

*Structured problem
solving demands
structured
communication*

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Just the Facts

Problem solvers often have trouble sharing knowledge and communicating solutions and results.

Communication efforts can be organized and structured more effectively using the situation-complication-question-answer framework and the Pyramid Principle.

The approach incorporates layers of data and evidence into a logical structure, providing the audience with enough information and knowledge to understand the situation.

Whether to share knowledge with peers or pitch a proposal to senior managers, there comes a time when problem solvers must communicate.

After hours of methodical research and analysis, many problem solvers get a thrill from the revelation of a solution.

Often, problem solvers build a presentation outlining the journey to share this excitement. For a Six Sigma project, for example, they may structure their communication using the same define, measure, analyze, improve and control (DMAIC) problem-solving framework used for the discovery. Only later, however, they realize that the audience had lost interest, the message was not clearly received and the excitement was not transferred.

The problem raises the question: "Is there a better way to structure communication for engagement and clarity?"

Barbara Minto had the same question. After graduating from the Harvard Business School in 1963, she became the first female consultant at the revered McKinsey & Co. At the firm, she noticed a global deficit in communication skills. In her work to improve the consultants' skills, Minto developed a highly effective method of communication and recorded it in her international bestseller *The Pyramid Principle: Logic in Writing and Thinking*.¹

Effective communication in business requires two elements: a narrative and logical structure. Whether you are preparing a presentation or report, the tools to use are situation-complication-question-answer (SCQA) to establish a narrative and the Minto Pyramid Principle to build a logical structure. The DMAIC approach, although useful in problem solving, is not often effective for structuring communication because the audience of time-pressed senior managers, for example, may not have a particular interest in it.

This article applies SCQA and the Minto Pyramid Principle to elements of DMAIC to illustrate a practical approach to more effective and engaging communication. The article will first describe how to establish a narrative with SCQA in relationship to DMAIC. It will then explain how to support it using Minto's Pyramid Principle and the idea of mutually exclusive and collectively exhaustive (MECE). To show how to apply this approach, the DMAIC example is reconstructed using the Minto tools.

SCQA spelled out

The SCQA framework is an effective tool to improve one-to-one or one-to-many communication:

Situation: The situation is the steady state—in other words, how things were before a problem happened or how things were perceived before a problem was identified. It must be common knowledge or easily proven because the situation establishes an agreement with the audience before focusing the audience's thoughts on the complication.

Complication: The complication is what changed in the situation—whether an event or a perception—and must be fixed. The complication is closely related to the define stage of DMAIC—that is, the part of define that states the problem. The complication must affect the situation directly to create a logical and intuitive narrative. Lastly, the complication must be specific enough that the audience has only one question about it.

Question: The question is the logical extension of the complication and what the answer intends to address. The situation, complication and question can be as short as a sentence each. Easily fitting on one or two presentation slides, they must be intuitive extensions of one another. At this stage, the goal is not to convince but to draw the audience from the widely accepted situation through a reasonable complication and intuitive question toward the proposed solution: the answer.

Answer: Having established the necessity of the narrative and how to construct it using SCQA, the important step of establishing the audience's attention, interest and context for your answer is complete. Now the solution must be presented in an equally thoughtful manner. The remainder (and bulk) of the communication can be dedicated to the logical construction of the answer.

