The Department of the Navy

Guide for Developing and Using IT Performance Measurements

This guide supplements the IT Capital Planning and Portfolio Management processes by providing an outcome-oriented method for measuring the impact of IT investments.

IT Investment Practices

Weighing Your Investments

Version 1.0 • October 2001

DEPARTMENT OF THE NAVY
CHIEF INFORMATION OFFICER
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MEMORANDUM FOR DISTRIBUTION

Subj: DEPARTMENT OF THE NAVY INFORMATION TECHNOLOGY PERFORMANCE MEASURES

Encl: (1) Department of the Navy Guide for Developing and Using Information Technology Performance Measurements

This memorandum transmits the *Guide for Developing and Using Information Technology (IT) Performance Measures*. It was developed in response to Clinger Cohen Act direction that agencies manage IT using performance measures that indicate how the IT supports the organizations mission, and Government Performance and Results Act direction that agencies report performance through measures that relate to their strategic goals.

The Department of the Navy Chief Information Officer (DON CIO) developed the IT Capital Planning and Portfolio Management processes to assist DON organizations in selecting, managing, and evaluating IT investments. Recently, an Integrated Product Team (IPT) was commissioned to develop the enclosed *Guide for Developing and Using Information Technology (IT) Performance Measures.* This guide supplements the IT Capital Planning and Portfolio Management processes by providing an outcome-oriented method for measuring the impact of IT investments on the organizations mission, goals, and objectives. To achieve this end, the guide recommends the use of Kaplan and Norton's Balanced Scorecard, modified for the federal government.

As with almost everything we do in this evolving world of IT, this area is subject to change and improvement as events and new capabilities dictate. The guide will be maintained as a living document on our Web site (www.don-imit.navy.mil), therefore feedback on your individual successes and best practices, and suggestions for improving the guide would be most appreciated. The point of contact in this office is Mr. David Carder who can be reached at carder.david@hq.navy.mil or (703) 601-0230.

D. E. Porter

Distribution: (see page 2)

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As you use this Guide, please acknowledge and use the *Metrics Guide for Knowledge Management (KM) Initiatives*, issued August 2001. The KM Guide can be found on the DON IM/IT Web page.

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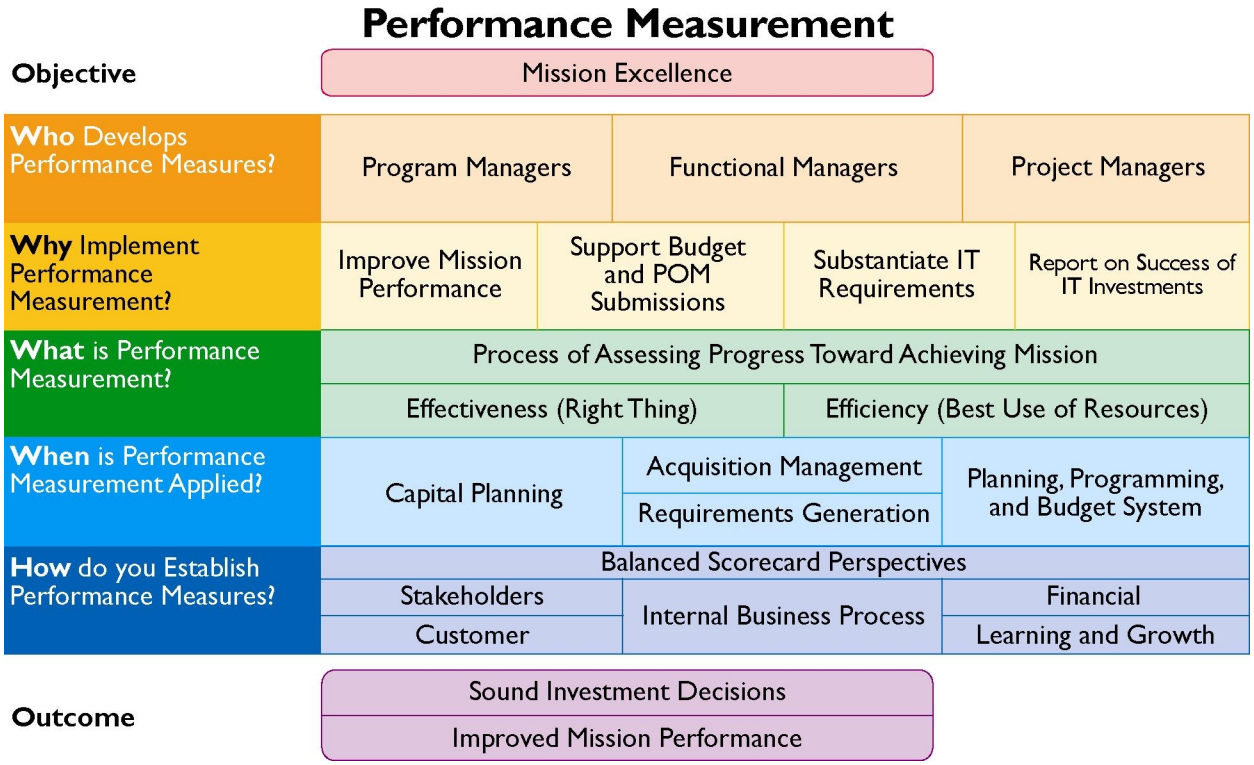
Executive Summary

Background

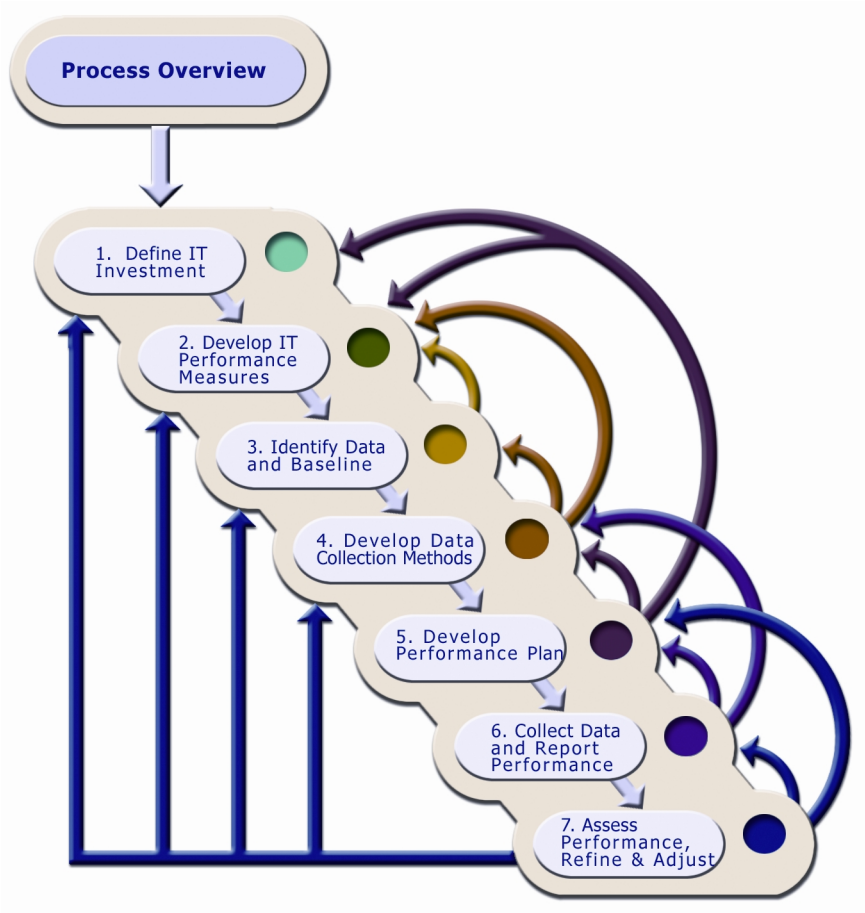
One of the underlying tenets in pursuit of information superiority in the Department of the Navy (DON) is the ability to focus resources on Information Technology (IT) investments that are the most effective in achieving that superiority. This is manifested directly by investing in IT that supports the warfighting mission by providing secure information when and where it is needed. It is also manifested by focusing on IT investments that improve the mission and strategic objectives of all DON organizations, afloat and ashore, that directly or indirectly support the warfighting mission. The Government Performance and Results Act of 1993 (GPRA) directs that agencies report performance through measures that relate to their strategic goals. The Clinger-Cohen Act of 1996 (CCA) further directs that agencies manage IT using performance measures that indicate how the IT supports organizational missions.

The DON Chief Information Officer (CIO) has developed the IT Capital Planning and Portfolio Management processes to assist DON organizations with their responsibilities and initiatives related to selecting, managing, and evaluating IT investments to be compliant with GPRA and CCA. The *DON IT Guide for Developing and Using Performance Measures* supplements the IT Capital Planning and Portfolio Management processes by providing an outcome-oriented method for measuring the impact of IT investments on the organization's mission, goals, and objectives. To achieve this end, this guide recommends the use of Kaplan and Norton's Balanced Scorecard, modified for the federal government. The following graphic summarizes the who, why, what, when, and how of the performance measurement process.



Execution

The process for developing and managing IT performance measures is an iterative one that begins with the definition of the investment and involves constant refinement and management throughout the life cycle of the asset. The following graphic illustrates the process.



Step 1 – Define IT Investment. Review the Mission Need Statement, Operational Requirements Document, or other requirements documentation to understand the nature and intent of the investment and how the investment supports the mission of the organization.

Step 2 – Develop IT Performance Measures. Develop objectives, associated measures, and actions to achieve the objectives, within each of the five Balanced Scorecard Perspectives.

Step 3 – Identify Baseline Data. Identify data that already exists and the requirements for the collection of new data that will be used to support the baseline of information required by the measures developed in Step 2.

Step 4 – Develop Data Collection Methods. Develop methods and procedures for collecting, storing, and updating the data identified in Step 3 to satisfy required reporting frequencies.

Step 5 – Develop a Performance Plan. Develop a plan that describes how the organization will review objectives and measures developed for the IT asset, and how corrective actions will be taken to achieve intended targets. Corrective actions can involve such things as modifying internal processes to more effectively use the investment or taking action to continue, modify, or cancel based on the investment's ability to meet its intended objectives.

Step 6 – Collect Data and Report Performance. Begin collecting and updating the data as determined in Step 4. The data should be displayed in a manner, and with the required frequency, to effectively evaluate actual performance of the investment in comparison to the target performance for each measure.

Step 7 – Assess Performance, Refine and Adjust. Take the corrective actions identified in the Performance Plan from Step 5 based on periodic reviews of the reports from Step 6.

Conclusion

The Balanced Scorecard, using the process described in the *DON Guide for Developing and Using IT Performance Measures*, substantially increases the likelihood that:

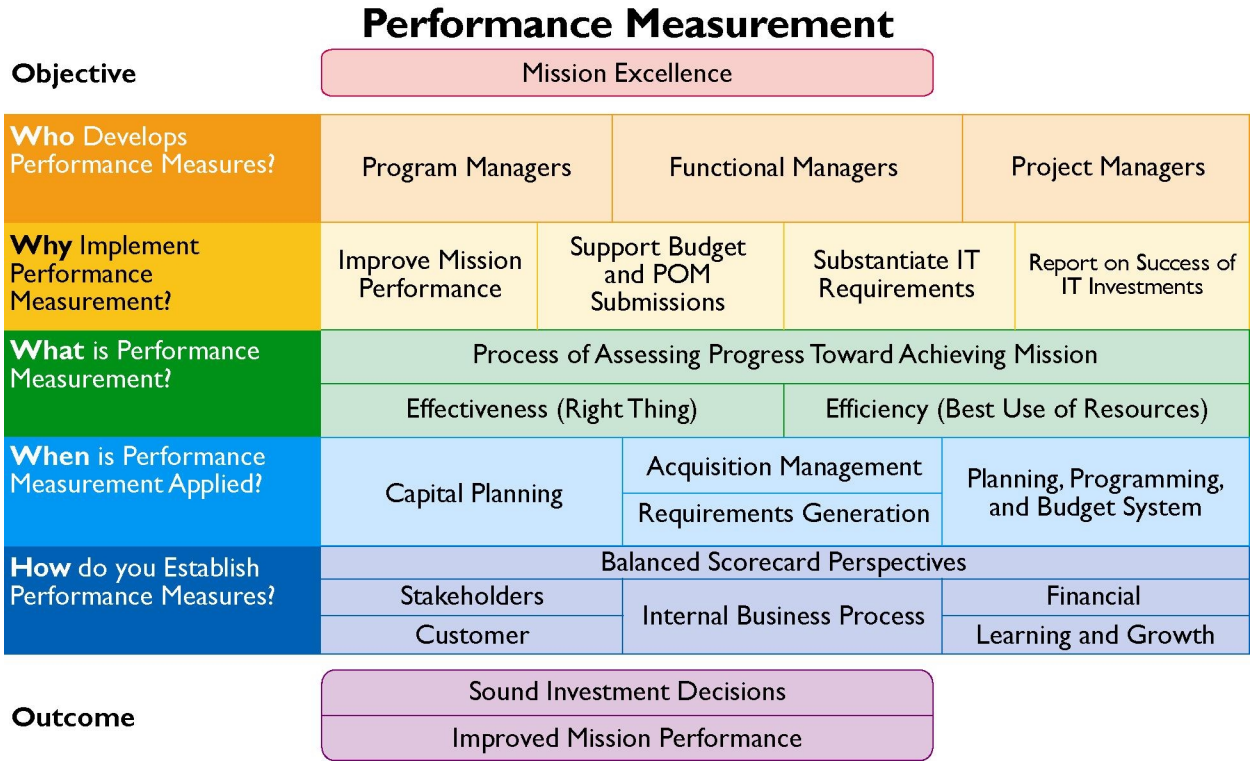
- Investments will be linked to overall mission support and improvement
- Realistic objectives will be considered for IT investments
- Actual performance of the investment will meet or exceed its intended purpose
- Corrective actions will be taken in a timely fashion if performance requirements aren't met.

It provides a model for ensuring that the investment will be continually evaluated from the perspective of the customer and the stakeholder and will also be continually evaluated from the financial perspective. The model helps ensure that objectives and measures are evaluated relative to the perspectives of learning and growth and internal processes within the organization. From this standpoint, it is a far better method of measuring performance as compared to traditional cost and performance measures. The real value to the DON is the model's strength in increasing the probability that IT investments will lead to improved mission performance and information superiority.

