



Poor Frank

An Example of Business Problem Solving

Fred Nickols

Introduction

Many articles, books, and training courses that address the subjects of problem solving and solving problems do so from the perspective of the individual as a lone problem solver.

This view might hold true for the kinds of math problems found on standardized tests and for that very sizable set of problems we as individuals must face and solve in the course of making our way through life. However, solving problems in an organizational setting is an activity that far transcends the skills and abilities of a single individual – no matter how talented he or she might be.

The case study serving as the centerpiece of this article is intended to illustrate in a small way the complexity associated with organizational or business problem solving. A second objective is to present a useful framework for keeping track of the bases that must be covered in the course of solving a problem.

Poor Frank

Frank Henderson is the director of a small special operations division in a \$300 million training services and publishing company. The work of his division includes registering people for seminars, booking hotels and conference centers as training sites, hiring and training seminar leaders, fulfilling orders for materials, preparing invoices, and handling customer inquiries and complaints. Frank's division supports more than 50 different programs.

Frank is in a bit of a dither. He has a *big* problem – a "rate" problem – and a host of related, smaller problems. It's budget time and he's just informed his 50-odd internal customers that, unless some "magic" can be worked, the rates his division charges are going to be about 20 percent higher next year. His customers, the company's program managers, are very unhappy and Frank's boss wants to know what can be done.

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Essentially Frank is caught in a real cost-crunch – between a rock and hard place, as the saying goes. On the one side, his operation, along with several others, was recently moved from the old, "drab-but-dirt-cheap" quarters it occupied for the last five years to brand-new, very fancy and very expensive facilities. Long-term, all things considered, this is a good move for Frank's company. But, short-term, the cost of space has more than doubled. On the other side of the equation, things are equally glum. Frank's division has been losing work. The work lost amounts to 20 percent of the division's hours for the previous year. Frank saw some of this coming and earlier in the year took steps to reduce his division's staff. In addition, he instructed his managers to begin making greater use of less expensive temporary agency staff.

The net of all this is that the fixed expenses in Frank's division have increased considerably and must now be distributed over a much smaller base of productive hours. As a consequence, the rates Frank must charge in order to recover the expense of work performed in his division have been increased and, according to projections, will have to be increased yet again.

Poor Frank. What is he to do?

Time Out for Some Theory

Problem solving is an information-based search activity and the search is for information. Except for those problems confined to our own small sphere of personal knowledge and influence, the information necessary to solve a business problem is typically scattered about the organization. Moreover, it is not necessarily in a form conducive to rational analysis, problem solving, or decision-making. As a result, in the course of solving a business problem, we must stay continuously focused on the information we need, the information we have, and any differences between the two.

Although the immediate object of the search process is information, the ultimate goal of the problem solving process is action. Even if a decision is made to do nothing, this is a conscious, deliberate act. But the appropriate action to take, especially in an organizational setting, is not always easily determined. In other words, although we know that a situation presents a problem and that something must be done about it, we are frequently uncertain as to the action to take.

What makes a problem a problem, then, is uncertainty regarding the action to take. If we are confronted by a situation requiring action and we know immediately what to do, we do it. We might call a situation a problem because it requires action, but it is not the kind of problem that requires us to figure out what to do unless we also are stymied, stumped, or stuck.

The most fundamental objective of the problem solving process is to reduce uncertainty regarding action. Uncertainty is reduced by information. It is for this reason that problem solving is said to be an information-based search activity.

The Reduction of Uncertainty

The reduction of uncertainty regarding action typically proceeds in three identifiable stages or phases.

- First there is *identification*. This phase is triggered by the detection or even the suspicion of a problem, and it terminates with the conclusion that there is (or isn't) a problem and that it is (or isn't) worth solving. The kinds of information typically sought during this phase can be summed up as "facts and figures."
- Next comes *investigation*. Here, the purposes are to find out what is causing the problem (if the concept of cause is relevant) and what might be done about it. The kinds of information generally of most use in this phase fit under the heading of "insights and ideas."
- Last comes *intervention*. The aim here is to do what has been determined. Action, in an organizational setting, generally requires consensus, commitment, cooperation, coordination,

planning, evaluation, review, revision and, more than anything else, resources. In this phase, the information requirements are those associated with planning, action and "the politics of persuasion."

