A Framework for Structured Problem Solving

Solving complex business problems and applying IT solutions is the most important part of the CIO role within an organization. Apply this structured approach to tackling these problems and develop solutions based on facts and logic.

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INTRODUCTION: A SCENARIO

It had been two years since John Smith, the CEO of ACME Wholesale, hired his CIO, Bill Porter. John couldn’t be more pleased with his decision. Bill is an outstanding executive who has more than exceeded John’s expectations. He is well educated, but it is his ability to solve complex business problems that really impressed John and the management team. Bill has a very structured way of thinking and analyzing problems. He knew how to sort through all the “fog,” gather the facts, and develop a solution based on logic. He had significantly improved the value of IT within the company.

During his annual performance review with Bill, John praised him for helping solve several key business problems. As they reflected on Bill’s accomplishments, John asked, “What’s your secret to solving these problems?”

“Well,” Bill said, “it’s quite simple if you have a structured way to look at the problem. Most problems are not well defined and are often expressed in terms of symptoms or undesirable outcomes. The trick is to apply order to chaos by taking a structured approach to an unstructured environment.”

Bill went on to stress that a strong focus on planning and analysis is critical to successful problem solving. “Too many people jump to conclusions and want instant solutions without proper data analysis,” he said. “There are never any silver bullets.” He emphasized, however, that a diligent and methodical analysis of the situation will always result in an effective solution to the problem. Bill described a simple four-step approach that he applies to every problem – planning, data gathering, synthesis, and recommendations.

The key is to spend the time up front articulating a clear problem definition statement, understanding the key elements that need to be examined in more detail, and then creating a broad data collection plan. “Once you have a plan, the rest becomes execution,” he said. “The plan provides structure and focus for what needs to be done to solve the problem.”

“The other important aspect of problem solving is engaging as many people as possible in the process,” Bill added. “Two heads are better than one and four are better than two. The structured approach I use provides the framework for engaging multiple stakeholders in helping solve the problem.”

John nodded his head and said, “I’m sure it’s not as simple as you make it seem. I’m just glad we have you on our leadership team to make it happen.”
PROBLEM-SOLVING FRAMEWORK

Have you been faced with the difficult challenge of solving a complex business problem, but didn’t have a clue where or how to start? Do your users come to you with problems that they can’t clearly explain, yet they want an IT solution to fix it? Have you been put in the middle of two stakeholder groups demanding conflicting solutions to perceived problems?

If this sounds familiar, you are not alone. Solving complex business problems and applying IT solutions is the most important part of the CIO role within an organization. How you solve them is a critical success factor in your overall performance.

So what is problem solving? Problem solving is part science and part art. It’s a state of mind that requires a lot of thought and analysis. Problem solving requires a logical approach to sorting through a lot of data. Remember, the solution is never obvious. Effective problem solving can be best characterized by the following statements:

- An understanding of the real needs of the situation. This involves a level of research and data gathering, followed by detailed analysis to achieve real understanding.
- An awareness of the business environment. Problem solving must be done in the context of the environment around the problem. It must be factored in, in order to have an effective, practical solution.
- Active communication. Problem solving is best done by engaging multiple stakeholders in the process and keeping everyone informed.
- Being flexible and adapting to change. Problem solving is a voyage of discovery and as you uncover new insights, you need to adjust your thinking and perspective.
- Good, penetrating questions. Understanding and learning comes from asking a lot of questions that uncover new facts, leading to more insight into the problem.
- Dealing with the facts, just the facts. Effective problem solving needs to remove the emotion and politics surrounding the problem and solution.
- Analytical thinking. Problem solving starts from a state of ignorance and uncertainty and grows to understanding and certainty through analysis and thought.
- A full and thorough diagnosis. Problem solving is all about analysis, discovery, and insight from the facts.
- Creativity and innovation. The best solutions to problems often come from “out of the box” ideas.
- Applying new ideas and tools to problems. A solution is only effective if it
can be implemented and deliver the desired outcomes.

- **Effective report writing.** A clear articulation of the problem analysis, conclusions, and recommendations is critical to selling the solution.
- **Acceptance** of the solution. Obtaining buy-in along the way to the problem analysis and recommended solution is critical.

