# *The* Performance-Based Management *Handbook*

*A Six-Volume Compilation of Techniques and Tools for Implementing the Government Performance and Results Act of 1993 (GPRA)*

## Volume One

# *Establishing and Maintaining a Performance-Based Management Program*

**1**

# *The Performance-Based Management Handbook*

*A Six-Volume Compilation of Techniques and Tools for Implementing the Government Performance and Results Act of 1993*

## Volume 1

## Establishing and Maintaining
## a Performance-Based Management Program

Prepared by the

Training Resources and Data Exchange
Performance-Based Management Special Interest Group

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## Preface

*?. . . chart a course for every endeavor that we take the people's money for, see how well we are progressing, tell the public how we are doing, stop the things that don't work, and never stop improving the things that we think are worth investing in."*

President William J. Clinton, on signing the
Government Performance and Results Act of 1993

### Introduction

All high-performance organizations, whether public or private, are, and must be, interested in developing and deploying effective performance measurement and performance management systems, since it is only through such systems that they can remain high-performance organizations. When President Clinton signed the Government Performance and Results Act of 1993 (GPRA) into law, this commitment to quality was institutionalized. Federal agencies were required to develop strategic plans for how they would deliver high-quality products and services to the American people. Under GPRA, strategic plans are the starting point for each federal agency to (1) establish top-level agency goals and objectives, as well as annual program goals; (2) define how it intends to achieve those goals; and (3) demonstrate how it will measure agency and program performance in achieving those goals.

The publication of *The Performance-Based Management Handbook, A Six-Volume Compilation of Techniques and Tools for Implementing the Government Performance and Results Act of 1993* follows a logical progression of resources developed to assist in the effective and efficient implementation of GPRA. In chronological order, these resources are:

- The National Performance Review (NPR)

- *How to Measure Performance—A Handbook of Techniques and Tools*

- *Guidelines for Strategic Planning*

- *Guidelines for Performance Measurement*

- *Executive Guide: Effectively Implementing the Government Performance and Results Act*

- *NPR Benchmarking Study Report Best Practices in Customer-Driven Strategic Planning*

- *NPR Benchmarking Study Report Best Practices in Performance Measurement*

- *The Performance-Based Management Handbook, A Six-Volume Compilation of Techniques and Tools for Implementing the Government Performance and Results Act of 1993*

### The National Performance Review

In the same year that GPRA was signed into law, President Clinton and Vice President Gore initiated the National Performance Review (NPR) to reinvent government. One of NPR's reinvention initiatives was to foster collaborative, systematic benchmarking of best-in-class organizations, both public and private, to identify best practices in a wide range of subjects vital to the success of federal agencies in providing high-quality products and services to the American people.

### *How to Measure Performance—A Handbook of Techniques and Tools*

Developed in October 1995, *How to Measure Performance—A Handbook of Techniques and Tools* was the Performance-Based Management Special Interest Group's (PBM SIG's) first handbook. It was produced at a time when DOE personnel were struggling with the concepts and conventions of performance measurement

and has been touted as a very useful guidance document. The handbook describes three different approaches to developing performance measures; provides sections on performance indexing, data analysis, and reporting techniques; and includes a thorough glossary of terms, an inclusive list of references, and a substantial list of sample performance measures.

### Guidelines for Strategic Planning

This Department of Energy (DOE) guidance document (DOE/PO-0041) was published in January 1996 by the Office of Policy and International Affairs to help strategic planning teams plan for, organize, and prepare the departmental strategic plan required under GPRA. It provides guidance both to those organizations and personnel starting the strategic planning process for the first time and to those reviewing or updating existing plans. The steps outlined within this document represent a very simplified approach to strategic planning.

### Guidelines for Performance Measurement

The DOE Performance Measurement Coordination Team released this guidance document (DOE G 120.1-5) in June 1996. It is often referred to as a companion document to the PBM SIG's first handbook. While both documents cover performance measurement, this document also covers the relationship of performance measurement to organizational operations, presenting topics such as performance linking, tying into departmental systems, and coordinating performance measures.

### Executive Guide: Effectively Implementing the Government Performance and Results Act

The U.S. General Accounting Office (GAO) published this document (GAO/GGD-96-118) in June 1996. It resulted from a study done at the request of Congress in which a number of leading public sector organizations that were successfully pursuing management reform initiatives and becoming more results-oriented were studied. Each of these organizations set its agenda for management reform according to its own environment, needs, and capabilities. Yet, despite their differing approaches to reform, all these organizations commonly took three key steps to becoming more results oriented: (1) define clear missions and desired outcomes, (2) measure performance to gauge progress, and (3) use performance information as a basis for decision making. These three key steps are discussed in this GAO executive guide, along with their relationship to GPRA. Also discussed is the role of top leadership and the practices it can follow if it hopes to make GPRA a driving force in an organization. Accompanying the discussion of each practice is a case illustration involving a federal agency that has made progress in incorporating the practice into its operations.

### NPR Benchmarking Study Report: Customer-Driven Strategic Planning

In February 1997, NPR published its *Benchmarking Study Report Best Practices in Customer-Driven Strategic Planning*, which documents and details the in-depth processes and approaches of those best-in-class organizations that excel at incorporating their customers' needs and expectations into their strategic planning processes. This study provided public and private leaders and managers with world-class practices and formulas for success in developing and deploying strategic plans and goals for an agency.

### NPR Benchmarking Study Report: Best Practices in Performance Measurement

To complement its strategic planning study, NPR commissioned the first-ever intergovernmental benchmarking consortium involving not only U.S. federal agencies, but also local governments and the government of Canada in a collaborative study of performance measurement. As documented in its June 1997 report, the NPR Performance Measurement Study Team found that the best performance measurement and management systems and practices work within a context of strategic planning that takes its cue from customer needs and customer service. They also found that:

- Leadership is critical in designing and deploying effective performance measurement and management systems.

- A conceptual framework is needed for the performance measurement and management system.

- Effective internal and external communications are the keys to successful performance measurement.

- Accountability for results must be clearly assigned and well-understood.

- Performance measurement systems must provide intelligent information for decision makers, not just compile data.

- Compensation, rewards, and recognition should be linked to performance measurements.

- Performance measurement systems should be positive, not punitive.

- Results and progress toward program commitments should be openly shared with employees, customers, and stakeholders.

## The Performance Measurement Process Model

To provide them with a useful frame of reference as they studied performance measurement in best-in-class organizations, the NPR Performance Measurement Study Team built a model of the performance measurement process used in the federal context. This Performance Measurement Process Model was published in its June 1997 report. This model is shown in Figure PBM.1 on the following page.

# Performance Measurement Process Model

**Customers and Stakeholders Input**

**Management Priorities and Decisions**

**Congressional Priorities and Decisions**

**Performance Reporting to Customers and Stakeholders**

**Customer Driven Strategic Planning**

**Multi-Year Goal Setting and Resource Planning**

**Annual Performance Planning**

**Resource Allocation**

- Mission is clear and energizes employees
- Strategic goals and objectives have focus and are stretching
- Owners are identified for goals and objectives
- Strategies are developed and resources allocated
- Customer needs are addressed
- Outputs and outcomes are defined (logic models or other tools are used)
- Decision issues and decision processes are used

**Establishing and Updating Performance Measures and Goals**

- Management culture is supportive
- Measures flow from goals, and objectives are developed by managers working with
  - multi-disciplined teams
  - focus groups and
  - stakeholders
- Inventory of common measures is explored
- Balanced Scorecard or similar tools are used
- Measures cascade and align through the organization
- Performance levels are reflective of resources

**Establishing Accountability for Performance**

- Ownership of each measure is formalized and resources provided
- Responsibilities for data collection, reporting, analysis and posting are identified
- Managers use measures to evaluate performance
- Reward systems are clear and consistent and are reflective of level of success

**Measuring Performance (Data Collection and Reporting)**

- Data sources are identified
- Information systems are designed to support data collection and reporting
- Pilot tests are conducted
- Automated or manual requests are used for periodic updates
- Data entry, tabulation, summarization methods are documented for each measure
- Data definition for common measures are followed
- Reliability, timeliness, accuracy, rapid access, and confidentiality are addressed

**Analyzing and Reviewing Performance Data**

- Data are integrated
- Analytical capabilities are developed
- Results are analyzed and validated
- Management reviews results vs. expectations and makes mid-course corrections
- Feedback is provided to activity/process owners for continuous improvement

**Evaluating and Utilizing Performance Information**

- Activity/process owners use performance information for continuous improvement
- Results are displayed and shared with customers and stakeholders
- Rewards and recognition are based on results
- Benchmarking and comparative analysis with best in class are done
- Management feedback is provided for updating goals and measures
- Performance information is used to identify opportunities for reengineering and allocation of resources
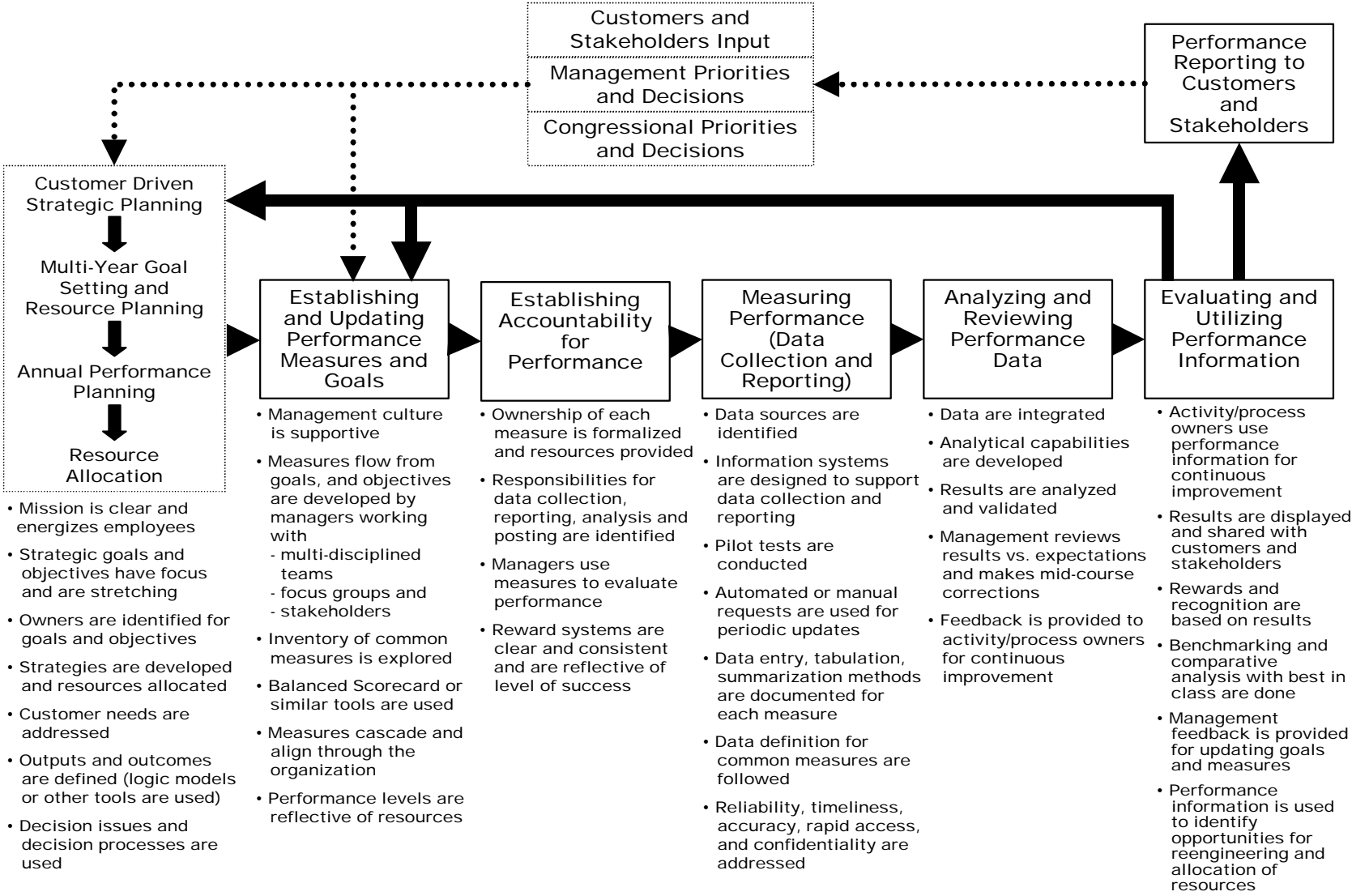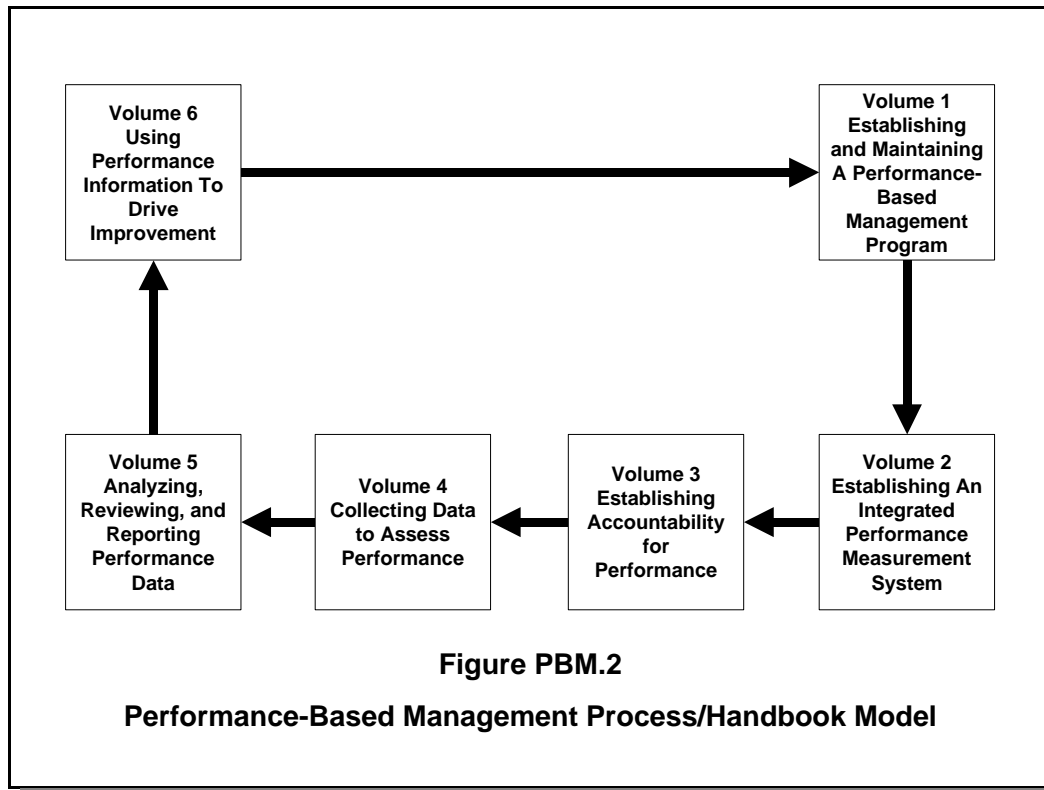
**Figure PBM.1**

**NPR Performance Measurement Process Model**

**The Performance-Based Management Handbook**

The PBM SIG adapted the NPR Performance Measurement Process Model into a performance-based management process model and used this model to structure *The Performance-Based Management Handbook*. The PBM SIG Performance-Based Management Process/Handbook Model is shown in Figure PBM.2 below. Topics covered by each volume are listed after the figure.

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┌──────────────┐                          ┌──────────────┐
│  Volume 6    │                          │  Volume 1    │
│  Using       │                          │ Establishing │
│  Performance │ ───────────────────────▶ │ and          │
│  Information │                          │ Maintaining  │
│  To Drive    │                          │ A Performance│
│  Improvement │                          │ -Based       │
│              │                          │ Management   │
│              │                          │ Program      │
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┌──────────────┐  ┌──────────────┐  ┌──────────────┐  ┌──────────────┐
│  Volume 5    │  │              │  │  Volume 3    │  │  Volume 2    │
│  Analyzing,  │  │  Volume 4    │  │ Establishing │  │ Establishing │
│  Reviewing,  │◀─│ Collecting   │◀─│ Accountability│◀─│ An Integrated│
│  and         │  │ Data to      │  │ for          │  │ Performance  │
│  Reporting   │  │ Assess       │  │ Performance  │  │ Measurement  │
│  Performance │  │ Performance  │  │              │  │ System       │
│  Data        │  │              │  │              │  │              │
└──────────────┘  └──────────────┘  └──────────────┘  └──────────────┘
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**Figure PBM.2**

**Performance-Based Management Process/Handbook Model**

**Volume 1: Establishing and Maintaining a Performance-based Management Program**

- An Introduction to Performance-Based Management
- Step 1: Define Organizational Mission and Strategic Performance Objectives
- Step 2: Establish an Integrated Performance Measurement System
- Step 3: Establish Accountability for Performance
- Step 4: Establish a System/Process for Collecting Data to Assess Performance
- Step 5: Establish a System/Process for Analyzing, Reviewing, and Reporting Performance Data
- Step 6: Establish a System/Process for Using Performance Information to Drive Improvement
- Maintaining a Performance-Based Management Program

**Volume 2: Establishing an Integrated Performance Measurement System**

- Understanding Performance Measurement
- Establishing an Integrated Performance Measurement System
- Choosing a Performance Measurement Framework

- Developing Performance Measures—Getting Organized

- Developing Performance Measures—Sample Approaches

- Maintaining an Integrated Performance Measurement System

**Volume 3: Establishing Accountability for Performance**

- The Concept of Accountability

- Establishing Accountability for Performance

- Accountability Tools

**Volume 4: Collecting Data to Assess Performance**

- Determining Data Needs

- Components of a Data Collection Plan

- Data Collection Considerations

- Data Collection Methods

- Suggestions for Measuring R&D Activities

**Volume 5: Analyzing, Reviewing, and Reporting Performance Data**

- Introduction to Data Analysis

- Training Your Organization in Analysis Skills

- Generating Useful Information - Step 1: Question Review

- Generating Useful Information - Step 2: Data Collection and Organization

- Generating Useful Information - Step 3: Data Analysis

- Generating Useful Information - Step 4: Data Presentation

**Volume 6: Using Performance Information to Drive Improvement**

- Using Performance Information to Drive Improvement

- Benchmarking

- Reengineering

- Continuous Improvement

- Process Improvement

**About This Volume**

## Volume 1 Overview

Some people may get confused by the meaning of the term *performance-based management program*. A performance-based management program does not refer to a group of people who have the words ?Performance-Based Management" on their doorways or to a box in an organizational chart that refers to a work group as ?Performance-Based Management." Rather, a performance-based management program refers to a formalized framework within an organization for the implementation, conduct, and maintenance of a performance-based management approach to business operations. Having explained that, the purpose of this first volume of the PBM SIG's *The Performance-Based Management Handbook* is to show the reader how to establish and maintain a performance-based management program.

As defined by the PBM SIG, performance-based management is a systematic approach to performance improvement through an ongoing process of establishing strategic performance objectives; measuring performance; collecting, analyzing, reviewing, and reporting performance data; and using that data to drive performance improvement. Flowing from that definition are the six steps to establishing a performance-based management program:

1. Step 1: Define organizational mission and strategic performance objectives

2. Step 2: Establish an integrated performance measurement system

3. Step 3: Establish accountability for performance*

4. Step 4: Establish a process/system for collecting performance data

5. Step 5: Establish a process/system for analyzing, reviewing, and reporting performance data

6. Step 6: Establish a process/system for using performance information to drive improvement

[*While establishing accountability for performance is shown as the third step, it actually is an integral process to each of the other five steps. The reason that it is shown as Step 3 is in keeping with the six steps of the NPR Performance Measurement Process Model (shown in the Preface to this document) which was the framework around which the PBM SIG structured *The Performance-Based Management Handbook*.]

Steps 2 through 6 above are covered in detail in Volumes 2 through 6 respectively of *The Performance-Based Management Handbook*. Step 1, however, is not dedicated to a separate volume, but, rather, is covered in Section II of this volume. Thus, this volume serves two purposes: it lays out the framework for establishing and maintaining a performance-based management program; and it provides a good overview of Volumes 2 through 6. The reader should note, though, that the information provided herein on those volumes has been condensed. Therefore, the reader should refer to those volumes for more detailed coverage (information, suggestions, and examples) of each specific step.

Establishing a sound performance-based management program is not an easy or short task. As a matter of fact, getting a program firmly established will take years, not days or months. Afterward comes the task of maintaining the program. Areas identified as needing to be constantly maintained, to which ongoing attention should be given are:

- **Leadership** - Never underestimate the role of leadership. Leadership is responsible for championing the cause, for ?getting the ball rolling," and keeping it rolling. Without strong leadership, the program won't succeed. Leadership must be dedicated to the program 24 hours a day, seven days a week. Remember, a champion never rests on his/her laurels!

- **Commitment** - Everyone involved—especially those in leadership positions—needs to be committed to the program. The degree of commitment to the program will determine its degree of success. Commitment to the program should be nonstop, not for just certain periods of time. Faltering commitment will erode the program.

- **Involvement** - Performance-based management is inclusive, not exclusive. Thus, it should involve all ?interested" parties. Specifically, stakeholders, customers, and employees should be involved where applicable. Involvement is an area that can ?fall by the wayside." Management may assume that they know what stakeholders, customers, and/or employees think, want, or need, and, thus, ?leave them out of the equation." Don't make this mistake. Keep all involved who should be involved.

- **Communication** - Communication is a partner to involvement. Communication is not a something that can be done once in a while, but something that needs to be done on a continual basis. Communicating what's being planned, what's expected to happen, what's happened, and what corrections are being made as a result of what happened keeps everyone informed. It also keeps the program at the forefront . . . which is where it should be.

- **Feedback** - An ongoing feedback process will help to make adjustments to the program to keep it operating efficiently. Also, seeking and using feedback from stakeholders, customers, and employees let's them know that their opinion is valued and that they are involved in the process.

- **Resources** - A sound performance-based management program must be adequately resourced. Otherwise, it can't function properly. Resources include people, money, and equipment. All must be appropriately stocked.

- **Customer Identification** - Customer identification is important to performance-based management. Failing to identify and meet the needs of a customer could be disastrous. Always keep the customer in mind.

- **Learning and Growth** - Performance-based management is not a stagnant process. It requires learning and growth. Thus, the organization must keep pace with emerging technologies and trends in business management.

- **Environmental Scanning** - As pointed out above, performance-based management is not a stagnant process. Furthermore, performance-based management does not operate in a stagnant environment. Both the external and internal environments must be monitored constantly for threats to and opportunities for the organization.

- **Sense of Purpose** - An established performance-based management program may become ?routine," operating out of habit rather than with a sense of purpose. It's important for the organization to maintain a clear of sense of purpose for its program.

- **Organizational Capacity** - As noted by NPR (1997), a focus on organizational capacity—the commitment of people to an organizational ideal as a necessary ingredient of success—supports a new or continued emphasis on process management as a way of ensuring that inefficient and ineffective processes do not get in the way of the drive to success. It would be wise to maintain this focus.

Listed in the last section of this volume are areas for maintenance checks for each step of the process for establishing a performance-based management program. Following each maintenance check area is a list of questions to ask about that area. A ?no" response to a question means that area needs to be updated. The goal is to keep the performance-based management program ?fresh" and operating efficiently and effectively. Following these maintenance checks periodically will help an organization to achieve that goal.

## Section I: An Introduction to Performance-Based Management

For those who are not familiar with performance-based management, this section will ?bring them up to speed." It does not present an in-depth coverage of performance-based management, but, rather, gives a brief overview of it. For those wanting to delve further into the subject, please refer to the list of references and suggested readings in Appendix C.

### What Is Performance-Based Management?

For the sake of this handbook, the definition of performance-based management is as shown in the box to the right. This definition incorporates the PBM SIG's approach to structuring each of the volumes of *The Performance-Based Management Handbook*. It also follows the performance-based management framework shown in Figure 1.1 below. Please note that the PBM SIG does not subscribe to the notion that it is the ultimate authority on the subject of performance-based management, nor does it claim that this definition is the best one available. However, it does believe that this definition is a good one that works within the scope and concept of its handbook on the subject.

**Performance-Based Management is . . .**

Performance-based management is a systematic approach to performance improvement through an ongoing process of establishing strategic performance objectives; measuring performance; collecting, analyzing, reviewing, and reporting performance data; and using that data to drive performance improvement.
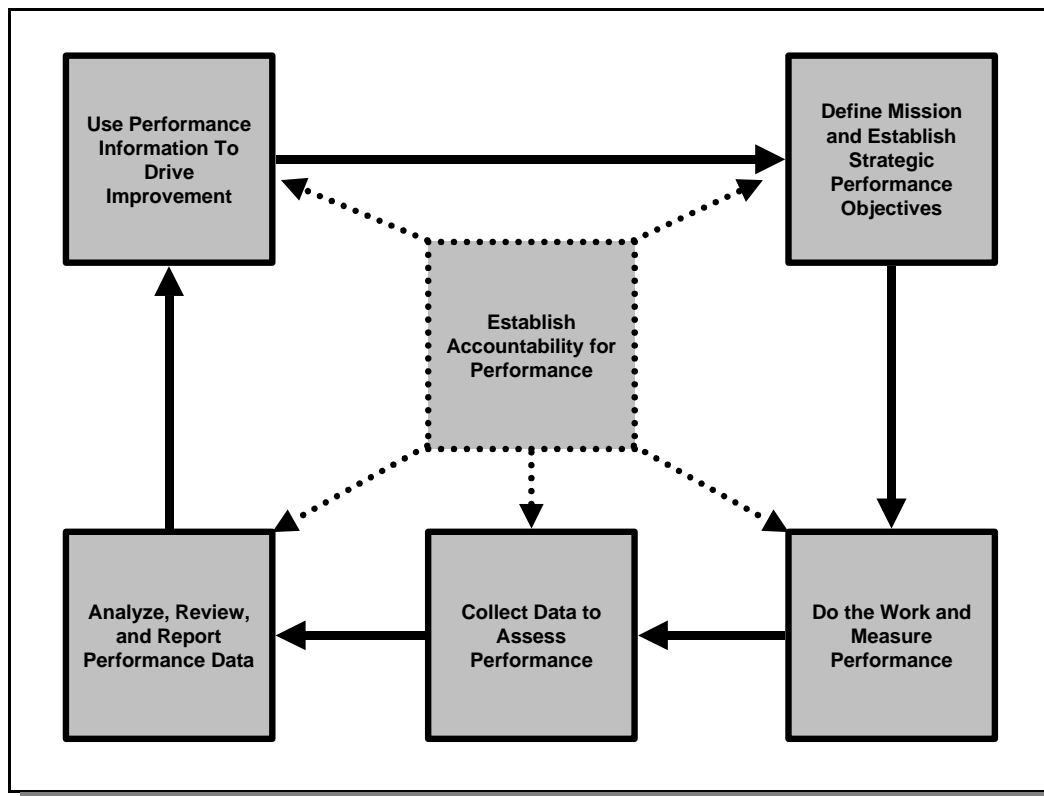


**Figure 1.1**

**The PBM SIG Performance-Based Management Framework**

Basically, performance-based management follows the Plan-Do-Check-Act (Continuous Improvement) Cycle developed by Walter Shewhart of Bell Labs in the 1930s. In the performance-based management cycle shown in Figure 1.1, the first step is to define the organization's mission and to establish its strategic performance objectives (also known as the strategic planning phase). The next step is to establish performance measures based on and linked to the outcomes of the strategic planning phase. Following that, the next steps are to do the work and then collect performance data (measurements) and to analyze, review, and report that data. The last step is for management to use the reported data to drive performance improvement, i.e., make changes and corrections and/or ?fine tune" organizational operations. Once the necessary changes, corrections, or fine tuning have been determined, the cycle starts over again. (Note that accountability for performance is established at all steps in the framework.)

## What Is the Difference Between Performance Measurement and Performance-Based Management?

Many people get confused by the similarities and differences that exist between *performance measurement* and *performance-based management*. Performance measurement, in simplest terms, is the comparison of actual levels of performance to pre-established target levels of performance. To be effective, performance measurement must be linked to the organizational strategic plan. Performance-based management essentially uses performance measurement information to manage and improve performance and to demonstrate what has been accomplished. In other words, performance measurement is a critical component of performance-based management.

## What Are the Benefits of Performance-Based Management?

Performance-based management has many benefits, including:

1. It provides a structured approach to focusing on strategic performance objectives. In other words, performance-based management focuses on the achievement of results, not on the number of activities.

2. It provides a mechanism for accurately reporting performance to upper management and stakeholders. Performance-based management takes the guess work out of, ?How are we doing?" Because all work is planned and done in accordance with the strategic performance objectives, the end result is an accurate picture of individual, program, and organizational performance.

3. It brings all ?interested" parties into the planning and evaluation of performance. Performance-based management brings customers, stakeholders, employees (i.e., those who do and/or are most familiar with the work), and management together to plan strategies and goals and to evaluate results. It is the antithesis of the ?command and control" style of management of the past. The key word is *involvement*. Performance-based management involves those who should be involved in the process.

4. It provides a mechanism for linking performance and budget expenditures. At the beginning of the cycle, performance-based management provides a framework for showing what goals will be accomplished and what resources will be necessary to accomplish those goals. At the end of the cycle, it shows what was actually accomplished and what resources actually were used to achieve those results. Thus, performance-based management takes the uncertainty out of budget allocations and provides an effective accounting for dollars spent.

