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An Analysis of the Knowledge and Skill Levels Required to Effectively Support Analytical Cost Decisions in Source Selections

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AN ANALYSIS OF THE KNOWLEDGE AND SKILL LEVELS REQUIRED TO EFFECTIVELY SUPPORT ANALYTICAL COST DECISIONS IN SOURCE SELECTIONS

THESIS

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Abstract
We analyze these three factors (education, experience, and training) in an effort to identify the knowledge and skills necessary for cost analysts to possess to be effective members of cost panel evaluation teams during source selections. This research effort assesses whether the cost panel members and senior Air Force acquisition military and civilian personnel associate the levels of education, experience, and training as being key factors in fulfilling cost analysts duties while supporting the selection of a source in the government procurement process. To accomplish this objective, a literature review, personal interviews, and questionnaires were utilized. Descriptive statistics and hypothesis testing were conducted to evaluate the responses. The recommendations of this study are intended to assist cost analysts in attaining the knowledge and skills necessary in contributing and supporting a cost panel a during source selection.

Subject Terms
Cost Analysis, Cost Analysts, Source Selections, Knowledge, Skills

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Anthony L. Smith

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Abstract

This research effort intends on identifying the knowledge and skills necessary for cost and price analyst to be effective members of cost panel evaluation teams during source selections. The purpose of this research is to determine what levels of education, experience, and training (the three factors studied under this research) the participants of source selection evaluation team members, specifically the cost panel members, have when conducting a source selection.

It also assesses whether the cost panel members and senior Air Force acquisition military and civilian personnel associate the levels of education, experience, and training as being key factors in fulfilling cost analyst duties and supporting the selection of a source in the government procurement process. From this analysis, a suggested education level, training requirement, and experience level that will form knowledge parameters that provide for future source selection or training that may be needed before members are assigned to fulfill a cost or price analyst role on a source selection.

To accomplish this objective a literature review, personal interviews, and questionnaires were formed and utilized. The recommendations of this study are intended to assist cost and price analysts in attaining the knowledge and skill necessary in contributing and supporting a source selection.

AN ANALYSIS OF THE KNOWLEDGE AND SKILL LEVELS REQUIRED TO EFFECTIVELY SUPPORT ANALYTICAL COST DECISION IN SOURCE SELECTIONS

I. Introduction

General Issue

The acquisition of major weapon systems is integral in advancing the United States' war fighting capabilities and thwarting any attacks on its national security. The advancement of these capabilities, although necessary, is quite costly. The Department of Defense (DoD) spends billions of dollars every year on procuring weapons systems.

Today's acquisition environment is a far cry from what is normally characterized as the *Reagan* or *Build-up years*. During the era of the Cold War, a monolithic threat once posed by the Soviet Union, the American people saw military protection as a priority. As such, military spending was at an all time high. Defense Military and civilian personnel strengths were commensurate with the increased defense spending. Due to the real threat of nuclear war, Congress faced minimal pressure from the public on how it outlaid taxpayer dollars. Between 1974 and 1997, the federal government continually spent more money than it collected. By 1997, the federal deficit was $288 billion, and the gross federal debt had totaled $5.4 trillion (OMB, 1999).

Shortly after the fall of the Berlin Wall and eventually the Soviet Union, marking the end of the Cold War, the focus changed from military protection to that of excess military spending. With the raised awareness of the soaring deficit and the end of the

Cold War, the President and Congress have worked to reduce the federal spending to reduce the overall deficit. The reduction in federal spending greatly affected the DoD.

"The fall of the Berlin Wall in 1989 and the Break-up of the Soviet Union in 1991 brought with them growing demands by US taxpayers for what was seen as a richly deserved 'peace dividend'. US military spending had long exceeded that of American allies, and citizen's demands for both tax relief and balanced budget exerted overwhelming pressure for cuts in military appropriations. Consequently, US defense outlays declined by 30 percent in the ten years between 1987 and 1997. Outlays for defense modernization, the combination of spending for procurement and research and development, declined even more sharply, by roughly 45 percent during the same period" (Druyun, 2001). Accordingly, Defense procurement spending dropped an inflation-adjusted 67% between 1987 and 1995 (Pare, 1994).

In more recent times, the economy has flourished and the continued pursuit of balanced budgets and fiscal restraint has led to projected surpluses in the out-years. As of February 2001, the DoD spent $54.9 billion dollars in total obligation authority for procurement, of which, 34% went to the Air Force, resulting in $18.8 billion dollars (see appendix A). The director of the Office of Management and Budget stated about the health of the American fiscal situation, "The American fiscal situation has probably never been so strong as it is in calendar 2001, as it was on September 10th. With all the events of this year, we will run an enormous surplus, either the second- or third largest in American history" (Daniels, 2001). However, he went on to say, "Overnight, a climate of fiscal restraint has been dispelled. We now face a great risk of runaway spending, the erosion of the long-term surpluses we have been anticipating, and the erection of a much

larger permanent federal government" (Daniels, 2001). With the continued scrutiny of how efficiently government spends the tax payers' money, Congress, DoD, and the Air Force want to ensure the procurement process provides quality products at fair and reasonable prices and that the costs are real. Fair and reasonable prices and cost realism are indicated as:

> **Fair and Reasonable-** "All source selections are conducted with the expectation of adequate price competition and rely on market forces to ensure awarded prices are reasonable. Only in extraordinary circumstances will additional information beyond proposed prices be necessary for the contracting officer to determine the price fair and reasonable" (AFSSPG 1.5.5.4.1.1, 2000);
>
> **Cost Realism**-"the process of independently reviewing and evaluating specific elements of each offeror's proposed cost estimate to determine whether the estimated proposed cost elements are realistic for the work to be performed; reflect a clear understanding of the requirements; and are consistent with the unique methods of performance and materials described in the offeror's technical proposal" (FAR 15.404-1 (d)(1), 2001).

There are currently two methods available for the competitive procurement of goods and services: sealed bidding and competitive negotiation. Under sealed bidding procedures, in order for the contractor to be eligible for award, the bidder must be considered *responsive* and *responsible*. In this context, responsive and responsible are defined as:

Responsive-"A bid that contains a definite, unqualified offer to meet the material terms of the IFB (Invitation For Bid). In this context, a *material* term is one that could affect the price, quantity, quality, or delivery of the items being procured" (Arnavas and Ruberry, 1994:3-36);

Responsible-"the apparent ability to complete the requirements of the contract successfully. The FAR requires the Contracting Officer to make an affirmative finding of responsibility and not merely a finding that there is no evidence of nonresponsibility" (Arnavas and Ruberry, 1994:3-29).

On the other hand, under competitive negotiation, the process used to competitively award contracts to bidders is called *source selection*. "Source selection procedures are designed to (1) maximize competition; (2) minimize the complexity of the solicitation, evaluation, and selection process; (3) ensure the impartial and comprehensive evaluation of proposals; and (4) ensure selection of the source whose proposal is most advantageous and realistic and whose performance is expected to best meet state Government requirements" (Nash and Schooner, 1992:369). According to the Federal Acquisition Regulation, "The objective of the source selection is to select the proposal that represents the best value" (FAR Part15.302, 2001).

Item two identified by Nash and Schooner, implies there is inherent complexity in the source selection process. The source selection is a thorough process of procuring systems by means of evaluating competitive proposals in terms of achieving the best expected value, frequently summed up as a Best Value approach. The importance of the

results of the source selections is evident. Because this process is so important and inherently complex, the personnel involved in the source selection process require great knowledge and skill in order to complete comprehensive evaluations and arrive at a best value decision. This assessment is echoed in an article written in 1994 by Colleen Preston, then the Deputy Under Secretary of Defense (Acquisition Reform):

> The world in which the DoD must operate has changed beyond the limits of the existing acquisition system's ability to adjust or evolve. It is not enough to improve the existing system…we must be able to procure state-of-the-art technology and products, rapidly, from reliable suppliers who utilize the latest manufacturing and management techniques…this reality coupled with fiscal constraints makes the current way of conducting acquisitions unaffordable and inefficient (Preston, 1994:8).

As a result, the acquisition community must find a way to increase its efficiency while reducing costs associated with procuring weapon systems.

Problem Statement

The current system of acquiring major defense weapon systems requires a significant amount of experience, training, and education in source selection processes and cost evaluation techniques. The personnel available to conduct the source selection process are limited. As a result, general guidelines on the education level, experience level, and the type of acquisition training required to evaluate the attributes of future cost panel members are needed to ensure effective and efficient cost and price analyses are completed in support of source selections decisions.

Research Objective

The purpose of this research is to determine what levels of education, experience, and training (the three factors studied under this research) the participants of source selection evaluation team members, specifically the cost panel members, have when conducting a source selection. It also assesses whether the cost panel members and senior Air Force acquisition military and civilian personnel associate the levels of education, experience, and training as key factors in fulfilling cost analyst duties and supporting the selection of a source in the government procurement process. From this analysis, a suggested education level, training requirement, and experience level that will form knowledge parameters that provide for future source selection or training that may be needed before members are assigned to fulfill a cost or price analyst role on a source selection.

Methodology

This study utilizes research methods to study the knowledge required of cost panel members. An analysis was conducted concentrating on the education, training, and experience level of cost analysts having served on source selections. The data collection tool utilized for this research was the questionnaire instrument. The questionnaire captured input from members having served on recent cost panels of source selections and Senior Executive Service staff and senior military personnel who fulfill the decision maker's role on source selections.

The questionnaire instrument will be used in two phases. Phase one of the questionnaire process solicits the opinions of Senior Executive Service staff and senior military personnel on what the knowledge mix should be for cost panel members. Phase two asks current working level cost and price analysts with source selection experience their knowledge mix and based on their personal experience, the relevant importance of each factor in conducting a cost or price analysis on a source selection. Comparing the two phases will identify any similarities and differences in responses from the two groups.

Descriptive and analytical statistics were used to analyze the returned questionnaires, as well as hypothesis testing. The results of the analysis will be used to compile potential solutions and recommendations of what skills and attributes are required of cost and price analysts prior to being assigned on a cost panel evaluation team of a source selection.

Area of Study

The bounds of this study are limited to actions directly relating to identifying the skills, experience, and education level of cost and price analysts having recently been involved in source selections. These identified factors attained from both military and civilian Air Force cost and price analysts will be contrasted with those identified by senior Air Force acquisition management. Air Force Materiel Command (AFMC) Aeronautical Systems Command will be the main focus of this research, specifically cost and price analyst personnel fulfilling cost and price analyst roles during source selections. Civilian cost and price analysts previously contracted to support cost panel evaluations by

the government for their expertise were also polled to obtain an outside opinion on this matter.

Overview of Thesis Structure

This chapter has presented the general issues, problem statement, and research objectives of this research effort. Chapter II surveys literature relevant to the government source selection process and source selection panel members. Several government regulations, instructions, and directives are visited to familiarize the reader with the source selection process, as well as, any other research efforts devoted to source selections and their members, focusing on members serving as cost analysts.

Chapter III discusses the methodology used to reach the research objective posed in Chapter I. Chapter IV displays the results of the research effort. Finally Chapter V contains the conclusions and recommendations made as a result of this research effort. The study concludes with recommendations for further research efforts on this topic area.

II. Literature Review

Introduction

This chapter contains background information gathered during the research phase of this study. The initial focus will be on the environment in which the DoD conducts acquisitions, followed by a review of the government acquisition workforce. This chapter will go on to outline the organizational structure of a source selection, followed by an in-depth review of the personnel involved in the process, including their responsibilities outlined by governing regulations. A review is then conducted on the available training in the areas of defense department acquisition and cost analysis.

The goal for this chapter is for the reader to gain an understanding of the acquisition environment, source selection process, and formal education and training available for source selection members.

DoD Acquisitions

"The last fifty years, from the end of the World War II to the present, has seen the development of weapons systems to meet the needs of the warfighters on land, at sea, in the air and beyond. It has consumed billions of dollars, employed millions of people, and led to the development of technological weapons that use sound, bits and bytes, and electrons bouncing around. As weapons have taken on greater complexity, the government's approach to the development of these systems has evolved its own complexity" (Kausal 2000:5-3). This further drives home the complexity factors that cost analysts face today. Not only is the environment that affects the source selection process more complex, but the acquisitions themselves have also become more complex. The

former Secretary of Defense noted "The problem is that the DoD's acquisition system is a complex web of laws, regulations, and policies, adopted for laudable reasons over many years" (Perry, 1994:4). To add to the complexity, Congress plays a major role by not only authorizing and appropriating funds for DoD but also by enacting major rules and regulations for the purpose of defense acquisition. There have been many changes to DoD acquisitions, listed in Figure 2-1 are a few of the major changes that occurred in the recent past.

Weapon system cost and schedule overruns, and performance deficiencies are often publicized and lead to demands for reform. Some of these changes have been initiated to improve the efficiency in the way the Defense Department acquires their weapons. One example of such initiatives is Reduction in Total Ownership Cost (R-TOC). "The primary objectives are to arrest cost growth, reduce costs and capture savings, then reinvest the savings into future procurement" (Aerospace, 2000:2). Contrary to the true intent of reform initiatives, they may be in fact making it more difficult for cost analysts to complete their duties during source selections. "The sporadic nature of acquisition reform complicates the task of the cost analyst by adding another degree of uncertainty in the estimating process: a changing regulatory framework" (Green, et al 2000:77).

Office of Federal Procurement Policy (OFPP) Act of 1983
Established a central office to define overall government contracting and acquisition policy and to oversee the system, among other things.

Competition in Contracting Act (CICA) of 1984
Revised government policy to mandate competition and created an advocate for competition, the Competition Advocate General.

DoD Procurement Reform Act 1985
Defense Procurement Reform Act established a uniform policy for technical data and created a method for resolving disputes.

Defense Procurement Improvement Act of 1986
Provided policy on the costs contractor submitted to the Government for payment and on conflicts of interest involving former DoD officials.

Defense Acquisition Improvement Act of 1986
Among other things, created the Under Secretary of Defense (Acquisition, Technology and Logistics).

DoD Reorganization Act of 1986 (commonly referred to as Goldwater-Nichols Act)
Among other items, revised the Joint Chiefs of Staff role in acquisition and requirements determination.

Ethics Reform Act of 1986
As a result of the "Ill-wind" procurement scandal Congress mandated more stringent ethics laws.

Defense Acquisition Workforce Improvement Act (DAWIA) of 1990
Mandated education, training and professional requirements for the defense acquisition corp.

Federal Acquisition Streamlining Act (FASA) of 1994
Repealed earlier laws on acquisition, such as the Brooks Act provisions on computer acquisitions.

Federal Acquisition Reform Act (FARA) of 1996
Revised procurement laws facilitate more efficient competition; included improving debriefings, limiting need for cost/pricing data and emphasizing price versus cost negotiations, among other items.

Clinger-Cohen Act of 1996
Included changes to competition practices, commercial item acquisition, and included fundamental changes in how information technology equipment is purchased.

Figure 2-1. Major Acquisition Acts

The newly appointed Under Secretary of Defense (Acquisition, Technology and Logistics), E.C. Pete Aldridge, while speaking at a Defense Acquisition University and

Defense Systems Management College anniversary celebration, stated one of his five goals during his tenure in office is "to revitalize the quality and the morale of the Acquisition Workforce." He went on to state, "Over the years you have all experienced the reductions in the Acquisition Workforce…being a smart buyer is absolutely *essential* for the Acquisition Workforce and the government as we head into the future. We need to work on those things that can bring the quality of the workforce up, improve their morale, and certainly training and education is one of those critical areas" (Aldridge, 2001:4). His goals points out two themes that occurred throughout the acquisition career field that intensified the complexity and complications of the working environment.

The first theme is that of a downsizing workforce. According to the 1998-1999 Deputy Assistant Secretary of Cost and Economics Annual Report, the problem is as follows:

> During 1998-1999, AFCAA saw a continual decrease in personnel numbers, especially on the military side. The shrinking numbers are a familiar occurrence across the entire Air Force as the cost analysis career field has become absorbed into the overall financial management career field. (Deputy, 1999:53)

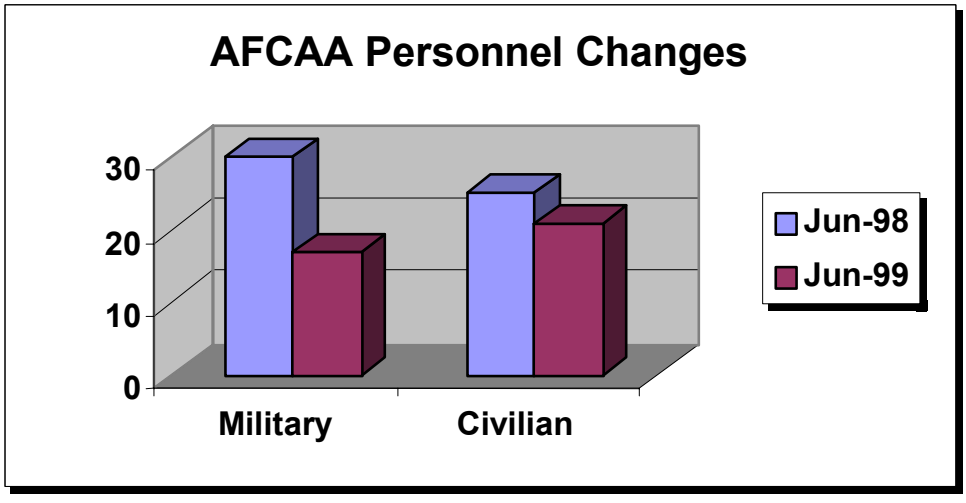

Figure 2-2. AFCAA Personnel Changes

To compound this personnel shortage, a Government Accounting Office report stated, "Even with declines in both the defense procurement budget and the civilian workforce since 1990, the number of acquisition organizations remains relatively constant" (GAO, 1996). With the level of organizations remaining constant and the number of acquisition workforce shrinking, many offices are left understaffed or vacant.