What you need in your management toolkit is a structured way to look at these problems and to develop solutions based on facts and logic. Figure 1 outlines a simple framework that will provide the structure needed to help you solve problems in an unstructured environment.

**Structured Problem Solving Framework**

This framework is designed to help launch a process that will put structure around an unstructured environment:

- It is a way of thinking about problems.
- It helps individuals and teams to decompose complex, unstructured problems and solve them in an efficient and effective way.
A Framework for Structured Problem Solving

- It is a way to be clear about the problem definition and scope.
- It allows you to break the work into relevant areas of focus and to gather data on what is important to solving the problem.

In a nutshell, problem solving is about logical thinking that gathers data on multiple elements of the problem and synthesizes it into fact-based conclusions, recommendations, and actions.

This framework is a top-down approach that starts with an open, broad focus on discovery and narrows to specific, focused recommendations. Each phase of the framework has a set of steps that build on each other to reach the final results.

There is a clear need for continuous learning and iterative thinking as the process proceeds. As new data is gathered, new insight into the problem is achieved, resulting in a new path towards the solution.

**PROBLEM DEFINITION & PLANNING**

The most important part of this approach is the planning phase. This is where structure is put into the problem-solving process and where the work plan is defined. Taking the time to do this thoroughly and thoughtfully will ensure that the problem is solved efficiently and effectively.

Since many problems are first expressed as symptoms, having a clear problem definition statement is where you need to start. This needs to be done in business terms, in the context of the user’s environment. Start with a discussion around the desired business outcomes i.e. what the user wants to accomplish. Initial discussion may be in broad terms, but has to be translated into a specific desired end-state definition of results.

Once that is understood, the discussion switches to the current business outcomes or performance and why it cannot deliver the desired results. The barrier or inhibitor to resolving the problem needs to be articulated as the “gap” that needs to be closed. Think of the gap as a chasm that needs to be crossed. There are lots of ways to cross it and the challenge now is to determine the best way. The fundamental question becomes: what needs to be done in order to overcome the barrier and solve the problem?

During this problem definition step, there may be several iterations of this cycle in order to get to the root definition of the problem. Problems are often initially expressed in terms of symptoms. It is very important to articulate the problem correctly.

For example, an executive may say, “We need greater profits,” which is a desirable outcome. A discussion around the barrier to achieving higher profits may identify that the company’s internal cost structure is higher than the competition. The key question now becomes, “How can we bring down costs?” Hence, the problem statement now focuses around internal costs. Further
discussion around this may identify that the barrier to doing this is redundant and inefficient customer care processes. Hence the key question now becomes how do we streamline these processes to reduce costs? The barrier to streamlining processes may be poorly organized customer data and the key question becomes how can we provide better access to customer information to provide more responsive and efficient customer service. This outcome-barrier-key question cycle may go through several iterations until the root definition of the problem is reached.

Once there is a clear definition of the business problem, the project definition needs to be articulated. What is the overall objective of the project? What will the project accomplish in order to achieve the business objective of reducing costs and improving profits? In the example above, it may be to determine the best way to apply technology to streamline customer care processes to reduce cost.

**ISSUES**

Once we have the overall project objective defined, the next step is to start to apply structure to it and to formulate what needs to be done to solve the problem. This starts with the list of the issues or key elements of the problem that need to be examined during the data-gathering phase. Issues break the problem definition into smaller and easier-to-solve pieces. These are a set of essential topics that must be addressed in order to fully understand the problem and accomplish the project objectives. This is captured in a simple Issue Diagram (Figure 2). In our customer care example, the issues may include: customer, processes, costs, organization and skills, competition, CRM best practices, and technology.

![Issue Diagram](Image)

From a planning perspective this list represents the areas that the project needs to research and better understand during the data gathering and analysis phase.
This list can easily be developed in a white board exercise with a few members of the project team. In terms of how many issues are required, more is better than less, specific is better than general. Issues need to be focused on the problem and avoid extending beyond the defined scope. A good rule of thumb is to have six to eight key issues.