5. It represents a ?fair way" of doing business. Performance-based management represents fairness. Decisions on budget allocations, employee promotions, work assignments, reward and award distribution, and the like are based on objective performance planning/results, not on appearance, personality, or other forms of favoritism.

6. It provides an excellent framework for accountability. Performance-based management ensures accountability for results. In the performance-based management framework, all actions, decisions, expenditures, and results can be easily explained, justified, and reported.

7. <u>It shares responsibility for performance improvement</u>. In the performance-based management process, performance improvement becomes a joint responsibility between the organization and its stakeholders/customers or between the individual and his/her management. This ?jointness" assures input from both sides and increases involvement in the process, ownership of results, and accountability for performance.

## How Do You Establish a Performance-Based Management Program?

The steps to establishing a performance-based management program ?borrow from" the steps in the performance-based management framework shown in Figure 1.1 on Page 3. Taking from this framework, the six steps are as shown in Figure 1.2 below. Discussion of each step is provided in the ensuing sections of this document.

[Please note that, while establishing accountability for performance is shown as the third step, it actually is an integral process to each of the other five steps. The reason that it is shown as Step 3 is in keeping with the six steps of the NPR Performance Measurement Process Model (shown in the Preface to this document) which was the framework around which the PBM SIG structured *The Performance-Based Management Handbook.*]
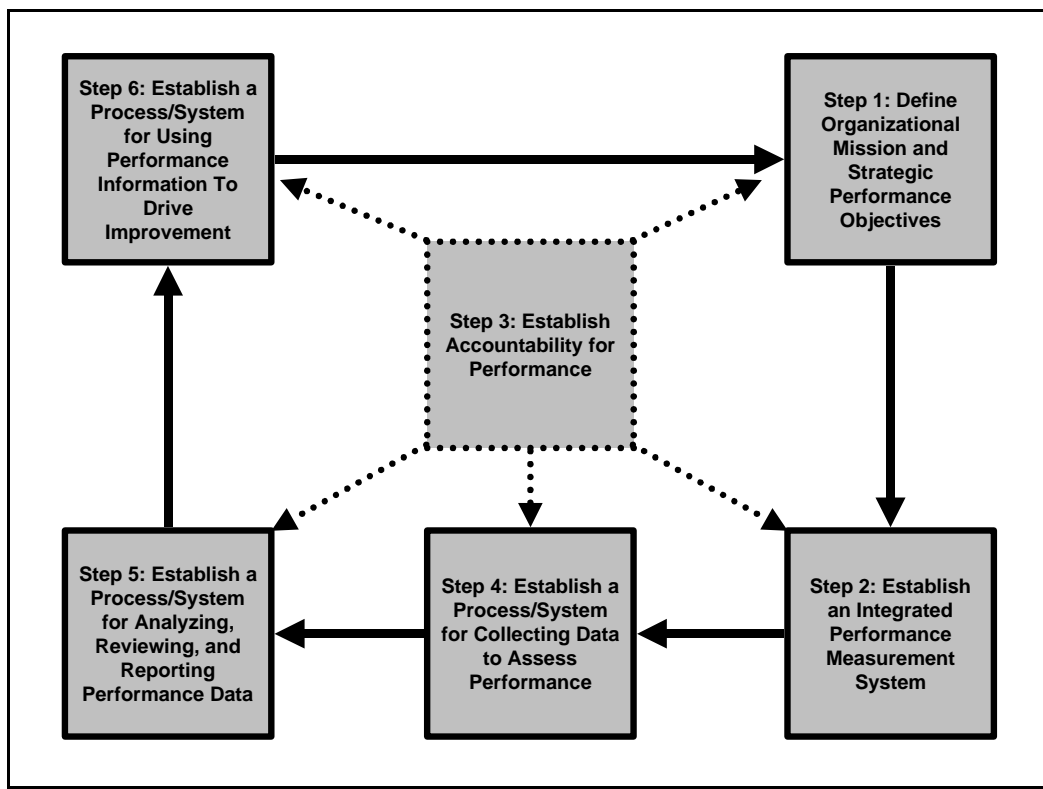


**Figure 1.2**

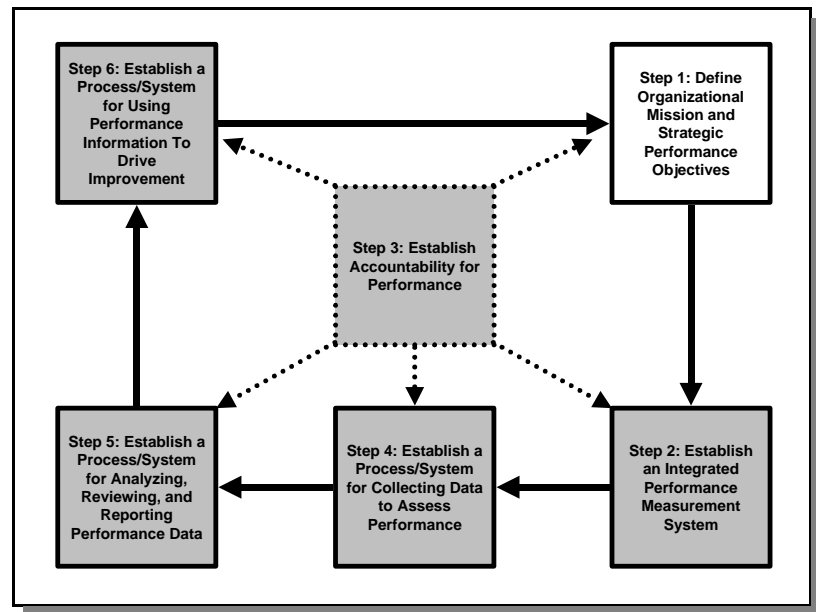**The Six Steps to Establishing a Performance-Based Management Program**

# Section II: Establishing a Performance-Based Management Program

## Step 1: Define Organizational Mission and Strategic Performance Objectives

*?Strategic planning, someone said, is what you do to be sure the place you get is somewhere you want to be!"*

From *Guidelines for Strategic Planning*, U.S. Department of Energy (1996)

The first step to establishing a performance-based management program is to define the organizational mission and strategic performance objectives. This step also is known as the *strategic planning phase* of performance-based management, and it is covered in this section. In order to provide a good understanding of strategic planning without going into great (and overwhelming) detail, the PBM SIG gleaned information from two useful documents: *Guidelines for Strategic Planning* (DOE/PO-00411996) by the U.S. Department of Energy and *Serving the American Public: Best Practices in Customer-Driven Strategic Planning* (1997) by the National Partnership for Reinventing Government (formerly the National Performance Review). This information is presented below. It is not an in-depth look at the subject, but rather a review of the highlights captured from each document. For more information on strategic planning, please refer to these two aforementioned documents as well as the documents listed in ?Appendix C: References/Suggested Reading."

Step 6: Establish a Process/System for Using Performance Information To Drive Improvement

Step 1: Define Organizational Mission and Strategic Performance Objectives

Step 3: Establish Accountability for Performance

Step 5: Establish a Process/System for Analyzing, Reviewing, and Reporting Performance Data

Step 4: Establish a Process/System for Collecting Data to Assess Performance

Step 2: Establish an Integrated Performance Measurement System

### Introduction to Customer-Driven Strategic Planning

As defined by NPR, strategic planning is ?a continuous and systematic process where the guiding members of an organization make decisions about its future, develop the necessary procedures and operations to achieve that future, and determine how success is to be measured." One of the benefits of strategic planning, as established in the tenets of GPRA, is that it can be an opportunity to unify the management, employees, stakeholders, and customers through a common understanding of where the organization is going, how everyone involved can work to that common purpose, and how progress and levels of success will be measured.

For many successful organizations, the ?voice of the customer" drives operations and charts the course for the future. Companies, as well as state and city governments, have begun focusing on customers as one of the key drivers in planning for the future. When the ?voice of the customer" becomes an integral part of organizational strategies, the organization becomes what is termed a ?customer-driven" organization. A customer-driven organization is ?one that maintains a focus on the needs and expectations, both spoken and unspoken, of customers, both present and future, in the creation and/or improvement of the product or service provided."

## Requirements for Successful Strategic Planning

Two areas integral to strategic planning are:

- **Leadership** - Senior leaders own their strategic planning processes. They recognize that their success, and the success of their organization, is tied to the quality with which they serve their customers.

- **Communication** - Communication is the lifeblood of successful strategic planning. It does not replace the need for vision and values or well-developed structure and deployment; it makes these things more successful. Effective communication in the development and deployment of the strategic plan is thought to be one of the hallmarks of successful companies.

Six requirements for successful strategic planning identified in the two areas of leadership and communication are:

1. <u>Senior leadership must be personally involved in all aspects of strategic planning</u>. Effective leadership demands clear, consistent, and visible commitment by leaders throughout the organization. Chief executives should personally explain or cascade the strategic vision throughout the organization, through town hall meetings with employees and customers, executive workshops, video telecasts to all hands with real-time call-in capabilities, and other direct methods.

2. <u>Top leaders must clearly convey the organization's mission, strategic direction, and vision to employees and external customers</u>. A clear, concise statement that communicates what the organization is and is not increases the likelihood for buy-in from both employees and external customers.

3. <u>Organizations need to operate with a sense of urgency</u>. It has been said that there are two types of companies—the quick and the dead. The impetus to move, or to move more aggressively, to a greater customer focus is the result of one of two things: a cataclysmic event or a new-found leadership commitment. Both bring a very real sense of urgency to the organization.

4. <u>Successful leadership requires not only the time, efforts, and personal abilities of chief executives, but the creation of a framework for success</u>. Successful organizations recognize the importance not only of senior executive leadership, but of creating and sustaining an organizational leadership system that facilitates, develops, and rewards leaders at all levels of the organization. Best-in-class organizations are structured and operated to encourage participation and innovation by all employees, regardless of level.

5. <u>External communication (with the customer) is a must</u>. Best-in-class organizations establish formal relationships with customers to better understand their needs and expectations to be able to include these needs in their visioning. The employee having direct interface with the customer also feeds customer requirements up the chain for inclusion in the strategic plan.

6. <u>Communication within an organization is a critical success factor</u>. The fuzzier the goals, the more chaos in an organization; the more clearly goals are communicated, the easier it is for employees to decide what needs to be accomplished. If employees are part of the process, they will accept it. If they know there is no employee participation, it doesn't matter how good the plan, it will not work.

## Advance Planning and Preparation

Effective planning requires a structured, cohesive process. There are several key issues to be addressed when developing an organizational planning process:

- Who is the strategic planning process owner and how much commitment is there to strategic planning?

- Who will execute the planning process in the organization?

- How will customers and other stakeholders be represented in the planning process?

- What are the strategic planning and business planning horizons?

- What information is needed for a successful planning process and who will be responsible for developing and managing it?

- What are the expected outcomes or results to be achieved?

- How do we define success and how will we know when we get there?

- Who is going to be responsible for deployment and performance, and who will help, and in what ways?

- What resources (e.g., money, people, or other inputs) exist to enable the process?

There are many different and correct answers to these questions, and the right ones will be dictated by the realities of the individual situation. In other words, there is no single set of right answers on how to prepare and plan to develop and deploy an organization's strategic planning process. However, these are the types of questions that must be asked and answered in the context of the organization. Taken together, they will dictate the structure and implementation of a successful strategic planning process.

## External and Internal Information

Successful organizations recognize that strategic plans must be based on accurate, timely and complete information. Current and future customer requirements are the driving force behind the creation of strategic direction for the best-in-class organizations.

The gathering of external and internal data for the purpose of strategic planning is generally known as *environmental scanning* (i.e., the 360-degree gathering and analysis of information from a variety of sources on such matters as customers' needs and expectations, technology developments, marketplace dynamics, demographics, politics, and societal trends). Many organizational planners see this information as the key to the planning process.

Environmental scanning begins by: first identifying potential sources of data that can impact business operations, both from outside and inside the organization; gathering the data; and analyzing the data to provide insight into customers, the industry, the organization, and its future. Best-in-class organizations gather external and internal data continuously, and use that data as input to all facets of the planning process.

The external environmental scan consists of an assessment of the outside world in which the organization will operate over the planning horizon. The internal environmental scan consists of an organization looking inward, assessing its own strengths and weaknesses.

## Setting Strategic Directions

The pivotal point in the strategic management process is the point at which strategic direction (i.e., the organization's goals, objectives and strategies by which it plans to achieve its vision, mission and values) is set. It is at this point that an organization's knowledge and insights about its past, present, and future converge and a path is chosen around which the organization will align its activities and its resources.

Without strategic direction, an organization risks both internal misalignment and the likelihood that it will fail to respond to the vagaries of a changing world. Regardless of the structure of the planning process, its timing or its participants, guidance from the highest levels plays a central role in ensuring success.

Nowhere is the voice of the customer more important to heed than in the direction-setting process. Organizations of all kinds appear to have decided that maintaining an internal focus on excellence will not provide them with the advantage they need to succeed. (An important activity in the direction-setting process is to understand who the customers of the organization really are.)

Components integral to setting strategic direction are:

- A <u>mission statement</u> that identifies the purpose for which the organization is organized or the function that is now carried out in the business world. (See ?About The Mission Statement" below.)

- A <u>vision</u> of the future business environment and the organization within it.

- A <u>values statement</u> of the organization's code of ethics or the values it espouses related to teamwork, quality, and protection of the environment and community in which it operates.

- <u>Assumptions</u> about the business environmental conditions that should be expected to exist in the future.

- <u>Business strategies</u> or broad statements of how objectives are to be accomplished, e.g., a growth strategy.

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**About the Mission Statement . . .**
*(From DOE's Guidelines for Strategic Planning)*

Mission statements (like organizations) tend to stand for long periods of time. But they should be examined and debated periodically both by those to whom the organization ?reports" and by those accountable for carrying them out. A whole hierarchy of missions exists in a large organization, and each level derives its mission from the mission of the parent. It is important for the planning team to be certain they are ?performing" the right mission.

The mission statement serves to clarify the purpose of the organization for people both within and outside. In addition to clarifying the job(s), it should serve to narrow and focus, as well as to inspire and motivate. It should be debated and reduced to the essence—100 words* is one ?rule of thumb"—that tells **why** we do **what**, for **whom**, and **how** in an easily understandable way. It should describe what products or services are provided to what customers (products) or clients (services) or sponsors, and what activities or kind of work we do to provide these products or services. When developing a mission statement, consider the following questions to facilitate group discussion:

- Will it be clear to everyone within and outside the organization?

- Does it tell what our job is, what needs we are trying to fill, for whom, how?

- Is it clear who we regard as our customers—not only who they are but who they should be?

- Is our primary focus or strategic thrust clear? Does it reflect our distinctive competence?

- Does it reflect our core values, philosophy and beliefs? Will it energize, motivate, and stimulate our organization?

- Is it concise enough for people to remember the main points?

(*One benchmarking partner in the NPR study on best practices in customer-driven strategic planning cautioned that a mission statement longer than 17 words would not be remembered.)

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### Implementation: Translating Strategic Direction into Action

While setting strategic direction may be the pivotal activity in the strategic management process, all the direction in the world is useless if it isn't used to actually go somewhere. Translating direction into action is the step that makes strategic direction live, breathe, and move the organization. Three components of implementation are:

1. **Business Planning** - The business planning process is carried out at the level of the business unit and levels below. During business planning, components identify their own strategies to support the

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strategies of the organization, identify initiatives (sometimes called sub-strategies) and supporting projects that will ensure that they can accomplish the performance objectives for which they are responsible, create the business case to support approval of the initiatives, and ultimately create plans to implement them, which include milestones, schedules, and resource requirements. The horizon for business planning varies, though most plans are made on a yearly cycle for a three-to-five-year time period.

2. **Budget Planning** - For most people, talking about implementation immediately raises the specter of the budget process, without which the grandest of plans could never be implemented. Strategies cost money, and budgeting is a very real part of implementing the strategy of an organization. In best-in-class organizations, strategy drives the budget, not the other way around.

3. **Building Organizational Capacity** - Organizational capacity is centered on people and processes. It is the focus that is moving or has moved organizations to use a team approach for problem solving or strategy setting at the business unit level and below. Organizational capacity concerns the commitment of people to an organizational ideal as a necessary ingredient of success. Focus on capacity forces companies to consider staff capabilities, and that the staffs have necessary knowledge, skills, and tools for success. Additionally, it is this focus on organizational capacity that is supporting a new or continued emphasis on process management as a way of ensuring that inefficient and ineffective processes do not get in the way of the drive to success.

## Performance Evaluation and Reporting

Implied within every stage of the planning process is the ability to determine progress made toward the goals or targets set. This assessment ability is a monitoring function that simply tracks activities (and their results). It may be as simple as a to do list or as complicated as a plan of action with milestones. Also implied within the planning process is the ability to measure effectiveness of the actions taken in the conduct of the organization's business.

Best-in-class organizations do not view performance assessment as merely an end-of-year task, but as an integral part of the management process itself. This thought is covered in the next section of this document which looks at the second step to establishing a performance-based management program: establish an integrated performance measurement system. But first, take a look at lessons learned about achieving success in strategic planning efforts.

## Lessons Learned About Achieving Success in Strategic Planning Efforts

In DOE's document, *Guidelines for Strategic Planning*, six lessons learned are identified about achieving success in strategic planning efforts. These lessons learned are:

1. The same people who are accountable for getting the job done must do the strategic planning. Information gathering, analysis, and other activities may be delegated to staff specialists or to subordinate managers, but defining the mission, setting goals and objectives, and developing strategies should be a participatory process involving the key ?line" managers. It is almost impossible for a task force or team to transfer to a ?higher" level group of managers the sense of conviction or excitement they developed in days of agonizing through a planning process. Any plan developed by people other than those directly responsible for ?running" the part of the enterprise in question will almost certainly be filed away along with all the others done by ?special groups"—regardless of the quality of the plan or the competence of the planning group.

2. The key managers involved must recognize that strategic planning is an important part of their job duties, and they must be willing to commit the time, energy, and resources required for the work. When the scheduled dates for strategic planning meetings approach, there is always the realization that this week's crises are much more pressing than 10 to 30 year thinking! It is crucial that the time required to do this thinking be set aside and protected for the sake of all concerned.

3. <u>The one thing certain about the future is that it will be different from what we expect it will be</u>. No matter how seriously or actively we plan for 2005 or 2030, in just a few years threats and issues will change dramatically, just as they have in the past few years. Accordingly:

    • Do not spend too much time or detailed effort in forecasting elaborate scenarios of the distant future.

    • Revisit your strategic plan at least annually and update it when appropriate to reflect the changing world.

    • Involve new members of the management team and take advantage of their new insights and contributions.

4. <u>If there is not a close linkage with the rest of the program planning, budgeting, and evaluation processes, with a constant infusion of strategic thinking into ongoing operating decisions, management actions will usually evolve into, or simply remain in a largely reactive, crisis-driven, status-quo mode</u>.

5. <u>A key to success in strategic planning is the willingness and ability of key line managers and their ?direct reports" to think beyond the current crises, priorities, and leader's desires</u>. They should assume an organizational perspective that considers the success of the enterprise in meeting the immediate and longer-term needs of stakeholders. The trap into which many people fall is to start thinking about where they are today and then extrapolate to (1) what they think it is possible to achieve or (2) what they think will most satisfy some important stakeholder. The courageous and much needed approach is one where the top officials (using the best inputs available to them) recognize the vital role of their part of the organization, and try to envision what would be the best course to pursue for the longer-term interests of the stakeholder.

6. <u>Following a strategic planning effort, many of those involved feel that the process is more valuable than the product</u>. It is the debating, sharing of convictions and doubts, and deliberating that is most valued. Later, when circumstances change and must be dealt with, management teams will have a strong basis on which to build and agree, having already discussed and reached accord on many of the underlying issues.

### Beyond the Strategic Plan

Flowing out of the strategic plan are two ?performance-based products" that further define and validate organizational (and/or individual) strategic performance objectives. These two products—performance plans and performance agreements—aide in the development of the strategic performance measures covered in the next section. A brief description of each follows:

• **Performance Plans** - Performance plans outline organizational and individual commitments to achieving specific results against the goals, objectives, and strategies of the organizational strategic plan for the resources requested in the budget. In other words, performance plans state what is going to be accomplished for the budgeted money. Performance plans are used for establishing performance agreements and for comparing planned results to actual performance results. (Please see ?Appendix D: Development and Contents of a Performance Plan" for an example approach to developing performance plans.)

• **Performance Agreements** - Performance agreements are designed—in partnership with management and those actually doing the work—to provide a process for measuring performance and, therein, for establishing accountability. The agreements state expectations for each party signing the agreement. They help improve communication with customers and stakeholders, and make transparent the conduct of an organization or individual. Agreements written in plain and concise format with specific annual deliverables allow  customers and stakeholders to know what they are getting for their money as well as give them an opportunity to influence organizational priorities. (Please see ?Appendix E: Guidelines for Performance Agreements" for an example approach to developing performance agreements.)

(For more information about the DOE strategic plan, performance plans, and performance agreements, please go to the DOE Strategic Management System Web Site at http://www.cfo.doe.gov.)

## Section III: Establishing a Performance-Based Management Program

## Step 2: Establish an Integrated Performance Measurement System

*?A prerequisite for having a sensible performance measurement system is that some kind of agreement exists on agency or program goals and how to achieve the goals. That is step one; the performance measurement system is step two. So first have agreement on what to accomplish at the agency level, which is often called a strategic plan, or at the program level, which can be called a strategic plan if the program is large enough or may be called an operational plan, if the program is smaller. The measurement system is relevant only in the context of some degree of agreement on what goals we are shooting for and how we are trying to get there. That tells us what kind of measures will be useful in managing for performance and communicating what performance is desired and what performance we are achieving.*"
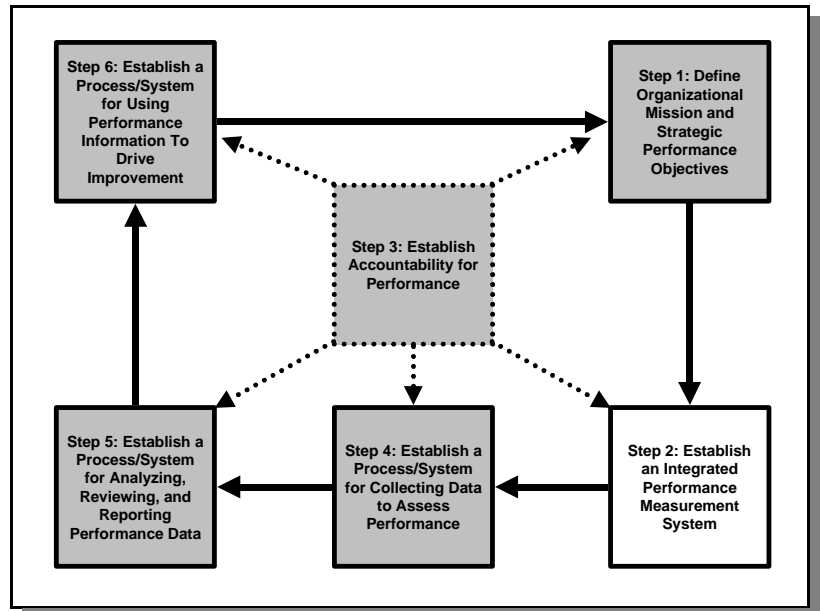


Joseph S. Wholey
From *Performance Measurement and Performance-Based Management: An Interview with Joseph S. Wholey (1998)*

As Joseph S. Wholey so aptly explained above, establishing a performance measurement system is the next step to take after creating the strategic plan. The information contained in this section has been condensed from Volume 2, ?Establishing An Integrated Performance Measurement System," of *The Performance-Based Management Handbook*.

## ESTABLISHING AN INTEGRATED PERFORMANCE MEASUREMENT SYSTEM

### Why Establish an Integrated Performance Measurement System?

Performance measurement systems succeed when the organization's strategy and performance measures are in alignment and when senior managers convey the organization's mission, vision, values, and strategic direction to employees and external stakeholders. The performance measures give life to the mission, vision, and strategy by providing a focus that lets each employee know how they contribute to the success of the company and its stakeholders' measurable expectations.

Integration makes it possible for performance measures to be effective agents for change. If the measures quantify results of an activity, one only need compare the measured data with the desired goals to know if actions are needed. In other words, the measures should carry the message.

Inappropriate measures are often the result of random selection methods. For example, brainstorming exercises can get people thinking about what is possible and provide long lists of what could be measured. Unfortunately, such efforts by themselves do not provide reliable lists of what should be measured. Unless the measures are firmly connected to results from a defined process, it is difficult to know what corrective actions to take as well as be able to predict with confidence what effects those changes will have.

In order to be able to identify effective corrective actions to improve products and services, results of all key processes must be measured. In this way, specific processes that need to change can be identified when progress is not satisfactory.

## Major Components of Integrated Performance Measurement Systems

There are a number of sources that should be examined as a first step in establishing an Integrated Performance Measurement System. These sources typically provide a strategic perspective in developing a set of ?critical few" performance measures. They also give us the major components of an integrated performance measurement system. These components are:

- **The Strategic Plan** - Strategic Plans set the foundation for effective performance measurement systems. Traditional performance measurement systems that focus on the wrong set of performance measures can actually undermine an organization's strategic mission by perpetuating short-sighted business practices. For this reason, it is appropriate to discuss the critical elements of strategic plans and review the compatibility of strategic plans to an integrated performance measurement system.

- **Key Business Processes** - Processes and their activities are the means to achieve the outcomes—the end results—of the Strategic Plan. But, usually, there are many processes and activities within an organization, each potentially needing performance measures. With this reality in mind, the secret to a successful integrated performance measurement system is to clearly identify the organization's ?key" business processes, that is, those having the most impact on the success or failure of the organization's goals. The primary objective should be to keep the number of key processes to a manageable yet useful level. Too many can lead to an overwhelming number of measures and resulting data. Too few can lead to inadequate information on which to base business decisions.

- **Stakeholder Needs** - *Stakeholders* refers to those people who have or perceive they have a stake in the future success of an organization or organizational unit. It is imperative to have a very clear idea of who these people are and what their needs and expectations are. Their points of view and expectations should all be considered in developing strategic goals and objectives. If they have a stake in the output of the process, they should have a stake in the input to the process.

- **Senior Management Involvement** - In most best-in-class organizations, the performance measurement initiative is originally introduced, and continually championed and promoted, by the top executives. In many organizations, leadership commitment to the development and use of performance measures is a critical element in the success of the performance measurement system.

- **Employee Involvement** - When developing an integrated performance measurement system, don't forget to involve your employees in the process. After all, they are the ones who directly contribute to the input, output, outcome, performance, process, and every other aspect of the organizational operation. Employee involvement is one of the best ways to create a positive culture that thrives on performance measurement. When employees have input into all phases of creating a performance measurement system, buy-in is established as part of the process. The level and timing of employee involvement should be individually tailored depending on the size and structure of the organization.

- **Accountability for Measures** - Successful deployment of an integrated performance measurement system is related strongly to developing a successful system of accountability, that is, managers and employees alike ?buy in" to performance measurement by assuming responsibility for some part of the performance measurement process. (NPR 1997)

- **A Conceptual Framework** - A conceptual framework can help in deciding what to measure. For example, measuring organizational performance can be linked to the strategic planning process. Or you can use a balanced set of measures to ensure that senior leaders can get a quick comprehensive assessment of the organization in a single report. A family of measures can be used to align measurement across levels of the organizations. (NPR 1997) These and other frameworks are discussed later in this section.

- **Communication** - Communication is crucial for establishing and maintaining a performance measurement system. It should be multidirectional, running top-down, bottom-up, and horizontally within and across the organization.

- **A Sense Of Urgency** - The impetus to move—or move more aggressively—to a new or enhanced performance measurement and performance management system is generally the result of a cataclysmic event—most frequently, a circumstance threatening the organization's marketplace survival. One of several scenarios may precede initiating a performance measurement system within an organization.

### Integrating Performance Measures Vertically and Horizontally

Performance measures need to be integrated in two directions: vertically and horizontally. Vertical integration of performance measures motivates and improves operating performance by focusing all employees' efforts on the organization's strategic objectives. It is initiated once the company's strategic plan and measures are solidified. Horizontal alignment of performance measures assures the optimization of work flow across all process and organizational boundaries. These performance measures are customer-focused and assess the enterprise-level capability of a process to provide value from the customer's perspective. Customers do not ?see" the process boundaries through which their products flow, but they care about the attributes of the product delivered to them.

### Ensuring Organizational Commitment

The last step in establishing an integrated performance measurement system is to ensure organizational commitment to the system. This step can be achieved by integrating the key components of the measurement system (identified earlier in this section) through a technique called *Catchball*. In this technique, stakeholders, customers, senior management, and employees ?throw and catch" ideas, needs, strategies, etc., as if playing a game of ?catch." In doing so, these ideas, needs, strategies, etc., are cascaded throughout the organization through the involvement of the principal parties. This involvement brings about ?buy-in" which brings about commitment.