Government Acquisition Workforce

To ensure a similar basis of discussion, a definition of acquisition workforce is required that displays government, military and civilian, employees considered part of acquisition workforce. As simple as this may seem, the Defense Department contracted out with a consulting firm "in response to congressional criticism that DoD lacked a consistent, defense-wide approach for determining both the size of the workforce and the skill sets of those serving in it" (Burman, 2001).

The consulting firm's report identified the numbers of personnel serving in the DoD key Acquisition and Technology Workforce (A&TWF). Based on data received by the Defense Manpower Data Center (DMDC), the report sized the workforce at 135,014 civilian and military personnel, as of September 30, 2000. The consulting firm integrated an "algorithm [that] used both the occupations and organizational placement to determine whether or not an individual should be included" (Burman, 2001). The algorithm includes three categories of occupations and two categories of DoD organizations. They were as follows:

> Personnel in Category I are in such occupations as contracting or program management and are presumed to be performing acquisition-related work

regardless of where they are located in the Department. As a result, all personnel in these occupations are counted as part of the Key A&TWF.

Personnel in Category IIA are in occupations such as electronics engineering or computer specialist. They are counted only when they are serving in components of such acquisition-relate organizations as the Army or Air Force Materiel Commands.

Personnel in Category IIB are in occupations such as space science or microbiology. They are counted only when they are found in technology-related organizations such as the Office of Naval Research or the Army Research Lab.

Finally, Category III adds flexibility to the model by allowing Defense components to either add or delete personnel to improve the accuracy of the count. For example, Defense Acquisition Workforce Improvement Act positions not counted under Categories I or II would be added in Category III.

For military personnel, all officers located in acquisition or technology-related organizations are counted. However, enlisted personnel are not counted unless a component chooses to add them using the Category III capability (Burman, 2001).

During a hearing on DoD acquisition workforce in 1997, the Honorable Herbert H. Batement, Chairman, Subcommittee on Military Readiness stated "Since 1990, there has been significant reductions in the military workforce, military and civilians alike. However, the number of organizations supporting acquisition has remained the same. In spite of efforts in other areas to consolidate like functions, acquisition organizations have resisted efforts to merge common areas such as personnel, budgeting, computer specialists, contracting, and other areas that are not unique to an acquisition organization's basic mission." He went on to say, "We must also keep in mind the readiness needs of our military forces. Reducing civilian personnel must be accomplished in a rational manner without causing further damage to an overall readiness

condition that, at this time, is fragile. Over the past few years, I have watched as large numbers of civilian employees have been eliminated from the workforce simply to get to a mandated ceiling. Many of these reductions were taken from the low end, or blue collar support sector, while the upper end, the white collar management end has remained in tact. This approach will damage readiness if we are not careful" (Bateman, 1997).

There is an abundant amount of literature that talks to the effects of downsizing of employees, to include outsourcing and privatization. James Brower wrote, "While the study [QDR 1997] called for reductions in infrastructure, support functions, and personnel to fund weapons modernization. But while the study wisely attempts to build more muscle out of the defense budget, in the process it makes some recommendations that have potentially bone-breaking consequences—while leaving some fatty depots of pork untouched. In a well-meaning attempt to put mission first, the QDR forgets that a healthy national defense puts people first always. The QDR's call for unbridled outsourcing and privatization to supplant modernization accounts introduces a sinister game of musical chairs that will put many defense workers off, behind, down, and out" (Brower, 1997).

Furthermore, the Deputy Assistant Secretary of Defense for Civilian Personnel Policy (DASD CPP), Dr. Diane M. Disney displayed that "eleven years of downsizing have brought significant changes in the overall DoD civilian workforce. Between 1989 and 2000, DoD reduced its civilian workforce by more than 410,000 positions, from approximately 1,177,000 to just above 700,000—a 37 percent reduction. The civilian Acquisitions Workforce has declined even further" (Disney, 2000). This sentiment is further echoed by further research. Today's acquisition environment is one of shrinking

and unstable budgets, rapidly advancing technology, and high personnel turnover in already undermanned program offices. Essentially, today's acquisition workforce is forced to do more with less (Cho et al, 2000:1-1). Although the numbers of available employees that work on government acquisition has dwindled, the true impact may yet to come.

Given the previous circumstance, the aging of the workforce is now more critical than ever. The Acquisition 2005 Task Force Final Report: Shaping the Civilian Acquisition Workforce of the Future identifies the problem as follows, "[DoD] is facing a crisis that can dramatically affect our Nation's ability to provide warfighters with modern weapon systems needed to defend our national interests. After 11 consecutive years of downsizing, we face serious imbalances in the skills and experience of our highly talented and specialized civilian workforce. Further, 50 percent will be eligible to retire by 2005. In some occupations, half of the current employees will be gone by 2006 (Gansler and Rostker, 2000). With this predicament looming, the Defense Department has some tough choices it must make in the upcoming years. Although the picture for the immediate future may not look bright, there may be some opportunity to enhance the future acquisition force.

Opportunity

"Demographics and downsizing have given DoD a unique window of opportunity to reshape its civilian Acquisition Workforce to meet future challenges. A common perception is that the Department already has a wide range of tools. In reality, however,

many of the personnel authorities available today are either not well understood or are no longer as effective as they were previously" (Gansler and Rostker, 2000).

The second theme mentioned by the Under Secretary of Defense (Acquisition, Technology and Logistics) is that of education and training. This theme will be explored more thoroughly later in the upcoming sections of this chapter. Several organizations within the DoD as well as outside of the DoD that offer training in acquisition and/or cost analysis will be outlined to get a better understanding of the training currently available to members of the cost analysis community within the Aeronautical Systems Center.

Source Selection Organization

"The Air Force personnel very seldom use the sealed bid acquisition approach now because an LPTA (lowest price technically acceptable) includes the same award decision principle as sealed bids and also offers the opportunity to hold exchanges with the offerors" (GAO, 2000). There are three types of source selections procedures to follow depending on the dollar threshold met with the acquisition. Table 2-1 summarizes the procedures and thresholds outline in United States Air Force Source Selection Procedures Guide dated March 2000 (Wright, 1997:31).

The focus of this research as outlined in Chapter I mainly focuses on the Agency procedures. The Agency thresholds outlined below have been met by the source selections selected as case studies. Once the procedure to be followed by the source selection is identified, the organizational structure for the source selection to follow is also given.

Table 2-1. Source Selection Procedures Applicability

Procedures	All Source Selections Other Than Information Technology	All Information Technology Source Selections
Basic	Simplified Acquisition Threshold (SAT) to $10M	SAT to $15M for 1 Fiscal Year (FY) or to $30M for the Total Program.
Median	$10M to $100M.	$15M for 1 FY or $30M for the total program to $120M.
Agency	>$100M.	>$120M.

Short descriptions of each position and the associated responsibilities for an agency level source selection are given below, while Figure 2-3 displays a typical organizational chart for an agency level source selection.

Source Selection Authority

The Source Selection Authority (SSA) is the official designated to oversee the source selection process and select the sources or sources from which the government will procure the system or service, and announce contract award. The SSAs responsibilities are specified in the Air Force Federal Acquisition Regulation Supplement (AFFARS) Part 15. They are as follows:

(1) (i) Appoint the SSET chairperson(s) and the SSAC chairperson and PRAG chairperson (if the SSAC and PRAG are used);

(ii) Ensure the SSET is knowledgeable of policy and procedures for properly and efficiently conducting the source selection, as necessary; and,

(iii) Ensure all involved in the source selection are briefed and knowledgeable

of Subsection 27(a) of the Office of Federal Procurement Policy Act (41 USC 423)(FAR 3.104) regarding unauthorized disclosure of source selection information.

(2) Review and approve the SSP;

(5) Review all necessary information to determine if award without discussions is appropriate; and approve release of Evaluation Notices and exclusion of any offeror from the competitive range; and

(6) Make selection decision and document the supporting rationale in the Source Selection Decision Document (SSDD);

Source Selection Advisory Council

The Source Selection Advisory Council **(**SSAC) is made up of senior military or Government civilian personnel, or any combination, assigned by the SSA. The SSAC serves as the SSAs advisors during the source selection process. The SSA also delegates duties to the SSAC to include: selecting and approving the SSEB membership, reviewing the evaluation criteria, and weighing these criteria.

The SSAC responsibilities are also listed in the AFFARS Part 15 as follows:

(1) Review the SSP prior to SSA review/approval;

(2) Review the evaluation and findings of the SSET and provide advice and analysis as requested by the SSA;

(3) Provide briefings and consultation at the request of the SSA;

(4) Normally provide comparative analysis unless the SSA does not require it; and

(5) Offer a recommended source selection decision for the SSA's consideration, if requested by the SSA

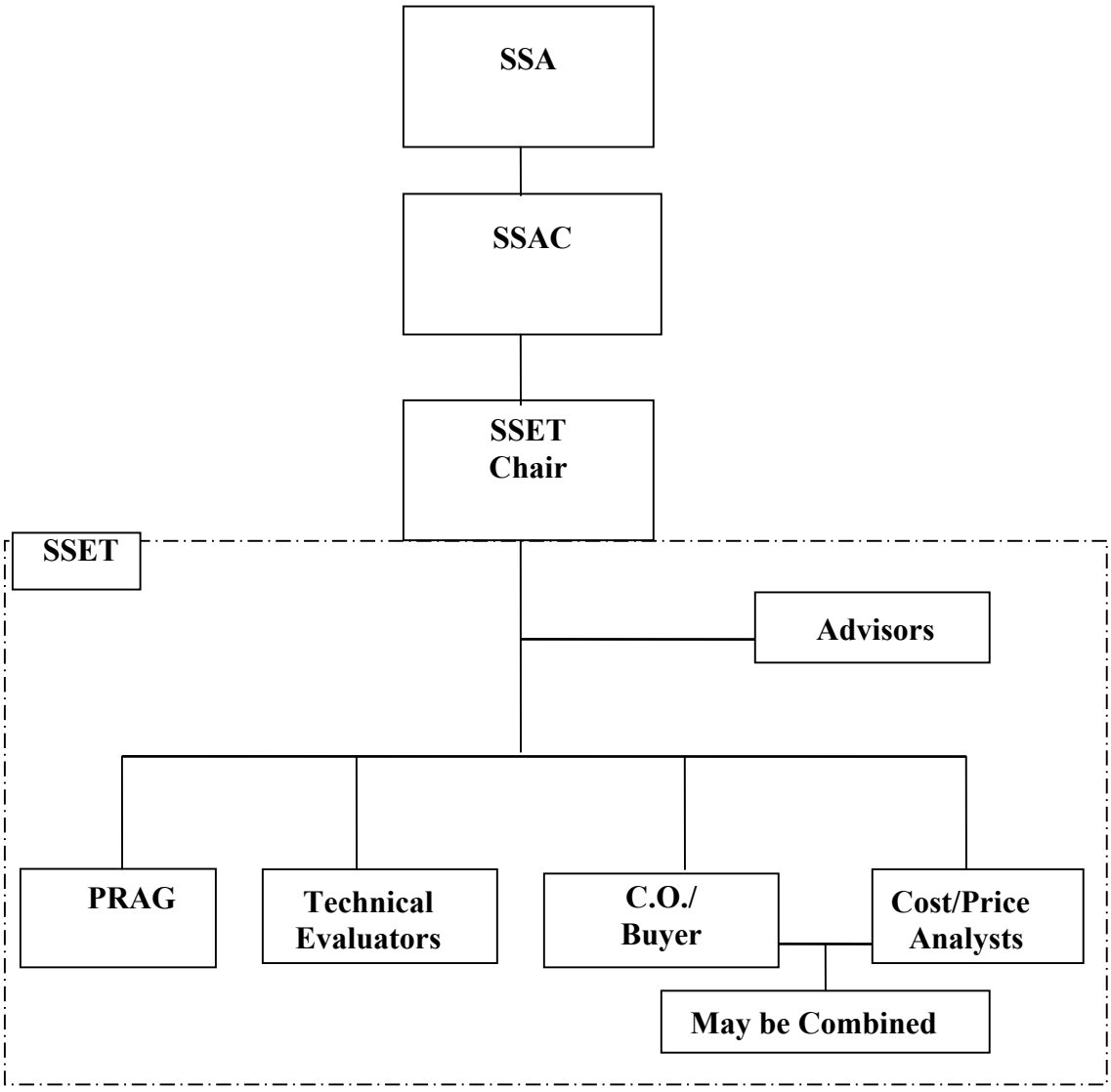

Figure 2-3. Source Selection Organization

Source Selection Evaluation Team Chair

The Source Selection Evaluation Team (SSET) chair is the day-to-day manager of the evaluation process. The SSET chair oversees the different evaluations underway and provides the information necessary for the SSA to come to a decision. The responsibilities of the SSET chair are listed in the AFFARS Part 15 as follows:

(1) Be responsible for the proper and efficient conduct of the source selection process;

(2) Ensure personnel, resources, and time assigned to the source selection reflect the complexity of the program;

(3) Be responsible for establishing effective liaison with the requiring office to ensure requirements are effectively addressed in terms of the requirements documents and with threshold/objective language, if used;

(4) Appoint members to the SSET, subject to approval of the SSA. Substitutions may be approved by the SSET Chairperson subsequent to SSP approval, and do not require an amendment to the SSP;

(5) Ensure that all persons receiving source selection information are instructed to comply with applicable standards of conduct and sign the Source Selection Information Briefing Certificate (see Attachment 5315-5);

(6) Recommend approval of the SSP to the SSAC Chairperson (if applicable) or to the SSA;

(7) Ensure members of the SSET are knowledgeable of their responsibilities before any proposal is reviewed, including details on how the evaluation is conducted;

(8) Review and recommend SSA approval of release of ENs through the contracting officer;

(9) In conjunction with the contracting officer, prepare the SSDD for the SSA's signature, unless otherwise directed by the SSA;

(10) Offer a recommended source selection decision for the SSA's consideration if requested by the SSA; and

(11) Participate in debriefings to offerors.

Source Selection Evaluation Team

The Source Selection Evaluation Board (SSEB) or Team (SSET) is a group made up of any combination of military and Government civilian personnel, representing functional and technical specialties. They conduct contract proposal analyses and present their findings to assist the SSA in making the source selection.

The responsibilities of SSET are also pointed out in the AFFARS Part 15. They are as follows:

(1) Conduct an in-depth review and evaluation of each proposal, and any subsequent revisions, against the approved factors, subfactors, elements, and other solicitation requirements; and

(2) When a briefing is used, prepare briefing charts that clearly summarize the evaluation results. Briefing charts shall be suitable to serve as the official record of SSET proceedings for median source selections in lieu of more

formal documentation, such as the PAR. These briefing charts will be presented to the SSAC (if any SSAC is used). Otherwise, these briefing charts will be presented directly to the SSA.

Aeronautical Systems Center

The Major Command within the Air Force responsible for procuring major weapon systems and the focus of this study is the Air Force Material Command (AFMC), headquartered at Wright-Patterson Air Force Base, in Dayton Ohio. AFMC's mission is "To develop, acquire and sustain aerospace power needed to defend the United States and its interest…today and tomorrow." (AFMC Fact Sheet, May 2001:1). Aeronautical Systems Center (ASC) is part of AFMC. Their major responsibility in fulfilling the AFMC mission is to acquire aeronautical systems from fighter jets, bombers, and transport planes to surveillance drones. The source selections conducted at ASC are most often conducted with agency procedures in place due to the high volume and high dollar amount of procurements.

Education and Training Organizations

Air Force Institute of Technology

The Air Force maintains an organization that delivers a masters and doctorate level education. Within this school, the Graduate School of Engineering and Management, Department of Systems and Engineering Management offers a Master of Science degree with major in Cost Analysis (GCA). The GCA program offers attending students the knowledge required to carry out cost analyses on resources within the

Department of Defense acquisition management environment. The program focuses on quantitative concepts and techniques with specific DoD and USAF cost-related topics and knowledge.

The student is also exposed to regulations, procedures, and environment surrounding DoD acquisitions. This focus prepares students to play a vital role in the cost analyses conducted on systems acquired through the military acquisition process. The graduates of the Air Force Institute of Technology GCA program are prepared to carry out cost estimating at the base, MAJCOM, and higher levels.

Defense Acquisition University

The Defense Acquisition University (DAU) is another institution that offers acquisition based formal education. The DAU provides mandated education courses for military and civilian acquisition personnel. The DAU provides education through the Internet and by classroom instruction. DoD Directive 5000.57 chartered the DAU on October 22, 1991. DAU's mission is to provide the acquisition community with the right learning products and services to make smart business decisions.

The DAU provides education and training programs to meet the training requirements of acquisition personnel throughout DoD. The Acquisition Workforce is provided with a full range of education to foster and support career goals and professional development. The DAU constantly monitors the needs of the different acquisition functional careers and adapts the training, education, and experience available to meet these changing needs. Since the DAU contains numerous experts in the different aspects of the acquisition processes, they provide seminars as well as individual council.