**Hypotheses**

Once the key issues are defined, we now apply hypotheses thinking to create a set of potential conclusions about each of the areas that we will be examining. We develop hypotheses for each issue and seek to prove or disprove the hypotheses through our data collection and analysis efforts. In the same way that issues break the problem definition into smaller and easier-to-solve pieces, hypotheses break issues into smaller and more manageable pieces. This starts to build more structure into the issue diagram, which is the foundation of the structured problem solving approach (Figure 3).

These hypotheses are potential answers to issues surrounding the problem and are based on what the team expects to find or what logically they should find during the data-gathering phase. You need to be very careful, however, not to be a “hammer looking for a nail.” What this means is that you need to be objective in creating hypotheses and not be swayed by politics or personal biases. Remember, logical thinking is what needs to be applied here.
There needs to be a sufficient number of hypotheses to cover each of the issues. They need to be specific, relevant, and testable with data. Relevance determines how connected the hypothesis is to the issue and overall problem. A good test of relevance is the “So what?” question. If the answer is trivial or meaningless, than the hypothesis is not very relevant. Every hypothesis needs to contribute to solving the problem. Specificity is also important. You want to avoid hypotheses that are too general or truisms. You need to ask, “What will I achieve if I prove this hypothesis?”

Finally, you must be able to test each hypothesis in order to prove or disprove it. You want to avoid hypotheses that take too long to test or require monumental data collection and analysis. Also, you can’t test something that hasn’t happened, so avoid hypotheses that are stated in the future tense. During the project, as you collect and analyze data, these hypotheses will be tested, revised if required, and transformed into supported conclusions about the problem.

In our example, a set of hypotheses around the process issue might be:

1. Our customer care processes contain many manual steps, in a primarily paper based environment.
2. There is significant duplication of effort in many steps of the process.
3. There are too many control points that slow the processes down and inhibit efficient and effective service to customers.
4. Customer care personnel are not empowered to make quick decisions to serve customers.

**Key Questions**

With a good set of hypotheses defined, a set of key questions need to be created to test them. Key questions are used to probe hypotheses and identify what data needs to be collected. They focus the data gathering needed to prove, disprove, or modify hypotheses. This is the data that will provide quantitative and qualitative support for the final conclusions. The data allows the team to accept, reject, and modify their hypotheses and, in so doing, continue to focus the team’s effort on the project objectives. In other words, if you can answer these questions, then you will have the answer to the truth about the hypotheses. This linkage of issues to hypotheses to key questions completes the structured issue diagram format (Figure 4). It’s this structure that allows the team to get organized to solve the problem.
Ultimately, it doesn’t matter if the hypotheses are proved to be true or false. If the data proves hypotheses false, the team generates and tests new hypotheses, based on their most informed current speculation. Remember this is an iterative learning process. Gaps in key questions and hypotheses will emerge as the project progresses. They should be welcomed as opportunities to learn more about the problem and to provide new and useful insights. As you discover new facts, it will allow you to modify your thinking. Those hypotheses that prove false often demonstrate areas where facts are counterintuitive. These might be the areas where you can bring the greatest value to your users – helping them exploit flaws in common industry or functional understanding. In either case, the learning from the analysis will lead to a strong conclusion that will help solve the problem.

Following along in our example, the key questions for Hypothesis #3 – “There are too many control points that slow the processes down and inhibit efficient and effective service to customers” – might include:

1. What are the control points in each of the processes?
2. What impact are they having on customer service?
3. Why do they exist and what purpose do they serve?
4. What would happen if they were eliminated?
Data Sources

As you create the key questions, you need to be thinking about data sources. Data sources identify where you need to go to find the data required to answer the key questions. It is very useful at this stage to capture and cross-reference the data sources into a matrix or table, called a Data Matrix (Figure 5). This provides you with a consolidated view of all your issues, hypotheses, key questions, and data sources. It provides the structure for the project team to go out and start gathering the data needed to solve the problem.