# CHOOSING A PERFORMANCE MEASUREMENT FRAMEWORK

When you are developing or updating your performance measures, you should consider conceptual frameworks to stimulate thought about what should be measured. Experience has shown that a framework is needed to organize your thoughts, identify common vocabulary, and ensure appropriate coverage for your performance measurement system. This is particularly important when you are developing a measurement

system for the first time. If you are just developing your performance measurement system, select one framework and use it. Although some frameworks fit particular organizations better than others, any framework will help get you started. When updating your performance measures, it is useful to review other frameworks to identify new ideas and approaches that might improve your system. (DOE, 1996)

## Balancing Measures: One Concept, Different Frameworks

The concept of *balancing* performance measures took root in 1992 when Robert Kaplan and David Norton first introduced the Balanced Scorecard. The gist of the concept is to translate business mission accomplishment into a critical set of measures distributed among an equally critical and focused set of business perspectives. Since Kaplan and Norton introduced the Balanced Scorecard concept, many variations of the concept have surfaced, due mainly to the fact that no two organizations are alike and their need for balanced measures and their identified business perspectives vary. Regardless, the two key components of all of these frameworks are a <u>balanced set of measures</u> and a <u>set of strategically focused business perspectives</u>.

Four frameworks that use the balanced approach are: the Balanced Scorecard, the ?Critical Few" set of measures, performance dashboards, and the Malcolm Baldrige National Quality Award criteria. These are described below.

- **The Balanced Scorecard** - In 1992, Robert Kaplan and David Norton introduced the Balanced Scorecard concept as a way of motivating and measuring an organization's performance. The concept takes a systematic approach to assessing internal results while probing the external environment. It focuses as much on the process of arriving at successful results as on the results themselves. Under the Balanced Scorecard methodology, the processes that contribute to desired results are viewed cross-functionally. Measures that make one function look good while deflating another are avoided, thus minimizing negative competition between individuals and functions.

  The Kaplan/Norton Balanced Scorecard asks questions from four interconnected business perspectives. These are: (1) <u>Financial</u> – How do we look to our stakeholders?, (2) <u>Customer</u> – How well do we satisfy our internal and external customer's needs?, (3) <u>Internal Business Process</u> – How well do we perform at key internal business processes?, and (4) <u>Learning and Growth</u> – Are we able to sustain innovation, change, and continuous improvement?

  The Balanced Scorecard provides a way for management to look at the well-being of their organization from the four identified perspectives. Each perspective is directly tied to organizational strategy, and strategically linked performance objectives and measures flow from these perspectives, providing the user with an integrated performance measurement system.

- **The ?Critical Few" Performance Measures** - Having too many measures—therefore generating a large amount of routine data—could distract senior management's focus from those measures that are the most critical to organizational success. The process of simplifying and distilling a large number of performance measures across the organization to select a ?critical few" that drive strategic success should be viewed as part of the performance measurement process itself. It helps sharpen understanding of the strategic plan and its supporting objectives.

  The selection of a critical few set of performance measures highlights the need for a balance between internal and external requirements, as well as financial and nonfinancial measures. Although there is not a magical, ?right" number of strategic measures, best practice companies typically have defined a working number of measures of between three and 15 at each level within the organization, depending on the complexities of the organization.

  As with the Balanced Scorecard, the ?critical few" framework develops strategically focused business perspectives and then identifies performance objectives and measures for each perspective. Whereas some organizations develop a working number of measures for each perspective, others develop performance indexes (see Volume 5, *Analyzing and Reviewing Performance Data*, for more information)

to report performance levels for a particular perspective. These indexes take data from many measurement sources and ?roll them up" into a single, meaningful, reportable number.

- **Performance Dashboards** - A performance dashboard is an executive information system that captures financial and nonfinancial measures as indicators of successful strategy deployment. In France, companies have developed and used the *Tableau de Bord*, a dashboard of key indicators of organizational success, for more than two decades. The *Tableau de Bord* is designed to help employees ?pilot" the organization by identifying key success factors, especially those that can be measured as physical variables. Many dashboards are indexed measures that roll-up performance in a weighted manner to a few select gauges based on many measures, or inputs.

- **The Malcolm Baldrige National Quality Award Criteria** - In 1988, the Malcolm Baldrige National Quality Award (MBNQA) was instituted to promote total quality management (TQM). Since that time, TQM has gone through many changes and now generally is referred to by other names, such as ?continuous improvement" or ?reengineering." One fact remains, though, and it is that all Baldrige winners don't look at TQM (or whatever they call it) as a separate program or entity. On the contrary, they integrate its philosophies and practices into their organization's day-to-day operations.

  The Baldrige standards call for a balance among customer satisfaction, employee satisfaction, and business results. The award is based on criteria created through a public-private partnership and focused on three business factors: Approach (the processes used to run an organization), Deployment (the execution of an approach), and Results (the outcome of the approach and deployment.) Based on a 1000-point scale, the award criteria are divided into seven perspectives:  Leadership, Strategic Planning, Customer and Market Focus, Information and Analysis, Human Resource Focus, Process Management, and Business Results.

## DEVELOPING PERFORMANCE MEASURES—GETTING ORGANIZED

The performance measurement framework that you select will help you determine your strategic focus as you begin to develop your performance measures. However, before you go about this task, you need to ?get yourself organized."  Specific steps to take in getting organized are:

1. Establish the performance measurement team. The team should be made up of the people who actually do the work to be measured and the people who are very familiar with the work to be measured. It is important that each person understands the task before him/her and his/her role in its accomplishment.

2. Gain an understanding of the jargon. Performance measurement jargon can be very confusing, but needs to be understood and agreed to by the performance measurement team.

3. Consider the ?considerations."  The ?considerations" are: Keep the number of performance measures at each management level to a minimum; develop clear and understandable objectives and performance measures; determine if the cost of the measure is worth the gain; consider the cost of attaining the next level of improvement; assure that the measure is comprehensive; consider performing a risk evaluation; consider the weight of conflicting performance measures; and develop consistent performance measures that promote teamwork.

4. Know how to check/test your measures. After you have developed your performance measures, you will need to check/test them for soundness (i.e., completeness, applicability, usefulness, etc.). Knowing how to perform these checks/tests and, thus, knowing what to look for in a performance measure, will help your team develop sound performance measures from the start.

5. Take a look at how other organizations measure performance. Now that your team is organized and ready to develop its performance measures, take one last important step: look at what other organizations similar to yours have done and are doing with regard to their performance measurement

system. The point here is to eliminate your team's ?reinventing the wheel" and, thus, save you valuable time and resources (and spare you many headaches!). The odds run high that you will be able to find another organization to share useful information that your team (and organization) can adopt and adapt to its particular circumstances.

## DEVELOPING PERFORMANCE MEASURES—SAMPLE APPROACHES

In Volume 2, ?Establishing An Integrated Performance Measurement System," the PBM SIG presents three approaches to developing performance measures. The sample approaches come from DOE's *Guidelines for Performance Measurement* (DOE G 120.1-5, 1996, the University of California, and the Auditor General of Canada. While it is not possible to condense these approaches into a few pages for inclusion herein, the broad steps taken within each approach are presented below. Please see Volume 2 for a more detailed look at these approaches.

### The DOE Approach

The fundamental purposes of performance measurement are to provide insights into operations and to support planning (to make adjustments in organization goals, strategies, and programs that translate into improved products and services to customers and stakeholders). The approach outlined here assumes that your organization already has a strategic plan. Development of performance measures relies upon the description of your organization that comes from strategic planning.

The approach outlined in *Guidelines for Performance Measurement* calls for a six-step process. These six steps are:

1. <u>Use a collaborative process</u>. Develop the measurements using collaborative processes and include both the people whose work will be measured and the people who will implement important parts of the measurement process (if they are different).

2. <u>Describe your organizational processes</u>. Develop a flow process model or input/output chart that defines your organization's main activities.

3. <u>Design the measurements</u>.  Design performance measures to demonstrate progress toward achieving the strategic and shorter-term goals laid out in your organization's strategic plan.

4. <u>Collect the data</u>. Measurements are only useful if the produced values are valid. Ensure data quality because it is crucial to delivering useful information.

5. <u>Use the data</u>. There is a difference between collecting data and translating data into useful information. Collected data should be processed and presented in meaningful ways.

6. <u>Continually improve the measurement process</u>. Expect to change your measures and measurement process to respond to changing needs and priorities. Apply the concept of continuous improvement to your measurement system to make sure your measures make sense and measure the right things.

### The University Of California Approach

The University of California (UC) approach was first highlighted in the PBM SIG's *How to Measure Performance—A Handbook of Techniques and Tools* (PBM SIG 1995). It provides an easy-to-follow approach to developing performance measures. In the UC approach, there are six basic steps to the process of developing performance metrics:

1. Assemble the People Who Actually Do the Work or Are Very Familiar with it. Get your team together. Review the *Guidelines for Teams* (on Page 35). Make sure everyone understands the task and their roles and responsibilities.

2. Identify and Focus on a Limited Number of Critical Work Processes and Internal and External Customer Requirements That Can Be Effectively Managed. Use a balanced approach. Pick one of the frameworks shown in Section III of this volume or devise one suitable to your needs.

3. Identify and Align Critical Desired Results to Customer Requirements. Keep your customer(s) in mind. They're your ?real employer." As noted by NPR (1997), ?most of the best-in-class organizations place customer satisfaction above all else."

4. Develop Specific Measurements to Reflect Critical Work Processes and Results. Make sure your measures meet the criteria and ?pass the tests" outlined in Section IV of this volume.

5. Establish Performance Goals, Standards, or Benchmarks. You need to know where you are going and where you want to be. Goals, standards, or benchmarks will do this for you.

6. Create Gradients for Rating the Degree of Success. You need to grade yourself in order to know how well you are doing.

## The Auditor General of Canada Approach

This approach comes from *Developing Performance Measures for Sustainable Development Strategies*, a document produced by the Office of the Auditor General of Canada (AGC) and the Commissioner of the Environment and Sustainable Development. It consists of the following steps:

1. Confirm program role. WHY is your program relevant to the strategic objective? Defining the role that the program is intended to fulfill with respect to strategic objectives provides a basis for establishing program targets and performance measures.

2. Identify the key program activities and outputs. This step is essential to ensure that program managers and staff focus on key issues that contribute to the achievement of organizational strategy.

3. Identify program stakeholders and issues. WHO do you want to reach? In order to formulate a set of strategic objectives, it is essential to identify who program activities and outputs are intended to serve, influence or target, and who the other principal groups affected are and how they are affected.

4. Identify what the program aims to accomplish. WHAT results do you expect to achieve? Desired results should be defined in terms of outcomes that then become the focus for determining appropriate objectives, milestone targets and measures.

5. Identify responses and performance requirements. HOW are you going to achieve your objectives? Performance objectives must be defined in operational terms to be managed effectively.

6. Identify potential performance measures. Performance measurement is required to understand the gap between actual and expected levels of achievement and when corrective action may be warranted. The results indicated by a performance measure will generally be compared with expectations specified by a performance target (which might be based on a benchmark best practice, a technical standard or some specified progression from the baseline value).

7. Establish information capabilities and a baseline for each measure. Understanding what information is currently available to your organization as well as your organization's capabilities for gathering and analyzing information is an important first step in the selection of performance measures. The process of establishing baseline measures for each measure will shed light on your organization's information capabilities and gaps.

8. Assess the adequacy of performance measures. Once a list of candidate performance measures has been developed, the next step is to select a set of performance measures that is suitable for tracking performance toward specified objectives.

9. <u>Establish accountability and resources for implementation</u>. An accountability system formalizes the relationship between results, outputs, activities, and resources. It allows people to see how their work contributes to the success of the organization and clarifies expectations for performance.

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## MAINTAINING AN INTEGRATED PERFORMANCE MEASUREMENT SYSTEM

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For those who already have established an integrated performance measurement system, the real issue is managing a mature system. They might ask, ?How do I maintain it?" The answer is that you maintain it like you would an automobile or an airplane—through a series of regularly scheduled maintenance checks (which are outlined below).

- **Maintenance Check #1: Measurement System Components** - At the beginning of this section, a list of nine key components of an integrated performance measurement system was provided. These components should be checked (reevaluated) annually to look for any changes within the component that would impact the system.

- **Maintenance Check #2: The Performance Measurement Team** -The performance measurement team is made up of the people who actually do the work being measured and those who are very familiar with the work being measured. It is important to periodically check the following things about your team: (1) changes to the make-up of the team due to turn-over, reassignment, etc.; (2) ?burn-out" of team members due to stagnant, repetitive roles/responsibilities (perhaps a rotation of assignments is in order); and (3) understanding of roles/responsibilities and task by team members (all should understand them and agree to them).

- **Maintenance Check #3: New Legal Requirements/Issues** - The issuance of new laws, regulations, and orders can have significant impact on an organization and its mission. For the most part, adherence to these laws, regulations, and orders is a requirement, not an option. Therefore, it is imperative that an organization ?stay on top" of legal developments and incorporate their requirements into the performance measurement system. It also is ?a must" that these requirements be communicated thoroughly to employees and stakeholders.

- **Maintenance Check #4: New Developments/Technology** - It will be necessary to keep abreast of and review any new developments (theories, practices, etc.) and/or technology that has emerged in the performance measurement field since the time that your system was instituted. When assessing these new developments/technology, consider: (1) the impact (both positive and negative) the incorporation of these new developments and/or technology into your system would have on the organization and the system; (2) the value-added of these new developments and/or technology; and (3) the cost of these new developments and/or technology.

- **Maintenance Check #5: Feedback! Feedback! Feedback!** - Feedback may be the greatest asset for a maintenance check. Seek it and use it. Get it from your employees and your customers/stakeholders. In particular, get it from a benchmarking partner—a similar organization with a successful, mature measurement system. They can give you new ideas to ?breathe life" into your system. (See Volume 6, *Using Performance Information To Drive Improvement*, for more information on benchmarking.)

## Section IV: Establishing a Performance-Based Management Program

## Step 3: Establish Accountability for Performance

*?Accountability is a multidimensional concept and often a key enabler of success . . . To truly work, accountability has to be shared by managers and employees; further, your organization as a whole must be accountable to the customer and stakeholder.*"

National Partnership for Reinventing Government
From *Balancing Measures: Best Practices in Performance Management*

[As was pointed out earlier, while establishing accountability for performance is shown as the third step in the six steps to establishing a performance-based management program, it actually is an integral process to each of the other five steps. The reason that it is shown as Step 3 is in keeping with the six steps of the NPR Performance Measurement Process Model (shown in the Preface to this document) which was the framework around which the PBM SIG structured *The Performance-Based Management Handbook*.]

The information contained in this section has been condensed from Volume 3, ?Establishing Accountability For Performance," of *The Performance-Based Management Handbook*.
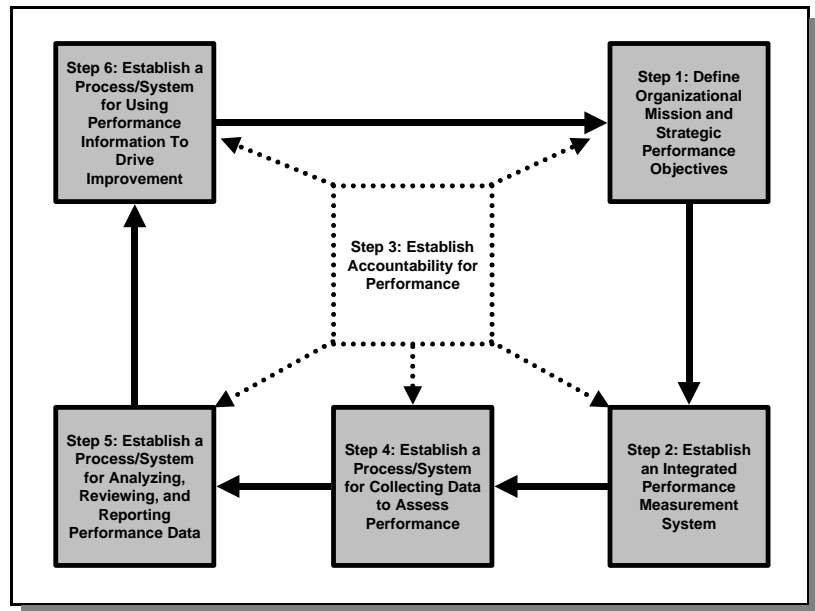


## UNDERSTANDING THE CONCEPT OF ACCOUNTABILITY

### What is Accountability?

In all of the available literature on the subject of accountability, no common definition or view of accountability can be found. This lack of commonality is due partly to the fact that the concept of accountability—especially in the governmental setting—is just coming to the forefront. For the sake of discussion in this document, the PBM SIG developed the definition of accountability shown to the right.

### A Working Definition Of Accountability

Accountability refers to the obligation a person, group, or organization assumes for the execution of authority and/or the fulfillment of responsibility. This obligation includes:

• Answering—providing an explanation or justification—for the execution of that authority and/or fulfillment of that responsibility,

• Reporting on the results of that execution and/or fulfillment, and

• Assuming liability for those results.

### Key Aspects of Accountability

Five key aspects of accountability are:

1. <u>Accountability is a relationship</u>. - Accountability is a two-way street, or, as described by the Auditor General of British Columbia, ?a contract between two parties."

2. <u>Accountability is results-oriented</u>. - In today's public and private sector organizational structure, accountability doesn't look at inputs and outputs, it looks at outcomes.

3. <u>Accountability requires reporting</u>. - Reporting is the ?backbone" of accountability. Without it, accountability will not stand up.

4. <u>Accountability is meaningless without consequences</u>. - A key word used in defining and discussing accountability is *obligation*. Obligation indicates liability, and liability comes with consequences.

5. <u>Accountability improves performance</u>. - The goal of accountability is to improve performance, not to place blame and deliver punishment.

### The Five Levels of Accountability

Just as there is no commonly accepted and used definition of accountability, there are diverging theories on the levels of accountability. Some say accountability applies only to individuals, some say it applies only to groups, and some say it applies to both. The PBM SIG identifies five levels of accountability:

1. <u>Personal Accountability</u> - An accountability relationship with oneself.

2. <u>Individual Accountability</u> - An accountability relationship within a work setting.

3. <u>Team Accountability</u> - A *shared* accountability relationship within a work group or team.

4. <u>Organizational Accountability</u> - *Internal* and *external* accountability relationships within an organization.

5. <u>Stakeholder Accountability</u> - A *detached* accountability relationship between stakeholders and the organization.

## ESTABLISHING ACCOUNTABILITY FOR PERFORMANCE

Accountability doesn't ?just happen." A person or group doesn't all of a sudden say, ?I'm accountable!" or ?We're accountable!" It just doesn't happen that way. Accountability has to be established first through an ?accountability environment," then through an accountability framework. The environment integrates accountability into the individual, team, and organizational performance systems. The framework ensures the execution and fulfillment of the accountability obligations. This section covers the establishment of both.

### What Is an Accountability Environment?

As used here, an accountability environment refers to the condition in which accountability can flourish. Specifically, an accountability environment is the condition in which individuals, teams, and organizations feel:

- Motivated to execute their authority and/or fulfill their responsibility;

- Stimulated to perform their work and achieve the desired results;

- Inspired to share (report) their results; and

- Willing to accept the liability for those results.

The optimal accountability environment is one of proactive accountability wherein the individual, team, and organization is focused on achieving great results rather than figuring out ways to explain away poor results.

For the most part, the accountability environment is established from the top down, i.e., organizational leadership institutes and promotes the environment and cascades it throughout the various levels of management down to the individual worker. Thus, ?troubles" with the accountability environment at the individual worker level usually can be traced to a ?polluted" environment within the management level. However, there are times when the individual worker shuns accountability regardless of management support and commitment.

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**Requirements for an Accountability Environment**

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Just as there are many components necessary for the establishment of an integrated performance measurement system (see Step 2), there are many requirements for the successful establishment of an accountability environment. These requirements are:

- Leadership - As was noted above, the accountability environment is established from the top down. Thus, leadership becomes the most important ?ingredient" in the environment. (Leadership, as used here, refers to any individual or group in a position of authority to direct and control the work of others.):

- Reciprocation - Reciprocal accountability ensures the ?two-wayness" of the accountability relationship. It guarantees fairness and promotes both transparency and clarity. Under the concept of reciprocal accountability, a person/group/organization with assigned authority and a person/group/organization who has been delegated responsibilities by that authority undertake a *quid pro quo* relationship. The authority is responsible for providing adequate direction, guidance, and resources as well as removing barriers to performance. In exchange, the delegatee is responsible for fulfilling its responsibilities. In this relationship, both are accountable to each other.

- Equity - Equity, or fairness, is the cornerstone of accountability. The assumption of a fair deal should be maintained and promoted by organizational leadership. Inequity should be avoided because it will destroy trust and organizational credibility. As a result, performance will be less than optimal.

- Trust - Fairness brings about trust; trust indicates fairness. There can be no established accountability relationship without trust. If either or both parties don't trust the other, there probably exists a lack of transparency, and the relationship is doomed for failure. In other words, accountability cannot survive in an environment of mistrust.

- Transparency - Transparency, the condition of complete openness, is one of the sustaining elements of accountability, and, thus, is key to the establishment of an accountability environment. Transparency means that the actions of individuals, groups, or organizations in the accountability relationship are conducted without deceit or hidden motives and that all performance information is complete and not intentionally missing pertinent data. In its simplest terms, transparency means all players put ?all of their cards on the table." An environment without transparency means one that is full of hidden agendas. It also means an environment of mistrust and damaged accountability.

- Clarity - Clarity also is one of accountability's sustaining elements. In order for individuals or groups to execute authority and/or fulfill responsibility, they need to have a clear picture of what it is they are to execute/fulfill and what results are expected. Thus, key focus areas for clarity are authority, organizational mission, roles and responsibilities, performance expectations, and performance reporting.

- Balance - In order for accountability to work, there has to be a balance between accountability and authority; expectations and capacities; and pay and performance.

- Ownership - Optimal performance can be achieved by giving individuals and groups a sense of ownership for their actions. Ownership gives them an interest in their outcomes and, thus, leads them to ?take care of business" (fulfill their responsibilities). An example of this concept can be seen using the analogy of renting a car versus owning a car. Usually, a person renting a car pays no attention to vehicle maintenance or wear and tear. On the other hand, when the car is owned, particular attention is paid

to maintenance (oil changes, tire rotation, etc.) and handling of the vehicle in order to achieve optimal performance and prolong the life of the vehicle. In other words, ownership increases responsible behavior and a caring attitude.

- <u>Consequences</u> - As stated earlier in this document, accountability is meaningless without consequences. Accountability comes with liability, and liability indicates consequences. The consequences could be good (rewards) or bad (sanctions). Whatever the case, consequences help drive the execution of authority, the fulfillment of responsibility, and the improvement of performance. Establishing consequences and not following through with them has the counter-effect of deflating the meaning and importance of accountability.

- <u>Consistency</u> - Consistency assures stability. The inconsistent application of policies, procedures, resources, and/or consequences within an organization undermines the accountability environment by weakening perceived organizational commitment and credibility. It deflates employee morale and promotes employee cynicism. Ownership ?goes out the window" and performance suffers. Individuals and groups need consistency. It increases predictability and decreases the need to ?guess what's next."

- <u>Follow-Up</u> - In their document, *Modernizing Accountability Practices in the Public Sector* (1998), the Auditor General of Canada and the Treasury Board Secretariat refer to this requirement as ?reasonable review and adjustment," noting that, ?Something has to happen as a result of reporting accountability information in order to 'close the loop'. The party or parties reviewing results need to consider what has been accomplished in light of expectations and the circumstances that existed, and then recognize achievements as well as under-achievements. Where expectations have clearly not been met, corrective actions may need to be taken, possible adjustments to the accountability arrangement made and lessons-learned noted. An accountability relationship without follow-up is clearly incomplete and unlikely to be effective."

## Barriers to the Accountability Environment

Below is a list of barriers to the accountability environment—things that are counter-productive to establishing a healthy and effective accountability relationship. This list is not in-depth or all-inclusive, but it should provide a picture of some of the more ?likely-to-occur" barriers faced in the business world today.

1. <u>Hidden Agendas</u> - Business/office ?politics" sometimes focus employee performance on areas targeted for personal gain. Such tactics only leave employees feeling used (and abused) and not very motivated to perform. These tactics also destroy trust, a key element of accountability. Remember that accountability requires transparency . . . and transparency means openness.

2. <u>Favoritism</u> - Favoritism is a tricky issue. Management could favor high performers, leaving other employees feeling ?left out." Or management could favor employees regardless of performance, also leaving other employees abandoned. Accountability requires inclusiveness and team work. Favoritism doesn't support that requirement.

3. <u>Lack of Leadership</u> - Leadership commitment to establishing an accountability environment is crucial. Without it, performance results will be much less than expected

4. <u>Lack of Resources</u> - It is useless to expect optimal performance if individuals or teams are not provided with the resources to perform the work. To profit from performance, organizations must invest in their employees.

5. <u>Lack of Follow-Through</u> - When management says they are going to do something and they don't, it tells the employee that management can't be trusted to follow-through. For example, announcing rewards or penalties for performance and not following through with them, paints management as untrustworthy. It also doesn't inspire employees to perform.

6. <u>Lack of Clarity</u> - When lines of authority or roles and responsibilities aren't clear, it's difficult to pinpoint where certain accountabilities reside. It also lends to some performance obligations ?falling through the cracks." Clarity is essential to an accountability relationship.

7. <u>Data Misuse</u> - Performance information must be complete and credible, and it must be reported in a timely manner. Withholding data shows a lack of transparency and a need for mistrust. Not using data at all can come to mean that performance is not important to the organization. In either case, the accountability relationship suffers.

## Establishing a Framework for Accountability

When an individual or organization is assigned authority and/or delegated responsibility, they must provide a plan, execute the plan, and measure and report real results relative to that plan. The recipient of the report provides feedback, a new plan is developed, and the cycle begins again. This cycle provides the basic framework for accountability. An example of this cycle is the performance-based management framework shown in Figure 1.1 on Page 3 of this volume. Another example is the Auditor General of Alberta's framework shown in Figure 1.3 to the right. Other examples are the frameworks laid out in GPRA and the DOE Strategic Management System framework.



**Figure 1.3**

**Auditor General of Alberta Framework for Accountability**
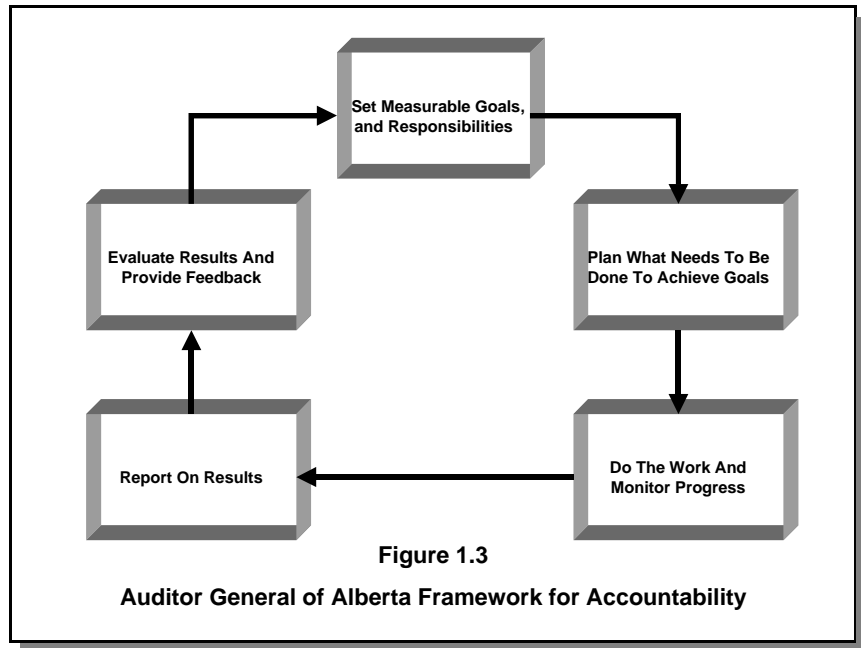
## ACCOUNTABILITY TOOLS

Since accountability requires reporting, the focus of accountability tools is on reporting of performance—both intentions and results. Accountability tools include:

- **Strategic Plans** - Strategic planning is a process for helping organizations think about the objectives they should establish to fulfill their mission and in what directions they should move to achieve those objectives. It is the foundation for all planning, budgeting, execution, control, and evaluation activities by an organization. The benefits of strategic planning include building consensus around organizational goals, objectives, and priorities; providing the basis for resource allocations and operational planning; defining baselines for controlling outcomes; and helping to evaluate organizational performance.

- **Performance Plans** - Performance plans outline organizational commitments to achieving specific results against the goals, objectives, and strategies of the organizational strategic plan for the resources requested in the budget. In other words, performance plans state what is going to be accomplished for the budgeted money. Performance plans are used for establishing performance agreements and for comparing to actual performance results.

- **Performance Agreements** - Performance agreements are designed—in partnership with management and those actually doing the work—to provide a process for measuring performance and, therein, establish accountability. The agreements state expectations for each party signing the agreement. They

help improve communication with customers and stakeholders, and make transparent the conduct of an organization or individual. Agreements written in plain and concise format with specific annual deliverables allow customers and stakeholders to know what they are getting for their money as well as give them an opportunity to influence organizational priorities.

- **Accountability Reports** - Published annually, accountability reports include program and financial information, such as audited financial statements and performance measures reflecting performance in meeting key organizational goals. For example, the DOE's FY 1998 Accountability Report integrates performance results, financial status, and management controls to provide a status report on DOE's performance in FY 1998.

- **Performance-Based Contracts** - Industry has been using performance-based contracting since the 1980's to streamline the procurement cycle, achieve lower costs and higher quality and to move away from audit and inspection at the end of the procurement to building in the performance expectation at the beginning of the cycle. Dramatic improvements have been made by allowing providers to be innovative in how they deliver the desired end product and focusing on what the purchaser wants as an end product. Performance-based contracts hold the customer accountable for establishing clear performance expectations and the provider accountable for achieving those expectations.