The US Army Logistics Management College

The Army Logistics Management College (ALMC) contains the School of Systems and Acquisition Management and the School of Logistics Science. They offer acquisition management, purchasing, financial management, decision risk analysis, and quantitative analytical techniques as well as many others. The ALMC serves all branches of military service, the Defense Logistics Agency, as well as other US Government agencies, and international officers.

The Naval Post Graduate School

The Naval Post Graduate School is another institution maintained within DoD that offers education and training applicable to the acquisition community. They offer graduate level programs with integrated curricula in acquisition and contract management, systems acquisition management and financial management.

Source Selection Personnel Training Process

Another organization within ASC that assists in the procurement process is the Source Selection Personnel Training Process (SYG) group. SYG is an organization made of a multifunctional team. The organization is responsible for assisting source selection teams understand and implement the DoD acquisitions procedures set forth in governing regulations. Their focus is on helping Acquisition Force Integrated Product Teams and source selection teams that are planning new contract awards. They also provide assistance to any organization within ASC that requires knowledge or education in the Pre-Award Process. SYG maintains objectives to improve the overall procurement

process. They meet these objectives several ways. Provide day-to-day assistance, workshops, and training to organizations involved in the procurement process. They also provide lessons learned and knowledge of previous experiences with other teams and Centers.

III. Methodology

Introduction

This chapter outlines the research methods employed to accomplish the research objectives outlined in Chapter I and complete this study. The basis for this study will be discussed, followed by the design of the research. After research design, this chapter will focus on the sample and the population it was derived from. The data collection tool will then be discussed in some length and the type of data it produced. Also, the data analysis methods and techniques will be discussed. A final review of the research methodology will end the chapter.

Research Design

This study will use specific observations to create general principles. This method is identified as inductive based research (Dooley, 2001). Inductive research will be the backbone of the data analysis utilized in Chapter IV of this study. The data collection was structured in a cross-sectional design. That is, data was collected from different observational units at the same point in time (Neufeld, 1997). The data collection tool utilized was a questionnaire.

Two questionnaires were distributed to two different subject samples in order to reach the research objectives. The first questionnaire went to Senior Executive Service staff and senior military personnel, serving in management roles, with experience in the acquisition environment and more specifically with the source selection process. The second questionnaire went to working level cost and price analysts with recent service on

cost panels in source selection evaluation teams. Comparing the two questionnaires will identify any similarities and difference and be reported in Chapter IV.

Population

Due to the objectives of this research, two populations were sought. The first population was all Senior Executive Service (SES) staff and senior military personnel with previous experience in the source selection process throughout the Air Force. This population consisted of all acquisition personnel from Air Force Material Command's product and materiel centers. The population included military officers and civilian government employees with extensive acquisition experience serving in management positions that had participated in at least one source selection.

The second population focused on all individuals of the Air Force, military and civilian, who had recently participated in source selections as cost or price analysts. Specifically, price or cost analysts that have served as lead price or cost analysts of a cost panel, members having served as a cost or price analyst on a cost panel, or members having served as either a cost lead or a member of recent source selections. Within the aforementioned constraints, this population resides within the acquisition personnel from the product and materiel centers.

Although both of the populations seem to come from the same universe, there are some significant differences that ensure the two populations do not mix. That is that a member from one population cannot satisfy the requirements of the other population. One of the main designations that separate these two groups is civilian grade or rank. As an SES or as a senior military member, the Air Force considers these members as senior

management. Typically senior management does not fulfill the role of cost or price analysts during source selections. They are the decision makers in the process and have the overall authority to decide on what bidder the Air Force will contract with and end up utilizing their product or service. This is especially true in the Agency level source selections, which pertains to this study.

The same can be said for the cost or price analysts that fulfill their role on a cost panel. Because of their civilian grade or rank, they also typically do not have the authority to select the bidders to provide the solicited product or service to the Air Force. This is also true in Agency level source selections.

Sample

Since there are two populations in this study, naturally two samples, one of each population, must be considered. For the two samples, purposive sampling was considered. Individual members selected as part of the sample were chosen based on similar characteristics. Respondents are only chosen because of certain characteristics (Dooley, 2001).

For the SES and senior military members, the characteristic used to form this sample was that of members having served as Source Selection Authorities (SSAs) or Source Selection Authority Council (SSAC). Since Agency level source selections satisfy the highest dollar threshold, these positions are held for only the most senior acquisition professionals throughout the Air Force. With this distinguishing characteristic, the sample size is inherently narrow within the population. The sample of interest was senior acquisition personnel who had participated in source selections

conducted at Wright-Patterson Air Force Base (WPAFB) Aeronautical Systems Center (ASC) as SSAs or SSACs.

To select these individuals to participate in this sample, the Source Selection Personnel Training Process (ASC/SYG) agency identified five source selections recently conducted at ASC. The ASC/SYG office maintains documentation of source selections conducted at ASC and points of contact to gather more information. The five Agency level source selections identified served as a basis for this study. The SSAs from these source selections served three key roles in the acquisition career filed within the Air Force. One role was the Principle Deputy to the Assistant Secretary of the Air Force for Acquisition and Management (SAF/AQ). The second role was the Associate Deputy Assistant Secretary of the Air Force for Contracting (SAF/AQC). The third role represented by one of the SSAs in these five source selections was the Commander of the Aeronautical Systems Center.

The characteristic used for the cost or price analyst group was them having served on the cost panel in the five source selections pointed out by ASC/SYG. These five recent source selections were used as a basis for identifying cost or price analysts that served on the cost panel.

The cost or price analysts selected from ASC to represent the sample have similar characteristics that may be applicable to other cost or price analyst from other product centers. "Acquisition personnel generally have experience at more than one product center due to the nature of Department of Defense positions. This is especially true for military personnel…the personnel also use the same regulations and military standards in conducting business" (Pierce and Wainwright, 1993).

The two samples were based on the research objective. The individuals on these two purposive samples have recently participated in source selections and fulfilled the roles under study.

Data Collection Development

Prior to developing questionnaires, a semi-structured interview method was used for the purpose of exploratory research. "Research that begins without hypothesis but with only a general question is exploratory research" (Dooley 1995). The semi-structured interview was the most suitable as it allowed follow-up to general questions based on the answers given. These interviews were invaluable in building robust questionnaires and giving the researcher more in-depth knowledge of the source selection process.

Electronic mailing of the questionnaires was selected as the best method to meet the research objective. The questionnaires incorporated data obtained during the exploratory interviews and literature review. The questionnaires proved advantageous over census, observational, and experimental methods. "Social science regards the census as impractical since only the national government has the resource to contact everyone and the legal mandate to require that everyone cooperate" (Dooley, 1995). Questionnaires tend to be more economical than observation and experimentation. Also observation and experimentation would have required more time than was available.

Two questionnaires were developed to meet the research objectives. The first questionnaire was designed for the SES members and senior military personnel. This forty-nine-question questionnaire contained a cover page thanking the subject for their

participation and some general instructions. The cover page was followed by eight sections: 1) Demographics, 2) Formal Education, 3) Experience, 4) Acquisition Training, 5) Source Selection Training, 6) Source Selection Process, 7) Manning the Source Selection Team, and 8) Role of Contractor Support. A copy of this questionnaire is attached in Appendix B.

The first section, Demographics, provided information about the respondents to ensure they met the sample requirements. The respondents were asked their military rank or civilian grade, organization and office symbol, and their Air Force Special Code or job series code.

Section two, Formal Education, begins with the respondent being asked to list all formal education degrees and areas of concentration and is followed by questions regarding the level of importance, using a one through seven Likert scale, of formal education as a cost or price lead or cost or price analyst during a source selection. The questions that follow deal with bringing in consultants that have specific or advanced education to supplement the cost panel team and how important they are to the overall success of a source selection decision. This section is geared to develop inferences on how important formal education is viewed by Air Force senior acquisition management in the source selection process.

Section three goes into Experience. This section gathers the amount of years of DoD acquisition experience, followed by the number of source selection experiences, participated as a full time member, cost/pricing panel lead, and cost/pricing panel member. The next few questions are in a Likert scale format and concentrate on gathering information on how important experience level is in serving as a cost or price

analyst lead, cost or price analysis panel, how often experience cost personnel serve as Source Selection Advisory Council members, and based on their own experiences, how they would rate the level of cost experience of the cost panel members. These questions are geared at arriving an overall opinion on how important SES members and senior military officials, depicted as the Decision Makers (DMs), believe general experience is to the outcome of a source selection.

Acquisition Training and Source Selection Training are next in sections four and five, respectfully. Section four of the questionnaire gathers certification level, what courses covered by Defense Acquisition University or alike have been taken (including an attachment at the end of the questionnaire with a short course description of each course listed) and how acquisition training is thought to be linked to performing well on a source selection. While section five gathers information on how source selection training is viewed in general, how important it is during a cost or pricing panel, and the level of adequacy of the training available.

Section six researches the Source Selection Process. This section gathers opinion data on how successful the cost or price analysts were, how effective at meeting the SSAs needs, and how often the cost or price analysis team was part of the critical path in the source selection schedule. Also this section attains what factors are viewed when considering success of the team. This section further inquires how the cost or price analysis teams are integrated in the source selection process and how the team is viewed by the SSAs, to include rank ordering factors of knowledge of team members.

Staffing the Source Selection Team issues and the Role of Contractor Support are explored in section seven and eight, respectively. The questions in section seven review:

What concerns during staffing teams are there, who should be staffing the teams and from what organizations, and who should have control of the staffing. While section eight gather general opinions on how comfortable and to what level of involvement should contracted support play in the evaluation team, and whether cost or contracting personnel are preferred leading the cost panels during source selections where cost is an issue.

Finally the questionnaire wraps up with an open area where additional comments can be made to be added to the questionnaire, as well as, the attachment with the course descriptions discussed in section four of the questionnaire.

The second questionnaire was designed for the working level cost or price analysts. This 40-question questionnaire contained a cover page as in the first questionnaire. The cover page was followed by six sections: 1) Demographics, 2) Formal Education, 3) Experience, 4) Acquisition Training, 5) Source Selection Training, and 6) Source Selection Process. A copy of this questionnaire is attached in Appendix C. These sections of the second questionnaire fulfill the same role as they did in the first questionnaire, but with a separate sample responding. This questionnaire is also followed up by an open area and attachment of course descriptions for the courses in section four.

Validation of Questionnaire

The questionnaire was sent out to cost analysis members in ASC to review for appropriateness and validation. This is an important step to ensure that the targeted audience has the ability to review the questions and make suggested changes or clarify ambiguous language of the questionnaire.

Distributing the Questionnaires

An introductory electronic mail was sent to all members identified by the points of contact of cost and price analysts as well as the SSAs for the five identified source selections. They included a brief message stating the research effort, who was involved, to include the sponsor of the research effort, and how they were selected. Attached to the message was the questionnaire, with instructions to either print it out and return it through the base mail distribution system or, since both of these questionnaires were distributed by electronic mail, through the electronic mail system.

Analysis of the results

Data analysis for this study was conducted through the use of descriptive and inferential statistics utilizing a personal computer. McClave *et al* describe these two methods of statistics as:

> Descriptive statistics utilizes numerical and graphical methods to look for patterns in a data set, to summarize the information revealed in a data set, and to present the information in a convenient form.
>
> Inferential Statistics utilize sample data to make estimates, decisions, predictions, or other generalizations about a larger set of data.

Although there are numerous software packages that can conduct the method of statistics described above, the Microsoft ® Excel software package was chosen to analyze

the data. This software package was selected based on the researches knowledge and experience in Excel. As the questionnaire responses were received, the data was manually transferred from the questionnaire and input into an Excel data file by category of response, either sample one or sample two.

This study uses means testing to compare the results received from the two different samples to see whether there are any statistically significant differences in the level of importance or level of agreement in the response to the posed questions among the given study groups. Where there are statistically significant differences in response levels, possible causes are explored. If no statistically significant differences exist, then the two comparison groups statistically have no difference in the level of response on the posed question.

When comparing two means with small samples, as in this case, compute the *t* statistic and conduct the T-test to compare the means (McClave, et al, 1998:368). The *t* statistic is used because there are two problems that arise when making inferences about a population mean using the information gathered from a small sample. The two problems as stated by McClave *et al* are:

> 1. The normality of the sampling distribution for $\overline{X}$ does not follow from the Central Limit Theorem when the sample size is small. We must assume that the distribution of measurements from which the sample was selected is approximately normally distributed in order to ensure the approximate normality of the sampling distribution of $\overline{X}$.
>
> 2. If the population standard deviation σ is unknown, as is usually the case, then we cannot assume that *s* will provide a good approximation for σ when the sample size is small. Instead, we must use the t-distribution rather than the standard normal *z*-distribution to make inferences about the population mean μ.

The decision makers and the workers make up the two independent groups for this test. Each response for each sample was placed into Microsoft ® Excel 2000 and then by utilizing the data analysis tool to conduct the T-test to compare two means, the results were given and put in a table format to more easily display the t-statistic and the associated significance value. The T-test in Excel gives two options; the first option is the T-test with equal variances and the second option is the T-test with unequal or unwilling to assume that the variances are equal. In order to conduct either test, we must first use an F-test to determine if the variance of the populations of the DMs and the Workers are the same. The data analysis tool also has the capability to conduct this type of F-test. To look for evidence of a difference in population variances we can test the Null Hypothesis against the Alternate Hypothesis.

Null Hypothesis	$H_o := Var_{DMs} = Var_{Workers}$
Alternate Hypothesis	$H_a := Var_{DMs} \neq Var_{Workers}$

"The sample statistic in this case is the ratio of the two sample variances which, under the assumption of population normality, follows the *F* distribution. If the Null Hypothesis is rejected, we have evidence that the population variances differ. If they differ, the second *T-test* is the correct one for testing the equality of population means" (Neufeld, 1997:310).

Once the F-test is conducted and the variance assumption is made the T-test can be conducted according to the results. For the T-test, again we test the Null and Alternate Hypotheses for the comparing the means of the two samples to make inferences about the population mean.

The hypothesis for the T-test is:

Null Hypothesis $H_0 := \mu_{DMs} = \mu_{Workers}$

Alternate Hypothesis $H_a := \mu_{DMs} \neq \mu_{Workers}$

The risk of making an incorrect decision, deciding that the null hypothesis is false when in fact it is true, is denoted as the alpha value. The alpha value utilized throughout this study is 0.05. Again, the alpha value is the probability that the statistical test could lead to rejecting the null hypothesis when in fact the null hypothesis is true. Another value used for this test is the p-value. "The observed significance level, or p-value, for a specific statistical test is the probability (assuming Ho is true) of observing a value of the test statistic that is at least as contradictory to the null hypothesis, and supportive of the alternative hypothesis, as the actual one computed from the sample data" (McClave, et al, 1998:332). "A small *p* value is evidence that the sample is not the kind of sample which would be expected from the population described from the Null Hypothesis. This leads to the conclusion that the population must be different from that described by the Null Hypothesis. The Null Hypothesis is rejected" (Neufeld, 1997:223).

Two types of errors are possible when conducting hypothesis testing; Type I or Type II. A Type I error is deciding that the null hypothesis is false when in fact it is true. As mentioned previously, the risk of making a Type I error is denoted by the alpha value. A Type II error is concluding that the null hypothesis is true when in fact it is false. The probability of committing a Type II error is by beta. "Rather than making a decision to accept the hypothesis for which the probability of error is unknown, avoid the potential Type II error by avoiding the conclusion that the null hypothesis is true. Instead…simply state that the sample evidence is insufficient to reject the Null Hypothesis with an alpha

level at 0.05" (McClave et al, 1998:321). The results of the analysis are found in the next section of this study, Chapter VI.

Summary

The overall objective of this research is to identify the education level, experience level, the type of training necessary to perform effectively as a source selection cost panel member. Once these factors are identified, they should be utilized to evaluate the personnel available prior to them serving on a source selection.

Senior Executive Service and senior military staff was polled based on their position within the Air Force acquisition environment and their experience. Also working level cost or price analysts having recently conducted a source selection were polled based on their first hand experience in the source selection process and the cost or price analysis panels. Data from these two questionnaires were analyzed to see if there were any similarities and differences reached by the respondents.

IV. Results and Analysis

Introduction

This chapter presents the collected and analyzed data provided by the chosen source selection decision makers and workers during the questionnaire process. Discussed first are the questionnaire target and response rates. The next discussion will focus on the demographics of the respondents. Then, the results and analyses starting with the decision makers' sample, followed by the workers sample, including within sample analysis is discussed.

An overall sample analysis is displayed first, followed by each sample grouped in accordance with the questionnaire section headings. For the decision makers, the groupings were as follows: Formal Education, Experience, Acquisition Training, Source Selection Training, Source Selection Process, Staffing the Source Selection Team and Role of Contractor Support. For the workers sample, the groupings are as follows: Formal Education, Experience, Acquisition Training, Source Selection Training, and Source Selection Process.

The next section will cover means testing between the decision makers and the workers sample. Finally, a brief summary will conclude this chapter. Figures, charts, and appendices are displayed or referenced throughout the chapter, where appropriate, to more easily illustrate results.

Target and Response

Initially, the target samples of workers and decision makers were personnel that had participated in the five most recent source selections conducted at Aeronautical Systems Center (ASC). Based on the information provided by the ASC Source Selection Training and Support office located at Wright-Patterson Air Force Base Ohio, the five t source selections were identified.

