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ANALYSIS OF THE COMPANY OFFICER MANAGEMENT INFORMATION SYSTEM (COMIS) PERFORMANCE MEASUREMENT SOFTWARE AT THE UNITED STATES NAVAL ACADEMY

by

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June 2000

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The United States Naval Academy is a federal organization charged with developing midshipmen morally, mentally, and physically, so that they may become future officers in the Navy and Marine Corps. In order to better monitor the development of midshipmen, the Academy requires some form of a performance measurement tool. Recently, the Midshipman Information Database System (MIDS) was created to store information about each midshipman. In 1999, the Company Officer Management Information System (COMIS) prototype was created to work in conjunction with MIDS to enhance a Company Officer's ability to develop midshipmen and measure their performance.

This research involves presenting the COMIS prototype to a sample of Company Officers, and gathering their opinions through a survey. The results of the survey are compiled to determine how well COMIS is received by Company Officers and what improvements to COMIS should be made in the future.

The results of this research show that Company Officers feel COMIS is a useful performance measurement tool, and that its development should continue. The best avenue of COMIS development is to incorporate it into a module of MIDS. Combining these two computer programs into one will significantly enhance the development of midshipmen well into the 21st century.

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ANALYSIS OF THE COMPANY OFFICER MANAGEMENT INFORMATION SYSTEM (COMIS) PERFORMANCE MEASUREMENT SOFTWARE AT THE UNITED STATES NAVAL ACADEMY

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ABSTRACT

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I. INTRODUCTION

A. BACKGROUND

Performance measurement is a critical practice within today's successful businesses. It benefits all organizations, both private and government. The earliest forms of performance measurement trace back to the work of Edward Deming in the 1950's. Initially, he was well received in Japan, and his philosophy did not emerge in the U.S. government until the late 1980's. Deming's theory focused more on quality than quantity. He strived to improve the process of production, through the use of feedback loops. Deming also recognized the value of employees as untapped sources of knowledge, and he empowered them. Since Deming, numerous others have fostered the growth of performance measurement through their own theories, such as Peter Drucker, J. M. Juran, Peter Crosby, and Tom Peters (Balanced Scorecard, 2000a).

Chang and De Young (1996) list three reasons for measuring performance in an organization. The reasons are to provide a common understanding among employees, to provide knowledge for better decision-making, and to provide feedback on improvement efforts. They believe performance measurement is important because "organizations can effectively improve only that which they can effectively measure" (Chang & De Young, 1996, p.5). Harbour (1997, p.1) also claims, "...a critical enabler in achieving desired performance goals is the ability to measure performance."

The U.S. government began supporting the idea of performance measurement with the passing of the Government Performance and Results Act (GPRA) in 1993. Congress had found waste and inefficiency in federal programs because program

managers and decision makers were getting insufficient information about program performance. This caused the public to lose confidence in the federal government. The GPRA was designed to improve the confidence of the American people by holding federal agencies accountable for achieving program results. The GPRA created a goal-setting, performance-measurement framework, which was designed to improve federal program effectiveness and public accountability by promoting a new focus on results, service quality, and customer satisfaction (Balanced Scorecard, 2000b).

The United States Naval Academy (USNA) falls under the guidelines of the GPRA because it is a federal agency under the Department of the Navy. The Superintendent has put forth a strategic vision, and there have always been means of measuring midshipmen performance. One current example is the Midshipmen Information Database System (MIDS). MIDS came online as the official midshipmen database in 1999, and it has many functions, one of which is performance measurement. Another example of a performance measurement tool is the Company Officer Management Information System (COMIS).

COMIS was developed in 1999 by Naval Postgraduate School students to provide Company Officers at the Naval Academy with a computer program that measures the performance of midshipmen. It was designed to be a standard performance measurement tool that could consolidate midshipmen data into useful performance information and to enhance the Company Officer's impact on the moral, mental, physical, and professional development of midshipmen (Boone, Hagen, and Utroska, 1999). COMIS also uses the latest computer IT-21 compliant technology available at the USNA. COMIS was created using the Measurement Linkage Model™ by Chang and De Young, and it was developed

with the Company Officer in mind. It is user-friendly, and Company Officers were directly involved in deciding the key result areas (KRA's) and key indicators (KI's) that were used for midshipmen performance measurement (Chang and De Young, 1996).

COMIS began development in 1999, and it is not yet ready for release to the Academy. There are still three major steps in its developmental process. The first is to finish a fully functional COMIS prototype. The second is to successfully migrate midshipmen data from MIDS into COMIS. Creating an extraction program that will convert the MIDS data into a format recognized by the COMIS program is one way to do this. Another way would be to incorporate the functionality of COMIS into Company Officer module of MIDS. The third major step is to evaluate the effectiveness of COMIS. This thesis focuses on step one and involves obtaining Company Officer feedback necessary for completing the COMIS prototype.

H. James Harrington states, "Measurement is the first step that leads to control and eventually to improvement. If you can't measure something, you can't understand it. If you can't understand it, you can't control it. If you can't control it, you can't improve it" (Kaydos, 1999, p.3). Company Officers are tasked with developing midshipmen by providing leadership and guidance. The only way they can control and improve midshipmen performance is by measuring where the midshipmen are currently performing. A performance measurement tool is vital for the success of a Company Officer, and ultimately for the success of the Naval Academy in developing the leadership of future Junior Officers in the Navy and Marine Corps.

B. PURPOSE

The purpose of this thesis is to determine Company Officers' opinions about the capabilities of the existing COMIS prototype. The most effective means of accomplishing this is by demonstrating to Company Officers, the capabilities of COMIS and its potential as a performance measurement tool. Company Officers need to be involved in the development of COMIS because they will be the primary users. This research includes giving a COMIS demonstration to the Company Officers and receiving their feedback through a survey. The survey is then analyzed to determine what changes, if any, need to be made to COMIS.

The results of this analysis will be used to enhance the development of COMIS and determine areas of future study. Company Officer feedback is an essential element for COMIS verification of user needs and software requirements upgrades. The final goal of the Leadership Education and Development (LEAD) program's research in this area is to develop a user-friendly performance measurement tool that will be utilized by the USNA Company Officer.

C. RESEARCH QUESTIONS

The following research questions fall into two categories. The first category of questions will be answered primarily through research in current literature. The second category will be answered by analyzing the results of the COMIS Survey for Company Officers.

1. Literature Research

Before analyzing the specifics of the COMIS program, its history needs to be investigated. Previous research of performance measurement also needs to be updated, in order to incorporate the most current practices. The following questions address improvements in performance measurement and the development of the COMIS prototype.

1. What are the current practices of performance measurement?
2. Have there been any recent changes in performance measurement by Company Officers at the USNA?
3. What is the Company Officer Management Information System (COMIS)?
4. What is the history of COMIS?
5. How does COMIS assist the Company Officer in performance measurement?
6. What is the Midshipman Information Data System (MIDS)?
7. How does MIDS assist the Company Officer in performance measurement?
8. What are the recent improvements to MIDS?

2. Survey Results

The crux of this thesis is based on Company Officer feedback about the COMIS prototype. The following questions were used in developing a thorough survey to gather Company Officer opinions and recommendations about COMIS.

1. What are the advantages and disadvantages of COMIS?
2. What are the best and worst functions of COMIS?
3. What are the Company Officers' opinions of COMIS?
4. Is COMIS worth keeping?
5. How can COMIS be improved?

6. How extensively would COMIS be used by Company Officers if it becomes an official program?

D. BENEFITS OF STUDY

The benefits of this study are threefold. First of all, a user-friendly performance measurement tool will enhance the Company Officer's ability to improve midshipmen performance, while at the same time reducing information overload. Through the current and future research of Naval Postgraduate School students, COMIS will continue to incorporate the newest strategies of performance management. Continued performance measurement research will not only keep the United States Naval Academy in compliance with the GPRA, but it will also keep the Academy at the leading edge of performance management technology.

The second benefit of this research is to further strengthen the relationship between the Naval Postgraduate School and the U. S. Naval Academy. Graduate students at NPS can apply their studies through research projects, like this one, that will benefit USNA at little or no cost. Just as the initial COMIS research project used Information Technology (IT) students to develop the actual COMIS prototype, so can future IT students use the results of this study to complete the COMIS software. Ultimately, NPS is able to have a direct impact on the development of future graduates from the Naval Academy by improving the leadership tools available to Company Officers.

Finally, this research is a tangible benefit of the LEAD program for the Naval Academy. Prospective Company Officers attend a yearlong master's program before taking over a company of midshipmen, and performance measurement is one area of study. LEAD students are also required to write a thesis as part of this program. COMIS

is a product of thesis research and is something the Academy can directly use to improve the quality of midshipmen.

E. SCOPE AND METHODOLOGY

1. Scope

The scope of this thesis is broken down into five phases. The first phase involves a complete review of performance measurement theories and practices. This phase is important in ensuring that COMIS is equipped with the most up-to-date information regarding performance measurement. It means Company Officers will not be given an outdated tool that will be of no use to them. Instead they will have a leading-edge performance measurement program that will help them develop midshipmen into the finest Naval and Marine Corps officers.

The second phase consists of a review and analysis of the current COMIS software. This phase is necessary to establish where previous research stopped and to determine the focus of this thesis so that efforts are not duplicated.

The third phase consists of surveying Company Officers' opinions about COMIS. Company Officers will ultimately be the only ones who regularly use COMIS, so their opinions matter the most. Only by finding out what the user wants, can one create a program that satisfies his or her needs.

The fourth phase entails an in-depth analysis of the Company Officer surveys. This phase is the meat of the thesis. One of the biggest advantages of COMIS is that Company Officer input was used to help create performance measures for midshipmen.

Now that the COMIS software is developed, it is time to see if it meets Company Officer expectations.

The fifth and final phase consists of recommending a method for getting future Company Officer feedback to the COMIS manager. This phase is important because it will ensure that COMIS is continually updated to match the needs of Company Officers.

The end result of this research is to determine if COMIS satisfies the needs of the USNA Company Officer for evaluating midshipmen and to determine if further development should continue on the prototype so it can become an authorized performance measurement tool. Follow on thesis research will be conducted if the need exists to maintain and enhance the functionality of the COMIS tool.

2. Methodology

The methodology used in this thesis research consists of the following steps.

1. Conduct a literature review of books, magazine articles, CD-ROM systems, and other library information resources on performance management and measurement.
2. Conduct a thorough review of previous research on COMIS.
3. Conduct a review of the current capabilities of the MIDS company officer module and compare it to COMIS.
4. Examine the current COMIS software program.
5. Create a demonstration for Company Officers of the capabilities of COMIS.
6. Create a survey to gather feedback from company Officers about COMIS.
7. Choose 20 Company Officers (or as many as possible) to participate in this study.
8. Thoroughly analyze Company Officer feedback and make recommendations to improve COMIS.
9. Establish a means for future feedback methods involving COMIS.

F. ORGANIZATION OF STUDY

This study consists of six chapters, which describe the background of COMIS and performance measurement in general, the steps necessary to test COMIS, and the recommendations for improving the COMIS prototype. Chapter I provides a brief introduction and summary of this thesis. Chapter II consists of a literature review on performance measurement, COMIS, and MIDS. Performance measurement focuses primarily on recent developments in the field. The review of COMIS is designed to give a summary of development to date on the prototype. Finally, MIDS is reviewed to include any upgrades to the system since the COMIS prototype was developed. This could be rather extensive as MIDS was being developed at the same time as the initial COMIS prototype.

In Chapter III, research methodology is described. This chapter explains the steps in analyzing the COMIS prototype and the obstacles that need to be overcome. Chapter IV is the heart of this thesis. It provides a detailed analysis of the results of the COMIS survey for Company Officers. Chapter V continues with an analysis of the survey by describing the steps needed to fully implement COMIS as a performance measurement tool. Finally, Chapter VI summarizes this research and provides lessons learned. Recommendations for future research are also enumerated in this chapter.

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II. LITERATURE REVIEW

A. INTRODUCTION

Performance measurement has increased in popularity among today's corporations. It originally dates back to the 1950's with the work of W. Edwards Deming. In 1987, Deming's philosophy prompted the U. S. government to create two initiatives, one military and one civilian. The military version is known as Total Quality Management (TQM), and the civilian initiative is the Malcom Baldridge National Quality Award. The military has since decreased the emphasis of TQM, but the Baldridge Award is still a good incentive for many companies (Balanced Scorecard, 2000a).

The private sector embraced the concept of performance measurement well before the public sector did. In the early 1990's, the public sector realized the success that performance measurement brought to their private counterparts, and in August 1993, President Bill Clinton signed the Government Performance and Results Act (GPRA). The GPRA brought the public sector under the same standards for performance planning and management as the private sector. One month later, President Clinton signed Executive Order 12862 requiring federal agencies to determine from their customers the kind and quality of service their customers seek (Balanced Scorecard, 2000b). Now, both public and private organizations are using performance measurement in the accomplishment of their missions. It has become an essential part of management, and it has a distinct purpose: "to motivate behavior leading to continuous improvement in customer satisfaction, flexibility, and productivity" (Lynch & Cross, 1995, p. 1).

This chapter examines several recent theories of performance measurement. It also discusses performance measurement practices in the public sector, and it identifies

characteristics of successful organizations that use performance measurement strategies. The chapter then focuses on performance measurement at the U. S. Naval Academy and it describes one automated performance measurement tool, COMIS, that is currently under development for use by Company Officers. Finally this chapter examines the MIDS database, which is the source of most of the information provided by COMIS.

B. PERFORMANCE MEASUREMENT

The current appeal for performance measurement has created an exhaustive collection of literature. The section covers three main areas. The first subsection is a review of current and applicable performance measurement strategies. The second reviews performance measurement in the public arena, and looks at some of the best practices of performance measurement. The final subsection discusses specific performance measurement issues at USNA.

