Columbia College Calgary

Problem Solving Process

Adopted from an article by
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"A Guide to Problem Solving"

Problem Solving is a fundamental process that remains the same regardless of the problem. Of course, the complexity of the process changes with the nature of the problem.

A DEFINITION OF PROBLEM SOLVING

Problem Solving is a process that brings a current difficult or undesired condition closer to a more meaningful, beneficial, and desired outcome.

Major Premises

The Steps in the problem-solving process are based on the following premises:

1. The most important single action in problem solving is becoming more clearly aware of the actual problem and not the symptoms of the problem.

2. Problems may have many causes, not just one. Every situation can be described as a field of forces. These include various psychological, social, political, economic, and cultural forces.

3. Valid decisions depend on clear, accurate, and objective information.

4. Working with others can improve the process. A group of informed individuals working on a problem can compress into a few hours the or days mental work that might take months for one person.

5. Getting good results from a valid decision requires that those who must carry out the decision, understand it, and are committed to it.

6. Those responsible for solving a problem must develop a supportive environment:
   6.1 The people who experience the problem should ideally participate in making any decisions for change.

   6.2 Those who participate in the problem-solving process should have a trusting relationship and should communicate openly about the problem.

7. Consensus building may be an important ingredient in finding a solution that is satisfactory to all stakeholders.

INTRODUCTION

There are essentially three major parts in the problem solving process. These are:

A. To determine and define the problem,

B. To identify alternatives and prepare recommendations,

C. To make recommendations and implement decisions.

As the reader will note on the flow chart (see Appendix), each of these areas is noted by the letters A, B and C. All the boxes marked with the letter "A" relate to determining and defining the problem. These include the first four boxes. Detailed activities associated with these boxes are described

further in this document. The five boxes marked with the letter "B" relate to identifying alternatives and preparing recommendations. Again, detailed activities are described within this document. That will assist the reader as they proceed through each of these steps. Finally, the five boxes marked with the letter "C" will assist the reader in making recommendations and implementing decisions. Detailed activities are included to assist in proceeding through these steps.

It is critical that the participants read through the entire document before attempting to solve any problem. This will assist them in knowing what questions are to be addressed and hopefully feel more comfortable as they move through each step in the problem solving process.

STEPS IN PROBLEM SOLVING

The Problem Solving Process is a cyclical feedback system. It is essentially continuous, with no real beginning or end, and the completion of one step may affect the definition of the next steps. These steps are outlined on the following page.

A1. Assess the Situation

Before launching a strategy for change, it is important to assess the problem in terms of whether any specific action is really needed and, if said action is taken, whether it will actually have some impact on solving the problem. This should normally require the participation of the various stakeholders who are or will be affected by a decision.

To assess the situation, answer the following questions:

1. What is occurring that requires change?

2. What will result if nothing changes?

3. Can any significant change actually be introduced?

4. Can relevant and objective information be obtained?

5. Does the situation deserve the effort (right now) compared with other problems, priorities, and interests?

6. Are the persons involved in the situation committed to making a change?

7. At which step in the process should the effort begin? Here are four examples or options:

   - To remove or reduce a deficient condition, consider beginning with step A2 and go through all the steps.

   - To develop an improved strategy (rather than change a deficiency), consider beginning with step B2, although steps A3 and B1 can provide some useful tools.

   - If there is a plan of action that has not been tested or put into practice, consider beginning with step B4.

   - If a tested strategy simply has not been put into practice, consider beginning with step C5.

A2. Identify the Problem

One of the most crucial and difficult steps in the problem solving process is to identify the actual problem. Problems usually are obscure, disguised, or locked inside some emotional distress, attitude, conflict, or misleading outgrowth of another situation. This may require input from an objective third party or expert. Another major difficulty is in determining the standard by which a deficient condition is measured. Unless we are clear about our standards, we cannot be clear about our problems.

This step may take a long time and may include several revisions, but the effort is well worth the investment, of time. A problem that clearly described is half solved.

<u>To identify the problem, answer the following questions:</u>

1. What is specifically desired that is not happening? What are the standards or values that apply to the situation?

2. What is happening (described in objective and observable terms)?
   - Who is involved?
   - Where does it occur?
   - When does it occur?
   - Why is it happening?
   - What is the extent of the problem, that is, how many or how much?
   - Would gathering more information fundamentally change the answer that you already have (thinking strategically)?

3. Now the problem should be summarized in one comprehensive and concise, word, phrase, or statement.

4. It may also be wise to get input and feedback from a relevant decision maker or more senior individual at this point and at various points as you proceed through the process.

5. It may be wise to get input or feedback from various internal and external more senior individual who may be affected by the outcome at this point and at various points throughout the process.

A3. Define the Goal

The goal is a statement of what is to be done about the problem. It should be expressed whenever possible in measurable terms, that is, the results to be achieved in the form of observable and/or behavioral outcomes. Abstract or subjective statements of outcome are impossible to assess.

To define the goal (the desired outcome), define or answer the following:

1. Results - the outcomes expected:
   - What specifically is to be the expected result?
   - Who will be involved?
   - When will the result be achieved?
   - Where will the result occur?