It's also important at this stage to think about what technique you will use to gather the data (e.g., document review, survey, Internet research, interviews, workshops, focus groups, observation, job shadowing, etc.) and how you will represent or report the data (table, statistical pie chart, trend line, graphical pictorial, word lists, etc.). This will help you formulate your work plan and assign data collection tasks to team members. It will also let you consolidate data gathering around several hypotheses. For example, if you are going to interview the President of the company, you want to ask questions from several hypotheses in one interview.
Another very useful activity in the planning phase is to start to format the final report. This is another technique that will help keep the team focused on the project objectives. A quick starting point is to create a storyboard out of the initial planning ideas and thinking. The issues, hypotheses, and key questions can be used to do this. The structure of the issue diagram can be viewed as a logic tree and can be easily transferred to a set of mainly empty, but numbered, pages. The issues become the chapters. The hypotheses stand in for what will be the major headlines of the chapters. The key questions stand in for findings. The data appears as charts, graphs, exhibits, and text points. As data is gathered and analyzed, it transforms the storyboard from a document that is initially speculative into one that is supported by the facts or revised until the facts do support the conclusions.

While the structured planning framework is top-down, the data-gathering process is, by nature, bottom up. Once you’ve built the issue diagram and storyboard framework, the exercise becomes one of gathering and synthesizing the necessary data to populate each chapter.

**PROJECT MANAGEMENT/WORK PLANS**

Once the initial thinking of the problem and project objectives has been done and a data matrix framework has been defined for the project, building a work plan is fairly easy. This involves laying out who will do what and when, thereby creating a detailed work schedule. This will break down the activities by the various data collection techniques and assign ownership to individual team members. The task assignments should be based on experience, skills, and personal interest. For example, you don’t want the most junior team member interviewing the President of the company and you don’t want the most experienced team member doing raw Internet research. You need to strike the right balance of task assignments to maximize the data collection effectiveness.

Another important aspect of this planning activity to consider is how to consolidate the data collection activities to provide the most efficient approach to gathering the data. For example, if you have assembled a group of stakeholders to run a process-mapping workshop, you might use that forum to conduct a survey on customer care issues.

Sometimes you will find that the data you need is not readily available and you may need to develop a new collection method to get it. For example, developing a Web-based survey tool and sending out to customers, or asking sales people to gather customer input during their regular call cycle. These data collection activities require extra preparation and monitoring to ensure the right data is being gathered.

Finally, the work plan needs to be documented. This usually involves building a project plan model in Microsoft Project or Excel and using it to track data collection progress during the execution phase. The key elements of the plan need to include the following:
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• A list of the data that needs to be collected and the sources for each.
• A list of the collection assignments of the team members.
• A list of the specific data collection activities (interviews, workshops, survey, etc.)
• A schedule of when activities will take place and when they need to be completed.
• A budget of estimated time and expense needed to collect the data.
• The milestone checkpoint reviews that will be used to monitor progress.

The project manager or team leader needs to closely monitor the data collection activities of the team and manage issues that arise, adjusting the plan to ensure the data required is collected.

DATA GATHERING

Once the work plan is finalized, the team needs to start gathering the data. While this can be viewed as a laborious step, it is an extremely important one. This discovery step should be viewed as a treasure hunt where the team gets to play “Sherlock Holmes” and uncover the facts needed to solve the problem. Approached the right way, it can be made to be more fun than tedious work.

Data will be gathered from a variety of sources, within the company and outside of the company. A number of different techniques will be used to get the facts and the right ones need to be selected. These will include a number of the following:

• Document review. This involves reading existing documentation. It often includes company strategy documents, any previous analysis or reports on the problem and other relevant printed materials.
• Internet research. This data-gathering activity involves the electronic search of relevant databases and other Internet-based sources. This needs to be very focused and targeted to avoid being drowned in non-relevant data. The objective of these searches is often to gather historical or statistical data that provides context for the project. It’s also a good way to validate industry trends and generate new ideas.
• Interviews. These are one-on-one discussions with selected stakeholders to seek their input and views on various elements of the problem. Interviews play an important role in data gathering, as they are not only a source of facts, but also opinions. They can also provide clues or directions to other important sources of data. Each interview needs to be well planned with a set of relevant questions and a thorough set of notes need to be taken to capture the information obtained in the discussion. Often two-on-one discussions are more effective, as it allows one team member to focus on note taking.
- **Focus groups.** These are group interviews where a small set of stakeholders are assembled in a room for a discussion around a common topic. This is an informal roundtable chat led by a team member. Key ideas, thoughts, and relevant data need to be captured and documented, usually on flip charts and verified with the group. Focus groups are a good way to pull pieces of data and facts together in synergistic ways. They also allow for a broader level of participation by stakeholders in solving the problem. Focus groups are typically run as half-day sessions.