- **Self-Assessments** - Self-assessment is an on-going process whereby a performing organization monitors its own performance and evaluates its ability to meet performance objectives, measures and expectations, and to control and improve its processes. The culmination of this process is a self-assessment report. The report is used by the performing organization and other organizations in the chain of authority and responsibility to evaluate and assess performance and as a basis for continuous improvement.

- **Performance Reviews** - Performance reviews are an ongoing process of planning and monitoring performance. These reviews compare actual performance during a specified review period with planned performance for that period. From that comparison, concerns can be addressed, modifications can be made to performance expectations, and future direction can be planned. Performance reviews also serve as formal documentation of performance and for employee development and promotion.

- **Management Controls** - Management accountability is the expectation that managers are responsible for the quality and timeliness of program performance, increasing productivity, controlling costs and mitigating adverse aspects of agency operations, and assuring that programs are managed with integrity and in compliance with applicable law. (OMB 1995) Management accountability is enhanced through management controls. As identified in the Office of Management and Budget Circular No. A-123, 1995, *Management Accountability and Control*, management controls are the organization, policies, and procedures used to reasonably ensure that: programs achieve their intended results; resources are used consistent with agency mission; programs and resources are protected from waste, fraud, and mismanagement; laws and regulations are followed; and reliable and timely information is obtained, maintained, reported and used for decision making.

- **Equity Statements** - (From the Citizens' Circle for Accountability) If intended outcomes of proposed action would affect the public in important ways, fairness requires that the public understand the trade-offs implicit in what is planned—whose needs would be honoured and whose would not. Because the ?who" question often goes unanswered, a simply-structured equity statement can set out, in summary form: who would benefit from what is proposed, how, both in the short and longer term, and why they should benefit, who would bear what costs and risks from it, both in the short and longer term, and why they should, and who would be accountable to whom, for what.

- **Accountability Meetings** - In their article, *Doing More for Less Without Being Overwhelmed*, the American Training Alliance (http://www.americantrainingalliance.com) puts forth the concept of the Accountability Meeting. The purpose of the meeting is not to evaluate performance, rather it is to improve future performance by using past lessons learned and understanding present limitations. The meeting is conducted by those accountable for another's results, e.g., team leader, manager, supervisor, director, etc.

## Section V: Establishing a Performance-Based Management Program

## Step 4: Establish a Process/System for Collecting Data to Assess Performance

*?Facts are stubborn things; and whatever may be our wishes, our inclinations, or the dictates of our passions, they cannot alter the state of facts and evidence.*"

John Quincy Adams

Webster defines the term datum as ?An assumed, given, measured, or otherwise determined fact or proposition used to draw a conclusion or make a decision." Indeed Mr. Adams was correct in asserting that facts or data are stubborn things, for if data were subject to our wishes, inclinations or passions, then the validity of the conclusions or decisions drawn from the data could be questioned by anybody with a differing view of the world. The Congress, and through it the American public, expect a certain level of performance for their tax dollars. It is only through hard, factual data and sound analysis at the corporate level that public confidence can be achieved and maintained.
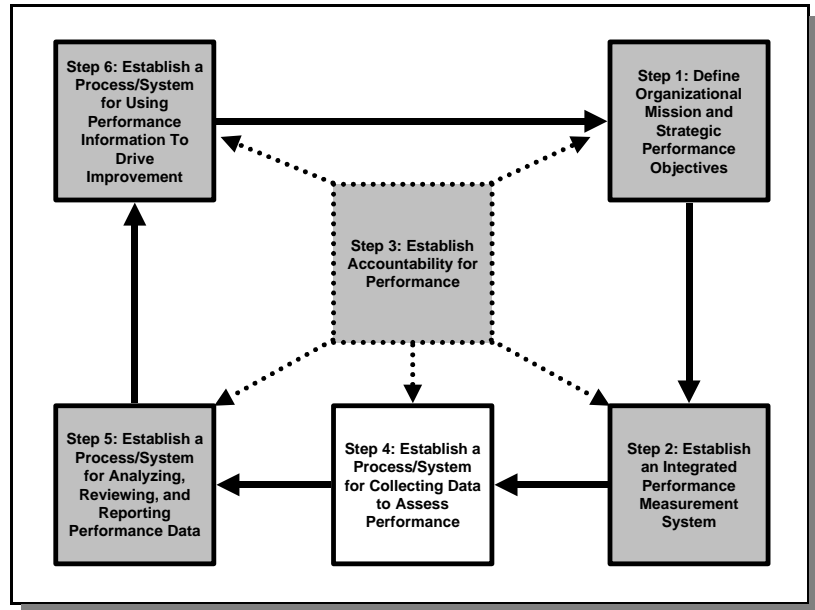


The information contained in this section has been condensed from Volume 4, ?Collecting Data To Assess Performance," of *The Performance-Based Management Handbook*.

## DETERMINING DATA REQUIREMENTS

Prior to the actual collection of data, the requirements prompting the need to collect data have to be fully understood and the characteristics for a good performance measurement system must be identified, for it is this system that will provide the collected data. Several performance measurement frameworks were presented in Step 2 to stimulate thought about what should be measured and how the process should be organized. Please refer to that step (and its corresponding volume) for more information on the subject

### Determining Data Requirements

Developers of the data collection plan need to concentrate on identifying the data that decision makers use to operate the organization and then need to conduct a survey of what data is already available. If they start by defining what is available rather than what is needed, the emphasis is put in the wrong place, and, inevitably, a large data collection exercise is underway before the purpose of the data collection effort is

clearly defined. Taking the time to define the purpose of the data collection and reporting effort up-front can yield benefits down the road as well. For instance, line management could have fewer objections to narrowly defined data collection requirements that impact their daily operations. Thus, the first step in data collection is to list the performance objectives and accompanying performance measures for which data is needed.

It is important to look beyond your own organization for performance measures and data requirements. The nesting of strategic and performance plans is vital to assuring that the data collected is consistent across the organization and is provided in a timely manner. The organization's strategic and performance plans are the primary management documents from which performance measures are developed. Within an organization such as the Department of Energy, there are several subordinate organizations, each with its own strategic and/or performance plans. It is incumbent upon each subordinate organization to develop their plans such that they are in alignment with the organizational plans above them.

An equally important data linkage within DOE is the annual agreement the Secretary of Energy reaches with the President on plans and expectations for the upcoming fiscal year in key priority areas, as well as in business practices. These expectations are communicated in the form of commitments made in each of the Department's five business areas. Usually, these commitments involve a very small number of organizations—possibly one—reporting information to DOE Headquarters that represents the Departmental performance for that commitment. These data are typically outputs of a process rather than the outcome measures associated with the strategic plan.

## ?Best Practices" In Data Collection

The National Performance Review (NPR) used the experience of several U.S. agencies, local governments, and the Canadian Government to identify the ?best practices" in performance measurement (NPR 1997). The study team documented four principles that were used by all of their partners for gathering the highest quality data. Underlying these ?best practices" is the understanding that the people providing the data are motivated to provide good data, that they see that the data are used and useful, and that the benefits of collecting the data outweigh the costs. Data collection must be:

- *Focused* on the organization's assessment and improvement needs;
- *Flexible* to take advantage of any data source or method that is feasible and cost-efficient;
- *Simple and aligned* with the organization's needs to provide clear, relevant information; and
- *Consistent* to allow comparisons and easy transition from one data set to the next.

## Data Quality

To ensure that data collection and analysis is applicable to the decisions that will be made from the analysis, it is important to verify and validate the data. Verification ensures that the data collected represents the data desired—that a set of data meets a specified set of criteria. Validation is the comparison of the data with the requirements specification—does the data collected accurately represent the condition it is supposed to describe? Together, verification and validation check for any oversights or deviations from requirements, and identifies them.

The U.S. General Accounting Office (GAO) looked across all federal agency performance plans and complied the following advice on ways to improve the quality of performance information and meet GPRA requirements for the verification and validation of agency performance information.

1. **Foster Organizational Commitment and Capacity for Data Quality**
   - Communicate support for quality data
   - Review organizational capacities and procedures for data collection and use

- Facilitate agency-wide coordination and cooperation

- Assign clear responsibilities for various aspects of the data

- Adopt mechanisms that encourage objectivity in collecting and managing data

- Provide responsible staff with training and guidance for needed skills and knowledge

2. **Assess the Quality of Existing Data**

- Build data quality assessment into normal work processes, including ongoing reviews or inspections

- Use software checks and edits of data on computer systems and review their implementation

- Use feedback from data users and other stakeholders

- Compare with other sources of similar data or program evaluators

- Obtain verification from independent parties, including the office of the inspector general

3. **Respond to Data Limitations**

- Report data limitations and their implications for assessing performance

- Adjust or supplement problematic data

- Use multiple data sources, with offsetting strengths and limitations

- Improve the measure by using another source or new methods of measurement

4. **Build Quality into the Development of Performance Data**

- Use prior research or analysis to identify data elements that adequately represent the performance to be measured

- Gain agreement among internal and external stakeholders about a set of measures that are valid for their intended uses

- Plan, document, and implement the details of the data collection and reporting systems

- Provide training and quality control supervision for all staff who collect and enter data, especially at local levels

- Provide feedback to data collectors on types of errors found by data checks

- Use analytic methods and transformations appropriate for the data type and measure being reported

## COMPONENTS OF A DATA COLLECTION PLAN

The purpose of data collection is to provide a basis for analysis, in other words, to turn data into information that is used by, and useful to, decision makers. Before data can be collected, though, a data collection plan needs to be developed.

### Components of Data Collection Planning

A data collection plan is essential to ensuring that collected data supports the overall objectives of the performance measurement program and provides details to support decision-making by the users of the information. The integrity of the performance measurement program is dependent on the quality of the collected data. Development of a data collection plan should include the considerations that follow.

- **Statement of Informational Requirements** - The data collection plan should clearly define the informational needs of the performance measurement program. Specifically, the plan should discuss what information will be required as inputs for each of the measures. Clear relationships between the informational requirements and the objectives being measured should be established.

- **Statement of Information Sources** - For each identified measure or data element, the data collection plan should specify a specific data source. The data collection plan should clearly define the relationship between the performance measure, the performance objective, the performance evaluation method, and the data sources. This identification should include comments regarding the availability, cost, reliability, and quality of each potential data source. If some data appears difficult to obtain, the data collection plan should outline alternative sources for that data, and specify what impacts the use of the alternative source might have upon the evaluation.

- **Data Collection Process** - In any data gathering activity, it is important to establish the reason and process for the data collection, the time period(s) for which the data will be collected, and the form(s) of analysis that will be used with the collected data. Establishing this process will assist in determining what type of data to collect, how to collect and store the data, and what type of analysis may be used by decisions makers with the data. The information used from the data analysis should report what the data reveals about a given inquiry. The reporting of this information should be factual, supported by the data with the proper use of analytical tools appropriate to the type of data collected.

- **Data Collection and Reporting Frequency** - The type of data being collected and the needs of the decision makers for the timing of the information dictate collection and reporting frequency. The collection and reporting frequency do not have to be the same. Some users may like to see monthly data only once a year, for example, while other users may want trend information such as organizational financial data more frequently. To be useful for management decisions, however, information timing should be matched to the need for decisions and to the cost of collection and processing. Regardless of the timing considerations, ensuring data quality is crucial to delivering useful information to management. And, data collection and information development should be driven by management need and relationship to program mission, not data collection convenience.

- **Data Collection Costs** - The more sophisticated the data collection and reporting system, the more expensive it will be to implement. Improved timeliness, depth of understanding, breath of coverage, and user ease-of-use come at a price. Tight control of the reporting system development process is required and close attention must be paid to collecting only what is needed, not all that is available. System developers need to resist the temptation to collect the easiest available data at the expense of data that may be harder to collect but is more valuable to decision makers.

- **Data Protection** - Protecting sensitive data is of paramount importance to every organization, and should be the first consideration when designing a performance information system. Each organization will have information that is for internal management use only and not intended for dissemination outside of the organization. Many organizations will build a two-tiered information system—one tier designed to provide information destined for public consumption and a second tier designed to report internal operating, financial, and other performance information.

## The Trial Run

It is important to pilot new data collection methods by doing a trial run. The trial run does not have to involve the entire program, but must include all untested aspects of the outcome measurement system, involve a representative group of participants, and last long enough to span all the key data collection points. Some options for using a subset of participants in a trial run include:

- For multi-site programs, use only some sites.

- If staff are organized into units, use only some units.

- If participants go through the program in groups, use only some groups.

## Ensuring Data Quality

Data quality may be defined as ?the extent to which information remains reliable and consistent across the organization." The issue of data quality often comes down to answering the question, ?Is the data collected of use for the intended purpose?" In this case, any data that is incorrect can potentially impact the quality of the data and any decision made from that data. Thus, poor quality data can have a negative impact on an organization since many management decisions are based on quantitative analysis. Incomplete, inaccurate, or missing data increases the risk of incorrect reporting of findings and trend analysis. Moreover, having to scrub data to fix a particular problem is expensive and time consuming. Therefore, it pays to initiate a data quality system because improvements in data quality will lead to more informed management, strategic planning, and decision making. The four steps to implementing a data quality system are: (1) establish a data quality position; (2) formulate a data quality policy; (3) determine objectives; and (4) obtain management and employee commitment. When developing the data quality system, make sure you:

- Develop a common architecture with consistent data definitions and formats.

- Standardize data elements and data entities.

- Determine valid use(s) of the data.

- Establish a database map.

- Obtain input from credible sources to define and validate data definitions.

- Resolve conflicting information.

- Create data edit criteria (i.e., acceptance criteria for out of control limits data, accuracy, completeness, currency).

- Create entries to populate look-up tables used to edit data.

- Maintain a program-area dictionary/glossary.

- Use a single integrated data system.

## Data Collection Systems and Software

Traditional data collection and reporting involves manually collecting performance data on forms, looking for trends in the data, and summarizing the results in printed management reports. However, this traditional method of reporting is rapidly being replaced by automated software systems that rely on a computer's processing power to help collect, analyze, process, and communicate management information in real-time and in both visual and printed form.

A new class of software—performance information systems—is appearing. Software systems in this category take advantage of more sophisticated features available from client/server-based information systems, such as querying and reporting, data mining and data warehousing, and multi-dimensional analysis. These more sophisticated systems typically incorporate additional information technology components as well, such as executive information systems, graphical user interfaces, advanced reporting features, ?drill-down" reporting to gain access to the underlying data, and linkages to databases at multiple locations. These systems are most applicable in situations where sophisticated trend analysis or forecasting (e.g., leading indicators) are required, or where enterprise-wide information systems are being developed to manage and integrate not just performance information, but other corporate information as well.

The sophistication of the collection and reporting system should be matched to the mission needs of the organization. Clearly, the information technology investment must return benefits to the organization that exceeds the investment costs. These benefits should be mission-related, and they will typically accrue in terms of improved information accuracy, security, accessibility, timeliness, and cost-effectiveness.

## DATA COLLECTION CONSIDERATIONS

Before selecting a data collection method (as described in the next section), many aspects of the data collection process must be considered. The most notable aspects to consider are:

- **?Data Breakouts"** - Harry Hatry in his book, *Performance Measurement: Getting Results* (1999), suggests that planning for breakout groups in data collection and analysis can provide very useful information. Breakouts or disaggregations of data sets can reveal highly useful findings on performance that are hidden by aggregation. Breakouts also can distinguish differences in performance among relevant groups. Identifying such differences is the first step toward asking: (1) Why is high performance occurring in some places and not others? Answers to this question can lead to transferring successful practices to less successful work. (2) Why is low performance occurring in some places and not others? Answers to this question can ensure that appropriate improvement options are identified and addressed. Breakouts also can help identify inequities among customer groups—situations in which some groups had significantly better outcomes than others.

- **Sampling Techniques** - Sampling refers to the measurement or surveying of only a portion of the whole population of interest. Sampling offers a useful way to maximize the benefits of data collection when collection of information from the full population is not feasible. Sampling often attempts to measure a representative group of events and to generalize those results for the population at-large. There are other instances where the ability to generalize is less important than simply sampling some portion of prevailing views.

  If the data collection plan includes collecting data from only a portion of the scope of the performance area, then the data collection plan must specify the method of sampling. (There are three primary sampling methods: random sampling, stratified sampling, and systematic sampling.)  It must justify the sampling method, provide details of the statistical impact of the chosen sample methodology, and discuss any limitations the sample might place upon extrapolating the results. It also should outline the assumptions used in constructing the samples (especially assumptions about subject variances). Further, the data collection plan should provide information about the amount of data necessary to reach the desired sample size. When including the use of sampling in the data collection plan, it is important to understand any bias which may exist with the sampled data. Sample bias refers to the likelihood that a measurement by a sample of the population does not accurately reflect the measurement of the whole population. Random sampling and the collection of larger samples are effective ways to decrease sample bias.

- **Bias** - Each method of evaluation contains potential sources of bias in one form or another. The term *bias* refers to the likelihood that data collected may reflect only a portion of the spectrum of relevant opinion. Bias may occur in quantitative and qualitative data collection. It often occurs as the result of the collection of an incomplete or inaccurately weighted sample of data. It is imperative therefore, to closely examine data to get a feel for the information and spot potential sources of bias. When interpreting data it is critical to ask how might this data be biased and how might these biases be removed? Often, these answers lie in additional questions that can be asked during data collection to clarify answers that may contain elements of bias.

- **Cost** - As with many other management decisions, cost plays a central role in the evaluation planning process. Data collection techniques vary widely with respect to cost. Program managers should balance the needs of the evaluation with the financial resources available for the evaluation. Some low-cost data collection techniques limit the type of information that can be collected or the quality (i.e., the validity, reliability, and accuracy) of the data. Among the least-expensive data collection methods are program and agency records, file reviews, content analyses, focus groups, mail questionnaires, and telephone surveys.

- **Data Reliability** - The measurement process may be perceived as part of a larger series of measurements. Data collection methods vary in their ability to collect data that points toward similar conclusions. Data is reliable if another analyst employing the same methodology could collect a comparable set of data. If the current evaluation process is part of a pattern of prior evaluations, you should consider the implications to comparability of data should you elect to employ a different data collection strategy, method, or tool. Further, if collected data is meant to form a database of information for future comparison, you should select a data collection method that allows future evaluations to collect comparable data. If consistency over time is important, statistics and well-run surveys generally offer more reliable data sources. Data collected through the other methods will generally not be as generalizable to the whole population and may not compare to earlier or later similar studies.

- **Data Validity** - Validity refers to the accuracy of a measure. A measurement is valid when it measures what it is supposed to measure and performs the functions that it claims to perform. Given the imperfect nature of measurement, validity is a matter of degree—the degree to which collected data accurately measures the factor or parameter the evaluator intended to measure. Since validity is a matter of degree, it is incorrect to say that a measurement is either valid or invalid. All measurements have some degree of validity. It's just that some are more valid than others. The important thing to note is that valid measurements are the ones that take into account all relevant factors, given the whole context of the measurement, and weight them appropriately.

- **Demographic Diversity/Diverse Populations** - A diverse population refers to the target population of a sampling program whose target audience is non-homogeneous in one or more factors. Program stakeholders may differ with respect to income, size (specifically in reference to organizations), and ethnicity.

- **Geographic Scope/Diversity** - Some sampling programs cover such expansive geographic regions that the types of data readily available will be limited. By the same token, some data collection techniques become prohibitively expensive (or very slow) to execute for programs covering wide geographic areas. Managers may find site inspections and personal interviews difficult to implement for geographically widely-dispersed programs. On the other hand, focus groups, official statistics, file reviews and questionnaires (mail or telephone) may better serve such widely dispersed programs.

- **Level of Accuracy** - Data collection may yield a body of information that varies in its degree of accuracy. Some collection techniques may produce results that are similar to another overall, but differ in degree of focus. For example, if an evaluation attempted to ascertain the amount of energy saved, one data collection method might measure savings for a multi-building facility, while another might measure energy savings per boiler in a single building or in each of the buildings in the facility. Each body of data will yield valuable information, but will differ in its degree of accuracy. Data collected by official statistics is usually more coarse (less accurate) than data collected by individual metering, producing a finer (more accurate) data set.

- **Level of Detail** - Data collection accumulates verifiable facts for use in the evaluation process. Different methods are capable of collecting information of differing levels of detail. Program managers should consider carefully what level of detailed information is required and appropriate, and how best to accumulate it. While official statistics and mail questionnaires may provide valuable information for an evaluation, they do not offer much detailed information on the program's operations or on its personal impact. On the other hand, case studies, focus groups, and personal interviews may gather more in-depth information.

- **Response Rate** - Response rate usually applies only to surveys, and refers to the ratio of responses received to the number of questionnaires (or other data collection technique) solicited. Response rate is important in determining the bias of the data received from the instrument. If a technique has a low response rate, the evaluator may question who responded. If a survey is being conducted, it may be that one disaffected group is more likely to respond (say those who had a bad experience with the program) and hence the data collected may be biased toward a negative review of the program. There are several ways to improve response rates. Data collection techniques with traditionally the lowest response rates are mail-in surveys. Surveys administered in person or over the phone have proven to have significantly higher response rates.

- **Speed** - Several data collection techniques offer rapidly available data. For other techniques, however, the data collection process requires more time. You should carefully consider how quickly the information is needed. Quite often, the data that can be collected more quickly may sacrifice one or more of the other necessary characteristics (i.e. level of detail, or level of accuracy).

- **Stakeholder Input** - Stakeholders are those individuals affected or impacted by the outcome of a particular action or series of actions. Stakeholder input typically is collected through formal surveys, informal discussions, or structured forums such as focus groups. Various types of information may be collected through this input including program structure and operation; potential measures; sources and types of data already collected; and opportunities for program improvement.

# DATA COLLECTION METHODS

Depending on the type of information available and the data and analysis needs, one or more data collection method may be appropriate to support the compilation of performance measurement information, or to support the evaluation of performance when traditional data collection techniques are not feasible. This list is not exhaustive, nor is the treatment given to each technique comprehensive. For additional information on each of the techniques listed, please see the reference section at the end of this volume.

Each data collection method embodies an important set of choices. Just as the different evaluation methods provide expanded options for answering some kinds of questions, different collection methods may yield different information and provide differing insights. When selecting a method of data collection, the program manager should keep in mind the many trade-offs between the different types of data collection methods.

Each method varies in its performance with respect to bias, cost, response rate, speed, level of detail, validity, reliability, and usefulness with demographically diverse populations. When considering the data collection methods, the program manager should assess the limitations of each type of data and the requirements of the evaluation with respect to each of these factors, in order to select the optimal method of data collection.

## Program and Agency Records

Most agencies and programs routinely record data on customers and/or transactions for administrative purposes. Harry Haltry's book on performance measurement (Haltry 1999) suggests that this data collection procedure has been by far the most widely used for producing performance data. In addition to being a source of outcome information, agency records are also the main data source on the amounts of input (both dollars and employee time) and output produced by the program. Records can also be a source of demographic characteristics of customers and other characteristics of the workload for use in providing breakouts of outcome indicators.

## Site Inspections/Observations

(The information herein comes from Hatry, 1999.) Trained observers are used to rate outcome conditions that can be perceived by the eyes or other physical senses of an observer. For trained observer ratings to be a suitable performance measurement procedure, the outcome needs to be measurable by physical observation and to be reliable on a scale that identifies several variations of the condition to be measured, e.g., never, seldom, sometimes, often, always. The goal is to ensure that different observers at different times give the same or very similar ratings to similar conditions. Three procedures to follow to ensure a high degree of reliability of observations are to: (1) use systematic rating scales that provide well-defined yardsticks against which the observers can assess observed conditions, (2) provide adequate training and supervision of the observers and the process, and (3) periodically check the quality of the ratings.

### Use of Special Technical Equipment

Hatry (1999) also suggests using special technical equipment to collect data for outcome indicators that require scientific measurement, such as noise levels, air pollution levels, water pollution levels, and road conditions (using road meters). The advantages of using special technical equipment are that it usually provides accurate, reliable data and that it may be the only reasonable way to achieve completely credible information on important environmental outcomes such as those listed above. The disadvantages to this type of data collection are that the equipment can be expensive to procure, operate, and maintain, and that the information obtained must be interpreted to be useful to program personnel and outsiders.

### Surveys and Interviews

Surveys provide a method of gathering information from stakeholders and others by directly questioning them. Generally speaking, a survey is simply a planned effort to collect data through direct questioning. This questioning can produce either qualitative or quantitative data, or both. Some methods allow free-form input, while others seek categorical responses. Questionnaires used to gather data may take the form of personal interviews, telephone interviews, or mail questionnaires.

### Purchasing or Using Statistics from an Outside Source

Statistics purchased or used from an outside source can be inputs to analyses. For example, statistics from outside sources are often used in cost-benefit analyses and regression analyses. Additionally, secondary statistics may offer an opportunity to assess the effectiveness of a program by comparing data for participants and non-participants. Types of available statistics include:

- **Government Statistics** - Data collected and published by the United States Government, through any of its entities, offers a great resource for evaluation data. Official statistics generally provide data that are relatively reliable and consistently collected. For the data analysis to provide value, the agency must follow a standard collection methodology. Some data analysis techniques may require a stream of data. In these cases, government tends to collect certain statistics on a more regular basis than many private sources.

- **Privately Published/Collected Data** - Private organizations such as trade associations and advocacy groups collect data that may be valuable to your organization's performance measurement effort. Unfortunately, this kind of data is prone to interrupted collection, irregular methods, non-uniformity, and uncontrollable bias. The careful program evaluation professional will only use data that conforms to the researcher's needs and will specify data limitations, or seek to apply multiple lines of evaluation methods when any data is in doubt.

### Peer Review/Expert Panel Evaluation

A traditional approach to research and development (R&D) program evaluation has been peer review. This approach involves the reviewing of one's work by those with expertise in the field. Peer review is premised upon the assumption that a judgement about certain aspects of science, for example its quality, is an expert decision capable of being made only by those who are sufficiently knowledgeable about the cognitive development of the field, its research agenda, and the practitioners within it.

Several governmental agencies including the National Science Foundation (NSF) and the National Institutes of Health (NIH) currently use peer review to determine funding considerations. These reviews may take the form of highly structured or unstructured processes. Authors have recently begun to press for evaluation of basic scientific research through an enhanced peer review process that broadens both the definition of peer and the evaluation issues addressed.

### Quantitative Methods for Research and Development (R&D) Activities

Quantitative methods for collecting performance data include the use of indicators of input such as funding and human resources, and indicators of output such as publications, citations, and patents, to identify research program effectiveness and productivity (Cozzens et al. 1994, NRC 1994, Hauser 1997, Geisler 1999). Economic methods are also quantitative, but will be discussed separately in this section. The validity of quantitative performance indicators is based on the argument that research must be subject to peer review before it can be funded or published and that research impact can be extrapolated from how frequently patents and publications are cited (Cozzens 1989, NSTC 1996).

Quantitative indicators of research quantity are most appropriate for assessing the research produced in organizations that encourage publication and whose main research output is knowledge in the form of publications and patents (Cozzens 1989, NRC 1994, Hauser 1997, Geisler 1999). Hauser (1997) states that organizations can effectively use market-outcome indicators of cost and net present value to evaluate applied projects, if they adjust for projects that are small-scale, low-risk, and short-term. However, to evaluate the long-term value of technology development programs, organizations should combine market outcome metrics with more direct measures of research such as publications, patents, and citations.

- **Publication Counts** - Publication counts provide useful information when combined with a larger, richer set of indicators and analyses. Their use alone, or without sufficient information about other aspects of performance and the circumstances of the research, can produce an incomplete, if not inaccurate, picture (NSTC 1996).

- **Patent Counts** - Counts of patents, new devices, computer programs, and other inventions do not say much about whether a program is conducting world-class science at the frontier of knowledge; but some mission agencies may use them to gain insight about connections between their program and the agency mission (NSTC 1996).

- **Citation Counts** - Counts of the number of times a publication is cited must be used with caution because high numbers of citations may indicate a negative evaluation, citation rates vary among fields, and citation counts typically only include journal references (NSTC 1996). Citation counts are often expanded with co-citation and cross-citation analysis to illustrate links between researchers (Cozzens 1989).

- **Integrated Metrics and Mixed Methods** - These are more comprehensive methods of assessing organizational effectiveness that balance the strengths and limitations of multiple individual methods. Integrated approaches often incorporate a framework for describing an organization and a menu of metrics that include a combination of objective and subjective measures. The Federal Government of Canada (Canada 1993) describes using partial indicators that subjectively incorporate combinations of quantitative information as a method of assessing socioeconomic outcomes. These integrated metrics provide a higher level of reliability and flexibility, but they are complex and require more time and effort to implement (Cozzens et al. 1994, Werner and Souder 1997).

### Economic Methods

The value in using economic methods is to estimate how much benefit or return organizations receive from initial investments in R&D. From these estimates, organizations can make better decisions about budget and human resource allocation. The results of economic methodologies typically indicate that R&D activities produce high overall rates of return (GAO 1997). Assessment methods that are available to measure many of the economic facets of an organization's research include (Link 1993, Averch 1994, Cozzens et al. 1994, NSTC 1996, Tassey 1996, GAO 1997, Geisler 1999):

- **Rates of Return** - Rates of return estimate the actual economic value derived from investment in R&D.

- **Production Functions** - Production functions are mathematical functions that incorporate values for technology input and output to estimate R&D impact via increased productivity.