The DON CIO is very interested in collecting best practices, lessons learned, and examples of performance measures that have been developed for Navy and Marine Corps investments. You are encouraged to send these to Ms. Joeneicy Lewis, DON CIO, 703-602-6274, e-mail lewis.joeneicy@hq.navy.mil. Additionally, any comments on the Guide itself should also be forwarded to Ms. Lewis.

1.0 Introduction

The purpose of this *Guide for Developing and Using Information Technology (IT) Performance Measures* is to help Navy and Marine Corps managers develop performance measures that enable them to be more successful in their efforts to acquire, deploy, and manage IT investments. The Department of the Navy (DON) Chief Information Officer (CIO) has commissioned a series of Guides to support the IT Capital Planning Process. Each of these Guides requires the establishment and usage of performance measures. The DON IM/IT Performance Measures IPT selected the Balanced Scorecard approach as an industry-recognized management system that helps translate mission and strategy into tangible objectives and measures. The Balanced Scorecard has proven to be a valuable tool for government and private industry organizations that wish to measure their performance against mission objectives. Although this Guide is focused on IT investments, the process can be used for developing measures for other business objectives with little modification. The key issue addressed in this guide is not whether the IT investment works, but whether it is providing value in line with the organization's strategy, whether it supports the mission, and whether it delivers results. The graphic below outlines the who, why, what, when, and how of the performance measurement process. Each of these areas is discussed in the sections on the following pages.



1.1 Who will use this Guide?

This Guide was written primarily for those who are responsible for the acquisition and deployment of IT investments and for managing operations or maintenance of IT investments. The users of this guide will benefit the most from the use of performance measures to perform the IT-related portions of their jobs.

1.2 Why do managers use performance measures?

Performance measurement is a key component of effective management. A continuing theme in management theory and practice is that *what gets measured is what gets attention*. Successful managers use performance measures to:

- Improve mission performance
- Support budget and Program Objective Memorandum (POM) submissions and justifications
- Substantiate requirements for IT
- Report on the success of IT investments.

The Government Performance and Results Act (GPRA) of 1993 directed federal executive agencies to measure progress toward outcome goals. The Clinger-Cohen Act (Information Technology Management Reform Act (ITMRA)) of 1996 mandated that executive agencies undertake performance measurement of their IT investments to ensure that IT investments support accomplishment of the agencies' programs, goals and objectives, i.e., mission accomplishment. The linkage of IT investments to desired agency *outcomes* is a step beyond traditional measures that have focused on IT system *output*, e.g., cost, performance, schedule, speed of operation or response times. By law, executive agencies must implement IT performance measurement, consider outcomes in acquisition decision-making, and conduct performance measurement to determine how well goals are met. As implemented within the Department of the Navy by publications such as the DON CIO IT Capital Planning Guide, Navy and Marine Corps organizations must establish processes to:

- Use performance measures in the selection of IT investments, the management of such investments, and the evaluation of the results of such investments.
- Integrate IT performance measurement with the processes for making budget, financial, and program management decisions within the Command. This becomes extremely critical when there are no cost savings or cost avoidances and the investment is being made solely on the anticipation of increased productivity.
- Include minimum criteria to be applied in considering whether to undertake a particular IT investment. These criteria include quantitatively expressed projected net value, risk-adjusted return on investment, and specific quantitative and qualitative criteria for comparing and prioritizing alternative information systems investment projects.

Performance measurement will enhance the current DON enterprise IT processes by helping senior managers focus on true mission impacts for proposed and existing IT investments. Funding will be directed to those systems best meeting the DON strategic goals and objectives, and which produce the best performance for the money spent.

Appendix A contains the references used to develop this Guide. Appendix B contains the acronyms and abbreviations used in the Guide and Appendix C contains a glossary of terms.

1.3 What is performance management?

Performance management is the use of performance measurement information to effect positive changes in organization culture, systems and processes. It provides a framework to:

- Help managers establish agreed-upon performance goals
- Allocate and prioritize resources
- Inform managers about the needs to change current policy or program directions to meet those goals
- Share results of performance in pursuing those goals.

Performance measurement is the process of assessing progress toward achieving predetermined goals, including information on the efficiency with which resources are transformed into goods and services (outputs), the quality of those outputs (how well they are delivered to customers and the extent to which customers are satisfied), outcomes (the results of a program activity compared to its intended purpose), and the effectiveness of operations in terms of their specific contributions to mission objectives.

Performance measures are the standards used to measure success in achieving an objective. Performance measures describe the precise measurement that will generate a quantitative (or qualitative) indicator that explicitly or implicitly indicates progress towards achieving the objective.

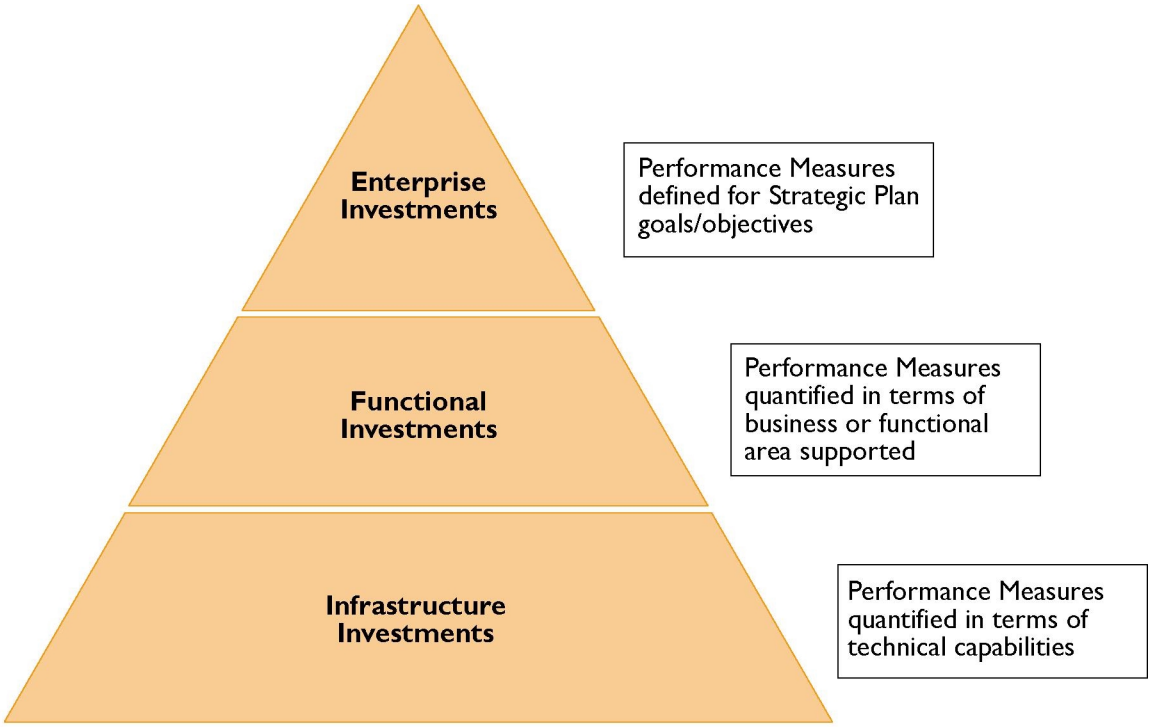
In an IT context, performance measures provide the information you need to assess how well your IT investment supports your organization's missions, goals, and quantitative objectives.

Performance measures focus on achievement. Since the concern is on satisfying mission objectives, a few, well chosen measures that emphasize the vital and critical success factors of the mission are better than a large number of system-oriented output measures. Performance measures provide the means to assess effectiveness and efficiency.

- Effectiveness is doing the "RIGHT" things:
  Achievement of missions and goals
  Customer satisfaction
  Quality of work
  Appropriateness of work
- Efficiency is doing things by employing the "BEST" use of available resources:
  Quantity of work
  Cost of work
  Timeliness of delivery (schedule)
  Responsiveness to changing requirements

Many managers understand that the context or level of their IT investment will drive the information requirements for their performance measures. They also know that they need to focus on the factors they can influence or control. There is recognition that different management

tiers need different types of information to make business decisions. Consequently, there are three tiers or levels of performance measures defined by the DON IT Capital Planning Guide to satisfy these needs, as illustrated below:



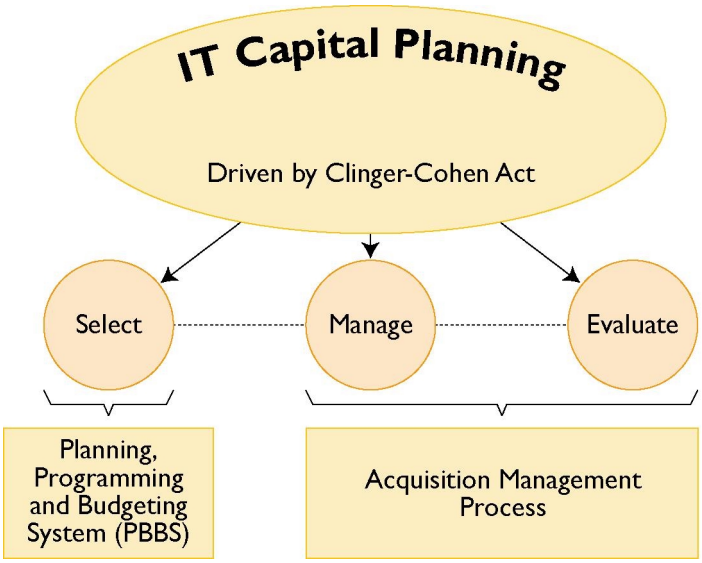
Levels of Performance Measures

- ***Enterprise Level Investment*** – At the enterprise level, the focus is on performance measures, which relate to the initiatives supporting the objectives defined in your organization's Strategic Plan. These performance measures are usually defined in terms of "outcomes" which measure the effectiveness of the initiatives in achieving the objectives. Depending on the type of the investment being measured, the enterprise level could be your Command, a CINC, Systems Command (SYSCOM), the Navy, or the DON itself. At these levels, you would be focused more on the accomplishment of strategic goals than functional or operational goals. While broad in scope, these Enterprise-level performance measures have the degree of specificity needed to measure progress and success.
- ***Functional Level Investment*** – At the functional level, the focus is on developing IT investment performance measures that quantify customer satisfaction and benefits to the business area supported by the Automated Information System (AIS). Typically, this is the application layer of an organization's IT investments. To be relevant, these performance measures must be defined in terms of outputs or outcomes which are meaningful to the functional or business area. The functional level is where the interests of the user community are directly represented. As the AIS is being acquired, however, the focus is on the metrics that gauge the success of the acquisition program. Traditionally these take the form of cost, schedule, and performance metrics, including earned value and many other "efficiency" metrics.

- ***Infrastructure Level Investment*** – IT investment performance measures at this level are normally defined in terms of customer satisfaction or "technical" outputs, outcomes or improvements, e.g., interoperability, interconnectivity, processing cycle times, Input/Output transactions, bandwidth, etc. Typically, this level represents investments in network infrastructure and the associated hardware and software. This level involves the collection of information concerning the outcome/result of the IT investment's performance in technical terms and the comparison of actual performance against projected performance for that investment. Furthermore, it calls for customer-oriented measures that assess the quality of infrastructure support. Examples of technical IT performance measures can be found in the DON IT Standards Guidance (ITSG) document (v 98.1, Chapter 10).

1.4 When are performance measures developed?

Since performance measures are used to support the selection, funding, acquisition, deployment, maintenance, and enhancement of an investment, there are a number of management processes in IT Capital Planning that require performance measures, as shown in the illustration below.



- ***During the Select phase of the IT Capital Planning process*** – The DON has adopted performance measures as one of the minimum criteria to be considered in making IT investment funding decisions (DON CIO Memorandum of 2 February 2001, subj: Minimum Criteria for Funding Information Technology (IT) Investments). These criteria include:
  - Savings, cost avoidances, or performance improvements
  - Relevance to mission or business area goals
  - Risk, expressed as minimal Return on Investment (ROI), project longevity, or technical risk.

  During the selection phase of Capital Planning, the establishment of performance measures that support performance improvements for individual IT investments is one of the minimum criteria to be considered in deciding whether to fund an investment.

The requirement to base IT investment funding decisions on the specified minimum decision criteria applies not only to budgeted IT investments but also to those investments which surface during execution. Decisions to fund these emergent IT investments during execution must be supported by documentation addressing the minimum criteria as the basis for funding approval.

- ***During the Manage phase of the IT Capital Planning process*** – Performance measures are used for measuring ongoing IT projects against their projected costs, schedules, and benefits and for taking action to continue, modify, or cancel them. Reviews should be performed at regular intervals during the life cycle of an IT investment to ensure that it continues to meet its mission objectives cost-effectively. The decision to continue, modify, or cancel an IT investment project should be a deliberate management decision, documented and justified by a review and analysis of the measures.
- ***During the Evaluate phase of the IT Capital Planning process*** – When managers evaluate performance, they compare actual to planned achievement, identify the reasons for variance, and identify appropriate corrective actions. For example, during the Post-Deployment Review (PDR), which occurs during the Evaluation phase of the Capital Planning Process, actual performance improvements versus those that were projected to have occurred are examined as part of the review. Performance evaluation is applied to both the initiatives taken to improve a functional area and to the actual operation or performance of the functional area. The evaluation phase of Capital Planning assesses the technical and functional performance of an investment, its cost effectiveness and contribution to mission, and how well the investment was managed to delivery. IT investments should be subject to regular scrutiny through the application of performance measurements, which provide the feedback necessary to assess the continued effectiveness of the process, as outlined in the DON IT Investment Evaluation Handbook.
- ***During the Planning, Programming, and Budgeting System (PPBS) process*** – This is the process where the actual investment funding allocation decisions are made. In the DON, this occurs during the programming or POM development phase of PPBS when decisions related to policy implementation, program levels, program direction, and affordability are addressed based on guidance flowing from the planning phase. As each project is reviewed at various stages during its life cycle, decisions are made regarding the future of the project. A key criterion for making these decisions is an assessment of whether the IT performance measures indicate that the investment is meeting its mission objectives. Decisions may be made which call for the suspension of funding or make future funding releases conditional on corrective actions being taken. The PPBS process is associated with the Select phase of IT Capital Planning.
- ***During the Acquisition process*** – Performance measures are developed and monitored routinely by the program manager and presented during milestone reviews to Milestone Decision Authorities (MDAs). If necessary, the measures are adjusted periodically to reflect realistic targets based on experience. During milestone reviews, measures are used as one of the critical factors in deciding whether to continue, modify or terminate a particular program. As part of an IT acquisition, the CIO confirms that the investment is being made in accordance with the Clinger-Cohen Act, and that there are:
  - Clearly established measures and accountability for program progress

- Established mission-related, outcome-based performance measures that are linked to strategic goals.