The five source selections had 28 military and civilian government employees serving as cost or price analysts on the Source Selection Evaluation Team to serve as the workers sample. While the composition of the decision makers sample included the Source Selection Authorities of the five source selections. Since there is only one Source Selection Authority (SSA) on a source selection, the initial decision maker sample had only three members (some members fulfilled the SSA role on more than one occasion). Eventually, more members were targeted to increase both sample sizes. This included high-level acquisition management personnel having previously served as SSAs for the decision makers' sample and military and civilian government contracted cost analysts for the workers sample.

Overall, there were 43 questionnaires sent out to both decision makers and workers. Of these questionnaires sent out, 18 questionnaires were returned for an overall corresponding response rate of just below 42%. Of the 10 decision maker questionnaires electronically mailed, five members returned the questionnaires for a 50% response rate. Although the decision makers sample is small, the individuals fulfilling these roles possess considerable source selection knowledge and based on their management position provide for an adequate sample for this research study. Of the 33 questionnaires

electronically mailed for the workers sample, only 13 members returned the questionnaires for a response rate of 39%. The workers sample size is a concern and inferences made based on this sample are highly suspect, although their knowledge and experience levels in the cost analysis and source selection arena do add insight into the questions posed throughout the questionnaire. Table 4-1 summarizes the response rates described above.

Table 4-1. Questionnaire Response Rate

Sample ID	Questionnaires Mailed	Questionnaires Completed	Response Rate (%)
DMs	10	5	50.0%
Workers	33	13	39.4%
Total	43	18	41.9%

Demographics

Table 4-2 shows the civilian grade or military rank of the decision makers. Based on the grades or rank, the data indicates that the majority of the DMs are upper level management (SES & Lt Gen). Represented by Table 4-3, the workers sample primarily contained mid-level managers (Maj, GS-13, and GS-14).

Table 4-2. DMs Rank or Grade

DMs	# of Respondents
SES	3
Lt Gen	1
GS-15	1

Table 4-3. Workers Rank or Grade

Workers	# of Respondents
GS-14	1
GS-13	2
GS-12	4
Maj	1
Capt	1
Contractors	4

The education level for both sample groups was another demographic statistic collected by the questionnaire. Both sample members listed all degrees and areas of concentration. The answers provided lead to a very thorough understanding of not only what level of education the respondents attained but also in what areas of study.

All of the returned questionnaires from decision makers indicated not only that each member received a bachelor's degree, but also a master's degree, some even two. The data received from the workers also indicated the spread of education was from bachelor's degree to master's degrees, with one contractor having attained a doctorate degree. Figure 4-1 displays the spread of both samples in regards to education level attained, while table 4-4 shows the spread for the area of study data given by the respondents.

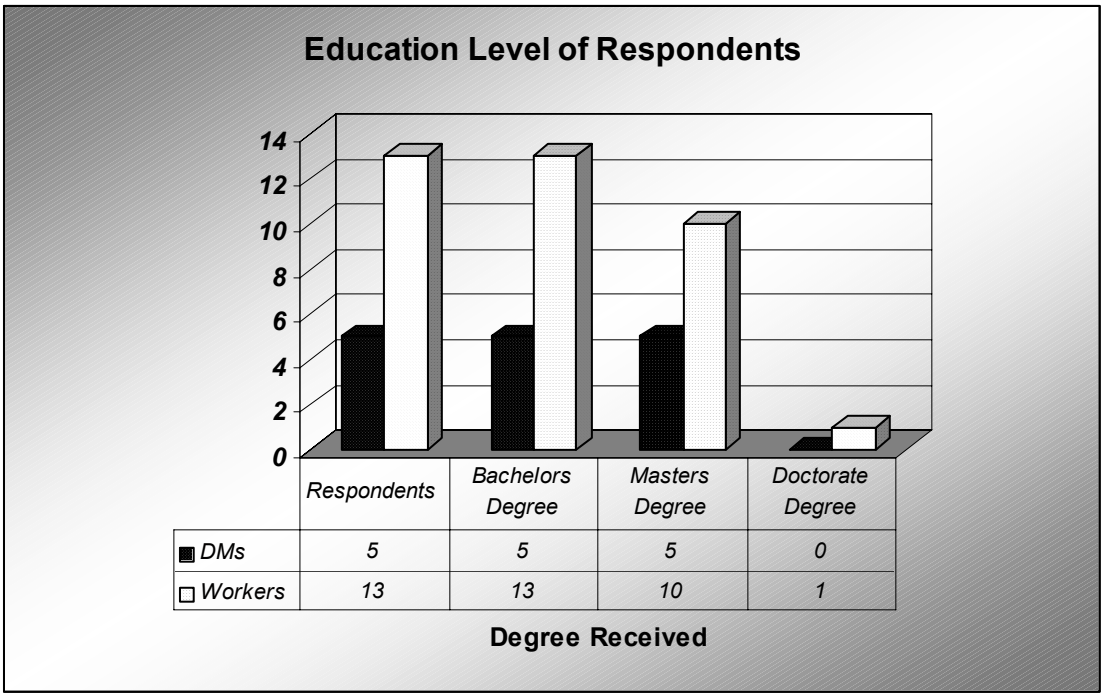

Figure 4-1. Education of Respondents

Table 4-4. Concentration of Degrees

<table>
<tr><th rowspan="2">Degree Type</th><th rowspan="2">DMs</th><th colspan="3">Workers</th></tr>
<tr><th>Military</th><th>Civilian</th><th>Contractor</th></tr>
<tr><td rowspan="8">Bachelors Degree</td><td rowspan="2">Personnel & Procurement Management</td><td>Pre-professional Studies</td><td>Political Science</td><td>Civil Engineering</td></tr>
<tr><td rowspan="7">Accounting</td><td>Economics</td><td rowspan="2">Human Resources Management</td></tr>
<tr><td>Park Administration</td><td rowspan="2">Business Management</td></tr>
<tr><td>Production Management</td><td>Mathematics</td></tr>
<tr><td>Aeronautical Engineering</td><td>Quantitative Analysis</td><td rowspan="3">Engineering</td></tr>
<tr><td rowspan="2">Economics</td><td>Business Management</td></tr>
<tr><td>Economics /Accounting</td></tr>
<tr><td rowspan="7">Masters Degree</td><td>MBA</td><td>Space Studies</td><td>Business MGMT</td><td>Civil Engineering</td></tr>
<tr><td>Public Administration</td><td rowspan="6"></td><td>Economics</td><td>MBA</td></tr>
<tr><td rowspan="2">National Resources Strategy and Public Administration</td><td>MBA</td><td rowspan="2">Systems Management</td></tr>
<tr><td>MBA</td></tr>
<tr><td>Nat Security & Strategic Studies</td><td>MBA</td><td rowspan="3">Government Services</td></tr>
<tr><td>Mechanical Engineering</td><td rowspan="2">MBA</td></tr>
<tr><td>Economics (Math)</td></tr>
<tr><td>Doctorate Degree</td><td></td><td></td><td></td><td>MIS</td></tr>
</table>

Given this diverse area of study, the two samples varied widely in the area of concentration, albeit a majority of the degrees received was in the business related field.

Although, both samples had a high percentage of graduate level degrees, formal education was viewed differently, as seen in the following section.

Result Analysis

Due to having two different samples and utilizing two different questionnaire instruments, not all questions posed to one sample were posed to the other. Hence, the first section of the data analysis shows only the decision makers results, followed by the workers results, and finally a means comparison analysis was conducted for questions that were posed to both sample groups.

Where possible, a Likert scale was displayed with a range of 1 to 7, with 1 representing a low level of agreement or importance in regards to the question posed and 7 representing a high level of agreement or importance. Each response for each sample was placed into Microsoft ® Excel 2000, utilizing the data analysis tool to compute a mean, standard error, median, mode, sample variance, sample standard deviation, minimum score, maximum score, and count representing the number of respondents to the question in the respective category. Appendix C and D contains both questionnaires posed to the respondents.

Decision Makers

The DMs questionnaire contained 49 questions overall. Some questions did contain more than one part and would add to the 49 questions total. There were questions that contained a place to answer respondent specific information to include the demographic section discussed earlier in this chapter, the experience section, and the

additional space provided at the end of the questionnaire for respondents to add any comments on the questions posed or those that should have been included within this study. Table 4-5 displays summary statistics containing all of the questions with a Likert scale or other quantifiable response.

Formal Education

Questions 5 through question 9 comprised the formal education section in the DM questionnaire. In general, the DMs polled indicated that formal education was a moderately to highly important attribute possessed by members conducting source selection duties. There was at least a 5.4 sample mean response for all questions posed in this section except one, question number 8. The mean response of 5.4 to 5.8 was received in regards to the importance of formal education when fulfilling the role of cost team lead and cost analyst. Also a mean response of 5.4 was computed for how often outside consultants who have specific or advance education are brought in to supplement source selections and if there is a need for this specialized or advance education with regards to cost expertise as permanent members of a headquarters staffs.

Although this high level of agreement or importance on how often outside consultants are brought in was computed, a mean response of 4.4 was computed for question number 8, on how important the outside consultant contributions to the overall evaluation and success of a source selection decision. Although this was a lower mean response than the rest of the mean response levels in this section of the questionnaire, a mean response of 4.4 still showed a moderate degree of importance put on the outside

consultants with specialized or advance education to the overall success of a source selection.

Experience

Questions 10 through 18 of the DMs questionnaire make up this experience section of the questionnaire. The first portion of this section handles the members own experience level with Defense Department acquisition and source selection experience. The next portion of this section measures the DMs perceptions on how experience level factors in the source selection process.

The DMs have an average of 19.8 years of DoD acquisition experience. This high level of experience is expected based on the management positions these members serve in the Air Force. The next several questions specifically target source selection information. The first measure is of source selection experiences. This encompasses all interactions previously encountered with the source selection process. The mean response computed was 19. One member had 50 plus years of experiences, which positively skewed this figure. The median response was 15.

The next question measures the amount of full-time membership on a source selection organization. The mean response was 3.75. With the following two questions measuring the number of cost panels lead and the number of cost panel they had merely been members. These two sample mean figures were 1 and 2.1 respectively. These last three questions show that although the DMs had extensive DoD acquisition and source selection experiences, in general, only a few had actually participated as a cost lead or cost member on a source selection evaluation board.

Table 4-5. DMs Questionnaire Statistics

Question	Description	Mean	SE	Median	Mode	Var	Std Dev	Min	Max	Count
5	Formal Education Cost Team Lead	5.4	0.24	5	5	0.55	0.3	5	6	5
6	Formal Education Cost Analyst	5.8	0.37	6	5	0.84	0.7	5	7	5
7	Outside Consultants w/ Adv Ed	5.4	0.4	6	6	0.89	0.8	4	6	5
8	Outside Consultants Overall SS Success	4.4	0.51	4	4	1.14	1.3	3	6	5
9	Outside Consultants as Staff Members	5.4	0.51	5	5	1.14	1.3	4	7	5
10	DoD Acq Experience	19.8	1.02	20	20	2.28	5.2	16	22	5
11	SS Experience	19	7.97	15	15	17.82	317.5	5	50	5
12	SS Full time Member	3.75	1.11	4	N/A	2.22	4.92	1	6	4
13	Cost/Price Panel Lead	1	0.45	1	0	1	1	0	2	5
14	Cost/Price Panel Member	2.1	1.35	0	0	3.01	9.05	0	6.5	5
15	Experience Level and Cost Analyst	6	0.71	6.5	7	1.41	2	4	7	4
16	Experience Level and Lead Cost Analyst	6.6	0.24	7	7	0.55	0.3	6	7	5
17	Experience Cost as SSAC Members	5.2	0.58	5	4	1.30	1.7	4	7	5
18	Cost Experience of Cost Panel Members	5.6	0.24	6	6	0.55	0.3	5	6	5
22	Acq Training prep for SS Responsibilities	4.8	0.49	5	5	1.10	1.2	3	6	5
23	Add Acq Training Beneficial	5.6	0.51	6	6	1.14	1.3	4	7	5
24	Formal Acq Training for Good SS	5.8	0.58	6	7	1.30	1.7	4	7	5
26	Type of Training prior to SS—DAU	4	0.71	3.5	3	1.41	2	3	6	4
26	Type of Training prior to SS—AFIT	2.67	0.33	3	3	0.58	0.33	2	3	3
26	Type of Training prior to SS--Func Expert	6.5	0.29	6.5	6	0.58	0.33	6	7	4
26	Type of Training prior to SS--Web	4	1.22	4	4	2.45	6	1	7	4
27	Formal SS training for Lead Cost Analyst	5.8	0.58	6	7	1.30	1.7	4	7	5
28	Formal SS training for Cost Analyst	6	0.55	6	6	1.22	1.5	4	7	5
29	Current SS training & support adequate	4.4	0.51	4	4	1.14	1.3	3	6	5
30	DoD has trained, edu, exp to provide train & supp	4.8	0.73	4	4	1.64	2.7	3	7	5
30a	Training, Education, Support outsource or Ktr	1.8	0.37	2	2	0.84	0.7	1	3	5
33	Cost Help from SME	6.2	0.2	6	6	0.45	0.2	6	7	5
33	Cost Help from GA	5.6	0.4	5	5	0.89	0.8	5	7	5
33	Cost Help from Neutral Experts	5	0.71	5	N/A	1.58	2.5	3	7	5
34	Valuation of standing cost team for Agency SS	4.2	0.58	4	3	1.30	1.7	3	6	5
34a	If valuable, what level--SAF/XX	3.75	1.03	4	4	2.06	4.25	1	6	4
34a	If valuable, what level--center level	5.6	0.75	6	7	1.67	2.8	3	7	5
34a	If valuable, what level--separate agency	3	0.71	2.5	2	1.41	2	2	5	4
34a	If valuable, what level—contractor	1.5	0.50	1	1	1.00	1	1	3	4
35	SS overall success of cost team	4.75	0.95	5.5	6	1.89	3.58	2	6	4
36	SS overall effectiveness meeting SSA needs	5.5	0.65	5.5	N/A	1.29	1.67	4	7	4
37	Cost team critical path in SS schedule	5	1.08	5.5	N/A	2.16	4.67	2	7	4
39	Relative ranking—Education	2.2	0.37	2	3	0.84	0.7	1	3	5
39	Relative ranking—Experience	1.2	0.2	1	1	0.45	0.2	1	2	5
39	Relative ranking--Job Training	2.6	0.24	3	3	0.55	0.3	2	3	5
40	Bias a concern when team is filled w/ local people	3.2	0.97	2	2	2.17	4.7	1	6	5
41	Staff SS w/ outside functional experts	2.4	0.51	2	2	1.14	1.3	1	4	5
42	Feasible to staff Agency SS w/ func exp from other AF orgs	4.2	1.16	3	2	2.59	6.7	2	7	5
43	SSA or HQ involvement with staffing SS	4.4	0.81	4	4	1.82	3.3	2	7	5
45	Gov personnel over contractor support on SS	6.4	0.4	7	7	0.89	0.8	5	7	5
46	Comfortable if majority of SSET is contractors	1.8	0.37	2	2	0.84	0.7	1	3	5
48	SS w/ cost issue, comfortable w/ FM over CONS	6.2	0.37	6	6	0.84	0.7	5	7	5
49	SAF/AQ own career cost personnel Acq & SS	2.8	0.66	3	3	1.48	2.2	1	5	5
49a	If so, 63AXs and 64X as cost estimators	4.25	0.63	4	4	1.26	1.58	3	6	4
49b	If so, 65XXs assigned to SAF/AQ	5.25	0.85	5.5	N/A	1.71	2.92	3	7	4

The next four questions measures the DMs perceptions on how experience level factors in the source selection organization. In general, the DMs questioned indicated that experience is a very important attribute possessed by members conducting source selection duties. The mean response of 6 and 6.6 was computed in regards to the importance of experience when fulfilling the role of cost analyst and cost team lead. In addition, a mean response of 5.2 was computed for how often experienced cost personnel fulfill the role of primary members of the Source Selection Advisory Counsel. Finally based on their most recent source selections, the DMs rated the level of cost experience of the cost panel members at a mean of 5.6. Overall, these four questions ranged from a mean response of 5.2 to 6.6. These relatively high numbers shows the DMs perception on how experience plays a significant role in the source selections when it comes to attributes possessed by members of source selection organizations.

Acquisition Training

This section of the questionnaire contained questions 19 through 24. Not only did these questions measure what the DMs current certifications levels are and in what areas, but also attained a listing of the courses offered by the Defense Acquisition University they indicated are critical to cost analysts prior membership on cost panels. These questions went on to measure what level of agreement they indicated for how adequately the acquisition training received prepared them for their source selection duties, whether additional acquisition training would have been beneficial, and how important acquisition training is to a good source selection.

Table 4-6. DMs Certification Discipline & Levels

Discipline	Financial Management	Contracting	System Acquisitions	Program Management	Technical Evaluation	Cost Estimation	Business
Certification Levels	III, III	III	III	II, III	III	III	III

Table 4-6 displays what the DMs current certification levels and in what areas. The certification disciplines possessed by the DMs show a wide breadth of acquisition training, while the levels show the amount of study received in each particular area, three being the highest. Although there are only five DM respondents, members are not restricted to one discipline for certification. Therefore, more than five disciplines are possessed by the DMs.

Figure 4-2 displays what courses offered by the DAU are considered critical by DMs for cost analysts before source selection team membership and how often they were selected by the five DMs. Attachment B shows a short description of each course offered. To ensure the capture of all courses available to DoD personnel critical to cost analysts for source selection purposes, question 21 asked if any courses had not been included or simply overlooked. Writing courses and a cost accounting course from a college level beyond the freshman year was suggested for addition to the list.