- **Workshops.** These are more structured reviews or creative brainstorming sessions that produce a defined output. They follow a more formal disciplined approach that captures critical data in a methodical way. They often involve a cross functional group of stakeholders who have detailed working knowledge of the area being examined (for example, the customer care center). Workshops can often run over a period of a few days in order to capture the detail of data required.

- **Surveys.** Surveys are used for gathering large samples of data that can be converted into statistical results. These are often used in conjunction with focus groups and workshops to validate a key fact identified. Surveys are more focused and provide additional detail around the targeted area. They are also a good way to establish areas of importance and performance.

- **Observation and job shadowing.** This involves a “walking the walk” approach where a team member spends time watching how a particular set of activities happen and probing the front-line personnel with questions of why, where, and when in order to better understand what is occurring. This approach is particularly useful in understanding the big picture environment (for example, observing a customer care center in operation or touring a warehouse). Sometimes it could involve sitting with a specific individual for a whole day to fully understand their environment and job challenges.

Regardless of which data gathering technique is used, it is extremely important to document the facts and observations. Taking detailed, quality notes is critical for the data analysis and synthesis phase. Without this, the team can’t develop logical conclusions based on facts. Evidence is needed to support the conclusions that the team will develop. Having a set of note-taking standards for the team will help ensure consistency in data capture. Once a data collection activity has been completed, the team members must review and file their notes with the project manager. This will ensure that the most recent understanding is being captured. Waiting a few days or a week to do this will result in watered down notes and forgotten data.

Another important aspect of data gathering is to ask for copies of user documents so that you have real life examples of what’s being used. This will provide a source of additional data as you can review these in more detail in your project room. They also help by providing better context to the problem.
DATA ANALYSIS & SYNTHESIS

While the planning phase takes a top down approach, the data analysis and synthesis phase follows a bottom up structure. In effect, it turns the logic tree upside down, building on facts to form recommendations. As the team gathers data and provides it to the project manager, the process of synthesizing facts into findings and further into conclusions and recommendations takes place simultaneously. This continuous thinking about the problem and what’s been gathered is critical to developing the logical relationship between raw data and recommendations. Each recommendation needs to be based on a strong conclusion, which in turn is supported by a set of findings.

This logical linkage is a critical step in the structured problem-solving process and must be strictly adhered to. It’s this linkage that ensures you’re making recommendations based on facts. The logical tree structure or Structured Logic Diagram (Figure 6) is used as a tool to synthesize the data and build the logic case for each recommendation.

Facts are collected during the data-gathering phase and come in various forms. A fact is a piece of information that was expressed in an interview, observed during a job shadowing exercise, documented in a workshop, read in some documentation, or identified in a research activity. These facts are aligned with specific hypotheses through the question sets developed during the planning phase.

Findings are aggregations of a number of facts that cause you to believe that there is enough evidence of a pattern to declare it as a finding. Findings are small collections of facts from multiple sources, a large number of similar opinions, or an aggregation of statistical data into a chart, graph, or table. Findings need to be relevant to the issues of the problem, hence need to be properly selected. Those that are irrelevant should be discarded, regardless of how interesting they might be.
With a thorough understanding and analysis of the facts and findings some level of insight will occur that allows you to logically draw conclusions from all the data. These conclusions could in fact be confirmed hypotheses that were identified by the team in the planning phase. Others will be derived from creative insight into the problem based on the data gathering and logical analysis of the facts and findings. In effect, many will be intuitively obvious because the findings are so strong in support of them. The critical aspect of developing sound conclusions is ensuring they are backed up by solid evidence of findings.

A good conclusion can be derived in a number of ways:

- A confirmation of expected outcomes from the initial hypothesis planning activities, based on proof derived from findings.
- An insight or new perspective that was not previously known but provides value to the problem-solving process.
- Something that is logically derived from judgment and creativity that can be supported by knowledge, experience, and the findings.

These conclusions are at the root of the problem. They are confirmed knowledge that can’t be refuted because they are supported by facts and findings. With a sound understanding of them, conclusions will form the basis for a set of recommendations to solve the problem.