The acquisition process is associated with the Manage phase of IT Capital Planning.

1.5 What is the Balanced Scorecard?

The Balanced Scorecard is an industry recognized management system that helps translate a business unit's mission and strategy into tangible objectives and measures. The Balanced Scorecard, developed by Kaplan and Norton of Harvard Business School, provides a framework for establishing measures that represent a balance between external measures that create value for stakeholders and customers, and internal measures necessary to sustain the unit, such as critical business processes, innovation, and learning and growth[1]. Kaplan and Norton defined four perspectives for their traditional scorecard – customers, internal business processes, financial, and learning and growth. For the government environment, many practitioners have added a fifth perspective – stakeholders. The stakeholder perspective is necessary because of the oversight role external organizations play in many government programs. Stakeholder interests need to be addressed in order to ensure success. Definitions of these five perspectives are provided below:

Perspective	Definition
Stakeholders	The individuals or organizations that establish or influence the budget and issue or influence policy and direction for your project or your organization.
Customers	The direct recipients of your products and services.
Internal Business Processes	The processes you use to plan, manage, and perform tasks.
Financial	The processes you use to create budgets and monitor financial performance. This perspective should also include the financial results of the investment.
Learning and Growth	The developmental dimensions of the investment, e.g., improving staff proficiency or skills, retention, training technology innovation, culture, organization, etc.

Balancing objectives and measures from these five perspectives provides a greater degree of assurance that the investment will meet its intended outcomes. For example, agencies have sometimes neglected to address the actions necessary to reengineer or modify the internal processes needed to achieve the efficiencies afforded by an IT investment. In other instances, they have failed to consider the impact of the IT investment on employee training, organization, culture and morale, and other "Learning and Growth" considerations. Use of the Balanced Scorecard process will result in the development of objectives, measures, and actions within each of these five perspectives that are linked to the vision of the IT investment, which in turn will be linked to the mission and vision of the organization.

Balanced scorecard measures are usually organized into a matrix with the following headings:

Objectives	Measures	Definition	Targets	Actions

[1] *The Balanced Scorecard*, Kaplan and Norton, 1996.

In order to populate this matrix, there are a number of terms we need to understand:

- **Objectives** define how to satisfy your stakeholders' and customers' requirements for each Balanced Scorecard perspective.
- **Measures** define how to determine achievement of the objectives or progress toward the objective.
- **Definitions** are descriptions of the measure to ensure an understanding by everyone involved of what the measure represents.
- **Targets** are the desired value or limits on value of the measure or dimension of performance.
- **Actions** are defined as those steps that must be accomplished to achieve particular outcomes.

Most managers understand the value and importance of measuring performance. The challenge is finding the time and resources to put a measurement system in place that is not only relevant to their day to day business, but also provides real visibility to their organization's performance. The Balanced Scorecard can provide that capability.

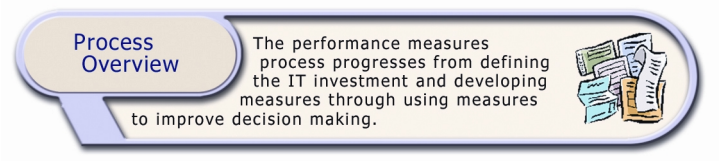
1.6 How to develop performance measures

This Guide is designed to provide the information you need to develop performance measures for your investment. To help illustrate the performance measures development process, this Guide uses an example based on an IT investment to illustrate the Balanced Scorecard process. This example is based on an initiative to implement a supply chain management solution that will ultimately consolidate several independent systems that perform procurement, material management, and inventory management functions. This example is interspersed throughout the text to highlight or enhance the processes outlined in the Guide.

Example
The text for the example will appear like this – italicized, in a white box

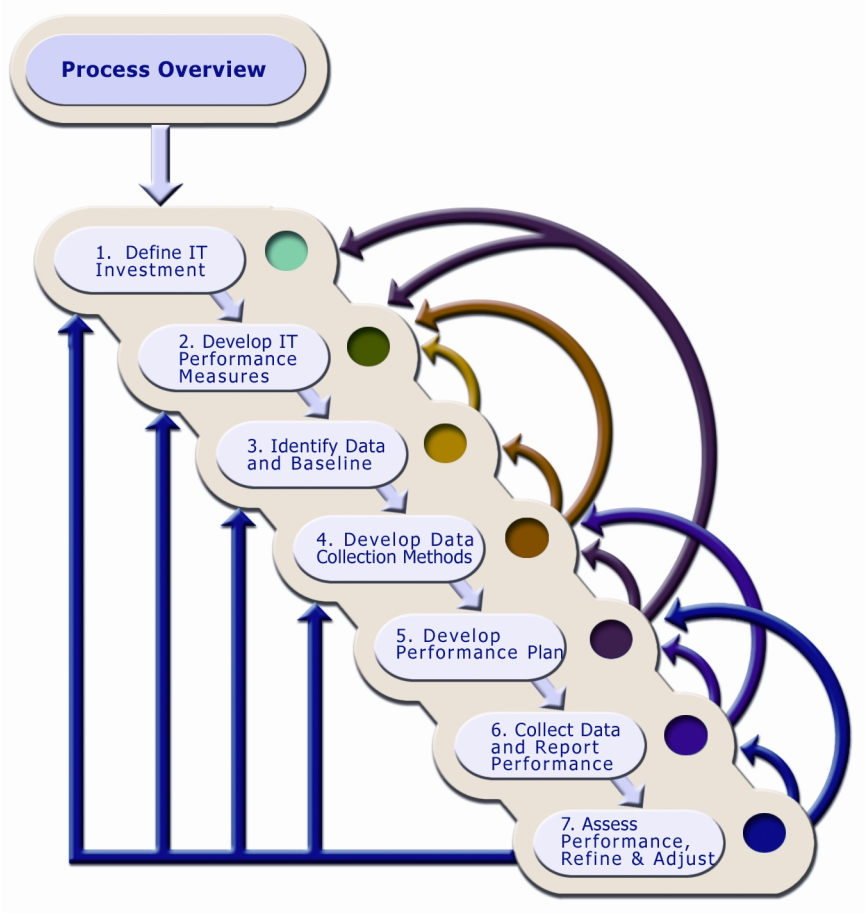
Prior to using the process for the first time, we recommend that you read the following section completely while examining how each step was executed in the example. This should provide you with sufficient background to introduce the Guide to your team and to begin developing your measures.

2.0 Process Overview



The purpose of this guide is to describe a process for developing, implementing and managing performance measures. It can be used for any of the tiers outlined in Section 1, Introduction, although our example will be at the functional level. At the functional level, the focus is on developing IT investment performance measures that quantify benefits to the business area supported by the investment. The process has been designed to engage stakeholders and senior leadership. According to most practitioners, maintaining their engagement and commitment is a critical factor in the success of any performance measurement process. One important lesson learned from many agencies is to be sure that senior leadership provides a clear case for measurement and enforces the use of the performance management process.

A recommended process for developing measures is outlined in the following graphic. It progresses from defining the investment and developing performance measures through implementing and using the measures to improve decision-making. Performance measurements should continue and be refined or adjusted through the life cycle of your IT investment. You never finish with performance measures until your IT investment ceases to exist.



Two aspects of performance measurement that are absolutely necessary for success are a focus on decision-making and the use of collaboration. Performance measurement needs to be a part of an investment's strategy and execution. Measures have to be useful to decision makers for both making an investment and providing feedback as to whether the original strategy is working. It is important to get key managers and leaders involved in the selection and application of performance measures.

Best practices indicate that the steps outlined for the performance measures development process are more successful when using a collaborative approach. Depending upon the complexity of the project and the level in the organizational structure, this collaboration may involve the project team and selected individuals from the line organization. For functional or enterprise-level investments, this will likely require the involvement of multiple organizations, so it's important for the right people to be involved in the process.

One factor repeated throughout our research and interviews with Department of Defense and industry representatives is that the difficult process to develop and implement performance measures is simplified by forming teams and building a collaborative team environment. This is because teams enable more effective use of organization resources and achieves better buy-in for implementing performance measures. A team approach enables groups to focus on:

- Achieving a common goal which leads to increased customer satisfaction with the product
- Advocating innovation, change, and results
- Capitalizing on the effectiveness of the organization
- Breaking down barriers between departments and functional specialists
- Building management commitment critical to implementation
- Empowering employees at all levels to become full partners in the decision making process
- Fostering commitment
- Helping obtain buy-in
- Promoting management and employee involvement and exchange of information.

Teamwork also is the key to building the type of leadership and user commitment needed for successful implementation of your investment. When specialists from many functional areas work together as a team, a feeling of ownership and commitment evolve, resulting in an easier sell of the final product. Organizations are becoming more team-oriented in structure due to downsizing and constrained resources. Effective use of teams and teamwork are important success factors in today's workplace.

Successful teams have a number of common characteristics that help them achieve their objectives, such as:

- Having a common goal, i.e., a clearly articulated and understood charter
- Having the full support of both executive leadership and management
- Being equipped with a common core of skills, inherent in problem solving, benchmarking, and process improvements

- Consisting of the cross-functional skills and business knowledge that enable them to successfully address the work of the team
- Trusting each other
- Knowing everyone's role and being familiar with the responsibility of those roles
- Communicating openly and effectively
- Taking advantage of diversity
- Being recognized and rewarded

2.1 Step 1 – Define IT Investment

The first step in the IT performance measurement process is defining the investment. The investment definition captures the operating framework for the IT solution and should have a clearly defined need and set of requirements. All investments can be related to either a financial or customer service objective.
Nearly all private sector investments have a financial objective at their core. Investments are undertaken to generate revenue, increase profits, reduce costs, or capture market share. In government, where profit is not possible, investments are frequently made for other reasons. An organization such as the Department of the Navy is evaluated based on its capability to perform its mission successfully, which can be related to customer service, where the customers and stakeholders determine if this objective is achieved.

To be beneficial, the IT investment should either produce financial benefits such as cost savings, cost avoidance, and productivity improvements or should contribute to improved readiness or strategic capability. If neither of these are achievable, then the investment should be re-evaluated.

Your investment definition could be based on a number of different documents ranging from an investment justification, business case analysis, or Mission Needs Statement and Operational Requirements Document. Regardless of the form it takes, the definition should address the following:

- The investment's linkage to strategic and business goals relating to the mission
- Definition of the current mission and IT environment
- The mission need, including the background and scope of the investment, functional concept, functional improvements, planned locations and planned mode of operations
- Mission deficiencies, including areas such as process, hardware, software, technology and policy compliance
- The impact of deficiencies on the mission
- The migration planning process
- Security, interface, and interoperability requirements
- Projected benefits, including functional benefits, business process improvements, policy and procedure changes, and other projected benefits
- Description of the Return-on-Investment (ROI) calculated by comparing the life cycle costs of the proposed system with the current system
- Constraints and assumptions
- Resource requirements
- Architectural requirements

As you develop your performance measures, you will collect a wealth of information and will make a number of decisions about how the measures were constructed and what they mean. We strongly recommend that you capture this information and document these decisions as you go through the process. Appendix D contains an outline for a Performance Management Plan that

provides a framework for not only documenting your entire measurement development process, but also addresses how you plan to use and manage your measures.

Example

The manager assembled a cross-functional team and began defining the investment. She had carefully included representatives from the information systems department, accounting, and managers of the major line organizations. They reviewed the Command's strategic plan to understand how the supply chain management investment would support the Command's objectives. Using the Balanced Scorecard methodology they identified the strategic goals related to the investment. They discovered that the Command had three significant goals that related to the investment. First was "Continually improve internal business processes," second was, "Reduce internal operating costs to allow funds to be shifted to fleet maintenance," and third was "Customer service second to none." The manager previously met with the Commanding Officer, Executive Officer, and Comptroller and shared their guidance with her team. The Commanding Officer's direction was:

> *"We have a number of challenges. We understand inventory management, procurement, delivery, and our customers – the sailor on the deck plate and the Marine in the field. However, we are still unable to satisfy their requirements on a regular basis. We monitor our delivery times and supply availability statistics in great detail but I believe we can still improve our responsiveness.*
>
> *"We need to drastically reduce operating costs while improving our ability to predict demand and deliver what our customers need when they need it. We have several IT systems that support our processes. They interface reasonably well – but we want to implement a fully integrated supply chain management system that also can be used as a catalyst to streamline our processes. I expect this IT investment to achieve our command goals of reduced operating costs and improved service."*

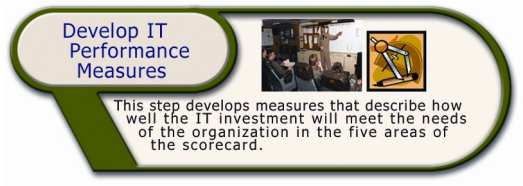
The manager briefed her team, "I think we have an opportunity to really help the Command improve. I believe that we can use our performance measures to capture all the concerns our stakeholders and customers have and to document the success we are going to have." The team agreed that there were a number of issues that would need to be addressed. They reviewed the requirements document and identified the following guidelines:

- *Seek commercial off-the-shelf (COTS) or government off-the-shelf (GOTS) software solutions to minimize implementation time, risk, and overall cost*
- *Reduce cycle time and inventory stock levels*
- *Generate financial transactions automatically*
- *Provide status of checks of requisitions and shipments via the web*

The manager documented this information and confirmed the requirements with senior leadership.

