

## ***1) AFFINITY DIAGRAM***

### **1. What is a key difference between an Affinity Diagram and other tools?**

Affinity Diagram builds the hierarchy 'bottom-up', starting from the basic elements and working up, as opposed to starting from the top header and working down.

### **2. Why is an Affinity Diagram called a creative, silent (non-verbal) activity?**

It aims to stimulate creative, 'right-brained' thought, rather than logical 'left-brained' thought, by banning discussion during the building of the diagram. This silent activity also has the benefit of avoiding discussions that could become heated or otherwise drift away from the real problem at hand. The most effective way to work is to have everyone move the displayed ideas at will, without talking. This is a new experience for many people. It has two positive results: It encourages unconventional thinking (which is good), while it discourages semantic battles (which are bad). It also helps prevent one person from steering the Affinity.

### **3. When shouldn't we use the Affinity Diagram?**

As a rule of thumb, if less than 15 items of information have been identified; you can skip the Affinity process. Instead, you can clarify and combine the ideas and then use one of the Decision-Making Tools to identify the highest priority items.

### **4. What are the traits of ideal team?**

Each member has a good understanding of the problem, works well together and has complementary, rather than supplementary, knowledge.

## ***2) BAR CHART***

### **1. What is a key difference between a Bar Chart and other tools?**

Bar Chart display discrete quantities rather than continuing change.

### **2. What Questions The Bar Chart Answers?**

What are the differences in system response between the groups? Does the data contain outliers?

### **3. What are Practical variations on Bar Charts?**

They are Percentage Bar Charts, Three-dimensional Bar Charts, Side-by-side Bar Charts, Stacked Bar Charts, and Pictorial Charts.

### **4. Using Bar Chart how do you show a variable changes over time?**

If you are showing how a variable changes over time, use bar chart with time as the horizontal axis.

### **3) BRAINSTORMING**

**1. In the meeting, the facilitator focuses the group by describing the four rules of Brainstorming (which he will help to drive during the meeting, what they are?)**

- No criticism or debate. Absolutely no negative talk allowed. Focus on the problem, not each other. Suspend judgment until later .
- The sky is the limit. The wilder the ideas the better. Crazy ideas often lead to useful ideas .
- Quantity rather than quality. The more ideas you have, the more chance of a useful one appearing .
- Mutate and combine. Key off each other's suggestions, changing and mixing existing ideas in order to create new ones. Even slight variations or 'misinterpretations' are valid.

**2. Why does Brainstorming use divergent thinking instead of conventional thinking that we often use to jump to solutions that are easy to find?**

Brainstorming enables the mind to reach its full creative potential by suspending judgment, removing the fear of failure and encouraging the use of divergent thinking to achieve a long list of ideas. True divergent thinking differs from conventional thinking, in that the list will contain illogical and unconventional ideas as well as logical and obvious ones.

#### **4) Cause and Effect Diagram:**

- 1. What is the main limitation that you should keep in mind when working with a cause and effect diagram?**

A 1:

The main limitation that we should keep in mind when using cause and effect diagram is that if a problem is caused by a combination of factors, it is difficult to use this tool to depict and solve the problem.

- 2. Primary cause areas in a cause & effect diagram are frequently arranged into four major categories, what are the recommended categories for administration and service?**

A 2:

**Equipment, policies, procedures, and people** are recommended for administration and service while manpower, methods, materials, and machinery are recommended for manufacturing.

#### **5) Control Chart:**

- 1. What are the basic components of control chart?**

A 1:

Control chart has the following three basic components:

1. A centerline, usually the mathematical average of all the samples plotted.
2. Upper and lower statistical control limits that define the constraints of common cause variations.
3. Performance data plotted over time.

- 2. What is the main difference between run chart and control chart?**

A 2:

Run chart focuses on time patterns while control chart focuses on acceptable limits of the process.