1. Current Strategies

There are numerous performance measurement models in existence today. This subsection addresses two of the more commonly known ones. The Measurement Linkage Model™ by Chang & DeYoung is used as the basis for the COMIS prototype. The second model, The Balanced Scorecard approach, is currently one of the most popular models used in the public arena. Both of these models offer a structured approach to looking at the performance of an organization.

a. Measurement Linkage Model

The Measurement Linkage Model™ was designed by Chang and DeYoung in 1995 to help work groups design and implement their own performance

measurement and improvement processes. It consists of eight steps, which guide an organization through the planning stage to the implementation stage of a successful measurement system. These steps help work groups link their own specific performance measurement system to that of the entire organization through the use of Key Result Areas (KRA's) and Key Indicators (KI's). In other words, the model starts with the "big picture" result areas of the organization and cascades them down to the individual work group levels. The Measurement Linkage Model™ allows work groups to establish the correct performance measures and to determine how to track information to gauge their success against those measures. It is flexible enough to accommodate the needs of a wide variety of sizes and types of organizations (Chang & DeYoung, 1995). The Measurement Linkage Model™ is shown in Figure 1.

Before an organization decides which performance measurement system to use, it must understand the reasons and the importance of measuring performance. Chang and DeYoung (1995, p. 6) list three reasons for measuring performance: (1) to provide focus, direction, and a common understanding, (2) to provide knowledge for making better decisions, and (3) to provide feedback on organizational improvement efforts. An organization must answer the question, "Why measure performance?" The best response is another question, "How can you improve that which you cannot measure?" An organization must know where it currently stands before it can improve.

Using a performance measurement system effectively is more than just compiling data. Data itself does nothing; the data must be transformed into information. too much data actually hinders an organization's ability to measure performance. This effect is

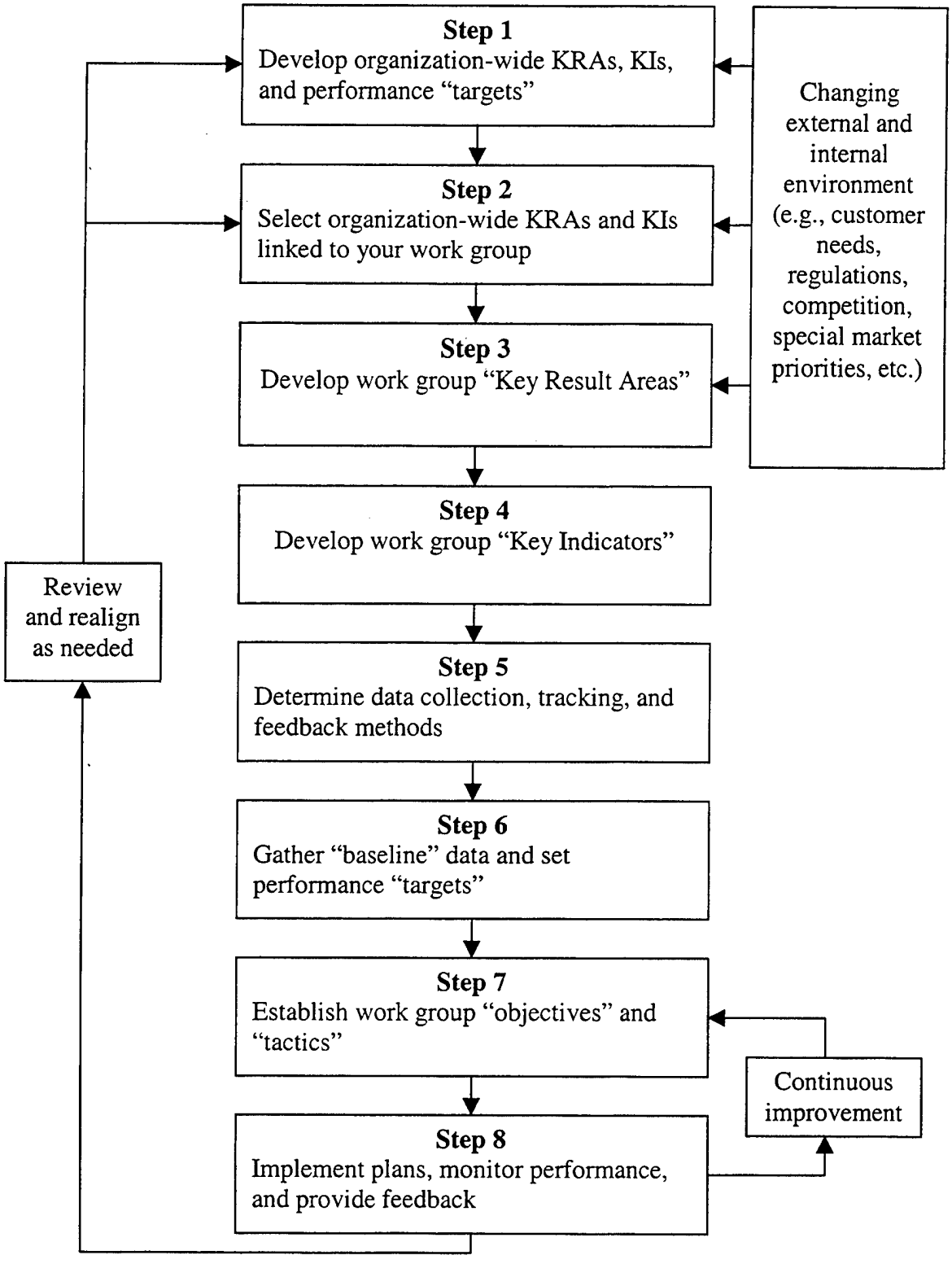

Figure 1: Measurement Linkage Model (Chang and DeYoung, 1995, p. 16)

called "information overload" (Boone, Hagen, & Utroska, 1999). Good leaders are able to sift through data to come up with the most useful and pertinent information. In developing the Measurement Linkage Model, Chang and DeYoung came up with a list of 10 features of excellent measurement systems (1995, p.8):

1. A system should provide information-rich data that is "actionable."
2. A system should contain a masterful blend of both efficiency and effectiveness indicators.
3. A system should include measures that focus on accomplishment, reward-oriented categories.
4. A system should not measure A and hope for B.
5. Measures should be easy to understand.
6. Managers or employees should be accountable for measurement accuracy and results.
7. A work group should only be accountable for measures over which they have control.
8. Measurement information should be analyzed and acted upon in a timely manner.
9. Measures should be cost-effective to collect.
10. A measurement system should focus on continuous improvement, rather than just compliance and control.

Chang and DeYoung use the analogy for organizational improvement as the "race without a finish" (p.109). In order to prevent being worn down from this race, an organization needs to know how long the laps are and when the baton is handed off. The race has no end because an organization always has room for improvement. The interim targets along the way are the reason for performance measurement.

b. Balanced Scorecard

Robert Kaplan and David Norton developed the Balanced Scorecard concept in 1992 as a method for measuring performance. It is a "conceptual framework for translating an organization's strategic objectives into a set of performance indicators" (Procurement Executives' Association [PEA], 1998, p. ix). The Balanced Scorecard relies on four perspectives to which performance indicators are attached: (1) Financial, (2) Business Process, (3) Customer, and (4) Learning and Growth. These perspectives define a company's strategy. Along with these four perspectives are four questions relating to an organization's vision and strategy: (1) How do our customers see us? (2) What must we excel at? (3) Do we get the best deal for the Government? and (4) Do we continue to improve and create value (PEA, 1998, p. x)? The Balanced Scorecard model is shown in Figure 2.

An organization must carefully balance its attention and resources between the four perspectives in order to remain effective and efficient. Some of the performance indicators attached to these perspectives measure an organization's progress toward achieving a vision, while others measure long-term drivers of success. By using the Balanced Scorecard approach, an organization monitors both its current performance levels and its ability to learn and improve. Current performance levels are measured through customer satisfaction, financial state, and business process results—the first three perspectives from above. Improving processes, motivating and educating employees, and enhancing information systems are all means of learning and improving—the last perspective from above (PEA, 1998). The next subsection shows how the Balanced Scorecard approach can be used in the public arena.

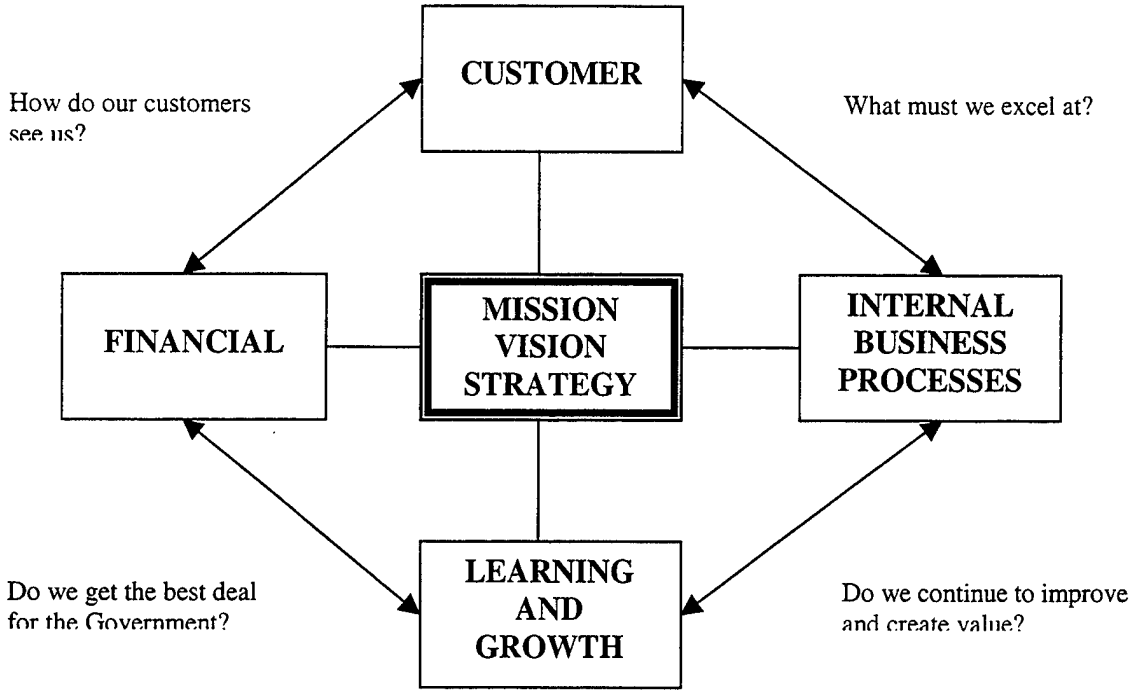

Figure 2: Balanced Scorecard Strategic Perspective (PEA, 1999, p. x)

2. Performance Measurement in the Public Arena

When it comes to performance measurement, the public sector is no different than the private sector. The same rules apply to both. The only difference is that private organizations use profit as the bottom line, and public organizations must use their mission instead. The bottom line still drives performance in both cases. For example, the U. S. Naval Academy's mission is to develop midshipmen into junior officers for the Navy and Marine Corps. The Academy's overall performance is measured by how successfully it accomplishes this mission. Just like in the private sector, the roles of the customer, stakeholder, and employee are vital to the success of a public organization. Balancing these three roles is the challenge of leadership. Both Chang and DeYoung's Measurement Linkage Model™ and Kaplan and Norton's Balanced Scorecard approach can be used in this situation. Chang and DeYoung's model can be used to develop a

performance measurement system that is similar to Kaplan and Norton's Balanced Scorecard. The biggest problem with the Balanced Scorecard approach in the public sector is not managing the balance; the problem is knowing who the customers are. The Naval Academy's customers could be the fleet, because the fleet receives the Academy's end product, but it could also be the parents of the midshipmen, because they are investing their children's lives in the institution. Government leaders need to achieve a balanced set of performance measures because they need to know their customers' expectations and their employees' needs in order to meet those expectations. Without taking these needs and expectations into account, an organization cannot achieve its stated objectives or its mission.

Performance measurement in the public arena became mandatory with the signing of the Government Performance and Results Act in 1993 and Executive Order 12862. Federal agencies now have no choice in the matter, and they must find a means to measure their success. Measuring their outcomes against their goals and their mission usually fulfills this. The Balanced Scorecard approach is a good model for federal agencies to use. The National Partnership for Reinventing Government (NPR) (1999, p.11) states, "This balanced approach to performance planning, measurement, and management is helping government agencies achieve results Americans—whether customers, stakeholders, employees, or other—actually care about." Vice President Al Gore noticed the success that corporations were having with the balanced performance measurement approach, and he charged the NPR with identifying and studying the best practices of using balanced measures in both the private and public sectors (NPR, 1999). The following subsection describes the NPR's results.

3. Best Practices in Performance Management

In order to complete its study, The NPR charted a team of federal, state, and local managers and staff to work with study partners from all levels of private sector, international, and government agencies. After reviewing the literature on performance measurement and balanced measures, the teams surveyed and interviewed over 100 organizations. From these interviews, they created over 30 case studies. They then compiled the information from the case studies and summarized their results. The next five sub-subsections list the best practices in performance management (NPR, 1999).

a. Establish A Results-Oriented Set Of Measures That Balances Business, Customer, And Employee.

In order to establish a balanced set of measures, an organization must take three steps. The first is to decide which measures mean the most. Bringing the customer, stakeholder, and employee together and having them create an easily recognized body of measures accomplishes this. The customer, stakeholder, and employee also need to clearly identify measures that meet their individual concerns. Secondly, an organization must commit to the initial change of using balanced measures by involving everyone in the process and by using any expertise available. The system must be nonpunitive so that people are more willing to change, and the leadership must provide clear and concise guidance for the establishment, monitoring, and reporting of the new measures. Finally, an organization must remain flexible. Performance management is a living process that requires constant attention. Limiting the number of performance measures and maintaining a balance between financial and nonfinancial measures will assist in maintaining flexibility (NPR, 1999).

b. Establish Accountability At All Levels Of The Organization.