2.2 Step 2 – Develop IT Performance Measures

Once the investment is clearly defined, performance measures must be developed that address both the needs of the stakeholders and customers. The challenge is to keep both in mind. Balanced Scorecard measures are usually organized into a matrix with the following headings:



Objectives	Measures	Definition	Targets	Actions

The purpose of this step is to guide you through a process to fill in these blocks of the matrix. Most teams work the steps in iterative loops as they refine their understanding of the objectives and measures. Appendix E contains a Balanced Scorecard Template to assist you in documenting your objectives, measures, definitions, targets, and actions.

Performance measures for an IT investment must not only provide an indication that the new or modified solution works, but that it brings value to the organization. IT measures must be developed in conjunction with the documentation supporting the investment, e.g., acquisition, functional, and technical documents. As discussed in Section 1, Introduction, and in Section 2, Process Overview, of this guide, the organization's investment definition will provide much of the supporting background information needed to develop IT measures. In some cases, there will be obvious indicators about what to measure, such as when issues of time, cost and schedule are clearly delineated. In other cases, measures may need to be refined gradually over time.

2.2.1 Define stakeholder and customer needs

Since objectives define what we plan to do to satisfy our stakeholders' and customers' needs, the first thing we need to do is to identify our stakeholders and customers and define their needs and expectations for our IT investment. This is a very important part of the process since it focuses attention on the human aspects of stakeholders' and customers' interests in the project. An investment can be a technical success, but if it doesn't produce results that customers and stakeholders value, it will not be implemented.

Process flow for defining stakeholder and customer needs:

- Identify stakeholders and customers
- Determine their needs for this investment
- Ensure that you have assessed their needs for each Balanced Scorecard perspective
- Confirm their needs
- Establish priorities for the needs to arrive at a manageable number (ideally, no more than 2 to 3 for each perspective)

It is important that you determine whether any of the stakeholders or customers have any personal interests in the investment and that these interests be considered as you define their needs and expectations. The value of the Balanced Scorecard approach is that it establishes a framework for capturing these human-side expectations that are also critical to the project's success. In order to reduce your long-term effort in collecting and reporting data, it's important to define your customer sets and their expectations before developing your detailed measures.

Although the process flows for defining stakeholders and customers and their needs produce similar products, most teams spend more time defining stakeholders than customers and have a greater challenge capturing stakeholder needs.

Stakeholders include individuals or organizations that establish or influence the budget and issue or influence policy and direction for your investment or your organization. Examples of stakeholders include Program Managers, Budget Officers, Comptrollers, Commanding Officers, and higher echelon Command officials. They may have a significantly different perspective on the investment from that of your customers. Typically, they are more interested in the effect of the investment on mission effectiveness and the overall perception of the organization's effectiveness.

> **Guiding questions** for identifying stakeholders and their needs:
> - Who outside the using organization will be most interested in the success of the investment?
> - Who approves the budget?
> - Who has decision or approval authority for requirement, design, development, and deployment?

For each stakeholder, define their needs and expectations as they relate to this investment for each Balanced Scorecard perspective:

- Stakeholder needs directly related to the investment
- Customer needs directly related to the investment
- Internal Business Process
- Financial
- Learning and Growth

Stakeholders will usually care most about the impact of the investment on their concerns about mission performance and finance. It is also useful to ask stakeholders to address the customer viewpoint, since, in many cases, stakeholders may serve the role of representing the customer at a very high level. While stakeholders may not have specific interest in the internal business processes or learning and growth perspectives, they may have high-level interests in these areas that could impact the planning and implementation processes for the investment.

Once you have the needs documented it is important to establish priorities for them. Most teams discover that they have a long list of needs for their stakeholders. These teams recognize that they will not be able to satisfy all of the stakeholders' needs, so they decide to focus on the needs that will have the greatest value to the stakeholders. Many practitioners find that a template similar to the one below is useful for capturing this information.

Stakeholders	**Needs**
Stakeholder #1	
Stakeholder #2	
Stakeholder #n	

Customers are the direct recipients of your investment's products and services. They are usually the users of the investment or the users of the investments products. Most teams find it easier to define the customers and their needs since they are also involved in the requirements for the investment.

Guiding Questions for identifying customers and their needs:

- Who will use the investment?
- Who will use the products and services of the investment?
- What will they use the investment's products or services for?

For every customer, define the needs and expectations related to this investment for each of the following Balanced Scorecard perspectives:

- Customer needs directly related to the investment
- Internal Business Process
- Financial
- Learning and Growth

Customers are in the best position to determine whether an investment aids in the performance of the agency's core mission. They can also provide important feedback on how an investment will affect the workforce, including long-term impact on learning and growth requirements.

Once you have the needs documented it is important to establish priorities for them. Most teams discover that they have a long list of needs for their customers. These teams recognize that they will not be able to satisfy all customers' needs, so they decide to focus on the needs that will have the greatest value to the customer. Many practitioners find that a template similar to the one below is useful for capturing this information.

Customers	**Needs**
Customer #1	
Customer #2	
Customer #n	

Example

After defining their stakeholders and customers and prioritizing their needs, the team had the following information to incorporate into its Performance Management Plan:

Stakeholders	***Needs***
CNO *CMC*	*IT investment contributes to mission effectiveness* *Improves ease of use* *Delivers substantial business benefit to DON and USMC* *Ensures public funds are spent responsibly*
Commanding Officer	*Needs to reduce operating costs* *Wants improved service to the warfighter*
Customers	***Needs/Expectations***
Command Users	*Want an easier way to order and track material* *Want more effective ways to support the warfighter* *Want better reporting mechanisms*
Sailors and Marines	*Want better visibility of supply status* *Want better availability of materials needed to support equipment* *Want a more effective means to contact Command employees to resolve problems*
Supply Officer	*Want clear requirements that do not change continuously throughout the life of the project* *Want to enter data only once* *Want ease of use*

With this information as a foundation, the team began developing its objectives.

2.2.2 Develop your objectives

Objectives describe what you will have to do to satisfy your stakeholders' and customers' needs within each Balanced Scorecard perspective. Objectives need to be focused very specifically on your stakeholder and customer needs and expectations. It is recommended that you involve some of your stakeholders and customers in this step. If they are unable to participate in the process, it is strongly recommended that you verify with them that these objectives are important.

Once you have developed your objectives, you should prioritize them to arrive at no more than two to three objectives per Balanced Scorecard perspective. Many teams find that they want to establish objectives that satisfy every need

Process Flow for developing objectives:

- Develop a set of objectives that address the lists of prioritized stakeholder and customer needs for each Balanced Scorecard perspective
- Reduce the number of objectives within each perspective to no more than two or three objectives
- Validate that the objectives are reasonable and can be performed using the Guiding Questions below
- Verify with stakeholders and customers that these objectives will satisfy their most important needs

Guiding questions for validating objectives:

- Will the objective satisfy the need?
- Is the objective achievable?
- Will you be able to perform the actions needed to satisfy the objective?
- Will the stakeholders or customers recognize the value of having that objective achieved?

expressed by their stakeholders and users. Then they find that multiple measures are required to document the achievement of each objective. The result of a large number of objectives and measures can make data collection and reporting a very costly and labor-intensive exercise. For example, if you have 2 objectives per perspective and 2 measures for each objective, then you will have a total of 10 measures to collect data and report. Since the goal is to have a small number of focused measures, you should limit the number of objectives you will measure.

Many teams find that one of the more successful methods for verifying that their objectives are important to stakeholders and customers is to use a *structured interview* process. By creating a set of interview questions that will be asked of each stakeholder or customer, the team ensures that it has identified the most important needs and objectives. The list of questions also helps make the best of the interviewee's time.

Process flow for conducting structured interviews:

- Develop a short list of questions that focus on key information needs
- Develop a list of prospective interviewees and schedule meetings or phone calls
- Send the list of questions to the interviewees in advance, if possible
- Conduct the interviews
- Document the interviews using the list of interview questions as a format.

First the team develops a short list of questions that will elicit the information they need. Typical interview questions include such topics as:

- How do you expect this IT investment to support the business needs of your organization?
- What mission improvements do you anticipate from this investment?
- What parts of this investment will have the greatest value for you?
- How will you measure the success of this investment?
- What risks would you anticipate in this implementation?

Example

The team was ready to develop their objectives. They developed the following list of prioritized objectives:

Stakeholder
Objectives
Improve mission effectiveness
Ensure stakeholders are informed of implementation status
Satisfy documentation requirements established by higher authority
Customer
Objectives
Ensure investment satisfies users' needs
Provide Sailors and Marines with better visibility of supply status
Improve Command responsiveness to the warfighter

Internal Business Processes
Objectives
Use an efficient method to deploy the system
Improve supply chain operations
Financial
Objectives
Deploy system within budget
Reduce operational costs for supply chain management
Learning & Growth
Objectives
Increase workforce proficiency in supply chain processes
Improve staff proficiency in deployment of COTS or GOTS solutions

2.2.3 Develop your measures and definitions

Now that you have identified your objectives, you are ready to develop your measures. How the organization demonstrates that the IT investment meets its objectives is answered by the measures. A performance measure is a way of **quantifying** or **qualifying** how well the solution meets the objective. A performance measure can be something as simple as determining on a qualitative scale of one to five how employees use data from a system, or it can be considerably more detailed by compounding many measures or creating algorithms. The majority of literature about performance measures recommends that measures are best when they are simple to understand and transparent in their meaning. Some measurement specialists suggest that the guiding design principles of measurement should be that they are understandable, relevant, and achievable.

Many teams use a process flow similar to the one shown in the box to develop their initial set of measures. It provides a method for quickly creating and evaluating the first measures they develop.

Process flow for developing measures:

- Identify measures that will clearly show that the objective was achieved
- Determine whether the measures will *prove* that the objective has been satisfied
- Determine if the measure is technically or organizationally feasible
- Determine whether the stakeholder or customer will recognize the measure
- Evaluate the measures against the Guiding Questions
- Create the definitions while the team fully understands the intent of the measures

The measures define how you will know you have achieved those objectives. Measures can take many forms that capture information about various stages of performance. Since stakeholders are most interested in outcomes, measures having definitions similar to the outcome, lag, and lead measures described in the following list would be appropriate. The important point is that the measure must support the objective.

- **Input** – An input measure evaluates what resources or activities are required to achieve an objective, such as the number of employees certified to implement a system.
- **Output** – An output measure describes the level of work or services provided to achieve an objective, such as number of help desk responses, or number of reports created.
- **Outcome** – Outcome measures describe the actual results of a system or program. These generally relate to the intended purpose of the system or program, such as "to improve organizational effectiveness." Outcome measures can often summarize the results of many actions into one defining statement. Of course, outcome measures may be harder to define if they draw from a number of different sources of assessment (i.e. system performance and customer satisfaction).
- **Lag measures** – These are measures that typically measure accomplishments after completion. A lag measure is characterized by terminology such as project completed on a specific date, customer satisfaction is 4.5 on a scale of 5 in a survey.
- **Lead measures** – These are performance drivers that typically measure progress toward outcomes. Using our supply chain management example, a lead measure might be the level of traffic on the supply status web site. Increased usage might indicate that sailors and Marines are using the system regularly and might foreshadow improved visibility of supply status. In conjunction with a decrease in the number of customer service calls, these measures might foreshadow increased customer satisfaction with the supply chain management process.

Many teams find that this is an iterative process as they brainstorm for measures, and then accept, reject, or modify them. Appendix F contains a collection of examples of IT performance measures. Once the team has developed its initial set of measures, it should check them to confirm that the data will be collectible and will provide the information that will be needed to manage the investment.

Once you have defined your measures, you should write a definition of each measure to help ensure understanding by everyone involved with the measures and their implementation.

Guiding questions for evaluating measures:
- Do the measures clearly link to stakeholder and customer needs?
- Are the measures outcome-oriented?
- Are the measures quantifiable?
- Are the measures easy to gather without being costly or labor intensive?
- Does the measure indicate how well the effort will achieve its objectives?
- For your customer-related measures, are they mainly lead measures?
- Are you using a small set of significant performance measures that provide a clear basis for assessing accomplishment, facilitate decision-making, and focus on accountability?

When you implement your measures, you will need participation and cooperation from people both within and outside your organization's team. You are encouraged to involve key Subject Matter Experts (SMEs) in developing your measures and data collection methods. If this is not possible, you are strongly encouraged to circulate the measures to the people involved for comment and concurrence.

Example

As the team began to address its measures and definitions, it checked to make sure the team included appropriate SMEs. The team developed the following measures and definitions:

Stakeholder		
Objectives	***Measures***	***Definitions***
Improve mission effectiveness	*Reduced cycle time*	*Time between order and receipt of supply is reduced.*
Ensure stakeholders are informed of implementation status	*Status Briefings*	*The team will brief the stakeholders to ensure they are informed of the progress of the investment.*
Satisfy documentation requirements established by higher authority	*Compliance with documentation requirements.*	*A large amount of acquisition and system documentation will be required for this investment, e.g. Clinger-Cohen Act compliance confirmation or certification, GPRA, DoD 5000 series, Enterprise Architecture and Architecture Framework guidance, and Joint Requirements Oversight Council (JROC). This measure will assess its completeness and accuracy as assessed by the approvers of the various documents.*
Customer		
Objectives	***Measures***	***Definitions***
Ensure investment satisfies users' needs	*Customer satisfaction with their involvement in the design.* *Customer satisfaction with the solution*	*Involvement in the design is one of the keys to user satisfaction with the solution.* *During design reviews, development, and testing, users will have the opportunity to influence the solution.*
Provide Sailors and Marines with better visibility of supply status	*Improved supply status visibility.*	*Surveys and feedback to customer service representatives will indicate the level of success in satisfying this objective.*
Improve Command responsiveness to the warfighter	*Improved responsiveness to warfighters.*	*Surveys and feedback indicate the level of success in satisfying this objective.*
Internal Business Processes		
Objectives	***Measures***	***Definitions***
Use an efficient method to deploy the system	*Minimize schedule variance.*	*A baseline schedule will be developed and variance tracked and reported.*
Improve supply chain operations	*Reduced procurement lead times.* *Reduced order to receipt elapsed time*	*These two criteria have been determined to be key to customer requirements for responsiveness.*

Example (continued)

Financial		
Objectives	***Measures***	***Definitions***
Deploy system within budget	*Minimize cost variance*	*A baseline budget will be developed and variance tracked and reported.*
Reduce operational costs for supply chain management	*Reduced labor costs* *Reduced procurement costs* *Reduced shipping costs* *Reduced software maintenance costs*	*Baseline costs in these categories will be captured and compared to costs after deployment.*
Learning and Growth		
Objectives	***Measures***	***Definitions***
Increase workforce proficiency in supply chain processes	*Increased knowledge of supply chain processes.*	*Based on before and after training assessments, Command staff display increased scores on knowledge of supply chain processes. Since processes and automated tools will both change, this measure will capture both.*
Improve staff proficiency in deployment of COTS or GOTS solutions	*Increased number of training courses*	*Number of training courses successfully completed indicates increased knowledge and proficiency by staff.*

2.2.4 Establish your targets

Targets represent the level of performance or the rate of change in your measures over time that you intend to attain. Targets should be reasonable and attainable. For example, establishing a target of 100% for on-time delivery when actual performance is 20% sets unrealistic expectations for the investment.