#### **6) Check Sheet:**

- 1. When should we use a check sheet?**

A 1:

We should use a **check sheet** as a data gathering and interpretation tool when we want to:

1. Distinguish between opinion and fact;
2. Gather data about how often a problem is occurring; and
3. Gather data about the type of problem occurring.

## 2. What are the three types of check sheet?

A 2:

The three (3) types of check sheet are as follows:

1. **Tabular Format.** Also known as “tally sheet”. We use it when we want to count how often something happens or when we want to record a measurement
2. **Location Format.** We use it to mark a diagram showing the exact physical location of a defect or characteristic.
3. **Graphic Format.** We use it to record and display data at the same time. The raw data are plotted directly onto a graph-like chart

## **7) Force Field Analysis**

### **1. How field force analysis technique helps in the planning process of process improvement?**

A: This technique helps increasing success probability of the decision or situation under investigation through identifying changes that could be made to the plan by:

- reducing the strength of the restrain forces
- strengthen the driving forces

### **2. What are the possible sources of the forces that are included in the field force model?**

A: Sources could include persons (key players, stakeholders), habits, attitudes and behaviors.

## **8) Flow Chart**

### **1. What does each of the following symbols represent (square, diamond, and arrow)?**

A: Square or rectangle: activity or task  
Diamond: decision point  
Arrow: flow of control

### **2. Is it possible to have two arrows out of a single process in flow chart diagram? Explain?**

A: No it is not possible, because it would make the process illogical.

## **9) Decision Matrix**

### **1. What is the importance of weight distribution in a decision matrix?**

A: Weight is used to reflect the relative importance of each criterion involved in the decision matrix to have a more accurate decision.

### **2. What does decision matrix do?**

A: Decision matrix allows teams and individuals to systematically prioritize a set of decisions or situations based on certain criteria.

## 10) *Pareto Chart*

### 1. What does Pareto Chart do?

A Pareto chart is a graphing tool that prioritizes a list of variables or factors based on impact or frequency of occurrence. This chart is based on the Pareto principle, which states that typically 80% of the defects in a process or product are caused by only 20% of the possible causes

### 2. Why would you use Pareto Chart in Quality Improvement Project?

It is easy to interpret, which makes it a convenient communication tool for use by individuals not familiar with the project.

### 3. Give examples when you can use Pareto chart during the following phases of Quality Improvement Project:

- **Define Phase**
- **Measurement Phase**
  
- **Define Phase:** to stratify Voice of the Customer data to indicate the most important requirements of the customer.
- **Measurement Phase:** to stratify data collected on the project to indicate the most important causes that contribute to the quality problem.

## 11) *Histogram*

### 1. What does Histogram do?

A histogram is a basic graphing tool that displays the relative frequency or occurrence of data values-or which data values occur most and least frequently. A histogram illustrates the shape, centering, and spread of data distribution and indicates whether there are any outliers. The frequency of occurrence is displayed on the y-axis, where the height of each bar indicates the number of occurrences for that interval (or class) of data, such as 1 to 3 days, 4 to 6 days, and so on. Classes of data are displayed on the x-axis. The grouping of data into classes is the distinguishing feature of a histogram

### 2. Why would you use Histogram in Quality Improvement Project?

It is important to identify and control all sources of variation. Histograms allow you to visualize large quantities of data that would otherwise be difficult to interpret. They give you a way to quickly assess the distribution of your data and the variation that exists in your process. The shape of a histogram offers clues that can lead you to possible Xs (causes of the quality problem). For example, when a histogram has two distinct peaks, or is bimodal, you would look for a cause for the difference in peaks.

**3. Give examples when you can use Histogram during the following phases of Quality Improvement Project:**

- *Measure Phase*
- *Analyze Phase*
- *Improve Phase*
- *Control Phase*

- Measure phase: to begin to understand the statistical nature of the problem.
- Analyze phase: to help you identify potential Xs that should be investigated further. They can also help eliminate potential Xs.
- Improve phase: to characterize and confirm your solution.
- Control phase: to give you a visual reference to help track and maintain your improvements.