In order to establish accountability in an organization, upper management must lead by example. They should allow accountability to flow down to all levels of the organization and make this accountability work by rewarding employees for success. An organization must also keep its employees and customers informed of what is happening. With the dawn of the Internet, this can be accomplished easily (NPR, 1999).

c. Collect, Use, and Analyze the Data.

Data is a necessity for measuring the performance of an organization. Feedback data from customers can be collected through surveys. Performance data is the most important, and therefore, sufficient time and money should be invested to make it right. Performance data should also be relevant. The data collection process should be centralized at the highest level possible within the organization to ensure accurate analysis. Accurate analysis is essential, and combining both feedback and performance data will make it more complete. The final step in analysis is to publish the results for everyone to see (NPR, 1999).

d. Connect the Dots.

Performance management efforts need to be connected to the business plan and budget of an organization. This connection provides meaning to the people who run the program or who are affected by it. This connection also builds a framework that allows the entire organization to focus on the same goals and mission (NPR, 1999).

e. Share the Leadership Role.

Just as accountability should be cascaded throughout an organization, so should leadership (NPR, 1999). Leadership is the critical element in a successful organization. It "gives the performance management process a depth and sustainability that survives changes at the top—even those driven by elections and changes in political party leadership" (NPR, 1999, p. 7).

f. NPR Lessons Learned.

The NPR discovered that a balanced approach to performance measurement works well and will improve the overall performance of any organization. The most important thing the NPR learned (1999, p.13) is that "there is no such thing as a fixed and truly balanced set of measures." An organization must remain flexible and open to change in order to fit the process of balancing employee needs and customer expectations. Although every organization is different, the NPR came up with several lessons learned that could help organizations incorporate the best practices in performance management (NPR, 1999).

1. **Adapt, don't adopt**. A best practice is not identical for all organizations. It must be adapted to fit the specifics of each organization.

2. **We aren't so different after all**. Although organizations are not identical, they all face similar problems. Common answers should be used for common problems.

3. **Leadership doesn't stop at the top**. Leadership should cascade throughout the organization. Employees with leadership aid the organization in problem solving and in achieving the mission.

4. **Listen to customers and stakeholders**. Organizations should not assume they know what the customer wants. They should take customer suggestions because appeasing the customer is part of their business.

5. **Listen to employees and unions**. Organizations should not underestimate the inputs from the bottom of the chain of command. Sometimes the best ideas are generated down there. Employees will feel part of the organization if their inputs are valued.

6. **Partner with customers, stakeholders, and employees; don't control**. The more those who have a vested interest in the success of an organization feel a part of it, instead of feeling ruled by it, the more successful the organization will be.

These six lessons learned combined with the five best practices in performance management are the guidelines for any public organization. By following these steps, federal organizations can and will improve their services and their outputs, which leads to overall mission accomplishment. The U. S. Naval Academy is one example of a federal organization that could benefit from the results of this NPR study. The next subsection describes how performance measurement is currently used at the Academy.

4. Specifics of Performance Measurement at USNA

The U. S. Naval Academy has produced Naval and Marine Corps Officers for over 150 years. It has been responsible for the development of thousands of midshipmen, and every single one of those midshipmen has been observed, critiqued, measured, and ranked according to his or her performance. The mission of the U. S. Naval Academy is to "develop midshipmen morally, mentally, and physically..." (United States Naval Academy [USNA], 2000a). In order to ensure that this development successfully occurs, some form of performance measurement must exist. The Commandant offers guidelines for performance measurement through several Academy Instructions, and a class ranking system for overall order of merit (OOM) exists. Overall order of merit is calculated by a formula that takes into account five individually weighted categories, (1) Academic and

Professional Course grades (64.48%), (2) Military Performance grades (17.68), (3) Conduct grades (7.8%), (4) Physical Education grades (6.66%), and (5) Athletic Performance indicator (3.38%) (USNA, 2000b). Although these guidelines are in place at the Academy, individual Company Officers must still look for their own sets of key indicators to determine and assess the level of a midshipman's performance.

In 1999, two theses were written to determine the indicators that are important in measuring midshipmen development. The two theses both used Chang & DeYoung's Measurement Linkage Model™ as a guideline. Belz (1999) wrote the first, and Boone, Hagen, and Utroska (1999) wrote the second. Belz' research involved interviewing 15 Company Officers to establish specific KRA's and KI's of midshipmen performance. Belz names three total KRA's, which are taken directly from the mission statement of the Naval Academy: moral development, mental development, and physical development. From the Company Officer interviews, Belz compiled a list of 15 potential KI's that Company Officers use to measure both midshipmen and company performance. The majority of items on this list are also measures in the annual Color Company Competition at USNA (Belz).

1. Physical Readiness Test (PRT) scores
2. Physical Education (PE) grades
3. Overall Grade Point Average (GPA)
4. GPA delta
5. Class absences
6. Extra Instruction (EI) hours
7. Number of D's and F's in military performance

8. Number of semester Academic Board cases
9. Number of Weight Category 5 and 6 cases
10. SIR chits per midshipman
11. Attendance at company functions
12. Morale
13. Success in intramurals
14. Drill grades

Belz (1999) scrubbed this list against Chang & DeYoung's criteria for effective Key Indicators. According to Chang & DeYoung (1995), KI's must "provide critical/important data, be easily understood, be controllable by actions, track actual performance change, align with existing data or be clearly established, and measure efficiency or effectiveness" (p.63). All of these criteria must be true in order for the measure to be a valid KI. After scrubbing the list, only five of the above measures qualify as valid KI's. The valid KI's are (1) PRT grades, (2) PE grades, (3) Overall GPA, (4) Class Absences, and (5) Drill grades (Belz).

Boone et al. (1999) found similar results in their research. They also interviewed Company Officers to obtain key indicators for their model. Boone et al. use the same three key result areas as Belz (1999)—moral, mental, and physical development—but they add a fourth: professional development. Boone's et al. list of KI's, however, is more extensive. The key indicators of mental development include (1) grades, (2) honors students, (3) academic extracurricular activities, (4) academic boards and probationary students, and (5) hours studied (Boone et al.). This KRA is probably the most important because it has the largest impact on a midshipman's OOM. Moral development is the

hardest to measure because a midshipman is usually assumed to be moral until proven otherwise. Because of this, only three KI's exist for moral development: (1) the number of honor offenses and counseling sessions that occur both individually and within a company, (2) the number of demerits a midshipman receives and his subsequent conduct grade, and (3) community service (Boone et al.). Physical development, on the other hand is probably the easiest to measure because all midshipmen must meet the same standards with respect to gender. The KI's include (1) PRT scores, (2) number of PE failures, (3) PE curriculum grades, and (4) body fat measurements (Boone et al.). Finally professional development is measured to help identify corrective actions for poor performers and to determine the type of graduate going to the fleet. The KI's for professional development include (1) absences, (2) professional development (PRODEV) grades, (3) uniform inspection results, (4) room inspection results, (5) Fourth class midshipmen professional quiz and board results, and (6) performance grades (Boone et al.)

These two studies reveal important information for the performance measurement of midshipmen. Based on USNA Company Officer inputs, the key indicators of Boone's et al. (1999) thesis combined with drill performance are the indicators required to measure midshipmen and company performance. These are the measures that Company Officers must know in order to successfully do their jobs. This is where the COMIS prototype is useful, as the following section explains.

C. COMIS

1. Purpose of COMIS

COMIS was designed to be a user-friendly performance measurement tool that satisfies the needs of the Company Officer for evaluating the performance of his or her midshipmen. When it was created in 1999, no such performance measurement tool existed at the Academy. The Midshipmen Information Database System was in the process of creation, but it was not fully functional. Now, MIDS has grown tremendously. It includes a Company Officer module, which has extensive information about each midshipman, and is used regularly by Company Officers. Although the Company Officer module has ample data about midshipmen, it has no application of performance measurement theory, nor was it created taking Company Officer inputs into consideration. Company Officers are therefore forced to search through the entire database to find the specific indicators of performance that they regularly use to measure the development of their midshipmen. COMIS is a stand-alone system that helps Company Officers by tracking both midshipmen and company level performance. It also complies with the GPRA of 1993. Company Officers know what performance indicators are important for the moral, mental, and physical development of their midshipmen. COMIS merely enhances their ability to drive continued performance improvement while at the same time reducing the information overload that can be associated with large databases like MIDS (Boone et al., 1999).

2. History of COMIS

COMIS is a result of recent nationwide interest in measuring performance and results. Ever since the Government Performance and Result Act of 1993, federal agencies have fallen under the same microscope as civilian agencies with respect to strategic plans and improved organizational outcomes. All government agencies are now required to institutionalize performance measures. In 1997, the National Performance Review established a starting point for federal agencies' strategic plans. Agencies must first establish top-level goals and priorities, then define a means to achieve these goals, and finally demonstrate how they will measure progress along the way (Boone et al., 1999).

In 1998, three students from the Naval Postgraduate School in Monterey, California decided to research the performance measurement of midshipmen at the United States Naval Academy. One student, Mike Boone, was in the Company Officer LEAD program, and the other two, Terry Hagen and Willie Utroska, were IT students. After conducting an initial needs assessment, Boone et al. (1999) concluded that no sanctioned performance measurement tool existed at USNA. They researched several performance measurement models and chose Chang & DeYoung's Measurement Linkage Model™ as the basis for their system. Boone et al. then compiled data from Company Officer interviews into a list of Key Result Areas and Key Indicators. Once this research step had been achieved, they designed the software program, COMIS, using Microsoft Access 97. The design and layout of COMIS was influenced by three sources—the feedback from Company Officer interviews, the data dictionary from the Company

Officer module of MIDS, and a former in-house database tool "Brigread Plus" created by Chief Petty Officer Canfield using Paradox 7 (Boone et al., 1999).

Unfortunately Boone, Hagen, and Utroska's research ended before COMIS was fully functional. The prototype still needed some final adjustments as of November 1999. During this same timeframe MIDS became more functional, and its development still continues today. The recent upgrades to MIDS will be discussed in a later section.

3. Capabilities of COMIS

COMIS is an interactive, windows based software program designed as a stand-alone product for each Company Officer. The software requirements include a Windows 95 or later operating system and Microsoft Access 97. Minimum hardware requirements include an IBM 486 or higher processor, 12 MB of RAM, VGA monitor, and a mouse or other pointing device. A printer is also required for generating reports. COMIS uses 25 data tables downloaded from the Company Officer module of MIDS, and five of its own data tables that require manual entries (Boone et al., 1999).

The two main features of COMIS are its "View Midshipmen Records" switchboard and its "Enter/Update Performance Information" switchboard. The "View Midshipmen Records" switchboard contains a display of individual midshipmen data and a display of statistics at the company, platoon, or squad level. The individual midshipmen data is similar to the data found in the Company Officer Module of MIDS. The three statistic pages show this same information compiled at their respective levels and display it using horizontal bar charts (Company Officer Management Information System [COMIS], 1999).

The "Enter/Update Performance Information" switchboard is where the basis of the Measurement Linkage Model™ is displayed. This switchboard contains a page for each of the four KRA's: Moral Development, Mental Development, Physical Development, and Professional Development. It also contains a fifth page for information about liberty privileges for midshipmen. Each of the four KRA pages contains an easy to read layout of all the KI's for their respective KRA's (COMIS, 1999). The benefit of these four pages is that the Company Officer can go to one location for all of the information he or she needs to monitor the moral, mental, physical, and professional development of his or her midshipmen.

Other features of COMIS are the four manager pages. These pages are designed to make COMIS as user-friendly as possible. The four managers are: Help Manager, Search Manager, File Utilities Manager, and Report Manager. The Help and Search Managers are similar to those found on any Windows-based software. They can be accessed either from the main menu or at any time during the session by pressing one of the function keys. The Help Manager opens a help menu to assist the user with any software problems or questions. The Search Manager allows the user to find a specific piece of information within the program. The File Utilities Manager is mostly for program maintenance. It contains five functions: Compile, Upgrade, Compact, Repair, and Backup. Unless problems exist, most Company Officers will not use these functions except for Backup. The Backup function allows users to save the COMIS database to another file in case their computer crashes or they need to take their data to another computer loaded with COMIS. The Report Manager allows the user to create an unlimited array of reports. It allows the user to specify five criteria to be generated on the

report, which it then transforms into an organized, printable format. The Report Manager does a similar function to the Ad Hoc Query function of MIDS (COMIS, 1999).

D. MIDS

MIDS is a web-based application accessing the Naval Academy database. It was created in 1999 as a replacement for the Honeywell Mainframe/NATS system. The purpose of MIDS is to replace and improve upon the functionality of the former NATS system (J. O'Dell, personal communication, April 24, 2000). It is an integrated database running on an Oracle platform that uses web modules as its fundamental building blocks (Boone et al., 1999). Each module performs a specific function. One example is the Company Officer Module. MIDS contains large amounts of information about each midshipman and about many other activities at the Naval Academy. Because it is accessed through the Internet, Company Officers can use MIDS from any computer connected to the World Wide Web.

1. Company Officer Module

The Company Officer Module within MIDS is one improvement over the old NATS system. This module was designed to replace the former PC-based, stand-alone system Brigread Plus, designed by Chief Canfield. Brigread Plus was not connected directly to NATS; it accessed NATS on a daily basis to update its data tables (J. O'Dell, personal communication, April 24, 2000). The Company Officer Module is a direct component of MIDS. It displays real-time information about each midshipman, and it is used primarily by Company Officers. During COMIS' initial development, the Company Officer Module was still under construction and only contained the following

information: personal demographic information, current grades, class schedule, absences and excuses, military grades/status, QPR and class standings, final course grades from all previous classes, Midshipman Academic Performance Reports (MAPR's) and special MAPR's, parental information, leave periods taken, leave addresses, and a section for personal notes (Boone et al., 1999). Since June of 1999, the Company Officer Module has grown tremendously. On top of the information previously mentioned, it now includes a section for conduct and conduct offenses, PRT results, intramurals/varsity sport, movement orders and excusals, midshipmen striper positions, extracurricular activities, Company Officer MAPR's (COMAPS) and special COMAPS, and lastly ethnicities. Appendix B is a full display of the current Company Officer Module pages.