Process flow for developing targets:

- Review investment documentation to identify existing performance targets
- Establish targets
- Evaluate targets against current performance, industry benchmarks, or anecdotal information
- Revise targets, if needed, to represent a *stretch* goal that will reflect continuous and achievable improvements

Example

The team established target values for its measures.

Stakeholder			
Objectives	***Measures***	***Definitions***	***Targets***
Improve mission effectiveness	*Reduced cycle time*	*Time between order and receipt of supply is reduced.*	*20% reduction*
Ensure stakeholders are informed of implementation status	*Status Briefings*	*The team will brief the stakeholders to ensure they are informed of the progress of the investment.*	*Monthly*
Satisfy documentation requirements established by higher authority	*Compliance with documentation requirements*	*A large amount of acquisition and system documentation will be required for this investment, e.g. Clinger-Cohen Act compliance confirmation or certification, GPRA, DoD 5000 series, Enterprise Architecture and Architecture Framework guidance, and Joint Requirements Oversight Council (JROC). This measure will assess its completeness and accuracy as assessed by the approvers of the various documents.*	*100% compliance*
Customer			
Objectives	***Measures***	***Definitions***	***Targets***
Ensure investment satisfies users' needs	*Customer satisfaction with their involvement in the design* *Customer satisfaction with the solution*	*Involvement in the design is one of the keys to user satisfaction with the solution.* *During design reviews, development, and testing, users will have the opportunity to influence the solution.*	*Average score is 4 on a scale of 1 to 5.* *Average score is 4 on a scale of 1 to 5.*
Provide Sailors and Marines with better visibility of supply status	*Improved supply status visibility*	*Surveys and feedback to customer service representatives will indicate the level of success in satisfying this objective.*	*Average score is 4 on a scale of 1 to 5.*
Improve Command responsiveness to the warfighter	*Improved responsiveness to warfighters*	*Surveys and feedback indicate the level of success in satisfying this objective.*	*Average score is 4 on a scale of 1 to 5.*

Example (continued)

Internal Business Processes			
Objectives	***Measures***	***Definitions***	***Targets***
Use an efficient method to deploy the system	*Minimize schedule variance*	*A baseline schedule will be developed and variance tracked and reported*	*10% maximum variance*
Improve supply chain operations	*Reduced procurement lead times* *Reduced order to receipt elapsed time*	*These two criteria have been determined to be key to customer requirements for responsiveness*	*5% reduction* *15% reduction*
Financial			
Objectives	***Measures***	***Definitions***	***Targets***
Deploy system within budget	*Minimize cost variance*	*A baseline budget will be developed and variance tracked and reported*	*10% maximum variance*
Reduce operational costs for supply chain management	*Reduced labor costs* *Reduced procurement costs* *Reduced shipping costs* *Reduced software maintenance costs*	*Baseline costs in these categories will be captured and compared to costs after deployment*	*10% for all categories*
Learning and Growth			
Objectives	***Measures***	***Definitions***	***Targets***
Increase workforce proficiency in supply chain processes	*Increased knowledge of supply chain processes*	*Based on before and after training assessments, Command staff display increased scores on knowledge of supply chain processes. Since processes and automated tools will both change, this measure will capture both*	*Average scores increase by 25%*
Improve staff proficiency in deployment of COTS or GOTS solutions	*Increased number of training courses*	*Number of training courses successfully completed indicates increased knowledge and proficiency by staff.*	*100% of courses scheduled are completed satisfactorily*

2.2.5 Define your actions

Actions are the key tasks or programs required to achieve your objectives. As you develop your action lists, it's important to remember that the actions need to support the objectives and not the measures. Many teams use a process similar to that outlined in the box to develop and validate their actions.

Once you have developed your complete Balanced Scorecard with its objectives, measures, definitions, targets, and actions, you can incorporate it into your Performance Management Plan.

Process flow for defining actions:

- Define the actions that will be needed to achieve the objective
- Evaluate actions for relationships to the measures and targets. For those actions that support both the objective and the measure, verify that the action is primarily focused on the objective
- Review actions that only support implementation of a measure, e.g., designing and conducting a survey, to make sure the action and measure both support the objective

Example
The team defined a variety of actions required to achieve the objectives, as shown in the table on the following pages.

Stakeholder				
Objectives	***Measures***	***Definitions***	***Targets***	***Actions***
Improve mission effectiveness	*Reduced cycle time*	*Time between order and receipt of supply is reduced.*	*20% reduction*	*- Reengineer processes* *- Integrate systems* *- E-commerce*
Ensure stakeholders are informed of implementation status	*Status Briefings*	*The team will brief the stakeholders to ensure they are informed of the progress of the investment.*	*Monthly*	*- Schedule formal meetings* *- Meet with stakeholders to determine their reporting interests* *- Provide reports as required*
Satisfy documentation requirements established by higher authority	*Compliance with documentation requirements*	*A large amount of acquisition and system documentation will be required for this investment, e.g. Clinger-Cohen Act compliance confirmation or certification, GPRA, DoD 5000 series, Enterprise Architecture and Architecture Framework guidance, and Joint Requirements Oversight Council (JROC). This measure will assess its completeness and accuracy as assessed by the approvers of the various documents.*	*100% compliance*	*- Determine which documentation will be required* *- Incorporate documentation into the project plan* *- Monitor production and sign-off of documentation*
Customer				
Objectives	***Measures***	***Definitions***	***Targets***	***Actions***
Ensure investment satisfies users' needs	*Customer satisfaction with their involvement in the design* *Customer satisfaction with the solution*	*Involvement in the design is one of the keys to user satisfaction with the solution.* *During design reviews, development, and testing, users will have the opportunity to influence the solution.*	*Average score is 4 on a scale of 1 to 5.* *Average score is 4 on a scale of 1 to 5.*	*- Develop a satisfaction survey to accompany major events and documentation products* *- Ensure surveys are completed and returned* *- Follow-up with personal interviews for any that are not returned* *- Follow-up on any surveys with adverse comments* *- Develop a satisfaction survey for regular distribution*
Provide Sailors and Marines with better visibility of supply status	*Improved supply status visibility*	*Surveys and feedback to customer service representatives will indicate the level of success in satisfying this objective.*	*Average score is 4 on a scale of 1 to 5.*	*- Ensure surveys are completed and returned* *- Follow-up with personal interviews for any that are not returned* *- Follow-up on any surveys with adverse comments*

Improve Command responsiveness to the warfighter	*Improved responsiveness to warfighters*	*Surveys and feedback indicate the level of success in satisfying this objective.*	*Average score is 4 on a scale of 1 to 5.*	*- Develop a satisfaction survey for regular distribution* *- Ensure surveys are completed and returned* *- Follow-up with personal interviews for any that are not returned* *- Follow-up on any surveys with adverse comments*
Internal Business Processes				
Objectives	***Measures***	***Definitions***	***Targets***	***Actions***
Use an efficient method to deploy the system	*Minimize schedule variance*	*A baseline schedule will be developed and variance tracked and reported.*	*10% max variance*	*- Use IEEE standard life cycle management (LCM) process for solution deployment* *- Develop a project management plan and baseline* *- Obtain management approval of baseline* *- Track variances, document impacts and report to management*
Improve supply chain operations	*Reduced procurement lead times* *Reduced order to receipt elapsed time*	*These two criteria have been determined to be key to customer requirements for responsiveness.*	*5% reduction* *15% reduction*	*- Collect and baseline this data for the fiscal year ending prior to implementation* *- Collect and baseline this data for the intervening quarters* *- Collect and compare this data monthly*
Financial				
Objectives	***Measures***	***Definitions***	***Targets***	***Actions***
Deploy system within budget	*Minimize cost variance*	*A baseline budget will be developed and variance tracked and reported.*	*10% max variance*	*- Develop a budget and baseline* *- Obtain management approval of baseline* *- Track variances, document impacts and report to management*

Reduce operational costs for supply chain management	*Reduced labor costs* *Reduced procurement costs* *Reduced shipping costs* *Reduced software maintenance costs*	*Baseline costs in these categories will be captured and compared to costs after deployment.*	*10% for all categories*	*- Collect and baseline this data for the fiscal year ending prior to deployment* *- Collect and baseline this data for the intervening quarters* *- Collect and compare this data monthly*
Learning and Growth				
Objectives	***Measures***	***Definitions***	***Targets***	***Actions***
Increase workforce proficiency in supply chain processes	*Increased knowledge of supply chain processes*	*Based on before and after training assessments, Command staff display increased scores on knowledge of supply chain processes. Since processes and automated tools will both change, this measure will capture both.*	*Average scores increase by 25%*	*- Develop a user assessment instrument* *- 90 days prior to deployment assess user skills and understanding of the process* *- 90 days after training, assess user skills and understanding of the software and the process*
Improve staff proficiency in deployment of COTS or GOTS solutions	*Increased number of training courses*	*Number of training courses successfully completed indicates increased knowledge and proficiency by staff.*	*100% of courses scheduled are completed satisfactorily*	*- Identify relevant courses* *- Schedule staff for courses* *- Track attendance and satisfactory completion*

2.3 Step 3 – Identify Data and Perform Baseline

Once the measures have been defined, it's time to determine the data requirements and sources for the information needed to satisfy the objectives and measures you have developed. Many organizations are already collecting data on their business processes and IT systems. An important element in this step is identifying data that is already available in the organization. Teams often discover that data exists that reasonably matches the data requirements for their measures. Frequently, they adjust their measures to take advantage of data that is readily available. The Measurement Definition Template in Appendix G is a recommended format for defining data requirements and sources. The illustration shown below is based on the example developed in this Guide. It is keyed to a measure to "Reduce Procurement Lead Time" within the Internal Business Process Perspective and documents the sources, owners, frequency, etc., for the measurement data for this measure.

Process Flow for identifying data and performing baseline

- Determine data requirements and information sources
- Determine data availability
- Match existing data with data requirements for measures
- Document data definitions
- Collect data if available
- Document baselines

Measure Name: Reduce Procurement Lead Time	
Balanced Scorecard Area:	*Internal Business Process Perspective*
What strategic issue is this measure designed to address?	*Continually improve internal business processes* *Customer service second to none*
Objective	*Improve supply chain operations*
Measurement Owner/Point of Contact (POC)	*Name: Mary Jones* *Phone Number: 222-1232* *E-Mail: mjones@department.gov*
Which users have access to this measure?	*Item managers and procurement*
How often will this measure be updated?	*Monthly*
What is the unit of measure?	*Days*
Definition: Describe the measure in a manner everyone will understand.	*Measures the time between the receipt of a requisition and issuance of a funded order to a vendor*
Where will the data come from?	*System requisition receipt logs and procurement order logs*
List existing or supplementary reports:	*Procurement Administration Lead Time (PALT) Reports*

If the information is available, the team should determine whether it should baseline its measures at this time. Developing a baseline is an essential element of performance measurement. Without a baseline, goals are mere guesses. Establishing baselines primarily involves data collection and consensus building. For agencies to assess future performance, they must have a clear record of their current level of performance. Many teams decide to baseline the data that supports their measures at the end of standard time periods, such as end of month, quarter, or fiscal year.

Establishing a baseline requires collecting data about current processes, work outputs and organizational outcomes. If the data is available, collect it to establish the baseline. In other instances, there are agency or industry standards related to the measures that can be used to establish the baseline. If you are automating a manual process, then capture the manual performance data and use that to establish your initial baseline.

Guiding questions for determining data availability include:

- What are the units of measure?
- What are the required data ranges?
- What is the frequency required?
- If the measure requires compilation of other data, what are the sub-elements needed?
- If historical data is required, is it readily available?
- Who controls the data?
- Can the data be readily obtained?

If no baseline exists for the measures chosen, you can establish it when you collect the first sets of results data.

2.4 Step 4 – Develop Data Collection Methods

Once the measures and the data have been defined, it's time to develop the collection methods you and your team will use to collect, analyze, and report the data. Your method should provide information on the activities to be performed, resources that will be consumed, target completion dates, who will collect measurement data, who will make the decisions based on the feedback and to whom the results will be presented. Appendix G contains a template for use in developing data collection methods. This Measurement Definition Template provides a framework for documenting your data collection methods and processes. The collection method should ensure that the data being collected supports the measures and objectives.

Process flow for developing a data collection method:

- Identify sources of existing data for each measure
- Establish agreements with personnel to collect new data if no data currently exists
- Agree upon roles and responsibilities for data collection frequencies and reporting cycles
- Determine the impact of the data collection processes on existing operational processes
- Document the sources, systems, and personnel associated with the new or existing data
- Use automated data collection where possible
- Collect and verify data
- Evaluate relevancy and accuracy of data

Once you've developed your method, it's useful to validate it with questions such as those in the box.

Guiding questions for validating your data collection plan:

- How is the measurement taken?
- What constraints apply?
- Who measures?
- When (how often) are the measurements taken?
- Where are the measurement results sent?
- Where are the results stored and who is the keeper?
- What is the cost of data collection?
- Will data collection significantly alter existing operational processes or negatively influence those who will have to collect the data?
- Who provides the resources to collect data?

As you develop your data collection methods, it's important to remember that the data must be collected in a timely and appropriate manner that does not significantly alter existing operational processes or negatively influence those who have to collect the data. In other words, data collection should not impose so much additional work on those who have to collect the data that it becomes a detriment to the entire measurement process. If the data collection process consumes too much time by personnel, then collecting the measures may become too costly and will need to be reevaluated.