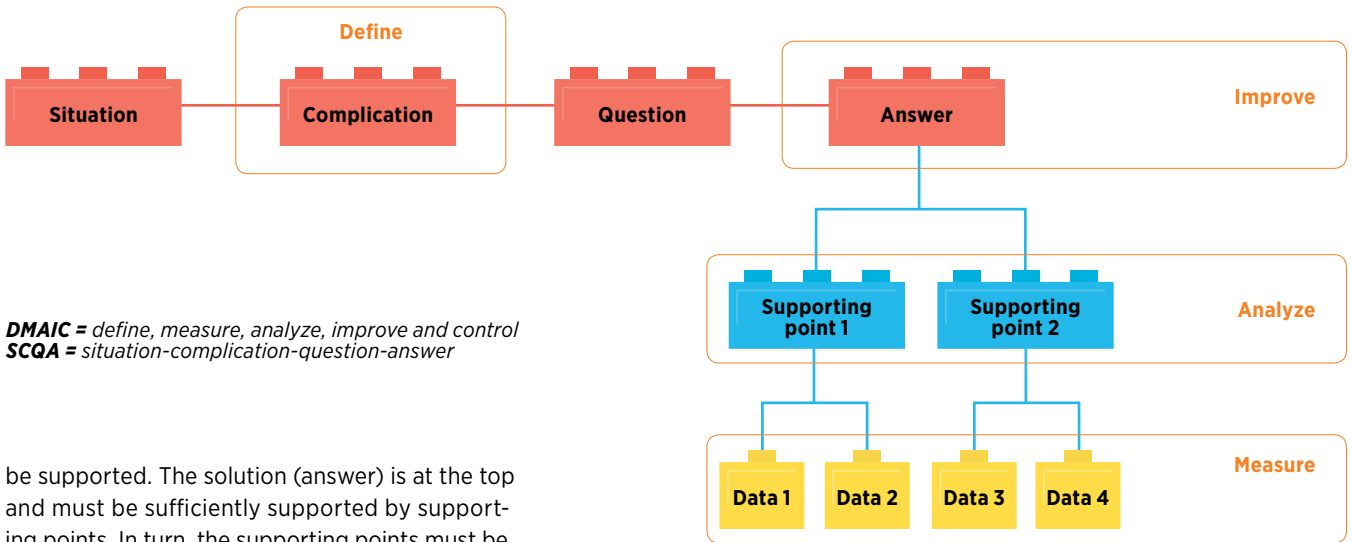
With the context established, the audience is primed for the main point. What is the answer? The improve element of the DMAIC process has the answer. The Pyramid Principle complements SCQA and helps structure the supporting points and data compellingly (see Figure 1).

Pyramid structure

Imagine a pyramid. The top of the pyramid is your answer to the question in SCQA. In a pyramid of stone, the top stone is supported by a wider set of stones. The wider stones are supported by a still wider base. This is just how the answer should

FIGURE 1

SCQA and DMAIC



DMAIC = define, measure, analyze, improve and control
SCQA = situation-complication-question-answer

be supported. The solution (answer) is at the top and must be sufficiently supported by supporting points. In turn, the supporting points must be sufficiently supported by data so that the entire structure is solid and robust.

Leading with the main point (the solution) is paramount because it is what the audience needs to answer the established question. If the solution is less-than-completely intuitive, the audience will start wondering how such a conclusion was reached, and solutions often are not intuitive. Rather than letting the audience wonder aimlessly, their thoughts can (and should) be guided.

To help guide the audience through the logic, build support for the answer with ideas from the analysis stage of DMAIC. These supporting points immediately follow the solution so that the audience's thoughts are guided to the evidence and reason required for the solution to be whole and true.

Finally, data from the measurement stage of DMAIC can be supplied to support each of the supporting points. Data are occasionally saved for the appendix—but only when a solution's supporting points are completely intuitive for the audience, not requiring explanation. The data show your supporting points as true, complete and verifiable. Data uphold supporting points just as the supporting points uphold the solution.

When executed for the entire answer, the pyramid structure supplies the audience with the most important information first, comprehensive

supporting points and data to justify the supporting points. In other words, this arrangement supplies the information just when the audience might question the argument's assertions.

The audience is guided when statements are made and immediately justified with reason or data. Whether written or oral, the information should follow the pattern: solution, supporting point, data, data; supporting point, data and more data. Although a brief introduction of all supporting points may be necessary when expounding, justification back to data should follow each supporting or sub-supporting point.

The data from the measurement stage of DMAIC should be included immediately after each supporting point to affirm its validity. In some cases, the data can be placed in the appendix, but be sure that enough evidence is provided so skeptical audience members easily can draw the intended conclusion.