2. Criteria - measure for acceptability:
   - What are the quantitative standards that indicate the minimum level of goal achievement?
   - What are the qualitative standards that indicate the minimum level of goal achievement?

3. Conditions - the perimeters of the effort:
   - What limitations or restrictions in terms of time and/or money are to be imposed?
   - What resources in terms of people and/or equipment are required?

Now the goal should be summarized in one concise word, phrase, or statement. Check to make sure that it described an outcome rather than a strategy. It is important not to confuse ends with means at this point.

A4. Provide a Structure

If the individual or group chooses to move ahead in the problem solving process, it will proceed to step B1.

B1. Analyze the Forces

This step is to collect, organize, and analyze all the relevant information regarding the current situation as a foundation for creating a creative and realistic plan for change. At this point, it is very helpful to involve stakeholders (individuals) who are familiar with the situation.

This step has two aspects: past circumstances that have influenced the formation of the problem and present factors (forces) that affect the achievement of the goal.

Past Circumstances

To have a clear picture of the circumstances from which the issue evolved, answer the following questions:

- What are the past decisions, occurrences, and factors that created the present problem or situation?
- What was the context in which these circumstances occurred?
- Were any pay-offs or benefits derived from these past decisions or actions? If so, what were they and who benefited from them?

Present Factors (Force-Field Analysis)

Force-field analysis, developed by Kurt Lewin (1951), is a tool for organizing and analyzing information as a basis for a change effort. Any situation can be considered as a dynamic balance of forces working in opposite directions. Forces moving toward change (supporting forces) are opposed by any number of forces moving in the opposite direction (opposing forces). No change will take place in the situation unless an imbalance between these forces is created. This procedure involves identifying the problem, determining the goal that the group or individual wishes to achieve, listing the supporting forces and the opposing forces, and assessing each force in terms of its strength and vulnerability to change.

An important aspect of this procedure is brainstorming, which is a group process designed to produce a large number of ideas in a short period of time. While someone writes down what is said, the members of the group spontaneously and quickly express their ideas more or less by free association. No comments or criticisms are permitted: anything and everything offered is noted. Each participant is encouraged to say whatever he or she wishes, no matter how unusual or unrealistic it may appear.

The Procedure

State the problem in the middle of a sheet of paper. State the goal at the right side of the sheet. Then use the brainstorming technique noted above to create a list of supporting forces and enter these on the left half of the sheet. Make a similar list of present opposing forces on the right half of the sheet. Be as specific as possible.

The next step is to clarify items and eliminate repetition. Then, for each of the two lists, rate each item in terms of its strength, with the strongest being rated 10 and the rest rated between 1 and 9 when compared with the strongest.

Next, for each of the two lists, rate each item that was given a strength of 5 or above in terms of how vulnerable it is to change efforts. Start by rating the easiest to change as 10: then weigh the other items on a scale of 1 to 10, in contrast with the easiest. This will provide a picture of how easily each force can be controlled or influenced.

Finally, identify and list the items for additional information as needed and proceed to obtain that information.

Once the analysis is completed, alternative strategies for creating an imbalance - or creating change - can be developed. In general, this change can occur through any of the following alternatives:

- Changing the strength of any force,
- Changing the direction of any force,
- Withdraw opposing forces, or
- Adding new supporting forces.

It often is best to begin by working with opposing forces. Increasing supporting forces often increases resistance (it is a law of physics that every action has an equal and opposite reaction). Strategies for change that are directed toward reducing opposing forces generally are more effective.

B2. Generate Alternative Strategies

The first step is to review and revise the goal if the intervening steps have helped to clarify it. The next steps are quite unlike systematic problem analysis. They require quite a different orientation - an openness to the absurd, spontaneous, and poetic resources of the preconscious. In these steps, creativity and innovation are employed while logic and proportion are suspended.

Fantasizing

Attention is focused on the specifications of the goal and the people involved. For about two minutes, everyone privately fantasizes freely about a solution to the problem on their own sheet of paper. The fantasies are then shared and compared to see what patterns are present as well as what elements are different from others.

Brainstorming

First considering those opposing forces that are strong and vulnerable, brainstorm actions to remove or minimize them. The process then is repeated with the supporting forces that are strong and vulnerable. When ideas no longer flow freely, repetition is then eliminated and each statement is clarified.

Synthesizing

The list of items is synthesized by identifying logical combinations. All items that have an organic or logical connection are identified with a given letter. Each combination is then defined by a brief description of the strategy to be used, and, where appropriate, one or more are linked to provide more comprehensive possibilities.

B3. Select the Best Strategy

This step uses a matrix to compare alternative strategies with decision-making criteria. This enables the group and possibly more senior decision makers to be as precise as possible about the relative value of any one strategy or combination of strategies. There are two alternative procedure.

Fixed-Criteria Procedure

A "quick and dirty" distinction of one strategy versus another can be made by selecting the criteria of most benefit and least cost. Cost/benefit criteria are listed vertically and alternative strategies are listed horizontally. Using the rating system employed in the force-field analysis, assign a value of 10 to the alternative with the highest benefit and lowest cost and then rate the others on a scale of 1 to 9. Select the alternatives with the best combinations of benefit and cost.