**12) *Gantt Chart***

**1. Talk about three different uses of Gantt chart, with real life examples?**

[1] The Gantt chart is a popular tool for planning and scheduling simple projects. It enables the project manager to initially schedule project activities and then to monitor progress over time by comparing planned progress to actual progress.

Example: quality improvement project

[2] The Gantt chart can be also used to organize and clarify the actual and intended use of resources in a time framework.

Example: Scheduling classrooms for a university, scheduling conference rooms in organizations and scheduling hospital operating rooms for a day.

[3] The Gantt chart can be also used for trial-and-error schedule development to get an idea of what different arrangements would involve.

Example: a tentative surgery schedule might reveal insufficient allowance for surgery that takes longer than expected, and can be revised accordingly.

**2. What do you need to identify/determine to prepare a Gantt chart?**

To prepare a Gantt chart, the project manager must first:

- Identify the major activities
- Identify time estimates for each activity
- determine the sequence of activities
- Identify responsibilities for each activity

### **3. What are the most important advantages and disadvantages of Gantt chart?**

Advantages:

- Simple, easy to use and understand
- Popular

Disadvantages:

- fails to reveal certain relationships among activities

### **4. There are two types of Gantt chart, identify them and discuss them in some detail?**

[1] Load Chart: a Gantt chart that shows the loading and idle times for a group of machines or list of departments, rooms etc. It is used to organize the actual and intended use of resources in a time framework.

[2] Schedule Chart: a Gantt chart that shows the orders or jobs in progress and whether they are on schedule. It is used to monitor project progress.

**13) Run Chart:**

**1. When to use run chart**

Ans.

- a. Used to establish a baseline for improvement
- b. See what happening in a process
- c. Analyze the effects of change you have made to a process

**2. How do we interpret a Run Chart?**

Ans. Interpreting a Run Chart requires you to apply some of the theory of variation. You are looking for trends, runs, or cycles that indicate the presence of special causes.

A Trend signals a special cause when there is a sequence of seven or more data points steadily increasing or decreasing with no change in direction.

When Run Chart shows nine or more consecutive data points on one side of the centerline, it is an unusual event and should always be investigated. A cycle must recur at least eight times before it can be interpreted as a signal of a special cause of variation.

**14) Process Map**

**1. How process map is different from flowchart?**

Ans. Process map used to show cross-functional processes where, flowcharts are used to diagram steps within a function or specific process.

**2. How many functions should be listed on a processes map?**

Ans. 2-6

**15) Pie Chart**

**1. When to use Pie chart?**

Ans. To easily compare categories

**2. At which stage/area of process improvement do we use pie chart?**

Ans. At the stage of Measuring, displaying and analyzing data

## 16) *Scatter Diagram*

### 1. What is Scatter Diagram?

It is a graphical representation that the pattern of behavior in one variable due to change in another one.

### 2. When is it used?

It is used to examine the relationship between two variables. It could be used to examine cause and effect too by examining relationships.

## 17) *Three Actual Rule:*

### 1. What is “Three Actual” Rule?

It a guideline to make sure that decisions are based on facts.

### 2. How “Three Actual” Rule is built?

- Actual place should be visited.
- See the actual problem.
- Actual people involved should be involved by asking them and have what they say.

## 18) *Weighted Voting*

### 1. What is Weighted Voting?

A weighted voting is one in which the preferences of some voters carry more weight than the preferences of other voters. It is conducted usually after brainstorming after each member knows the weight he carries to resolve the contradicting issues.

### 2. How is it built?

- Set up a grid with names on rows and options on columns headings.
- Give each member a number of votes to distribute according to their preferences.
- After they are ready, record members’ votes by options not by person.
- Review the results and make agreement if it needs to be narrowed further (a decision matrix may be used.)