2. Future Upgrades to MIDS

Every time MIDS gains functionality, the Company Officer Module is updated to match it. These upgrades are determined by the needs of the Naval Academy. The Superintendent and the Director of Information Technology Strategic Development (ITSD) make the final decisions on what to include in the MIDS database (J. O'Dell, personal communication, April 24, 2000). MIDS is a continuously evolving program, and it has several short-term goals for the future. One of the initial improvements to MIDS will be the inclusion of service selection data for the first class midshipmen. Shortly after this, summer cruise information will be added (O'Dell). These two items currently exist in a separate database in the Professional Development Department. Developers are also working on a 360 Feedback Survey for MIDS (O'Dell). This survey will allow subordinates to rank the performance of their superiors. One nice advantage of this survey is that it will incorporate platoon and squad assignments into MIDS, which

will be very useful for Company Officers. With the addition of platoon and squad data, Company Officers can generate reports at lower levels of the chain of command. Physical standards information such as height, weight, and body fat percentage will also be incorporated into MIDS in the future (O'Dell). This data will be handy for Company Officers tracking the physical development of their midshipmen. Medical information will not be included in MIDS because the medical clinic has its own database located at Bethesda Naval Hospital. Some other information that will exist in MIDS is precommissioning medical issues, as it will be part of the service selection upgrade. MIDS is also planning to include a digital photograph of each midshipman in the future (O'Dell). The potential of MIDS is unlimited. It will continue to grow as long as the demand for new ideas exists. The limiting factor for the development of MIDS is only the time it takes to physically incorporate the changes.

3. Ad Hoc Query Tool

The Ad Hoc Query Tool is a separate program used to compile data from within the MIDS database. It is another web-based application created by Web Intelligence. It was chosen as the query tool for MIDS because it is an industry standard and because of its accessibility through the web (J. O'Dell, personal communication, April 24, 2000). By having a tool like this, users are given some flexibility in designing their own reports. Once a query is created, it is stored on site so that others can use it. Most of the reports that Company Officers use have already been created. The disadvantage of this tool is that it is somewhat tedious and confusing to create a new query.

In order to simplify the report generation process through the Ad Hoc Query, MIDS recently added a Company Officer Summary Information page (see Figure 3).

This page contains 15 frequently used reports by Company Officers. It allows the user to summarize information on a single Company of midshipmen based on the category selected, and it provides a more user-friendly atmosphere than the Ad Hoc Query. This Summary Information page and the Ad Hoc Query are the only two methods of creating a report that compares the same information on different midshipmen.

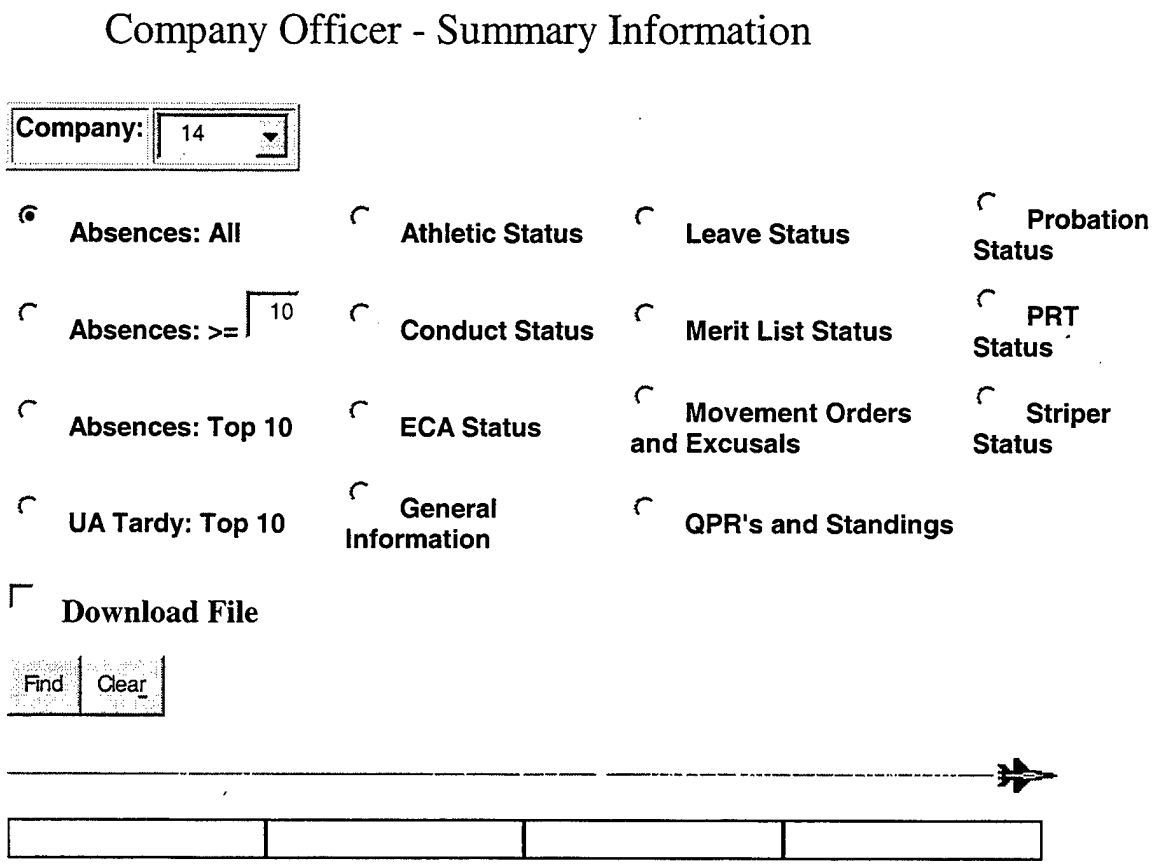

Figure 3: Company Officer - Summary Information Page

D. CHAPTER SUMMARY

This chapter reviewed several strategies of performance measurement and how they apply at the Naval Academy. The Balanced Scorecard approach by Kaplan and Norton is currently the basis for most performance measurement theories used by successful organizations in both the private and public sectors. This theory was used in

completing the NPR's summary of the best practices in performance management. Chang and DeYoung's Measurement Linkage Model is the theory behind the development of COMIS. COMIS was developed as a performance measurement tool for Company Officers at the Naval Academy. Through Company Officer interviews, researchers developed a list of Key Result Areas and Key Indicators, which determined the design of the COMIS database. Most of the data for COMIS comes from MIDS. This chapter also examined the recent improvements of MIDS and the future plans for it. The remaining chapters of this research will focus more closely on the capabilities of COMIS, and on the Company Officers' opinions of it.

III. RESEARCH METHODOLOGY

A. INTRODUCTION

The purpose of this research is to analyze the existing COMIS software program. The research methodology is divided into three main areas. The first area involves a review of current trends in performance measurement and a thorough examination of the capabilities of the COMIS prototype. Because COMIS gets most of its data from MIDS, MIDS is also reviewed. Having a grasp of recent developments in performance measurement is essential for recognizing useful feedback. With current performance measurement knowledge, the purpose of COMIS and the role it plays for Company Officers is better understood. Reviewing the COMIS prototype also provides a solid knowledge of its capabilities and of its advantages and disadvantages.

The second major area of research methodology involves creating and presenting a demonstration to Company Officers about the current and proposed functionality of COMIS. This demonstration generates the Company Officers' opinions about COMIS that are essential for this research. Before they can provide honest feedback about COMIS, Company Officers need to see the full potential of the prototype in the same environment that it is intended to be used—their individual offices.

The final area of research methodology involves gathering feedback from Company Officers. In order to effectively analyze COMIS, feedback must be obtained directly from the individuals who will use it. A short survey gathers this feedback, and the survey results are analyzed with SPSS. In order to accurately capture the impressions and opinions of the Company Officers, this survey is conducted immediately following

the COMIS demonstration. The results of this survey help generate conclusions and recommendations for follow on research of COMIS.

B. RESEARCHING PERFORMANCE MEASUREMENT

The first step in analyzing COMIS is to conduct an in-depth review of current performance measurement. There are many theories of performance measurement, and not all are reviewed in this thesis. Only the most current studies and the most applicable theories are reviewed. Chang & DeYoung's Measurement Linkage Model is included because it provides the framework for the original COMIS research. The Balanced Scorecard concept is also included because it is increasingly used by public sector agencies. A recent 1999 study by the NPR uses the Balanced Scorecard technique to help define the best practices in performance measurement.

The second step of researching COMIS is to study its current functions and capabilities. The reasons for this are twofold. First, the ending point of previous research must be known in order to determine the starting point for this research. Secondly, Company Officers require an in-depth demonstration of the capabilities of COMIS in order to produce useful feedback.

Finally, MIDS is researched to determine the extent of its development. MIDS is a continuously growing database, and it is important to know all its functions relating to performance measurement. As MIDS matures, it may begin to incorporate similar data and functionality as COMIS, which would require an update to COMIS' data tables.

C. DEMONSTRATING COMIS TO COMPANY OFFICERS

The initial plan of this research was to incorporate actual MIDS data into COMIS, so that Company Officers could test the COMIS prototype using recognizable data from midshipmen within their respective companies. They would then be able to comment on COMIS' effectiveness. However, the existing prototype design could not support this evaluation. Because the core of this research is based on Company Officer feedback, another method for generating this feedback has been developed. A demonstration of the COMIS prototype using sample data is used instead, and the feedback from Company Officers is based on this demonstration. This new methodology assesses the prototype based on its potential instead of its actual performance.

In order to get an accurate reflection of overall Company Officer feedback, a random sample of Company Officers are surveyed. The sample size is 20, and it includes 2 O-4's, 3 females, 1 SEAL, 4 aviators, 5 submariners, 6 surface warfare officers, and 5 Marines. Each of the six battalions is represented by at least two Company Officers; most are represented by three or more. The Company Officers surveyed have a wide range of computer skills as well as a diverse affinity to MIDS. The sample size and composition is broad enough to adequately cover all different types of feedback expected from the entire population of Company Officers.

The demonstration consists of the COMIS prototype created by Boone, Hagen, and Utroska in 1999. It also includes Microsoft PowerPoint slides of the pages that are not yet created and linked in the prototype—the Help Manager, Search Manager, File Utilities Manager, and Report Manager pages. Sample midshipmen data already exist in the COMIS prototype to aid in displaying the functionality of the program. Sample

reports also exist in the COMIS prototype. Company Officers are given the survey to review prior to the demonstration so that they can better focus their thoughts during the presentation.

The COMIS demonstration was downloaded to each Company Officer's desktop computer, in order to mimic the same environment in which he or she would use COMIS. The prototype worked perfectly on all but four of the Company Officers' computers. In these four cases, Microsoft Access 2000 was unable to open the COMIS prototype correctly. Each of the separate forms of COMIS existed; however, the links connecting them did not work properly. This detracted from the overall user friendliness of the COMIS prototype, but the problem was explained to each of the Company Officers involved, and they accounted for it when they completed their surveys.

During the demonstration, each of the KRA's and their respective KI's are also covered. Company Officers are asked to comment on any additional KI's they feel should be included. The survey includes a comments section for this type of information. Overall, Company Officers support COMIS development, although there are a few individuals who feel it is unnecessary. These results are covered in more detail in the following chapter.

D. DEVELOPING A SURVEY

As previously mentioned, a survey is used as the tool for gathering Company Officer feedback about COMIS. The information presented in the demonstration determined the content of the survey. It is designed to compile two different categories of information. The first category captures the overall opinions of Company Officers

about COMIS, while the second category focuses on specific attributes of COMIS. The complete COMIS Survey for Company Officers is included as Appendix A.

1. Survey Format

The survey includes 25 total questions in three separate sections. The first section targets overall Company Officer impressions of COMIS and how much they would use it. It includes 10 statements to be ranked on a scale from 1 to 5, where 1 = "Strongly Disagree," and 5 = "Strongly Agree." The second section has the Company Officers rank each of the 15 different pages shown in the COMIS demonstration. This scale also went from 1 to 5, where 1 = "Worthless, I would not use this page," and 5 = "Perfect, page has everything I need." The final section of the survey is a "Comments Section" for any additional recommendations that Company Officers may have about COMIS. It is also used for explanations of any positive or negative remarks from the previous two sections. The entire survey is only two pages long; short enough to not intimidate Company Officers by intruding on their time, yet long enough to be effective in obtaining accurate feedback.

2. Explaining the Survey Questions

Each of the initial 10 statements in Section A of the survey has its own specific purpose. Listed below are the statements and the meanings behind them.

1. **COMIS is a useful performance measurement tool.** This statement targets Company Officers' initial reactions on whether or not they think COMIS is useful.

2. **I would use COMIS for measuring midshipmen performance.** This statement determines whether the COMIS demonstration is appealing enough to make Company Officers change their current method of measuring performance.

3. **COMIS has all of the key indicators I need to adequately measure midshipmen performance.** This determines the completeness of the information within the COMIS prototype and also reveals any changes in performance measurement theory at USNA from previous research.

4. **COMIS is user-friendly.** Self-explanatory.

5. **COMIS is easier to use than MIDS in performance measurement of midshipmen.** Statements 5 and 6 compare COMIS to MIDS strictly in the realm of performance measurement, not in overall features. The intent of COMIS is not to replace MIDS, but rather to enhance it. This statement focuses on ease of use.

6. **COMIS is more functional than MIDS in performance measurement of midshipmen.** This is the same as statement 5 above, but it compares the functionality between the two.