The next three questions focused on how acquisition training affects a source selection. Question 22 had a mean response of 4.8 as to whether acquisition training had adequately prepared the respondents for their responsibilities on a source selection. When asked if additional training in acquisition been beneficial, the mean response rose to 5.2, with a final mean response of 5.6 for how important formal acquisition training is

to a good source selection. The DMs indicated acquisition training as moderately important to the source selection process.

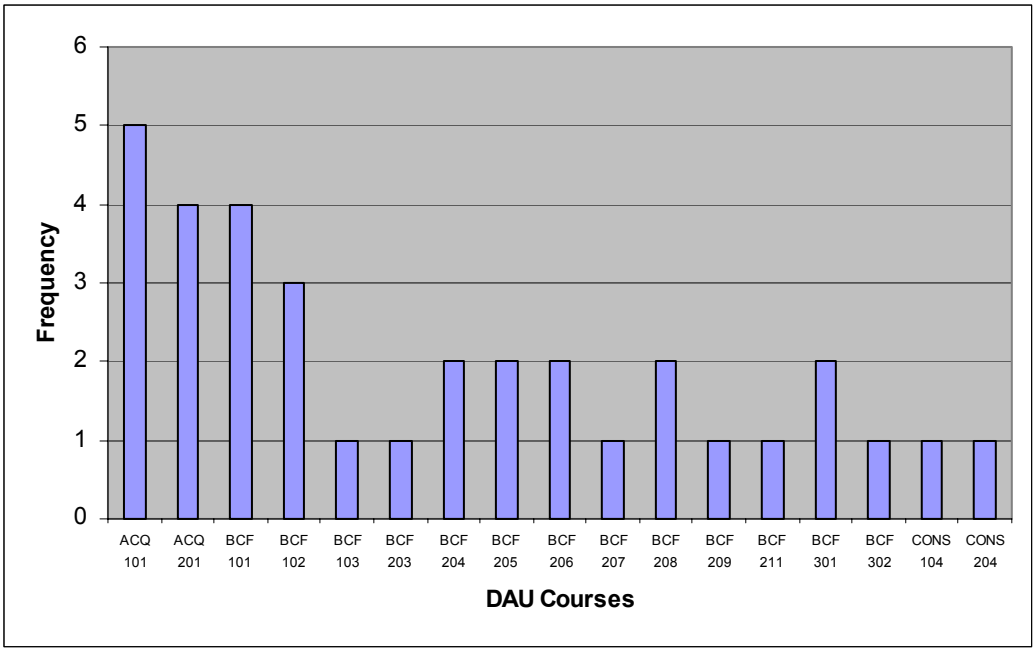

Figure 4-2. DMs Suggested Courses

Source Selection Training

This section of the DM questionnaire contained questions 25 through 31. This section of the questionnaire measured the importance of source selection training to the membership of a source selection organization. The first question gathered from what source did the DMs receive the bulk of their source selection knowledge. All participants responded with on the job training, experience, or actual source selection experience. This showed that the DMs received the majority of their knowledge not from a classroom but from actually conducting a source selection. The follow-up question asked if they believed that members should receive training before a specific source selection. Four of the five respondents answered yes with the fifth answering not necessarily. The next

question asked what type of training do members need before a source selection and were four options: DAU, AFIT, focused short course by functional experts, and focused web courses. The mean responses were 4, 2.7, 6.5, and 4 respectively. Out of the four choices given, the DMs gave a much higher mean response for the focused short courses by functional experts, with DAU and the web courses tying while AFIT ended up with the lowest mean response. This showed that the DMs had a much higher interest with short training given by functional experts.

The next two questions measured the importance level of source selection training for serving as a cost analyst lead and as a cost analyst. The mean responses were 5.8 and 6.0 respectively. These responses were a high level of agreement to the importance of source selection training to the staffing of source selection cost analysts. The next several questions focused on the availability of source selection training and who should provide this service. A mean response of 4.4 was given for the current source selection training and support being adequate. While mean response of 4.8 was given for the thought of DoD having sufficiently trained, educated, and experienced resources to provide the source selection training. When asked if this service could be outsourced to a contractor, a mean response of 1.8 was received showing a very low level of consideration for this type of action.

The final question in the source selection training section asked at what Air Force organizational level should this service be provided. The DMs that responded to this question answered either with all levels or with the Major Command/Center level.

Source Selection Process

This area of the DM questionnaire contained questions 32 through 39. The first question in this section asks the DMs to list the factors they review when forming an opinion on whether or not a cost analysis team was successful. In general, the DMs questioned selected to judge the cost team based on their careful reason and methodology selected, substantiation of the estimate, easily followed and presented information, but most importantly, if they received a protest or survived the scrutiny of protests. Basing the success of the cost team on whether the team received a protest is an interesting issue. Recent studies show that contractors protest award decisions based on several different factors.

An article written by Steve Roemerman researched why certain contractors filed protests and why some did not. In his study, he found that some of the reasons contractors file protests are not necessarily because of bad work on the part of the government (Roemerman, 1998:28-30). In these cases, the decision of the DMs would be that the cost team had failed to correctly analyze the proposals and select the appropriate source, when in fact, the cost team may have accomplished everything correctly and the non-recipient was poised to protest the government regardless of the reasons given for their non-selection. This research indicates that basing whether the cost team was a success or not on whether the contractor protest is not a good indicator of the cost team's performance.

The next question asks the DMs to rate how valuable to the final decision are certain individuals or agencies. The agencies listed to rate are: subject matter experts, government agencies, and neutral experts for cost evaluation review. The mean

responses to these three options are 6.2, 5.6, and 5.0 respectively. This is an indication that these groups or individuals moderately to highly contribute to the final decision during source selection. The follow-up question asked how valuable would it be to have a standing team of cost evaluation experts to review or supplement ongoing agency level source selections. The mean response given by the DMs is 4.2. This showed that according to the DMs, a standing team of cost evaluation experts is somewhat valuable. The question went on to ask where this team should be formed. Should it be formed at the Secretary of the Air Force for Acquisition level, at the acquisition center level, a separate agency, or by the contractor? Each of these locations was listed for rating. The mean responses are 3.75, 5.6, 3, and 1.5. The DMs rated the acquisition center level with the highest mean response.

The next three questions focus in on the source selections conducted within the last year. The three questions asked what they feel was the overall success of the cost analysis team, how effective was the cost team in meeting the SSAs analysis needs, and finally if the cost team was in the critical path in the source selection schedule. The average responses to these questions were a moderate level of agreement. The mean responses are 4.75, 5.5, and 5.

The DMs then went on to list what they though were individual characteristics necessary for cost analysts to possess in order to be an effective member of a source selection. The majority of the responses bordered around the functional skills acquired as part of their training in cost analysis, for example: analytical and quantitative skills, functional training, and source selection training and experience. There were a few abstract qualities given, such as: careful thinker, objective, flexible, and possess common

sense. One of the skills given by one DM was having good writing skills. This focused on the ability to present things in an understandable manner. This shows that although cost analysts must ensure they have a full understanding of the science of numbers, the ability to communicate results in a written format is an important attribute.

The final question in the source selection process area asked the DMs to rank order education level, experience level, and job training in the order of 1-low, 2-medium, and 3-high according to their elative importance during the cost analysis portion of a source selection. The DMs ranked experience as a mean response of 1.2, education as a mean response of 2.2, and job training as 2.6. The median was represented in the same order: experience, education, and job training with a response of 1, 2, and 3 respectively. This does not mean that experience was of low importance, it means that compared with these other two factors, it rated the lowest.

Staffing of Source Selection

This section of the DM questionnaire contained question 40 through 43. Explored in this section are issues dealing with the staffing a source selection. The first question focuses on what the concern level is for bias when filling a source selection team with local personnel. There was minimal concern with bias with a 3.2 mean response, and even a smaller mean response, 2.4, when asked if they would prefer to staff the source selection with outside functional experts.

The level of mean responses almost doubled (4.2) when asked if it is feasible to staff Agency level source selections with functional experts for other Air Force organization and 4.4 when asked if the SSA or higher headquarters should be involved in

the staffing of source selection teams to allow for better teams from a variety of sources. These results seem to imply that although there is minimal concern of bias from the local cost analysts, they would like to see more involvement from higher management when selecting the cost analyst that will serve on a source selection.

Role of Contractors Support

This final section of the DM questionnaire contains questions 44 through 49. This section measured perceptions toward contractor support, as well as, a look at how the DMs feel the Air Force should staff the cost panels of source selection teams. The first question asked what role, if any, they feel the contractors play in source selections. All five DM responded differently, with a common tone though. They indicated that contractor support should be limited to either administrative support or technical and engineering evaluations only, augment the government staff, an independent advise pool, or provide expertise not otherwise available. When asked if they indicated government personnel are preferred to contractor personnel, the DMs answered with one of the highest sample mean of agreement calculated, 6.4. They followed that up with answering a sample mean of 1.8 for how comfortable they were if a majority of the SSET members were contractors. The final question on contractor support simply asks if they would ever consider using contractors as the SSET. There was a resounding answer of NO, or only in a supportive role, but not as the whole team. These answers seem to indicate that the DMs feel that there is a role for contractor support on government run SSETs, but only a limited one.

The next final two questions focuses in on the career field used by the Air Force to staff cost panels on source selections. The first question asks if cost is an issue, would they feel more comfortable with a Financial Management cost person lead cost panel over a Contracting person lead cost panel. A mean response of 6.2 appeared for this question. When asked if the Secretary of the Air Force for Acquisition (SAF/AQ) should maintain its own career field of cost personnel to support acquisitions and source selection analysis, a computed mean response of only 2.8 resulted for a very low level of agreement. The final two subset questions asked if the Air Force did have a separate pool of cost trained acquisition support personnel, how should they be characterized as Acquisition Managers and Contracting personnel or more so with a Financial Management/Cost Analysis designation assigned to SAF/AQ. A higher sample mean resulted for the Financial Management/Cost Analysis designation, although not statistically significant.

Workers

The Workers questionnaire contained 40 questions overall. Some questions did contain more than one part and would add to the 40 questions. There were questions that contained a place to answer respondent specific information to include the demographic section discussed earlier in this chapter, the experience section, and the additional space provided at the end of the questionnaire for respondents to add any comments on the questions posed or those that should have been included within this study. A table displaying summary statistics is shown, table 4-7, containing all of the questions with a Likert scale or other quantifiable response.

Formal Education

Questions 4 through 6 comprise the formal education section in the workers questionnaire. Question 4 was included in the demographics portion discussed previously. In general, the workers questioned indicated formal education is a moderately important attribute possessed by members conducting source selection duties.

Table 4-7. Workers Questionnaire Statistics

Q	Description	Mean	SE	Median	Mode	Var	Std Dev	Min	Max	Count
5	Formal Education Cost Team Lead	4.92	0.38	5	6	1.38	1.91	2	7	13
6	Formal Education Cost Analyst	4.31	0.31	5	5	1.11	1.23	2	5	13
7	DoD Acq Experience	13.65	2.21	15	4	7.98	63.64	2	25	13
8	SS Experience	6.92	2.12	5	2	7.64	58.41	1	30	13
9	SS Full time Member	5.77	1.80	4	1	6.48	42.03	1	25	13
10	Cost/Price Panel Lead	1.38	0.51	1	0	1.85	3.42	0	5	13
11	Cost/Price Panel Member	4.92	1.37	4	1	4.94	24.41	1	18	13
12	Experience Level and Cost Analyst	6.08	0.21	6	6	0.76	0.58	4	7	13
13	Experience Level and Lead Cost Analyst	6.46	0.27	7	7	0.97	0.94	4	7	13
17	Acq Training prep for SS Responsibilities	4.5	0.38	5	5	1.31	1.73	2	6	12
18	Add Acq Training Beneficial	4.42	0.45	5	5	1.56	2.45	1	7	12
23	Formal SS Training prepared for SS Responsibilities	4.2	0.55	4	4	1.75	3.07	1	7	10
24	Additional SS Training in cost/price beneficial	5.09	0.44	5	6	1.45	2.09	3	7	11
26	Formal SS training for Lead Cost Analyst	5.31	0.41	6	6	1.49	2.23	2	7	13
27	Formal SS training for Cost Analyst	4.92	0.40	5	6	1.44	2.08	1	6	13
31	Prepared for SS Cost/Price analysis Responsibilities	5.15	0.42	6	6	1.52	2.31	2	7	13
32	Other members of Team Prep for SS Cost/Price Resp	5.08	0.34	5.5	6	1.16	1.36	3	6	12
35	SS overall success of cost team	6.31	0.26	7	7	0.95	0.90	4	7	13
36	SS overall effectiveness mission of cost team	6.23	0.26	6	7	0.93	0.86	4	7	13
37	Cost team efficient in SS schedule	5.46	0.35	6	6	1.27	1.60	3	7	13
38	Rate Quality of products of cost team	6	0.34	6	6	1.22	1.5	3	7	13
40	Relative ranking--Education	2.08	0.29	2.5	3	1.00	0.99	1	3	12
40	Relative ranking--Experience	2.25	0.25	2.5	3	0.87	0.75	1	3	12
40	Relative ranking--Job Training	1.67	0.14	2	2	0.49	0.24	1	2	12

A sample mean response of at least 4.3 for the questions posed in this section was computed. The mean response of 4.9 and 4.3 was computed on how important education level is in serving as a cost/price analyst lead and cost analyst respectively. This level of response is consistent with how each member of the worker sample views their education

level. Each member has at least a bachelor's degree with one member having a doctorate degree.

Experience

Questions 7 through 13 of the workers questionnaire make up this experience section of the questionnaire. The first portion of this section handles the members own experience level with Defense Department acquisition and source selection experience. The next portion of this section measures the workers perceptions on how experience level factors in the source selection process.

The workers have an average of 13.7 years of DoD acquisition experience. This moderately high level of experience is expected based on the middle management positions these members serve in the Air Force. The next several questions specifically target source selection information. The first measure is of source selection experiences. This encompasses all interactions previously encountered with the source selection process. The mean response computed was 6.9. One member had 30 plus experiences, which positively skewed this figure. The median response is 5.

The next question measures the amount of full-time membership on a source selection organization. The mean response was 5.77. With the following two questions measuring the number of cost panels lead and the number of cost panel they had merely been members. These two sample mean figures are 1.4 and 4.9 respectively. These last three questions also show that, although like the DMs, the workers had extensive DoD acquisition, in general only a few had many source selection experiences and only a few

had actually participated as a cost lead or cost member on a source selection evaluation board.

The next two questions measures the workers perceptions on how experience level factors in the source selection organization. In general, the workers questioned indicated that experience is a very important attribute possessed by members conducting source selection duties. The mean response of 6.1 and 6.5 was computed in regards to the importance of experience when fulfilling the role of cost analyst and cost team lead. These relatively high numbers shows the workers perception on how experience plays a significant role in the source selections when it comes to attributes possessed by members of source selection organizations.

Acquisition Training

This section of the questionnaire contained questions 14 through 18. Not only did these questions measure what the workers current certifications levels are and in what areas, but also attained a listing of the courses offered by the Defense Acquisition University they indicated are critical to cost analysts prior to membership on cost panels. These questions went on to measure what level of agreement they indicated for how adequately the acquisition training received prepared them for their source selection duties, whether additional acquisition training would have been beneficial, and how important acquisition training is to a good source selection.

Table 4-8. Workers Certification Discipline & Levels

Discipline	Financial Management	Contracting	System Acquisitions	Program Management
Certification Levels	I, I, II, II, III, III, III, III, III	III	III	III, III, III, III

Table 4-8 displays what the DMs current certification levels and in what areas. The certification disciplines possessed by the workers show a wide breadth of acquisition training, while the levels show the amount of study received in each particular area, three being the highest. Although there are 13 worker respondents, members are not restricted to one discipline for certification. Therefore, the workers possess more than 13 overall certifications.

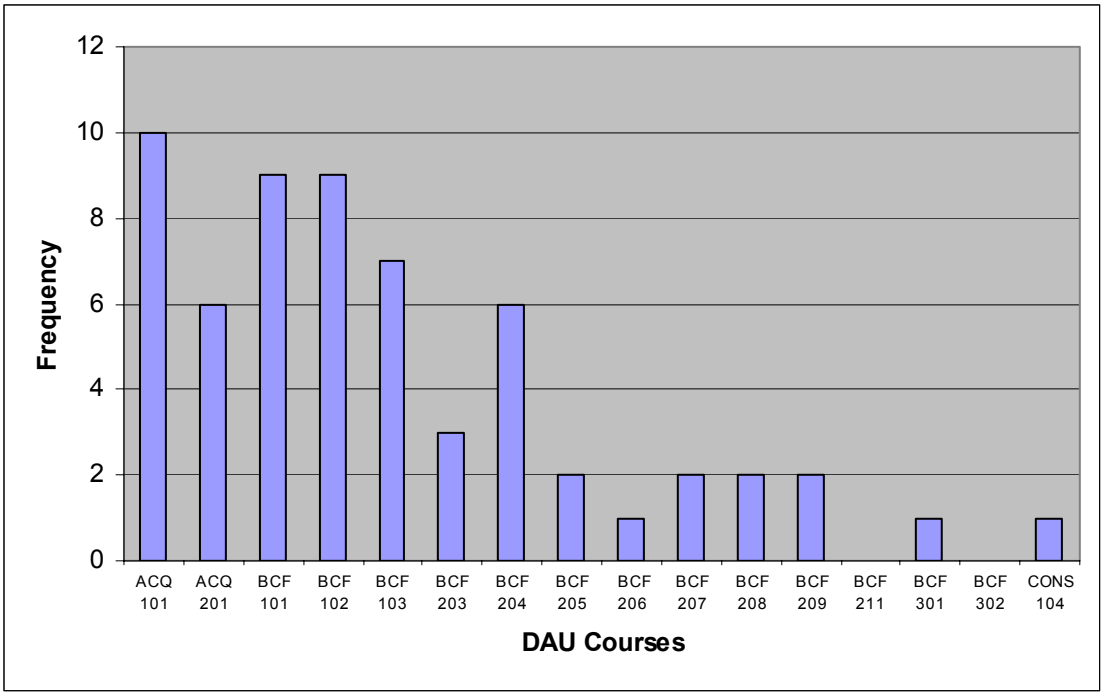

Figure 4-3. Workers Suggested Courses

Figure 4-3 displays what courses offered by the DAU are considered critical by workers for cost analysts to possess before being selected on source selection team. Also shown is how often the 13 workers selected them. Attachment B shows a short description of each course offered.

