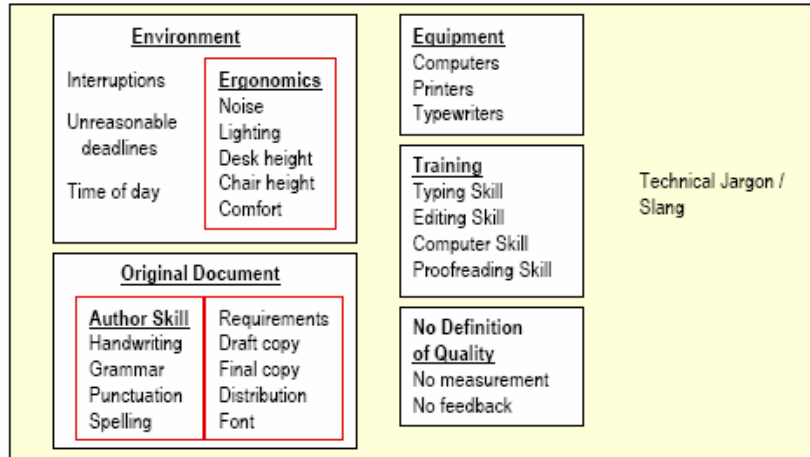
Affinity Diagram
(continued)

Example of an Affinity Diagram

A publication team wanted to reduce the number of typographical errors in their program's documentation. As part of a first step, they conducted a brainstorming session that produced the following list of factors that influenced errors:

Computers	No Feedback	Proofreading skill	Printers
Unreasonable deadlines	Noise	Lighting	Typewriters
Chair height	Comfort	Desk Height	Time of Day
Technical jargon	Interruptions	Handwriting	Grammar
Slang	Spelling	Draft copy	Punctuation
Distribution	Font	Final copy	Editing skill
Computer skill	Typing skill	No measurement	

The following affinity diagram helped them focus on areas for further analysis:



Tips for Keeping Ideas Flowing

- 1. Use 3x5 cards or post-it notes to record your ideas.** This allows you to cluster similar thoughts, eliminate duplications and use a silent version of any of the techniques listed in this section. This can be helpful when issues carry a lot of emotion.
- 2. Be Creative.** Don't limit suggestions or ideas early on in discussions. Encourage people to think "outside the box". Play "What If" and try to visualize the desired state IF you could do anything you wanted. Play "If I were the Commandant".
- 3. During your idea generating sessions:**
 - Change seats views can be affected by where you sit in relation to others.
 - Avoid cliques encourage people to sit with those whom they don't know.
 - Review the data or ideas periodically - encourage further inputs.
 - Rotate groups (and/or members) to provide a fresh perspective.
- 4. Make it clear you want EVERYONE to participate!**
 - Create a climate where it is OK to disagree.
 - Work to develop a group consensus.
 - Don't evaluate ... concentrate on getting a quantity of ideas.
- 5. HAVE FUN!**

Force Field Analysis

Force Field Analysis is a technique that helps you identify and visualize the relationships between the significant forces that influence a problem or goal.

You can use the Force Field Analysis to:

- Identify key factors (forces) that promote or hinder the solution of a problem or the achievement of a goal
- Identify improvement opportunities

How To Do It:

1. Define the Objective

Clearly identify the problem or goal to be analyzed.

2. List the Forces

List the key factors that *promote* or *hinder* the achievement of your goal or the resolution of your problem. Groups should use an idea generation technique. Use two lists, one for promoting forces and one for hindering forces.

3. Prioritize

Prioritize the forces in each list according to their relative impact on the problem or goal. You can use nominal group technique or some other decision-making tool.

4. Implement

Minimize or weaken the hindering forces and maximize or strengthen the promoting ones.

Goal: Quit Smoking	
Promoting Forces	Hindering Forces
better health →	← habitual behavior
save money →	← need for nicotine
family won't breathe smoke →	← need to have fingers occupied
food will taste better →	← need to have something in mouth
won't have to leave building every half hour →	← gain weight every time I try to quit