7. **COMIS should be incorporated into the Company Officer module of MIDS, instead of being developed as its own program.** This targets Company Officers who favor the idea of "one-stop shopping" for getting midshipmen performance information. Company Officers who are familiar with and prefer the layout of MIDS, yet still like the idea of COMIS would agree with this statement. In order for this situation to occur, however, the MIDS database managers would have to take COMIS research on board and create a similar program within MIDS.

8. **If I used COMIS, I would still need additional information from MIDS to adequately measure midshipmen performance.** This is similar to statement 3, but it emphasizes using both COMIS and MIDS for performance measurement.

9. **COMIS development should continue so it can be used by Company Officers.** This statement reveals Company Officer support for COMIS.

10. **A performance measurement tool other than COMIS should be developed for Company Officers.** This reveals Company Officer support for an alternate performance measurement program because of dissatisfaction with the COMIS prototype.

Section B of the survey is designed to determine which pages within COMIS need improvements. The results from this section will also aid future research by directing the focus of efforts for improving the prototype. These pages are ranked based on the

usefulness of the information found on them, not by their looks or appeal. Ultimately, the results show which pages should be kept and which pages should be removed from the COMIS prototype.

E. CHAPTER SUMMARY

This chapter has described three main areas of research methodology required in this thesis. The first area involves a review of performance measurement theory and of the COMIS software. The second area includes creating a demonstration of the potential of COMIS and presenting it to a sample group of Company Officers. Finally, the third area involves gathering feedback from Company Officers about their opinions of COMIS through the use of a survey. The results of this survey are critical in deciding what type of performance measurement system Company Officers at the U.S. Naval Academy will use for their midshipmen, and the results are especially important to anyone conducting follow-on research about COMIS. The following chapters analyze and summarize the results of this survey. They also recommend a course of action to complete the development of COMIS.

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IV. DATA ANALYSIS AND SURVEY RESULTS

A. INTRODUCTION

This chapter analyzes the responses from the COMIS Survey for Company Officers. Company Officers answered twenty-five different questions about the COMIS prototype and gave recommendations for its improvement. The surveys were collated, the data was recorded into a statistical software package (SPSS), and it is presented in the following sections. This chapter is divided into two sections. The first section analyzes the mean score for each question in Parts A and B of the survey. The second section looks at the survey more closely. It studies each individual question from Parts A and B and highlights Company Officer responses for them. It also summarizes the suggestions that Company Officers have for improving COMIS.

B. DATA ANALYSIS

The data for this thesis are the opinions and suggestions of Company Officers regarding the COMIS prototype. Twenty of the thirty total Company Officers at the Naval Academy were given a demonstration of the capabilities of COMIS. They then recorded their impressions on a survey. The Company Officers represented each of the six battalions at the Academy and each of the four major line officer designations (Surface Warfare, Aviation, Submarine Warfare, and Marine Corps). This sample of Company Officers offers a variety of leadership styles, and a corresponding variety of opinions toward COMIS.

The survey consists of three parts, Part A, Part B, and Part C. Part A is 10 questions long and is designed to capture the overall impressions that Company Officers have about COMIS. Each statement has five possible responses:

1. Strongly Disagree
2. Disagree
3. Neither Agree nor Disagree
4. Agree
5. Strongly Agree

Part B is 15 questions long, and each of these questions is about a specific page within COMIS. These pages are ranked based on the usefulness of the information found on them. Again, there are five possible responses:

1. Worthless, I would not use this page.
2. Bad, page is missing substantial information or has too much unnecessary information.
3. Average, page has some information I need and some I do not.
4. Good, page needs only minor changes.
5. Perfect, page has everything I need.

Part C is a section for comments, used to amplify information about any extreme marks from Parts A or B. It also records suggestions that Company Officers have about improving COMIS.

Tables 1 and 2 display the minimum, maximum, and mean scores for the questions in Parts A and B respectively. The minimum and maximum scores are the lowest and highest scores from any of the Company Officers for each particular question. The mean score is the average score per question from all of the Company Officers combined. In Part A, the higher the mean score, the more Company Officers, on average, are in agreement. If the mean score is greater than or equal to 4.0, it means that, on average, Company Officers agree with the question. If the mean score is between 2.0 and 4.0, it means that, on average, Company Officers neither agree nor disagree with the

question. If the mean score is less than or equal to 2.0, it means that, on average, Company Officers disagree with the question. In Part B, the higher the mean score, the more Company Officers, on average, feel that the information on that particular page of COMIS is useful. If the mean score is greater than or equal to 4.0, it means that, on average, Company Officers find the page to be good or perfect. If the mean score is between 2.0 and 4.0, it means that, on average, Company Officers find the page to be of average usefulness. If the mean score is less than or equal to 2.0, it means that, on average, Company Officers find the page bad or worthless.

Part A reveals that the mean Company Officer score is in agreement (mean score $\geq$ 4.0) with four of the ten statements. Company Officers, on average, agree that (1) COMIS is a useful performance measurement tool, (2) COMIS is user-friendly, (3) COMIS should be incorporated into the Company Officer Module of MIDS instead of being developed as its own program, and (4) COMIS development should continue so it can be used by Company Officers. These four statements are summarized by stating that Company Officers feel COMIS is useful and easy to use, but it is missing some items and requires improvement, and this would be best accomplished by making COMIS a module of MIDS. The highest mean score is 4.35 with the statement that COMIS development should continue. The lowest mean score is 2.10 with the statement that a performance measurement tool other than COMIS should be developed for Company Officers. Zero of the ten statements in Part A receive a mean score less than or equal to 2.0; four receive a mean score greater than or equal to 4.0. Company Officers, on average, neither agree nor disagree with the remaining six of the ten statements in Part A.

In Part B, Company Officers rank every page in COMIS as average or above (mean score > 2.0). The Tip of the Day page receives the lowest mean score of 2.90. Three of the pages are averaged as good or perfect (mean score ≥ 4.0) by the Company Officers. They are the View Single Records Page, the Professional Development Page, and the Physical Development Page. The survey data show that Company Officers like the overall idea of COMIS. The prototype is useful in measuring midshipmen performance, and it is user-friendly. Of course improvements need to be made, but the majority of Company Officers feel this research should continue and not be left unattended.

Descriptive Statistics: COMIS Survey for Company Officers, Part A

	N	Min.	Max.	Mean
COMIS is a useful performance measurement tool.	20	1	5	4.05
I would use COMIS for measuring midshipmen performance.	20	1	5	3.80
COMIS has all the KI's I need to adequately measure midshipmen performance.	20	1	5	3.45
COMIS is user-friendly.	20	3	5	4.00
COMIS is easier to use than MIDS in performance measurement of midshipmen.	20	1	5	3.60
COMIS is more functional than MIDS in performance measurement of midshipmen.	20	2	5	3.85
COMIS should be incorporated into the Company Officer module of MIDS, instead of being developed as its own program.	20	1	5	4.05
If I used COMIS, I would still need additional information from MIDS to adequately measure midshipmen performance.	20	2	5	3.10
COMIS development should continue so it can be used by Company Officers.	20	3	5	4.35
A performance measurement tool other than COMIS should be developed for Company Officers.	20	1	4	2.10
Valid N (listwise)	20			

Table 1: Descriptive Statistics of COMIS Survey, Part A.

Descriptive Statistics: COMIS Survey for Company Officers, Part B

	N	Min.	Max.	Mean
View single records page	20	3	5	4.00
View squad stats page	20	2	5	3.75
View platoon stats page	20	1	5	3.55
View company stats page	20	1	5	3.45
Mental development page	20	1	5	3.70
Moral development page	20	1	5	3.80
Professional development page	20	3	5	4.05
Physical development page	20	2	5	4.05
Privileges page	20	2	5	3.70
Report manager page	20	2	5	3.80
Search manager page	20	2	5	3.60
Welcome page	20	1	5	3.50
Tip of the day page	20	1	5	2.90
Help manager page	20	2	5	3.80
File utilities manager page	20	2	5	3.70
Valid N (listwise)	20			

Table 2: Descriptive Statistics of COMIS Survey, Part B.

C. SURVEY RESULTS

Company Officers have a variety of opinions about COMIS. Some like certain functions more than others. Some feel that COMIS is an important asset to the job of a Company Officer, while others feel it detracts from leadership ability. This section looks at the individual responses to each of the COMIS survey questions, and it highlights the comments of Company Officers. A copy of the frequency tables for the COMIS Survey for Company Officers is in Appendix C.

1. Part A, Overall Statements about COMIS.

a. COMIS Is A Useful Performance Measurement Tool.

As mentioned in the previous section, the average score by Company Officers is in agreement with this statement. Only one Company Officer (5%) disagrees with this statement to any extent, while 18 (90%) others either agree or strongly agree. One Company Officer in favor of COMIS states, "All of the information in COMIS is very useful and well organized." The Company Officer against COMIS mentions, "COMIS is just a duplicate of MIDS. It does not measure anything; rather, it just maintains information on a midshipman. The majority of information in COMIS is information a Company Officer should already know without having to look it up." Another states, "The information is useful, but it is a bit of overkill that doesn't equate to better development." A third Company Officer recommends that COMIS should incorporate some type of quantitative total multiple for performance measurement like Overall Order of Merit (OOM), but OOM is not the end-all-be-all answer. This recommendation would require substantial follow-on research.

b. I Would Use COMIS For Measuring Midshipmen Performance.

Thirteen (65%) Company Officers agree with this statement, while four (20%) disagree. Company Officers would use COMIS because it provides a convenient source of performance data about their midshipmen. There are two main reasons that Company Officers would not use COMIS. The first is because they feel COMIS depersonalizes the job of a Company Officer. It makes it easy for the leader to minimize his or her contact with the midshipmen, and prevents the leader from getting to know

them. One Company Officer mentions, "There are subtle intangibles [of performance] that are missed by not getting out and knowing your people." The second main reason for not using COMIS is because of the problem with manually entering data. Someone must manually enter data that cannot be extracted from MIDS into the COMIS data tables. If midshipmen enter the data, then it becomes just one more tasking for their already busy schedule. Company Officers' time is just as valuable. Manually entering data also raises the question of accuracy; however, any form of data in a computer database must be manually entered at some point. Having midshipmen manually enter data into COMIS is no different than having midshipmen manually enter in excuses for their absences or tardiness from their classes. Midshipmen squad leaders already keep a squad leader's notebook to track the performance of their people. COMIS could provide squad leaders with an electronic version of this notebook, and the information in it would be stored in the COMIS database for other functions as well.

c. COMIS Has All Of The Key Indicators I Need To Adequately Measure Midshipmen Performance.

Just over half (60%) of the Company Officers agree with this statement, and only three (15%) disagree. Those in favor like the fact that Company Officers were involved in the initial research, specifically in creating the list of KRA's and KI's. In this aspect, COMIS keeps the user in mind. One opponent to this statement feels that "collating data on midshipmen under one single program is a good idea; however, there is no substitute for daily observation/interaction with midshipmen in measuring performance." However, COMIS never intended to replace daily interaction. A good performance measurement system does not replace good leadership; rather, it enhances

the leader's ability to keep track of his or her people. The NPR (1999) emphasizes the relationship between an organization and its employees in its study of the best practices of performance measurement. Organizations must listen to their employees and partner with them. A Company Officer still needs to get out and know his or her midshipmen. Another comment about this statement is that bearing and attitude, as seen by the Company Officer on a daily basis, are two KI's missing from COMIS.

d. COMIS Is User-Friendly.

Sixteen (80%) Company Officers agree that COMIS is user-friendly. The remaining four (20%) neither agree nor disagree. No one finds COMIS too hard to use, although one Company Officer feels that COMIS is somewhat time intensive to learn and has too many pages. The majority of Company Officers find the COMIS prototype easy to navigate, and easy to locate information. One Company Officer mentions that COMIS would be very useful during counseling sessions because it is easy to scroll through the four KRA pages and identify a midshipman's strengths and weaknesses.

e. COMIS Is Easier To Use Than MIDS In Performance Measurement Of Midshipmen.

Eleven (55%) Company Officers agree with this statement, and 7 (35%) are indifferent. Those in agreement feel that COMIS appears more user-friendly than MIDS, and that the data presentation is much better in COMIS than in MIDS. One Company Officer states, "Using the tabs is easier than screening down an entire page to find data." Opponents, on the other hand, do not like the drop down boxes in COMIS. Replacing them with a matrix presentation like in MIDS would be better so the Company Officer can see everything in front of him or her at once.

f. COMIS Is More Functional Than MIDS In Performance Measurement Of Midshipmen.

One (5%) Company Officer disagrees with this statement. The majority (65%) of Company Officers agree that COMIS is more functional than MIDS in performance measurement of midshipmen. One Company Officer mentions, "COMIS has an advantage over MIDS in the data it presents and in its functionality."

g. COMIS Should Be Incorporated Into The Company Officer Module Of MIDS, Instead Of Being Developed As Its Own Program.

Sixteen (80%) Company Officers agree to some extent, and only three (15%) disagree. As mentioned in the previous section, the average score by Company Officers is also in agreement with this statement. This statement was one of only four statements in Part A with an agreement percentage of 80% or higher. The overall opinion of Company Officers is that COMIS should be used to help change MIDS. This would combine the two separate programs into one convenient location for all of the performance data Company Officers need to adequately measure their midshipmen.

h. If I Used COMIS, I Would Still Need Additional Information From MIDS To Adequately Measure Midshipmen Performance.

This statement has the most balanced response of all the statements in Part A: seven (35%) Company Officers agree with it, seven disagree, and six (30%) neither agree nor disagree. Those Company Officers in agreement with this statement feel that the information in COMIS is adequate to measure midshipmen performance. Those in disagreement, comment that the historical data presentation in MIDS is useful to analyze trends in midshipmen performance.

i. COMIS Development Should Continue So It Can Be Used By Company Officers.