- **Customer Surplus** - Customer surplus is an estimation of economic impact that makes use of how much a consumer is willing to pay for a product.

- **Social Rate of Return** - Social rate of return functions assesses the sum of the social benefits from technology changes as compared to cost of the technology investment.

Economic methods can indicate the value of applied or developmental research projects more easily than the value of fundamental research projects (Averch 1994, Hauser 1997). Both Averch (1994) and Cozzens et al. (1994) however, suggest that the economic value of public and fundamental R&D also can be measured using variations on production function analysis, surplus methods, and social rate of return.

## Cost-Benefit/Cost Effectiveness Studies

There are significant and varied data collection requirements to develop cost-benefit studies and cost effectiveness studies. The *Cost-Benefit Study* attempts to evaluate the costs of programs together with the benefits they foster. To accomplish this evaluation, these analyses convert all of the benefits and costs into dollar values. The results of a cost-benefit study attempt to determine if the costs of an action is justified by the value of the benefits that would result. The *Cost Effectiveness Study* is a type of cost-benefit study in which either (1) the costs of the program being evaluated are identical so that it is necessary to compare only the benefits, or (2) the benefits of the programs are identical so that only the costs need be compared, or (3) benefits are not transformed into monetary terms.

- **Time Frames Of Study** - When conducting cost-benefit/cost effectiveness studies, it is important to consider the time frame of the study. Three time frames are:

  1. *Life*-Cycle - This time frame, or scale, of study evaluates all benefits and costs of the program from inception through program termination. These studies attempt to analyze whether or not the program's entire costs are justified by all the possible benefits that will occur.

  2. *Prospective* - This time frame, or scale, of study includes only those costs and benefits that will occur in the future. These studies do not include the costs associated with program start-up costs. These studies attempt to review whether or not the program's future operation costs are justified by its future benefits.

  3. *Retrospective* - These studies review only the costs and benefits that occurred in the past. Although this type of study has been widely performed, it does not provide justification for continuing the program.

- **Identifying Costs and Benefits** - Direct costs and benefits are the easiest to compile. These measures typically include all program operation costs, administrative expenses, and overhead expenses on the cost side, while benefits usually include only the impact the program was designed to create. Program costs and benefits often include indirect, or tangential, impacts or expenses. Indirect costs and benefits accrue as byproducts or as spillovers from the program's operations. Following these chains of costs and benefits further out from their source requires careful analysis due to the difficulty in directly linking them to the program operation. Indirect costs may include overhead costs, tax impacts, productivity slowdown, costs to the private sector, and/or increased costs to the government. Indirect benefits may include technology spin-offs, secondary job creation, private market activity, and/or further research.

- **Valuing Benefits** - Very often program benefits, either direct or indirect, include factors not expressed in terms of dollars. Common benefits include energy saved, emissions reduced, lives saved, time saved, increased productivity, increased jobs, and/or improved aesthetic features. These varied benefits must be converted to a dollar figure to allow comparison with the costs of the programs, if using cost benefit analysis. There are several methods, specific to each type of benefit, to convert these benefits into dollar measures. There is a wealth of literature describing benefit valuation and conversion. Common methods of conversion include: market prices, ?shadow prices", hedonic price estimation, and/or contingent valuation. Often, evaluators will use sensitivity analysis (completing several Cost-Benefit Analyses with differing values for the benefits, in order to understand the net change for each unit of

input) to test the resilience of the evaluation findings to changes in the conversion of benefits into dollars.

- **Converting Costs And Benefits Into Present Values** - The cost-benefit study converts the streams of future costs and benefits into current costs and benefits by a ?present value" calculation. Under such a system, future benefits and costs are mathematically discounted by some percentage. The selection of the percentage will significantly impact the analysis. A low rate will increase the relative importance of future benefits and review more favorably programs with high up-front costs. A high rate will minimize the value of benefits accrued in the future and exaggerate the costs for programs with high up-front costs. Results of these studies are often presented as ?Net Present Value" (the value of present benefits minus the present costs), a benefit-per-cost ratio (which is the present value of benefits over the present value of costs), or the Return on Investment (a method that calculates the rate necessary for present costs and benefits to be equal).

### Case Studies

The case study is a research method that uses extensive description and analysis of a complex situation studied in its context to answer questions about the efficiency and effectiveness of current programs. Good case studies:

- Provide illustrative examples of program successes and failures
- Identify problems within current programs
- Show the interaction between program objectives and real life constraints
- Test specific theories and strategies
- Identify common program elements for further study and comparison
- Provide significant, credible, and comprehensible data
- Demonstrate justifiable and compelling evidence for recommendations that can be generalized to other programs

The six types of case studies are:

1. *Program's Effects* - Examines the results of specific actions undertaken
2. *Illustrative* - Descriptive details are used to familiarize specific aspects of the sample
3. *Exploratory* - Shows the results of a program and gauges what needs have not been met
4. *Critical Instance* - Examines a distinctive feature of the program to test or challenge key hypotheses, strategies, or problems.
5. *Cumulative* - Incorporates the findings from several case studies to answer new queries based on description judgements, or cause and effect analysis.
6. *Program Implementation* - Acts as a normative investigation of an operation's execution.

### Content Review

Content review refers to the codification and analysis of qualitative data. By coding and classifying the qualitative data sources, this technique attempts to develop an understanding of the meaning of large volumes of qualitative analysis. Data sources for which content review may be useful include free-response surveys or questionnaires, case studies, site inspection reports, focus group reports, or literature searches.

- **Notes on Coding** - Content review relies upon the classification of written communication into categories. Evaluators using content analysis must consider the entire message being communicated when classifying it. The primary activities of content review are unitizing communication (breaking

communication up into the smallest units that are comprehensible as a message) and categorizing (placing these messages into categories). Thus, content review relies upon a great degree of subjective analysis.

The evaluator should clearly establish what constitutes a unit of communication (even down to a sentence or multi-sentence chunk), in order to create some degree of consistency in the unitization process. Coding categories must be flexible enough to cope with changing data collection and changing analysis methodologies (broader categories capture more cases in each category, but preclude detailed analysis). When possible, select meaningful, descriptive coding category names with which the program managers are familiar. It may be necessary to create terms for patterns that emerge in the course of the review, but select meaningful names so that the program participants and managers can easily understand them.

Only code text for information valuable for use in this specific evaluation. There are several computer packages that can code narrative text. Among the most widely used are ETHNO, Text Analysis Package (TAP), QUALPRO, TEXTBASE, ALPHA, THE ETHNOGRAPH, and HYPERQUAL.

## File Review

Reviewing data that has been previously collected and is present in the program files, or other program documentation, may provide information necessary and pertinent to the evaluation of a program. This type of review offers a relatively quick method to discover what data has already been collected with an eye toward minimizing the need for additional data collection and the costs associated with that data collection effort.

- **Types of File Documents** - The types of files that should be considered for file review include the following:

     1. Authorizing legislation, congressional testimony, and comments of legislators

     2. Documents related to the regulatory implementation of the legislation (internal review of legislation, public comments, and final rule support documents)

     3. Budget documents, administrative documents, and meeting minutes

     4. Program participant data collected as part of their interaction with the program under review

- **Uses of File Review** - Although files vary widely between programs, file reviews are particularly helpful in the areas of demographic information on program participants, such as location, size, and type of participant, and information on the types and/or frequencies of services provided. A careful file review may discover key performance measures or required reporting.

## Focus Groups

Focus groups are small-group, facilitated sessions, designed to quickly gather in-depth information while offering stakeholders a forum for direct participation. They are usually facilitated by an outside, third party and can yield invaluable information. Focus groups can be used to gather a wide variety of information, including:

1. Obtain general background information about a topic of interest.

2. Generate research hypotheses that can be submitted to further research and testing using more quantitative approaches.

3. Stimulate new ideas and creative concepts.

4. Diagnose the potential for problems with a new program, service, or product.

5. Generate impressions of products, programs, services, institutions, etc.

6. Learn how respondents talk about their interests to facilitate the design of questionnaires, survey instruments, and other research tools.

7.  Interpret previously obtained quantitative results.

8.  Provide a forum for stakeholders to present views and participate in the process.

## SUGGESTIONS FOR MEASURING OUTCOMES OF R&D ACTIVITIES

Evaluators have found that assessing research and development (R&D) performance is difficult because of specific qualities that are inherent to research and the scientific process. No one can predict what discoveries will be made as a result of R&D activities because they are neither routine nor do they have specific outputs. Any goal that was predicted would most likely shift before the time to evaluate the goal had arrived. Cozzens (1999) outlines four factors that pose particular challenges for meeting the requirements of GPRA: (1) the attributes of research that can be tracked and measured are not always important; (2) significant research events occur unpredictably and cannot be subject to schedules; (3) many sources of funding and contribution are often integrated in a single research program; and (4) there is no easy, accurate method to objectively evaluate research quality or result.

These challenges and the risk of researchers falling back on safe, short-term projects with easily identified and reported outputs, make performance reporting a task that requires constant vigilance and maintenance. Successfully joining the international trend toward accountability and results-oriented research management requires U.S. science agencies to integrate their abilities and goals with public interests and transition from an initial short-term focus to longer-term strategies. Cozzens (1999) concludes that the new accountability could allow agencies to publicly highlight their achievements, communicate more effectively with regulators and the Federal Government, and directly address the concerns and needs of their stakeholders.

• **Methods Chosen Depend on Type of R&D** - For research and technology development programs, as for other types of programs, most authors stress that due to the limitations inherent in the individual methods, a complete picture of performance can only be shown if multiple methods are used in combination to balance the subjective versus objective aspects of each and compensate for weaknesses. Quantitative objective metrics are based on numerical measures of R&D input and output: staff count, R&D cost, time spent, number of publications, cost reductions, and goals met. Quantitative subjective metrics are based on non-numerical judgements that are converted into numeric values and ratings via profiles, scaling models, checklists, and scoring models. Qualitative metrics measure human resource and other aspects of R&D performance using self-assessment, supervisory rating, peer rating, and external audit. GPRA gives agencies that can not define quantitative performance goals for their programs the option of using measurable qualitative goals and measures, if approved by the Office of Management and Budget (OMB 1999).

  A 1993 study by the Federal Government of Canada (Canada 1993) looked at the data collection methods for measuring the socioeconomic impact of R&D. The Canadian study team concluded that, although more work is needed, available methods can provide a limited assessment of the impact of government R&D activities, with some providing ?reasonably accurate" quantitative assessments. Their report suggests using cost-benefit methods as a way of analyzing applied research, but not basic research. The methods they discuss include modified peer review, user surveys, benefit-cost methods, case studies, partial indicators, and integrated partial indicators. Modified peer reviews incorporate assessment of research quality by scientific peers with assessment of the socioeconomic value of the research. Partial indicators are quantitative information on program inputs (i.e., funding, human resources), outputs, activities, or impacts. The information obtained using partial indicators can be analyzed further with integrated partial indicators. These assign an overall score for the project based on the outcome of the individual partial indicators.

  The Canadian study team suggests that determination of which method to use is dependent on three factors: (1) whether the assessment is occurring before or after the R&D is completed, (2) what type of R&D is involved, and (3) the purpose/category of the R&D.

## Section VI: Establishing a Performance-Based Management Program

## Step 5: Establish a Process/System for Analyzing, Reviewing, and Reporting Performance Data

This section focuses on the analysis that prepares management to review, make mid-course corrections, and report the performance information that has been collected during the performance cycle prescribed for the organization. The product of the analysis will be a briefing or report to management that forms the basis for management decisions and presentation of results and performance management decisions to stakeholders. The data analysis principles and methods in this section could be applied to an individual process, to a program, or to an agency's performance. They can be applied whether the analysis is for a quarterly report on one performance measure or to data collected for an in-depth evaluation study.
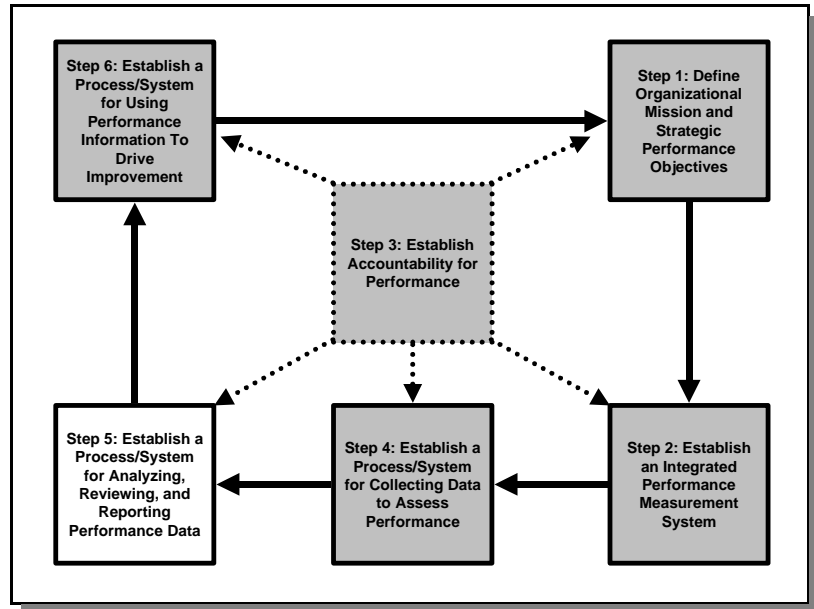


The information contained in this section has been condensed from Volume 5, ?Analyzing, Reviewing, And Reporting Performance Data," of *The Performance-Based Management Handbook*.

## INTRODUCTION TO DATA ANALYSIS

Analysis is one of the most important steps in performance-based management, yet it is often the one that is neglected. Even highly educated individuals are often unfamiliar with numerical analysis. There is a shortage of the program evaluation expertise and funding required to meet the requirements of the Government Performance and Results Act of 1993 (GPRA), according to a recent General Accounting Office (GAO) report. Yet, statistically rigorous analysis that supports achievement of goals can be performed without an undue cost burden. Spreadsheet software (such as Microsoft® Excel®) makes it easy for a qualified analyst to perform trending and analysis.

### Purpose of Data Analysis and Review

The purpose of data analysis and review is to convert raw data into performance information and knowledge. The data that have been collected are processed and synthesized so that organizations can make informed assumptions and generalizations about what has happened, why this might vary from what was expected, and what corrective action might be required. Put another way, the purpose of data analysis is insight. The problem

with our information age was succinctly stated by Daniel Boorstein (Wheeler 1993) who said, ?information is random and miscellaneous but knowledge is orderly and cumulative." Before information can be useful it must be analyzed, interpreted, and assimilated.

Analysis is required throughout the performance-based management cycle, but is particularly critical at the time when performance data is prepared for use by managers and staff for the following purposes: setting new goals or targets; evaluating progress against goals or targets; validating the measures and measurement process; and answering ?why" something happened.

## What's Included in the Analysis Process?

The data analysis process can be described as a model for generating useful information shown in Figure 1.4 to the right. This model has four components, each of which will be addressed in this section:

1. Formulate precisely the questions we are trying to answer.

2. Collect and organize the data and facts relating to those questions.

3. Analyze the data to determine the fact-based answer to the questions.

4. Present the data in a way that clearly communicates answers to the questions.



**Generating Information**

Information Needs

Questions

Communication          Data

Analysis

**Figure 1.4**
**Model For Generating Useful Information**
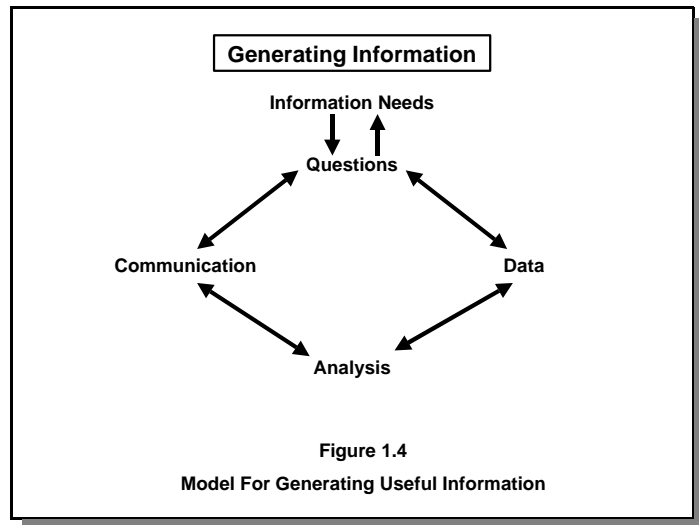
## Guiding Principles for Analysis: Five Perspectives

Before getting into the detail of data analysis, it may be helpful for you to see guiding principles by which organizations abide when establishing and implementing analysis and review. People have different views of what these guiding principles ought to be, and each point of view is valuable. Thus, five points of advice are provided here.

1. **The NPR Benchmarking Study** - In February 1997, the National Partnership for Reinventing Government [formerly the National Performance Review (NPR)] published the *Benchmarking Study Report: Best Practices in Customer-Driven Strategic Planning*, which documents and details the in-depth processes and approaches of those best-in-class organizations that excel at incorporating their customers' needs and expectations into their strategic planning processes. With regard to analysis, this study reported:

   • Everyone needs information. A reporting objective is to keep everyone in the loop, interested, and motivated. Many communication devices are available including meetings, reports, newsletters, charts placed in work areas.

   • Not everyone knows what to do with raw data, so world-class organizations have in-house staff or outside contractors, or a combination of these, analyze the raw data. Some organizations provide training to ensure that everyone can use and understand data and its analysis.

   • User information needs differ. Different levels of the organization, both on the front lines and the executive offices, will use different pieces of analyzed data. As a general rule, decision makers need information that is concise, timely and to the point. There is often tension between these attributes and needs and the needs of the analyst, i.e., objective and thorough analysis that meets professional standards.

- Over time, analysis can become more sophisticated. Good tools are available and should be used. They range from very sophisticated to less complex. As indicated by the Baldrige Quality Award scoring for the ?Information and Analysis" criteria, there is a maturity continuum for the development and use of information and analysis for the management of an organization.

- A picture is worth a thousand words. Using visuals can be very effective.

2. **Inspector General's Office of Evaluation at HHS** - The U.S. Department of Health and Human Services' (HHS') Office of Inspector General, Office of Evaluation and Inspections produced its *Technical Assistance Guides for Conducting Program Evaluations and Inspections* in September 1990. It pointed out that:

- Creative insights are the key to an effective analysis

- Each analysis is unique

- Analysis occurs throughout the cycle, not just at the end

- Analysis is an evolving, dynamic process

- It is essential to develop an initial plan for analyzing the information gathered

- The analyses themselves should be as simple as possible

- Analysis takes time and cannot be rushed

- Analysis is best done collaboratively, not in solitude.

3. ***Understanding Variation: The Key to Managing Chaos*** - In his book, *Understanding Variation: The Key to Managing Chaos* (Wheeler 1993), Donald J. Wheeler observes that:

- No data have meaning apart from their context.

- While every data set contains noise, some data sets may contain signals. Therefore, before you can detect a signal within any given data set, you must first filter out the noise.

- Traditional limited comparisons [of numerical values] can neither filter out the noise nor highlight potential signals.

- The best analysis is the simplest analysis, but you have to use the right data.

- Arbitrary numerical goals tend to distort the system more than they transform it.

4. **The Joint Commission on the Accreditation of Healthcare Organizations** - The Joint Commission on Accreditation of Healthcare Organizations' *Proposed Revisions to Standards for Improving Organization Performance* (JCAHO 1997) include the following standards for analysis:

- Data are systematically aggregated and analyzed on an ongoing basis. The frequency at which data are aggregated are appropriate to the activity or area being studied. Aggregation of data at ongoing points of time enables the organization to judge a particular process' stability or a particular outcome's predictability in relation to performance specifications.

- Appropriate statistical tools are used to analyze and display data. Statistical quality-control tools are helpful.

- The organization compares its performance over time and with other sources of information. Performance can be evaluated from three perspectives: Compared internally over time, to similar processes in other organizations (benchmarking), and compared to external sources of information. External sources are as up-to-date as possible and include recent scientific, clinical and management literature; well-informed practice guidelines; and performance measures, reference databases, and standards that are periodically reviewed and revised.

- Undesirable patterns or trends in performance and sentinel events are intensively analyzed to determine where best to focus changes for improvement. This analysis would be in order (1) if

important single events, levels of performance, patterns, or trends vary significantly and are undesirable from those expected; (2) if performance varies significantly and undesirably from other organizations and/or recognized standards; or (3) when a sentinel event occurs.

Note: When analysis and improvement activities lead to a determination that there are issues related to an individual's performance, appropriate action is taken through existing personnel channels.

5. **The PBM SIG's First Handbook** - Perhaps the most important principle comes from the PBM SIG's first handbook, *How to Measure Performance—A Handbook of Techniques and Tools* (PBM SIG 1995):

   - Use the numbers to help people improve, not to judge people. Variation is a fact of life. What we want to do with performance measures is to understand the variation. We want to learn how to influence performance with elements of the process that we can control. To interpret what we see, we need to know about variation and how observations vary.

## TRAINING YOUR ORGANIZATION IN ANALYSIS SKILLS

Training needs vary by the degree to which the person or organization will be involved with the analysis. Some organizations provide data directly to the manager, some to the relevant business units for analysis, and some use ?cross talk" between levels. Thus, analysis skills may be centralized or decentralized. An organization may establish skilled measurement coordinators within each operating area of its organization, train them in measurement and analysis techniques, and charge them with the responsibility of educating team leaders and employees. Often having staff working side by side with expert contractors is a cost-effective way to ?train the trainer".

Although there is no ?Professional Engineer" certification for statisticians and analysts, a certification method is available through the American Society for Quality (ASQ). The ASQ Certified Quality Engineer certification includes statistical tools, management techniques, ethics, and ISO 9000.

## GENERATING USEFUL INFORMATION - STEP 1: QUESTION REVIEW

In Figure 1.4, ?Model for Generating Useful Information" (on page 35), the cycle begins with initial planning. During the planning, we started by defining the question. Then, rather than diving into the details of data collection, we considered how we might communicate the answer to the question and what types of analysis we will need to perform. The first step in analysis and review is to refer to the planning documents. What were the performance questions to be answered? What is the data collection and analysis plan? Have reporting channels and formats been prescribed?

The analysis plan helped define data needs and clarify what characteristics are most important in the data. With this understanding as a foundation, the plan should have dealt coherently with the ?where, who, how, and what else" issues of data collection. Nevertheless, it is important to retrace this step before beginning the analysis in light of any changes that may have occurred since then. If there is not an analysis plan, now is the time to write one, no matter how ?quick and dirty."  It is also important to remember that no analysis plan has to be followed rigidly. Indeed it is important to be open to the unexpected and to changes that have occurred since the plan was written. It is important for the analyst to consider correcting earlier errors or omissions in order to present the best analysis possible.

When starting this first step in generating useful information, here are some common questions to consider:

1.  **How does actual performance compare to a goal or standard?** Within their span of control, responsible workers compare actual performance with a goal or standard. If variance warrants action, a report is made to the responsible decision-maker. This one basic question of how actual performance compares to a goal or standard could be a comparison between expectations and actuality on any number of possible performance questions.

2.  **If there is significant variance, is corrective action necessary?** A second question analysis must address is what to do in response to the answers found when actual performance is compared to expected performance and when trend analysis is completed. If the variance between the two is significant, more analysis is needed to determine whether corrective action is needed. If it is needed, what might that corrective action be, and what would be priorities for possible actions?

3.  **Are new goals or measures needed?** Wether the variance is small or significant, one question always ?on the table" is the quality and appropriateness of the measure, the goal, and the measurement. The decision to create new performance measures or goals will depend on three major factors: (1) the degree of success in achieving previous objectives, (2) the extent of any change to the scope of the work processes, and (3) the adequacy of current measures to communicate improvement status relative to critical work processes.

4.  **How have existing conditions changed?** Analysis needs to account for any changes in existing conditions. These changes could have several dimensions. For instance, the external conditions that influence performance may have changed since assumptions were made or last checked. Or there may be urgent performance questions for which new data must be collected if the report is to be considered responsive to stakeholder interests. There may even be new audiences for the current performance information whose needs were not addressed in the analysis plan.

## GENERATING USEFUL INFORMATION - STEP 2: DATA COLLECTION AND ORGANIZATION

The popular saying ?Garbage In, Garbage Out" is a reminder that the quality of the analysis is only as accurate or insightful as the quality of the information analyzed. Before analyzing and drawing conclusions from the data, collect the data, verify that the data collection process has met requirements, complete the data, and organize it as outlined in the data collection and analysis plan

Data should be collected from all possible sources. The analysis plan should indicate what data has been collected on these various aspects or where to pull that data: from baseline data; performance measurements (self-assessments, on-site reviews, etc.); relevant in-depth evaluation studies (expert review, GAO studies, etc.); status of assumptions about external influencing factors; and other parts of the organization, programs and facilities.

### Checking the Quality of Data

Before information collection begins, there will have been developed explicit criteria for assessing the apparent accuracy and informativeness of data and data sources in order to weight information correctly and appropriately in the analysis. It is important to purge the raw information set of any ?garbage."

It is important, however, to at least get to the point in analysis—even of flawed data—where the analysis points out where the flaws exists and how the data quality can be improved. Useful conclusions can be drawn from data sources even if determined to be flawed. Often, a self-fulfilling prophecy establishes itself:(1) the data

is not good enough to graph and analyze; (2) therefore, the data is never analyzed; (3) therefore, no one ever sees any results from the data; and (4) therefore, there is no incentive or visibility for improving the data quality. Here are some recommended ?quality check points" for your data:

- **Data Accuracy** - Analysts have to determine if each item of data is accurate, if the data source is informed. Accuracy is judged differently for different types of information and can involve cross-checking information between reports, verifying numbers with knowledgeable respondents, or assessing the plausibility, the detail, the documentation, the consistency, and the overall ring of truth of discussions. Certain sources, whether those be document files or individuals, are known to be more informative and accurate than other sources.

- **Logical Inconsistencies** - You can look for logical inconsistencies by cross checking two or more separate items of information against each other. Cross tabulations, contingency tables, and scatter plots are common techniques for cross checking quantitative data.

- **Bias in the Collection Process** - It is important to check for evidence of bias in the data collecting process. This data quality check is particularly true for surveys, such as customer satisfaction surveys, and other data collection strategies where data is collected from a sample of the full population. The concern is that there will be a discrepancy between the true situation and the results of the data collection, leading to the possibility of drawing a false conclusion.

- **Sampling Errors** - Check for how the sample was drawn. The accuracy of inferences drawn from a sample to a population is critically affected by the sampling procedures used.

- **Data Comparability** - Check to see if data is comparable and translate if necessary. Sometimes the raw data is not in the format or level of aggregation that is required. You may need unit costs instead of total costs, or an error rate rather than number of errors. You may need new variables that make comparisons for top-level audiences. More common variables that can be computed include ratios, proportions, percentages, averages, rank-order scored, and indexes calculated by adding other separate variables. Each of these can be eye-catching depending on the circumstances.

- **Content Analysis** - Completing the data by doing a content analysis may be necessary if there are narratives of discussion or documents that are rich in information but difficult to analyze in the original form.

### Organizing, Synthesizing, and Aggregating the Data

Once the raw data are collected and verified, it is often necessary to further organize it before analysis of performance can occur. Performance measurements are usually formulated based on one or more raw data inputs. Therefore, your analysis that organizes, synthesizes or aggregates the raw data prepares the foundation for the performance measurement. Recognize that you must analyze individual data before you can use it properly in a combined data set.

A word of caution: John Wheeler states in *Understanding Variation: The Key to Managing Chaos* (Wheeler, 1993) that ?as data are aggregated, they lose their context and their usefulness. Aggregated data may be used as a report card, but they will not pin-point what needs to be fixed." A common error seen is that organizations do not understand single variable analysis of data, but immediately leap to constructing indexes and aggregated values in the hope of providing an answer. An organization should first have an understanding of the individual components of performance data prior to constructing aggregates. With that word of caution out of the way, here are some ways to organize, synthesize, and aggregate your organization's data:

- **Using a Scorecard** - It is seldom the case that one looks at an individual performance indicator. A balanced scorecard approach is often used to get the full picture of the health of an organization. This approach also minimizes the problems of measurement perturbing the system. Common items to consider including in a balanced score card are productivity, unit cost, schedule adherence, budget adherence, customer satisfaction, employee satisfaction, environmental, safety, and quality. Usually six or seven key areas are chosen, and one representative indicator used for each.

- **Using Expert Judgement** - Where data is primarily qualitative, and for purposes of validation of self-assessments, experts or ?peers" may be asked to combine data and describe the findings, again in qualitative terms. The credibility of data analysis by experts depends upon their perceived objectivity and knowledge of the subject matter being reviewed.

- **Using Meta Analysis and Evaluation Synthesis** - Evaluators have developed a number of techniques for summarizing evaluation findings in both quantitative and qualitative ways. The basic idea behind these synthesis methods is that, through the use of systematic and comprehensive retrieval practices (accumulation of prior studies), quantification of results using a common metric such as effect size, and statistical aggregation of the collection of results, it is possible to derive a more accurate and useful portrayal of what is known and not known about a given topic. It is also possible to demonstrate outcomes for your program using existing evaluation studies, thus saving time and money.

- **Normalization** - The terms ?normalizing" or ?normalization" are used to denote the practice of creating a rate indicator that can be used to compare dissimilar organizations. Usually, this practice is used when counting errors or events. It should be noted that the actual statistical definition of ?normalizing" or ?normalization" is the procedure of taking skewed or non-Normal (non bell-shaped) data and performing a mathematical operation on the data to make it normally distributed.