In our customer care example, a process workshop might have uncovered several facts and findings, confirming the hypothesis and leading the team to conclude that in fact, “There are too many control points that slow the processes down and inhibit efficient and effective service to customers.” Findings that would support this conclusion include:

- Front-line staff must adhere to the standard procedures manual for all customer interactions.
- All financial adjustments, such as credit notes, require three levels of management sign-off.
- Every credit note requires that a document be filled out with the business rationale for the adjustment.
- The credit note approval is a manual, paper-based process.
- The average cycle time for credit note approval is 23 business days.
- 75% of all credit notes are due to errors in invoicing, caused by duplication of orders between inside and outside sales personnel.

One of the challenges of the data analysis and synthesizing phase is data management. During the data gathering activities a lot of information is gathered and reviewed and it needs to be sorted, catalogued, and stored for easy access. The project manager is usually responsible for this. A relational database structure, such as Microsoft Access, is a good tool to use to document the findings and logically group them to support conclusions. Some findings may in fact be used to support multiple conclusions.
A more important aspect of the project manager’s role is to be able to step back from the detail data and start to look at the big picture in terms of identifying the logical connections between facts to form findings and findings to support conclusions. It’s this logical thinking that will make or break the project and the project manager needs to be cognizant of it and avoid being drawn into detailed data analysis i.e. “analysis paralysis.” The project manager also needs to engage the team in the problem-solving process by pushing their creative juices and challenging their thinking. This is very much a collaborative exercise.

If done right, this synthesizing activity will in fact start to occur early in the data gathering phase as the team discovers new facts. This will trigger an iterative cycle of additional data gathering to confirm that additional piece of information that is needed to support a conclusion. A good technique to use during this is a “wall map” that contains the structured logic diagram thinking. As findings are made and aggregated to form conclusions, they are put onto the wall map. Over time the big picture will start to emerge. This ensures that one will be able “to see the forest for the trees.” This should also be mirrored in electronic documentation to facilitate the report writing activities.

During the data analysis and synthesizing phase the team also needs to be testing its logic with the stakeholder community. As a conclusion or recommendation is being formulated, it needs to be reviewed, along with the supporting findings, with various levels of the user community and eventually with the project sponsor or steering committee. An important part of the logic associated with structured problem solving is getting buy-in to each conclusion along the way. This will help ensure buy-in to the final recommendations. Be sure not to leave this to the final report presentation. Every new idea and recommendation should be reviewed and agreed to prior to the report being tabled.

**RECOMMENDATIONS & SOLUTION PRESENTATION**

If the team has vigourously followed the structured problem-solving approach and has a strong set of conclusions supported by findings, then recommendations will logically follow. If conclusions are viewed as business problems or opportunities, then recommendations are solutions that fix the problem or take advantage of the opportunity. Recommendations can be viewed as prescriptions that improve the health of the situation. They contain both the “medicine” and instructions on the way it should be taken. They define the solution elements in terms of the required resources, skills, technology, budget, timing, organizational structure, and so on. This will be based on the logical relationships that have been synthesized by the team.

In our customer care example, the findings clearly confirmed that there were too many control points in the process that slowed it down. However, the findings also
showed that there was a problem with credit notes caused by the company’s order management process. Customers were being invoiced incorrectly for duplicate orders. Yet the front line staff in the customer care center could not easily process a credit note. Due to the paperwork involved and the number of sign-offs needed, it took over four weeks to process a credit note. This was a major source of customer dissatisfaction, as well as a productivity inhibitor. There are two recommendations that could logically be applied to this problem:

1. Empower the front-line staff to immediately process credit notes for all duplicate order situations, documenting each one for audit trail purposes.

2. Change the order management process to prohibit outside sales staff from processing orders. Instead, team them with an inside sales person who enters all orders.

You can see that the structured problem-solving framework, based on data and logic, makes it very easy to develop recommendations that make sense.

In order to bring the project to an end, the team needs to consolidate all of their work into a very concise report that summarizes the logic of the structured problem solving analysis. This is extremely important to ensure that the team doesn’t become so involved with the detailed facts, findings, and analysis that they lose sight of the big picture objectives.