Sixteen Company Officers (80%) feel COMIS development should continue, so they can use it in the future. No one feels that COMIS development should cease. This statement is only the second statement in Part A that has at least an 80% agreement rate with zero disagreements. Company Officers feel the prototype is a good idea, but it needs work. One comment is, "COMIS is a step in the right direction that will be most effective when the Company Officer/Senior Enlisted does not have to worry about manual updates to the information [not extracted from MIDS]."

j. A Performance Measurement Tool Other Than COMIS Should Be Developed For Company Officers.

One (5%) Company Officer agrees with this statement, and 13 (65%) disagree with it. The majority of Company Officers feel that if research is to be continued in developing a performance measurement tool, it should be focused on COMIS or something very similar. No one is interested in starting new research from scratch.

2. Part B, Usefulness of Individual Pages within COMIS.

a. View Single Records Page.

Zero Company Officers mark this page bad or worthless, and only two find it average. Eighteen (90%) Company Officers feel that the information on this page is useful and that the page needs only minor changes or none at all. Two Company Officers feel the "Confidential Comments" tab on this page is a great idea, but that it could be larger. Company Officers also like the photograph feature. Two

recommendations for improvements to this page are to include a tab for Movement Orders and Excusals, and to include on the Grades tab a block for the average section grade of an instructor. This would allow comparison of a specific midshipman's grade to the grades of the others in his or her class.

b. View Squad Stats Page.

The Squad Stats Page has a 70% approval rate and a 10% disapproval rate. All three stats pages are very similar and generate the same comments. There are two main requests to improve these pages. The first is to include averages for the statistic displayed along with the bar graph. Five Company Officers mention this. The second request is to allow for other data to be compared (i.e. SQPR, CQPR, Fourth Class pro quiz scores, class standings, absences, tardiness, number of conduct offenses, PRT scores, room/personnel inspections, etc.) instead of just displaying grade point average. Any quantifiable data found in the COMIS database should have the capability of being displayed on the stats pages.

c. View Platoon Stats Page.

Twelve (60%) Company Officers feel this page is good or perfect, and only three (15%) find it bad or worthless. The same remarks from the Squad Stats Page apply to this page. Company Officers like these two pages because squad and platoon data is important and useful for midshipmen leaders, and currently MIDS does not generate any reports at these levels.

d. View Company Stats Page.

Twelve (60%) of the Company Officers feel this page is good or perfect, but five (25%) feel it is bad or worthless. The problem with the Company Stats Page is that it needs to be fully developed. The COMIS prototype uses a different format for this page than for the platoon and squad stats pages. These three pages need to be the same.

e. Mental Development Page.

All four of the KRA pages receive high marks from Company Officers. Sixteen (80%) like the Mental Development Page and only two (10%) do not. The biggest Company Officer recommendation for improving this page is to include some form of grade point average (GPA), as GPA is one of the KI's associated with Mental Development. Several Company Officers also recommend including the midshipman's name along with the alpha code. Other recommendations are to list all ECA's in a matrix as opposed to a pull down menu, and to add EI sessions and quiz scores. Finally, one Company Officer feels that academic trend information would be useful on this page to assist Company Officers in determining the level of output of a particular midshipman.

f. Moral Development Page.

Only 15 (75%) Company Officers think this page is good or perfect, yet only one (5%) finds it worthless. The biggest argument against this page is that moral development is almost impossible to measure. One comment is, "[At the Academy], each midshipman is judged moral until proven otherwise, so how does one determine moral development?" Recommendations for this page are to add the midshipman's name along

with his or her alpha code, and to create a chart of all conduct offenses like MIDS, instead of using one page per offense.

g. Professional Development Page.

The Professional Development Page is another page of COMIS that has zero marks against it. It also has the highest mean score (4.05) from Company Officers. Eighteen (90%) Company Officers find this page good or perfect. Those who find that it needs only minor changes make several recommendations. The first is to add striper positions and other leadership positions (team captain, club president, etc.) to the page. Next is to include summer cruise grades and any awards, Letters of Commendation, or Letters of Appreciation. A third recommendation is to include historical data for Fourth Class pro quizzes, MAPR's, absences, and Professional grades. Linking this page with the database from the Professional Development Department would alleviate manually entering service selection data. The final recommendation for this page is to include ECA's.

h. Physical Development Page.

The Physical Development Page shares the highest mean score (4.05) of all the pages in COMIS with the Professional Development Page. Eighteen Company Officers (80%) like this page, and only one (5%) does not. Five Company Officers recommend that a history of medical chits be included on this page instead of just the most recent. This historical file would allow Company Officers to track "chit-riders"—those midshipmen who always seem to be sick for drill, inspections, or after weekends. The second biggest request is to list the sport or intramural of each midshipman, and to

include the sports that are currently in season. Historical PRT data is another common request, and this could be achieved by adding a tab to the top of the page.

i. Privileges Page.

The Privileges Page is not yet created, so Company Officers scored it based on its potential. Only one (5%) does not approve of the page, and 12 (60%) think it will be good or perfect. Company Officers are eager to have a liberty tracking system, because eligibility for liberty is currently one of the most confusing and complex regulations at the Academy. Under the current regulation, midshipmen are authorized different liberty depending on their rank, their conduct performance, their academic standing, their company PRT average, and their company grade point average. All of this information is currently stored in the COMIS database, so completing the Privileges Page should not be difficult. Because liberty policies change with each Commandant, this page would also have to be updated to reflect the current policy.

j. Report Manager Page.

Thirteen (65%) of the Company Officers find the Report Manager useful, and only one (5%) does not. One Company Officer likes it because it allows Senior Enlisted Advisors to have access. The current Ad Hoc Query function of MIDS does not allow access to Senior Enlisted Advisors. The most common recommendation for the Report Manager Page is to include an averaging function on the reports. The other big recommendation is to allow unlimited criteria for generating reports instead of just using five.

k. Search Manager Page.

One-half of the Company Officers think that the Search Manager Page is good or perfect; three (15%) feel it is bad or worthless. This page is intimidating because of the number of fields it has. One comment from the survey is to modify the data fields to make the Search Manager as user-friendly as the rest of COMIS. Another comment was, "Allow for 'plain English' searches."

l. Welcome Page.

Seven (35%) Company Officers approve of the Welcome Page, and only two (10%) do not. The remaining 11 Company Officers are indifferent. The Welcome Page is designed for the first time user to provide installation instructions, default details, and a tutorial; and it has the option of being hidden upon program startup (COMIS, 1999). Most Company Officers state that they would probably deselect this page and not use it.

m. Tip of the Day Page.

Seven (35%) Company Officers disapprove or feel this page is unnecessary, and six (30%) find it useful. The remaining 35% are indifferent. The Tip of the Day Page has the most evenly balanced scores of all the pages in Part B of the COMIS survey, and it also has the lowest mean score (2.9) of all the COMIS pages. This page is designed with user-friendliness in mind. It provides tip for using COMIS effectively. It can also be deselected so that it does not appear on start up (COMIS, 1999). Several Company Officers feel this page is useful for the initial few applications of COMIS, but after that they would deselect it.

n. Help Manager Page.

Twelve (60%) Company Officers find this page good or perfect, and only one (5%) finds it bad. This is another page designed to make COMIS as user friendly as possible. The Help Manager Page is not yet linked in the COMIS prototype, so Company Officers did not have a chance to test it in depth. Instead, they based their answers on its potential.

o. File Utilities Manager Page.

The majority of Company Officers (60%) find the File Utilities Manager Page useful, and only two (10%) find it bad or worthless. This page is also not yet linked in COMIS, so Company Officers scored it based on its potential. Of the five maintenance functions on this page, Company Officers feel that they would use the Backup Function the most. The other functions (Repair, Compact, Upgrade, Compile) are not designed for regular use by Company Officers. These pages are only required when the COMIS database manager directs it.

3. Additional Company Officers Requests for COMIS

The survey results show that Company Officers like the overall idea of COMIS, but that there is room for improvement. This section discusses some of the other recommendations that Company Officers listed in Part C of the COMIS survey. The most common recommendation of all the Company Officers is to incorporate COMIS into MIDS. Company Officers want to go to one location for checking midshipmen data and measuring performance. One Company Officer refers to this as "one-stop shopping." The next biggest overall recommendation is to include some form of trend analysis

within COMIS. Trend analysis allows Company Officers to catch midshipmen before they fall below standards. It could be for specific KI's like grades, PRT, or performance, or the trend analysis could be for entire KRA's. One Company Officer suggests that creating flags or tripwires to alert Company Officers or Senior Enlisted Advisors when a midshipman is absent, tardy, or has unsatisfactory grades would assist in trend analysis.

One logistical recommendation to improve the COMIS prototype is to have a separate COMIS workstation so that midshipmen can enter data and not tie up their Company Officer's computer. The midshipmen chain of command could then keep the COMIS data tables current. One Company Officer suggests cross-referencing class absences with Movement Orders and excusals, in order to alleviate some of the work done by the midshipman academic officer, and another suggests inputting training received or missed into COMIS for accountability purposes. These two recommendations, however, are focused more on management and record keeping and do not affect performance measurement. The final recommendations by one Company Officer involve connecting COMIS to the current system of performance measurement. He suggests that COMIS should be able to scan and interpret counseling sheets. He also suggests adding a feature to COMIS that will make COMIS data compatible and transferable to a fitness report. The fitness report is currently used as the formal documentation of a midshipman's performance, and it uses similar criteria as the data found in COMIS.

E. CHAPTER SUMMARY

COMIS has come a long way since its creation, but it has room to grow. Company Officers need to be active participants in the development of any performance

measurement tool, whether it is COMIS or a module of MIDS, because they will ultimately be the ones using it. The COMIS Survey for Company Officers was created in order to accurately capture the responses and opinions of Company Officers about COMIS. This chapter revealed those results in two formats. The average score for each question was revealed and the responses of each question were analyzed. This data can now be used to make recommendations for the future of COMIS development. The following chapter provides conclusions about COMIS and gives recommendations for future research.

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V. CONCLUSION AND RECOMMENDATIONS

A. CONCLUSION

This research examined the capabilities of the Company Officer Management Information System (COMIS) prototype. COMIS is a performance measurement tool designed for Company Officers at the United States Naval Academy to measure the performance of their midshipmen. It is based on the Measurement Linkage Model™ by Chang and DeYoung, and it uses Company Officer inputs in the generation of its Key Result Areas and corresponding Key Indicators. The COMIS prototype was created in 1999, but it was never tested. This thesis took the existing prototype to the current Company Officers at the Academy and gathered their opinions about COMIS and their recommendations for improving it.

Research for this thesis entailed an extensive review of current performance measurement theories for both the private and public arenas. Previous research on performance measurement at the Naval Academy was also reviewed. In order to gather Company Officer feedback, a survey was created about the existing COMIS prototype. This survey was given to twenty Company Officers following a demonstration of the capabilities of COMIS. Company Officers ranked the overall prototype and each individual page within it. They also provided recommendations for improving the COMIS prototype.

The survey results were broad, yet there were several majority opinions that were recognizable. Company Officers feel that COMIS is a useful performance measurement tool and that its development should continue so they can eventually use it. They also

find the COMIS prototype user-friendly, but they would rather see COMIS incorporated into a module of MIDS. Not all of the pages in COMIS are fully functional, and Company Officers remarked that these pages obviously should be completed. The pages that Company Officers liked best were the View Single Records Page and the four KRA pages (Professional Development, Physical Development, Mental Development, and Moral Development). These pages are the backbone of the COMIS program. This survey verified that an interest in performance measurement, specifically in COMIS, exists among Company Officers at the Naval Academy. The biggest point to emphasize before fully incorporating COMIS into the Academy is that COMIS is not designed to replace good leadership or human interaction between Company Officers and midshipmen. There is much to be gained from these actions. COMIS is merely intended to assist the Company Officer in measuring midshipmen performance. It provides a single location where a Company Officer can quickly find all of the relative performance information about each midshipman. COMIS will ultimately make the job of a Company Officer easier by providing him or her with more time to be a good leader.

In order to successfully incorporate COMIS into the Academy, a COMIS database manager will be required. This manager could be a student in the LEAD program, or it could be a full-time employee from the IT department. The role of the COMIS database manager will be twofold. The first role will be to ensure that the COMIS "Design Master" program, or main COMIS replica (Boone et al., 1999, p.108), is fully functional and up-to-date. The second role will be to instruct Company Officers on how to use COMIS and to answer any questions or solve any problems they might have with COMIS. The COMIS database manager will have tremendous responsibility because if

the main COMIS replica is not functioning or if Company Officers do not know how to use COMIS, then the program will just become a waste of computer space. Company Officers will not see the full potential of COMIS, and they will feel that it is more of a burden on their time than a useful tool that can assist them. The Commandant of Midshipman also stated his concern that this program must work flawlessly and be dependable if it is instituted at the Academy (S. Locklear, personal communication, January 24, 2000).

A reliable feedback method is essential to assist the COMIS database manager. Without feedback from the end users, the database manager can only assume that everything is working perfectly. One method of feedback would be to create an Email account for the COMIS manager. Company Officers would then be able to send any questions or suggestions directly to the manager who would check his or her Email regularly. This would ensure a quick response time. One example of a department at the Academy that uses this method is the Professional Development (PRODEV) Department. PRODEV uses an Email account, LUCEFIX, to report any computer/network problems, and it works very effectively. The following subsection discusses some recommendations for follow-on research to ensure that COMIS remains a useful tool for the Academy.

B. RECOMMENDATIONS FOR FUTURE RESEARCH

Performance measurement is a continuously evolving process; so is information technology (IT). With this in mind, COMIS will never be a completed product. It will need to be refined to match current trends in performance measurement, and it will need to keep up with the latest steps in IT. In conjunction with the ever-changing needs of a

computer-based performance measurement system, this thesis provides five areas to be considered for future research.