Goal-Criteria Procedure

Review the goal and identify each element that can be described as a criterion or measure. Segregate into two categories (IN/OUT and WANTS) criteria by which to measure alternatives. IN/OUT criteria represent minimum conditions that an alternative must satisfy to be considered further, ie., alternatives meet these criteria or are tossed out. Alternatives that do meet minimum conditions are then evaluated by WANTS criteria, ie., which is preferable? The key measure is the comparison among the criteria. If the relative importance of the criteria listed under WANTS differs, assign each a weight of 10 and weigh each against the criterion using a scale of 1 to 10.

Screen out alternatives using the IN/OUT criteria: then compare the alternatives against each WANT criterion in turn and assign a rating. Use the rating mechanism described previously. Multiply the weight for each criterion by the rating for each alternative. Compare the resulting scores.

If the alternative with the highest score has face validity, a tentative decision can be made. If it does not, the next highest alternative should be reviewed.

B4. Forecast Potential Problems

The next step is to test the feasibility of the selected course of action. Again, it will help if people who are involved, affected by, or have technical knowledge about the situation participate. Looking at the preferred course of action, carry out the following steps:

1. Brainstorm a list of things that could go wrong and list every idea.

2. Rate each potential problem in terms of probability. Using 10 as a rating for certainty, assign each item a score from 1 to 10.

3. For each item that received a rating of 5 or more (seems probable), rerate it in terms of threat. Using 10 as a rating for catastrophe assign each item a score from 1 to 10.

4. For items with ratings of 4 or more on both scales, seek preventive actions: if you cannot prevent the problem, seek a contingency action to keep the problem from having a serious impact.

5. For an alternative with preventive or contingency actions, if no crippling potential problems seem likely, the preferred course of action should be sound.

6. If problems still seem likely, return to major step B3. Select another alternative and repeat the steps for forecasting and analyzing potential problems.

B5. Develop Recommendations

The final steps is to identify and describe recommendation(s). This may include certain concerns or observation that either precede or follow it. It may also describe two or more options for consideration with related pluses and minuses associated with each.

C1. Present Recommendation(s)

After receiving, reviewing, assessing, and discussing the options it is then necessary to determine what recommendation(s) will be given to decision maker(s).

The decision maker(s) may choose to accept all or part of the recommendation(s); request further information or study; or not accept the recommendation(s).

C2. Sharing and Getting Feedback

Once it is decided to move forward with a decision it is important to share the decision with other stakeholders. This sharing should be open and invite questions, comments and concerns. It is quite possible that one or more conditions or variables had been over looked and to move forward without being open to feedback and willing to change would be short sighted. Therefore the presentation should always be in the form of "This is what we are planning to do" - "Do you have any suggestions or concerns?" This forum of openness will encourage response and rather than becoming defensive, the presenter should be quiet, accept the input or ask for clarification, and proceed back to the drawing board.

It is also important to get advice on implementation, procedures, concerns and timing. As noted in A1, this step may be informally utilized at various points throughout the problem solving process.

C3. Test the Strategy

Before beginning to carry out any change, it is important to test the strategy. Testing may reveal more potential problems and also may clarify the extent to which the ability and commitment exist to carry out the strategy. The result in most instances is a refinement of the strategy that will increase its effectiveness.

The test to be used will be dictated by the nature of the strategy. If the strategy is interpersonal, role playing may suffice. If the strategy is technical (change in policy, procedures, or methods), a brief trial period with a small number of people may suffice. The test should give some indication of the plan's feasibility.

C4. Write a Work Plan

The next step is to develop a work plan that delineates the activities necessary to carry out the strategy. This should account not only for the activities that directly relate to implementing the strategy but also for any contingency to prevent potential problems. To complete this step, complete the following:

1. List all the tasks required to carry out the selected course of action.

2. Order the tasks in chronological sequence.

3. Write a plan that (at minimum) accounts for the following:
   - Tasks - What needs to be done
   - Primary responsibilities - who is going to carry out the tasks, and
   - Deadlines - when the tasks are going to be accomplished

C5. Implement and Evaluate the Plan

The process at this point may seem overwhelming. However, if the chosen strategy seems to be right, the following may help:

1. Proceed with the plan.

2. Forgive and remember. If errors are made while the strategy is being carried out, forgive the lapse, remember the goal and carry on.

3. Evaluate and revise. Be aware of the consequences of any action, and if the plan is not progressing, either revise it
   or return to step A2.

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APPENDIX
Problem Solving Process Flow Chart

A1. Assess the Situation

A2. Identify the Problem

A3. Define the Goal

A4. Provide a Structure

B1. Analyze the Forces

B2. Generate Alternative Forces

B3. Select Best Strategies

B4. Forecast Potential Problem

B5. Develop Recommendations

C1. Present Recommendations

C2. Sharing and Getting Feedback (Use at any stage as required)

C3. Test the Strategy

C4. Write a Work Plan

C5. Implement and Evaluate the Plan