To ensure the capture of all courses available to DoD personnel critical to cost analysts for source selection purposes, question 16 asked if any courses had not been included or simply overlooked.

The following suggested courses were given:

- DSMC Program Management Course 84-2
- Professional Military Comptroller School
- QBA Graduate Level course
- CON 104 Contracting Pricing
- CON 331 Executive Cost Price Analysis
- QGT 345 Quantitative Technical Cost/Price Analysis

The next two questions focused on how acquisition training affects a source selection. Question 17 had a mean response of 4.5 as to whether acquisition training had adequately prepared the respondents for their responsibilities on a source selection. When asked if additional training in acquisition been beneficial, the mean response stayed relatively constant at 4.4. The workers indicated acquisition training as moderately important to the source selection process.

Source Selection Training

The source selection training section of the questionnaire contains questions 19 through 27. The first question in this section asks from what source did they receive the

bulk of their source selection training. Ten of the 13 workers responded on the job training either as the sole source or as part of the source from which they received the bulk of their source selection training. Four of the 13 workers mentioned they received their training in part or as a whole from other organizations including the source selection support office (ASC/SYG) mentioned in the literature review.

The next two questions asked if before the first and then subsequent source selections they received any formal source selection training and if so, what type, from whom, and how long was the training provided. Seven of the thirteen members stated that some sort of formal source selection training was received before they participated in their first source selection. The type of training received ranged from a briefing lasting an hour given by a program office to training provided by the primary contracting officer and legal, lasting over two and a half days covering ethics, evaluation team training, and analytical tools available and practicality of each tool.

For those respondents that participated in more than one source selection, four of the six that previously did not have any training before there first source selection did indeed have training prior to their subsequent source selection. The time duration of this training ranged from a fifteen-minute web-based training session to a three-day in-house training. Posed next is a follow-up question asking what material should be covered during source selection training sessions. Below is a compiled list:

- Cost proposal evaluation criteria and techniques
- Available analytical techniques
- Documentation and supporting requirements of analyses
- Roles and responsibilities of cost members
- Governing regulatory framework
- Source selection procedures

The next two questions measured how adequately formal source selection training prepared them for their source selection duties and if additional training the area of cost analysis would have been beneficial. The workers mean response resulted in a moderate agreement that they were adequately prepared with a mean response of 4.2, although a higher mean response resulted in whether additional training would have been beneficial, 5.1.

The follow-up question was asked in what cost analysis area would have additional training been beneficial, provided in what format and given by whom. The answers given here mirrored those given in what materials should be covered during source selection training sessions in general. This leads to the belief that not enough time is being spent in these training efforts to assist the analyst for what lies ahead. Five options were given as to what format the additional training should be given under:

- Source Selection Training Organization (SSTO)
- Web Based (WB)
- Formal course (FC)
- Organization/Unit (OU)
- Other

Figure 4-4 shows the frequency the workers selected each method. Each individual worker was able to select all that apply. The one member that selected "other" qualified his remark by stating experienced buyer/cost team members. This figure shows training by the source selection training organization is the preferred method for additional training.

The final two questions measure the worker's perception of how important formal source selection training is for a cost analyst in a source selection. For a cost lead, the mean response is 5.3, while for the cost analyst the mean response dropped to 4.9.

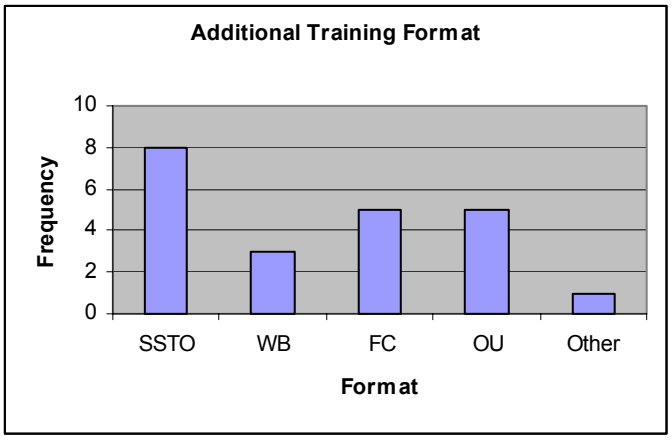

Figure 4-4. Workers Suggested Additional Training

Source Selection Process

This final section of the workers questionnaire contained questions 28 through 40. The source selection process section has numerous questions concerning the source selection process, cost team selection, cost analyst successful characteristics, and biggest problems encountered during source selection. The first question asks the workers to characterize the current source selection cost evaluation process. The majority of the responses ranged from fair and reasonable to lengthy and restrictive. Some responses stated that it was a *hit and miss* depending on the qualifications of the team. Also, some workers characterized the process as ad hoc, unorganized, or even broken. The range of responses varied greatly, mainly due to the workers individual experiences with source selections.

The workers were asked how they were selected for their source selection responsibilities and also, if they had the opportunity to select anyone, how did they determine the members to be on the cost team. The results from the first question

centered on having experience with the program or system as a cost analyst or financial manager or experience with similar source selections. The results from the second question also varied. There were several respondents that listed source selection and cost experience as main drivers, while others chose *willingness to learn* and *personnel availability* as factors to selecting individuals for a role on a cost panel. There is a lurking issue concerning the selection of individuals with experience in source selections or those that have a proven record. As mentioned in chapter two, many acquisition personnel are reaching retirement eligible. With this being the case, inexperienced individuals must be given the opportunity to gain the first hand knowledge and experience that they are lacking by being selected to participate in cost panels. If only experienced individuals are selected, a pool of inexperienced cost analysts will remain when the former group becomes eligible to retire.

The next two questions asked the workers to rate how prepared they indicated they were and also how prepared they indicated other members were for their responsibilities on the cost team. The mean responses were 5.2 and 5.1 respectively. The workers generally agreed that they were prepared for their responsibilities.

The questionnaire went on to ask the workers input on the biggest problems they encountered and what the major problem areas are in the cost analysis conducted on contract proposals. Some of the biggest problems encountered were support and coordination efforts among the different teams. One example given of this problem was late inputs given to the cost team from the technical evaluation team, which caused scheduling difficulties. Another problem was the unrealistic schedule set forth by the program managers for the completion of the cost evaluation. The other problem listed

was having an inexperience cost team. The time taken to bringing people *up to speed* also caused problems, although as mentioned earlier this may be a necessary evil.

As for contract proposal analysis, problems here focused mainly in the inconsistencies of the data or the insufficient data provided by the bidders to allow for analysis. This problem led cost analysts to request more data to appropriately conduct the evaluation and generally lengthened the process. This adds to the sense indicated by the workers of a repetitive and lengthy process.

The next area discussed in the questionnaire is the cost team performance evaluation. The workers were asked what they indicated the overall success of the cost team was, how effective in terms of mission, how efficient in terms of time, and the how they rated quality of the products of the cost team. The mean responses given were, 6.3, 6.2, 5.5, and 6, respectively. This showed a moderately high level of agreement for how they rated the team's overall performance in the source selection. What is interesting to note is how the workers rated the team's efficiency. Although one of the majority flaws stated with the source selection process is its lengthy nature, the workers indicated that based on the work completed they were very efficient.

The following question polled the workers to list what individual characteristics are necessary in order to be an effective member of a source selection cost analysis team. The dominant characteristic given was the ability to work well with others and have a team mentality. Following closely was having strong analytical skills and good estimating background. Last but not the least listed was good work ethics and dedication to completing the task at hand.

The final question in the source selection process area asked the workers to rank order education level, experience level, and job training in the order of 1-low, 2-medium, and 3-high according to their elative importance during the cost analysis portion of a source selection. The workers ranked job training as a mean response of 1.7, education as a mean response of 2.1, and experience as 2.3. The median response was represented in a slightly different manner. Although job training was still the lowest rated with a 2, Education and experience had the same median response of 2.5. This indicates that compared with these other two factors, it rated the lowest.

Table 4-9. Contractors Descriptive Statistics

Q	Description	Mean	SE	Median	Mode	Var	Std Dev	Min	Max	Count
5	Formal Education Cost Team Lead	5.75	0.63	6	6	1.26	1.58	4	7	4
6	Formal Education Cost Analyst	4.75	0.25	5	5	0.5	0.25	4	5	4
7	DoD Acq Experience	16	4.55	18	N/A	9.09	82.67	4	24	4
8	SS Experience	5.75	1.49	5	5	2.99	8.92	3	10	4
9	SS Full time Member	5	1.87	4.5	N/A	3.74	14	1	10	4
10	Cost/Price Panel Lead	1.5	1.19	0.5	0	2.38	5.67	0	5	4
11	Cost/Price Panel Member	3	1.15	3	1	2.31	5.33	1	5	4
12	Experience Level and Cost Analyst	6.5	0.29	6.5	6	0.58	0.33	6	7	4
13	Experience Level and Lead Cost Analyst	6.5	0.5	7	7	1	1	5	7	4
17	Acq Training prep for SS Responsibilities	5.33	0.67	6	6	1.15	1.33	4	6	3
18	Add Acq Training Beneficial	3.33	0.33	3	3	0.58	0.33	3	4	3
23	Formal SS Training prepared for SS Responsibilities	4.67	0.67	4	4	1.15	1.33	4	6	3
24	Additional SS Training in cost/price beneficial	4.75	0.48	4.5	4	0.96	0.92	4	6	4
26	Formal SS training for Lead Cost Analyst	5.75	0.48	5.5	5	0.96	0.92	5	7	4
27	Formal SS training for Cost Analyst	5.75	0.25	6	6	0.5	0.25	5	6	4
31	Prepared for SS Cost/Price analysis Responsibilities	5.75	0.25	6	6	0.5	0.25	5	6	4
32	Other members of Team Prep for SS Cost/Price Resp	4.75	0.63	5	5	1.26	1.58	3	6	4
35	SS overall success of cost team	6.5	0.29	6.5	7	0.58	0.33	6	7	4
36	SS overall effectiveness mission of cost team	6.5	0.29	6.5	7	0.58	0.33	6	7	4
37	Cost team efficient in SS schedule	5.25	0.85	5.5	N/A	1.71	2.92	3	7	4
38	Rate Quality of products of cost team	5.75	0.63	6	6	1.26	1.58	4	7	4
40	Relative ranking—Education	1.67	0.67	1	1	1.15	1.33	1	3	3
40	Relative ranking--Experience	2.33	0.67	3	3	1.15	1.33	1	3	3
40	Relative ranking--Job Training	2	0	2	2	0	0	2	2	3

Workers within Sample

The Workers within sample analysis contained three different groups taken from within the workers sample. The three groups are the Government Contractors, Government Civilians, and Government Military. Again, the same rules apply for the questions taken from the workers questionnaire. The Workers questionnaire contained 40 questions overall. Some questions did contain more than one part and would add to the 40 questions.

Table 4-10. Civilian Descriptive Statistics

Q	Description	Mean	SE	Median	Mode	Var	Std Dev	Min	Max	Count
5	Formal Education Cost Team Lead	4.86	0.40	5	5	1.07	1.14	3	6	7
6	Formal Education Cost Analyst	4.43	0.43	5	5	1.13	1.29	2	5	7
7	DoD Acq Experience	15	2.65	15	15	7	49	4	25	7
8	SS Experience	9.14	3.70	6	10	9.79	95.81	2	30	7
9	SS Full time Member	7.43	3.10	4	8	8.20	67.29	1	25	7
10	Cost/Price Panel Lead	1.57	0.72	1	0	1.90	3.62	0	5	7
11	Cost/Price Panel Member	7.14	2.16	5	2	5.73	32.81	2	18	7
12	Experience Level and Cost Analyst	5.86	0.34	6	6	0.90	0.81	4	7	7
13	Experience Level and Lead Cost Analyst	6.29	0.42	7	7	1.11	1.24	4	7	7
17	Acq Training prep for SS Responsibilities	4.71	0.36	5	5	0.95	0.9	3	6	7
18	Add Acq Training Beneficial	4.71	0.36	5	5	0.95	0.9	4	7	7
23	Formal SS Training prepared for SS Responsibilities	4.5	0.67	4	3	1.64	2.7	3	7	6
24	Additional SS Training in cost/price beneficial	5	0.68	5.5	3	1.67	2.8	3	7	6
26	Formal SS training for Lead Cost Analyst	5.14	0.70	6	6	1.86	3.48	2	7	7
27	Formal SS training for Cost Analyst	4.43	0.65	5	4	1.72	2.95	1	6	7
31	Prepared for SS Cost/Price analysis Responsibilities	5.29	0.61	6	6	1.60	2.57	2	7	7
32	Other members of Team Prep for SS Cost/Price Resp	5.5	0.34	6	6	0.84	0.7	4	6	6
35	SS overall success of cost team	6.71	0.18	7	7	0.49	0.24	6	7	7
36	SS overall effectiveness mission of cost team	6.29	0.42	7	7	1.11	1.24	4	7	7
37	Cost team efficient in SS schedule	5.86	0.26	6	6	0.69	0.48	5	7	7
38	Rate Quality of products of cost team	6.43	0.20	6	6	0.53	0.29	6	7	7
40	Relative ranking--Education	2.29	0.36	3	3	0.95	0.90	1	3	7
40	Relative ranking--Experience	2.29	0.29	2	2	0.76	0.57	1	3	7
40	Relative ranking--Job Training	1.43	0.20	1	1	0.53	0.29	1	2	7

There were questions that contained a place to answer respondent specific information to include the demographic section discussed earlier in this chapter, the experience section, and the additional space provided at the end of the questionnaire for

respondents to add any comments on the questions posed or those that should have been included within this study. Tables 4-9, 4-10, and 4-11 display summary statistics for each separate group within the sample containing all of the questions with a Likert scale or other quantifiable response.

Table 4-11. Military Descriptive Statistics

Q	Description	Mean	SE	Median	Mode	Var	Std Dev	Min	Max	Count
5	Formal Education Cost Team Lead	3.5	1.5	3.5	N/A	2.12	4.5	2	5	2
6	Formal Education Cost Analyst	3	1	3	N/A	1.41	2	2	4	2
7	DoD Acq Experience	4.25	2.3	4.25	N/A	3.18	10.13	2	6.5	2
8	SS Experience	1.5	0.5	1.5	N/A	0.71	0.5	1	2	2
9	SS Full time Member	1.5	0.5	1.5	N/A	0.71	0.5	1	2	2
10	Cost/Price Panel Lead	0.5	0.5	0.5	N/A	0.71	0.5	0	1	2
11	Cost/Price Panel Member	1	0	1	1	0	0	1	1	2
12	Experience Level and Cost Analyst	6	0	6	6	0	0	6	6	2
13	Experience Level and Lead Cost Analyst	7	0	7	7	0	0	7	7	2
17	Acq Training prep for SS Responsibilities	2.5	0.5	2.5	N/A	0.71	0.5	2	3	2
18	Add Acq Training Beneficial	3.5	2.5	3.5	N/A	3.54	12.5	1	6	2
23	Formal SS Training prepared for SS Responsibilities	1	0	1	N/A	-	-	1	1	1
24	Additional SS Training in cost/price beneficial	7	0	7	N/A	-	-	7	7	1
26	Formal SS training for Lead Cost Analyst	5	1	5	N/A	1.41	2	4	6	2
27	Formal SS training for Cost Analyst	5	1	5	N/A	1.41	2	4	6	2
31	Prepared for SS Cost/Price analysis Responsibilities	3.5	1.5	3.5	N/A	2.12	4.5	2	5	2
32	Other members of Team Prep for SS Cost/Price Resp	4.5	1.5	4.5	N/A	2.12	4.5	3	6	2
35	SS overall success of cost team	4.5	0.5	4.5	N/A	0.71	0.5	4	5	2
36	SS overall effectiveness mission of cost team	5.5	0.5	5.5	N/A	0.71	0.5	5	6	2
37	Cost team efficient in SS schedule	4.5	1.5	4.5	N/A	2.12	4.5	3	6	2
38	Rate Quality of products of cost team	5	2	5	N/A	2.83	8	3	7	2
40	Relative ranking--Education	2	1	2	N/A	1.41	2	1	3	2
40	Relative ranking--Experience	2	1	2	N/A	1.41	2	1	3	2
40	Relative ranking--Job Training	2	0	2	2	0	0	2	2	2

Means Testing

This study uses means testing to compare the results received from the two different samples to see whether there are any statistically significant differences in the level of importance or level of agreement in the response to the posed questions among the given study groups. Where there are statistically significant differences in response levels, possible causes are explored. If no statistically significant differences exist, then

the two comparison groups statistically have no difference in the level of response on the posed question.