In many organizations, the people who are responsible for collecting and reporting data take pride in their work because they see their role as the "messenger" and may be reluctant to having their duties altered. This can be a barrier to successful performance measurement because the individuals who design performance measures are often not the same people who are charged with collecting data for the measures. As a result, it will be important to consider the cultural changes that may be introduced into the organization when you develop data collection methods.

There are ways to mitigate the undesired consequences of introducing new data collection methods. One way is to involve the data collection personnel in the measurement process as early as possible. Invite them to think of new and creative ways of getting to the data quickly and painlessly. Be sure to communicate with them regularly and allow them to assist in the design and planning of the data collection method. This will encourage all personnel to feel that they are a part of an important and essential task, instead of feeling as though they are being burdened with new work. A good best practice for collecting data for measures is to clarify roles and responsibilities and ensure that the personnel collecting data understand the importance of their task.

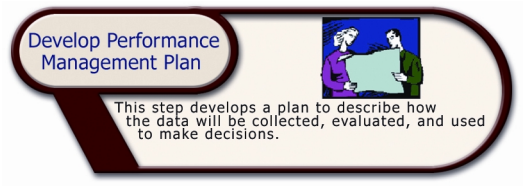
While ease of collection, responsibilities, and costs should have been considered in the development of the measures, the process of creating the collection method makes these points more evident.

In determining who will collect the data and who it will be reported to, you may recognize that information on different measures may be collected or reported by different locations. The persons collecting the data should have both the required access and the resources to collect it. The organization receiving the report should have an interest in the investment and should have appropriate authority to respond to the reports. If you are unable to clearly identify who should receive the data reports and who has interest in them, it may be an indication that the data and measures are not relevant and should not be implemented.

Measures may be reported on a variety of schedules. Financial measures will be dependent upon financial reporting schedules, development measures will be dependent upon calendar or event completions, and operational measures will be dependent upon surveys and other information collected from users. Additionally, the recipient of the reports will have requirements for frequency. The data collection method should define the schedules for reporting the results of the data collection processes.

Example
As the team began collecting its baseline data for procurement lead time they discovered that the data currently being captured was procurement administrative lead time, which is measured from the time the requisition is received in procurement until the order is issued. This meant that the time spent by the item manager in processing the requisition, i.e., verifying that the person placing the requisition was authorized to order the item, identifying a source of supply, checking the supply system for alternates, etc., was not currently being captured. The team debated whether to change the measure or change the data definition. They also checked to determine whether the data was available for the measure as they defined it. They discovered that the data was available, although it was not being reported within the context of procurement lead-time. As the team constructed its data collection method for this measure, they designed a way to extract this additional data and combine it with current reporting practices.

2.5 Step 5 – Develop Performance Management Plan



A Performance Management Plan describes how you plan to manage the project and how you plan to use the measures to ensure that you accomplish what's important to your stakeholders and customers. The Balanced Scorecard should provide you with cause-and-effect information on how measures are linked. For example, internal process improvements may need to be made to support customer objectives. Indicators that show failure to achieve process outcomes would indicate that there could be difficulties achieving customer outcomes later on.

Appendix D contains an outline for a typical Performance Management Plan. This outline contains sections for all the information you have collected or created throughout the measures development process.

Your Plan should address how the performance measurement data will be integrated into your organization's management processes within the business and technology domains to improve decision-making. It should also address its links to the Select, Manage, and Evaluation phases of the IT Capital Planning Process. The types of management processes and the management level involved depend on the scope of the investment and the measures employed.

Process flow for developing a Performance Management Plan

- Determine how you will manage the performance measurement process
- Review the objectives to ensure they link to stakeholder and customer needs
- Review the objectives to ensure they link to the organization's strategic goals
- Review the measures to ensure they are outcome-oriented and will measure accomplishment of the objectives
- Determine the composition and responsibilities of the performance management organization, i.e., will it consist of a steering team, review team, working group, or some combination
- Define who will use the results of the measures
- Determine how the results will be used to influence decisions
- Describe how often reviews will be conducted
- Define how often measures will be evaluated and re-evaluated
- Define how often measures will be reported and to whom
- Define how corrective actions will be taken and by whom
- Document this information into a Performance Management Plan and obtain the approval of the manager responsible for the investment

An important function of your Plan is to describe how the results will be used. If the results aren't used, performance measures will not be taken seriously nor will they be applied effectively. Your measures should enable you to continuously evaluate, even after deployment, whether the investment meets the outcome objectives.

In Step 2, Develop IT Performance Measures, you defined your IT investment's objectives and linked them to organizational strategic and business goals. As you develop your Performance Management Plan, you may find that you need to clarify these linkages and your objectives. Coordinate with your stakeholders and customers to make sure that your plan will achieve the right set of goals.

Example
Throughout the measures development process, the team had been entering information, such as stakeholder and customer expectations and performance measures into the Performance Management Plan. Now they expanded it to ensure that all of the measurement events were planned and scheduled. The key elements they added to their Performance Management Plan in this step were: • *Periodically reviewing data for relevance* • *Ensuring data is collected consistently* • *Capturing baseline data* • *Integrating performance data into the monthly status reports* • *Developing recommended actions in response to performance data* • *Using the performance data to improve organizational decision-making*

2.6 Step 6 – Collect Data and Report Performance

Chances are that some amount of data will already exist for an IT system which is being modified or replaced, that describes how well the system functions or how the system impacts the organization's operations. In this case, data collection may not require significant changes to existing processes. If you are measuring the performance of a new IT system, however, it will be necessary to begin collecting new data as outlined in Step 4, Develop Data Collection Methods. The goal of this step is to employ simple, streamlined collection methods and automate these methods as much as possible.

Process flow for collecting data:

- Identify sources of existing data for each measure
- If no data currently exists, establish agreements with personnel to collect new data
- Agree upon roles and responsibilities for data collection frequencies and reporting cycles
- Document the sources, systems, and personnel associated with the new or existing data
- Use automated data collection where possible
- Collect and verify data
- Evaluate relevancy and accuracy of data

There are many ways of collecting data for measures, both quantitative and qualitative. How data is collected will depend on the types of measures you have selected. Qualitative measures such as user satisfaction or delivery time may require data to be gathered from stakeholder surveys, feedback forms, or interview questions. More quantitative measures may require visual observations of the systems' performance and automated system output reports. In the early stages of data collection, there will be much trial and error, and through time the bumps will be worked out. The key to success is to ensure that consistent data collections take place that demonstrate the effectiveness of the method as well as the measures. Consistency should prevail over precision until you have had time to establish data collection procedures.

Guiding questions for collecting data:

- Is the data easily accessible? If not, can it be made more accessible?
- Is the data collection so burdensome that it detracts from the purpose of measurement?
- Can data collection be streamlined or automated?
- Are a variety of data collection methods being employed?
- Does the data appear to reflect the objectives of the measures?
- Does the data collected reveal trends - does the data tell a story?
- Is the data collection process integrated with other

Web-based tools make data collection considerably easier because customer and user surveys and interviews can be automated and implemented in less time than many paper methods. Many commercial off-the shelf (COTS) tools enable not only data collection, but also provide built-in data analysis tools that cut down on the time it takes to receive reports. Timing is critical because measures with long lag times – such as annual measures – lose their relevance to stakeholders. When automated data collection methods can be employed with short-cycle measures such as weekly and monthly, measures become more meaningful and more powerful as decision-making tools for leadership. Overall, the team should strive for consistency, timeliness and meaningful data collection.

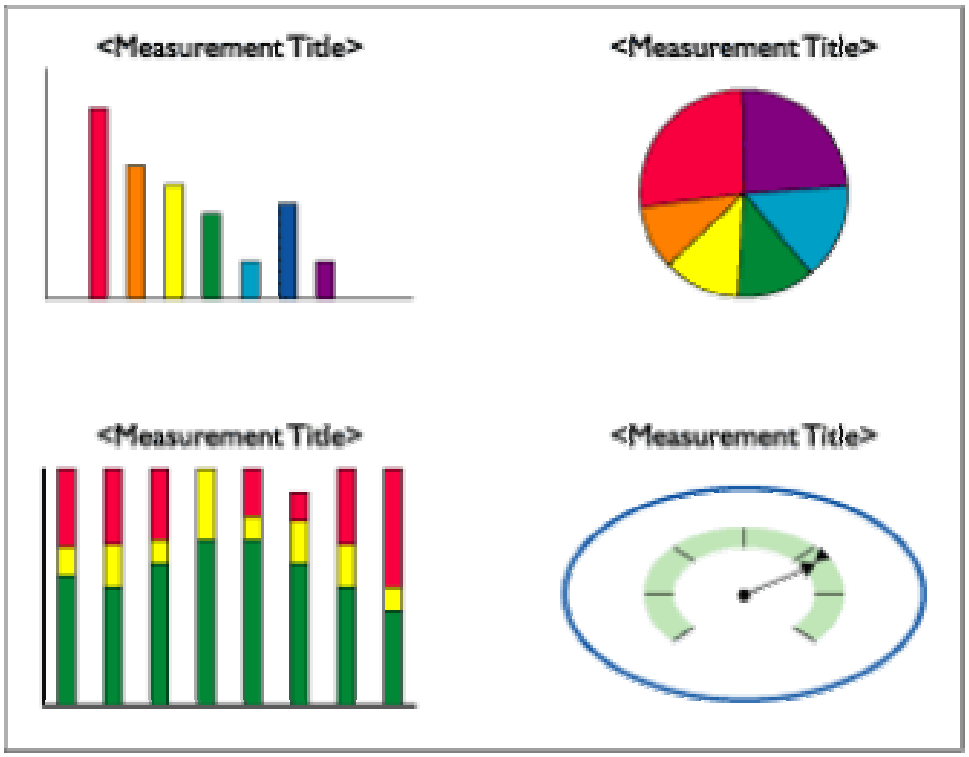
Communicating the data is an important component of the measurement process. The needs of the organization and the audience, as well as the types of measures chosen, will influence how the measures should be visually displayed. Ultimately, the best way to display measures is in a simple and uncluttered format that allows viewers to understand at a glance whether the IT investment is meeting its objectives. Quantitative data lends itself to line charts and bar graphs. Many organizations use qualitative surveys that can be displayed in pie charts and diagrams. Color-coded displays enable users to quickly understand the performance of the investment and see if improvements need to be made. This is why so many of the performance measurement processes today use commonly understood color coding to indicate performance based on the traffic light principle (green is equal to good, yellow is neutral, and red is poor). One glance at a measure should reveal what is being measured (system performance, return on investment, or user satisfaction?) and whether investment is performing positively or negatively.

Process Flow for reporting and displaying performance:

- Agree upon the audience who will view the performance measures
- Agree upon the format for individual measures, such as line charts, pie charts, and gauges
- Research and select the ideal display technology for the scorecard
- Input measures and integrate the system with data for measures
- Test and review the scorecard process or application
- Train and inform users about the scorecard display process or application
- Establish technical support or a feedback mechanism for questions about the scorecard
- Deploy scorecard display process or application to pilot group and then expand to greater audience
- Regularly communicate and disseminate learning about the scorecard measures

Some practitioners believe that people respond to measures in one of two ways: visual displays and numeric displays. There are those who will only want to view numerical data and will instantly understand the meaning of the measure, while others will need to see a visual or written explanation. If possible, it is best to provide both types of displays for a measure. In the example of user satisfaction, the measure could be displayed with a color-coded chart indicating survey results and a short text statement summarizing the results. It is also helpful to display a text-based definition of the measure as described in Step 2, Develop IT Performance Measures.

Some useful formats for the display of measures are shown in the following graphic.



Although there are a multitude of new technologies that enable electronic displays of scorecards, some practitioners recommend starting with a simple display and advancing once the measurements prove to be effective. This will help to prevent the organization from spending a lot of time and money creating or investing in a new technology for displaying the scorecard, instead of managing performance for results. Too many times, the performance of the technology and issues of data integration can shift focus away from the important learning that the measurement program is intended to provide. Technology is just one aspect of an effective performance management process.

In the early stages of measurement, it may be wise to limit the audience to whom the measures are reported and displayed. You may want to report to a small pilot group of viewers who can provide feedback about the measures before reporting the results to a larger group. That way, feedback can be integrated and adjustments can be made. When choosing the audience to receive the initial results, it will be helpful to review the questions in Step 5, Develop Performance Management Plan, of this guide such as, "who will use the results of this measure," and "how will the results of this measure be used to

Guiding questions about displaying performance measures:

- Can all of the users of the display process easily access performance data?
- Are the measures readable in a format or with an application that is shared by all of the stakeholders?
- Are the displays consistent in the use of color and style to eliminate confusion?
- Is there an obvious mechanism for users of the display process to provide feedback about the measures through e-mail or dialog capability?
- Can users of the display system determine who owns the measure and can be contacted with issues, questions, and comments?
- Are definitions of the measures visible in the display process?
- Can contextual information be provided with the measures so that users can understand variances or significant changes in results?

influence decisions?" Develop the pilot audience for reporting based on these questions and gradually increase the audience to all appropriate customers and stakeholders.

Organizations have different needs and budgetary requirements that will influence the type of performance measures display system that is right for them. There are several types of automated performance measurement applications organizations can choose from to display measures and collect and report measurement data. These include web-based, fully customized solutions, semi-custom solutions, and COTS/GOTS products. Many organizations choose to implement an automated performance application to simplify the data collection and reporting process and to share performance results with a larger audience. Web-based applications allow organizations to display performance measures to personnel in multiple remote locations. Web-based performance display products allow many stakeholders to review and monitor measures over time and also provide feedback about the measurement process. This also allows senior leaders to assess performance measures quickly and easily, thus facilitating more informed decisions.

Customized measurement applications are of course more costly and time consuming than COTS products but they do allow the most flexibility in design and data collection options. Semi-customized solutions may be more appropriate for organizations that have complex, hard to access, data sources and must meet certain measurement design requirements within a budget. COTS solutions are a great choice for organizations that have relatively accessible data and fewer measurement design requirements. Most performance measurement applications have a variety of display features that allow users to customize their measure displays. These include the ability to view multiple graphical displays of the data such as in charts, line graphs and diagrams, and to view clusters of many measures at one time. Some measurement applications also enable users to view contextual descriptions of the measure, review background documents related to the measures, dialog about the performance, and capture real time survey data about measures.