The greatest strength of the Pyramid Principle is that the audience knows what to do with each piece of information because of the consistent structure. The evidence follows a pattern that seems to anticipate their thoughts. Additionally, clear lines of reasoning will make the supporting point solid and robust if the supporting point and data are MECE.

MECE

The rule for all supporting points and data is that they should be MECE. All supporting points that uphold the answer must be of the same type without overlap, mutually exclusive, and represent all possibilities, collectively exhaustive. MECE in a Venn diagram will have support elements in each of the regions while none are in multiple regions, mutually exclusive. At the same time, no elements are outside of the regions nor are any regions empty, collectively exhaustive. MECE may make a boring Venn diagram, but that is what makes the structure persuasive and easy to follow.

Just like the rules for our MECE Venn diagram, ideas in the argument should not be in two categories simultaneously supporting the answer. Speculation and doubt are invited into the audience's mind when the structure cannot be understood clearly. The arguments may be complex, but the structure should not be. Take time to find categories that allow data and supporting points to be MECE.

It is nearly impossible to show that the data and rationale cover all possibilities if they are not confined to residing within an MECE set. There's no doubt that it could be done, but in a presentation of limited time or memorandum that must be solely sufficient for understanding, it is hardly worth the risk.

In addition to reducing confusion from complex or intermingled thoughts, this approach also can help proactively identify and remedy holes or failures in logic. MECE and the pyramid structure can be a challenge to construct, but they are profoundly powerful in building a logical, coherent and easy-to-follow answer.

Example

To give a practical example of the applications of SCQA and the Pyramid Principle, consider a DMAIC project to reduce tooling costs on a fleet of milling machines. The problem statement is, "Tooling costs are too high."

Measurements are done to establish the current state, and the analysis reveals that inconsistent coolant flow is the primary contributor to the accelerated tool wear. That, in turn, is the primary contributor to the increased tooling expenditure. The improvement action, tested and verified, is to increase and standardize coolant pressure. The controls are documentation and auditing.

To build the SCQA narrative from the DMAIC project, first pull the problem statement from the define stage, "Tooling costs are high," which is the complication. Now go back to the situation, which is likely, "When the machines were first installed, everything ran well."

Put together, you get, "When the machines were first installed, the tool life was as expected, but now the tool costs are getting higher." This leads straight to the question, "How do we fix the high tooling costs?" This is the perfect question for our answer from the improve action, "Increase and standardize coolant pressure."

The pyramid structured and MECE arguments must support the answer. The supporting points are found in the analysis of DMAIC: The coolant pressure correlated with increased tool life, and the other factors do not correlate. Stating the noncorrelations will help address the audience member's "But what about ...?" interjections.





Is there a better way to structure communication for engagement and clarity?

To be MECE, the correlation tests for raw material composition, physical dimensions, work center, and cutting speeds and feeds must be included in the supporting point. Avoid analysis of compounded variables. Operators may be a factor, but this compounds variables because they may use multiple work centers or change speeds and feeds, as well as being unique individuals.

The overlap of variables is complicated and will lead the audience to be less certain of the findings. Supporting point No. 1 is that the pressures are, on average, too low. That supporting point is immediately followed by a graph showing data of cutting life directly proportional to pressure.

Next, supporting point No. 2 states that work center pressures are inconsistent, and follow-up data illustrates the wide dispersion of current pressures.

Different steps to take

DMAIC and other quality tools are powerful for problem solving, but the steps in solving a problem effectively are not the same as the steps in

communicating the solution effectively. When communicating, the audience or reader is the customer. Problem solvers must consider the customer's needs when preparing presentations, reports and other communication.

Using Minto's techniques, problem solvers can structure communication with the same rigor they use to structure their problem solving. The result of identifying the customer—and the subsequent rigor in communication—is an engaged audience, clear communication and the best chance for the problem solver to recreate his or her excitement in the audience. [QD](#)

REFERENCE

1. Barbara Minto, *The Pyramid Principle: Logic in Writing and Thinking*, Minto International, 1978.



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