1. **Incorporate COMIS into a module of MIDS.** MIDS falls under the purview of the IT department at the Academy. Follow-on research would entail getting the administration to buy into the value of COMIS. A student in the LEAD program could assist the IT department in incorporating COMIS into MIDS. Given the opportunity, a prospective Company Officer with a solid background in performance measurement knowledge combined with the database knowledge of the IT department could produce an outstanding performance measurement tool. This avenue of research is also worth pursuing because many of the future plans for MIDS include items already in the COMIS database (i.e. platoon/squad information, service selection data, height/weight/body fat, digital photograph, etc.)

2. **Examine how OOM is calculated and modify it to incorporate data interchangeable with the KRA's and KI's of the Measurement Linkage Model™ used by COMIS.** OOM is one current measure of midshipmen performance at the Academy. It is affected primarily by academics, but other items such as conduct and military performance are included as well. The overall performance indicator should be indicative of the performance measurement theory and tools being used in an organization.

3. **Develop a trend analysis function of COMIS.** Trend analysis could be at the KI level or it could be at the KRA level. Either way, it would assist Company Officers in identifying midshipmen before they fell below standards.

4. **Create data extraction program to download MIDS data into the COMIS database.** This avenue of research would only be necessary if COMIS remained a stand-alone system and was not incorporated into MIDS.

5. **Upgrade COMIS to include Company Officer recommendations from the COMIS survey.** This thesis provides all of the Company Officer recommendations for improving COMIS. Some of the more common recommendations are to include more information on some of the pages within COMIS (i.e. QPR on Mental Development Page and Sports on Physical Development Page); to show historical data for items like the PRT, grades, conduct offenses, and medical chits; and to create an averaging function for the stats pages and the Report Manager.

Performance measurement is an important part of leadership and management in any organization. The Naval Academy is a federally funded organization that must prove

its worth to the American public, and COMIS, or some other form of a performance measurement tool, will help the Academy do this. A performance measurement tool like COMIS will assist Company Officers in their role of developing midshipmen into the future officers of the Navy and Marine Corps.

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APPENDIX A. COMIS SURVEY FOR COMPANY OFFICERS

Part A. For the following questions, circle your answers using the guide below:

1 Strongly Disagree
2 Disagree
3 Neither Agree nor Disagree
4 Agree
5 Strongly Agree

1.	COMIS is a useful performance measurement tool.	1	2	3	4	5
2.	I would use COMIS for measuring midshipmen performance.	1	2	3	4	5
3.	COMIS has all of the key indicators I need to adequately measure midshipmen performance.	1	2	3	4	5
4.	COMIS is user-friendly.	1	2	3	4	5
5.	COMIS is easier to use than MIDS in performance measurement of midshipmen.	1	2	3	4	5
6.	COMIS is more functional than MIDS in performance measurement of midshipmen.	1	2	3	4	5
7.	COMIS should be incorporated into the Company Officer module of MIDS, instead of being developed as its own program.	1	2	3	4	5
8.	If I used COMIS, I would still need additional information from MIDS to adequately measure midshipmen performance.	1	2	3	4	5
9.	COMIS development should continue so it can be used by Company Officers.	1	2	3	4	5
10.	A performance measurement tool other than COMIS should be developed for Company Officers.	1	2	3	4	5

Part B. Rank the usefulness of the information found on the following pages of COMIS based on the scale below:

1 Worthless, I would not use this page.
2 Bad, page is missing substantial information, or has too much unnecessary information.
3 Average, page has some information I need and some I do not.
4 Good, page needs only minor changes
5 Perfect, page has everything I need.

<u>View Midshipmen Records Page</u>

1.	View Single Record Page	1	2	3	4	5
2.	View Squad Stats Page	1	2	3	4	5
3.	View Platoon Stats Page	1	2	3	4	5
4.	View Company Stats Page	1	2	3	4	5

Enter/Update Performance Information Page					
1. Mental Development Page	1	2	3	4	5
2. Moral Development Page	1	2	3	4	5
3. Professional Development Page	1	2	3	4	5
4. Physical Development Page	1	2	3	4	5
5. Privileges Page	1	2	3	4	5
Report Manager Page	1	2	3	4	5
Search Manager Page	1	2	3	4	5
Welcome Page	1	2	3	4	5
Tip of the Day Page	1	2	3	4	5
Help Manager Page	1	2	3	4	5
File Utilities Manager Page	1	2	3	4	5

Part C. Use the space below to make any comments or recommendations you may have about COMIS. Explain any positive or negative marks from above.

APPENDIX B. COMPANY OFFICER MODULE PAGE

DOE 001234 Co: 14 Class: 00

Name:	John Doe	**Home Of Record:**	Anytown
SSN:	123456789	**State:**	MD
Status:	ACTIVE	**Former Alpha:**	
Date of Birth:	09-DEC-1976	**Former Military:**	
Upward Mobility Code:	NONE	**Gain Code:**	Gain From Another Officer Candidate Program
High SAT V:	680	**Proj Grad Date:**	24-MAY-2000
High SAT M:	600	**Service Assign:**	USMC PILOT
Advisor:	DECREDICO M A	**Major:**	HISTORY
Room Number:		**PO Box:**	13202
Academic Grade Disclosure - Congress:	NO	**Military Grade Disclosure - Congress:**	NO

Midshipmen entering "Yes" for "Academic Grade Disclosure - Congress" authorize disclosure of academic, performance and conduct grades to the nominating congressman. Midshipmen entering "Yes" for "Military Grade Disclosure - Congress" authorize disclosure of information concerning military performance, conduct offenses, and punishment awarded to the nominating congressman.

SPRING 2000 GRADES

Course	Section	6 Week	12 Week	End of Term	Exam	Course
ES420	1111	C	C			
FP326	2001	C	B			
HH360	3011	B	B			
HH362	3001	B	B			
NS404	4412	A	A			
PE427	0531					

Ac Yr Ending	Sem	SQPR	Proj CQPR	CQPR
2000	SPRING	2.87	2.92	

SCHEDULE

Title	Course	Section	Meeting Time	Building Room	Primary Instructor
WEAPONS SYSTEM ENGR	ES420	1111	MWF1,T12	MU121,RI078	DONEY
AMERICAN PRESIDENCY	FP326	2001	MWF2	MI211	BRATTEBO
HISTORY OF THE SOUTH	HH360	3011	TR9	CH202	DECREDICO
HISTORY OF THE MIDDLE EAST	HH362	3001	MWF3	MI112	TUCKER
JUNIOR OFFICER PRACTICUM (MARINE CORPS)	NS404	4412	MWF4	LU305	HANNER
GOLF	PE427	0531	W56	FH OPEN AREA	MIRANDA

Total Credits: 15 **Free Periods:** M 567 T 567 W 7 R 12567 F 567 S 1234567

ABSENCES AND EXCUSES

Course	Section	Meeting Date	Period	Absence Category	Minutes	Excuse Category	Excuse	Minutes
FP326	2001	14-JAN-2000	2	ABSENT		ABSENT	MISC (STRIPER DUTIES)	
FP326	2001	24-MAR-2000	2	TARDY	10	TARDY	UA (TARDY)	10
NS404	4412	14-JAN-2000	4	ABSENT		ABSENT	MISC (STRIPER DUTIES)	

Absent: 2
Tardy: 1
Left Early: 0

CONDUCT

Fall Total	Spring Total	Total Ac Year	Conduct Grade	Minor Offenses (35 Demerits or More) for Last 2 Semesters	Minor Offenses (35 Demerits or More) for Career	Major Offenses for Last 2 Semesters	Major Offenses for Career	Cumulative Demerits	Current Status
5	0	5		0	0	0	2	185	PROFICIENT

Record 1 of 1

CONDUCT OFFENSES

Case Number	Ac Yr Ending	Sem	Commit Date	Level	Demerits Award
001267	2000	FALL	24-SEP-1999	CLOSED CASE / FINAL DISPOSITION	5
002036	2000	FALL	03-NOV-1999	DISMISSED	
002771	2000	FALL	14-OCT-1999	DISMISSED	0
970057	1997	FALL	02-SEP-1996	CLOSED CASE / FINAL DISPOSITION	20
970058	1997	SPRING	14-MAY-1997	CLOSED CASE / FINAL DISPOSITION	100
970059	1997	SPRING	01-MAR-1997	CLOSED CASE / FINAL DISPOSITION	50
990191	1999	FALL	22-SEP-1998	CLOSED CASE / FINAL DISPOSITION	10

Records 1 to 7 of 7

PRT RESULTS

Ac Yr Ending	Sem	Exam Date	Curl Ups	Push Ups	Sit & Reach	Run	Optional Bike	Optional Swim	Score	Validated	Passed
2000	FALL	07-OCT-1999	88	101	PASSED	09:15			88.7	NO	YES
1999	SPRING	07-JAN-1999	101	101	PASSED	09:26			92.2	NO	YES
2000	SPRING	01-MAR-2000	96	101	PASSED	09:32			89.8	NO	YES

Records 1 to 3 of 3

INTRAMURALS/VARSITY SPORTS

Ac Yr Ending	Season	Sport	Participation Level	Letter Winner	National Team Championship	Captain	All American	Intramurals Manager	Intramurals Supervisor	Intramurals Coach	Intramurals Assistant	Intramurals Official	Start Date	P Mar
2000	SPRING	SOCCER (6SIDE)	INTRAMURAL	NO	NO	NO	NO	NO	NO	NO	NO	NO	09-FEB-2000	
2000	SPRING	RUGBY	CLUB	YES	NO	NO	NO	NO	NO	NO	NO	NO	24-MAR 2000	
2000	WINTER	STREET HOCKEY	INTRAMURAL	NO	NO	NO	NO	NO	NO	NO	NO	YES	05-NOV 1999	
2000	FALL	RUGBY	CLUB	YES	NO	NO	NO	NO	NO	NO	NO	NO	24-AUG 1999	
1999	SPRING	RUGBY	CLUB	YES	NO	NO	NO	NO	NO	NO	NO	NO	11-FEB-1999	
1999	WINTER	WEIGHTLIFTING	INTRAMURAL	NO	NO	NO	NO	NO	NO	NO	NO	NO	05-NOV 1998	
1999	FALL	RUGBY	CLUB	NO	NO	NO	NO	NO	NO	NO	NO	NO	24-AUG 1998	
1998	SPRING	RUGBY	CLUB	NO	NO	NO	NO	NO	NO	NO	NO	NO	10-FEB-1998	
1998	WINTER	WEIGHTLIFTING	INTRAMURAL	NO	NO	NO	NO	NO	NO	NO	NO	NO	06-NOV 1997	
1998	FALL	FLAG FOOTBALL	INTRAMURAL	NO	NO	NO	NO	NO	NO	NO	NO	NO	02-SEP 1997	
1997	SPRING	RUGBY	CLUB	NO	NO	NO	NO	NO	NO	NO	NO	NO	11-FEB-1997	
1997	WINTER	FIELD BALL	INTRAMURAL	NO	NO	NO	NO	NO	NO	NO	NO	NO	05-NOV 1996	

Records 1 to 12 of 12

MOVEMENT ORDERS

MO Code	Organization	Status	Proceed Date	Return Date	Reason	Destination City	State
M0000299	PRESIDENCY CLASS (FP326)	APPROVED BY OPERATIONS OFFICER	23-FEB-2000 0645	23-FEB-2000 1315	TO ATTEND A WHITE HOUSE WELCOMING CEREMONY FOR KING JUAN CARLOS OF SPAIN.	WASHINGTON	DC
M0000625	PRESIDENCY CLASS	APPROVED BY OPERATIONS OFFICER	02-APR-2000 0630	02-APR-2000 2000	TO SEE THOMAS JEFFERSON'S MONTICELLO IN CHARLOTTESVILL, VA	CHARLOTTESVILLE	VA
M0000570	MENS RUGBY	APPROVED BY OPERATIONS OFFICER	31-MAR-2000 1600	02-APR-2000 2000	FINALS OF THE FIRST ROUND OF THE NATIONAL TOURNAMENT HOSTED BY PENN STATE UNIVERSITY.	STATE COLLEGE	PA
M0000697	MENS RUGBY	APPROVED BY OPERATIONS OFFICER	09-APR-2000 0700	09-APR-2000 1800	CHERRY BLOSSOM RUGBY TOURNAMENT!	WASHINGTON DC	DC
M0000653	MENS RUGBY	APPROVED BY OPERATIONS OFFICER	08-APR-2000 0800	08-APR-2000 2000	CHERRY BLOSSOM RUGBY TOURNAMENT IN DC	WASHINGTON DC	DC

Records 1 to 5 of 5

EXCUSALS

EX Code	Status	Organization	Proceed Date	Return Date	Reason
E0000077	APPROVED BY OPERATIONS OFFICER	NS404 (MARINE)	08-FEB-2000 1145	08-FEB-2000 1315	MCWL BRIEF
E0000246	APPROVED BY OPERATIONS OFFICER	MENS RUGBY	15-APR-2000 0700	15-APR-2000 2000	SWEET 16 OF THE RUGBY NATIONAL TOURNAMENT.
E0000250	APPROVED BY OPERATIONS OFFICER	MENS RUGBY	16-APR-2000 0700	16-APR-2000 2000	SWEET-16 NATIONAL TOURNAMENT HOSTED AT USNA. ALL MEMBERS OF NAVY RUGBY NOT ACTUALLY PLAYING WILL BE IN KHAKI (SHORTS OR PANTS) AND BLUE RUGBY POLOS
E0000284	APPROVED BY OPERATIONS OFFICER	NS404 MARINE CAPSTONE	24-MAR-2000 1600	24-MAR-2000 1800	MARINE OCCUPATIONAL SPECIALTY INFORMATION BRIEF AND QUESTION/ANSWER SESSION INVOLVING OFFICERS AND SNCO'S OF THE YARD AND OUTSIDE ORGANIZATIONS.
E0000456	APPROVED BY OPERATIONS OFFICER	NS404	25-APR-2000 0530	25-APR-2000 0730	MARINE CORPS PFT

Records 1 to 5 of 5

MILITARY GRADES/STATUS

Ac Yr Ending	Sem	Conduct	PE	Perf	Academic Status
1997	SUMMER				
1997	FALL	A	B	A	
1997	SPRING	F	B	C	
1998	FALL	A	B	A	
1998	SPRING	A	B	B	
1999	FALL	A	B	B	
1999	SPRING	A	A	A	
2000	FALL	A	A	A	
2000	SPRING				

Records 1 to 9 of 9

QPRS AND STANDINGS

Ac Yr Ending	Sem	Class	SQPR	CQPR	Sem MQPR	Cum MQPR	Overall Stnd	Acad Stnd	Milit Stnd	Status
1997	SUMMER	4/C	.00	.00	.00	.00	0	0	0	
1997	FALL	4/C	3.13	3.13	3.81	3.81	191	224	76	C
1997	SPRING	4/C	2.33	2.71	2.09	2.81	511	465	553	
1998	FALL	3/C	2.78	2.73	3.15	2.93	509	500	603	
1998	SPRING	3/C	2.94	2.78	3.15	2.99	484	478	458	C
1999	FALL	2/C	2.89	2.80	3.00	2.99	505	483	560	
1999	SPRING	2/C	3.13	2.85	3.55	3.12	463	468	441	C
2000	FALL	1/C	3.33	2.93	3.82	3.21	415	419	385	C
2000	SPRING	1/C	2.87		4.00	3.23	0		0	

Records 1 to 9 of 9

Status Codes:
S = Superintendent's List, C = Commandant's List, D = Dean's List, P = Academic Probation
The following codes refer to Academic Boards:
A = Retained on Appeal, W = Waived, B = Reviewed, PE = Pending

FINAL COURSE GRADES

Ac Yr Ending	Sem	Courses and Grades
1997	SUMMER	FP130 V HH104 V
1997	FALL	NL102 A SM121 B PE101 B HE111 B SC111 B A101 A HH205 B X101 A
1997	SPRING	SM122A C NS100 B HH206 A PE102 B HE112 C SC112 D A102 C X102 F
1998	FALL	HH262F A SP211 B NN200 C SM223 B PE201 B FS101 C A201 A X201 A
1998	SPRING	HH486B B FS102 B SM230 B NE203 A SP212 C PE202 B X202 A A202 B
1999	FALL	EE300 B FS201 C FP210 B NS310 C PE301 B HH381 B HH354 A A301 B X301 A
1999	SPRING	HH380 A PE322 A ES310 B EN200 B FS202 C NL302 A A302 A X302 A
2000	FALL	HH462B B HH383 B HH347 A EN300 B HE344 A NL400 B PE410 A A401 A X401 A
2000	SPRING	FP326 PE427 HH362 NS404 ES420 HH360

Records 1 to 9 of 9

STRIPERS

Ac Yr Ending	Sem	Command Level	Rank	Title
1999	SPRING	COMPANY	SGT	PLT SGT
2000	FALL	COMPANY	LTJG	PLT CDR
2000	SPRING	COMPANY	LT	CDR

Records 1 to 3 of 3

ECAS

ECA	First Class Status	Second Class Status	Third Class Status	Fourth Class Status
SCUBA CLUB	NON-MEMBER	NON-MEMBER	MEMBER	NON-MEMBER
SEMPER FIDELIS	NON-MEMBER	NON-MEMBER	MEMBER	MEMBER
TEAM BILL	SECRETARY	MEMBER	MEMBER	NON-MEMBER
USNA RUGBY CLUB	OTHER	MEMBER	MEMBER	MEMBER

Records 1 to 4 of 4

COMAPS

No Records returned

SPECIAL COMAPS

No Records returned

MAPRS

No Records returned

SPECIAL MAPRS

No Records returned

PARENTS

Addressee	Emerg Cont	Relationship	Addr Line 1	Addr Line 2	City	State	Zip	Country	Phone	Academic Grade Disclosure - Parents	Military Grade Disclosure - Parents
JOHN & ELEN DOE	YES	PARENTS	911 ANY STREET		ANYTOWN	MD	12345		5551212	NO	NO

Record 1 of 1

Midshipmen entering "Yes" for "Academic Grade Disclosure - Parents" authorize disclosure of academic, performance, and conduct grades to the parents/guardian as maintained in MIDS. In addition, a grade report will be automatically printed and mailed to the parents/guardian at the address maintained in MIDS.
Grades are mailed twice yearly after final exams are completed and grades are entered into a computerized database.
Midshipmen entering "Yes" for "Military Grade Disclosure - Parents" authorize disclosure of information to the parents/guardian concerning military performance, conduct offenses, and punishment awarded.

LEAVE PERIODS FOR COMRATS

Authorized Start Date	Start Date	End Date	Category	Approved	COMRATS	Processed
10-MAR-2000	10-MAR-2000	19-MAR-2000	REGULAR	YES	$48.15	YES
14-DEC-1999	17-DEC-1999	05-JAN-2000	REGULAR	YES	$101.65	YES
24-NOV-1999	24-NOV-1999	28-NOV-1999	REGULAR	YES	$21.40	YES
26-MAY-1999	22-JUL-1999	20-AUG-1999	REGULAR	YES	$152.25	YES
26-MAY-1999	12-JUN-1999	13-JUN-1999	REGULAR	YES	$5.25	YES
26-MAY-1999	05-JUN-1999	06-JUN-1999	REGULAR	YES	$5.25	YES
26-MAY-1999	26-MAY-1999	01-JUN-1999	REGULAR	YES	$31.50	YES
05-MAR-1999	05-MAR-1999	14-MAR-1999	REGULAR	YES	$47.25	YES

Records 1 to 8 of 8

Record Leave for COMRATS

LEAVE ADDRESSES

Start Date	End Date	Address	City	State	Zip	Country	Phone
21-DEC-1999	03-JAN-2000	911 ANYSTREET	ANYTOWN	MARYLAND	12345	UNITED STATES	8005551212
17-DEC-1999	04-JAN-2000	911 ANYSTREET	ANYTOWN	MARYLAND	12345		8005551212
05-MAR-1999	14-MAR-1999	on MO with rugby team to IRELAND	Dublin			IRELAND	

Records 1 to 3 of 3

Record Leave Addresses

PERSONAL NOTE

No Records returned

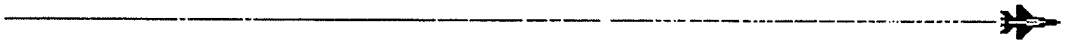
Add new Personal Note record

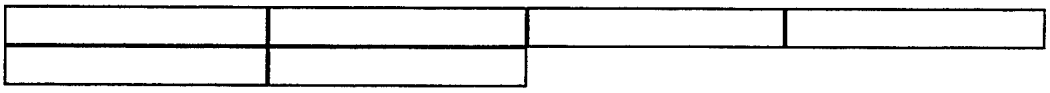
Note: Only one Personal Note may be added per Mid.

ETHNICITIES

Category	Ethnicity
ADMISSIONS ETHNIC ORIGIN	CAUCASIAN/WHITE
ETHNIC CODE - BUPERS	NONE
RACE CODE - BUPERS	WHITE (CAUCASOID)

Records 1 to 3 of 3





APPENDIX C. FREQUENCY TABLES

COMIS is a useful performance measurement tool.

		Frequency	Valid Percent	Cumulative Percent
Valid	1	1	5.0	5.0
	3	1	5.0	10.0
	4	13	65.0	75.0
	5	5	25.0	100.0
	Total	20	100.0	

I would use COMIS for measuring midshipmen performance.

		Frequency	Valid Percent	Cumulative Percent
Valid	1	1	5.0	5.0
	2	3	15.0	20.0
	3	3	15.0	35.0
	4	5	25.0	60.0
	5	8	40.0	100.0
	Total	20	100.0	

COMIS has all the KI's I need to adequately measure midshipmen performance.

		Frequency	Valid Percent	Cumulative Percent
Valid	1	1	5.0	5.0
	2	2	10.0	15.0
	3	5	25.0	40.0
	4	11	55.0	95.0
	5	1	5.0	100.0
	Total	20	100.0	

COMIS is user-friendly.

		Frequency	Valid Percent	Cumulative Percent
Valid	3	4	20.0	20.0
	4	12	60.0	80.0
	5	4	20.0	100.0
	Total	20	100.0	

COMIS is easier to use than MIDS in performance measurement of midshipmen.

		Frequency	Valid Percent	Cumulative Percent
Valid	1	1	5.0	5.0
	2	1	5.0	10.0
	3	7	35.0	45.0
	4	7	35.0	80.0
	5	4	20.0	100.0
	Total	20	100.0	

COMIS is more functional than MIDS in performance measurement of midshipmen.

		Frequency	Valid Percent	Cumulative Percent
Valid	2	1	5.0	5.0
	3	6	30.0	35.0
	4	8	40.0	75.0
	5	5	25.0	100.0
	Total	20	100.0	

COMIS should be incorporated into the Company Officer module of MIDS, instead of being developed as its own program.

		Frequency	Valid Percent	Cumulative Percent
Valid	1	2	10.0	10.0
	2	1	5.0	15.0
	3	1	5.0	20.0
	4	6	30.0	50.0
	5	10	50.0	100.0
	Total	20	100.0	

f I used COMIS, I would still need additional information from MIDS to adequately measure midshipmen performance.

		Frequency	Valid Percent	Cumulative Percent
Valid	2	7	35.0	35.0
	3	6	30.0	65.0
	4	5	25.0	90.0
	5	2	10.0	100.0
	Total	20	100.0	

COMIS development should continue so it can be used by Company Officers.

		Frequency	Valid Percent	Cumulative Percent
Valid	3	4	20.0	20.0
	4	5	25.0	45.0
	5	11	55.0	100.0
	Total	20	100.0	

A performance measurement tool other than COMIS should be developed for Company Officers.

		Frequency	Valid Percent	Cumulative Percent
Valid	1	6	30.0	30.0
	2	7	35.0	65.0
	3	6	30.0	95.0
	4	1	5.0	100.0
	Total	20	100.0	

View single records page

		Frequency	Valid Percent	Cumulative Percent
Valid	3	2	10.0	10.0
	4	16	80.0	90.0
	5	2	10.0	100.0
	Total	20	100.0	

View squad stats page

		Frequency	Valid Percent	Cumulative Percent
Valid	2	2	10.0	10.0
	3	4	20.0	30.0
	4	11	55.0	85.0
	5	3	15.0	100.0
	Total	20	100.0	

View platoon stats page

		Frequency	Valid Percent	Cumulative Percent
Valid	1	1	5.0	5.0
	2	2	10.0	15.0
	3	5	25.0	40.0
	4	9	45.0	85.0
	5	3	15.0	100.0
	Total	20	100.0	

View company stats page

		Frequency	Valid Percent	Cumulative Percent
Valid	1	1	5.0	5.0
	2	4	20.0	25.0
	3	3	15.0	40.0
	4	9	45.0	85.0
	5	3	15.0	100.0
	Total	20	100.0	

Mental development page

		Frequency	Valid Percent	Cumulative Percent
Valid	1	1	5.0	5.0
	2	1	5.0	10.0
	3	2	10.0	20.0
	4	15	75.0	95.0
	5	1	5.0	100.0
	Total	20	100.0	

Moral development page

		Frequency	Valid Percent	Cumulative Percent
Valid	1	1	5.0	5.0
	3	4	20.0	25.0
	4	12	60.0	85.0
	5	3	15.0	100.0
	Total	20	100.0	

Professional development page

		Frequency	Valid Percent	Cumulative Percent
Valid	3	2	10.0	10.0
	4	15	75.0	85.0
	5	3	15.0	100.0
	Total	20	100.0	

Physical development page

		Frequency	Valid Percent	Cumulative Percent
Valid	2	1	5.0	5.0
	3	1	5.0	10.0
	4	14	70.0	80.0
	5	4	20.0	100.0
	Total	20	100.0	

Privileges page

		Frequency	Valid Percent	Cumulative Percent
Valid	2	1	5.0	5.0
	3	7	35.0	40.0
	4	9	45.0	85.0
	5	3	15.0	100.0
	Total	20	100.0	

Report manager page

		Frequency	Valid Percent	Cumulative Percent
Valid	2	1	5.0	5.0
	3	6	30.0	35.0
	4	9	45.0	80.0
	5	4	20.0	100.0
	Total	20	100.0	

Search manager page

		Frequency	Valid Percent	Cumulative Percent
Valid	2	3	15.0	15.0
	3	7	35.0	50.0
	4	5	25.0	75.0
	5	5	25.0	100.0
	Total	20	100.0	

Welcome page

		Frequency	Valid Percent	Cumulative Percent
Valid	1	1	5.0	5.0
	2	1	5.0	10.0
	3	11	55.0	65.0
	4	1	5.0	70.0
	5	6	30.0	100.0
	Total	20	100.0	

Tip of the day page

		Frequency	Valid Percent	Cumulative Percent
Valid	1	4	20.0	20.0
	2	3	15.0	35.0
	3	7	35.0	70.0
	4	3	15.0	85.0
	5	3	15.0	100.0
	Total	20	100.0	

Help manager page

		Frequency	Valid Percent	Cumulative Percent
Valid	2	1	5.0	5.0
	3	7	35.0	40.0
	4	7	35.0	75.0
	5	5	25.0	100.0
	Total	20	100.0	

File utilities manager page

		Frequency	Valid Percent	Cumulative Percent
Valid	2	2	10.0	10.0
	3	6	30.0	40.0
	4	8	40.0	80.0
	5	4	20.0	100.0
	Total	20	100.0	

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