When comparing two means with small samples, as in this case, compute the *t* statistic and conduct the T-test to compare the means (McClave, et al, 1998:368). The decision makers and the workers make up the two independent groups for this test. Each response for each sample was placed into Microsoft ® Excel 2000 and then by utilizing the data analysis tool to conduct the F-test and the T-test to compare two means, the results were given and put in a table format to more easily display the t-statistic and the associated significance value. The hypothesis for the test is:

Null Hypothesis $H_0 := \mu_{DMs} = \mu_{Workers}$

Alternate Hypothesis $H_a := \mu_{DMs} \neq \mu_{Workers}$

"The observed significance level, or p-value, for a specific statistical test is the probability (assuming Ho is true) of observing a value of the test statistic that is at least as contradictory to the null hypothesis, and supportive of the alternative hypothesis, as the actual one computed from the sample data" (McClave, et al, 1998:332). "A small *p* value is evidence that the sample is not the kind of sample which would be expected from the population described from the Null Hypothesis. This leads to the conclusion that the population must be different from that described by the Null Hypothesis. The Null Hypothesis is rejected" (Neufeld, 1997:223).

DMs versus Workers

In the table 4-12, the similar questions posed to both the DMs and the Workers are compared to discuss any significant differences of the level of importance or

agreement. The output from the data analysis tool gives the *t* statistic and the associated p value or significance value. The results are displayed for each respective question.

Table 4-12 displays three questions that computed a statistically significant difference of means between the two groups. For these questions the null hypothesis is rejected.

Table 4-12. DMs vs. Wkrs Means Comparison

DM	Wkrs	Description	*t* statistic	P value
5	5	Formal Education Cost Team Lead	1.048	0.3100
6	**6**	**Formal Education Cost Analyst**	**3.081**	**0.0116**
10	**7**	**DoD Acq Experience**	**2.523**	**0.0226**
11	8	SS Experience	1.465	0.2029
12	9	SS Full time Member	-0.956	0.3553
13	10	Cost/Price Panel Lead	-0.565	0.5810
14	11	Cost/Price Panel Member	-1.470	0.1673
15	12	Experience Level and Cost Analyst	-0.104	0.9220
16	13	Experience Level and Lead Cost Analyst	0.381	0.7093
22	17	Acq Training prep for SS Responsibilities	0.484	0.6398
23	18	Add Acq Training Beneficial	1.737	0.1130
27	26	Formal SS training for Lead Cost Analyst	1.737	0.1130
28	27	Formal SS training for Cost Analyst	1.588	0.1467
35	**35**	**SS overall success of cost team**	**-2.275**	**0.0380**
36	36	SS overall effectiveness	-1.052	0.3522

The first significant difference in this comparison is on how important they indicated education level is in serving as a cost analyst in a source selection. Although both samples identified this attribute as moderately important, the DMs placed a much higher importance rate on this question than the workers. The next significant difference is on the number of average years of DoD experience for each sample. As previously discussed, the DMs had a much higher number of average years of DoD experience than the workers. Based on the DMs position in upper level management, this is to be expected. The greater amount of experience by the DMs can be looked at in two

different views. The greater experience can impart innate wisdom of the source selection process to the DMs that may be hard to explain or distribute to the workers. On the other hand, being at such a high level and far removed from the worker level, may in itself create a knowledge gap of what is thought to be conducted during a cost panel versus what actually occurs.

The final significant difference is on how successful they indicated the cost team was on the recent source selection. The workers had a much higher sample mean score than the DMs. This difference may be due to this question actually asking the workers to rate themselves on their recent work or performance. This being a factor, the mean response for both samples is still at least moderately successful.

Summary

This chapter provided the results from the data analysis conducted on the information received from the questionnaires. In the hypothesis testing, several of the questions came up statistically significantly different in one mean comparison between the two main samples. Although there were differences in how the questions were viewed, all three factors were seen as important to the source selection process. Chapter 5 explores the recommendations derived from the results and discusses possible future research in this area of study.

V. Conclusions and Recommendations

Overview

This chapter draws conclusions from each section of the questionnaire covered by both sample groups. Recommendations are given based on the conclusions made in the three general areas covered by the questionnaires: education, experience, and training. These recommendations will be followed by limitations of this study. Finally, recommendations for further research within this topic area are discussed.

Conclusions

Formal Education

In the first area of the questionnaire, both the DMs and the workers showed they possessed a relatively high level of formal education. All but two respondents had at least a master's degree. Both samples indicated formal education was at least moderately important to a cost analyst while serving as a cost panel lead or member during a source selection. The DMs often brought outside consultants with specific or advanced education to supplement the source selection process with a moderate impact in the overall evaluation and success of the source selection.

Experience

In general, the majority of the DMs and workers sampled had an overwhelming amount of years experience in DoD acquisitions. Although this was also the case with general source selection experience, the amount of cost panel experience dropped

significantly by both sample groups. Nevertheless, they both placed a high level of importance on actual cost analysis and source selection experience. The DMs indicated that experienced cost analysts often serve on the Source Selection Advisory Council to assist the overall source selection authority. They also rated cost analysts in the most recent source selections as having a high level of experience.

Acquisition Training

Both sample groups listed Contracting, Financial Management, Program Management, and Systems Acquisitions as areas of acquisition certification. However, only one had cost estimation as an acquisition certification area. Both sample groups also indicated several of the courses offered by the Defense Acquisition University were critical for cost analysts before serving on a source selection. The sample groups moderately agreed that their respective acquisition training adequately prepared them for the source selection responsibilities. They also indicated that additional acquisition training would have been beneficial. The DMs indicated that formal acquisition training is moderately important to a good source selection.

Source Selection Training

Both sample groups agreed source selection training as being at least moderately important to both the lead and the members of a cost panel in a source selection. The workers thought additional training would be beneficial and should be provided by the source selection training organization. The majority of the DMs indicated that specific source selection training should be accomplished before conducting a source selection

and that functional experts should give the training in focused courses. The DMs also moderately agreed to whether or not the current source selection training and support was adequate. Furthermore, they indicated that DoD has sufficiently trained, educated, and experienced resources to provide the training and support needed.

Source Selection Process

In general, the DMs indicated that the cost panels were moderately successful on source selections within the last year. The also indicated they were effective at meeting the source selection authorities needs. The workers also responded with a moderate to high level of agreement on how others on the cost panel as well as themselves were prepared for their responsibilities during the source selection. Although improvements can be made throughout different aspects of the source selection process and the education, experience, and training of cost analysts, this shows that the source selection teams conduct themselves according to complete the task for which it is formed.

Recommendations

This section starts with recommendations concluded from the data analysis and individual responses given by both sample groups in the general areas of education, experience, and training.

Education

In this section of the questionnaire, both the DMs and the workers thought formal education was important. Although in varied concentrations, both the workers and the DMs possess a high level of advanced degrees. No recommendations are given in this area.

Experience

Experience was highly important to both sample groups for a cost analyst serving in a source selection. Several recommendations were gathered based on the final comments made by both sample groups. The wealth of experience by cost analysts serving on a cost panel is highly important to the overall efficiency of the source selection. One responded expressed that if the members are not fully qualified, precious time will be spent training them during the source selection and this will slow the entire process. While another respondent declared that without training and experience, you are setting people up to fail, or at least succeed very slowly.

The recommendation in the area of experience is that the majority of the members of a cost panel should have previous source selection experience. The next recommendation is to allow experienced cost analysts to team with inexperienced cost analysts and increase the overall population of cost analysts with source selection experience.

Training

Training in both the general acquisitions and the source selection areas is very important for cost analysts to possess. There are two recommendations in the area of training resulting from the data analysis. The first recommendation is that cost analysts attend the DAU courses listed below before conducting a source selection. Both samples groups selected these courses. The courses listed in table 5-1 are not meant as an exhaustive list of classes for cost analysts to attend, only as a beginning set of classes.

Table 5-1. Critical DAU Courses

ID	ACQ	BCF	CONS
Number	101, 102	101-103 203-209 301 & 802	104

The final recommendation is for additional source selection training. The source selection support organization should provide the additional training, given by functional experts. The training should be required before and during the source selection process.

Summary

This research effort produced some conclusions and recommendations. The conclusions and recommendations are based solely on the questionnaire data returned on the questionnaires provided to the participants of this study by the researcher. The recommendations are given with the intent to improve the respective segment of the source selection and the cost analysts involved throughout the process.

Limitations

The applicability of this research is subject to the following limitations:

1. Both sample sizes for this research were small, with only five participants in the DM sample and 13 participants in the Workers sample. A greater sample size for both groups survey would increase robustness of the results. However, the background information provided by the DMs and the workers showed that most participants had significant amount of source selection experience and knowledge.

2. The research was limited to personnel having experience as cost panel members and those characterized as Decision Makers of source selections.

3. The participants of this research segregate into two categories. The workers were from Aeronautical Systems Center at AFMC, while, the DMs varied in their location. The conclusions drawn from these groups are restricted to their respective sample. While these individuals had valuable insight into the source selection process, parochial interests may have affected their views.

4. The factors studied in this research are not proposed to embody an exhaustive list of factors that may influence cost analysts and their performance during source selections. There are other factors in the knowledge composition of a cost analyst. These factors may significantly affect, positively or negatively, their performance on a source selection.

5. The information collected during this study was both qualitative and quantitative in nature, and is consequently susceptible to interpretation. One area of concern is that of the terminology given by the questionnaire. For example, formal education and success was not defined for the respondents and therefore, left open for

personal interpretations. Every effort was made to accurately reflect the true intent of the respondents.

6. The final limitation of this study was the validation phase of the questionnaire. Only one analyst responded with corrections or clarifications to apply to the questionnaires. These changes were incorporated and distributed to both sample groups. More respondents on the applicability and the effectiveness of the questionnaire would have increased the confidence of the validity of the utilized questionnaires.

Recommendations for Further Research

Future research efforts in this topic area are recommended. Replication of this study at other Air Force product centers and other procurement agencies in the Department of Defense may add to the recommendations given by this research.

Similar studies could also be conducted with cost analysts in general, and not restricted to source selection specific experiences. With this in mind, a generalized training program could be developed for cost analysts before being assigned to an office.

Further research could be conducted on the different knowledge factors that affect a cost analysts performance. This research could add to the factors under this study. A more comprehensive list of factors may then be analyzed to prioritize which factors affect a cost analysts performance the most. With these factors at hand, appropriate training measures may be taken to ensure the cost analyst is prepared before undertaking a source selection.

The recommendation is that more research be conducted on the emphasis placed on formal education with respect to cost analysis. As described in the literature review,

the Air Force Institute of Technology (AFIT) offers master's degrees specifically in cost analysis. Although this resource is available to further educate the cost analysts in their main task, none of the persons questioned had attended AFIT. The focused education offered at AFIT could positively affect cost analysts at the worker level and possibly hone their skills to effectively improve future cost panels conducted in source selections.

Only one person in both the sample groups combined held a certification in the discipline of cost estimating. This person was in the DM sample group. Research should be conducted into the effects of certification in the cost estimating discipline for personnel filling a cost lead role in DoD.

The final recommendation for further research is to investigate local databases utilized to track personnel and the type of experience they possess. To ensure the continued growth and the availability of experienced personnel involved in source selections, this recommendation is necessary.

Appendix A: DoD TOA: Procurement by Service Component

DoD TOA: PROCUREMENT BY SERVICE COMPONENT
(Then-Year Dollars in Millions)

	FY 97	FY98	FY99	FY00
GRAND TOTAL (1)	43,166	44,884	50,769	54,931
ARMY TOTAL	8,072	6,789	8,735	9,456
Aircraft Procurement	1,329	1,285	1,384	1,507
Missile Procurement	1,003	726	1,215	1,310
Weapons/Tracked Vehicle Procurement	1,419	1,252	1,536	1,732
Ammunition Procurement	1,143	998	1,183	1,161
Other Procurement	3,178	2,528	3,417	3,746
NAVY TOTAL	17,210	19,509	20,646	23,526
Aircraft Procurement	6,715	6,588	7,549	8,861
Weapons Procurement	1,332	1,054	1,608	1,418
Shipbuilding/Conversion	5,467	8,007	6,118	7,125
Ammunition Procurement	277	376	467	542
Other Procurement	2,838	3,008	4,047	4,284
Procurement, Marine Corps	581	476	857	1,296
AIR FORCE TOTAL	14,388	15,328	18,208	18,807
Aircraft Procurement	6,267	6,112	8,235	8,831
Missile Procurement	1,839	2,273	2,091	2,066
Ammunition Procurement	311	372	411	583
Other Procurement	5,971	6,571	7,471	7,327
OTHER TOTAL	3,496	3,258	3,180	3,142
Defense Agencies	1,999	2,059	2,050	2,009
Reserve Forces Equipment	781	647	358	344
DoD Chem Demil Program	716	552	772	789

NOTE: Totals may not add due to rounding.
FY2000 figures are the February 28, 2001 estimates.

SOURCE:
Army : Mr. Larry Stopher (703) 695-2254 DSN 225-2254
Navy : Mr. P. Lapada (703) 695-5843 DSN 225-5843
Air Force : Mr. Byron Strickland (703) 614-4643 or DSN 224-4643
Defense : OSD Comptroller (Program & Financial Control)

Source: FY 2000*STATISTICAL DIGEST2000*Assistant Secretary of the Air Force (Financial Management and Comptroller), www.saffm.af.mil

Appendix B: DAU Courses Descriptions*

Acquisition and Cost Analysis course descriptions relating to Source Selections and Cost Analysis offered by the Defense Acquisition University (DAU)

ACQ-101 - Fundamentals of Systems Acquisition Management provides an overview of the DOD systems acquisition process including the basics of system acquisition program management and the developmental life cycle of a system from inception to retirement. The course covers systems concept exploration, development, production, and deployment. 8 Class Days

ACQ-201 - Intermediate Systems Acquisition provides journeymen students from the DAWIA functional career paths a comprehensive and integrated view of the DOD systems acquisition management, technical, and business processes. Students become acquainted with the specialized terminology, concerns, policies, and roles of the primary acquisition participants. 18 Class Days

BCF-101 - Fundamentals of Cost Analysis enables DOD personnel new to the cost estimating field to prepare materiel system life cycle cost estimates. The course covers DOD policies governing these estimates and the techniques used in their preparation. Topics include a statistics review, regression analysis, learning curves, risk analysis, software cost estimating, exploratory data analysis, inflation adjustments, cost as an independent variable (CAIV), analysis of alternatives (AOA), contract cost structure, earned value, cost estimation for budget preparation, and economic analysis. 15 Class Days

BCF-102 - Fundamentals of Earned Value Management provides instruction on the application of earned value management (EVM) in the defense systems acquisition process. The course applies a basic management theory approach to understanding the concepts of EVM and its role in a successful program management process. It examines basic EV concepts relative to current DOD guidance, core concepts of the EVM systems criteria, the implementation and surveillance process, and the role of participating organizations. The instruction begins with the request for proposal and traces the life of the contract through development and review of the performance measurement baseline (PMB), program and system reviews, and the on-going analysis and surveillance processes. The instruction emphasizes the importance of the PMB as the integrated cost, schedule, and technical plan necessary for program success. The analysis emphasis, highlighted by a presentation by the OSD Acquisition Program Integration Directorate, emphasizes the usefulness of earned value information in evaluating the status of a program. Each subject includes an examination of the roles of the various participants including the program office, contractor, DCMC, buying commands, resource management organizations, and OSD. 8 Class Days

BCF-103 - Fundamentals of Business Financial Management concentrates on developing skills necessary for formulating and executing a program office budget.