- **Performance Indexes** - Often it is necessary to present information from several related areas simultaneously and to provide a statistical measure of how performance changes over time. The performance index does just that. It is a management tool that allows multiple sets of information to be compiled into an overall measure.

## GENERATING USEFUL INFORMATION - STEP 3: DATA ANALYSIS

### Overview of Analysis Tools

There are two categories of analysis tools: (1) those that analyze measurement data and (2) those that identify root causes and design improvements. Table 1.1 below shows the analysis tools that meet the criteria of these two categories.

| To Analyze the Measurement Data | To Identify Root Causes and Design Improvements |
|---|---|
| • Check Sheet<br>• Run Chart<br>• Statistical Analysis<br>• Statistical Process Control/Control Chart<br>• Matrices, Contingency Tables<br>• Flow Charts<br>• Decision Trees, Historical Timelines<br>• Scatter Plots of Relationships Between Variables | • Affinity Diagram<br>• Brainstorming/Creative Thinking<br>• Cause and Effect Diagram<br>• Cost-of Quality Analysis<br>• Criticality Analysis<br>• Failure Mode & Effect Analysis<br>• Fault Tree Analysis<br>• Histogram<br>• Pareto Analysis<br>• Story Boarding<br>• Gap Analysis<br>• Analytical Hierarchy Process |

**Table 1.1**

**Two Categories of Analysis Tools**

### Analyzing Single Variable vs. Multivariate Information

?Univariate" analysis of a single performance indicator or a single question from a written survey usually describes overall levels, shows variability, and identifies atypical responses. For quantitative variables, these are measures of central tendency (mean, median, mode), the minimum, maximum, range, variance and standard deviation of the responses, and outliers that deviate greatly form the norm. Similar univariate analysis of qualitative information would look at the typical response, the diversity of responses, and unusual responses.

Most analysis will be multivariate, that is, looking at multiple variables and comparing observed levels against appropriate criteria, or searching for associations among variables. Relationships between variables, including between program action and observed improvements, can be searched in two ways: visually and statistically. Which method you choose will depend partly on whether data is in nominal categories (e.g. geographical regions) or in levels of performance or response (such as 1-10). Visual techniques include contingency tables, matrices, percentage differences, and scatter plots. Statistical techniques includes tests such as chi-square, t-tests, analysis of variance, correlation, and regression.

### How Does Actual Performance Compare to Set Goals?

There are a number of ways to answer the question, ?How does actual performance compare to the goals or standards set?" A simple check list may do if all of your performance targets or standards are events that were to have occurred. However, often the performance goal or standard is not so simple. To measure current performance you need to know something about past performance, i.e., where you started. You also must know something about the target or expectation for current performance, and have a notion of what constitutes ?good" or excellent performance for this measure or indicator. That is, for a performance indicator or measure, you need a baseline or base level value, a target or expectation, and a benchmark. Often management encourages definition of ?stretch" targets, exceeding normal expectations, as well as regular targets to provide incentives for achievement.

- **Trend Analysis** - ?Goals" and ?stretch targets" can be numerical or they can be stated in terms of achievement of a significant, improving trend. One way of determining and showing a trend is a statistical process control chart. Another is to use expert opinion about qualitative definitions of success in a peer review. If a control chart is used, the chart becomes the criterion for determination of success. In both cases, numerical targets are not used. With the control chart, the goal or stretch target is stated as to ?achieve statistically significant improvement" in certain measures over certain time frames. Goals that are stated in terms of achievement of statistically significant improvements are easy to monitor using a control chart. This methodology eliminates the problem of ?we achieved a 49% improvement, but the target was 50 percent, so we failed." Also, it prevents a random, lucky fluctuation in performance from being declared as a success.

- **Statistical Process Control** - The simplest trending tool that allows for determination of statistical significance is *Statistical Process Control*, using control charts. A control chart includes: the performance data, an average (or center) line set at the mean (arithmetic average) of the data, an upper control limit set at the mean plus three standard deviations, and a lower control limit set at the mean minus three standard deviations. There are four types of control charts—the p-chart, c-chart, u-chart, and x-chart—that are used when the data being measured meet certain conditions (or attributes). Their characteristics are given in Table 1.2 (on the following page).

| Type | Characteristic |
|------|----------------|
| p-chart | Used with binomial data such as go/no-go situations. They account for sample size and are effective for small samples as well as large samples. |
| c-chart | Used for Poisson processes such as counting attributes or random arrival. |
| u-chart | Used for counting defects when sample size varies for each lot. |
| x-chart | Generic control chart that is used when the above conditions are not met. |

**Table 1.2**

**The Four Types of Control Charts and Their Characteristics**

### If There Is Variance, What Is the Cause and Is Corrective Action Necessary?

It is important to understand why there is variation between expected performance and measured performance. Analysis must set the stage for action plans at multiple organizational levels. What are causes, priorities for change, or gaps? Here are descriptions and examples of the most important types of analysis and commonly used tools:

- **Analyzing Common and Special Cause Factors** - A control chart can also be used for segregating Common Causes from Special Causes. Dr. Shewhart (Shewhart 1986) invented this way of thinking about uniformity and non-uniformity. He originally referred to these two types of causes as ?chance causes" and ?assignable causes." Common causes of variation produce points on a control chart that, over a long period, all fall inside the control limits, and no significant trends exist. The performance data does vary from point to point, but the pattern is apparently random. Common causes of variation stay the same day to day. A special cause of variation is something special, not part of the system of common causes. Special causes correspond to specific issues acting upon the process, such as personnel and equipment changes, weather delays, malfunctions, and other ?unique" events.

- **Analysis Using Histograms and Pareto Charts** - The histogram and related pareto chart are convenient graphs to display the results of causal analysis and help determine priorities for action. The histogram displays the number of instances of the attribute being measured in each category (or bin). Usually, the histogram is used when the categories are numeric (0-5 days, 6-10 days, 11-15 days) and you desire to keep the categories in their ?natural" order. The histogram also is used to check the distribution of process data. Distribution tests, such as testing for a ?normal" distribution, are of limited usefulness in process improvement. The difficulty is that the time sequence of the data is lost when lumped into a distribution histogram. If analysts perform a control chart first, they will know that the loss of time sequence is acceptable.

  The pareto chart is a specialized version of a histogram that ranks the categories in the chart from most frequent to least frequent. A pareto chart is useful for non-numeric data, such as ?root cause," ?type," or ?classification." This tool helps to prioritize where action and process changes should be focused. If taking action based upon causes of accidents or events, it is generally most helpful to focus efforts on the most frequent causes. Going after an ?easy," yet infrequent, cause will probably not reap benefits.

### Rules for Interpreting Data and Formulating Conclusions

Recommendations are normative statements of how things should be. They are grounded in, but depart from, an assessment report that describes what is the current status. The ultimate purpose of the recommendation is to convert findings into action statements that are directed to alternative ways of conducting business. A well written recommendation has five basic qualities. It should be timely, realistic, directed to the appropriate person or entity, comprehensive, and specific. Of the five, timeliness is most important.

In making recommendations, the analyst must consider the organizational environment, weighing resource and budget constraints, political pressures, and other conditions that might affect implementation. Successful recommendations are linked to the evaluation findings and grounded in the empirical evidence presented in the report.

Under some conditions it may be more appropriate to offer options or alternative scenarios. Options would be appropriate if: (1) there is no preponderance of evidence elevating one course of action over another, (2) the audience likes options, (3) a political decision that must be debated is involved, or (4) when it is important to generate ownership of whichever option is chosen.

Framing options or recommendations is a deliberate, evolutionary process that occurs throughout the analysis and review, culminating with interpretation of all the findings. Recommendations are solutions to problems and, as such, are developed as the program problems and potential solutions are discussed with interested stakeholders. Physically, recommendations may be presented separate from the evaluation report. Reports contain descriptive and empirical data based on observation and analysis. It rarely should be modified. Separating the recommendations, which are often modified, maintains the integrity of the report.

## GENERATING USEFUL INFORMATION - STEP 4: DATA PRESENTATION

### Overview of Effective Data Presentation

Before actually presenting any information, it is beneficial to evaluate and understand a few key areas:

- Who is the audience?
- What is the intended use of the data? Will it be used to support decisions and take actions or is it just to monitor performance?
- What is the basic message to be communicated (current status, performance rate, etc.)?
- What is the presentation format (report, brochure, oral presentation, etc.)?
- What is the underlying nature of the data and any assumptions?

A key point to keep in mind is that decisions should not be made based on graphs alone. No graph can tell everything. The purpose of presenting the data graphically is to provide information to assist in decision making and to monitor activities or progress. Combine graphs with narrative discussions to help the reader understand the data in the proper perspective related to operations. Consider including the following: (1) explain what the values mean for your organization, (2) relate to historical performance, (3) identify influencing factors (nature of operations, seasonal changes, significant management initiatives), (4) relate to management performance goals, and (5) explain significant increases or decreases.

### Chart Design: A Few Hints and Tips

The charting area is the focal point of the chart or graphic. The graphical, dramatic representation of numbers as bars, risers, lines, pies, and the like is what makes a chart so powerful. Therefore,  make your charting area as prominent as possible without squeezing other chart elements off the page. If you can still get your point across without footnotes, axis titles, or legends, do so to make the charting area bigger. However, remember that the document needs to communicate enough information to be a stand-alone document. The following are tips to keep in mind when designing your chart.

- **Less is More** - Do not try to put too many series in a chart. Line charts are especially intolerant of overcrowding. More than three or four lines, particularly if the lines follow much the same direction, is visually confusing. The only exception to this rule is creating a line chart of several series that people would not expect to be similar.

- **Group Bars to Show Relationships** - Group bars together tightly if you are trying to suggest that they belong together. If you are showing a group of bars over a series of years, for example, it makes sense to cluster the bars for each year and leave a little extra space between years. If there is no need to ?cluster" your chart data, put more space between your bars and make them a little wider so they are easier to see.

- **Avoid Three-Dimensional Graphics** - Adding a shadow or depth to a line or a bar does not add any new information to the graph. In fact, it adds confusion because it is harder to determine the value of the line or bar.

- **Use Grids in Moderation** - When using grid lines in your charting area, use only as many as are needed to get an approximate idea of the value of any given data point in the chart. Too many grid lines create visual clutter. Balance horizontal and vertical grid lines so that the rectangles they create are not too long and narrow or tall and narrow. Use soft colors, such as gray, for grid lines. Once you have defined the color and weight of the grid lines, make sure the chart frame (the frame around the charting area) is black or a dark, brilliant color and heavier than the grid lines. (Note: Gridlines should not be used on control charts because they will be confused with control lines.)

- **Choose Colors Carefully or Avoid Them Altogether** - When choosing colors, use your company's corporate colors where possible and appropriate. Failing that, you can use software-supplied templates or color wheels. Also consider where your chart will appear. If it is going to be part of a computer screen show or a slide presentation in a large room, use strong, coordinating colors that attract attention and help the people at the back of the room distinguish the individual series. However, if it is going in a publication where it will be examined at close range, keep the colors softer so you do not overwhelm the reader.

- **Limit Use of Typefaces** - Use one typeface, or at most two, on each chart, and use the same size and weight for similar elements such as the axes and legend text. A recommended setting for these is in 12 to 18 points and bold. If you use the bold and italic fonts in a typeface, as well as different sizes, you can generate enough typographic variety without going outside that type family.

- **Choose Legible Typefaces** - Pick a typeface that looks clear in smaller sizes and in bold, especially if your chart is to be printed in a small size in a publication or if it will be viewed by a large audience in a big room. If your title is big enough, you can use just about any typeface and it will be legible. However, for legend text, axes, footnotes and the like, take more care. Use faces that are neither too light nor too heavy.

- **Set Type Against an Appropriate Background** - Be careful about the background behind your type. Some color combinations, such as pink or violet type and a medium or dark blue background, could make your audience feel dizzy. If you are using a dark background color, your type must be bright enough to be readable. It should not look as if the background is trying to ?swallow it up." If you are using light type on a dark background, use a bold weight, especially with smaller type sizes. Complex fill patterns in the background also can make type hard to read, particularly smaller items like legend text and axis scales.

- **Use Pattern Fills with Moderation** - Many charting software packages can create just about any kind of color combination or fill pattern you can imagine. But do not become carried away with color and patterns without thinking about your output device. Sophisticated fill patterns take up more disk space and take longer to print on color printers.

**Choosing How to Report**

The burden of effectively reporting is on the analyst and writer, not on the audience. In reality, top-quality reporting is not our most important goal. Our most important goal is for our audience to understand our results, see their many implications, realize what actions are needed, grasp the best ways to accomplish those actions, take action, and follow up on the impacts of those actions. Our results are merely one input into a process of change. Offering straightforward conclusions, sensible recommendations that flow directly and obviously from those conclusions, and practical implementation plans are some of the ways to help effect those changes.

- **The Action-Oriented Report** - Michael Hendricks (Hendricks 1994) suggests the use of action-oriented reports rather than traditional reporting methods. Action-oriented reports are often structured as a series of short reports (15 to 20 pages) with each carefully focused on a particular issue or audience. Each report would have an executive summary and table of contents. Most important items are presented first no matter what the original study design. Rather than appendices, additional information is provided upon request. The style of an action-oriented report is involved and active, not detached and passive as in traditional reports. This style is achieved by speaking in the first or second person and using shorter sentences and the present tense. When possible and cost effective, photographs can supplement examples, analogies, and illustrations.

- **Briefings** - Briefings can be very effective, but they do have disadvantages: (1) a poor presenter can undermine the message, (2) the material presented must be selected very carefully, (3) briefings can be hard to schedule, and (4) external events can interrupt them and diminish their impact. The advantages are that briefings bring together the key actors and provide an opportunity to discuss the issues and move toward actions. They are also the typical method of choice by managers.

- **Other Reporting Methods** - Other methods to consider for written reporting of findings are draft reports, internal memoranda, interim progress reports, answers to ?question and answer" sessions, the text of speeches, press releases, and three by five index cards so managers can read quickly and easily.

**Simplified Graph/Report Generation**

Spreadsheet and database software can be used to generate pareto charts, bar charts, pie charts, and scatter diagrams. The choice of which software to use is often based on personal preference or company policy. However, software for more complex analyses and presentation beyond that performed by common spreadsheet and database software packages can be difficult to find. A comprehensive list of software used for data acquisition, data presentation, statistical analysis, and other subjects related to quality assurance and quality control is provided in the annual *Quality Progress Software Directory* produced by the American Society for Quality Control (ASQC). The report, published in March 1995, listed over 500 software packages. There are two parts to the annual *Quality Progress Software Directory*:

- A two-dimensional matrix lists each software package and indicates its applicability across 19 categories, such as calibration, data acquisition, and management.

- An index of each of the software packages (alphabetical by company) that includes a brief description of the software, hardware requirements, and price. Included in the description are company telephone and fax numbers and addresses, so the company can be contacted directly for more information.

The annual ASQC *Quality Progress Software Directory* can be obtained by writing to: ASQC Quality Press, P.O. Box 3005, Milwaukee, WI 53201-9488; or by telephoning 1-800-248-1946.

## Section VII: Establishing a Performance-Based Management Program

## Step 6: Establish a Process/System for Using Performance Information to Drive Improvement

The old adage that we ?are either moving forward or we are losing ground" definitely applies in today's world of stiff competition for ever scarcer resources. Simply put, organizations must aggressively seek best practices and reduced cost of operations. Utilizing performance information is how organizations achieve this goal.

This section provides the key elements to achieving performance improvement through the use of performance information. Specifically, it addresses three areas where management can use this information:

- Driving performance improvement,

- Benchmarking (including the use of performance data to accomplish benchmarking and the use of benchmarking data to drive improvement), and

- Changing management processes through reengineering, continuous improvement, and process improvement.
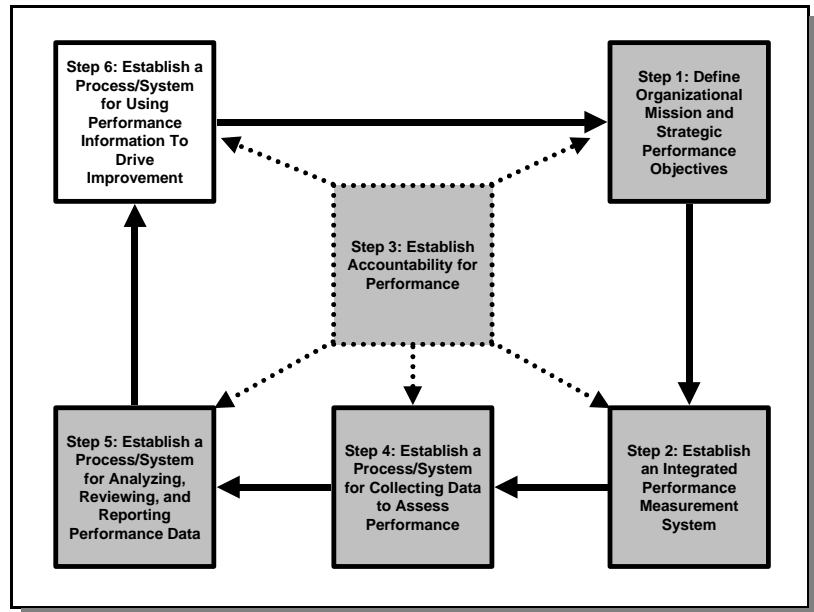
The information contained in this section has been condensed from Volume 6, ?Using Performance Information To Drive Improvement," of *The Performance-Based Management Handbook*.

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## USING PERFORMANCE INFORMATION TO DRIVE IMPROVEMENT

### Data Presentation

There are always many activities being performed within an organization. Performance measurement methods can be developed and used to assist in determining progress for any or all of these activities. Because the resultant performance information can be extensive, it is necessary to develop a strategy for dealing with and presenting these large amounts of data in an effective manner.

This performance measurement information has many uses. Primarily, these data provide management and individual performers with a view of current and past levels of performance. They also can provide an

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indication of future performance. These levels of performance provide the necessary clarity as to where an organization (or individual performer) stands relative to its goals and aspirations. Therefore, it is incumbent on management to establish an appropriate method for presenting key information in a way that promotes and encourages the behaviors necessary to attain the organization's objectives and vision.

### Presentation and Performance Measurement Architecture

At each level of an organization, there are specific objectives that need to be met. In an hierarchical organization, these objectives cascade down from the top to the individual performer. In non-hierarchical organizations, performance objectives are linked in less linear methods, but the concept is consistent. The process of developing an organization-wide performance measurement and presentation architecture is a remarkably effective alignment tool that goes far to provide what Kaplan and Norton describe as ?Achieving Strategic Alignment: From Top to Bottom" (Kaplan and Norton, 1996).

This alignment should result in each organization, team, group, and individual knowing and understanding their roles in achieving the overall organizational objective. It is important, in the rigors of day to day work, that there is constant and immediate feedback on progress. This feedback keeps all workers engaged each and every day. One approach to providing this feedback has been touted by many authors and consultants and is best exemplified by the cockpit, dashboard, or gauge metaphors.

As one analogy goes, there are pilots at each organizational level. From the bottom up, there are individuals at the work level who almost always have some level of self direction. The individual, therefore, should have performance indicators for self management. An example might be an Accounts Payable Clerk. This individual has certain performance standards and goals such as the number of invoices processed per day and the number of errors made, discounts taken, etc. The individual can readily see if he/she is making it and will know when additional effort is required without prompting from management. At the next level, the Accounts Payable Supervisor or Team Leader will monitor team performance as the individual statistics are combined for team performance indicators. The individual performance roll-ups may be augmented with other data, such as customer and employee satisfaction, and cost.

At the next level, the Accounting Services Manager is piloting a larger craft and may have data rolling up from each group managed, such as Accounts Payable, Accounts Receivable, Payroll, General Accounting, Reporting and Analysis etc. The Accounting Services Manager will then report to a Controller or Chief Financial Officer or Business Service Manager or some similar position. This hierarchical relationship continues up to the top executive.

Pilots or managers should have a set of performance indicators that are relevant to piloting their own craft that he/she is accountable for piloting. The set should be a combination of indicators that provide information on direction, altitude, and speed. In addition, there should be internal cabin environmental measures that indicate the internal conditions lest the craft be flying in the right direction, at the right speed and altitude, but the crew and passengers died because of lack of oxygen.

Mark Graham Brown (Brown, 1996) and other leading business writers indicate that no single cockpit should have more than 20 measures. But, as you can see, the cascading effect of the top to bottom alignment creates a lot of data. Fundamentally, the analogy states that there are piloting metrics and metrics that mechanics need to perform their work. Standing at one management level (cockpit), one can see that the next level metrics are mechanic's metrics from that vantage point. But, at that lower level, what are mechanic's measures at the previous higher organizational level are cockpit measures . . . and so on down the organizational ladder.

So, in the example with the Accounting Services Manager (ASM) being used, he/she may see that the costs of this area are rising and then can look under the hood to see the next level cockpit measures and recognize, for example, that the Accounts Payable and Payroll teams have rising costs. In a mature organization, those Team Leaders already will be aware of the rising trend, will have analyzed the issues and have the justification in place or an action plan to reverse the trends. The ASM then can provide assistance, reassign departmental

budgets, re-negotiate budgets with internal customers, or deploy motivational or disciplinary actions in a prompt and effective manner.

At each level then, the pilot is monitoring key indicators that are indices comprised of lower level measures. The pilot need not worry about these lower level measures unless his cockpit measures indicate a problem. Further, the cockpit may be constructed such that the key piloting metrics are always seen (e.g., speed, altitude, etc.) and some key and important mechanics' metrics are only seen if there is trouble (e.g., oil pressure warning lights).

Warning lights primarily address situations in which there are areas of performance that operate with a high degree of reliability but that have serious consequences should systems fail. For example, continuing with financial examples, an illustration my be the meeting of regulatory and administrative funds control requirements. This activity is usually a very dependable within the DOE Complex, but failure to meet these requirements may result in serious consequences up to, and including, criminal prosecution.

Measuring this activity usually results in a flat 100 percent performance line, so there is little value in presenting or demonstrating this performance level. But you can see that a warning light type of indicator would be valuable. Many, if not most, DOE Contractors have such a device that usually triggers ?procurement holds" on affected funds when the organization has expended a certain percentage of them (e.g. 90 percent). Again, these warning lights should appear only at the appropriate cockpit level for prompt and effective management response.

A graphical representation of the architecture that we have been discussing may look like Figure 1.5 below. (Note: This chart is for illustrative purposes only. Organizations may be bigger, smaller, or may be organized in a non-hierarchical way. The key message is that each level of management needs a similar set of metrics and that these metrics contain indices of performance at lower levels of the organization.)
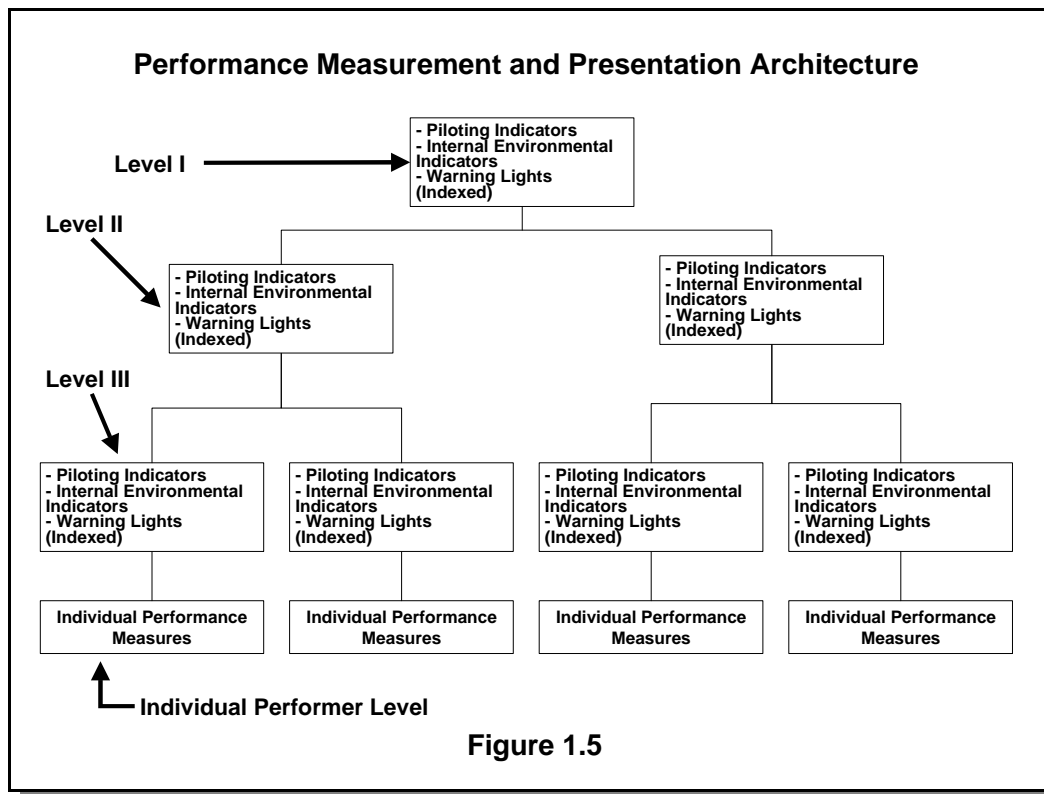


**Figure 1.5**

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## Performance Comparisons

As is discussed in the benchmarking section and in other sections, any performance measurement architecture should include comparative metrics in order to clarify the organization's position relative to competitors, peers, or colleagues. These comparisons will help target and motivate performance or allow recognition of excellence. Keeping score is only relevant within a comparative context. Additionally, measuring improvement is fine, but the rate of improvement may still be insufficient for the competitive environment in which the organization lives, and the only way to determine sufficiency of improvement is through comparisons to others.

## Other Management Concerns

In addition to monitoring performance through a limited set of indexed measures (cockpit measures), management should continuously analyze the measures in light of its current operating environment to assure itself that the correct measures are being used. Stephen Covey describes it using the analogy of a ladder (Covey, 1989). Your measurement system can tell you if you are climbing the ladder efficiently and effectively, but you must always look to see if your ladder is up against the right wall.

Eliyahu M. Goldratt and Jeff Cox in their book called *The Goal* (1992) illustrate this problem of measuring the right thing very effectively using an example from industry. In a manufacturing environment, key measures were related to individual machine productivity. The productivity measure helped demonstrate a prompt return on investment (ROI) per machine. This measure, however, prompted the manufacturing plant to push through and process as much as each machine could handle. The machine productivity goals were met, the ROI was demonstrated, but the plant was going bankrupt. The machine productivity measure was incentivizing large amounts of inventories to be accumulated because the metric architecture was misaligned with customer demand and other internal productivity metrics. The message from Goldratt and Cox is ?avoid measures that incentivize local optimization. Concentrate on more holistic measures."

Management always should be vigilant of measures that promote local optimizations or that are misaligned with overall objectives. Management should adjust the analysis in the short term and the performance measurement/presentation architecture in the mid-term.

## Data Display

In addition to management reviews, selected performance information and data should be publicly displayed at the appropriate levels. Team and individual performance information may be posted where the team conducts its work. In a well formed and mature team environment, a public display will increase the team's and individual's motivation to perform well and will create supportive group dynamics like healthy and collaborative competition, playfulness, and commitment to continuous improvement. In an immature environment, however, some public information may create dissension and disenfranchisement. To avoid dysfunctional or immature use of the data, managers should be aware of, and responsive to, indications that support activities and displays are being improperly used or misinterpreted.

Organizational measures should be posted more widely to ensure that all of the organization's individuals understand the overall progress and see a clear linkage between what they are doing and how the organization as a whole is performing. Easy to read graphs and charts should be used. Bar, line, area, and pie charts are only a few examples of easy to read charts that can be incorporated into a display strategy.

## Types of Data

In general, there are two kinds of data—quantitative and qualitative. *Quantitative* data are related to numbers and are reflective of easily measurable elements. If your target is *x*, you either make it our you don't. If your cost is *y*, assuming the cost was calculated correctly, the cost cannot be disputed. *Qualitative* information or data require analysis in order to interpret their meaning. Customer and employee satisfaction levels,

effectiveness of research and development, and effective decision support services are examples of areas that may need to be measured, assessed, reviewed, and interpreted with analytical skills. It is almost always necessary to incorporate both types of data to ensure that local optimization metrics are not being used to incorrectly navigate the activities of the organization.

### Management Reviews

Management should review performance information routinely. The frequency of the reviews should be determined by the competitive environment, the nature of the objectives being measured, the level of review, and many other factors. A high-tech organization within a competitive environment, where product innovation happens every 18 months, should have much more frequent access to performance information than an organization in a much more stable industry such as government contracting. However, within each organization, there are objectives that may require more frequent management reviews. There maybe construction projects with tight milestones and tight funding. There may be urgent environmental efforts underway. Or, there may be other politically sensitive issues requiring frequent management reviews of progress.

Each organization must determine the frequency of its management reviews of performance information, but, generally speaking, performance measures should not be allowed to deteriorate for too long before management responds. Prompt responses are much less expensive and may avoid crises; late remedial reactions are more expensive and usually do not avoid crises. This point is where the biggest savings are recouped in the Cost of Quality/Non-Conformance calculations and analyses. The push in industry is toward real-time performance information.

### Reaction to Data

As discussed above, the tone for how an organization performs will be set by how management reacts to performance information. When shortfalls are evident, management must demonstrate disappointment and a commitment to the corresponding actions necessary to execute a recovery. Management's attention and interest in the recovery plan and in monitoring the progress toward recovery are of utmost importance. Individuals throughout the organization will respond in concert with management's rigor or lack of it.

### Sharing Results with Customers and Stakeholders

End-to-end process reengineering and improvements often cross organizational boundaries. For example, partnerships with vendors may result in seamless order, delivery, invoicing, and payment processes in which vendors have access to the inventory databases of its customer. At pre-established inventory levels, the vendor ships more product. The shipment, in turn, generates an electronic invoice that causes the customer's payment system to issue an electronic settlement transaction. Once the systems are linked and the rules are programmed, no human intervention is necessary, except for the physical delivery of the product. This example is indicative of how many, if not most, organizations will need to integrate their processes with vendors, customers, and stakeholders in order to reduce costs and stay competitive.

Success of the newly reengineered processes is dependent on the performance of all parties along the value chain. As the parties depend more and more on their suppliers, customers, and stakeholders, assessment of their performance in the process is absolutely critical. In this example, metrics on shipping accuracy and timeliness will determine the viability of the supplier/partner. Timeliness and accuracy of payments, and accuracy of the inventory database are critical information for the vendor. Statistics on payment and shipping errors will help auditors and management assess the effectiveness and therefore, the long term usefulness, of these partnerships.

As with this example, there are many end-to-end processes within our organizations that create dependencies between myriad teams and sub-organizations. It is incumbent on the various partners to define and monitor the metrics necessary to perform (and improve) effectively and efficiently.

### Using Performance Information to Identify Opportunities

As performance information is gathered and analyzed, opportunities for reengineering and improved allocation of resources will become clear. Benchmarking performance is extremely valuable for targeting initial improvement priorities. Determination of the largest gaps in performance between the organization's current level and the ?best practitioner" identified makes selection of opportunities much more effective. This information is critical for selecting initial improvement targets. Once the larger gaps are closed or narrowed, continuous improvement is made possible by maintaining, refining, and using performance metrics.

# BENCHMARKING

The single most important and valuable benefit of benchmarking is that it allows us to see beyond our existing paradigms of process performance. As we benchmark other organizations, we greatly improve the likelihood of seeing tomorrow's solutions to today's problems. Often these truly new ideas are wholly different from the processes you see in your benchmarking efforts, but are inspired by what you have seen. There are a number of reasons to benchmark: (1) organizations must change to stay ahead of competitors, and benchmarking is a system for managing that change; (2) it promotes quantum leaps in performance; (3) a minimum amount of time is required to accomplish change; (4) it helps to establish effective goals and measures productivity; (5) it encourages striving for excellence, breakthrough thinking, and innovation; (6) it emphasizes sensitivity to changing customer needs; (7) it creates a better understanding of competitors and the dynamics of the industry; (8) it provides a sense of urgency for business process improvement; and (9) it ensures that the best industry practices are included in work processes.

### What is Benchmarking?

What is benchmarking? Here is a list of working definitions. Benchmarking is . . .

- an alliance between partners to share information on processes and measures that will stimulate innovative practices and improve performance.

- a process of finding and implementing best practices that accelerate the rate of improvement by providing real-world models and realizing improvement goals.

- the search for those best practices that will lead to the superior performance of a company.

- a positive, proactive, structured process that leads to changing operations and eventually attaining superior performance and a competitive advantage.

- a fundamental business skill that supports quality excellence.

- the continuous process of measuring products, services, and practices against the toughest competitors or those companies recognized as industry leaders.

- a process for rigorously measuring your performance versus the best-in-class companies and for using the analysis to meet and surpass the best-in-class.

### Types of Benchmarking

The seven types of benchmarking and a description of each are given below.

1. *Internal benchmarking* provides comparisons between yourself and similar operations within your own organization.

2. _Competitive benchmarking_ provides comparisons among competitors for a specific product/service.

3. _Functional benchmarking_ provides comparisons to similar functions within the same industry.

4. _Generic benchmarking_ provides comparisons of processes independent of industry or overall functions.

5. _Process benchmarking_ focuses on work processes or operating systems (e.g., billing, recruitment, customer complaint, procurement) to produce bottom-line results, such as increased productivity, reduced cycle time, lower costs, improved sales, reduced error rates, and increase profit.

6. _Performance benchmarking_ focuses on product and service comparisons, such as price, technical quality, ancillary product or service features, speed, and reliability. Tools used in performance benchmarking include reverse engineering, direct product or service comparisons and analysis of operating statistics.

7. _Strategic benchmarking_ examines how companies compete, and is seldom industry focused. A key objective is to identify the winning strategies of highly successful companies.

## When to Use/Not Use Process Benchmarking

This section will focus on _process benchmarking_. The information below is designed to help a company or organization determine when it should or should not use process benchmarking for improvement.

- **USE Process Benchmarking When:** The targeted process is critical to the organization's success; analysis indicates the organization's performance is not competitive; significant growth opportunities will be missed; there is an understanding of the process and its current performance measures; the process owner is committed to change (even radical change); and stakeholders will be part of the benchmarking team.

- **DON'T USE Process Benchmarking When:** The organization is not targeting the process; the organization is unsure how the process compares with the competition; it is uncertain what the organization's customers will require from the process; the process has not been mapped; there is a strong organizational resistance to changing the process; and only one or two people plan to conduct the study.

## What Costs Will Be Incurred?

Benchmarking is not free. While it does have a cost, the potential return on a company's investment can be dramatic. The following is a list of possible costs—some obvious and some hidden—that can be incurred during a benchmarking activity: direct labor for team members; data gathering/data analysis; research to identify potential benchmarking partners; publication and distribution of final report; training on specific skills and tools; long-distance telephone and fax charges; travel expenses; consultant fees for third-party competitive benchmarking; and implementation costs.

## What Are Benchmarking's Critical Success Factors?

Critical benchmarking success factors are those actions or activities that are absolutely necessary to successfully conduct and benefit from a benchmarking initiative. Several critical success factors are listed below.

- **Obtain Management Support** - In order for a benchmarking effort to be successful, management must: focus on the processes that are critical to their business; desire to use benchmarking in conjunction with strategic planning; be willing to admit that they're not the best; be open to new ideas from potentially unexpected sources; be committed to provide resources and to overcome resistance to change; recognize those teams that are successful benchmarking teams; understand the benchmarking process; communicate the objectives of the benchmarking project to the entire organization; and be willing to change.

- **Overcome Barriers** - To have a successful benchmarking effort, the following barriers must be overcome: a belief that the targeted process is not critical to the business; unreasonable fear of sharing information with benchmarking partners; inadequate resources committed to the benchmarking effort; the assumption that a person always has to travel to do benchmarking; not doing the required ?homework" before contacting benchmarking partners; benchmarking a company rather than a process; unwillingness to change (The ?Not Invented Here" syndrome); poor selection of benchmarking partners; lack of up-front plans for implementing findings and follow-through to implementation; not involving key stakeholders in the benchmarking project; and expecting results too quickly.

- **Understand Your Process Before Benchmarking Others** - In order for your benchmarking effort to be successful, you need to understand your process(es) first. Before benchmarking others, you need to: (1) use process mapping tools to define your current process, including top-down flowcharts, wall maps, product process maps or value-added flow analysis; (2) identify customer expectations for your process by reviewing existing process performance measurements against customer expectations; (3) define process performance (usually done in terms of cycle time, defects per unit produced, and cost); (4) use analysis tools to understand the causes for inefficiencies in the process. Examples of these tools include cause and effect diagrams, Pareto diagrams, run charts and control charts; and (5) identify benchmarking targets based on analysis. Typical targets include entitlement (cycle time), a competitors' performance and customer expectations.

- **Consider Adaptability** - Adaptability is critical to the success of a benchmarking effort. Ask yourself and others the following question: How easy will it be for your organization to adapt to a new way of doing business? If the results of your queries show that it would not be easy for your organization to adapt, you may want to reconsider your benchmarking effort.

- **Align Strategic Goals** - Another critical success factor is alignment to strategic goals. Ask yourself and others the following question: Is the benchmarking effort targeted at a business area that is aligned with your organization's strategic goals? If the results show that the benchmarking effort is not aligned with your organization's strategic goals, you may want to reconsider proceeding any further.

- **Develop and Ensure Trust** - Each organization must trust that the information they are providing will not be shared with unauthorized competitors or misused.

- **Beware of the ?Wolf At The Door"** - In many cases, a dire need to benchmark in order to get back into the competitive race or to accomplish that which is failing will provide significant impetus to a benchmarking team.

### Deciding What to Benchmark

Involve senior management in identifying candidate benchmarking targets. These targets usually can be identified as areas of business that are clearly ailing. Identify your key business processes. Excellent criteria for deciding what to benchmark include assessing the following: Does the process have strategic importance to the organization? Will improvement of the process result in a significant improvement in customer satisfaction, quality, cost, or cycle time? Is there a high potential for success?

### How to Do Benchmarking

There are many benchmarking models available in open literature. In addition, companies often design their own process to adapt to their specific culture. Xerox and Texas Instruments have 10-step processes. IBM and AlliedSignal, however, use four-step processes. Other companies use six, seven, or even 14 steps. Regardless of the number of steps, all have common elements. Perhaps the simplest and most successful model available was designed by the American Productivity and Quality Center (APQC). In this volume, we will use the APQC's four phase model:

1. **Plan:** Prepare the benchmarking study plan, select the team, select partners, and analyze your process.

2. **Collect Data:** Prepare and administer questions, capture the results, and follow-up with partners.

3. **Analyze:** Analyze performance gaps and identify best practices, methods, and enablers.

4. **Adapt and Improve:** Publish findings, create an improvement plan, and execute the plan.

### Planning Phase

Planning a benchmarking effort is as critical an activity as the actual gathering of the data, perhaps even more so. Benchmarking efforts that are not clearly planned and communicated to all team members can easily wander off track causing the team to lose site of the intended objective. A number of items need to be considered when planning a benchmarking effort. They are:

- Form (and train, if needed) the benchmarking team.

- Analyze and document the current process.

- Identify the area of study on which your team will focus.

- Identify the most important customer.

- Identify the smaller sub-processes, especially problem areas.

- Identify the critical success factors (CSFs) for the area and develop performance measures for the CSFs.

- Establish the scope of the benchmarking study.

- Develop a purpose statement.

- Develop criteria for determining and evaluating prospective benchmarking partners.

- Identify target benchmarking partners.

- Define a data collection plan and determine how the data will be used, managed, and distributed.

- Identify how implementation of improvements will be accomplished.

You may also wish to conduct an organizational self-assessment survey to help you understand key elements of your organization and your organizational strengths or weaknesses as you proceed with your benchmarking process.

### Collection Phase

The collection phase of a benchmarking effort is two-fold: the collection of secondary benchmarking information and the collection of the primary benchmarking data. Secondary benchmarking information is information gathered via Web searches, libraries, and professional organizations. This information helps the benchmarking team determine who to target as prospective benchmarking partners by identifying those organizations that use the same or similar processes. Primary benchmarking data is collected from a benchmarking partner. It is the data you will use to improve your process or program. Primary data can be collected via correspondence, telephone conferences, or site visits.

- **Collection of Secondary Benchmarking Information** - The process steps to collection of secondary benchmarking information are: (1) conduct a secondary research based on select/sort criteria. Sources of this information include libraries, business journals, and experts; (2) evaluate the results of the secondary information collection and identify potential benchmarking partners. These can include common interest groups; established business, industry, or research alliances; and local chambers of commerce; (3) develop data collection instruments such as forms, questionnaires, or matrices; (4) pilot the collection instruments internally to insure usability; (5) review the secondary information for usability and applicability; (6) identify and contact best practice partners and enlist participation; and (7) screen partners and evaluate for best ?fit" with criteria.

- **Collection of Primary Benchmarking Data** - The process steps to collection of primary benchmarking data are: (1) develop a detailed collection questionnaire based on the results of your secondary information collection and (2) conduct the benchmarking investigation using the detailed questionnaire and telephone conferences or site visits, as appropriate.

### Finding Benchmarking Partners

Where do you start the search for the best? You start by focusing on the process you are interested in improving, not on the company you think you might want to visit. All of the processes at world-class companies aren't world-class processes. The expectation that, if one process at a company is considered to be ?world class," then all processes at the same company must also be ?world-class" is called the ?halo" effect. For this reason, it is important to focus on the process and not on the company. In addition, companies considered mediocre can have a world-class process or two.

To determine which companies have processes similar to the one that you are interested in benchmarking, ask, ?Whose livelihood depends on this process?" Examples might include routine machinery maintenance for safe operation, fast and accurate distribution of products across the country, or fast turnaround of equipment.

Once the number of companies that are possible benchmarking partners have been identified, weigh the ease of getting access to information against possible performance compromises. It is important here to understand the spectrum of possible comparisons from parity: one company may do something that is simply ?different," while another might offer options that would result in some improvement over the current process. Still other companies' process might be considered a ?best practice," ?best-in-class," or even ?world-class."

Finally, you are encouraged to make your decision about who to benchmark based on fact, not on opinion. Some reputations are the result of clever advertising; others have been earned. Be alert and be cautious. The possible rewards are too great to not proceed with care. On the down side, a lot of effort spent on benchmarking a partner that has not been selected carefully can result in a lot of lost time and a lot of wasted dollars.

### The Analysis Phase

The analysis phase of a benchmarking project can be the most tedious and yet the most rewarding. The following information will enable you to take a structured approach to the process of sorting, understanding, and drawing conclusions about the data collected:

- Compare current performance data to the benchmarking partner's data.
    - Sort and compile the data.
    - Make the performance data comparable, i.e., normalize it in a way that provides comparability.
    - Identify any gaps in the data and assign actions for the collection of missing data.

- Identify any operational best practices observed and any process enablers.
    - What are the participants doing that you are not doing?
    - How do they do it?
    - What enablers—factors and practices that facilitate superior performance—allow them to do what they do?

- Formulate a strategy to close any gaps that have been identified.
    - Assess the potential adaptability of the current process to the new practices and enablers.
    - Identify opportunities for improvement.

- Develop an implementation plan.

To complete the analysis phase:

- Analyze the data and insights gathered from the benchmarking partners:
    - Compare the process performance measurements.
    - Review your goals.
    - Prepare a gap analysis report.

- Understand the factors that contribute to the partners' superior performance:
    - Which can be adopted in your company?
    - Which can be adapted to suit your needs?

- Develop a picture of what the modified process will look like and map the ?to be" process.

- Use project management skills to identify tasks, resources, and schedules to implement process changes.

- Identify who must be ?sold" on process changes and communicate the changes to them.

- Implement, monitor and communicate process performance.

## Adapting Improvements: The Most Difficult Step

Adapting performance improvements identified during the analysis phase of benchmarking is the point at which most unsuccessful benchmarking efforts falter. Failing to take this next step in the process can lead to wasted staff time and money, a demoralized benchmarking team, and, perhaps more importantly, a general sense that benchmarking efforts don't work. The four requirements for adapting improvements are:

1. Implement the plan.
    - Set realistic improvement goals.
    - Gain support for change from both upper management and staff doing the work.
    - Coordinate the improvement effort.

2. Monitor and report progress.
    - Celebrate successes!!!
    - Acknowledge the efforts of the benchmarking team.

3. Document the study.
    - Communicate the results both internally and to your benchmarking partners.
    - Assist in the internal communication and transfer of best practices.

4. Plan for continuous improvement.
    - Identify new benchmarking opportunities.
    - Set new goals.

# REENGINEERING

Reengineering can make dramatic process improvements, often amounting to cost reductions of 20-90 percent, cycle time reductions of 60-100 percent, and dramatic improvements in customer satisfaction leading from these cost and cycle time reductions. Companies often reengineer when they want to dramatically change their way of doing business or when their current way of doing business is not working.

Many business processes are so complicated that only a few people in the organization can actually understand the process and make the process work. That is why reengineering—simplifying these complex processes—has such a high payback in terms of costs and time saved. It is also why reengineering can often

increase the quality of work life by improving these processes such that individual employees can accomplish things on their own. Reengineering actually takes workers who are a small cog in a large, complex process they couldn't even understand and makes them a key part of a simpler and more understandable process. The workers often end up feeling much more empowered and fulfilled.

Safety can be dramatically improved when it becomes one of the reengineering focuses, as processes are simplified and made more understandable by the workers. Additionally, the reengineering of an organization's business processes can increase the organization's flexibility to respond to unexpected events in the business environment by educating the participants as to what the process is and what it is intended to accomplish. Prior to reengineering, many employees do not understand either what the process consists of or what it is trying to accomplish. Lastly, by improving the responsiveness to customers and stakeholders, reengineering can have a lasting and positive influence on these customers and stakeholders.

### What is Reengineering?

Reengineering is the radical redesign of current business processes with the intent of reducing cost and cycle time, resulting in increased customer satisfaction. Reengineering is possible because most business processes in large organizations cross departmental boundaries, have no individual process owner, and are often completely out of control. As a result, costs and cycle time are not good and the customer is likely not satisfied with the results. Thus, reengineering becomes a win-win for both the organization and its customers.

### What Costs Will Be Incurred?

Reengineering requires significant up-front investment. It typically requires a team (in-house or an in-house/consultant mix) working for six months up to a year to devise and implement a reengineering plan. However, when compared to the probable outcome of not reengineering—lost customers, lost market share and lost revenues—the cost is relatively small. Additionally, cost and cycle time reductions of 50 percent or more and corresponding increases in customer satisfaction far outweigh the costs incurred in preparing and implementing the plan. Obviously, if large consulting firms do much of the work, the cost could be higher than if an in-house team is used.

In addition to the direct cost of the team working to implement reengineering, there will also be an indirect cost in disruption to the organization. This indirect cost can be controlled best by being well organized (the effort is quick and well administered) and by communicating constantly with the people in the organization.

### Phases of Reengineering

There are four phases to reengineering:

1. **Organizing the Organization** - This first phase is the point where the organization needs to decide what process or processes will be reengineered. Depending on the number of reengineering efforts being undertaken, a team or teams will need to be put together. The teams will need to be organized according to the skill mixture needed, as well as include people who are and aren't familiar with the process.

   The organization needs to define a champion, preferably a ?heavy hitter," who can move roadblocks out of the way, someone who has a vested interest in the outcome and will guide the teams. The teams need to be given scopes of work and schedules, then need to be trained as a group prior to starting their efforts.

2. **Analyzing the Current Process** - The next phase is to analyze the current process enough to understand how it works and what are its cycle times. The process needs not be ?analyzed to death," as understanding and moving on with speed are of the essence. (It becomes a trade-off of detail for speed.) The team needs to keep in mind that those who want to keep the status quo always will be able to make a good explanation why the current process is the correct one.

   The team needs to keep in mind that processes start and end with a customer, so it is important that the processes being reengineered really are complete processes. A typical process starts with the customer ordering something and ends with the customer receiving and paying for the product. Since the goal of reengineering is to revise a process in order to serve the customer better, the team needs to keep asking two questions: ?Who is the customer?" and ?What does he/she want?"

3. **Developing New Concepts** - One consultant called this phase of the process ?The Big Aha." This phase is the time for ?Out of the box thinking." Remember, reengineering is not incremental change, and that cost and cycle time changes of greater than 50 percent are possible. Often, the group tends to want to be less radical, but they need to keep in mind the objective. Often the concept involves some type of computer system or perhaps a common database as the centerpiece of the new process.

4. **Moving from the Current Organization to the New Model** - When the new model has been defined, a strategy needs to be developed to deploy the new concept. Most often, the best way is to pilot the change in a small part of the organization to ?get the bugs out" of it, then to deploy it to a bigger unit, then to the whole organization. If the change is being done in a controlled environment, problems can be corrected. The important thing to remember is that, when the change is rolled out into the whole organization, it needs to work because there will be critics who don't want it to work and will be looking for excuses to put it down.

### Reengineering Lessons Learned

Reengineering is very difficult to accomplish, both because it is a complex undertaking involving many people working together and because it involves change. Due to the fact that many staff members in the organization may not consider this change to be in their best interest, there may be enormous resistance to the effort. There is a huge payoff to be had if the reengineering effort works, with cost savings and cycle time reductions in excess of 50 percent often being the norm.

Four critical areas for consideration are:

- **Leadership** - Leadership is THE critical item to address if you want reengineering to work. And to make this effort work, you will need to communicate, communicate, communicate. Leadership needs to provide a clear definition of the desired outcome, be honest in stating what they are trying to accomplish, and set a time table and stick to it.

- **Environment** - Management needs to know and involve customers and stockholders, link the process to the customers, and review the best practices of others who have been involved in a reengineering process. There also has to be a ?burning platform," i.e., something terrible that will happen if the reengineering is not successful, something which is even more terrible than the reengineering itself. This ?dire presence" encourages changes by forcing the workers to leave the comfort of what they now have to strike into the unknown future.

- **Technical Systems** - Management needs to seek and find outside sources of help so that their effort can be successful. They also need to follow a proven process and to develop an implementation plan for the entire process.

- **People Systems** - Reengineering will only work if the people in the organization are considered and involved at all levels. Teams need to be empowered, and cross-functional teams need to work all the issues.

## CONTINUOUS IMPROVEMENT

Continuous Improvement is defined in the DOE Quality Management Implementation Guidelines as, ?The unending betterment of a process based on constant measurement and analysis of results produced by the process, and the use of that analysis to modify the process." The basis of continuous improvement is usually diagramed as the Continuous Improvement Cycle and is also known as the Plan-Do-Check-Act Cycle or the Shewhart Cycle.

Why do it? Continuous improvement is undertaken to improve the efficiency of a process while reducing costs and cycle time, i.e., reducing the waste or those portions of a process that do not contribute to the end result.

### How Do You Do Continuous Improvement?

Most work is accomplished through repeatable processes consisting of many steps. One way of looking at a process is through the use of an input-output model, with the process taking some sort of inputs, adding value to the inputs in a work process consisting of many steps, and turning them into outputs or finished products. In a manufacturing business, the inputs would be raw materials and power to run the machines; the process would consist of many manufacturing steps, and the manufactured product would be the output.

Processes also take place in service industries, whether they are processes to handle claims in an automobile insurance company or preparing fast food at a McDonald's or Taco Bell. Because these processes are often very complicated and involve many steps and many people, there are usually many opportunities to improve these processes.

The concept of continuous improvement is that a small improvement in the cost and time to complete one cycle of the process, when multiplied by the many times the cycle is repeated, can lead to great savings over time. After a process has been improved many times in a small way, it will begin to become a much better process, eventually perhaps even becoming a ?world-class" process. Each improvement of the process reduces the excess time and cost in the process, i.e., the unproductive waste.

The three major quality experts—Crosby, Deming and Juran—believe that 85 percent of the problems in any organization are the problems caused by the systems the organization uses (which are controlled by management). Since the people who use the systems are the workers—the machine operators in a manufacturing plant, the clerks in an insurance claims process, or the food handlers at McDonalds—they are the best people to fix the problems. The way the workers fix the problems then, is through the use of continuous improvement.

The most commonly used technique to do continuous improvement is through use of the Plan-Do-Check-Act Cycle, initially developed by Walter Shewhart of Bell Labs in the 1930s. This cycle, also called ?The Shewhart Cycle," says to continually go through the cycle with a process, each iteration of which improves the process slightly. First, plan the process or change, then do it (the process or change). After the process or change is completed, check the results, usually by taking measurements. Then, based on the results of the measurements, take action. In other words, continue with the process or change that was developed or re-enter the cycle and improve on the initial change by going through the cycle again.

### What Costs Will Be Incurred?

Because continuous improvement requires training in the use of specific tools and processes, as well as champions to ensure that the right things are accomplished, there will be initial costs to start a continuous improvement effort. However, because the intent of this effort is to reduce waste, its cost—if done vigorously and correctly—should be considerably less than the cost of the waste that is eliminated. Thus, after the effort

is kicked off and has run for a period of time, perhaps one year or less if done correctly, continuous improvement should be a big money-maker for any organization.

### What Are the Critical Success Factors?

Without a doubt, the most critical factor in ensuring success of a continuous improvement effort is the enthusiastic support of the top leadership of the organization. If the leadership is not 110 percent behind the effort, it is doomed to failure. The leadership must make it clear to the entire organization why continuous improvement is necessary, that they support it very strongly, that those in the organization who support the effort will be rewarded, and that those in the organization who either try to stop it or do not support it will be punished or even removed from the organization. If the top leadership is not willing to give this level of support, there is really no reason to even start the effort.

Assuming top leadership enthusiastically supports the effort, the following additional actions are also necessary for the success of a continuous improvement effort: (1) clarify the process to be followed so that everyone understands what is being done and what is expected of them; (2) provide the necessary resources to ensure success. It will let the skeptics know that the organization is committed; (3) visibly reward those who support the effort and work toward its success; and establish new measures and stretch goals that fit the new direction.

### Deciding What to Take on

Every employee in the organization needs to be empowered to fix or improve any of the processes in which he or she is involved. When this empowerment happens, the employees decide to fix or improve the processes they feel need to be improved, eliminating managers trying to fix the wrong things or not noticing the things that really need to be fixed the most. Employees need to be able to fix everything.

### ?If It Ain't Broke, Break It!"

The saying, ?If it ain't broke, don't fix it," needs to be changed to, ?If it ain't broke, break it!" Just because a process appears to be working well does not mean it cannot be improved. Additionally, problems—when they do arise—need to be looked at as opportunities, since they point out areas that are ripe for improvement. Continuous improvement is really removing the waste from the processes. As some experts have estimated that all processes contain at least 20 to 40 percent waste, there should be a lot of opportunities for continuous improvement—removing the waste—in most organizations.

# PROCESS IMPROVEMENT

A process is an ongoing, recurring and systematic series of actions or operations whereby an input is transformed into a desired product (or output). This transformation is also referred to as ?adding value." Process improvement then can be defined as a set of management techniques for controlling and improving the effectiveness and efficiency of the process. The U.S. Navy views a process as the steps and decisions involved in the way work is accomplished. Process improvement then can be viewed as a management technique for making the result better. In order to be measured, monitored, and analyzed, the process must be repeated frequently, perhaps weekly or monthly at a minimum. It must also have measurable inputs and outputs, and the process must be controllable.

Process improvement can be used to make significant improvements in repetitive actions or operations. Managers often use process improvement when they need to increase the value added to an operation without changing the basic organization or the basic business systems in place. The three major quality experts—Crosby, Deming and Juran—agree that more than 85 percent of all problems associated with quality can be attributed to management policy or action (because management controls the systems). Process improvement is an excellent tool to reduce these problems.

## What Are the Critical Success Factors?

Without a doubt, the most important factor to the success of a process improvement effort is for the senior leadership to make it one of the organization's highest priorities. The importance of process improvement must be communicated from the top. Senior leadership must participate by attending training sessions and ensuring that everyone else receives the appropriate level of training.

## Getting Started: Coming to Agreement

In order for process improvement, or any other form of quality improvement, to be successful the organization must agree that customer satisfaction, whether internal or external, will determine the success of the improvement; management of processes must be by fact, not by intuition; continuous improvement must become a way of life for the organization; and each individual is accountable for the quality of the work he/she performs.

## Deciding What Process to Improve

In order to be most effective, the most important core process—those processes that interact with or have an influence on other processes—should be addressed first. But, deciding what are the most important processes requires management to first define the customer and the customer's goals. Management must also establish the priority of the process, the degree of improvement needed, and a baseline of the current level of performance.

## How to Do Process Improvement

Assuming that management has identified the primary customer, the core process to be improved, and the process to control and improve, it is time to get started. There are seven phases to go through in process improvement. They are:

1. **Organize the Team** - The process improvement team will need to be organized according to the types of skill-mix the team needs to have. Team members will probably require additional specific training. A small process may only require a single individual, the process owner. Complex processes, however, may require a large, multi-disciplinary team.

2. **Analyze the Current Process** - The next phase of process improvement is to analyze the current process by constructing a process flowchart. This tool is used to generate a step-by-step map of the activities, actions, and decisions that actually occur. It is important to talk to the individual who does the individual actions. Frequently, policies and procedures have not been updated to reflect valid changes, and requirements have been altered. In some cases, you may find that individuals have modified the procedure without communicating to other individuals involved in the process. The author of Volume 6 has participated in a study that documented a major monthly report effort on the part of an organization which was unseen by higher management and filed without any review or action.

3. **Simplify the Process** - The team must remove redundant or unnecessary activities. There will be a tendency for some individuals to try to keep some steps because they feel their job is threatened or they believe, often incorrectly, that there is a requirement for their step in the process. It is important to both validate and challenge requirements.

4. **Develop Outcome Indicators** - For each valid requirement in the process, there should be a measurable indicator. For example, if the requirement is to produce an accurate report on the fifteenth of each month, the process should have an outcome indicator that measures the conformance to the accuracy and an outcome indicator that measures conformance to the delivery specification.

   If the team can not define a measurable outcome indicator, they need to review the requirement. If the team or client can not define the requirement well enough to determine whether or not the output conforms to it, it may be able to be   eliminated. Outcome indicators often begin with the words ?Numbers of. . .", ?temperature of . . .", ?weight of . . .", or even ?cost of. . ." In general, when conformance is high, measure non-conformance. Avoid averages when the consequence of failure is high, because it tends to provide a false feeling of security. None of us would be happy with a process allowing our pay checks to be accurate plus or minus a dollar per hundred dollars paid.

5. **Determine If the Process Is Stable** - Team members should look for seasonal variation, or periodic variation caused by other processes. Are there outside influences that cannot be removed and that prevent the conformance? If so, the process may not be suitable for process improvement. (Control charts or run charts are often used to determine if the outcome is predictable.)