Overall, the needs and culture of the organization will guide decisions about how to report and display performance. One thing is certain: displaying performance measures to a group of stakeholders, or to the entire organization, empowers individuals with the knowledge to make informed choices and decisions about their investments. When many people share performance information, they become more knowledgeable and conscientious custodians of IT resources. This is the goal of good performance measurement practices.

2.7 Step 7 – Assess Performance, Refine and Adjust

Performance measures provide feedback to managers. Step 7 is a continuous process of refining and upgrading measures. Most practitioners agree that measurement systems mature over time and with learning. As data is collected, analyzed, and reported, it will shed light on progress toward achieving investment objectives. Your intuition and business sense will tell you whether the data appears accurate and reasonable, i.e., providing the information you need to manage your investment.

Once data is collected regularly for several cycles, it will be possible to see trends so that you may assess the performance of the IT investment. When assessing the performance of the IT investment, it will be necessary to frequently review the goals of the IT system as specified in Step 1, Define Investment, of this guide. You will need to regularly question and analyze the measures in light of the value the investment is bringing to the organization and determine if it is meeting its stated strategic objectives. Ongoing assessment enables you to determine the appropriateness of the measures as well as the data collection processes. As time goes on, some measures will lose their relevance. Some system enhancements or additions may prove so obvious that a smaller number of measures effectively demonstrate performance. Assessment of performance should indicate if the data being collected is accurate and timely.

It will be useful to provide a feedback system to collect input from users about the learning that comes from the scorecard or performance management system. This may be accomplished using e-mail, surveys, or online collaboration, but feedback is an important aspect of performance measurement. Performance feedback enables stakeholders and users to help you evaluate the measures, determine the proper displays of measures, assess the frequencies of displays, and understand

Process flow for assessing the investment's performance:

- Review the data collected
- Compare it to targets or benchmarks
- Evaluate the validity of the data
- Determine whether the objectives were met. If not, why?
- Evaluate whether the indicators adequately measure the results intended. If not, why?
- Assess the usefulness and timeliness of the data collected. If insufficient, what changes are necessary or what types of data are needed?
- Assess whether the staff understood their responsibilities
- Determine whether there are any lessons learned from the collection process and uses
- Determine what adjustments can and should be made to the measures, data, or baseline
- Determine the actions or changes that would improve performance

Guiding questions to help confirm the validity of the data:

- Does the data gathered appear to be accurate?
- Is the data easy to gather and not labor intensive or costly?
- Is performance really good? Is it really bad?
- Have we selected the right performance indicators?
- Were the targets set to achieve the goals realistic?
- If the data indicates targets are successfully reached or exceeded, does that match other perceptions of the situation?
- Can adjustments be made to improve the measures?
- What adjustments are needed to the data or baseline?
- Could any changes be made to improve performance?

the overall performance of the IT investment. This enables continuous improvement and refinement. Without a feedback mechanism in place, there is no way for users of the performance management system to express the value of the system.

Feedback will help you to assess the value and validity of the measures before decisions are made, particularly in the early stages of the data collection and analysis process.

Results, particularly outcomes, rarely provide meaningful information by themselves. Results must be examined in context of the objectives, environment and external factors. Therefore after collecting the results, you should conduct measurement reviews to determine how well the indicators worked and how the results contribute to objectives. The purpose of this step is to improve the measures for the next measurement cycle, to look for ways to improve the performance of your project, and to make meaningful conclusions from the results.

Guiding questions for assessing performance:

- Does the measurement data obviously describe the performance of the investment?
- Are data collection processes streamlined? Can they be improved?
- Are there discrepancies between predicted and actual results?
- Have new data or other requirements crept into the investment?
- Have operational needs changed since the measurement process started?
- Are staff adequately trained and equipped to collect and report measurement data?
- Would you invest in this investment today?
- Do the measures provide enough information about the investment to enable informed decision-making?
- What will senior leaders say about the measures?

The measurement reviews examine the effectiveness of the chosen indicators, baseline, and data chosen. This review is led by the appropriate level of management defined in the Performance Management Plan. It may include key stakeholders and customers as appropriate, and the team that created the indicators, if different. The review has two components. The first component evaluates the measures and data themselves.

The second component of the measurement review addresses the investments' performance based on the validated data.

Once these assessments are made, you will know whether to take actions to refine and adjust the measures, data collection methods, or process.

Process Flow for refining, adjusting and implementing:

- Continuously evaluate the appropriateness and usefulness of the data and measures
- Solicit feedback from users about the performance measures, data, and display system
- Determine if the scorecard is being used and providing value and make adjustments as necessary based on feedback from users
- Review the original project definition documents and assess if measurements are in line with requirements
- Use the guiding questions in this document, make adjustments to data collection, data definitions, and frequencies
- Implement appropriate corrective actions as needed

Example
One example of the measurement data collected by the team is related to the "Reduce cycle time" measure with its target of a 20% reduction. After making a number of changes in the processes as part of deploying the solution, and collecting the data for two quarters, this measure was not decreasing. The team examined the subordinate sets of data and determined that procurement lead times were actually increasing with the overall effect of preventing cycle times from being shortened. The team further researched the processes and the system operations and discovered that staff turnover had lead to a shortage of trained staff to provide back-up coverage for people who were on temporary duty or leave. The procurement manager began an aggressive cross-training program to correct this issue.

3.0 Lessons Learned

This guide was developed based on research into the subject of performance measurement practices implemented by numerous federal and defense agencies. In addition, the authors of this guide interviewed and consulted a number of subject matter experts and practitioners who have implemented performance measurement systems in their organizations. This research and collaboration revealed important insights that should be considered before developing a performance measurement or scorecard initiative. The following is a summary of observations and lessons learned about developing a performance management system:

- *Establish a Clear Case for Measurement.* Too many times, personnel view performance measurement as just another job added to the workload, without a clear rationale to justify its purpose. One organization reported that it spent an entire year developing a strategic Balanced Scorecard for the organization, designing the measures and implementing a Web-based display system. The measurement team used a consensus-based approach with leadership to select the measures, build the display system, and determine roles and responsibilities for data collection. Despite their best efforts, and GPRA legislation advocating performance measurement, the system is not being used. The display system is deployed and the original measures are displayed, but the leadership is not enforcing or encouraging its use. One important lesson learned from many agencies is to be sure that senior leadership provides a clear case for measurement and enforces the use of the performance management process.
- *Importance of leadership support and endorsement.* Much of the research about performance management indicates that leadership support is critical to success. Senior leaders should not only communicate the importance of measurement but should also participate in as much of the measurement process as possible. Many organizations report having difficulty scheduling time with senior leaders to get their input and ideas about measures. In these cases, it may be useful to block out time on their schedules in advance for periodic reviews of performance. It may also be helpful to draft a message from senior leadership about the measurement initiative to be distributed to stakeholders and users so that everyone in the organization understands the purpose of performance measurement.
- *Provide clear definitions of performance measurement terms*. A report for the US Health and Human Services revealed that one common stumbling block in the process of performance measurement is a lack of agreement on scorecard and performance terminology[2]. This fact also became clear in preparing this guide, as many definitions for the same set of terms became evident in the literature. Some of the existing guides about measuring performance use more than one definition of the same term such as objective, outcome, indicator, initiative and so on. One way to avoid this confusion is to provide agreed upon and documented definitions of terms to the measurement team and to the audience using the performance results. In some cases, it may be possible to include

[2] "Enabling Performance Measurement Activities in the States and Communities," A Report for the U.S. Department of Health and Human Services, The Northwest Prevention Effectiveness Center and Health Policy Analysis Program, (September 1998): 27.

definitions in the scorecard software or in a web based scorecard display tool. In the absence of shared definitions and understanding about performance measurement, misunderstandings will abound.

- *Focus on measurement, not on the technology to report measurement.* Often organizations spend significant amounts of time and money on expensive software applications and systems to display performance. This can lead organizations to be sidetracked from the importance of measuring performance and improving IT acquisition practices. Two of the organizations we interviewed stated that emphasis should be placed on developing effective performance measures and not on high cost software systems. Performance measurement systems should help simplify and speed up the measurement and data collection processes. If software implementations become burdensome, it can cause people to lose interest in performance measurement and detract from the goals of the system.
- *Select a small number of measures.* Again, much of the research in performance measurement stresses the importance of selecting a few good measures that will demonstrate the value of the IT investment, rather than many elaborate measures. Managers may not be able to dedicate the time needed to monitor too many or very complex measures based on detailed algorithms. In Measuring and Demonstrating Results for IT Performance, the General Accounting Office (GAO) supports this approach. The GAO publication found that leading private organizations often started measurement initiatives with many measures, but refined and focused them over time. In the beginning of the measurement process, it may be difficult to determine which measures will be the most informative. However, with practice and time, it will become evident which measures and data collection methods are the most effective.
- *Link Measures to Strategy.* Despite the wealth of research that emphasizes the importance of creating measures that link to the organization's strategy, there is a tendency to measure a system or process in isolation. With little or no experience in performance measurement, a manager can easily measure whether or not an IT system functions effectively. Technical analysis can reveal that a system works; it turns on and off, it delivers information, and it functions consistently. Many performance measurement experts have a saying that you get what you measure, so be careful not to measure the wrong things. One logistics manager related a perfect example of measuring a process in isolation. He explained that, to improve efficiency and reduce costs, his organization designed a measure to "reduce excess supply inventory." So, the supply personnel identified a particular part that was ordered infrequently and consumed considerable space in the warehouse. They cleared the warehouse of the part in order to make room for items used more regularly. Unfortunately, the part they removed from inventory was a critical and hard to find item for a weapon system that led to a significant delay in providing mission essential support to the warfighter. Although their intentions were earnest, this organization failed to develop measures that demonstrate progress against their strategy, which is to improve warfighting capability. Their measure was not a bad measure per se, but it was not in line with the overarching goals of the organization. The key issue addressed in this guide is not whether the IT investment works, but whether it is providing value directly related to the organization's strategy, whether it supports the mission, and whether it delivers results.

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Appendix B: Abbreviations and Acronyms

AIS	Automated Information System
CINC	Commander in Chief
CIO	Chief Information Officer
COTS	Commercial-Off-The-Shelf
DoD	Department of Defense
DON	Department of the Navy
GAO	General Accounting Office
GOTS	Government-Off-The-Shelf
GPRA	Government Performance and Results Act
IG	Inspector General
IT	Information Technology
ITMRA	Information Technology Management Reform Act of 1996
JROC	Joint Requirements Oversight Council
ITSG	Information Technology Standards Guidance
MDA	Milestone Decision Authority
PALT	Procurement Administrative Lead Time
POC	Point of Contact
PDR	Post Deployment Review
POM	Program Objectives Memorandum
PPBS	Planning, Programming and Budgeting System
PRA	Paperwork Reduction Act
ROI	Return on Investment
SME	Subject Matter Expert
SYSCOM	Systems Command

Appendix C: Glossary

Actions. Defined as those key steps that must be accomplished to achieve particular outcomes.

Architecture. The structure of components, their relationships, and the principles and guidelines governing their design and evolution over time.

Architecture Framework. Uniform methods for describing information systems and their performance in context with mission and functional effectiveness.

Automated Information System (AIS). A directed, funded combination of computer hardware and software, data, information, or telecommunications, that performs functions such as collecting, processing, sorting, retrieving, transmitting, and displaying information. (Department of Defense (DoD) Instruction 5000.2)

Balanced Scorecard. An approach to gauging the performance of an organization, project, or system that takes into account measures from four perspectives: strategic; customer satisfaction; internal business value; and innovation and learning. (Robert S. Norton and David P. Kaplan, The Balanced Scorecard)

Baseline. A quantifiable point at which an effort began, and from which change can be measured and documented. (National Academy of Public Administration (NAPA) Information Management Performance Measures)

Capital Planning. An integrated management process which provides for continuous identification, selection, control, life-cycle management and evaluation of IT investments with a focus on mission objectives. (Clinger-Cohen Act (CCA) of 1996)

Chief Information Officer (CIO). Responsible to the head of the agency regarding acquisition of information technology, management of information resources and establishes a Capital Investment Plan for information technology. (CCA of 1996)

Cost Avoidance. Reduction in unbudgeted costs resulting from IT development or modernization effort. (Department of the Navy (DON) Information Technology (IT) Capital Planning Guide)

Customers. Direct recipients of your products or services.

Definitions. Descriptions of the measure to ensure an understanding by everyone involved of what the measure represents.

Effectiveness. Doing the RIGHT things.

- Achievement of missions and goals
- Customer satisfaction
- Quality of work
- Appropriateness of Work (DON IT Capital Planning Guide)

Efficiency. Doing things by employing the BEST use of available resources.

- Quality of work

- Cost of work
- Timeliness of delivery
- Responsiveness to changing requirements (DON IT Capital Planning Guide)

Financial Processes. Processes you use to create budgets and monitor financial performance.

Information. Any communication or representation of knowledge such as facts, data, or opinions in any medium or form, including textual, numerical, graphic, cartographic, narrative, or audiovisual forms. (Office of Management and Budget (OMB) Circular A-130)

Information System (IS). A discrete set of information resources organized for the collection, processing, maintenance, use, sharing, dissemination, or disposition of information to support a functional activity or process. (Section 3502, Title 44, U.S. Code)

Information Technology (IT). The term "information technology," with respect to an executive agency means any equipment or interconnected system or subsystem of equipment, that is used in the automatic acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission, or reception of data or information by the executive agency…. The term "information technology" includes computers, ancillary equipment, software, firmware and similar procedures, services (including support services), and related resources…. (CCA of 1996)

Information Technology (IT) Investment. Any development/modernization (DEV/MOD) funding for any IT acquisition. (DON IT Capital Planning Guide)

Input Measure. An input measure evaluates what resources or activities are required to achieve an objective.

Internal Business Processes. Processes you use to plan, manage, and perform tasks.

Measures. Define how to determine achievement of or progress toward the objectives.

Lag Measures. Outcome measures that typically measure accomplishments after completion.

Lead Measures. Performance drivers that typically measure progress toward outcomes.