The Life-Cycle of A Problem

In addition to the three stages or phases of uncertainty reduction just mentioned, problems themselves may be viewed as having a life-cycle. The three stages or phases of the life-cycle of a problem are the problem state, the solution path or transition state, and the solved state.

- The *problem state*, also known as *what is*, is that condition or set of circumstances that requires action but for which the appropriate action to take is not immediately apparent. Consequently, there is a requirement to search for a solution.
- The *solution path* refers to the course of figuring out what to do about the problem, and to the changes that transpire in the course of moving from the problem state to the solved state. (Once all is said and done, the difference between these two views of the solution path is the difference between what was conceived and what was achieved.)
- The *solved state*, also known as *what should be*, is the goal state, the condition or set of circumstances that is being sought in place of the problem state.

Time In: Back to The Practice

By arraying the three stages of uncertainty reduction against the three stages of a problem's life cycle, a nine-cell

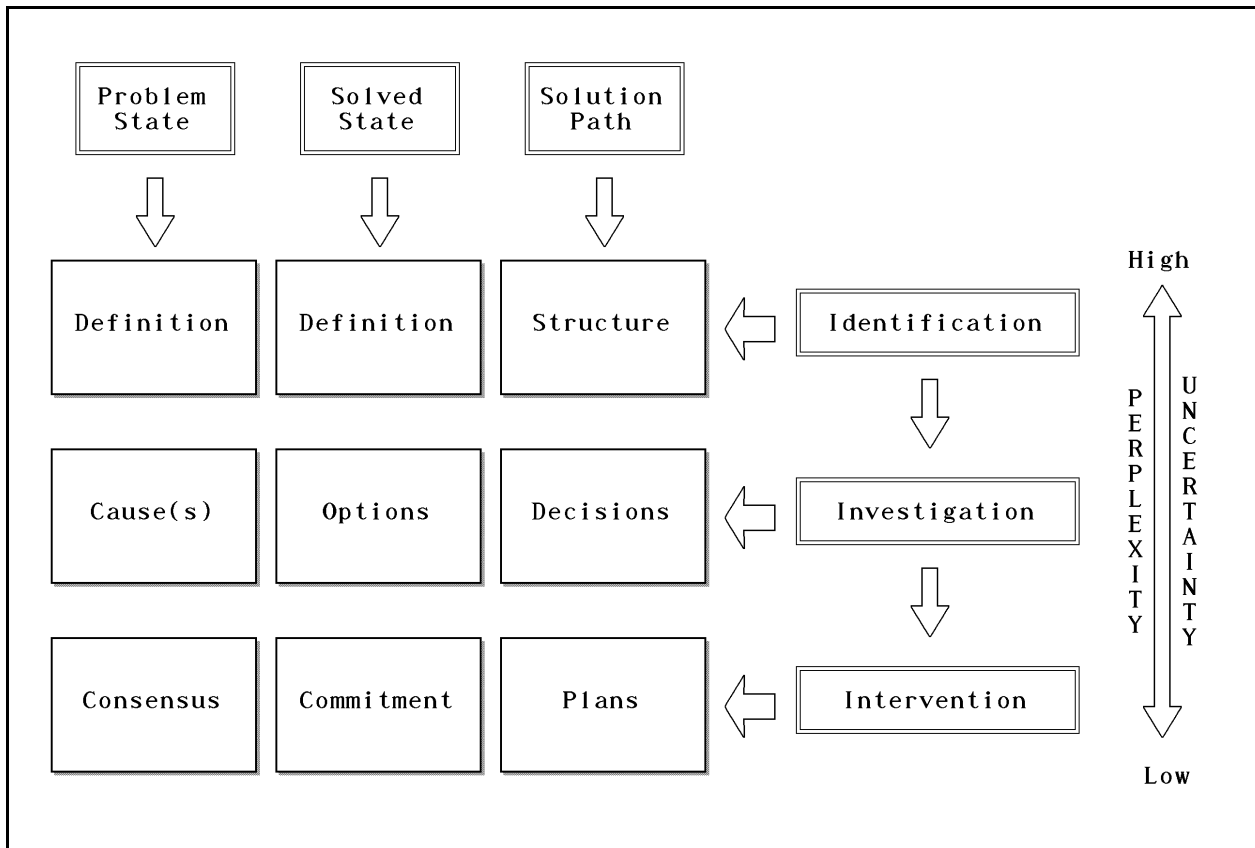


Figure 1 - The Problem Solving "Bases"

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matrix can be created (see Figure 1). These nine cells can be thought of as "bases" to be covered during the course of a problem solving effort. Each base is discussed briefly in the following paragraphs and related to poor Frank's problem.

Definition of The Problem State

To define the problem state means much more than simply providing a written description of it. To define the problem state is to establish its boundaries. This involves locating and isolating it as well as articulating it.

Frank has a lot of work ahead of him in order to adequately define the problem he's trying to solve. Is his problem one of rates being too high or is it that his costs have soared? Or, is it that his base of productive hours has plummeted as the result of lost work? Or, is it that he must get his rates down – or else?

Definition of The Solved State

The solved state must be defined with as much care as the problem state. It is very helpful here to indicate how the attainment of the solved state will be measured. The solved state may also be thought of as the goal state.

In Frank's case, several possible solved states suggest themselves: Lower rates, reduced fixed costs, increased levels of productivity, less expensive facilities, more work for the division, and so forth. Some of these, taken in relation to others, are actually solutions.

Structure of The Solution Path

All problems have some kind of structure. Problems consist of or are embedded in some network of factors and forces that interact with one another. The current configuration of this network of factors and forces produces the problem state. Some other arrangement of these same factors and forces would result in the solved state.

In Frank's division, the structure of the problem – and the structure of the search space or solution path – consists of those factors associated with fixed and variable expenses and their relationships to one another. (We'll take a look at the structure of Frank's problem later in this article.)

Cause(s) of The Problem State

Some problems are indeed "caused." Typically, these are situations where everything is going along just fine and then, Wham! – something happens and the situation deteriorates. The something that happens is usually an unforeseen change of some kind, and solving the problem often amounts to finding out what changed and, if possible, correcting it. A surge of current, for example, can "cause" a fuse to blow or some other component to burn out. The approach to these kinds of problems amounts to "find it and fix it."

In Frank's case, there are two obvious "causes." The move to a more expensive facility has more than doubled his expenses for space. And, the loss of work has decreased the base of hours over which he can spread his fixed expenses (like space).

Options for Achieving The Solved State

Unfortunately, not all problems have causes and not all problems that do have causes can be solved by finding and fixing the cause. As a result, many problems are solved as a result of compensating for causes, not by correcting them or putting things back the way they were.

In Frank's case, for example, he can neither get back the work that was lost nor can he relocate to cheaper quarters. He must find some other option for achieving the solved state, some other way of solving the problem besides fixing its cause.

Decisions Regarding The Solution Path

When covering this base, attention should be fixed on the 3 C's of decision making: Choices, Criteria, and Constraints. Choices and criteria are rather straightforward issues, but constraints complicate things. It is easy to

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figure out a solution to any problem, no matter its scope, scale, or complexity. It is not so easy to figure out a solution to a problem that will work within the constraints posed by the situation.

In Frank's case, several simple solutions present themselves right away: Move back into the old, inexpensive facility. Move into new, equally inexpensive facilities. Run out and find more work to replace the work that has been lost. These are all things a lot easier said than done. There are constraints on what Frank can do. It takes lead-time to obtain new business. Frank's division is a cost center, not an independent line of business; which is to say that Frank and his division can't go wherever he pleases but must go wherever corporate says. Frank's customers are in the new facility, too. Moving to new quarters and leaving them behind is probably not acceptable and, except for the upward impact on Frank's rates, it's not at all clear that Frank's customers are in any way dissatisfied with the new facilities.

What Frank is up against is the fact that what makes business problem solving difficult is not simply finding a solution but finding one that fits the constraints of the situation.

Consensus Regarding The Problem State

Perceptions and expectations differ from person to person and, organizationally speaking, they vary from division to division. What is problematic for one person or unit can constitute an ideal state for someone else or some other unit.

In organizations, problem solving is often a hotly political endeavor. For this reason alone, it is important to develop consensus regarding the definition of the problem and that it is a problem worth doing something about. Failure to do this might result in the problem solving effort being sidetracked, derailed (or even "torpedoed").

It would probably be unwise of Frank to complain too loudly about the effect the move to new quarters is having on his rates. But, he might find others receptive to the suggestion that his increased rates pose a serious problem for his customers and for the future financial viability of his division.

Commitment Regarding The Solved State

It is generally accepted that organizations are complex systems, meaning that if you make changes in one place, effects are sure to be felt elsewhere, including some places that weren't anticipated.

Because implementing a solution involves making changes in and to the organization, it is as important to develop commitment to the solution as it is to develop consensus regarding the definition of the problem. Frank, for instance, might be able to arrange to have some work reassigned from another division to his. By itself, this would have the beneficial effects of expanding his base of productive hours, thereby lowering his rates and pleasing his customers.

But, unless the effect on the rates in Frank's division is such that his new rates are lower than his present rates, and his new rates are also lower than the rates in the division from which he is obtaining the additional work, about all he really accomplishes as a result of such a move is to shift the cost burden from the programs he currently supports to the new ones. This won't do. He's not likely to develop any commitment to this solution.

Plans Regarding The Solution Path

Essentially, this amounts to "lining up your ducks." Once a solution has been settled on, it is important to lay out an action plan specifying who is to do what when in order to make things happen. Depending on the scope and seriousness of the problem, advance troubleshooting and contingency planning might or might not be called for.

Now, let's return to poor Frank and see how he fares as he comes to grips with his problem.

Getting to The Heart of The Matter

Frank knows in general that the loss of work and the increased space charges are contributing to his problem but

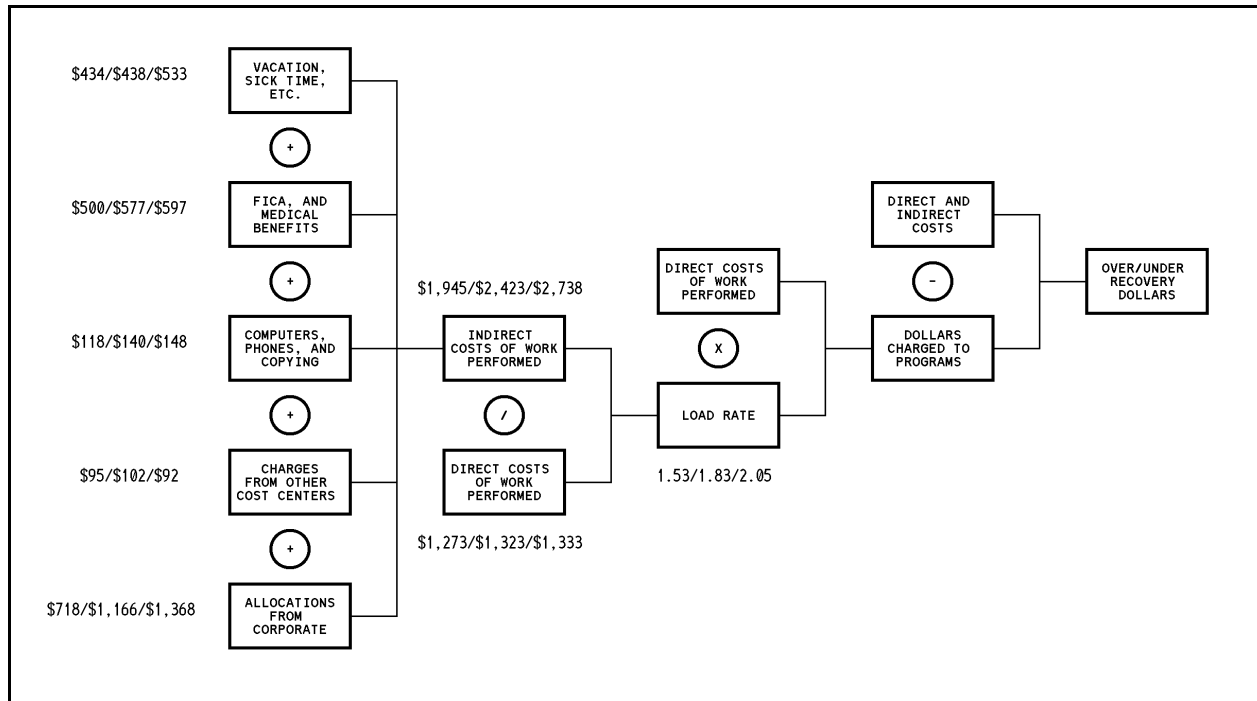


Figure 2 - The Structure of The Load Rate Measure

he's not sure of the relative effects of each. Determined to sort things out, he has his budget analyst construct a model of the arithmetic operations whereby charges to the programs are determined, and supply him with data for the past three years (see Figure 2).

Reviewing the model and the data, Frank notes immediately that the allocations category is the hardest hit. This is where the space charges show up – and in the load dollars used to determine the load rate. He also notes that the focal point for all the heat he's been taking – the load rate index – is (or should be) of secondary concern. After all, the "bottom line" for the program managers, quite literally, consists of the *charges* to the programs, not the rates.

The load rate could go up by a factor of 10, but if productivity could be increased by a like amount, then the hours would go down by a like amount and the charges would be the same. In other words, 100 hours at \$10.00 per hour is the equivalent of 10 hours at \$100.00 per hour.

Aware of several efforts aimed at improving productivity, Frank asks his budget analyst to compare actual charges to the programs with the fixed budget prepared at the beginning of the year. The results are spotty. Most programs are at or under budget, with a few significantly under budget and a few significantly over. Consultation with his two managers reveals that the four programs over budget have had increases in volumes that, percentage-wise, far outstrip the increase in costs.

Several of Frank's customers have suggested that he reduce staff as a way of reducing expenses. However, Frank already knows that this won't work. During the first half of the fiscal year, several retirements and postings to other divisions enabled Frank to effect a 19 percent reduction in regular staff. He refused to let any of the vacant positions be filled and directed the managers and supervisors to make use of agency or temporary personnel. As a result, there is no "excess capacity," so to speak. Reducing staff would only have the very undesirable effect of making it impossible to perform the remaining work of the division.

Frank's conclusions are as follows:

- The division has gotten smaller as the result of the loss of work.

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- The staff has been reduced by a corresponding amount, but the fixed expenses have not been correspondingly reduced.
- The staff is more productive and charges to the programs are in line with budgets or subsequent revisions. However, this increase in productivity actually makes matters worse. Because the same or greater amount of work is being accomplished in less time, the charges to the programs are not sufficient to recover the division's expenses. As a result, rates will have to be raised at the end of the fiscal year.
- Worse, next year is shaping up to be a problem, too.
- Unless fixed expenses can be decreased, rates for next year will have to be raised by about 10 percent over the year-end figures – after the rate increase – in order to recover what is projected to be about a \$225,000.00 under-recovery.
- Frank's goal, his "solved state," if you will, is to reduce his division's fixed expenses by about \$225,000.00 and his search is for a way of doing that.

Frank has an idea. It is clear he needs to reduce fixed expenses by about \$225,000.00. The easiest, simplest way to do that is to reduce the amount of space his division occupies.

Presently, Frank's division occupies 20,000 square feet; 15,000 in one building, and another 5,000 square feet in an adjoining one. This arrangement has existed since the move to the new facility, the result of Frank's division acquiring some programs and the supporting staff group from another division at the same time as the move to the new facility. At \$43.50 per square foot, "dumping" the 5,000 square feet this group occupies in the other building would have almost exactly the desired effect on Frank's expenses and rates.