6. **Determine If the Process Capable** - Can we meet the objectives? The team should use one or more statistical techniques to determine how frequently the process outcome conforms with the client's expectation as measured by the outcome indicator. Process elements should be rearranged or changed in order to reduce the number of non-conformances (i.e., reduce the variation). (See Crosby, 1979 for more information.)

7. **Determine If Further Improvement Is Feasible** - The goal of process improvement is to achieve a stable process, reduce the variation, and to increase the conformance with customer expectations. The team leader should be alert to two possibilities. First, further process improvement may not justify the work of the team. The process owner should continue using continuous improvement to make small incremental improvements. The second possibility is that the process itself may not be adequate to achieve the needed results. Benchmarking may demonstrate that others have significantly better processes which need to be imported, or management may need to turn to reengineering for a more radical change in the way business is being conducted.

## Section VIII: Maintaining a Performance-Based Management Program

Thus far you have learned how to establish a performance-based management program, and establishing a sound one is not an easy or short task. As a matter of fact, getting a program firmly established will take years, not days or months. Afterward comes the task of maintaining the program.

### ONGOING MAINTENANCE

Here are some areas that need to be constantly maintained, areas to which ongoing attention should be given:

- **Leadership** - Never underestimate the role of leadership. Leadership must be dedicated to the program 24 hours a day, seven days a week. Remember, a champion never rests on his/her laurels!

- **Commitment** - Commitment to the program should be nonstop, not for just certain periods of time. Faltering commitment will erode the program.

- **Involvement** - Involvement is an area that can ?slip." Management may assume that they know what stakeholders, customers, and/or employees think, want, or need, and, thus, ?leave them out of the equation." Don't make this mistake. Keep all involved who should be involved.

- **Communication** - Communication is not something that can be done once in a while, but something that needs to be done on a continual basis. Communicating what's being planned, what's expected to happen, what's happened, and what corrections are being made as a result of what happened keeps everyone informed. It also keeps the program at the forefront . . . which is where it should be.

- **Feedback** - An ongoing feedback process will help to make adjustments to the program to keep it operating efficiently. Also, seeking and using feedback from stakeholders, customers, and employees let's them know that their opinion Is valued and that they are involved in the process.

- **Resources** - A sound performance-based management program must be adequately resourced. Otherwise, it can't function properly. Resources include people, money, and equipment. All must be appropriately stocked.

- **Customer Identification** - Customer identification is important to performance-based management. Failing to identify and meet the needs of a customer could be disastrous. Always keep the customer in mind.

- **Learning and Growth** - Performance-based management is not a stagnant process. It requires learning and growth. Thus, the organization must keep pace with emerging technologies and trends in business management.

- **Environmental Scanning** - As pointed out above, performance-based management is not a stagnant process. Furthermore, performance-based management does not operate in a stagnant environment. Both the external and internal environments must be monitored constantly for threats to and opportunities for the organization.

- **Sense of Purpose** - An established performance-based management program may become routine or complacent, operating out of habit rather than with a sense of purpose. It's important for the organization to maintain a clear of sense of purpose for its program.

- **Organizational Capacity** - As noted by NPR (1997), a focus on organizational capacity—the commitment of people to an organizational ideal as a necessary ingredient of success—supports a new or continued emphasis on process management as a way of ensuring that inefficient and ineffective processes do not get in the way of the drive to success. It would be wise to maintain this focus.

## MAINTENANCE CHECKS FOR EACH STEP OF THE PROGRAM

Listed on the following pages are areas for maintenance checks for each step of the process for establishing a performance-based management program. Following each maintenance check area is a list of questions to ask about that area. A ?no" response to a question means that the area needs to be updated. The goal is to keep the performance-based management program ?fresh" and operating efficiently and effectively. Following these maintenance checks periodically will help an organization to achieve that goal.

### Step 1 Maintenance

Areas for maintenance checks for ?Step 1: Define Organizational Mission and Strategic Performance Objectives" and questions to ask about these areas include:

- **Strategic Direction** - Is the strategic direction of the organization keeping pace with the changing external business environment? Have the assumptions about the future external business environment changed? Is the mission and vision of the organization in alignment with the current and future environment?

- **Business Planning** - Are business units and their sub-strategies in alignment with the strategic direction of the organization? Has the horizon for business planning cycle been extended appropriately?

- **Budget Planning** - Are the finances available for planned strategies? Have new areas of financial resources been explored?

- **Building Organizational Capacity** - Has the focus on building organizational capacity waned? Do the organizational staff have the necessary knowledge, skills, and tools for success?

- **Performance Plans/Agreements** - Have lessons learned in designing and implementing performance plans/agreements been used to improve current performance plans/agreements? Do the performance plans/agreements accurately reflect the changes in the organization's strategic direction and the subsequent changes in business planning?

### Step 2 Maintenance

Areas for maintenance checks for ?Step 2: Establish an Integrated Performance Measurement System" and questions to ask about these areas include:

- **Measurement System Components** - Have the key components of the measurement system been reevaluated to look for any changes within the component that would impact the system?

- **The Performance Measurement Team** -Has the team been checked for changes to the make-up of the team due to turn-over, reassignment, etc.? Are the team members experiencing ?burn-out" due to stagnant, repetitive roles/responsibilities? Do the team members understand their roles/responsibilities and tasks?

- **New Legal Requirements/Issues** - Has the organization ?stayed on top" of legal developments and incorporate their requirements into the performance measurement system? Has the organization communicated these requirements thoroughly to employees and stakeholders?

- **New Developments/Technology** - Has the organization kept abreast of new developments (theories, practices, etc.) and/or technology that has emerged in the performance measurement field since the time that its system was instituted? Has the organization incorporated new developments/technology into its system?

## Step 3 Maintenance

Areas for maintenance checks for ?Step 3: Establish Accountability for Performance" and questions to ask about these areas include:

- **Reciprocation** - Does organizational leadership practice the concept of reciprocal accountability?

- **Equity/Trust** - Does the organization operate in an atmosphere of equity and trust?

- **Transparency** - Does the organization and its leadership operate in an atmosphere of complete openness?

- **Clarity** - Does the organization, its stakeholders, and its customers have a clear picture of organizational mission, performance expectations, and performance reporting? Do employees have a clear picture of authorities and roles and responsibilities?

- **Balance** - Is there an adequate balance between accountability and authority? Between expectations and capacities? Between pay and performance?

- **Ownership** - Has a sense of ownership been instilled in employees?

- **Consequences** - Is excellent performance rewarded appropriately? Is poor performance dealt with appropriately?

- **Consistency** - Are policies, procedures, resources, and/or consequences applied consistently?

- **Follow-Up** - Does the organization use reported performance information to make improvements, reward performance, and correct poor performance?

- **Tools** - Does the organization adequately use accountability tools? Does it use too many tools, i.e., are the tools too burdensome?

## Step 4 Maintenance

Areas for maintenance checks for ?Step 4: Establish a Process/System for Collecting Data to Assess Performance" and questions to ask about these areas include:

- **Data Needs** - Has the organization's data needs changed? Are the current data needs being met? Does the organization regularly assess its data needs?

- **Data Collection Plan** - Does the data collection plan clearly define the informational needs of the performance measurement program? Does the data collection plan stipulate specific data sources for each data element? Does the data collection plan specify data collection techniques? Is the data collection plan reviewed on a regular basis? Does the data collection plan need updating?

- **Data Collection Process** - Does the frequency of data collection meet organizational needs? Are the proper data collection techniques being used? Are new techniques being explored?

- **Data Quality** - Does the organization have a data quality system, i.e., a data quality position and a data quality policy? Is the data quality system reviewed on a regular basis? Does the data quality system need updating?

**Step 5 Maintenance**

Areas for maintenance checks for ?Step 5: Establish a Process/System for Analyzing, Reviewing, and Reporting Performance Data" and questions to ask about these areas include:

- **Training** - Are those responsible for data analysis adequately trained to do the analysis? Does the organization keep pace with emerging developments and subsequent training on data analysis?

- **Data Analysis Plan** - Does the organization have a data analysis plan? Is it current? Does it need updating?

- **Organizing Data** - Is the data organized, synthesized, and/or aggregated to provide meaningful and useful information?

- **Data Analysis** - Does the data analysis meet the needs of the organization? Does the analysis use current and accepted analysis methods and tools?

- **Data Presentation** - Are data presented clearly and in an understandable manner? Is the presented data useful to management? Does presented data accurately capture organizational performance?

**Step 6 Maintenance**

Areas for maintenance checks for ?Step 6: Establish a Process/System for Using Performance Information to Drive Improvement" and questions to ask about this area include:

- **Using Performance Information** - Does organizational management review performance data on a regular basis? Does it use the data for decision making and for identifying areas for improvement? Does it share results with customers and stakeholders? Does it communicate performance information within the organization? On a regular basis? Does it communicate within the organization decisions based on performance information? On a regular basis? Does it celebrate success? Within the organization? On a regular basis? Does it use benchmarking, reengineering, continuous improvement, and/or process improvement to improve organizational processes?

## Appendix A: Definitions

Because people often associate different meanings to ?common" terminology, definitions are always tricky and controversial. Such may be the case with the definitions given herein. Please remember that many of these definitions are applicable with respect to the U.S. Department of Energy and its operations. The intent here is to define terminology such that the reader can get a general understanding of it. The PBM SIG does not intend to be prescriptive or inflexible, nor does it  admit to being the highest source of information.

**Accountability**
The obligation a person, group, or organization assumes for the execution of assigned authority and/or the fulfillment of delegated responsibility. This obligation includes: answering—providing an explanation or justification—for the execution of that authority and/or fulfillment of that responsibility; reporting on the results of that execution and/or fulfillment; and assuming liability for those results.

**Activity**
Actions taken by a program or an organization to achieve its objectives.

**Assessment**
An all-inclusive term used to denote the act of determining, through a review of objective evidence and witnessing the performance of activities, whether items, processes, or services meet specified requirements. Assessments are conducted through implementation of activities such as audits, performance evaluations, management system reviews, peer reviews, or surveillances, which are planned and documented by trained and qualified personnel.

**Baseline**
The initial level of performance at which an organization, process, or function is operating upon which future performance will be measured.

**Benchmarking**
1. To measure an organization's products or services against the best existing products or services of the same type.  The benchmark defines the 100 percent mark on the measurement scale.
2. The process of comparing and measuring an organization's own performance on a particular process against the performance of organizations judged to be the best of a comparable industry.

**Bottom Up**
Starting with input from the people who actually do the work and consolidating that input through successively higher levels of management.

**Cascaded Down**
Starting with a top level of management, communicated to successively lower levels of management and employees.

**Characteristics**
Any property or attribute of an item, process, or service that is distinct, describable, and measurable.

**Continuous Improvement**
1. The undying betterment of a process based on constant measurement and analysis of results produced by the process and use of that analysis to modify the process.
2. Where performance gains achieved are maintained and early identification of deteriorating environmental, safety, and health conditions is accomplished.

**Corrective Action**
Actions taken to rectify conditions adverse to quality and, where necessary, to preclude repetition.

**Criteria**
The rules or tests against which the quality of performance can be measured.

**Goal**
1. The result that a program or organization aims to accomplish.
2. A statement of attainment/achievement, which is proposed to be accomplished or attained with an implication of sustained effort and energy.

**Guideline**
A suggested practice that is not mandatory in programs intended to comply with a standard. The word ?should" or ?may" denotes a guideline; the word ?shall" or ?must" denotes a requirement.

**Impact**
Characterization of the outcome of a program as it relates to specific objectives.

**Item**
An all-inclusive term used in place of the following: appurtenance, sample, assembly, component, equipment, material, module, part, structure, subassembly, subsystem, unit, documented concepts, or data.

**Lessons Learned**
A ?good work practice" or innovative approach that is captured and shared to promote repeat application. A lesson learned may also be an adverse work practice or experience that is captured and shared to avoid recurrence.

**Line Manager**
Includes all managers in the chain of command from the first-line supervisors to the top manager.

**Management**
All individuals directly responsible and accountable for planning, implementing, and assessing work activities.

**Measurement**
The quantitative parameter used to ascertain the degree of performance.

**Metric**
A standard or unit of measure.

**Objective**
A statement of the desired result to be achieved within a specified amount of time.

**Occurrence**
An unusual or unplanned event having programmatic significance such that it adversely affects or potentially affects the performance, reliability, or safety of a facility.

**Outcome**
The expected, desired, or actual result to which outputs of activities of an agency have an intended effect.

**Outcome Measure**
An assessment of the results of a program activity or effort compared to its intended purpose.

**Output**
A product or service produced by a program or process and delivered to customers (whether internal or external).

**Output Measure**
The tabulation, calculation, or recording of activity or effort and can be expressed in a quantitative or qualitative manner.

**Performance-Based Management**
A systematic approach to performance improvement through an ongoing process of establishing strategic performance objectives; measuring performance; collecting, analyzing, reviewing, and reporting performance data; and using that data to drive performance improvement.

**Performance Expectation**
The desired condition or target level of performance for each measure.

**Performance Indicator(s)**
1. A particular value or characteristic used to measure output or outcome.
2. A parameter useful for determining the degree to which an organization has achieved its goals.
3. A quantifiable expression used to observe and track the status of a process.
4. The operational information that is indicative of the performance or condition of a facility, group of facilities, or site.

**Performance Measure**
A quantitative or qualitative characterization of performance.

**Performance Measurement**
The process of measuring the performance of an organization, a program, a function, or a process.

**Performance Objective**
1. A statement of desired outcome(s) for an organization or activity.
2. A target level of performance expressed as a tangible, measurable objective, against which actual achievement shall be compared, including a goal expressed as a quantitative standard, value, or rate.

**Performance Result**
The actual condition of performance level for each measure.

**Process**
An ongoing, recurring, and systematic series of actions or operations whereby an input is transformed into a desired product (or output).

**Process Improvement**
A set of management techniques for controlling and improving the effectiveness and efficiency of a process. In order to be measured, monitored, and analyzed, the process must be repeated frequently, perhaps weekly or monthly at a minimum. It must also have measurable inputs and outputs, and the process must be controllable.

**Program Evaluation**
An assessment, through objective measurement and systematic analysis, of the manner and extent to which federal programs achieve intended objectives.

**Quality**
A degree to which a product or service meets customer requirements and expectations.

**Quality Management**
The management of a process to maximize customer satisfaction at the lowest cost.

**Reengineering**
The radical redesign of current business processes with the intent of reducing cost and cycle time resulting in increased customer satisfaction.

**Root Cause**
The basic reasons for conditions adverse to quality that, if corrected, will prevent occurrence or recurrence.

**Root Cause Analysis**
An analysis performed to determine the cause of part, system, and component failures.

**Self-Assessment**
A systematic evaluation of an organization's performance, with the objective of finding opportunities for improvement and exceptional practices. Normally performed by the people involved in the activity, but may also be performed by others within the organization with an arms-length relationship to the work processes.

**Senior Management**
The manager or managers responsible for mission accomplishment and overall operations.

**Situation Analysis**
The assessment of trends, strengths, weaknesses, opportunities, and threats, giving a picture of the organization's internal and external environment to determine the opportunities or obstacles to achieving organizational goals. Performed in preparation for strategic planning efforts.

**Stakeholder**
Any group or individual who is affected by or who can affect the future of an organization, e.g., customers, employees, suppliers, owners, other agencies, Congress, and critics.

**Strategic Planning**
A process for helping an organization envision what it hopes to accomplish in the future; identify and understand obstacles and opportunities that affect the organization's ability to achieve that vision; and set forth the plan of activities and resource use that will best enable the achievement of the goals and objectives.

**Task**
A well-defined unit of work having an identifiable beginning and end that is a measurable component of the duties and responsibilities of a specific job.

**Total Quality Management**
1. A management philosophy that involves everyone in an organization in controlling and continuously improving how work is done in order to meet customer expectations of quality.
2. The management practice of continuous improvement in quality that relies on active participation of both management and employees using analytical tools and teamwork.

**Validation**
An evaluation performed to determine whether planned actions, if implemented, will address specific issue(s) or objective(s).

**Verification**
1. A determination that an improvement action has been implemented as designed.
2. The act of reviewing, inspecting, testing, checking, auditing, or otherwise determining and documenting whether items, processes, services, or documents conform to specified requirements.

## Appendix B: Acronyms

**ABM** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Activity-based management

**AOP** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Annual Operating Plan

**APQC** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . American Productivity and Quality Center

**ARL** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Army Research Laboratory

**ASQC** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . American Society for Quality Control

**BMOP** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Business Management Oversight Pilot

**CEO** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Chief Executive Officer

**CFO** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Chief Financial Officer

**CIO** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Chief Information Officer

**COO** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Chief Operating Officer

**CPI** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Consumer Price Index

**CRT** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . DOE Contract Reform Team

**CSF** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Critical success factor

**DOE** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . U.S. Department of Energy

**ES&H** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Environment, safety and health

**EVA** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Economic value-added

**FY 19xx** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Fiscal Year 19xx

**FY 200x** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Fiscal Year 200x

**GAO** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . General Accounting Office

**GPRA** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Government Performance and Results Act of 1993

**IBM** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . International Business Machines

**IRG** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Initial Review Group

**ISO** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . International Standards Organization

**JIT** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Just-in-time

**JPL** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Jet Propulsion Laboratory

**MBNQA** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Malcolm Baldrige National Quality Award

**M&I** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Management and Integrating

**M&O** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Management and Operating

**NAC** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . National Advisory Council

**NASA** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . National Aeronautics and Space Administration

**NIH** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . National Institutes of Health

**NPR** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . National Performance Review

**NRC** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Nuclear Regulatory Commission

**NSF** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . National Science Foundation

**OMB** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Office of Management and Budget

**OSHA** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Occupational Safety and Health Administration

**PBM SIG** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Performance-Based Management Special Interest Group

**PDCA** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Plan-Do-Check-Act Cycle

**POCMs** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Performance objectives, criteria, and measures

**QCDSM** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Quality, cost, delivery, safety, and morale

**R&D** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Research and development

**ROI** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Return on investment

**S&T** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Science and technology

**SAI** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Strategic Alignment Initiative

**SPC** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Statistical process control

**TQM** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Total Quality Management

**UC** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . University of California

**UCOP** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . University of California Office of the President

**URL** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . Universal Resource Locator

**WWW** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . World Wide Web

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## Appendix D: Development and Contents of a Performance Plan

[Note: The following information comes from the Free Management Library located at http://www.mapnp.org/library/. The information below is presented *verbatim* from the ?Performance Management: Performance Plan" page located at http://www.mapnp.org/library/perf_mng/prf_plan.htm.]

#### Development and Contents of a Performance Plan

Most of us are used to thinking of performance management focused on the employee, rather than the organization, groups, etc. Therefore, when first reviewing the steps to develop a performance plan, it may be best to use the example of employee performance management as done below. The reader should keep in mind that these steps might be followed in performance efforts focused on the entire organization or some subsystem of the organization.

In the example below, the focus—or domain—of the performance management process is an employee. The employee is a machine operator; consequently, application of performance management in this example is rather straightforward for clarity in the example. Most applications are not this straightforward.

1. **Review organizational goals to associate preferred organizational results in terms of units of performance, that is, quantity, quality, cost or timeliness.**

   Organizational goals are often established during strategic planning. Performance management translates these goals to results, which typically are described in terms of quantity, quality, timeliness or cost. Results are the primary products or services desired from the focus of the performance process. Examples are a percentage increase in sales, extent of impact on a certain community, etc. Goals should be ?SMART" (an acronym), that is, specific, measurable, acceptable, realistic to achieve and time-bound with a deadline. For example, an overall goal may be to increase the organization's profit by 30% by the end of the next fiscal year. An associated strategy (or sub-goal), among others, may be to increase profit of the Catalog Department by 50% over the next fiscal year.

2. **Specify desired results for the domain—as guidance, focus on results needed by other domains (e.g., to internal or external customers).**

   For example, the operator's results are high-quality, printed images for the internal customer, the Catalog Department. This aspect of performance management is sometimes called ?goal setting", particularly when the focus of the performance process is on employees. Goals should be ?SMART" and challenging.

3. **Ensure the domain's desired results directly contribute to the organization's results.**

   Aligning results with organizational results is another unique aspect of performance management process. Do the employee's results directly contribute to the results of the organization? What organizational goals? How? For example, do the prints directly contribute to the desired profit increase of 50% of the Catalog Department? How? Is there anything else the operator could be doing that would be more productive for this goal? Should a job analysis be done to verify efficiency?

4. **Weight, or prioritize, the domain's desired results.**

   A weight, or prioritization, is often in the form of percentage-time-spent, or a numeric ranking with ?1" as the highest. For example, the employee's results might be weighted as follows:

   • 80% of his time over an 8-hour period, Monday through Friday over the next fiscal year, to be spent running the machine
   • 10% of this time in training
   • 10% of this time in a Quality Circle

5. **Identify first-level measures to evaluate if and how well the domain's desired results were achieved.**

   Measures provide information to evaluate accomplishment of results. Measures are usually specified in terms of quantity, quality, timeliness or cost. For example, measures for the operator might be the number of prints over some time interval, a certain grade on a test during his training and attendance recorded on attendance sheets to his Quality Circle. Identifying which measures to take is often the toughest part of the performance management process. You have to look at the appropriate level or domain in the organization, its desired results, and consider what are the most valid, reliable and practical measurements to use. With complex and rapidly changing domains, it often helps to identify outcome and driver measures, and patterns of effects.

6. **Identify more specific measures for each first-level measure if necessary.**

   For example, regarding the operator's measure for operating his machine, he may have to produce at least 500 high-quality prints an hour for eight hours, Monday through Friday during the fiscal year. High-quality means no smears or tears. The Director of the Catalog Department evaluates whether the operator made this goal or not.

7. **Identify standards for evaluating how well the domain's desired results were achieved.**

   Standards specify how well a result should be achieved. For example, the operator ?meets expectations" if the Director of the Catalog Department agrees that the operator produced 500 high-quality prints an hour for eight hours, Monday through Friday during the fiscal year. If he produces 600, he ?exceeds expectations", 700 is ?superior performance", 400 is ?does not meet expectation", etc.

8. **Document a performance plan—including desired results, measures and standards.**

   The performance plan describes the domain's preferred results, how results tie back to the organization's results, weighting of results, how results will be measured and what standards are used to evaluate results. Developing the plan is often the responsibility of the head of the domain (in this example, the employee's supervisor). However, the plan should be developed as much as possible with participants in the domain. (Note that a performance plan is not the same as a ?performance development plan," which is mentioned later below.)

NOTE: Now is the best time to take stock of overall performance plans. Does the domain have the necessary resources to achieve preferred results, e.g., necessary funding, training, input from other subsystems, etc? Are the standards realistic? Can the domain realistically achieve the results within the preferred time frame? Does everyone involved in the measures really understand how to recognize the measures? Do they know their role in the performance management process?

## Appendix E: Guidelines for Performance Agreements

[Note: The information contained herein has been adapted from *Guidelines for Performance Agreements for Level 8/9* published in 1998 by the University of Wollongong of New South Wales, Australia. The original text can be found at http://www.uow.edu.au/admin/personnel/conditions/gs_level8-9agree.html.]

### PREAMBLE

This document sets out the guidelines for the preparation and use of performance agreements. An annual performance agreement is additional to any fixed term or continuing contract of employment between the staff member and the university (although the employment contract also places broad performance requirements on the staff member).The performance agreement is a brief document which supplements the annual appraisal form and process. A performance agreement is a negotiated document; all parties are expected to contribute to the drafting of the agreement and commit to it. Copies of performance agreements will be placed on the personal file of the staff member. Performance agreements are strictly confidential.

### AIMS

Performance agreements provide a framework for relevant staff to set both qualitative and quantitative targets which allow their performance to be measured and recognized. They are used to determine salary outcomes relating to either progression through an approved scale or to the continued payment of an attraction and retention allowance. Performance agreements will:

- Assist with ensuring that priorities for staff accord with those identified by the vice-chancellor or in university or unit plans;

- Integrate organizational objectives and the work of individuals;

- Encourage strong performance; and

- Recognize superior performance or the need for improvement.

For the staff member, performance agreements will also provide clear targets which clarify the university's expectations of them as well as documentation of the support which the university will provide.  Linking of salary outcomes to key results for the university is a key method of ensuring commitment to the university's overall goals.

### APPLICATION

Any of the following staff with an employment contract of one year or more are required to complete and submit performance agreements:

- All senior managers (level 10 and above);

- General staff in levels 8/9 (progression through this range is not automatic but is based on achievement of tasks set out in individual performance agreements); and

- Staff in receipt of attraction and retention allowances

### CONTENT

The relevant components of a performance agreement will be as follows:

1. Performance Agreement: The overall agreement as shown in the attachment.

2. Performance Goal: One of the 4-6 key result areas set out in the agreement (e.g. improve client service).

3. Performance Indicator: An indicator which can be used to measure the performance against the goal (e.g.. targeted reduction in the number of complaints).

4. <u>Performance Standard</u>: The agreed standard of performance (e.g.. no more than 27 complaints per annum).

5. <u>Performance Outcome</u>: The result at the end of the term of the agreement (e.g.. 32 complaints were received in the period).

Performance goals will be:

- Strategic, concentrating on managing critical outcomes or results;

- Action based, focussing on results to be achieved over a given time period;

- Evaluative, capable of assessing whether results have been achieved.

Performance standards should be realistic and expressed in specific, measurable terms, which can be clearly and objectively assessed and should have regard to:

- Timing: dates by which milestones will be reached and/or projected completion dates;

- Costs: estimated cost improvements, including how these costs will be monitored and, where necessary, adjusted;

- Quality Standards: process improvements, quantifiable client feedback and conformance or non conformance to standard e.g.. error rates or clear up rates;

- Outcome or output units;

- Benchmarks: or other comparative targets which compare performance with performance of other organisations including competitors.

A performance agreement must not include targets already achieved or otherwise past. It is expected that performance agreements will contain no less than four and no more than six key performance goals although each goal may be measured by more than one indicator. Each agreement shall also contain a professional development goal.

## PROCEDURE

A performance agreement is completed as a component of the annual appraisal and must be submitted for approval accompanied by the full appraisal. The agreement is to be prepared jointly with the supervisor. The performance agreement shall be reviewed and approved by the relevant member of the senior executive of the university.

Performance agreements must be completed on an annual basis. The timing for making performance agreements will be determined based on integration with university and unit planning. It is not a requirement that performance agreements are conducted on an anniversary of appointment if such a time does not align with the planning processes of the unit concerned.

There should be a mid term review of each performance agreement so that progress may be monitored, the agreement updated if appropriate and corrective action discussed where necessary. A member of staff shall only be entitled to incremental progression (subject to any other provisions in their employment contract) if this procedure is followed and the goals and targets specified in the performance agreement are met. If the performance goals specified in the agreement are met, the staff member shall be paid the increment. If the goals are not met, incremental progression shall be withheld until the goals are met.

The supervisor should take into account any significant unforeseen factors not within the control of the employee which may have impeded or assisted achievement and any unforeseen degree of difficulty or ease in excess of what might usually have been expected. The relevant member of the executive is authorised to approve incremental progression if significant obstacles prevent the achievement of performance goals in any particular year. Where an increment is not approved, progress will be reviewed on six monthly intervals.

Where a level 8/9 employee is dissatisfied with a recommendation based upon the outcomes of a performance agreement, the employee may appeal the matter to the director, Personnel Services. The director discusses the matter with the employee and with the supervisor (and may also then, if applicable, consult with the relevant union) before making a decision. Where significant obstacles have prevented achievement, this will be taken in to account as part of the appeal. Where an increment is not approved, a review will be scheduled for within the next six months. Other eligible staff may seek review by the vice-chancellor or nominee. Where a supervisor considers that the performance of an employee is unsatisfactory, the issue should be discussed with Personnel Services as for any other performance related problem.

Performance agreements will be filed on employee personal files in the Personnel Services Division.

### PERFORMANCE AGREEMENT FORMAT

**1.    Parties to the Agreement:**

Staff Member:

Supervisor:

Senior Executive:

Date of Agreement:

Term of Agreement:

Agreement Ends:

Unit's Overall Goals:

**2.    Sign-Off of Agreement at Commencement:**

Staff Member:

Supervisor:

Senior Executive:

**3.    Review of Agreement**

**4.    Sign-Off of Agreement at Conclusion:**

Staff Member:

Supervisor:

Senior Executive:

**5.       Provisions of Agreement:**

| Performance Goal 1 | Performance Indicator(s) | Performance Standard(s) | Performance Outcome(s) |
|---|---|---|---|
|  |  |  |  |

| Performance Goal 2 | Performance Indicator(s) | Performance Standard(s) | Performance Outcome(s) |
|---|---|---|---|
|  |  |  |  |

| Performance Goal 3 | Performance Indicator(s) | Performance Standard(s) | Performance Outcome(s) |
|---|---|---|---|
|  |  |  |  |

| Performance Goal 4 | Performance Indicator(s) | Performance Standard(s) | Performance Outcome(s) |
|---|---|---|---|
|  |  |  |  |

| Performance Goal 5 | Performance Indicator(s) | Performance Standard(s) | Performance Outcome(s) |
|---|---|---|---|
|  |  |  |  |

| Performance Goal 6 | Performance Indicator(s) | Performance Standard(s) | Performance Outcome(s) |
|---|---|---|---|
|  |  |  |  |

| Professional Development Goal | Performance Indicator(s) | Performance Standard(s) | Performance Outcome(s) |
|---|---|---|---|
|  |  |  |  |