The team needs to select only the information necessary to make the case for the recommendations. This involves identifying the key messages that need to be made and packaging them with the supporting logic into a report. This can often be a challenging task for the team, as they have been immersed in so much data and are tempted to want to “tell all they know” about the problem. While this detailed understanding is critically important to the analysis and the many discussions that have occurred, the final report needs to be very selective in logically telling the story.

The storyboard approach is an excellent tool to use for this as it readily maps to the structured problem-solving logic diagram. In fact a draft storyboard was constructed very early in the planning phase using the issues, hypotheses and key questions from the issue diagram as the placeholders. All that’s required now is to update it with the actual facts, findings, conclusions, and recommendations and convert the storyboard into the final report.

The structure of the final report is very important, as it must both tell a compelling story and provide the logic needed to support the recommendations. The compelling story is the “sizzle” that sells the recommendations and the logic component is the irrefutable proof that they are sound recommendations, based on facts, findings, and conclusions.

There are a number of important techniques that can ensure the final report is a powerful communication document. Figure 7 depicts a number of elements, which include:
• **Layout.** The landscape format is best suited for reports that have a lot of graphical representation of data. It fits with the structured logic diagram and easily allows for the linkage of ideas on the page.

• **Headlines.** These are the key points that you want to emphasize on a page (conclusions and recommendations). A good rule of thumb is to only have one key point per page.

• **Vertical logic.** This represents the logical linkage of the supporting data with the headline. Every data represented (graphical or text) must be directly supporting the key point in the headline.

• **Exhibits.** Graphical representation is the most effective way to portray a lot of data. It more easily allows for the identification of trends and the linkage to headlines.

• **Source.** This shows where the data represented on the page came from. It is needed to provide credibility to the findings.

• **Horizontal logic.** This represents the logical linkage of multiple pages in the report to build an integrated case for the recommendations. It allows for the building of logical arguments in the story being told in the report.

• **Story line.** This is the thread line of the key messages that the report should present from start to finish. It summarizes the complete project.

![Diagram of Report Structure](image.png)

**Figure 7** Source: Ternoway Consulting Inc. © 2005

While the final report format will ultimately be set by your company’s culture and style, it’s very important to apply these techniques when creating it. This will
ensure that the key points are emphasized. A sample report flow could include these elements:

- **Table of contents.** An overview of the report structure
- **Executive summary.** A brief synopsis of the key findings and recommendations
- **Problem definition.** A summary of the business issues
- **Project objectives.** A definition of the mandate of the project team
- **Study approach.** A summary of approach taken by the project team (who, what and how)
- **Facts, findings, and conclusions.** A summary of the study findings, supported by sound logic
- **Recommendations.** A summary of the recommendations supported by logic
- **Next steps.** A brief overview of what should happen next as a result of the study
- **Appendix.** A categorized compilation of the detailed data and analysis from the study

The final report also represents a historical record of the complete project life cycle and as such should include all documentation. However, most of this will be in the form of appendices, as the key messages in the story line are the most important part. While some team members will want to have their detailed analysis included in the report, the project manager must ensure that it does not detract from the key messages and the logical argument being presented.

**SUMMARY**

No matter what business problem you are facing, you now have a structured way to help you solve it. This structured problem-solving framework will give you the confidence to start. It provides you with a structured way of looking at unstructured situations. It provides you with a way to establish a plan to go out and gather data and logically synthesize it into a set of conclusions that are supported by logic. This will provide the basis for solid recommendations based on a strong logical argument. This will result in a solution to the problem and a satisfied user.
About the Author
Brian Ternoway is the President of Ternoway Consulting Inc. He has over a decade of experience as a management consultant helping clients solve complex business problems. He specializes in general management issues and the transformation of enterprise processes utilizing e-business technologies and customer-focused methodologies. He has experience in strategic planning, business operations, process reengineering, sales management, market and product development, and the professional training/development area. Mr. Ternoway gained this experience over a 33-year period with IBM Canada Limited, dealing with the Retail, Consumer Goods, Finance and Insurance, Government, Education and Transportation industries.

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This is an independent, non-sponsored research report. It was not funded by any vendor or other party.

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