Learning and Growth. Addresses the developmental dimensions of the project, e.g., improving staff proficiency or skills, retention, training, technology innovation, culture, organization, etc.

Mission. An enduring statement of purpose, which describes "what" the organization does (functions, products, and services), "who" it supports (the customers and clients), and "how" it is accomplished (the activities, technology, methods, and processes). The mission reflects the over-arching critical activities of the organization. (DON IT Capital Planning Guide)

Mission Need Statement (MNS). Identifies and describes the mission deficiency, discusses the results of the mission area analysis, describes why non-materiel changes (i.e. doctrine, tactics, etc.) are not adequate to correct the deficiency; identifies potential materiel alternatives; and describes any key boundary conditions and operation environments that may impact satisfying the need. (DoDI 5000.2)

Mission Performance. The accomplishment of program or agency goals and desired results. (NAPA Information Management Performance Measures)

Objectives. Define how to satisfy your stakeholders' and customers' requirements for each Balanced Scorecard perspective.

Operational Requirements Document (ORD). Documents requirements as thresholds and objectives expressed as measure of effectiveness or performance and minimum acceptable requirements for the proposed concept or system. (DoD 2000.2R)

Outcome. Outcome measures describe the actual results of a system or program.

Output. An output measure describes the level of work or services provided to achieve an objective.

Performance Management. The use of performance measurement information to effect positive change in organization culture, systems and processes, by helping to set agreed-upon performance goals, allocating and prioritizing resources, informing managers to either confirm or change current policy or program directions to meet those goals, and sharing results of performance in pursuing those goals.

Performance Measure. Standard used to measure success in achieving an objective. The performance measure describes the precise measurement that will generate a quantitative (or qualitative) indicator that explicitly or implicitly indicates progress towards achieving the objective. (DON IT Capital Planning Guide)

Performance Measurement. A process of assessing progress toward achieving predetermined goals, including information on the efficiency with which resources are transformed into goods and services (outputs), the quality of those outputs (how well they are delivered to customers and the extent to which customers are satisfied) and outcomes (the results of a program activity compared to its intended purpose), and the effectiveness of government operations in terms of their specific contributions to program objectives.

Planning, Programming and Budgeting System (PPBS). The DoD resource allocation system used to identify mission needs, match the needs with resource requirements and translate the resource requirements into budget requests. (DON IT Capital Planning Guide)

Post-deployment Review (PDR). A review of an IT acquisition during the evaluation phase comparing expected versus actual performance results; determine actual return-on-investment; and, provide feedback on "lessons learned" to the Program Manager and Milestone Decision Authority. (DON IT Capital Planning Guide)

Process. A series of value-added tasks that are linked together to turn input into a product or service output. (DON IT Capital Planning Guide)

Return On Investment (ROI). Discounted life-cycle benefits (i.e., savings or cost avoidance stream over the life-cycle), divided by discounted life-cycle costs. (OSD(PA&E) Automated Information System Economic Analysis Guide)

Savings. Reduction in budgeted costs resulting from the IT investment. (DON IT Capital Planning Guide)

Stakeholders. Individuals and groups who establish or influence the budget and issue or influence policy and direction for your project or your organization.

Targets. Desired value or limits on value of the measures or dimension of performance.

Appendix D: Outline for a Performance Management Plan

Performance Management Plan

1. Information Technology (IT) Investment Definition

This section contains the information collected when defining the IT investment. It includes the definition of the stakeholders and customers and their needs and expectations. This process is described in Step 1 of this Guide.

2. Performance Measures

This section contains the Balanced Scorecard objectives, measures, definitions, targets, and actions. This process is described in Step 2 of this Guide.

3. Data Identification

This section defines the data that will be required to support the measures, its sources, and its availability. If the data is baselined, that information would also be located in this section. This process is described in Step 3 of this Guide.

4. Data Collection Methods

This section documents the data collection methods, including any templates or data collection tools that were used or developed. Describe the data collection process, including methods, sources, types of analysis, report types, formats, and frequencies. This process is described in Step 4 of this Guide.

5. Measures Management

Describe how you plan to use the data to make decisions. This section describes how the data will be reported, to whom, how recommendations for change will be generated, evaluated, and action taken. This process is described in Steps 5, 6, and 7 of this Guide.

Appendix E: Balanced Scorecard Template

Template for Stakeholder Perspective

LEVEL OF INVESTMENT circle one: (Enterprise, Functional, Project)			
Objectives	**Measures**	**Targets**	**Actions**
Questions:	**Questions:**	**Questions:**	**Questions:**
▪ What does the Program Documentation say will be delivered in terms of stakeholder benefits? ▪ What are the most important requirements to the project sponsors? ▪ What is most important to the employee? ▪ What policies and practices might change as a result of implementing this new system? ▪ How will this system help us attain our strategic objectives?	▪ How can the accomplishment of the objective be assessed? ▪ How can the objective be quantified? ▪ How can the objective be represented with units and equations? ▪ Are the measures we've selected balanced across the spectrum and organization?	▪ What is required for the Program Documentation by the stakeholder? ▪ Does the Project spending plan conform to acquisition "best practices" for this type of effort? ▪ Is the amount of time and dollars allocated for this project appropriate for the type of project?	▪ What activities, actions, or tasks will be needed to ensure that the objective is being met? ▪ Who needs to be involved with what component of the project review? ▪ Who needs to be involved with what phase of the overall project?
Example:	**Example:**	**Example:**	**Example:**
▪ Projects are delivered within budget	▪ Number/percent of project milestones met	▪ Project must be within 10% of budget	▪ Stakeholders surveys and feedback

Scorecard Template for: Customer Perspective

PROJECT LEVEL INVESTMENT			
Objectives	**Measures**	**Targets**	**Actions**
Questions:	**Questions:**	**Questions:**	**Questions:**
▪ What does the Program Documentation say will be delivered in terms of customer benefits? ▪ What are the most important requirements to the customer? ▪ How will this system help us attain our strategic objectives?	▪ How can the accomplishment of the objective be assessed? ▪ How can the objective be quantified? ▪ How can the objective be represented with units and equations?	▪ What is required for the Program Documentation by the customer? ▪ Does the Project spend plan conform to acquisition “best practices” for this type of effort?	▪ What activities, actions, or tasks will be needed to ensure that the objective is being met? ▪ Who needs to be involved with what component of the project review? ▪ Who needs to be involved with what phase of the overall project?
Example:	**Example:**	**Example:**	**Example:**
▪ Projects are delivered within budget	▪ Number/percent of project milestones met	▪ Project must be within 10% of budget	▪ Customer surveys and feedback

Scorecard Template for: Financial Perspective

PROJECT LEVEL INVESTMENT			
Objectives	**Measures**	**Targets**	**Actions**
Questions:	**Questions:**	**Questions:**	**Questions:**
▪ What is required in the Program Documentation in terms of financial benefits? ▪ What are the most important financial requirements? ▪ How can we improve productivity with this investment?	▪ How can the accomplishment of the objective be assessed? ▪ How can the objective be quantified? ▪ How is the objective represented with units and equations?	▪ What is the ideal or desired state of the objective? ▪ What does the Program Documentation or Cost Benefit Analysis require in terms of financial performance?	▪ What activities, actions, or tasks will ensure that the objective is being met?
Example:	**Example:**	**Example:**	**Example:**
▪ Manage costs in line with budget ▪ Reduce cost management overhead	▪ Percent of variance from the budget ▪ Decrease cost of management due to streamlining	▪ The project must be within 10% of budget ▪ 75% decrease in person hours for time reporting	▪ Regular financial status meeting

Scorecard Template for: Internal-Business Perspective

PROJECT LEVEL INVESTMENT			
Objectives	**Measures**	**Targets**	**Actions**
Questions:	**Questions:**	**Questions:**	**Questions:**
▪ What is required by the Program Documentation in terms of operational benefits? ▪ What are the most important operational requirements? ▪ How does this investment support the mission?	▪ How can the accomplishment of the objective be assessed? ▪ How can the objective be quantified? ▪ How is the objective represented with units and equations?	▪ What is the ideal or desired state of the organization with regard to this objective? ▪ What is required in the Program Documentation in terms of operational performance? ▪ What DoD standards apply?	▪ What activities, actions, or tasks will ensure that the objective is being met?
Example:	**Example:**	**Example:**	**Example:**
▪ Reduce administrative services ▪ Simplify traditional reporting processes ▪ Provide consistent source of data for time reporting	▪ Time saved to use new system vs. old. ▪ Time saved to process data vs. manual processing ▪ Quality of new time reports vs. old reports ▪ Ease of use	▪ 100% of reporting submitted electronically ▪ 95% system availability ▪ 100% satisfaction survey rating	▪ Regular status reviews ▪ Program/project management

Scorecard Template for: Learning and Growth Perspective

PROJECT LEVEL INVESTMENT			
Objectives	**Measures**	**Targets**	**Actions**
Questions:	**Questions:**	**Questions:**	**Questions:**
▪ What is required in the Program Documentation in terms of employee or learning outcomes? ▪ How can employee capabilities be expanded? ▪ How can the organization leverage internal staff?	▪ How can the accomplishment of the objective be assessed? ▪ How can the objective be quantified? ▪ How is the objective represented with units and equations?	▪ What is the ideal or desired state of the organization regarding this objective? ▪ What is required in the Program Documentation in terms of organization learning?	▪ What activities, actions, or tasks will ensure that the objective is being met?
Example:	**Example:**	**Example:**	**Example:**
▪ Improve the organization's ability to track service delivery by project or business area ▪ Improve the organization's ability to staff projects with internal personnel	▪ Ratio of contractors versus internal employees delivering system ▪ Number of internal employees qualified to implement system	▪ Ratio of 45% contractor to internal staff to implement system ▪ 90% of workforce trained in new system	▪ Workforce training ▪ Specific System training

Combined Template

Stakeholder				
Objectives	**Measures**	**Definitions**	**Targets**	**Actions**
				-
				-
				-
Customer				
Objectives	**Measures**	**Definitions**	**Targets**	**Actions**
				-
				-
				-
Internal Business Processes				
Objectives	**Measures**	**Definitions**	**Targets**	**Actions**
				-
				-
Financial				
Objectives	**Measures**	**Definitions**	**Targets**	**Actions**
				-
				-
Learning and Growth				
Objectives	**Measures**	**Definitions**	**Targets**	**Actions**
				-
				-

Appendix F: Sample Measures

Sample measures are provided to give you some ideas of types of measures used on various efforts. The measures you develop are important to the success of your project, program, or enterprise. You need to make sure you are measuring the right things to achieve the right targets and outcomes.

These measures are to be used as samples only and are not intended to imply they are measurements that will work with your specific effort.

From Robert S. Kaplan and David P. Norton's, "Translating Strategy into Action, The Balanced Scorecard," they have defined the following as core measures, measures they have seen repeatedly placed on scorecards.

Core Financial Measures

- Return-on-investment/economic value-added
- Profitability
- Revenue growth/mix
- Cost reduction productivity

Core Customer Measures

- Market share
- Customer acquisition
- Customer retention
- Customer profitability
- Customer satisfaction

Core Learning and Growth Measures

- Employee satisfaction
- Employee retention
- Employee productivity

Other Sample Measures

Financial Measures

- Decreased life cycle costs
- Cost improvements are achieved attributable to IT automation and service
- Increased Return on Investment (ROI)
- Reduced average cost of product and service
- Reduced repair cost
- Increased volume of sales for products, services, and consulting
- Meeting the net operating result target

- Sustaining/increasing employee work base
- Decreased cost per desktop application
- Decreased cost to spent ratio
- Increased cost avoidance through use of purchase card
- Increased percent of prompt pay interest paid versus total dollars disbursed
- Increased percent and cost of services provided in-house versus industry standard
- Decreased operating expenses

Customer Measures

- Increased joint IT customer/supplier service level agreements
- Increased in projects using integrated project teams
- Increased service level agreements met
- Increased customers satisfied with IT problem resolution
- Increased customers satisfied with IT training
- Increased customer retention
- Recognized as a provider of choice
- Increased IT solutions supporting process improvement projects
- Decreased complaints to the help desk
- Increased new business as a result of referrals
- Increased return business
- Improved user satisfaction with process
- Increased customer base
- Increased percent of on time deliveries as defined by the customer
- Reduced percent of defective products
- Reduced percent of software modifications due to errors

Learning and Growth Measures

- Increased number of staff trained in new technologies and techniques
- Increased staff professionally certified
- Increased IT management staff trained in management skills
- Increased IT budget devoted to training and staff development
- Increased employees skilled in advanced technology applications
- Increased number of dollars available to support advanced technology skill development
- Increased projects developed using state-of-the art methods and tools
- Improved team performance
- Increased percent of employee awards related to quality
- Increased percent of employee awards related to customer satisfaction
- Improved employee satisfaction

- Increased percentage of current competency completed and training completed
- Improved team building
- Increased capabilities and competencies of the workforce
- Increased partnering with industry and academia

Internal Business Measures

- Decreased application software failures and problems
- Increased projects on time, on budget
- Increased projects meeting functionality requirements
- Increased projects using standardization
- Increased staff trained in standards
- Reduced percent of items reworked
- Reduced cycle time
- Reduced average return time on technical support call
- Improved inventory accuracy for quantity and location
- Improved availability of valid financial information necessary to achieve financial objectives and targets related to a reduction in cost
- Increased research and development funding
- Increased Information Technology funding
- Reduced cost of doing business
- Increased system standardization
- Decreased stovepipe systems

Appendix G: Measure Definition Template

The purpose of the measurement definition template is to help the team describe each measure in as much detail as possible. The measurement team can then determine how the measures will be represented in formulas or images (line graph, bar graph, trend chart, etc.). The team can use the templates to specify how the data is displayed and represented in each of these views.

Measure Name:		
Balanced Scorecard Area:		
What strategic issue is this measure designed to address?		
Objectives supported by this measure:		
Definition - Describe the measure in a manner everyone will understand:		
Measurement Owner/Point of Contact (POC)	Name: Phone Number: E-Mail:	
Which users have access to this measure?		
How often will this measure be updated?		
What is the unit of measure, i.e., $, numbers, or percentages?		
Where will the data come from?		
List existing or supplementary reports:		
Distribution List for reporting:	To:	cc: