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THESIS

**THE NAVAL ENLISTED AVIATION MAINTENANCE
MANPOWER SYSTEM: ADVANCING READINESS
THROUGH IMPROVED UTILIZATION OF
INTELLECTUAL CAPITAL**

by

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September 2011

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**THE NAVAL ENLISTED AVIATION MAINTENANCE MANPOWER SYSTEM:
ADVANCING READINESS THROUGH IMPROVED UTILIZATION OF
INTELLECTUAL CAPITAL**

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ABSTRACT

Manpower within the Department of the Navy is a major consumer of valuable resources. Current manpower management strategies are not reinforced with sound system components that employ vital intellectual capital considerations.

When dealing with manpower, there are always two perspectives that must be considered. The first is the perspective of the employer, and the second is that of the employee. The Navy's current system of manpower, while seeking a mutually beneficial arrangement, actually creates a great deal of instability for both employer and employee. This instability results in very high expenditures of limited resources, with in many cases, very poor returns.

The current metric in manpower, is referred to as readiness. In its current state it lacks true meaning, as the metric fails to capture the true costs expended to achieve it, and once it is achieved, there is no commitment to preserving it. In fact, the current system design decreases readiness while attempting to increase readiness elsewhere, with the same asset.

This thesis examines present intellectual capital theory, and evaluates current enlisted aviation manpower system elements in terms of this theory. The research then turns to the employment of a systems approach to help determine a definitive direction for an improved, efficient system for the 21st century.

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I. INTRODUCTION

A. BACKGROUND

1. Intellectual Capital

The greatest challenge faced by management in any organization is how to optimize investment in human productive potential. Such investments can take various forms, ranging from upgrades in facilities or machinery to investments in human resources. It is generally understood there is an exponentially greater advantage to be derived from the investment intended to increase the capability of manpower or human capital rather than in machinery or infrastructure. Fitz-enz (2000) states:

As we move into the new millennium and find ourselves in a knowledge economy, it is undeniable that people are the profit lever. All the assets of an organization, other than people, are inert. They are passive resources that require human application to generate value. The key to sustaining a profitable company or a healthy economy is the productivity of the work force, our human capital.

This potential to make an investment and have that investment provide boundless rates of return is what makes the study of human capital simultaneously very important and very difficult. As in any enterprise, in the Navy, human capital is the essential element that constitutes the intellectual capital of the organization.

Intellectual capital consists of three elements: (a) human capital, (b) social capital, and (c) organizational capital. These intangibles, which consist of the stocks and flows of knowledge available to an organization, are prime factors in the value generation of an enterprise.

Human capital is defined by Baron (2007) as “the knowledge, skills, abilities and capacity to develop and innovate possessed by people within an organization.” This definition of human capital highlights the need for ongoing evaluation of which combination of knowledge, skills, and abilities will best prepare that capital for utilization—to best allow that capital to be leveraged as only human capital can be. The other

important aspect of human capital which differentiates it from any other form of capital is its requirement to attain fulfillment. Fitz-enz, (2000) states that “there is clear and abundant evidence that an organization that makes work as fulfilling as possible will develop and retain the most productive workers.”

Baron and Armstrong (2007) defines social capital as “the structures, networks and procedures that enable those people within an organization to acquire and develop intellectual capital, which is represented by the stocks and flows of knowledge derived from relationships within and outside the organization.” As a component of intellectual capital, the importance of social capital cannot be overstated. Every social relationship between an employee and another person or establishment has a value associated with it.

Baron and Armstrong (2007) defines the final element of intellectual capital, organizational capital, as “the institutionalized knowledge possessed by an organization.” As with social capital, the ability to capitalize upon the knowledge captured and retained within the organization has a definite value.

Since the Navy does not view value generation in the traditional sense of the term as revenue-generation, as the term is normally used by business and by economists, it is imperative to recognize the efficient employment of intellectual capital has an enormous impact upon a key organizational enabler. The term “enabler” as used here, means Naval Aviation Units ready for tasking. That enabler for the enlisted aviation manpower system is manpower readiness.

2. Intellectual Capital and Manpower Readiness

Within Naval Air Forces, each aviation unit possesses unambiguous operational requirements for which a specific number of qualified technicians are needed. The ability of the unit’s manpower to meet these requirements is measured in terms of manpower readiness. Stated simply, put manpower readiness is a tally of those sailors who are not just present but present *and* proficient. Unit enlisted aviation manpower readiness is a direct determinant of the ability of that unit to deliver on its requirements, and to meet fleet commander tasking. This readiness is measured continuously and is used as a gauge of whether the necessary level of manpower readiness is being achieved to support

current and future operational requirements. The level of manpower readiness is a direct result of the employment of intellectual capital by enlisted aviation manpower systems.

Readiness, regardless of the type of aircraft, or the echelon of maintenance, is and always has been a direct reflection of struggles of the management with intellectual capital. Although the Navy's manpower system has always had the capability to meet objectives, the means of meeting them has been highly inefficient, and has historically employed faulty metrics incapable of capturing the true picture. Badertscher, Bahjat and Pierce (2007), in the *Naval Aviation Vision 2020*, made the following assessments of the existing human capital strategy: "(a) Legacy systems are inflexible and unable to capture our workforce, (b) there is no total force perspective, (c) the return on investment has not been measured, and (d) there is a distinct lack of meaningful metrics."

In 2005, the *Naval Aviation Vision 2020* helped chart a new course for naval aviation. This document was a vision statement for the entire Naval Aviation Enterprise (NAE), as it has come to be called, with specific focus on many individual areas, including human capital or manpower. According to Badertscher, Bahjat and Pierce (2007), the methodology promulgated for manpower was to "deliver the right force, with the right readiness at the right cost at the right time." Although efforts to attain these objectives were not new, this focus on *how* attaining these objectives affect the "bottom line" of the organization was new. The "right force" in this equation is the human capital of the Navy. The ROI, or "right force at the right cost," is measured in manpower readiness (Badertscher, Bahjat & Pierce, 2007).

While the message was visionary, the means by which our current enlisted aviation manpower system functions has still not changed. There is definitely more discussion of the term "manpower readiness" and the drivers by which it is achieved. Even so, the core inefficient infrastructure of our enlisted aviation manpower system still exists, and continues to undermine the types of growth that could be achieved through the expert management of intellectual capital.

B. OBJECTIVE

The purpose of this research is to critically analyze the enlisted aviation manpower system's employment of the intellectual capital at its disposal. Critical to this analysis will be the contrast between the desire to achieve greater levels of manpower readiness and the legacy manpower system constraints that make this goal difficult to achieve. Also crucial will be recommendations for manpower system improvements based on the benefits to be gained from proper utilization of intellectual capital.

C. RESEARCH QUESTIONS

1. Primary Research Question

How can intellectual capital employment improvements contribute to increased manpower readiness in the Naval Aviation Enterprise?

2. Secondary Research Question

What present policies of the enlisted aviation manpower system, in the context of intellectual capital, contribute to or detract from achieving readiness?

D. SCOPE AND LIMITATIONS

This thesis will evaluate the current academic literatures related to intellectual capital management relevant to the current intellectual capital strategies used in the Navy's enlisted aviation maintenance manpower system. This thesis will contrast the current efforts to increase the level of manpower readiness with the employment of a legacy system structure that diminishes the ability to achieve greater manpower readiness. Due to the increasing demands placed upon an already stretched defense budget, the improvement in the Navy's capability to more efficiently utilize our intellectual capital is vital to the organization.

The definition of readiness for the enlisted aviation maintenance manpower system is centered on the following methodology from OPNAVINST 1000.16K *Total Force Manpower Policies Procedures*.

The fleet manpower requirements determination process is a standards-based system. The process identifies multi-year requirements to support the Planning, Programming, Budgeting, and Execution System (PPBES) process by establishing baseline manpower requirements based on Required Operational Capability (ROC)/Projected Operational Environment (POE) statements. The process ensures a validated and justifiable technique for determining the military and civil service quantity and quality of manpower requirements for fleet activities. The methodology is predicated on data obtained through engineering studies, industry standards, technical and operational evaluations, job task analysis, work study, activity sampling, wartime tasking identified in the ROC/POE instruction or through application of staffing standards, including use of the appropriate Navy Standard Work Week.

This description has been employed for decades, and is fundamental in its ability to accurately define manpower requirements. The baseline manpower requirements described are static and do not attempt to capture how requirements vary due to effective or ineffective intellectual capital management policies. More importantly, is the fact that this description has been used to establish an ineffective measurement of the returns garnered from our investments in intellectual capital. The measurement is manpower readiness, and like the methodology for determining requirements it also is incapable of capturing the real picture in regards to the effective employment of intellectual capital.

Human capital being the largest part of the intellectual capital equation, and the capital most commonly associated with meeting manpower requirements follows a basic five-step blueprint of: (a) plan, (b) acquire, (c) develop, (d) maintain, and (e) retain. Crucial to each step is the need to measure how intellectual capital strategies either benefit or obstruct the efficiency of the system.

For this study, analysis and recommendations will focus on the inherent need of the system to leverage highly valuable intellectual capital in order to generate value in the form of readiness.

E. METHODOLOGY

1. Intellectual Capital in the Enlisted Aviation Manpower System

This project has two major goals: (a) to evaluate the current system intellectual capital employment within the enlisted aviation manpower system, and its effects on value generation in the form of manpower readiness; and (b) to examine what effects improvements in intellectual capital utilization would have on the costs of the manpower system.

Since the ability to measure intellectual capital will be a crucial part of determining whether investments made to improve it are successful or not, measurement fundamentals will be examined.

2. Engineering an Improved Enlisted Aviation Manpower System

In viewing the manpower system as an engineered system designed to meet the need of readiness, apply principles of systems engineering design and architecture fundamentals to consider the creation of an alternate system(s). The potential system improvements will be centered on the goal of maximizing intellectual capital, and their associated costs. Measurement fundamentals to be employed with any future system shall be discussed to insure the capability for future system improvements.

F. ORGANIZATION

Chapter II will discuss intellectual capital theory and its potential contribution to the creation of an effective system of manpower. Chapter III will examine how the enlisted aviation manpower system operates, and then provide a study on how that operation compares to current intellectual capital theory. It will then further examine how the systems performance is interpreted in the form of metrics. Chapter IV will examine the concept of employing systems engineering to the creation of a new manpower system. Chapter V will include a summary of findings, and include all conclusions and recommendations for improving the utilization of intellectual capital within the Navy's enlisted aviation manpower system.

II. INTELLECTUAL CAPITAL

A. DEFINITION

In the closing years of the twentieth century, management has come to accept that people, not cash, buildings, or equipment, are the critical differentiators of a business enterprise. (Fitz-enz, 2000)

The incorporation of workers into capital theory began emerging in the second half of the 20th century. This was a divergence from the earlier belief that only tangible assets, such as plants and equipment, could improve value. Although this shift in thinking has been slow to manifest, perhaps aided by innovations of the information age, it has gained increasing attention in recent years. The initial theories focused on this “human capital” as what has been referred to as a “critical differentiator.” Differentiator, from the word differentiate, is defined as “to form or mark differently from other such things; distinguish.” Webster’s Dictionary (2011). However, more recently, many theorists have included human capital within the context of “intellectual capital.” Such an approach more thoroughly encompasses the intangibles that together with the tangibles comprise the “market value” of a corporation. Understanding intellectual capital is not only crucial to the creation of a manpower system, its inclusion or exclusion represents the “weight” which shifts the balance in deriving manpower profitability.

Intellectual capital is defined by Baron and Armstrong (2007) as “the stocks and flows of knowledge available to an organization.” This form of capital constitutes the intangibles of a company’s spreadsheet. However, although intellectual capital is intangible, this does not mean it is any less important than the more tangible assets of the organization. Even the most powerful technology is worthless without the people who know how to use it. Fitz-enz (2000) states: “All assets of an organization, other than people, are inert. They are passive resources that require human application to generate value.”

There are several separate elements that make up intellectual capital, and any attempt to understand a system of manpower must consider all of them. The three

primary elements of intellectual capital are: (a) human capital, (b) social capital, and (c) organizational capital. To understand the distinction between these three elements consider how Baron and Armstrong (2007) describe them: “the tripartite concept of intellectual capital indicates that, while it is individuals who generate, retain and use knowledge (human capital), this knowledge is enhanced by the interactions between them (social capital) to generate the institutionalized knowledge possessed by an organization (organizational capital).” Any system of manpower must be evaluated in relation to all three of these elements.

1. Human Capital

The first and by far the most important, element of intellectual capital is human capital. Sullivan (2003) defines human capital as “the stock of competences, knowledge and personality attributes embodied in the ability to perform labor so as to produce economic value. It is the attributes gained by a worker through education and experience.” The importance of human capital has been greatly overlooked, and has only recently begun to be widely incorporated into economic theories. Most modern theorists now acknowledge that human capital is the only factor that can genuinely add value. Fitz-enz (2000) states: “Only people generate value through the application of their intrinsic humanity, motivation, learned skills, and tool manipulation.”

The preparation of a worker to perform a task represents the creation, at a cost, of a stock of potential productive capital. While phrasing it in this manner may at first strike the reader as somewhat cold and dehumanizing, such terminology represents a deliberate effort to be as objective, precise, and coldly rational as possible about the subject. This is believed to be necessary because it is felt it is imperative that human capital, as any other form of capital, be examined at from this prospective when developing a system that maximizes the production and utilization of this capital. Efficient management, by definition, is the act of optimizing the employment of all available capital. Although this concept may seem self-evidently obvious, this core principle seems to be frequently overlooked when the humans involved are not viewed as an integral part of capital to be optimally managed. It is important to note that this form

of capital requires not only optimal management for the benefit of the employer, but it must also be measured by the standards of the capital itself.

Consider this example. A dollar of investment capital does not care how it is utilized. A dollar has no feelings that need to be considered. Even if it did have the capacity to feel, how it felt would be irrelevant to the process of the transaction or to the current and future value of the transaction. Monetary capital is simply the property of people, and can be thought of (and treated) as such. Money does not care who owns it, how it is treated, whether it is frivolously moved from one place to another, or about the goals of the people who own it. This remains true even if the transaction is unethical, ill-advised, or improperly conducted. In contrast, human capital *does* have feelings, and if managed improperly, disrespectfully, or unwisely, those feelings will have consequences that affect the future value of that capital.

This distinction is very important as we move forward into the 21st century, and continue to shift towards a knowledge-based, rather than an industrially-based, economy. This shift to a knowledge-based economy requires organizations to reevaluate all legacy human capital investment strategies. In order to achieve the maximum efficiency, human capital must be developed and utilized correctly. This principle applies not only to private sector business organizations, but to military organizations as well.

Looking deeper at human capital, all human abilities can be thought of as fitting into one of two categories. They are either innate or acquired. Innate abilities are those abilities that are genetically determined, and although potentially unchangeable from the prospective of management, have the ability to be developed to achieve a more significant contribution. In contrast acquired abilities are the prime focus of management. Acquired abilities are the basis for the compounding return associated with human capital, and must be among the prime considerations for creating a human capital strategy. The development of any acquired ability will require an investment, and how well that acquired ability is utilized will determine whether it results in a return or loss on that investment. It is important to understand that value in human capital is primarily

about the information available and the abilities that an individual possesses to effectively utilize that information, and, of course, their motivation and willingness to employ that ability.

2. Social Capital

The second element of intellectual capital is social capital. Although there is not one specific, universally-accepted definition for social capital, generally speaking, social capital is defined as the value added as a result of the interactions of the humans within the organization. Wacquant (1992) states “social capital is the sum of the resources, actual or virtual, that accrue to an individual or a group by virtue of possessing a durable network of more or less institutionalized relationships of mutual acquaintance and recognition.” These resources comprised of daily transfers of information through networks, whether social or institutionalized, are vital in promoting the growth of the organization, and even its very survival.

For the purposes of this study, this element will be examined this element from the perspective of Armstrong (2007), who defines it as “the structures, networks and procedures that enable the human capital, to acquire and develop the knowledge which is derived from relationships within and outside the organization.” The fact that there is not a universally accepted definition was addressed by the Social Capital Interest Group (2000), which stated that “all studies must discuss social capital in relation to the particular discipline, study level and context and that a set definition for such is not required, only an identification of operationalization or conceptualization.”

The potential for social capital, like human capital, to be overlooked, as a value source for an organization, is understandable. However the undervaluing of social capital is almost as detrimental as failing to appreciate the value of human capital. Although it is the knowledge, skills and abilities of individuals that create value, the social capital - the means by which those elements are developed, retained, and shared within and outside the organization – also has great economic value.

While social relations may be the basis for social capital, it is more than just the relations that have the ability to generate added value. Through the managing of the

relationships that constitute the social capital of the organization there is an obvious ability to drive all corporate capital appreciation. However, more fundamental is the ability for social capital merely as a result of its existence to generate compounding rates of return. Social capital must be recognized as the highly valuable corporate asset that it is in order for that capital to be robustly employed to generate a steady rate of return.

3. Organizational Capital

The third element of intellectual capital is organizational capital. Organizational capital is defined by Armstrong (2007) as “the institutionalized knowledge possessed by an organization that is stored in databases, manuals, etc..” The concept of organizational capital focuses on the knowledge owned by the organization. The key distinction is that, in contrast to human capital and social capital, organizational capital, although created by individual humans and social interactions among humans, organizational capital resides within inanimate objects, not within human minds.

In many ways the value of organizational capital is priceless. If we accept that human capital more so than physical capital, is the critical differentiator in a knowledge-based economy, then the existence of that knowledge in the form of organizational capital takes on a supreme importance. Another critical determinant in the employment of organizational capital ties directly to the social capital of an organization. This is because, the possession of knowledge in no way guarantees it will be shared for the benefit of the enterprise. Knowledge is the key component in economic growth and improved efficiency, and organizational capital theory is the art of knowledge management.

Organizational capital is perhaps the easiest of the three elements to understand. However, organizational capital may be the most under-appreciated means of generating economic value. The passing of institutionalized knowledge is fundamental in any business administration course of study. However, the means by which it is accomplished and to the degree to which it is accomplished will directly impact the ability of an organization to gain the benefit that comes from one of the best sources — enterprise experience.

B. ECONOMIC VALUE IN INTELLECTUAL CAPITAL

Understanding the economic value associated with intellectual capital is somewhat complex. However, the process is facilitated by understanding the functions of the individual elements. If the means by which each of the three elements of intellectual capital has the potential to create or reduce economic value is understood, it becomes easier to understand why intellectual capital is critical to the creation of a system of manpower.

One of the key principles for describing the economic value of human capital is that, in its most basic sense, it is realized the instant human knowledge is applied in any workplace/business environment. As simple as this statement may seem, the scope and magnitude of the value to be realized or lost is overwhelming. This concept can be appreciated by considering examples in everyday life. For instance, does the minimum wage clerk at the counter work hard to promote the “special of the day” that carries with it the greatest profit margin for the store?

This example highlights the complexities of human capital and sheds light on how important a role it plays in the organizational environment. The clerk’s education and training to understand his or her part in the organization will have far reaching ramifications. Does the clerk understand profit margin? Does the clerk have a vested interest in increasing the stores profits? Is the clerk interested in their work, or is their job just a way for them to pay their bills? These can seem like trivial questions when asked regarding the behavior of a minimum wage clerk, but the economic value associated with the answers have the potential to determine the future level of success or failure of any type of enterprise – regardless of its size or function.

This example highlights another principle for understanding potential economic value in human capital. This is the need for employees to be attuned to current organizational strategies. If, in the scenario above, the clerk comprehends neither the concept of profit margin nor the company’s strategy for maximizing the profit margin, this human capital driven value may not be achieved. Comprehending organizational strategies, and making choices and decisions that will generate value is a unique

characteristic of human capital. Determining whether human capital contributes to, or detracts from, value in each organizational environment is critical to evaluating the competency of a manpower system.

The relational aspect of social capital is often overlooked as a potential source of economic value. These networks must be viewed independently in order to appreciate their ability to generate value. If an employee is not aware of how the different work centers within the organization operate, their ability to *fully* understand how their efforts contribute to the success (or failure) of the enterprise is greatly impaired. As important as the internal network is, the external networks also have an innate capability to generate value. An example of internal and external social networks in the enlisted aviation manpower system is expressed in Figure 1. This aspect of social capital highlights the importance of human capital. This is because an external social network can so impact the ways in which an employee conducts themselves that it has the potential to generate economic value.

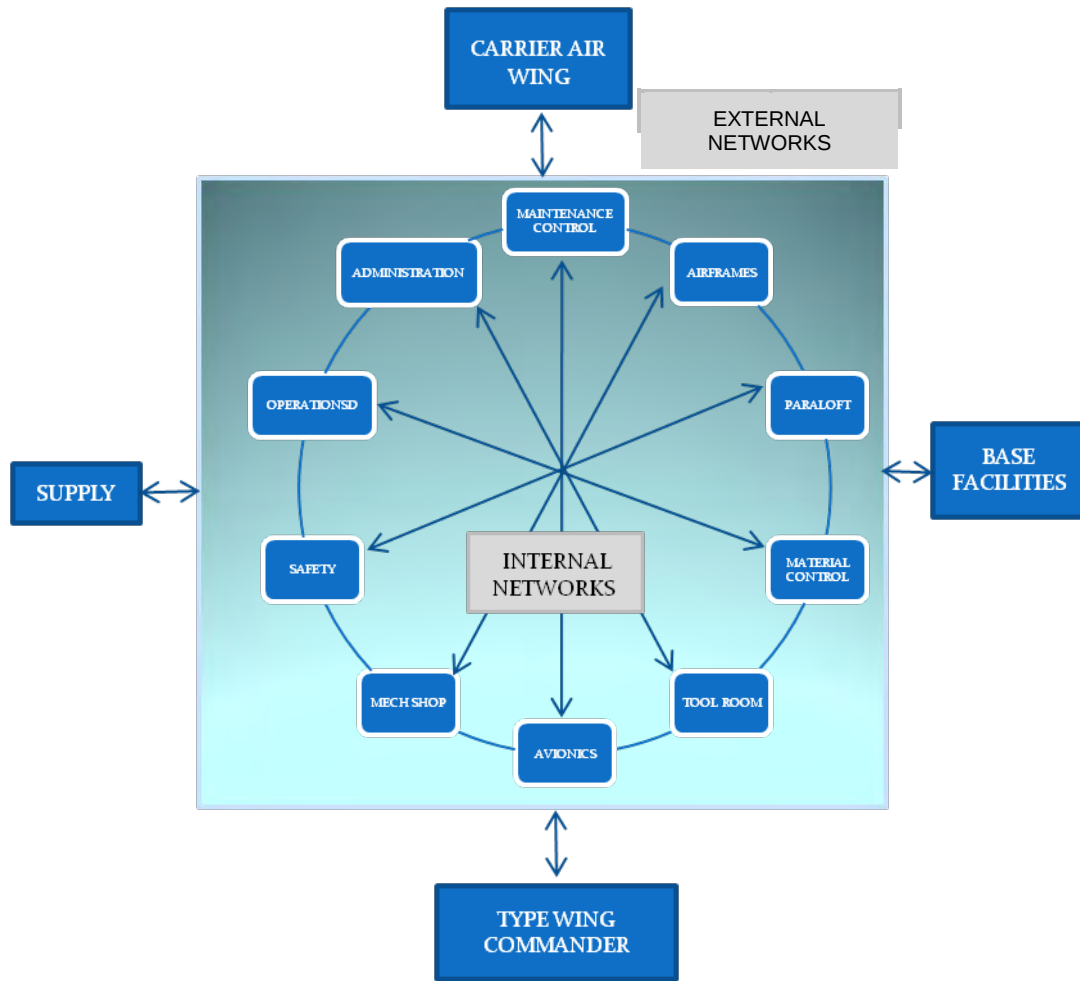


Figure 1. Sample of Internal and External Social Capital Networks

C. LEVERAGING INTELLECTUAL CAPITAL

Leveraging may be defined as “the use of certain fixed assets to enhance the return on investments or sales” (Fitz-enz, 2000). In a book entitled *Competing for the Future*, Hamel and Prahalad (1994) suggest that “all successful strategies have resource leverage at heart.” They then offer five ways to leverage resources: (1) concentrate resources on strategic goals, (2) accumulate resources efficiently, (3) complement resources from different areas for higher-order values, (4) conserve resources wherever possible, and (5) recover the investment in resources rapidly.

Achieving economic value through the successful leveraging of intellectual capital is a key requirement in a knowledge based economy. Organizational effectiveness is dependant on the effective integration of each element of intellectual capital. Assuming organizational strategies are profitable in their design, the achievement of economic value, from proper intellectual capital employment, is created by knowledge, and the capacity and desire of the individual to employ that knowledge to furthering the goals and strategies of the organization. Fitz-enz (2000) describes the five central functions of leveraging this capital:

“the first step is to recruit, develop, and retain human capital. Next comes leveraging human skills through technology. These steps rest on efficient and effective organizational structures. To this system are overlaid the last two functions: incentives and controls, and leadership and a learning culture. This is an integrated approach that combines the value adding of each function. If one of them is missing or suboptimized, the total is diminished severely.”

In most organizations economic value is easily defined, and therefore the path towards the creation of an intellectual capital strategy is fairly evident. However, there are many organizations, such as military organizations, in which an economic value statement is less defined. In some troublesome cases, the economic value statement may be quite arbitrary. Regardless of the difficulty in defining the economic value, in order to determine the success or failure of a manpower system, a measurement of the leveraging of each of the three elements that constitute intellectual capital must be employed. The leveraging of each of the elements of intellectual capital is fundamental.

However since it is often the fundamentals that become the greatest stumbling blocks, the subject is worth examining in greater depth.

1. Leveraging Human Capital

The leveraging of human capital is achieved through an understanding of the human capital cycle as expressed in Figure 2. Most critical in the cycle is the planning phase, during which there must be a clear understanding of the goals of the enterprise. Upon achieving the comprehension of those goals the human capital cycle follows the

five stage cycle of plan, acquire, maintain, develop, and retain. However it must be understood that this cycle never stops, and the planning phase must continue as long as the enterprise continues. Every successful enterprise is going to have changes in both short term and long term objectives, and it is critical for the organization to constantly be evaluating current human capital in relation to evolving enterprise goals.

Leveraging human capital must happen throughout the cycle, but it cannot happen without a clear understanding and definition of the goals of the enterprise. The definition of the goals is crucial to developing leverage points throughout the cycle, and as previously discussed, human capital must be leveraged from the perspective of the enterprise at the same time it is leveraged from the perspective of the individual.

The leveraging of human capital at the acquisition phase concerns the goal to be achieved in each and every acquisition. There are multiple questions that must be defined so that a clear and rewarding path can be initiated for both the company and the employee. The acquisition questions include cost, time, quantity, and quality. Primarily the enterprise must identify the intention of the acquisition both short term and long term. This question cannot be answered haphazardly. Due to the costs associated with acquisition, the path must be formulated with a specific long term goal in mind. At this same time, the acquisition must be evaluated from the employee's perspective, and it must be a combination of the two perspectives that create a mutually acceptable agreement.

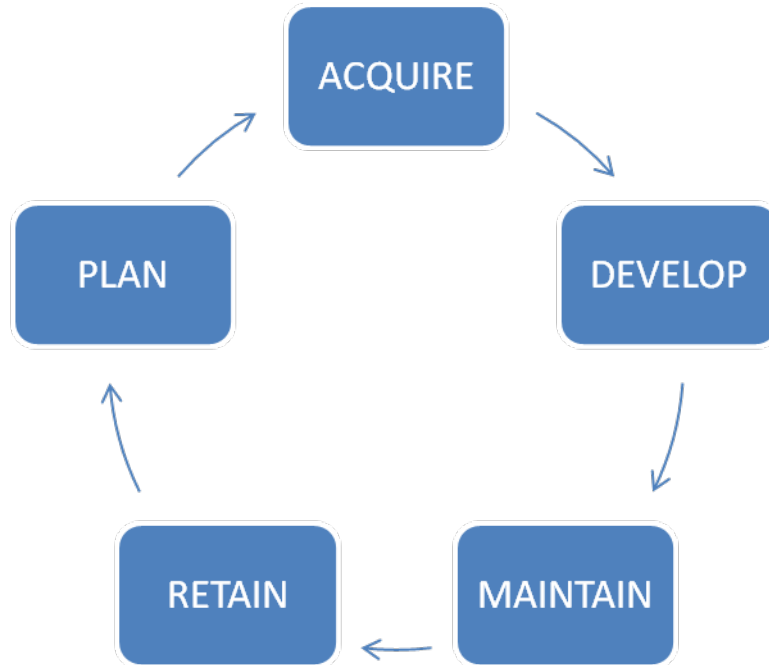


Figure 2. Human Capital Cycle

The need for leveraging of human capital during development and maintenance is paramount. This is because it is this development, and the maintenance thereof, that creates the stock of productive capital. Most investments made during these stages are directly tied to specific enterprise goals. These are typically traceable to specific processes, which deliver specific capabilities, which can be measured in some form of enterprise value. The enterprise value is tied directly to enterprise plans, and these plans are being constantly revised and evaluated. It is again worth mentioning that the employee, as human capital, unlike tangible capitals, must be a willing participant in his or her own maintenance and development. Fitz-enz (2000) describes maintenance by saying, “they (employees) need, expect, and demand communication from their supervisors. And they want to know what is expected in the way of performance” and the development sought.” He further says that in this way “employees expect a match between their skills and the jobs they are assigned,” and that “employees want training and work experience that helps them grow.”

Absolutely critical to the success of human capital leveraging is retention. Finnegan (2009), with regard to the frequent changing of jobs in the private sector estimates that “turnover’s price tag across the United States at \$25 billion annually - and that’s just to train replacements.” Retention of human capital as with the other components of the human capital cycle, is directly tied to enterprise goals through on-going enterprise planning. Leveraging retention does not convey a blanket strategy of retaining all personnel. It must be a well-refined system of matching human capital inventory (by competencies) with the ever-changing pattern of short term and long term demand. As the word *retention* implies, just as the enterprise can determine whom it wishes to retain so too the human capital can choose to remain or depart.

2. Leveraging Social Capital

The leveraging of social capital is fundamental in any system of manpower. No enterprise can afford to miss the benefits derived from the networking of its personnel and the sharing of accumulated knowledge, vital information and corporate know-how within a secure environment. If human capital has been properly acquired and developed, and is the differentiator in the enterprise, a great deal of corporate education will come from social networks within the enterprise, as well as from the collateral organizations with which they interact. Recognizing these networks as a stock of productive capital is imperative to developing a means by which these networks might be nurtured and institutionalized for further leveraging.

While leveraging is a significant source of value, there is also the possibility of lost value when the potential benefits of social capital are not considered or recognized. The danger is a possible loss of intellectual capital, if that information is not transferred, shared, transformed and institutionalized. The leverage of social capital is greatly dependent on how knowledge is developed and shared within the relationships among employees, corporate partners, and customers.

3. Leveraging Organizational Capital

The first step in leveraging organizational capital is the acknowledgement of its existence as a form of capital. Institutionalized knowledge by definition must be valued. If such knowledge is not valued, the institution is unsustainable. There is organizational capital associated with every facet of the management of an enterprise. It is present within the headquarters, and in all other divisions of the organization, even in the smallest functional unit. Organizational capital can be something as grand as a human capital strategy, or something as mundane as an optimal lunch break rotation.

The leveraging of such capital is in the capture and retention of knowledge garnered from every lesson learned within the enterprise. The company that can learn what works best and then successfully implement these winning strategies is the company that can gain the greatest leverage. A key principle in the leveraging of organizational capital is that all knowledge that is acquired from the improvement of processes has an associated cost. Therefore, each time a lesson must be relearned, that same cost is once again incurred. The cost comes in two forms: (a) the cost of doing business in a less-than-optimal state, and (b) the cost to once again prove that the current state is less than optimal and make change.

D. INTELLECTUAL CAPITAL AND MANPOWER SYSTEMS

In creating a system of manpower, there are many variables that must be considered. However, paramount in the creation of such a system is the principle that it will require the expenditure of tangible capital to acquire or generate, potentially productive capital. There are arguably many paths to generating variable rates of return from the system, but any system that is created without reflection upon a holistic intellectual capital approach will miss out on many, opportunities to compound returns.

It should be obvious that better management of human capital must be the centerpiece of any effort to increase the efficiency of any system of manpower. However, concern for human capital cannot be wholly detached or considered in isolation from the other components of intellectual capital. Tom Schuller highlighted this fact,

stating “the focus on human capital as an individual attribute may lead – arguably has already led – to a very unbalanced emphasis on the acquisition by individuals of skills and competences which ignores the way in which such knowledge is embedded in a complex web of social relationships” (Schuller, 2000).

The social relationships within a system of manpower relate to every aspect of how employees behave. However, the most important feature of their behavior is how the employees interact. This interaction, or social capital, is crucial to reaching greater efficiency levels within a system of manpower. The World Bank recognizes social capital as a set of horizontal associations which affect development through several related elements, such as information sharing and mutually beneficial collective action and decision-making (Grootaert & Bastelaer, 2001). The ability of social capital to stimulate development or growth through this mutually beneficial collective action and decision-making make its inclusion in the creation and sustainment of a system of manpower essential.

The means by which organizational capital is utilized within the constraints of the system of manpower can, and will, have consequences. Enterprise knowledge has a cost, and an effective system of manpower will capitalize on and proliferate that knowledge. An ineffective system can cause the enterprise knowledge or organizational capital to be improperly employed or even lost altogether.

In the engineering of a system of manpower the utilization of each component of intellectual capital must be considered to drive efficiency within the system. Rehtin (2002) defined the word “system” as “a set of different elements so connected or related as to perform a unique function not performable by the elements alone.” It is this systems mentality that must be utilized to gather all of the intellectual capital components (Figure 3) together during the architecting of a proficient system of manpower.

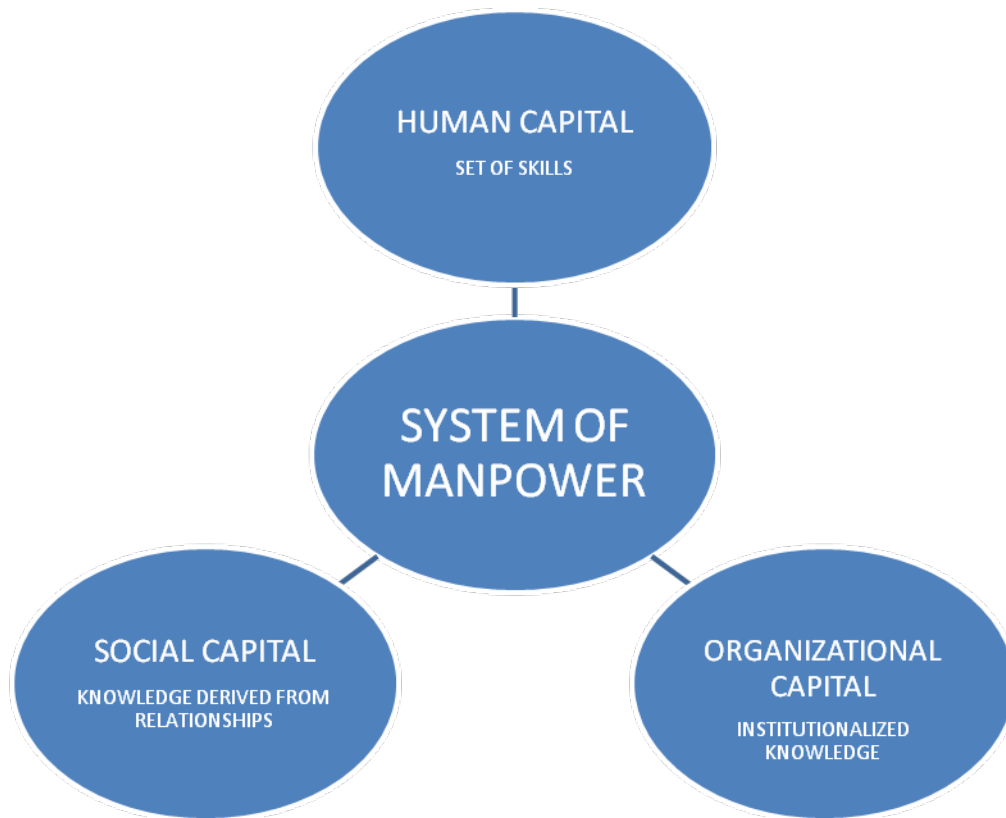


Figure 3. Intellectual Capital as Components of a System of Manpower

E. CHAPTER SUMMARY

At its foundation a system of manpower should be constructed on the basis of maximizing intellectual capital. While there may be a core principle in the creation of a manpower system that does not allow for intellectual capital to be a primary concern, a system that ignores basic intellectual capital utilization principles and measures will be highly inefficient, and therefore not sustainable in a competitive market environment. Human, social, and organizational capital are the basis for organizational effectiveness and, as such, they are a solid foundation for building a system of manpower.

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III. INTELLECTUAL CAPITAL IN THE ENLISTED AVIATION MANPOWER SYSTEM

A. ENLISTED AVIATION MANPOWER SYSTEM REVIEW

1. Department of Defense

The Department of Defense (DoD) realizes that “the United States is well into the transformation from an industrial-age economy to an information-age one, and the defense workforce must transform with it” Department of Defense (2006). This transformation has led to a divergence from the belief that only improvements in tangible assets, such as facilities and equipment, can lead to improvements in the economic value of the organization. Because it understands the challenges associated with determining the best way to invest in human productive potential, the DoD understands that people, are assets whose value can be enhanced through investment. Regarding the improvement of their human capital practices, a discussion draft from the Government Accounting Office (1999) to federal agencies entitled *Human Capital: A Self-Assessment Checklist for Agency Leaders* states the following:

Two principles are central to the human capital idea. First, people are assets whose value can be enhanced through investment. As with any investment, the goal is to maximize value while managing risk. As the value of people increases, so does the performance capacity of the organization, and therefore its value to clients and other stakeholders. Second, an organization’s human capital policies must be aligned to support the organization’s “shared vision”—the mission, vision for the future, core values, goals, and strategies by which the organization has defined its direction and its expectations for itself and its people. All human capital policies and practices should be assessed by the standard of how well they help the organization pursue its shared vision.

This discussion with the DoD is consistent with current human capital theory, and is a mandate to organizations to assess all policies and practices using a standard of how

well they help the organization pursue its shared vision. It is clear that likewise the DoD wants all U.S. military organizations to assess their utilization of human capital in ways that help them “maximize value”

2. Department of the Navy

The Department of the Navy (DoN) has realized that the costs of personnel and the related programs are rapidly approaching 70% of the department’s total obligational authority. In the *Department of the Navy Human Capital Strategy* (2007), the following was stated:

...fundamentally, we must create manpower and personnel systems capable of placing the right people with the right skills, at the right time and place, and at the best value, to support or accomplish 21st Century naval missions.

This direction from then Secretary of the Navy, the honorable Donald Winter, is the subject of this thesis. Creating a manpower system that has the right skills, at the right time and place, and at the best value is only accomplished by examining how intellectual capital is allocated and deployed within that manpower system. He further recognized that “competent motivated and dedicated people are the key to organizational and operational success.”

3. Commander Naval Air Forces

Closer to the naval enlisted aviation manpower system is the view point expressed by the Commander Naval Air Forces (CNAF). CNAF’s guidance for the way forward was in keeping with the overarching DoN policy, and reads “deliver the right force, with the right readiness at the right cost at the right time.” A key new term in this policy is the introduction of the word *readiness*. *Webster’s Dictionary* (2011) defines “ready” as “prepared mentally or physically for some experience or action.” This preparation, and the means of measuring this preparation, is at the center of every process in the quest to meet the “right force” requirement. In the quest to achieve this readiness of its right force, CNAF relies on other partners within the Naval Aviation Enterprise (NAE).

The NAE is a partnership tasked with the resolution of issues affecting nearly 200,000 personnel, 3,700 aircraft, 11 aircraft carriers, and a budget in excess of \$40 billion. The issues critical to this thesis are in relation to the manpower element, but extend to every facet of the entire enterprise. Organizations contained within the NAE are outlined in Figure 4, and Badertscher, Bahjat and Pierce (2007) cite the purpose for the NAE as:

it enables communication across all elements of the Enterprise, fosters organizational alignment, encourages inter-agency and inter-service integration, stimulates a culture of productivity, and facilitates change when change is needed to advance and improve. Working together optimizes the use of existing resources, manages the costs associated with generating readiness, and harnesses change as a positive force within our Navy and Marine Corps.

CNAF and the NAE identified certain key challenges that apply to the enlisted aviation manpower system within the current human capital strategy. Included among these were: (a) absence of any system for the measurement of return on investment, (b) legacy systems are inflexible and unable to functionally capture our workforce, (c) uncertainty regarding the amount of money which is actually being spent. It is obvious from a business perspective that these are not small deficiencies, and an enterprise with these deficiencies would not survive long in today's competitive market environment.

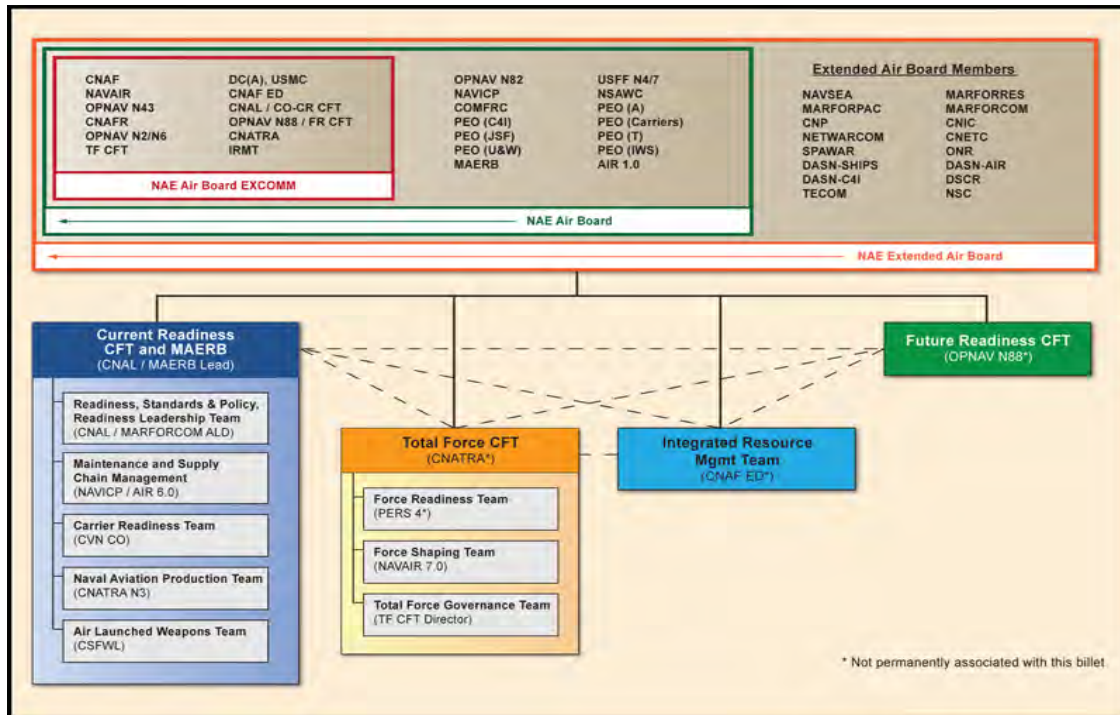


Figure 4. Naval Aviation Enterprise Leadership (Commander, Naval Air Forces, The Naval Aviation Enterprise, n.d.).

a. Commander Naval Air Forces and Manpower Readiness

Within Naval Air Forces, each aviation unit possesses unambiguous operational requirements. The execution of the operational requirements demands a specific number of qualified technicians. These requirements are calculated by Required Operational Capability/Projected Operational Environment (ROC/POE) documents and are based upon the “minimum quality and quantity of manpower required to effectively and efficiently accomplish the activity’s mission.” These requirements are then translated into manning documents that call for personnel by paygrade and classification.

The posture of the unit’s manpower to meet these requirements is measured in terms of manpower readiness. Unit enlisted aviation manpower readiness, at least in theory, is a direct determinant of that unit’s ability to deliver on those requirements, and to meet fleet commander tasking. This readiness is continuously

monitored and measured and these measurements are used as a gauge to determine whether the right level of manpower readiness is being achieved to support current and future operational requirements.

Current readiness measurements, along with the detailing system, are tied to classification in the form of what is called the Navy Enlisted Classification (NEC). This is a key limitation of our current EAMS. The reason the NEC is such a limiting factor is that the NEC indicates that the individual is capable of performing the work in accordance with the Navy Standards (NAVSTDs) and Occupational Standards (OCCSTDs), which will be described in depth in the next chapter, on a particular system or subsystem. When the Bureau of Naval Personnel (BUPERS) assigns an individual to a command, the detailing portion of the EAMPS management system is considered to have satisfied the requirement. However merely documenting the fact that a sailor has gone through a specified course of training does *not* necessarily prove they will be able to meet the requirements for the billet to which they have been assigned.

System knowledge in the form of an NEC alone does not qualify a sailor to meet the requirements associated with a particular billet - qualifications do. All qualifications in the EAMPS are gained via the completion of a professional qualification syllabus (PQS). A PQS is a hands-on verification of procedural and system knowledge normally verified through written and practical examinations. Until an individual has completed the appropriate PQS, he is not yet qualified to meet any of the operational requirements of that command.

Here-in lies the major problem. The overarching manpower authority assumes and acts as if it has satisfied the “manpower readiness requirement” of the end user at the point the trained sailor reports for duty at the assigned unit. This is true, despite the fact that it might be a year or even two (or more), before that individual is actually qualified in the billet to which they have been detailed. It must also be noted that some will *never* qualify to serve in the capacity for which they have been billeted. Despite this fact by virtue of them being coded with that particular NEC, both BUPERS and CNAF consider the requirement to have been satisfied.

This highly unrealistic way of measuring readiness is what Badertscher, Bahjat and Pierce (2007), identified as a serious problem when referring to the “distinct lack of meaningful metrics..” Leadbeater and Demos (1999) refers to the same situation when describing the way deceptive measures and misleading accounting practices are sometimes used in the civilian business sector to create the *illusion* of a company being profitable even when they are actually not:

that measuring can result in cumbersome inventories which allow managers to manipulate perceptions of intangible values to the detriment of investors. The fact is that too few of these measures are focused on the way companies create value and make money.

The Naval Aviation Enterprise is, of course, not in the business of making money. Instead, its major concern is creating value (readiness) with its human or intellectual capital management strategy. This difference, however, does not make the Navy any less vulnerable to damage as a result of deceptive and unrealistic metrics. Donkin (2005) underscores this well:

It is not the measuring itself that is the key to successful human capital management (substitute intellectual capital), but the intentions behind the measuring and the resulting practices that emerge. The effectiveness of these practices is heavily dependant on how they are perceived and understood by frontline employees and the kind of workplace behaviors they encourage. Measuring is not good in itself. Adopted without any rationale it will achieve little. Its prime uses are to evaluate cost and to test the effectiveness of a strategy, pointing the way to further improvement.

The means by which the current EAMPS functions have not changed in a very long time. There has recently been an increase in the discussion of the term “manpower readiness” and the drivers by which it is achieved. This increased awareness and discussion of manpower readiness is important because it demonstrates a concern for measuring what is being accomplished by our intellectual capital strategy. The problem, as Donkin (2005) points out, is the rationale *behind* the measuring. The readiness measurement is currently being used for accountability with little to no concern for the actual creation of value within the NAE. However as we will see in chapter 4 as a tool for measuring accountability, this approach is extremely inadequate. Manpower readiness

should be used for evaluating associated costs, and for testing the effectiveness of the intellectual capital strategies employed within the EAMPS.

Readiness, regardless of the type of aircraft, or the echelon of maintenance, is (and always has been) a direct reflection of the Navy's struggles with its management of intellectual capital. Although the Navy's manpower system has had the capability to meet objectives, the means of meeting them have been highly inefficient (Badertscher, Bahjat & Pierce, 2007). Furthermore, as has been previously discussed, Naval Aviation has been employing faulty metrics which have been incapable of realistically revealing the true situation.

This inefficient infrastructure continues to be an obstacle to the level of advancement that *could* be achieved by using a system centered on the expert employment of intellectual capital.

B. INTELLECTUAL CAPITAL IN THE ENLISTED AVIATION MANPOWER SYSTEM

1. Human Capital in the Enlisted Aviation Manpower System

Within the enlisted aviation manpower system human capital is represented by sailors. Sailors are defined by a rating structure which consists of occupational fields (i.e., broad groupings of similar occupations), ratings (i.e., occupational specialties) and rates (i.e., a paygrade within a rating). "This structure provides a framework for enlisted career development and advancement, and is the primary administrative means for classifying and identifying enlisted personnel" Manual of Navy Enlisted Manpower and Classifications (2011). For example an Aviation Structural Mechanic Second Class Petty Officer (AM2) with a NEC code of 8305 is described in the following way. The designation "Aviation Structural Mechanic" indicates a professional focus in relation to the scope of rating as shown in Figure 5 (NAVPERS 18068F, 2011) When the title *Aviation Structural Mechanic* is combined with the additional label of "Second Class Petty Officer," it further characterizes the specific skills possessed as described by the Occupational Standards (OCCSTDs) promulgated in the *Naval Enlisted Occupational*

Standards Manual (NEOCS), a small sample of which are provided in Figure 5 (NAVPERS 18068F, 2011). The “Second Class Petty Officer” has further implications in regards to Navy Standards (NAVSTDs). These standards are specific skills related to the performance of basic military requirements, which are also promulgated in the NEOCS. Samples of these are provided in Figure 6 (NAVPERS 18068F, 2011).

The final element, the NEC, describes a competency with regard to a specific weapon system, or subsystem. In this example, the designation 8305 indicates that the sailor has all of the OCCSTDs and NAVSTDs necessary to carry out all duties both military and technical on the Northrop Grumman C-2 Greyhound, and E-2C Hawkeye aircraft.

The budgeted requirements of end users, aviation squadrons, fleet readiness centers, or special assignments are matched to these human capital resources via a detailing system.

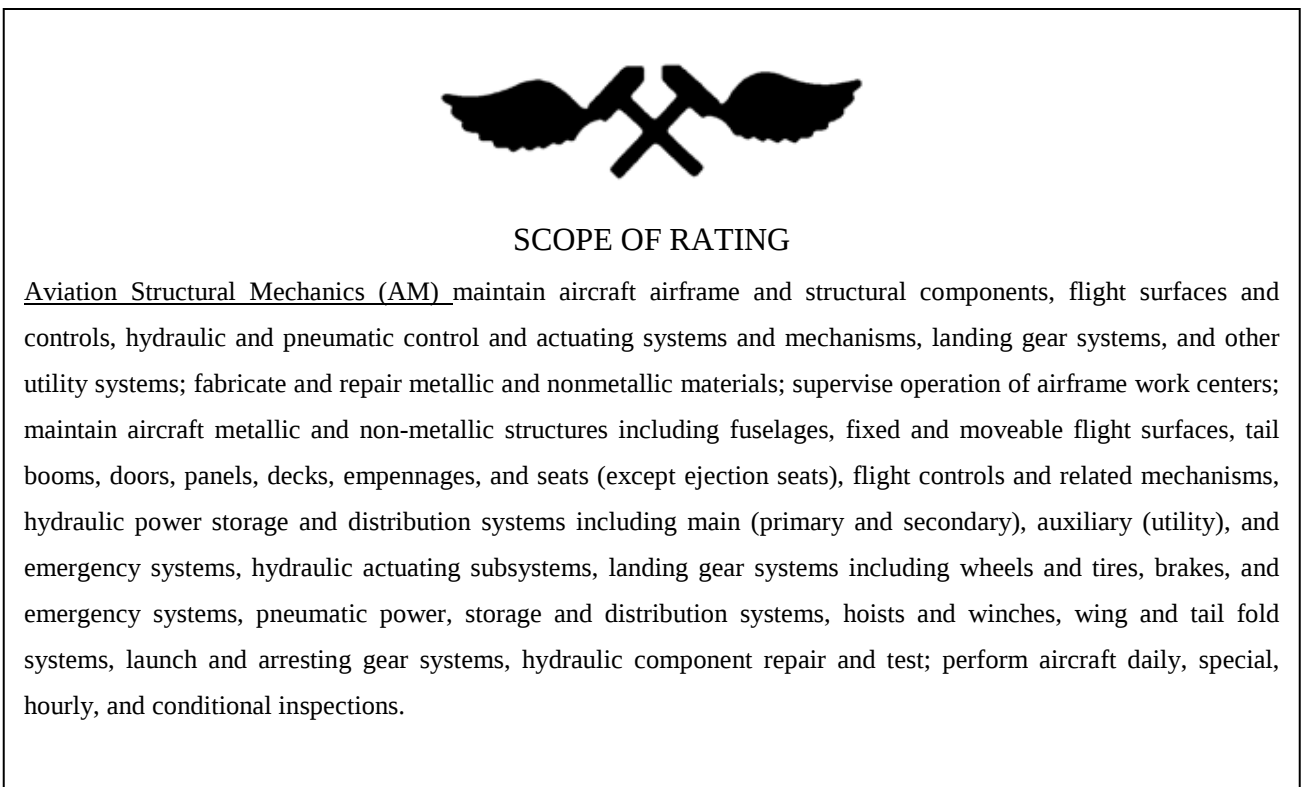


Figure 5. Navy Enlisted Occupational Standard for Aviation Structural Mechanic (AM) Scope of Rating

AVIATION SUPPORT		
TASK STATEMENT	SKILLS	ABILITIES
Conduct aircraft daily inspections	Equipment Maintenance Quality Control Analysis	Deductive Reasoning Selective Attention
Conduct phase inspections	Equipment Maintenance Quality Control Analysis	Category Flexibility Selective Attention
Conduct special inspections	Critical Thinking Quality Control Analysis	Category Flexibility Selective Attention
Conduct support equipment daily inspections	Monitoring Quality Control Analysis	Category Flexibility Selective Attention
Conduct support equipment pre-operational inspections	Monitoring Quality Control Analysis	Category Flexibility Selective Attention
Conduct aircraft transfer inspections	Critical Thinking Quality Control Analysis	Deductive Reasoning Selective Attention
Conduct aircraft turnaround inspections	Equipment Maintenance Quality Control Analysis	Category Flexibility Selective Attention
Conduct zonal inspections	Critical Thinking Quality Control Analysis	Deductive Reasoning Selective Attention
BRAKES AND WHEELS		
TASK STATEMENT	SKILLS	ABILITIES
Maintain aircraft brake assemblies	Equipment Maintenance Equipment Selection	Manual Dexterity Selective Attention
Maintain aircraft structural components	Equipment Maintenance Equipment Selection	Manual Dexterity Selective Attention
Maintain aircraft tire and wheel assemblies	Equipment Maintenance Equipment Selection	Manual Dexterity Selective Attention
Manage aircraft tire and wheel maintenance safety programs	Quality Control Analysis Reading Comprehension	Written Comprehension Oral Expression
CORROSION CONTROL		
TASK STATEMENT	SKILLS	ABILITIES
Conduct aircraft de-preservation	Equipment Maintenance Equipment Selection	Selective Attention Category Flexibility
Conduct aircraft preservation	Equipment Maintenance Equipment Selection	Selective Attention Category Flexibility
Conduct aircraft washes	Equipment Maintenance Equipment Selection	Selective Attention Category Flexibility
Conduct emergency reclamation	Equipment Maintenance Equipment Selection	Selective Attention Category Flexibility
Inspect aircraft and aircraft parts for corrosion	Equipment Maintenance Quality Control Analysis	Deductive Reasoning Selective Attention
Perform corrosion prevention procedures	Equipment Maintenance Equipment Selection	Manual Dexterity Selective Attention
Perform topcoat applications	Equipment Maintenance Equipment Selection	Manual Dexterity Selective Attention
Prepare aircraft surface for painting	Equipment Maintenance Equipment Selection	Manual Dexterity Selective Attention
Treat aircraft corrosion	Equipment Maintenance Equipment Selection	Manual Dexterity Selective Attention
FLIGHT CONTROL SYSTEMS		
TASK STATEMENT	SKILLS	ABILITIES
Maintain flight control systems	Equipment Maintenance Equipment Selection	Manual Dexterity Selective Attention

Figure 6. Sample of Occupational Standards(OCCSTD's) for an Aviation Structural Mechanic

SAFETY
USE AND MAINTAIN PERSONAL PROTECTIVE EQUIPMENT (LESS DAMAGE CONTROL/FIRE-FIGHTING EQUIPMENT)
KNOW THE HAZARDS OF USING CO2, PKP, AND HALON AS FIRE EXTINGUISHING AGENTS
KNOW THE PRECAUTIONS WHEN HANDLING AND STOWING FIRE EXTINGUISHERS
KNOW THE DANGERS INVOLVED WHEN HANDLING A CHARGED FIRE HOSE
KNOW THE DANGERS INVOLVED IN OPERATING INTERNAL COMBUSTION ENGINES IN ENCLOSED SPACES
KNOW THE DANGERS OF ENERGIZING ELECTRICAL EQUIPMENT IN A SPACE FILLED WITH EXPLOSIVE VAPORS
KNOW THE SAFETY PRECAUTIONS TO BE USED WHEN EMBARKED IN SMALL BOATS
KNOW THE SAFETY PRECAUTIONS TO BE USED WHEN INVOLVED IN SPORTING AND RECREATIONAL EVENTS
KNOW THE HAZARDS AND SAFETY PRECAUTIONS WHEN WORKING IN THE VICINITY OF FLIGHT DECK OPERATIONS
KNOW THE SAFETY PRECAUTIONS WHEN WORKING WITH OR IN THE VICINITY OF FLAMMABLE LIQUIDS
KNOW THE SAFETY PRECAUTIONS WHEN WORKING WITH OR IN THE VICINITY OF WEAPONS, AMMUNITION, AND PYROTECHNICS
KNOW THE SAFETY PRECAUTIONS WHEN WORKING WITH OR IN THE VICINITY OF ELECTRICAL AND ELECTRONIC EQUIPMENT
KNOW THE SAFETY PRECAUTIONS WHEN WORKING WITH OR IN THE VICINITY OF COMPRESSED GASES
DAMAGE CONTROL
LOCATE DC FITTINGS/EQUIPMENT WITHIN COMPARTMENTS USING COMPARTMENT CHECK-OFF LISTS
SET AND MAINTAIN PRIMARY AND SECONDARY FIRE AND FLOODING BOUNDARIES
PROPERLY OPERATE PORTABLE AND INSTALLED SHIPBOARD FIRE EXTINGUISHING EQUIPMENT
PROPERLY OPERATE PORTABLE AND INSTALLED SHIPBOARD DEWATERING EQUIPMENT
PROPERLY DON AND OPERATE AN OXYGEN BREATHING APPARATUS (OBA)
KNOW THE HAZARDS ASSOCIATED WITH FIREFIGHTING
KNOW HOW TO DETERMINE THE FOUR CLASSES OF FIRE
KNOW THE RECOMMENDED EXTINGUISHING AGENTS FOR EACH CLASS OF FIRE
KNOW THE FUNCTION AND USE OF THE OXYGEN BREATHING APPARATUS (OBA)
KNOW THE FIRE TRIANGLE AND FIRE TETRAHEDRON IN TERMS OF FIRE PREVENTION AND FIREFIGHTING
KNOW THE CONDITIONS THAT CAUSE SPONTANEOUS COMBUSTION
KNOW HOW TO PREVENT FIRES THROUGH GOOD HOUSEKEEPING PRACTICES
KNOW HOW TO REPORT A FIRE OR OTHER CASUALTIES
KNOW THE LETTERS AND SYMBOLS THAT DESIGNATE MATERIAL CONDITIONS OF READINESS
KNOW THE PROCEDURES FOR COMPARTMENTATION AND ITS USE IN MAINTAINING WATERTIGHT INTEGRITY
CAREER INFORMATION
KNOW THE PURPOSE OF THE PROFESSIONAL DEVELOPMENT BOARD
KNOW THE CAREER REENLISTMENT OBJECTIVES (CREO) PROGRAM
PROVIDE INPUTS FOR ENLISTED EVALUATIONS
KNOW THE CONTENTS OF THE ENLISTED SERVICE RECORD
KNOW THE REQUIREMENTS FOR ENLISTED WARFARE SPECIALIST DESIGNATIONS
KNOW THE FUNCTION AND USE OF THE NAVY ENLISTED CLASSIFICATION (NEC) SYSTEM
PROVIDE INFORMATION ON FINANCIAL MANAGEMENT TO JUNIOR PERSONNEL
KNOW THE PURPOSE OF THE PETTY OFFICER QUALITY CONTROL REVIEW BOARD
KNOW HOW TO APPLY FOR LIMITED DUTY OFFICER AND CHIEF WARRANT OFFICER COMMISSIONING PROGRAMS

Figure 7. Sample of Navy Standards(NAVSTD’S) for a Second Class Petty Officer

a. Plan

As seen in Table 1 (Department of the Navy, 2011), military personnel costs for FY 2012 are projected to cost the DoN \$46.6 billion. Developing a plan for the Navy's enlisted manpower system, a major portion of that cost, with nearly 269,000 sailors, is an immense accomplishment. This is one of the reasons this research is only considering a small portion of that total enlisted manpower or human capital.

MILITARY PERSONNEL	\$46.6 BILLION
OPERATION AND MAINTENANCE	\$47.9 BILLION
PROCUREMENT	\$45.8 BILLION
RESEARCH AND DEVELOPMENT	\$18.0 BILLION
INFRASTRUCTURE	\$3.1 BILLION
TOTAL	\$161.4 BILLION

Table 1. FY 2012 Department of the Navy Budget Submission Overview

Current planning in the enlisted aviation maintenance manpower system is based on manpower requirements. These requirements are created and verified using Required Operational Capability/Projected Operational Environment (ROC/POE) documents for fleet commands, and Missions, Functions, and Tasks (MTF's) for shore based commands. These requirements, per the *OPNAVINST 1000.16K Total Force Manpower Policies Procedures*, "reflect the minimum quantity, calculated using the approved Navy Standard Work Weeks, and quality of manpower required for peacetime and wartime to effectively and efficiently accomplish the activity's mission" The minimum quality is defined by use of the Occupational and Navy Standards discussed earlier in this chapter. Requirements are further evaluated to insure that consideration is given to whether the requirement should be met by military, civil, or contractor personnel. Requirements are then promulgated via manning documents, which describe requirements by rate, rank, and NEC. These requirements are then either funded or not, based on fiscal and available manpower resources.

A key point conspicuously absent from the representation of requirements in the manning document is any reference to the possible benefits that can be obtained as a result of persons remaining in positions related to their previous training and experience, or within the same units, work teams, and/or social networks from the beginning to the end of their career. Without this awareness, vast amounts of resources are expended to train people with skills they may have little or no opportunity to use before they are reassigned to another task in which such skills are not used, moved to a different unit or leave the Navy entirely. This lack of reutilization of skills is just one of the many problems that contribute to the inadequacy of the Navy's current system as expressed in the *Naval Aviation Vision — 2020*.

Planning in any manpower system cannot be based solely on requirements, there must be an adequate discussion as to how the current structures, by which the requirements are satisfied, impact the potential returns from expert intellectual capital employment. Regardless of the sophistication in the planning, developing and verifying of requirements, a manpower system cannot meet higher levels of achievement if core structures act as constraints. Thus, an examination of the constraints within the Navy's current system must form a major portion of this study.

Any effective plan for human capital must include a strategy for adding value at every element in the cycle. This must begin with the initial planning phase, and with all subsequent results being measured and evaluated to determine the need for future improvements within the cycle.

Currently, the human capital plan for the enlisted aviation manpower system is to properly train and man aviation units. As mentioned earlier, the stated goal is to "deliver the right force, with the right readiness at the right cost at the right time." While this ideal seems well-articulated and achievable, the strategy does not take into consideration the constraints that exist in the legacy manpower system, which will be discussed later in this chapter. Planning a human capital strategy requires examining every action within the cycle to determine where and how it will impact the other. The current system is asked to deliver the right force with the right readiness, and due to

legacy constraints in the system, when an individual is hired there is no clear commitment as to how they will be a “right force,” and to who’s “right readiness” they will contribute.

From the perspective of the human capital, the sailor, the plan looks and feels a great deal like a game of roulette. On the day they enter service, they know where they might be spending the next eight months or so. However, beyond this point in time, everything in their future appears to be unpredictable, and to depend entirely on random events. Such a situation creates a considerable amount of stress on the sailor. Did this system work 50 years ago, and even if so, does it still work today? At least at general level, perhaps from the highest levels of leadership, such a system can be said to have been convenient, and worked adequately. However, what is questionable is whether such a system represents the *optimal* use of human capital for today and for the future. Does it deliver value from the perspective of the sailor? Does it actually benefit the unit in which the sailor will spend his first few years of service, or the Navy as a whole?

We might ask “Is there a plan for human capital within the enlisted aviation manpower system?” *Webster’s Dictionary* (2011) defines the word *plan* as a method for achieving an end, a detailed formulation of a program of action. By this definition, the answer is no. The course taken by each sailor, while potentially rewarding, is so statistically varied and unpredictable that to say it follows “a detailed formulation” would be incorrect.

Planning in the human capital cycle must happen on a continuous basis. This is because unpredictable shifts in other elements happen continually and these unforeseen changes may directly or indirectly place unanticipated demands upon enlisted manpower. In a system in which an individual can spend two years of a six-year contract training to be an Aviation Electronics Technician and then receive orders to spend the last two years of the six years serving as a Naval Recruiter, attempting to formulate a program that anticipates the needs of individuals in advance is virtually impossible. To spend years training sailors to perform specific jobs, and then reassigning them to a job where, in a best-case scenario, only a portion of their acquired talents will still be relevant, can accurately be described as an inefficient use of resources. This fundamental

disregard for efficiency in short- and long-term human capital planning dooms the current human capital cycle to failure before it has even a chance to get started. The DoN claims to operate based on a strategy of placing the “right people with the right skills, at the right time and place, and at the best value,” and yet it still employs a legacy structure and strategy that seems to be in clear opposition to this stated goal.

b. Acquire

Human capital in the enlisted aviation manpower system is acquired via recruitment. The DoN requested for FY-12 more than \$254M for recruiting activities including advertising (Department of the Navy, 2011). This figure does not take into account the cost of pays and benefits for the entire enlisted recruiting force. In 2010, the DoN estimated that the average cost to recruit each sailor was nearly \$23,500. Recruitment is conducted by sailors of all occupational specialties serving away from their trained area of expertise, typically for a three- or four-year tour of duty. Important to note is that these recruiters who are providing the first interaction for this newly acquired human capital are not doing the job for which they were originally trained. The task of recruiting is seldom, if ever, the job these sailors have the desire to be performing.

The Navy retains a professional enlisted recruitment force, which has the task of overseeing the total recruitment effort. Recruitment is done through the utilization of a lengthy application process that includes an aptitude test and an extensive physical examination. During the recruitment process, the first rudimentary attempts at a human capital strategy are taken. The aptitudes of the applicant qualify him or her for any number of occupational specialties (ratings), or general apprenticeships. The applicant sits with a classifier, who presents him with a list of options based on the applicant’s aptitude and desires, and the needs of the Navy. From the list provided, the individual selects either a specific rating or an apprenticeship. The applicant is then “hired” for a specific length of time, normally between three and six years. Upon being hired, the individual enters the delayed entry program. They can be in delayed entry up to 12 months. At a date within that period, they officially enter the organization by means of attending boot camp in Great Lakes, Illinois.

In terms of being a value-added human capital element, the recruitment process is a very imperfect procedure. Current imperfections in this enlisted aviation manpower acquisition strategy include, but are not limited to, the ambiguity of the accession, contract length, and the persons conducting recruitment.

The ambiguity of the accession is in both the intentions of the organization, and in regards to the specific career path that can be expected by the human capital being accessioned. The individual being recruited fills an arbitrary accession requirement. However this arbitrariness provides no concrete level of fulfillment to the individual committing to the organization, and no added value to a specific end user aviation unit. The recruit gains nothing by being assigned in such an arbitrary fashion, rather than by some procedure which would more precisely match their training, career goals, and personal preferences. Likewise, the unit gains nothing by receiving a recruit assigned to them through such an arbitrary means, rather than a recruit more precisely attuned to its needs. From a viewpoint that recognizes the sailor as a form of capital, an asset which contributes to organizational performance from the beginning of this career, this uncertainty about their future career path can be seen as a non-value added step.

Also problematic is the selection of personnel used to conduct the recruiting. The Navy has traditionally used experienced sailors, all of whom have been trained for other jobs, to recruit new sailors. Even though those selected for this task are generally trained retrained for several months to perform this task, the practice nevertheless has numerous disadvantages. The first is that the acquisition of human capital, the “critical organizational differentiator,” should not be left in the hands of anyone other than highly skilled professionals who have an expressed desire to work in such an occupation. Secondly, and more importantly to this thesis is the loss in readiness to the EAMPS as a result of following this traditional procedure. It must be remembered that these new recruiters were all sailors in whom a large investment was made to provide readiness to the enterprise. By taking them away from the jobs they have been trained for, and instead having them serve three or four years in recruiting duty, this has a definite negative impact on present and future enterprise readiness.

It is imperative that every planned action element (acquire, develop, maintain, and retain) within the human capital cycle, should be measured in an objective manner. The following questions need to be asked: (1) What impact does that action applied to that item of human capital contribute to organizational value? (2) What is the return on investment for each elemental action? (3) How does each elemental action contribute to future strategies? and (4) How might each elemental action be received by his or herself?

c. Develop

Human capital development begins in the enlisted aviation manpower system in boot camp. The sailor begins to learn all of those items that will make them proficient in the basic military requirements which constitute the Navy Standards portion of their proficiency. Boot camp for enlisted sailors lasts nine weeks, and if all accession goals in FY-2012 are met, will cost the Navy an estimated \$10.6 million dollars. This number once again does not factor in the cost of the enlisted manpower operating the facilities nor the resulting decrease in readiness due to their being away from their chosen professions. At the completion of boot camp, the sailor has passed examinations proving proficiency in basic standards that could be utilized in a variety of potential future duty stations. Some of these proficiencies will be utilized and others will not be.

Upon graduation, each sailor moves on to a specific training program which was selected during the recruitment process. This training is provided at various locations and is designed to give them a basic or advanced comprehension of the skills, in accordance with the Occupational Standards outlined earlier. The level of training, whether basic or advanced, is typically aligned to the length of commitment they have made during the recruitment phase.

Upon completion of initial occupational training the sailor, through a variety of means, selects an ultimate duty station. For an enlisted aviation maintenance sailor, this will be either organizational (on aircraft), or intermediate/depot (aircraft component/overhaul). Typically, there is only minor input from the sailor in the decision as to where or to what type of command they shall be assigned. The billet that is chosen

will be coded or not coded with an NEC, which will determine whether or not the individual shall have specific training related to that NEC. If the sailor is in a general apprenticeship or does not require an NEC for the billet they will fill, they will report directly to their ultimate command.

If the sailor is sent for NEC training, it will be specific to the weapon system they will be working on. Upon completing this NEC training, the sailor will then also be sent to their ultimate duty station. At this duty station, together with the general apprenticeship, and non NEC billeted personnel, they will, at least in theory begin to contribute to the manpower readiness of the organization. It is important to point out that this measure of readiness differs among organizations under the cognizance of CNAF. Some organizations consider this sailor, with this initial training, to have begun contributing to the readiness of the organization simply by having reported for duty. However, other organizations tie the readiness to the sailor's ability to perform tasks consistent with the Occupational and Navy Standards described earlier. According to Navy manning, the arrival of these individuals satisfies the command's specific manning requirements—regardless of the fact that the individual may take two years to fully gain proficiency in Navy and Occupational Standards commensurate with his or her assigned billet. This state of affairs and its problematic implications will be discussed in greater depth in this chapter, for it is critical to current human capital utilization.

The sailor will continue his training in accordance with required professional development and the specific needs of their assigned unit. Further proficiency in Navy and Occupational Standards is achieved through a combination of e-learning, on the job training and formal classroom training. This learning serves three purposes: (1) making the sailor more proficient technician in their rating (OOCSTDs); (2) making them more proficient on the system they are currently assigned; and (3) making them more proficient in Navy Standards. These three knowledge bases will all contribute to preparing for examinations, which they will take to earn advancement.

The sailor will continue to serve with this first command for an average of 42 months, at which point they will transfer to another unit. This new unit can be anywhere in the world. The only way the individual will be able to build upon the

proficiency they already possess and continue to deliver readiness is if their new command is the same type/model/series aircraft. This option is referred to as NEC reutilization. This practice has, for a number of reasons, historically been frowned upon in the Navy. These reasons are not as important to this discussion as the fact that it is still such NEC reutilization is not an approved recommendation or mandate, and therefore does not happen very often. A second option, which happens more frequently, is that the new job will keep the sailor in their chosen aviation rating, but assign them to a new TMS or to a Fleet Readiness Center. At this new location, they will not contribute to readiness without further resource expenditures. The third option involves duties completely unrelated (such as recruiting, or company commander) to those for which they have already received training or for which they have already begun to demonstrate significant proficiency. The important note about all three of these options within human capital development is that they all represent a disruption in the availability of previously acquired readiness.

This disruption occurs even with the first option. Option one is the least impacting of the three upon readiness. However, it may still result in that quantity of readiness not being available for three months if the entire move goes well and they and their family acclimate to their new location, and that a host of other variables all go perfectly. Aldisert (2002), states “Another aspect of the paradox that human asset value fluctuates is that people are sentient beings. When they are on top of the world and feeling good about their contributions, they are unstoppable. On the other hand, if they are distracted for whatever reason, their productivity will diminish and over time will have a negative impact.”

It is not possible to list all of the potential paths that a sailor's career might follow upon completion of their first permanent duty station. However, what is critical is the fact that upon completion of this initial period, virtually all of the previous investments in human capital cease to be taken into account. Because this investment in human capital is not valued, essentially all of it is wasted. In the private sector, every effort would be made to insure that there is as close as possible to a 100% return on such

investments. However, this way of thinking, and associated practices, are alien to the Navy, and as a result, the Navy's use of human capital is drastically less efficient than it might otherwise be.

d. Maintain

The "maintain phase" of the human capital cycle in the current enlisted aviation manpower system of the Navy is uncharacteristic of most other manpower systems. This is because in the Navy, proficiency is sacrificed for diversity. The Department of the Navy has always preached the concept of a "well rounded sailor," discouraging tours which showed an unwillingness to step out of one's "comfort zone." Although this philosophy has merits, it is very difficult to promote this type of career diversity but also simultaneously demand a "right force for the right cost" that the enterprise currently seeks. The maintain cycle in the enlisted aviation maintenance manpower system has sailors scrambling for the "right" next move, and Naval Aviation Manpower managers scrambling to recruit refined talent that often times does not exist or is not available.

From the perspective of meeting basic human hierarchical needs the Navy's manpower system provides a pay and incentive system that is nearly on par with, or in some cases, surpasses, the opportunities present in the civilian sector. The Navy's first and second term retention which is a good indicator of how the "maintain cycle" performs in relation to the meeting of these needs is currently outpacing goals. The Navy is now actively forcing sailors to compete for limited availability through the Perform to Serve program all the way through their 14th year of service, with specific continuation boards examining sailors beyond that point.

A part of the maintain cycle that also must be discussed is promotion. This is because promotion and the way promotions are assigned is critical to the success or failure of the organization. Within the enlisted aviation manpower system, promotions are earned through a combination of evaluation, longevity of service, and examinations. There are also commissioning programs, which will not be discussed here, for they constitute only a very small percentage of promotions. The unique characteristic of these

promotions within the Navy is that the individual is not given an opportunity to stay within the area they are proficient. This is because all promotions lead to managerial positions, and this precludes individuals from continuing the practice of the art of maintenance. This is true, even if they have a demonstrated proficiency in such activities, and express a desire to continue in such a capacity.

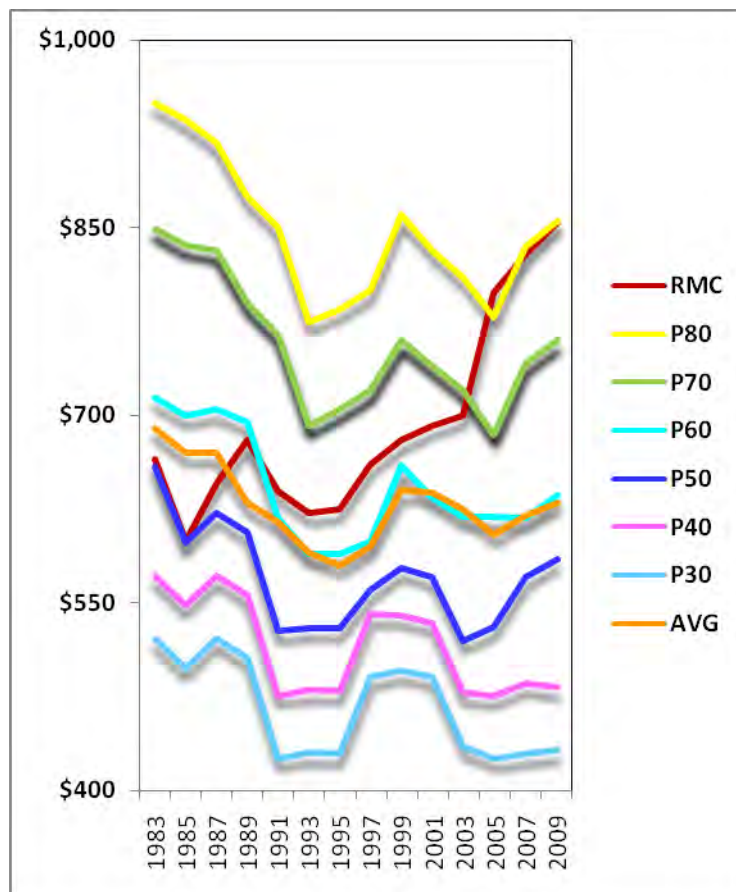
e. Retain

In order to truly facilitate a realistic discussion in regards to the EAMMS, retention must be examined from two different perspectives. Retention is currently viewed from the perspective of the Navy as a whole, and as will be discussed later, this policy is another critical concern. Fitz-enz (2000) states that “improving retention generates several values.” Among these values are “reduced training costs, and less supervisory time required.” These specific benefits refer to retention at a business unit level, or, as it is called in Navy terms, the command level. While the Navy does look at command retention levels, when doing so it does not concern itself with retaining the individual within any particular unit. Rather, its metrics only measure the level of retention of the human capital within the Navy as a whole.

The Navy has always paid very close attention to its retention needs, efforts and results. Unlike traditional organizations with fairly predictable operational environments, the Navy, being a war-fighting enterprise, experiences constantly-changing operational schedules. These constantly-changing schedules have drastic effects on the retention of talent. Another significant contributor to shifting retention rates of human capital within the enlisted aviation manpower system is the economy of the country as a whole. The Navy is no longer an employer with compensation packages that lag behind civilian industry. Pay and benefits for enlisted maintenance personnel currently rank high as Table 2 clearly shows. These major improvements in compensation have helped drive Navy retention to their current levels, with the Navy now having to screen every individual eligible for retention, to determine whether or not they are the premier candidate. This has shifted significantly in the last 20 years. In earlier times, meeting retention goals was a constant struggle, with the Navy often

coming up short and needing to use incentives to increase retention in specific occupational fields. At present the opposite situation prevails, with the Navy having larger numbers of people within its ranks wishing to remain in than it is willing to retain.

Wage Percentiles of Males, Age 22–26, with High School Education in Production/Craft Occupations



\$2009 constant dollars

Source: RAND National Defense Research Institute

Table 2. Regular Military Compensation (RMC) Versus Private Compensation

The Navy has spent much in the way of resources in the past to ensure it was capable of adjusting rapidly to losses in critical skill capacities. The Navy has consistently used tools such as retention interviews to determine why personnel were leaving, and reenlistment bonuses to alter retention trends to ensure projected future needs are met. Although this focus has been employed for some time, the true focus of

retention for the NAE, which is increased readiness, is almost impossible to measure, as a sailor is not specifically looked at for the unique talent he or she has achieved. Once a sailor has completed three tours, and possesses perhaps three NEC's, there is no unique way they can be defined because those NEC's describe what can be highly diverse skills, with no differentiation as to how they performed in the NEC. The more complicated it is to determine how an individual directly contributes to the increased readiness the enterprise seeks, the more likely it is that personnel will be retained and employed in an unsuitable manner.

2. Social Capital in the Enlisted Aviation Manpower System

a. *Social Capital Inside the Organization*

Maintenance within a naval aviation organization is highly procedural and dynamic, with sorties coming and going, aircraft in a constant flux of readiness postures, and on-going repair priorities on many as 30 aircraft or subsystems in a given work day. The means by which each work center supports the other is dependent on the structures and networks in which information is shared and knowledge ascertained. These structures and networks present an everyday challenge to maintenance managers due to the constant flux in human capital.

In order to fully comprehend social capital in the EAMPS, it is important to understand the rotational nature of enlisted manpower. As stated above the average tour of a sailor within a command is approximately 42 months. Upon completing a tour, the sailor then receives orders that transfer them to some other unit. This transfer can be to anywhere. This might place them in another local unit, or the transfer might place them in a unit on the other side of the globe. They are then replaced by a sailor who has likewise come from any number of places. Every unit experiences this constant turnover of personnel, and this is a constant disruption to the structures and networks that constitute social capital.

b. *Social Capital Outside the Organization*

When discussing social capital it is important to also examine the environment in which an aviation unit functions. Although it is not possible to discuss every operational environment in detail, certain general patterns can be described. Every operational aviation unit is dependent on lateral support units, and is subordinate to parent organizations. Examples of support units include facilities and supply. Examples of parent organizations are Type Wings and Carrier Air Wings. These units have networks and procedures for interactions, which represent knowledge to any end user. An example of this is a supply unit that requires a retrograde component to be packaged in a certain way. If a sailor understands the proper procedure and is able to package it correctly the first time (effectively employing their acquired knowledge), their ability to do so has a value. The interaction between these organizations often occurs on an hourly basis, and each process effects over all enterprise readiness in one way or another.

Social capital is often masked within the EAMPS by extremely high *esprit de corps*, which *Webster's Dictionary* (2011) defines as the common spirit existing in the members of a group, which inspires enthusiasm, devotion, and strong regard for the honor of the group. While this phenomenon is often prevalent in military organizations with high morale, it has only a limited capability to generate value the way properly managed social capital can do. *Esprit de corps* can obviously change with its environment, whereas social capital is the environment.

3. *Organizational Capital in the Enlisted Aviation Manpower System*

The struggles with organizational capital in the EAMPS closely resemble the difficulties that exist with social capital. Very much like social capital, organizational capital is highly reliant on stability within human capital. The constant rotation of human capital in the EAMPS as well as in the officer ranks, make the management of organizational capital challenging.

As has already been discussed, there is a great deal of disparity in the way individual organizations within naval aviation operate. By thinking of organizational

capital as a form of institutionalized knowledge, examining this constant rotation of sailors from one “institution” to another sheds light on the challenges that exist.

The environment of naval aviation maintenance has been transforming since the Chief of Naval Operations (CNO) codified the framework for the Navy Enterprise in NAVADMIN 204/06. This transformation has meant significant change throughout naval aviation maintenance and more specifically to individual units within naval aviation. The policies and procedures that have come with that change represent the organizational capital within that unit.

**C. OBSTACLES TO IMPROVING READINESS IN THE CURRENT
EMPLOYMENT OF INTELLECTUAL CAPITAL BY THE ENLISTED
AVIATION MANPOWER SYSTEM**

1. Obstacles in Human Capital Cycle

a. Obstacles in Planning

Obstacles within the planning cycle revolve around the infrastructure and the means by which the human capital cycle is carried out. At its most basic level planning must involve human capital goals that are clearly defined. Although defining goals for a force comprised of 260,000 people is an extremely challenging task, it must be done. Naval leadership has called for “the creation of a force that provides the right skills, at the right time, to accomplish the right work in the 21st century” (Winter, 2007). While this mantra makes a good sound byte, it lacks the specific definition of what are the right skills, when the right time is, and what the right work is. Consequently, since 2007, little has been done to examine the EAMS as a whole. Metrics have been changed in an attempt to improve the readiness posture. However, simply changing metrics has done nothing to directly address the core inefficiencies that have been identified.

b. Obstacles in Acquiring

Current manpower acquisition strategies do not fully support our desire for greater, more cost-effective readiness. An acquisition of precious human capital should,

from its earliest stages, have an end goal associated with it. The average length of an initial acquisition or contract is 48 months. Neither the sailor nor the Navy are aware where the sailor will serve, until, on average, 12% of their initial obligation has expired. The impact of this, as with every element of the system, is two-fold. The first issue is the sense of contribution from the sailors' perspective. The second is from the readiness manager, whose practical employment of that sailor drives mission success. The sailor typically arrives at their ultimate command with only 80% of their initial obligation remaining. This portion of the acquisition procedure of human capital has been in place for nearly 50 years and fails to contribute to a cost-effective, sailor-focused, human capital acquisition strategy.

The other significant detractor has been previously discussed; however, as it is a significant obstacle it is laid out here again. This obstacle is the sailor performing the acquisition. Currently recruiting is done by enlisted sailors from all Navy ratings many of whom are a part of the EAMS. These sailors have spent significant percentages of their obligatory contract time in schools, and the Navy has spent a significant level of resources in an attempt to attain crucial readiness within the NAE. However now they are being employed in a completely different area from that in which they have been trained. The method contributes minimally (if at all) to what they were initially acquired for: to contribute to NAE readiness.

c. Obstacles in Developing

The development stage of the human capital cycle within the EAMS struggles greatly with cost effectiveness. The initial development (including pay, training, housing, transportation), in his first year costs the Navy approximately \$100,000. This investment delivers a sailor to his first unit who, if measured by NEC standards, is now a "qualified sailor." However, in reality, the sailor is still an apprentice of unknown capabilities, and is qualified to do nothing in accordance with a well-refined qualification system. This sailor will now develop their skills within his assigned commands, of which he will be part for between 36 to 48 months. Even if his intention is to remain employed by the Navy, he likely will not reutilize the specific skills he was

trained to become competent in during his initial tour. His development while at this command will consist of more schooling, which is highly varied due to the individual needs of each type/model /series (TMS) aircraft and the specific unit. There is no accurate measurement of the cost of following this procedure. In reference to this specific issue CNAF has said, “it is uncertain how much we are really spending” (Badertscher, Bahjat & Pierce, 2007). The cost inefficiencies in this development cycle are further compounded by a lack of commitment to the reutilization of all training resources. At the moment true readiness is attained in the current developmental cycle of the EAMS. The system is timed to send that individual to a new location where they will begin to once again be a drain on limited resources, and, once again, will not contribute to the real readiness requirements of their new unit.

As previously noted, the advancement system used by the Navy further contributes to the obstacles in attaining increased readiness in the development of human capital in the EAMS. In general terms, it seems to be a wise policy to have a system that uses careful consideration of total performance to determine advancement. However, when examined closely from a human capital management standpoint, the specific details of the advancement system employed within naval aviation maintenance can be seen to lack the dynamics which would maximize value for either the individual sailors or for the NAE as a whole. While the system satisfies the requirement to provide the opportunity for advancement, which is one of the basic needs of human capital, it does *not* provide the opportunity to significantly improve readiness.

In the Navy’s advancement system, all sailors progress towards management. Although this might seem like a very positive, egalitarian, and fair policy on the surface, many sailors merely aspire to be the best technician they can be, and lack the desire for management. Does such individuals’ desire to remain a technician without ever becoming involved in management have the potential to negatively impact readiness?

The answer is undeniably that it does. The current system actually seeks to take a sailor, who at the 10-year mark, is beginning to truly master their technical skill, and move them out of their technical activities into managerial duties. If they remained

employed in a manner that continued to take advantage of at least half of their qualifications this could be legitimately seen as contributing to the return on investment expended to acquire those qualifications. However, the norm within the EAMS for an E-7 or Chief Petty Officer is that they drop most (or all) of their technical qualifications, which have come at a high cost over the early stages of their career. This divestiture from skills that are considered “menial” occurs not only at the E-7 level and above, but also extends to all pay grades. As an individual is promoted, he is moved beyond certain qualifications. This active decrease in readiness is not a reflection upon the competence of the sailors, but is a tradition that is consistent across the enterprise. The tradition stems from, among other things, the fact that a position in a specific unit is always only temporary. This forced conversion to management, and associated divestiture of skills significantly detracts from readiness.

d. *Obstacles in Maintenance*

The policies related to the maintenance phase of the human capital cycle, which are a legacy of a much less technical time in the Navy, coupled with a need to insure that sailors spent equal times at shore and sea, actually spends valuable resources *decreasing* readiness. In a look back at the example of the sailor on his first tour, at approximately the time he truly begins to contribute to a state of readiness, the Navy actually spends on average, \$35,000 to move the sailor and his family to a new duty station. This amount is only what is spent for the physical move. Does the move provide a benefit from the perspective of the sailor or for their family? There seems little evidence to indicate that it does. Perhaps in rare cases, an occasional sailor and/or their family might be moved to precisely the location they have yearned for, but for the average family, moving is a highly stressful, uncertain and unwelcome change that they would have avoided if possible. In addition, depending on the nature of the next duty station, there will probably be a significant amount of retraining involved, which amounts to a further expenditure of resources directly impacting readiness. If the individual is staying within the NAE, the resources being spent to pay for this new NEC, which, as has been discussed, is only theoretical readiness, can be considerable. This interruption of

the previous duty at the point at which the sailors contribution to readiness was at its peak, is not only detrimental to achieving readiness, but it also has a significant impact on the sailor's concept of contribution.

e. Obstacles in Retaining

The retention cycle of the EAMS could currently be described with the metaphor of “the tail that is wagging the whale.” Many traditional struggles with regards to retention no longer exist. The fact is that the Navy has achieved great successes in improving retention through increased compensations. Although in some ways this is tied to current struggles in the U.S. economy, the reality is that the present schedule of benefits has generated the highest retention rates in history. However, from the sailors' perspective, this situation has not been very positive, for it has brought on numerous new screening points for retention. Unfortunately for the sailors this is currently translating into a loss in job security, which will in turn, may drive retention rates *lower* in the future. As to whether the new systems, such as Perform to Serve, will successfully impact future readiness by retaining “the best,” the jury is still out. What will happen in terms of job security, being a desire of the more discerning sailor, only time will tell.

As has already been discussed, retention does not impact enterprise readiness to the extent that it could. This is due to the development and maintenance elements of the human capital cycle in the EAMS.

2. Obstacles in Current Social Capital Employment

The utilization of social networks to improve productivity goes back to the beginning of civilization. Ostrom (2000) implied that if societies are to prosper, citizens not only need physical and human capital, but also social capital. This concept makes the lack of comprehensive utilization of social capital in the EAMMS unintelligible and a direct impediment to improved readiness.

a. *Social Capital Within and Outside the Organization*

Every aviation organization within the enterprise that is manned by sailors endures constant disruptions to the social networks from which improved readiness might be derived. There are countless interdependent activities both internal and external being conducted by every aviation maintenance department. These constant disruptions to these interdependent activities have a twofold negative impact on readiness: (1) the need for the networks to be regenerated for future achievement, and (2) the new networks must be evaluated by management for their ability to contribute to the two most important aspects of readiness—productivity and overall safety.

The need to regenerate these social networks is high, but accomplishing this can be a significant challenge. The synergy that comes from prolonged involvement in a mutually-dependent activity does not exist initially. It typically grows as the social network is deepened and expanded. Currently within the EAMMS, these constant disruptions not only do not contribute to capitalizing on this synergy, but by their very nature, these constant disruptions directly and negatively impact readiness.

Robison (2010) describes this important characteristic of social capital:

Social capital like physical capital is subject to decay from use, the passage of time, and lack of maintenance. One might develop social capital that provides valuable services with a neighbor. But when that neighbor moves, the lack of maintenance in the form of face-to-face contacts, despite efforts to “stay in touch,” eventually diminishes the strength of the ties and the potential to extract services.

What Robison points out is the obvious. In this case, the decay in capital occurs as a result of the lack of maintenance of the capital, which results in a diminished ability to “extract services.” This is a definite part of how the EAMMS suffers due to the nature of its handling of social capital. However, if we take this example a step further and say that success is dependent on extracting services from this neighbor, and subsequently, from the neighbor who replaces him, this new relationship becomes a managerial challenge which will consume resources. Within the EAMMS, this challenge is

multiplied by the number of enlisted sailors in the unit, and by the number of sailors in collateral support units, for all sailors only remain in the positions for a limited time.

3. Obstacles in Current Organizational Capital Employment

Although the means by which improved readiness derived from organizational capital employment is hampered by the same constructs of the EAMMS that social capital is hampered by, the challenges faced are more far-reaching. Organizational capital, as previously discussed, is the institutionalized knowledge possessed by the organization. This knowledge, unlike social capital, which revolves around social networks, forms the basis from which the entire organization functions. Forms of organizational capital can be as significant as the unit's standard organization and regulations manual, to the procedures for processing an aircraft hydraulic sample for contamination. Becerra-Fernandez and Leidner (2008) state:

It has been argued that the most vital resource of today's enterprise is the collective knowledge residing in the minds of an organization's employees, customers, and vendors. Learning how to manage organizational knowledge therefore may produce many benefits, including leveraging core business competencies, accelerating innovation and time to market, improving cycle times and decision-making, strengthening organizational commitment, and building sustainable competitive advantage.

These insights make clear the need for comprehending how current organizational capital is being managed. It also sheds light on how an organization such as the Navy can lose sight of its stated goals.

Organizational capital in the Navy can be viewed from multiple perspectives: (1) the whole Navy, (2) the Naval Aviation Enterprise organization, and (3) the business unit (maintenance activity) organization. The Navy has always taken a holistic view of organizational knowledge, insisting on diversity throughout a sailor's career, with the intention that wherever the sailor went next he would be enriched by having gained "whole Navy" organizational knowledge. While this concept has merit, it can also be an obstacle to the goal of achieving greater readiness at the enterprise and business unit level.

When a sailor is removed from a job in which he is contributing to readiness through proven proficiency and a commensurate amount of organizational knowledge, consisting of what Becerra-Fernandez and Leidner (2008) label as “knowledge about processes, procedures, intellectual property, documented best practices, forecasts, lessons learned, and solutions to recurring problems,” the effects are obvious. If this is done with everyone in the unit, the loss in organizational capital is immense. Does any of the capital remain? Undoubtedly, in a best case scenario, *some* information will be passed from sailor to sailor as transfers are carried out. However, even so, the question is, What contribution to maximizing readiness through the utilization of organizational capital do these endless transfers accomplish?

Every aviation unit specific to a certain operating environment (or multiple) operating environments develops organizational know-how that is specific to the needs of the unit. The development of this know-how has a definite cost. This know-how, which the best organizations typically aggregate for future efficient utilization, is imperative to achieving readiness. This valuable organizational capital is routinely underutilized for three main reasons: (1) reinventing the wheel, (2) lack of long term process ownership, and (3) knowledge is lost altogether.

Several traditions are prominent in the EAMMS that make it function regardless of its intellectual capital strategies. Among these is the ability to constantly “reinvent the wheel.” This refers to either being the “new guy” in the command, or taking over a new position. The tradition has been to personalize the duties or programs that govern specific activities within one’s cognizance. While this does provide for a fresh perspective on how specific duties are being carried out, it invariably leads to “throwing out the baby with the bathwater.” It is in this manner that key organizational knowledge is lost. What is lost must be reacquired, invariably at a cost.

The lack of long term process ownership relates to the holding of multiple positions within every organization that one has been assigned. In a 42-month tour, personnel will hold from three to six different jobs. This lack of long-term process ownership invariably leads to losses of organizational knowledge.

The third problem happens for a variety of reasons, including lack of turnover, disregard for turnover information (the “I know what I’m doing, thanks anyway” syndrome), and a lack of understanding of what organizational knowledge is important to the incoming sailor.

Organizational capital spans every echelon of the Naval Aviation Enterprise and directly contributes to the individual and collective success of the organization. The constant transfers disrupt virtually every aspect of the operation, including: (1) the transfer of organizational knowledge, (2) the continuity of achievements in improved readiness, and (3) the commitment from every sailor, at every echelon, to long term process ownership and improvement. An understanding of this disruptive process must be realized and quantified in order to deliver the intellectual capital goals called for by today’s leadership.

D. CHAPTER SUMMARY

This chapter examined the constructs of the current enlisted aviation manpower system. It is clear that all echelons of the defense structure, including the Department of Defense and the Commander of Naval Air Forces, are increasingly recognizing, intellectual capital as a critical organizational differentiator. The focus on this form of capital within the EAMS was highlighted by then Commander Naval Air Forces, Admiral Zoortman, in 2007, in the *Naval Aviation Vision for 2020* (Badertscher, Bahjat & Pierce 2007), a document that pointed out key flaws in the utilization of our intellectual capital in attaining readiness throughout the enterprise.

The elements of intellectual capital were then examined for current utilization and functionality within the construct of the EAMPS, and obstacles to achieving greater readiness were identified. Several obstacles to achieving the readiness desired, were immediately evident, and all are tied directly to the legacy structures of the current system.

There is little doubt that the current system lacks meaningful metrics, starting with the term which is the focus of so many efforts: readiness. With current readiness

meaning one thing to the personnel distribution system, and another to the operational unit it is understandable that achieving improvements has continued to be such a challenge.

It is critical to understand the means by which the system operates and the many obstacles which impede advantageous exploitation of intellectual capital. These insights will be critical to conducting an analysis of the current system from a systems engineering perspective.

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IV. INTELLECTUAL CAPITAL IN POTENTIAL FUTURE MANPOWER SYSTEMS

A. DEFINING AND DESIGNING THE SYSTEM

The current EAMMS is an assemblage of legacy system elements that do not complement one another in their quest for a common goal. Considered purely from a systems engineering perspective a system of manpower is no different than a product to be engineered, for both instances, all of the individual elements must work together toward a common objective. During the previous 50 years, as human capital and technology have evolved, there have been minor adjustments to the individual elements of the human capital cycle within the EAMMS. However, there has been no comprehensive systems approach to creating the efficient system mandated by every echelon of Naval leadership. In order to create a system that delivers the efficiencies called for, into the 21st century and beyond, the system should be created and maintained under the direction of a systems engineer.

The first step in the systems engineering process “commences with the identification of a ‘want’ or ‘desire’ for something and it is based on a real (or perceived) deficiency” (Blanchard & Fabrycky, 2006). Within the EAMMS, there are multiple perceived deficiencies in intellectual capital utilization, a sample of which are reflected in Figure 7. These deficiencies reduce the ability to attain improved readiness. Important to note is that this paper has found the term “readiness” to likewise be deficient. Therefore, in this thesis, as various possible system solutions are considered for the EAMMS’s future employment of intellectual capital, those solutions will not be tied to this metric. Instead, each element of intellectual capital will be examined independently in terms of the contribution of each one to the stated goal of delivering “the right people with the right skills, at the right time and place, and at the best value, to support and accomplish 21st century naval missions” (Winter, 2007).

SYSTEM DEFICIENCY						
ROUTINE TRANSFERS	X	X	X	X	X	X
PROMOTIONS (PAYGRADE) AWAY FROM ACQUIRED SKILLS	X	X				
ALL PROMOTIONS LEAD TO MANAGEMENT	X	X	X	X	X	X
LACK OF REUTILIZATION OF TRAINING	X	X			X	X
UTILIZATION OF HIGHLY SKILLED PERSONNEL FOR UNRELATED TASKS	X	X	X	X	X	X
PERSPECTIVE	SAILOR	ENTERPRISE	SAILOR	ENTERPRISE	SAILOR	ENTERPRISE
CAPITAL IMPACTED	HUMAN CAPITAL		SOCIAL CAPITAL		ORGANIZATIONAL CAPITAL	

Figure 8. Sample Perceived Deficiencies and Their Impacts to Elements of Intellectual Capital

Defining the need in any system is challenging, but a failure to properly do so will lead to faulty engineering, and be detrimental to the achievement of stated goals. The needs statement currently expressed in the Navy's human capital strategy lacks the type of specificity required in elaborate systems design. However, such statements will serve the purpose of allowing for a theoretical discussion of system creation based upon proper employment of intellectual capital. The unique challenge in the engineering of a system of manpower is the potential for conflicting *needs*, as they will be defined by both the enterprise as well as current and potential future human capital.

Once the need is clearly defined the flow of system creation and refinement will need to follow a typical waterfall model as shown in Figure 9. Critical to this process, by virtue of the nature in which the enlisted aviation manpower is shared with other entities, is the need to coordinate system development across the broad range of stakeholders within the Navy's overall manpower structure.

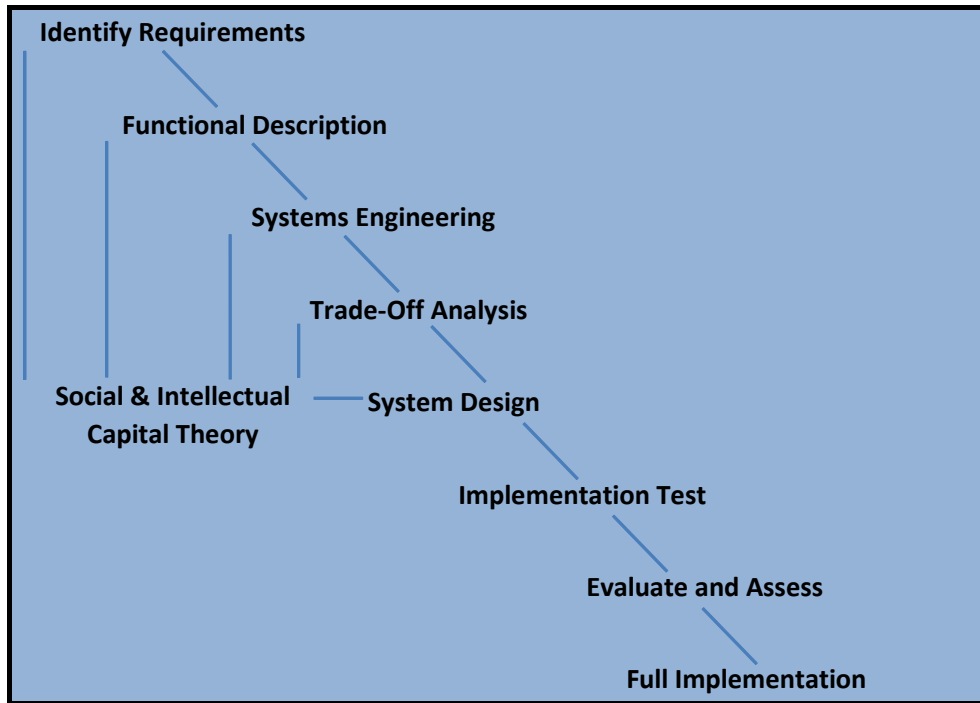


Figure 9. Sample Manpower System Waterfall Model

In developing the ultimate needs or requirements of the system, there will be a need to consider each element of intellectual capital and its contribution to the engineered systems ability to contribute to goal achievement. Understanding requirements in a mechanical system make potential solutions less abstract. However, when dealing with a system of manpower, it is imperative that requirements be based upon a structure that attempts to exponentially benefit from each investment in intellectual capital.

B. INTELLECTUAL CAPITAL CONSIDERATIONS FOR THE NEW SYSTEM

1. Human Capital Cycle

The systems engineering process must ultimately deliver a plan for human capital employment. This plan must generate value from the perspective of the sailor as well as the enterprise. Currently the system struggles with value added due to the conflicting nature between the Navy's overall manpower requirements and those of the enterprise. The plan must identify first and foremost to whom each element of the cycle is going to

generate value for. The plan must view people as people, but also as assets, as it seeks efficiencies with each strategic investment that is made in the quest for added value. Baron and Armstrong (2007) quoted Jay Chatzkel's very accurate description of human capital management as "an integrated effort to manage and develop human capabilities to achieve significantly higher levels of performance." If the system is to drive to the "right cost" goal, this objective must be clearly defined. The success of the system depends on this, as Blanchard and Fabrycky (2006) pointed out by saying, "the objective or the purpose of a system must be explicitly defined and understood so that system components may be selected to provide the desired output for each given set of inputs."

As was previously discussed, the human capital cycle requires continuous planning as each element of the system is evaluated for its contribution to overall goal attainment. The creation of this new system is only a beginning in the quest for an organizational effectiveness that is the "right force."

The system, like the human capital cycle, is comprised of a series of actions which deliver specific objectives and within systems these actions are referred to as functions. The first physical interaction with human capital in the new system will start with the function of acquisition. In decomposing the function of acquisition, in a civilian system of manpower, the means to accomplish the objective is fairly obvious. However, within the current complicated structure of the EAMMS, the means of satisfying acquisition requirements are fairly problematic. Current challenges include: (1) current acquisition is performed by human capital that was acquired for other purposes (rather than on the basis of what the sailor might be good at, their contribution to enterprise via [ROI] of prior training on hold, job satisfaction, first impression on new human capital, etc.) and (2) acquisitions are made with only a very general idea of where they will be ultimately employed (structure of training pipeline, sailors lack of purpose and control, end user receives sailor of unknown quality). These problematic areas will need to be clearly defined so that alternatives can be evaluated against truly desired system requirements. A sample of a hypothetical tradeoff analysis dealing with the requirement to acquire a sailor is provided in Figure 7.

What is immediately obvious even from a superficial examination is that, in the bureaucracy of an organization as large as the Navy, such a tradeoff analysis will be a major undertaking. A list of proposed refinements for each and every function which would contribute to the design of the new system of manpower will be a formidable effort. In the example of utilizing a sailor for the purpose of acquisition (recruiter), the process includes a number of major claimants that would each have a stake in the ultimate system design. The contribution during the trade off analysis, or whichever type similar evaluation is used, would require the involvement of ultimate decision makers. The identification of key stakeholders for each requirement of the system is paramount, and it is essential their input be present throughout the entire process, from initiation to completion. Blanchard and Fabrycky (2006) state “a better and more complete effort is required regarding the initial definition of system requirements, relating these requirements to specific design criteria, and the follow-on analysis effort to ensure the effectiveness of early decision making in the design process.”

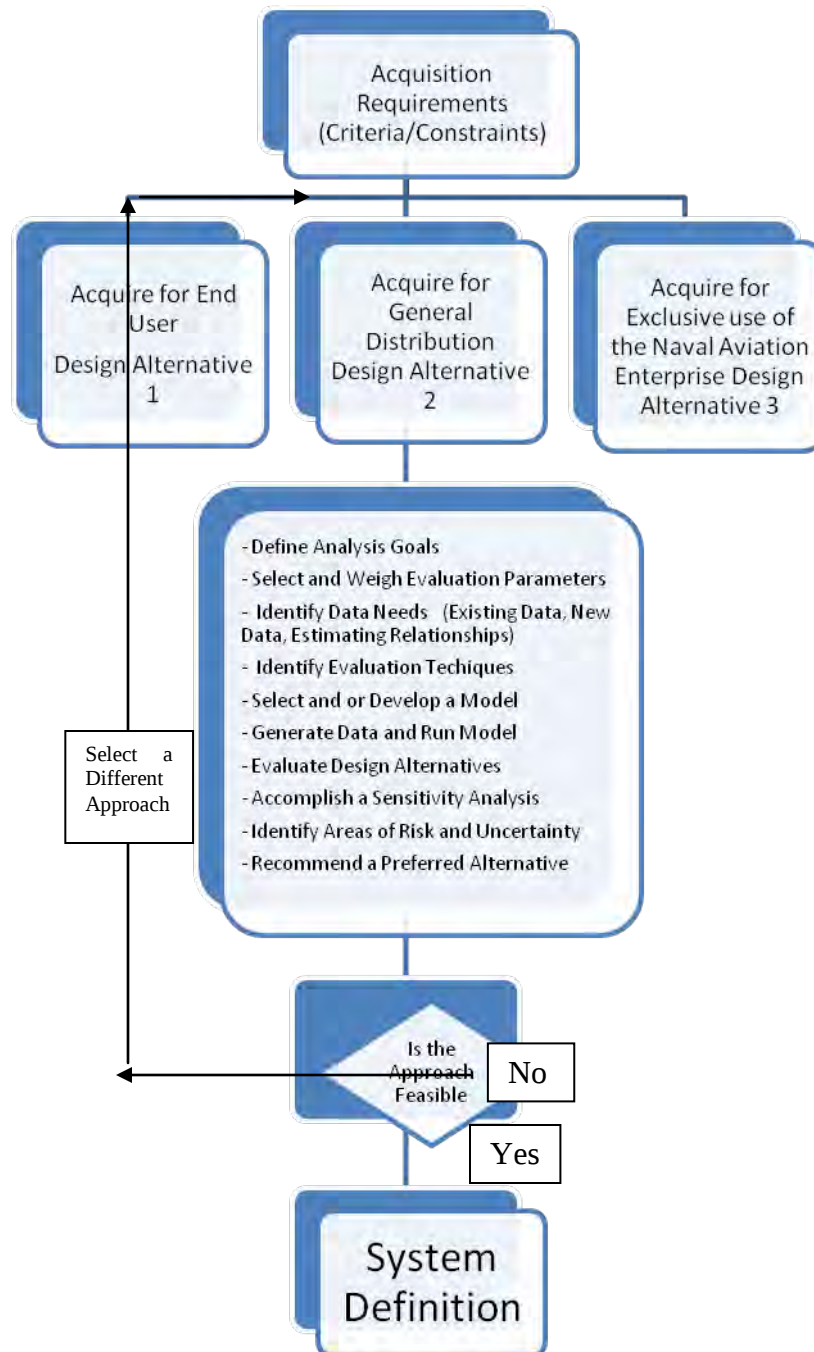


Figure 10. Conceptual Trade-Off Analysis for Acquisition Function

The function of development within the EAMMS is currently, like acquisition, divested among a multitude of process owners. The constructs of the current system, spanning individual organizations and multiple budget submissions, make the

measurement of total cost as well as potential return on investment in the current system difficult. A Rand Survey entitled *Finding the Balance Between Schoolhouse and On-the-Job Training in 2007* estimated Air Force enlisted school house training costs at approximately \$20,000 per airman, with a hidden cost for on-the-job training to be nearly \$40,000 per airman. Although the systems differ slightly, the training and costs associated are nearly identical. Spending \$60,000 (not including acquisition cost and pays received) on the development of human capital, and potentially receiving only 24 months of qualified contributions (readiness) before the individual is transferred and the process and costs repeat is obviously inadequate by layman standards. However, in the systems engineering process, what is critical is that the system design be directly in response to the requirements for the system in its entirety. If the requirement of the system is to have a sailor who is retained for 12 years be capable of understanding the general maintenance requirements of multiple aircraft or systems and know something about the acquiring of sailors, and if cost is of no concern, then this requirement could be said to have been satisfied in full in the current system. It is for this reason, that, once again, the need for involvement of the top echelons of the naval organization be intricately involved through requirements definition throughout the entire design review process.

The functions of maintenance and retention in the current EAMMS are a constantly flowing sea of change. Shifting levels of military pay and compensations, combined with the existence of sailors who lack specific definition, make it very difficult to gather accurate metrics as to why people stay or go. These same factors also make it difficult to ascertain whether the continued service of each such individual is desirable from the prospective of the organization. Currently, military pay and retention are both at all-time highs, which are reflective of many years of progressive gains in compensations for service. As has already been highlighted, military pay is currently on or above par with many of the best-compensated civilians in similar professions. A downside of the high compensation is the potential for it to be drawn back. The downside of the high retention is the creation of new methods for trimming those individuals who are not leaving of their own accord. Unfortunately, this set of circumstances translates into a loss

of job security even for those who, given their own preference and the best interests of the Navy, would otherwise be retained. While a certain amount of movement of personnel in and out of any system of manpower is inevitable, the current structure and policies related to retention perpetuate many of the Navy's worst problems with human capital management.

In decomposing the functions of maintenance and retention, it is necessary to build in variability. This is because there will always be external factors (war, economic shifts, etc.) that will contribute to tipping the balance one way or another. Due to the social nature of a manpower system, attainment of the objectives of these functions can be highly vulnerable to tensions between facts and perceptions about system behavior. The desired behavior must be tied to original requirements for the attainment of a pragmatic design.

2. Decision Assessment

In the engineering of this system, many decisions will require more than discussion in order to compare alternative design solutions. For the purpose of this paper, attaining solutions that value the variable contributions of effective intellectual capital employment, the assessment of design alternatives should ultimately employ an economic optimization model. In this model, the functional relationship is $E = f(X,Y)$ in which each specific evaluation measure (E) is linked to the utilization of social and organizational capital as controlled decision variables (X) with (Y) being expressed as system parameters. The importance of finding solutions that deliver acceptable levels of returns is paramount. This is especially true in regards to these critical components of intellectual capital, within the definition of the new system.

3. Social Capital

The requirement to include social capital considerations in the engineering of the new system is critical. The theory of social capital needs to be clearly discussed prior to the development of the stated system requirements. As previously discussed, disruptions

in the current system occur due to the means by which promotions occur, and, much more critically, as a result of the constant flow of persons entering and departing from the individual business units.

A measure of how broadly social capital is underutilized in our current system can be illustrated in the following example. Such a massive and lengthy undertaking as engineering a new system of manpower would, as discussed, require the involvement, over a number of years, of several major entities within the DoN structure. These entities would invariably use a mix of civilian and military personnel to define requirements and develop initial system designs. This type of engineering and iterative system creation would take years, and as those years waned on only the participating civilians might still be on the project. The military personnel, who would have been such a big part of the critical requirements and design phase, will have moved on through natural rotations, leaving their replacements to attempt to understand the rationale that brought them to the hypothetical system design. Their subsequent buy-in or lack thereof would have the potential to devastate all of the efforts up to that point. In examining this example, it is clear that no organization would choose to put even a minor business decision into the hands of temporary personnel, and yet by virtue of our current system design, we expose each and every business model or decision to this very inefficient employment of this element of intellectual capital.

This example represents only a minute fraction of the means by which the Navy's employment of social capital hampers improved efficiency on a daily basis. Without a comprehensive discussion as to how this inefficient employment effects the entire manpower system, it is nearly impossible to facilitate a discussion on a "right cost" in achieving any stated level of *readiness*.

4. Organizational Capital

Likewise, organizational capital must also be a consideration in overall manpower system design. The current, constant flow of personnel in and out of organizations does not allow for the type of knowledge management that creates value from the lessons-learned in each and every operational and administrative endeavor. In attempting to

deliver the “right cost,” the new system must consider the potential losses incurred as a result of poor knowledge management practices. Bontis (2002), in an article on personnel turnover, states “The importance of knowledge management is staggering, leading International Data Corporation (IDC) to report that in fiscal 2000 approximately \$12 billion was spent by *Fortune* 500 companies on duplicated work.” This figure describes the problem as it exists within the most cost-conscious, efficient companies in the United States. Most of these organizations have been aware of this problem for decades, and have already devoted much attention to resolving it. While a reliable analogous estimate for the Navy does not yet exist, given its historic lack of attention to such concerns, the figure for the Navy is probably many times higher. With the NAE’s rate of turnover, both at the business unit level and throughout the entire organization, the cost in both dollars and operational readiness is far beyond significant. Requirements for the new system must reflect the type of knowledge management that is required in today’s ever-changing, technologically-advanced, strategic environment.

C. IMPLEMENTING THE NEW SYSTEM

Implementing a new system of manpower will no doubt be a monumental undertaking. A manpower system design, unlike a product design, has a built in prerequisite, a necessity to participate in on-going evolutionary development. Understanding the inherent challenges in evolutionary development will require this new system to be placed in the hands of a proprietary system manager.

Currently the Naval Aviation Enterprise acts as a joint proprietor of the EAMMS utilizing a Total Force (TF) Cross Functional Team (CFT), which does not include all of the current process owners. While this is not ideal, it reflects a condition in which the enterprise accepts certain constraints on the system and attempts to mitigate issues as they arise within the jurisdiction of the CFT members. In order to implement this new system all process owners must be included under the proprietary control of a system manager.

D. CHAPTER SUMMARY

The time for implementing an improved manpower system is clearly now. The current scrutiny of government spending, coupled with prevailing process improvement mentalities, demand that this very large, complex, and most importantly expensive system be redesigned. The design must be within the constraints of highly defined readiness requirements as translated from the “right people with the right skills, at the right time and place, and at the best value” and must as a primary consideration evaluate results against the need to derive value from every element of intellectual capital.

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V. CONCLUSIONS, RECOMMENDATIONS AND SUMMARY

A. CONCLUSIONS AND RECOMMENDATIONS

1. Primary and Secondary Research Questions

This research sought to determine how intellectual capital employment improvements might contribute to increased manpower readiness in the Naval Aviation Enterprise? Intellectual capital in the research is defined as consisting of human, social, and organizational capital. The research further attempted to evaluate which present policies of the enlisted aviation manpower system contribute to or detract from achieving readiness.

2. Key Points

The current manpower system represents an immense expenditure of resources. Except for the implementation of specific, superficial policy changes, the system constructs have not significantly changed in 40 years. Within that same time period, in the EAMMS, human capital or sailors, and technology, have changed dramatically. What has also changed is the level of compensation, and that change, coupled with other societal factors, has led to much larger numbers of sailors wanting to stay within the organization. These factors, coupled with a focus on improving the attainment of “the right force, with the right readiness, at the right cost, at the right time,” drive a requirement to search for an enhanced solution.

This research has highlighted fundamental flaws in the systems current employment of intellectual capital, as it exists today, which are further reasons for seeking an enhanced solution. Of the flaws, most critical is this term “readiness,” and how it is utilized as a metric to describe a state of human capital. Readiness, as it relates to human capital, should describe a sailor who is “ready or qualified” to do a set of specific tasks. Anything short of this invalidates supporting data. The second most

significant fundamental flaw is the acceptance of constant flows of human capital in and out of positions, and the implications for lost value in social and organizational capital.

Finding a suitable design for this system will not be easy. However, it is my opinion that the application of a systems approach *must* be at the heart of the effort. This is because anything that does not examine the whole manpower process will fall short in arriving at a design that will deliver the type of efficient manpower system required for success in the 21st century.

3. Recommendations

The Naval Aviation Enterprise would be well served to revisit the Naval Aviation Vision 2020 (2007), review the well-articulated presentation about the observed discrepancies in the current system, and the need for a strategy to overhaul it, as documented by the leaders of the enterprise effort in its infancy. It is worthwhile to once more review precisely what the authors of that report said:

It is critical to understand why the strategy is necessary, what drives it, and the specific challenges associated with the future environment in which the strategy will operate. A quick assessment of the Navy's existing (default) Human Capital Strategy yields several observations:

- Legacy systems are inflexible and unable to functionally capture our work force
- Stovepiped organizations create a lack of focus across the Enterprise
- There is no Total Force perspective
- It is uncertain how much we are actually spending
- The return on investment has not been measured
- The budget cycle is driving personnel decisions
- We are deficient in forecasting future skill sets
- We struggle with identifying talent gaps and building critical bench strength
- We have difficulty recruiting and retaining the right people
- There is a distinct lack of meaningful metrics

This default strategy may have been acceptable in the past, but its reactive nature and disjointed approach necessitate the need for a new, Total Force Human Capital Strategy

While there has been *some* efforts directed towards *some* of these areas of concern, the key legacy structures that drive the majority of the discrepancies remain untouched. Furthermore, in recent years, there has actually been a strengthening of the earlier commitment to the meaningless metrics, such as “manpower readiness,” rather than efforts to move towards more meaningful metrics.

The call for a “Total Force Strategy” needs to move away from concerns about the “how did we get *here*,” to a focus upon “how do we get *there*?” In other words, less concern about why things were done as they were in the past and more concern about how to bring about the much-needed improvements. What is needed is to have a well-defined, and consequently a well-designed system of manpower.

Coincidentally, the largest impediment to the enterprise achieving the type of meaningful change that is so strongly desired is one of the fundamental flaws in the current system. The highest-ranking members of the enterprise are subject to the same type of frequent rotations that plague the entire system. The type of meaningful change that is sought will require many years to facilitate, with successive iterations lasting decades. The current system of rapid rotations throughout the entire chain of command impact the effectiveness of senior personnel in the same counterproductive manner in which they affect the junior sailors. By the time any given job, and all of the associated challenges, are fully understood by any given individual, it is time for them to be transferred to another position.

The strongest recommendation for a way forward would involve a group of senior personnel, enlisted and officer, being empanelled for a six- to ten-year period at the Naval Postgraduate School for the purpose of designing a manpower system for the 21st century. Their first order of business would be the employment of heuristics and sound systems reasoning to determine the real requirement definition.

B. AREAS TO CONDUCT FURTHER RESEARCH

1. Requirements Analysis

As previously discussed, there are a multitude of human capital statements that refer to ideology involving “the right force, right value, right skills, right cost,” but currently these slogans do not have specific, definitive criteria or definitions. The only way to move forward with the development of a human capital management system that has the capability of achieving value, from the perspective of every stakeholder is to properly conduct a requirements analysis.

2. Functional Decomposition

Once the requirement is properly defined, the functions necessary to achieve those requirements should be decomposed and scored for alignment with a sound, intellectual capital management strategy. Upon completing the subsequent steps of the systems engineering process the system will have been designed properly. At this point the design should be evaluated for the duration of its existence. This must be done because it is the *whole* system that makes the achievement of success possible, not the individual parts.

3. Implement

Once the system is designed the next major challenge will be the implementation. As the ultimate design will still be a mystery at this stage, a study as to how to begin to implement a new system would be another key milestone.

C. SUMMARY OF RESEARCH

This research has examined the existence of the three key elements of intellectual capital. These individual elements are recognized in current literature as intangible assets of an organization. The recognition of these intangible assets, and how they contribute to the creation of value in a system of manpower, is critical in achieving organizational efficiency in the 21st century.

In the enlisted aviation manpower system, there is currently a commitment to achieving value. However, the actual attainment of this goal remains elusive. This is primarily due to the legacy manpower management structures, and to various ineffective metrics still being employed to measure value and readiness. Utilization of individual elements of intellectual capital are currently measured in fragmented blocks or “tours” driving expenditures which deliver ill defined levels of competency and provide relatively short term returns. Once a particular tour has been completed, the process repeats, with little or no consideration for the ultimate state desired. This fragmentation creates multiple inefficiencies, both from the perspective of the individual sailor as well as from that of the Navy as a whole.

Current leadership speaks of the need to have a *right force*, with the *right skills*, at the *right cost*. However, the translation of this stated goal into practical reality has proven to be virtually impossible within the Navy because the system still lacks a holistic manpower focus. There must be a collective system focus that identifies the real need, defines the requirements, analyzes the functions, and creates and validates a design. The manpower system for the 21st century requires the employment of the science of systems engineering.

The engineering of a new system of manpower is not only advisable it is *absolutely* necessary. The current system is incapable of delivering the efficiencies mandated by all levels of command within the Department of Defense. To achieve the level of efficiency mandated, the new manpower system *must* be engineered in a way that meets the needs of the war-fighter but also maximizes the contribution from effective intellectual capital utilization.

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