But, there is another problem. Frank raised the issue of space consolidation at the time of the move and two objections surfaced. One objection is that the 15,000 square feet will not accommodate all the division's staff. The other objection is that some of the programs in the adjoining building require extraordinary amounts of tabletop space at their peak processing time in order to temporarily store thousands of trainee history files.

Frank is confident that the loss of work and the accompanying 19 percent staff reduction will defuse any objections about the 15,000 square feet being able to hold all the people, and he is sure he can overcome the objection about the tabletop space that is required at the peak processing period.

From Frank's perspective, the tabletop space requirement reflects current ways of looking at things. The files have always been spread out in boxes on tabletops and that is the way people think about setting up these files. Frank looks at the situation differently. He sees the tabletops as a huge, horizontal filing system, one that consumes a lot of floor space. What he needs in order to effect the space consolidation is a vertical filing system, one that doesn't take up a lot of floor space, yet keeps the files readily accessible without undue stooping and reaching.

One of Frank's staff associates has been researching the availability and suitability of vertical filing systems. By the end of the week, the verdict is in. Vertical filing systems are available, they will work, and the cost is less than \$20,000.00. Best of all, they occupy one-fourth the space of the table-top system.

Frank's next problem is convincing his boss, the vice president of operations, that it makes sense to spend \$20,000.00 out-of-pocket in order to save \$225,000.00 in internal chargebacks. The best way to position it, he decides, is to say that the expenditure is warranted as an experiment that could have tremendous payoff in terms of space savings in the larger divisions. (When presented with this argument, she agrees that it is better than arguing that his division can't afford the space it occupies. She reminds him that, given the much larger consolidation that is in the works, the shift to vertical filing systems could indeed have some very real and very large payoffs.)

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Two final obstacles remain. One is to get corporate to go along with the \$20,000.00 purchase, a capital expenditure that was not budgeted. The other is to get the facilities division to agree to make the physical move as quickly as possible. Getting corporate commitment is comparatively easy; the arguments and the data are laid out, questions are asked and answered, and the decision is made. The facilities division, already laboring under a punishing schedule, requires a little more explanation and justification before agreeing to alter its priorities. But, its managers see the sense of what is being proposed and they too buy in.

Lessons to be Learned

There are some very important lessons to be learned from the case study presented in this article.

- Consensus, commitment, and cooperation are essential when solving problems in an organizational setting. Frank had to "sell" his view of the problem and his view of the solution.
- It is extremely important to sort the wheat from the chaff, so to speak, in analyzing a problem. That Frank's customers were complaining about a rate increase was in fact "noise" or chaff. The real issue, for them, was whether or not charges were going up, not what was happening to rates.
- Frank was aided immeasurably by the construction of a model of the structure of the financial variables and their relationships to one another. The problem he was attempting to solve was embedded in this structure and so was its solution. This model was critical not just in focusing him on the fixed costs component of the problem but also in his efforts to convince others to adopt his view of the problem and of its solution. (Several die-hards had to be shown in black-and-white scenarios that reducing staff would not solve the problem but also make matters worse.)
- In the course of solving one problem, Frank had to solve several more along the way. Put another way, he had to cope with constraints.
- Finally, timing, luck, and first-hand knowledge of the situation played no small part in Frank's success. There can never be any substitute for these factors.

A Final Note--Maybe

As of this writing, Frank has consolidated his division in one building. He has carved roughly a quarter of a million dollars out of his load. The amount of the rate increase for the coming year has been limited to six-and-one-half percent instead of the 20 percent that was forecast.

Frank also recently submitted a proposal to a state agency to provide services similar to those he provides for programs in his own company. The work he bid on fits with the valleys in his existing workload. Thus, if he wins the contract, he'll add to his base of hours without appreciably increasing his fixed expenses. It's even possible that the rates he charges his customers might be reduced – if another problem doesn't come along. And, as all of us who live and work in organizations know, that's a big if.

About the Author

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