

Root Cause Analysis – Simplified Tools and Techniques

Bjorn Andersen and Tom Fagerhaug**I. Problem Understanding**

According to Andersen and Fagerhaug, the authors of *Root Cause Analysis – Simplified Tools and Techniques*, “Openness is a prerequisite” to root cause analysis.¹ The best tools used in root cause analysis have two things in common: “They are best applied by a team of people working together...” and “...they require an atmosphere of trust, openness, and honesty that encourages people to divulge important information without fearing consequences.”²

One method Andersen and Fagerhaug recommend such an open group use in problem analysis is the critical incident method. NALIP (National Association of Lutheran Interim Pastors) uses the critical incident method in its training program and encourages its use by intentional interim pastors in the field.

The critical incident method is helpful in understanding the significant aspects of a problem, and the “nature of the problem and its consequences.”³ The critical incident method requires assembling a group of participants who represent all departments or functional areas of the company that are involved in, or related to, the problem situation. Each participant is asked to write down answers to one or more predefined questions. The questions should cover issues related to the problem situation, which aspects cause the most problems, cost the most, generate the most negative publicity, and so on. Once the answers are submitted, they should be sorted according to frequency of mention and analyzed for patterns. The answers can be presented in a graph, if necessary. The most critical incidents can be used as starting points for a search for problem causes.⁴

A performance matrix is a useful graph used “to illustrate current performance and importance at the same time, helping to arrive at a sense of priority.”⁵ A performance matrix will help identify which causes will provide the greatest amount of relief, if addressed. A performance matrix is divided into four sectors on the basis of current performance and importance of the factors. The meaning of each quadrant is as follows:

- Unimportant (low importance, low performance). The performance level of this aspect of the problem is low, but its low importance renders it unnecessary to improve this particular issue.

¹ Bjorn Andersen and Tom Fagerhaug, “Root Cause Analysis, Simplified Tools and Techniques,” (Quality Press, Milwaukee, Wisconsin, 2006.) 27.

² Ibid.

³ Ibid.

⁴ Ibid., 30.

⁵ Ibid., 36.

- Overkill (low importance, high performance). The performance level of this aspect of the problem is high, but this is of less consequence because the issues in this quadrant are not especially important. Therefore, this is not a candidate for improvement.
- Must be improved (high importance, low performance). Factors that fall within this area are important, while the current performance level is low. This is an obvious area for starting improvements.
- OK (High importance, high performance). A golden rule is that areas where the performance is already good also should be improved too. If no factors fall within the “must be improved” quadrant, issues in the OK quadrant are the second choice for improvement.⁶

II. **Data Collection**

Andersen and Fagerhaug insist, “analysis based on insight and facts has a much better chance of accomplishing its objectives.”⁷ The authors discuss three specific tools (and a variety of techniques) to collect data: *sampling, surveys, and check sheets*.⁸

First tool – Sampling. It may be costly and time consuming to take a survey of the entire congregation and school families. The authors note, “Sampling is a way of economizing the data-collection process.”⁹ The authors discuss four types of surveys:

- **Random sampling** – Random numbers are used to determine which units will be drawn from a larger population. Random numbers can be found in special tables, by using a computer to generate them, or simply by throwing dice. An example is pulling out numbers 4, 11, 19, 21, 34, and so on, for testing for defects.
- **Systematic sampling** – A means to overcome the fact that random sampling can at times be difficult or even impossible. In systematic sampling, measures are made at fixed intervals of time, numbers, length, and so on. For example, every 20 minutes, the number of customers waiting in line are counted.
- **Stratified sampling** – A necessary tool when you know that there are differences between categories within the entire population. In such situations, data is purposely collected from each of the categories so that the samples represent the categories in the right proportions to one another. If a company has seven salespeople, customer satisfaction scores can be collected from the customers of each, relative to the number of customers each serves.
- **Cluster sampling** – An adequate approach when the population is known to be stable and without much variation. In this case, a group of the units is taken to represent the whole population; for example, the entire batch of parts produced during an hour may represent an entire week’s production.¹⁰

⁶ Ibid.

⁷ Ibid., 70.

⁸ Ibid., 69 – 84.

⁹ Ibid., 71.

¹⁰ Ibid., 71.

Second tool – Surveys. The authors note, “When you want to collect data about people’s attitudes, feelings, or opinions” a survey is useful.¹¹ Surveys are used to collect a customer’s level of satisfaction and determine their needs and expectations.¹² The authors recommend the following steps when conducting surveys:

1. Clearly define the objective of the survey and how the data will be used later.
2. Determine what information is required to achieve this objective.
3. Decide how the survey will be undertaken – that is, written (via mail, fax, email, or the Internet) or verbal (by telephone or in person).
4. Develop the questionnaire, keeping in mind issues such as type and sequence of questions, understandability, language, grouping of questions, brevity, and so on.
5. Test the questionnaire to ensure that all questions are easy to understand and can measure what they are intended to.
6. Identify the sample of respondents.
7. Perform the survey according to the chosen approach.

Third tool - Check Sheets. Due the messy nature of data collection the authors recommend using check sheets. The authors note, “The main purpose of a check sheet is to ensure that all data is registered correctly.”¹³ The steps involved are:

1. Clearly define what events are to be recorded. (Add a category of “other” to capture incidents not easily categorized into any of the specified groups.)
2. Define the period for data recording and suitable intervals.
3. Design the check sheet to be used during data recording, allocating space for recording each event, and for summarizing within the intervals and the entire recording period.
4. Perform the data collection during the agreed period, ensuring that everyone understands the tasks and events to be recorded.
5. Analyze the data to identify events with unusually few or many occurrences.

III. *Practical and Theological Reflection*

I routinely use the data collecting tools Andersen and Fagerhaug recommend in my intentional interim ministry placements. As Andersen and Fagerhaug state, surveys are useful in collecting data about “people’s attitudes, feelings, or opinions,”¹⁴ while check sheets and graphs are useful in organizing and presenting the data. I have not used the sampling method, other than making sure a person from each interest group is represented on the Transition Task Force. One criticism I have heard about using critical incidents, surveys, and check sheets is that the methods are based largely on polling participants and assessing opinion. When dealing with churches and schools, the tangible products have to do with staff, member numbers, budget, and demographics. Typically, those “hard” data numbers are publicly disclosed, but how we use the data is largely a matter of feeling, opinion and interpretation. So, while it may be true that much of the data gathering process done in ministry settings revolves

¹¹ Ibid., 75.

¹² Ibid.

¹³ Ibid., 79.

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around opinion, there may be value in making sure that all voices are being heard and the system is expected to be open and trust one another. Just as Andersen and Fagerhaug say, “openness is a prerequisite” to root cause analysis.¹⁵ Churches and schools often find themselves unable to solve problems because there is a lack of trust and openness. Problem solving is not done alone, or in isolation. At times of transition and change, groups or individuals may seek the path of least resistance attempting to implement solutions with little input. Knowing this King Solomon writes in Proverbs, “Plans fail for lack of counsel, but with many advisers they succeed.”¹⁶

¹⁵¹⁶ Proverbs 15:22.