Emphasis is placed on introducing students to the techniques the program manager and business financial manager may use to identify, evaluate and resolve budget related tasks, problems, and issues. The course simulates the total budget process from the viewpoint of a business financial manager in the acquisition community, as well as from the perspective of OSD. Specifically, it includes the fiscal cycle, the roles of DOD offices, the Office of Management and Budget and the Congress. Content includes cost analysis, funding policies, budget concepts, the DOD planning, programming and budgeting system, the Congressional authorization and appropriation process, and the budget execution process. 5 Class Days

BCF-203 - Intermediate Earned Value Management immerses students in earned value management (EVM) through a multimedia simulation of a typical program. The simulation approach develops application level EVM skills through performance of tasks requiring knowledge of current DOD guidance, core concepts of the EVM system criteria, the implementation and surveillance process, and the role of participating organizations. The simulation begins with preparing inputs for a request for proposal (RFP), moves to the analysis and review of the contract baseline via the integrated baseline review (IBR), and requires on-going analysis of cost reports and surveillance of the contractor's management processes. The instructional methods encourage the students to perform tasks and evaluate results and alternatives in a controlled environment. 10 Class Days

BCF-204 - Intermediate Cost Analysis emphasizes the development and application of cost analysis techniques and interpretation of the results. The course structure is based on the five primary steps in the cost estimating process:
1. Definition and Planning - purpose, definition, ground rules and assumptions, approach, and putting the team together.
2. Data Collection - sources, normalization, and earned value.
3. Estimate Formation - para-metrics (linear regression, multivariate and multiplicative modeling), analogy, expert opinion, catalog/non-development items, engineering standards, factors, and time phasing techniques for development, production (advanced unit and cum average learning curve theories) and operating and support.
4. Review and Presentation - risk analysis, cross-checks, and presentation format.
5. Final Documentation - content and structure.
Each step is discussed in detail with the primary emphasis on estimate formulation. Practical exercises and case studies allow the student to apply and analyze concepts taught in class. The computational aspects of these exercises will be performed primarily on the automated cost estimating integrated tool (ACEIT). 15 Class Days

BCF-205 - Contractor Finance for Acquisition Managers is designed for those working in, or selected for, positions requiring interface with contractors or dealing with contractor financial data. It provides an overall understanding of Defense contractor financial motivations and contractor financial motivations and constraints, and an appreciation for how they affect management of Defense systems acquisition programs. The curriculum includes discussion of the interrelationships among the contractor's

costing procedures, financial and managerial accounting systems, analysis of cost principles and indirect cost management of DOD contracts, as well as the contractor's perspective on planning and control in business management. Students discuss the environments in which industry prepares and DOD personnel evaluate cost proposals. The course concentrates on the Defense industry and includes the special financial regulations the government requires in the Federal Acquisition Regulations and the Cost Accounting Standards. 5 Class Days

BCF-206 - Cost Risk Analysis prepares cost analysts to model the cost risk associated with a defense acquisition program. Topics covered include basic probability concepts, subjective probability assessment, goodness-of-fit testing, basic simulation concepts, and spreadsheet-based simulation. Practical exercises, a small-group workshop, and a capstone article review reinforce techniques taught. 4 ½ Class Days

BCF-207 - Economic Analysis prepares students to conduct economic analyses of materiel systems. Topics covered include multiple-attribute decision analysis, cost analysis, present value analysis, and sensitivity analysis. Students apply their expertise in practical exercises and a group workshop. 3 ½ Class Days

BCF-208 - Software Cost Estimating is primarily for practitioners of software cost estimating. The course is designed for cost analysts and others whose duties should include estimating the cost of software development efforts or reviewing such estimates. Topics in the course include software life cycle management, architecture, interoperability, software development paradigms, software design approaches, metrics, capability evaluations, risk analysis, software reuse, open systems, function points, and software cost estimating models. Two software cost estimating case studies allow students to apply the course material. 8 ½ Class Days

BCF-209 - Selected Acquisition Report (SAR) is designed to enable the student to prepare, generate, and review the SAR. The SARs provide a summary to Congress of the costs, schedules, and performance status of Major Defense Acquisition Programs (MDAPs). The consolidated acquisition reporting system (CARS), which is the automated system for MDAP reporting, has been fully integrated into the course with in-depth, hands-on training exercises. 5 Class Days

BCF-211 - Acquisition Business Management presents intermediate level personnel with an intensive examination of important areas in acquisition business management. The course emphasizes acquisition business planning, PPBS preparation, budget and contract funds execution, management of program information, and special topics. Length: TBD

BCF-301 - Business Cost Estimating and Financial Management (BCEFM) Workshop is a capstone course which provides students with an integrated view of earned value management, cost estimating, and financial management disciplines and responsibilities as they relate to program management. This course centers around

integrated exercise and simulations. It enables students to interact by preparing and defending program cost estimates, using earned value management reporting to evaluate program status and funding requirements and responding to externally imposed budget reductions. Current BCEFM initiatives affecting the program management officer will also be provided. To enable students to work in other disciplines outside of their area of expertise, one hour electives in funds management, earned value management, cost estimating and PPBS will be provided. Guest speakers will represent program executive offices (PEOs), program management offices (PMOs), and OSD. 9 Class Days

BCF-802 - Selected Acquisition Report Review designed as a follow-on for personnel with previous selected acquisition report (SAR) experience. The consolidated acquisition reporting system (CARS), which is the automated system for MDAP reporting, has been fully integrated into the course with in-depth, hands-on training exercises. Exercises are supplemented with detailed , ready references for completing each section of the SAR in accordance with DoD 5000.2-R, "Mandatory Procedures for Major Defense Acquisition Program (MDAPs) and Major Automated Information System (MAIS) Acquisition Programs." Lecture and discussion cover the key concepts of the SAR and each of its sections, with special concentration on the SAR cost variance analyses and categorizations supplemented by a limited number of computer assisted case studies in a fully automated classroom. 3 Class Days

*Source: Defense Acquisition University course descriptions available at http://www.dau.mil/course/courseinfo-catalog.htm

Appendix C: DMs Questionnaire

Source Selection Questionnaire

1. Thank you for your participation in this study. I realize your time is valuable and greatly appreciate the time you have given to answer this questionnaire.

2. This questionnaire will measure your perceptions and attitude concerning the cost and price analysis aspect of the source selection process, specifically the selection of members working on these panels. You are in a position to make an important contribution to this AFIT research project. The data collected may also be beneficial to future source selection efforts.

3. Please take the time to complete the attached questionnaire. Your individual response will be combined with other responses and no individual response will be attributed to a single participant.

4. Once again, your participation is completely voluntary, but we certainly appreciate your help. The faculty advisor for this research project is Lt Col William Stockman

   AUTOVON 785-3636 x4796

ANTHONY L. SMITH, Capt, USAF
Student, Air Force Institute of Technology

Please answer the following questions.

Section 1: Demographics

1. Military rank or civilian grade. _____
2. Organization & office Symbol. _____
3. AFSC or job series (Code & Title). _____

Section 2: Formal Education

4. Education (List all degrees and areas of concentration)).
   _____
   _____
   _____
   _____
   _____
5. In your opinion, how important is formal education level in serving as a cost/price team leader in a source selection?

Low						High
1	2	3	4	5	6	7

6. In your opinion, how important is education level in serving as a cost/price analyst in a source selection?

Low						High
1	2	3	4	5	6	7

7. How often do you bring in outside consultants who have specific or advanced education to supplement your source selections?

Low						High
1	2	3	4	5	6	7

8. How important is outside consultant contributions to the overall evaluation and success of the source selection decision?

Low						High
1	2	3	4	5	6	7

9. Do you feel there is a need for this level of cost expertise as permanent members of the headquarters staffs (i.e., SAF/AQ, AFMC, etc)?

Low						High
1	2	3	4	5	6	7

Section 3: Experience

10. Years of DoD acquisition experience. _____

11. Number of Source Selection experiences. _____

12. Number of Source Selections in which you have participated (as a full time member). _____

13. Number of Cost/Pricing panels in which you have been the lead. _____

14. Number of Cost/Pricing panels in which you have been a member. _____

15. In your opinion, how important is experience level in serving as a cost/price analyst in a source selection?

Low						High
1	2	3	4	5	6	7

16. In your opinion, how important is experience level in serving as a cost/price analyst lead in a source selection?

Low						High
1	2	3	4	5	6	7

17. How often do you have experienced cost personnel as primary members of the SSAC?

Low						High
1	2	3	4	5	6	7

18. Based on you most recent source selections, how do you rate the level of cost experience of the cost panel members?

Low						High
1	2	3	4	5	6	7

Section 4: Acquisition Training

19. What is your current certification level and in what areas?

20. What courses/training offered do you feel are critical for cost/price analysts prior to membership in source selections (circle all that apply*)?

ACQ-101 –	**Fundamentals of Systems Acquisition Management**
ACQ-201 –	**Intermediate Systems Acquisition**
BCF-101 –	**Fundamentals of Cost Analysis**
BCF-102 –	**Fundamentals of Earned Value Management**
BCF-103 –	**Fundamentals of Business Financial Management**
BCF-203 –	**Intermediate Earned Value Management**
BCF-204 -	**Intermediate Cost Analysis**
BCF-205 –	**Contractor Finance for Acquisition Managers**
BCF-206 –	**Cost Risk Analysis**
BCF-207 –	**Economic Analysis**
BCF-208 –	**Software Cost Estimating**
BCF-209 –	**Selected Acquisition Report (SAR)**
BCF-211 –	**Acquisition Business Management**
BCF-301 –	**Business Cost Estimating and Financial Management (BCEFM) Workshop**
BCF-802 -	**Selected Acquisition Report Review**

*See attachment for short description of courses

21. What other relevant courses not listed do you feel are critical?

22. Acquisition training adequately prepared me for my source selection responsibilities.

Low						High
1	2	3	4	5	6	7

23. Would additional acquisition training have been beneficial?

Low						High
1	2	3	4	5	6	7

24. How important is formal acquisition training to a good source selection?

Low						High
1	2	3	4	5	6	7

Section 5: Source Selection Training

25. From what source did you receive the bulk of your source selection knowledge?

26. Do you believe prior to a specific Source Selection, members should have training (Y/N)?

    a. If yes, what type of training do members need prior to a source selection?

	Low High
Formal DAU courses	1 2 3 4 5 6 7
AFIT	1 2 3 4 5 6 7
Focused short courses by functional experts	1 2 3 4 5 6 7
Focused "canned" web courses	1 2 3 4 5 6 7

27. In your opinion, how important is formal source selection training in serving as a cost/price analyst lead in a source selection?

Low						High
1	2	3	4	5	6	7

28. In your opinion, how important is formal training in serving as a cost/price analyst in a source selection?

Low						High
1	2	3	4	5	6	7

29. Is the current source selection training and support adequate?

Low						High
1	2	3	4	5	6	7

30. Do you feel the DOD has sufficiently trained, educated and experienced resources to provide this service?

Low						High
1	2	3	4	5	6	7

    a. Is this something that could be outsourced to a contractor?

Low						High
1	2	3	4	5	6	7

31. If needed, at what level of the Air Force should this service be provided?

Section 6: Source Selection Process

32. When forming your opinion on whether or not a cost/price analysis team was successful, what factors do you base your decision on?

33. During Source Selections, how valuable is it to the final decision to acquire the following cost help?

	Low High
a. Subject matter experts (i.e. government, civilian, etc.)	1 2 3 4 5 6 7
b. Government Agencies (i.e. AFAA, DCAA)	1 2 3 4 5 6 7
c. Neutral experts for review of cost evaluation	1 2 3 4 5 6 7

34. How valuable would it be to have a standing team of cost evaluation experts to review/supplement ongoing agency level Source Selections?

Low						High
1	2	3	4	5	6	7

a. If valuable, should they be:

	Low High
Government-SAF level (SAF/AQ/FM/IL)	1 2 3 4 5 6 7
Government-center level (ASC, ESC, etc.)	1 2 3 4 5 6 7
Separate Agency	1 2 3 4 5 6 7
Contractor	1 2 3 4 5 6 7

35. On Source Selections within the last year, what do you feel was the overall success of the cost/price analysis team?

Low						High
1	2	3	4	5	6	7

36. On Source Selections within the last year, how effective in terms of mission was the cost/price analysis team?

Low						High
1	2	3	4	5	6	7

37. On Source Selections within the last year, how efficient in terms of time was the cost/price analysis team?

Low						High
1	2	3	4	5	6	7

38. On Source Selections within the last year, how would you rate the quality of the products of the cost/price analysis source selection team?

Low						High
1	2	3	4	5	6	7

39. In your opinion, what individual characteristics are necessary in order to be an effective member of the source selection cost/price analysis team?

40. Please rank order (low 1, medium 2, high 3) the following in order of *relative* importance during the cost/price analysis portion of a source selection process:

    Education level
    Experience level
    Job Training

Section 7: Staffing the Source Selection Team

41. Is bias a concern when using local personnel to fill Source Selection team?

Low						High
1	2	3	4	5	6	7

42. If possible, would you prefer to staff Source Selections with "outside" functional experts?

Low						High
1	2	3	4	5	6	7

43. Is it feasible to staff Agency Level Source Selections with functional experts from other Air Force organizations?

Low						High
1	2	3	4	5	6	7

44. Should the SSA/higher HQs be involved in the staffing of Source Selection teams to allow for better teams from a variety of sources?

Low						High
1	2	3	4	5	6	7

Section 7: Role of Contractor Support

45. What, if any, do you feel is the role of contractors in Source Selections?

46. Do you feel government personnel are preferred to contractor support on Source Selections?

Low						High
1	2	3	4	5	6	7

47. How comfortable are you if a majority of the Source Selection Evaluation Team members are contractors?

Low						High
1	2	3	4	5	6	7

48. Would you ever consider using contractors as the Source Selection Evaluation Team?

49. Many source selections use contracting personnel to man and lead the cost panels. On source selections where cost is an issue, would you be more comfortable with FM cost personnel?

Low						High
1	2	3	4	5	6	7

50. Should SAF/AQ have its own career cost personnel to support acquisition analysis and source selections?

Low						High
1	2	3	4	5	6	7

a. If so, should they be 63AX's (Acquisition Managers) and 64X's (Contracting) trained as cost estimators?

Low						High
1	2	3	4	5	6	7

b. If so, should they be 65XX's (Financial Management/Cost Analysis) assigned to SAF/AQ?

Low						High
1	2	3	4	5	6	7

Please identify any comments or tasks that you feel should have been included in the questionnaire.

This completes the questionnaire. Thank you for your participation.

Appendix D: Workers Questionnaire

Source Selection Questionnaire

5. Thank you for your participation in this study. I realize your time is valuable and greatly appreciate the time you have given to answer this questionnaire.

6. This questionnaire will measure you perceptions and attitude concerning the cost and price analysis aspect of the source selection process, specifically the selection of members working on these teams. You are in a position to make an important contribution to this AFIT research project. The data collected may also be beneficial to future source selection efforts.

7. Please take the time to complete the attached questionnaire. Your individual response will be combined with other responses and no individual response will be attributed to a participant.

8. Once again, your participation is completely voluntary, but we certainly appreciate your help. The faculty advisor for this research project is Lt Col William Stockman AUTOVON 785-3636 x4796.

ANTHONY L. SMITH, Capt, USAF
Student, Air Force Institute of Technology

Section 1: Demographics

1. Military rank or civilian grade. _____
2. Organization & office Symbol. _____
3. AFSC or job series (Code & Title). _____

Section 2: Formal Education

4. Education (List all degrees and areas of concentration)).
   _____
   _____
   _____
   _____
   _____
5. In your opinion, how important is education level in serving as a cost/price analyst lead in a source selection?

Low						High
1	2	3	4	5	6	7

6. In your opinion, how important is education level in serving as a cost/price analyst in a source selection?

Low						High
1	2	3	4	5	6	7

Section 3: Experience

7. Years of DoD acquisition experience. _____
8. Number of Source Selection experiences. _____
9. Number of Source Selections in which you have participated as a full time member. _____
10. Number of Cost/Pricing teams in which you have been the lead. _____
11. Number of Cost/Pricing teams in which you have been a member. _____

12. In your opinion, how important is experience level in serving as a cost/price analyst in a source selection?

Low						High
1	2	3	4	5	6	7

13. In your opinion, how important is experience level in serving as a cost/price analyst lead in a source selection?

Low						High
1	2	3	4	5	6	7

Section 4: Acquisition Training

14. What is your current certification level and in what areas?

15. What courses have you had (circle all that apply)*?

ACQ-101 – Fundamentals of Systems Acquisition Management
ACQ-201 – Intermediate Systems Acquisition
BCF-101 – Fundamentals of Cost Analysis
BCF-102 – Fundamentals of Earned Value Management
BCF-103 – Fundamentals of Business Financial Management
BCF-203 – Intermediate Earned Value Management
BCF-204 - Intermediate Cost Analysis
BCF-205 – Contractor Finance for Acquisition Managers
BCF-206 – Cost Risk Analysis
BCF-207 – Economic Analysis
BCF-208 – Software Cost Estimating
BCF-209 – Selected Acquisition Report (SAR)
BCF-211 – Acquisition Business Management
BCF-301 – Business Cost Estimating and Financial Management (BCEFM) Workshop
BCF-802 - Selected Acquisition Report Review

* See attached for a short description of each course.

16. What other relevant courses have you attended?

17. Acquisition training adequately prepared me for my source selection responsibilities.

Low						High
1	2	3	4	5	6	7

18. Would additional acquisition training have been beneficial?

Low						High
1	2	3	4	5	6	7

Section 5: Source Selection Training

19. From what source did you receive the bulk of your source selection training?

20. Prior to participating in your first source selection, did you receive any formal source selection training?

    a) What type of training did you receive?

    b) Who provided the training you received?

    c) How long did your training last?

21. Did you receive any source selection training prior to subsequent source selection?

    a) What type of training did you receive?

    b) Who provided the training you received?

    c) How long was the training?

22. For a cost/price analyst, what material should be covered during source selection training?

23. Formal source selection training adequately prepared me for my source selection responsibilities.

Low						High
1	2	3	4	5	6	7

24. Would additional training in the area of cost/price analysis have been beneficial?

Low						High
1	2	3	4	5	6	7

25. In what area concerning cost/price analysis would additional training be beneficial?

a) The format for the additional training should be (check all that apply)?

- ❑ Source Selection Trng Org (ASC/SYG, etc.)
- ❑ Web based
- ❑ Formal course (AFIT, DAU, etc.)
- ❑ Organization/Unit
- ❑ Other (please specify)_____

b) The additional training should be given by:

26. In your opinion, how important is formal source selection training in serving as a cost/price analyst lead in a source selection?

Low						High
1	2	3	4	5	6	7

27. In your opinion, how important is formal source selection training in serving as a cost/price analyst in a source selection?

Low						High
1	2	3	4	5	6	7

Section 6: Source Selection Process

28. How would you characterize the current source selection cost/price evaluation process?

29. How were you selected for your source selection responsibilities as a cost/price analyst?

30. If you selected individuals for a source selection, how did you determine the members on the cost/price team?

31. How prepared do you feel you were for your responsibilities on the cost/price analysis team?

Low						High
1	2	3	4	5	6	7

32. How prepared do you feel other members were for their responsibilities on the cost/price analysis team?

Low						High
1	2	3	4	5	6	7

33. What was the biggest problem that you encountered as a source selection member serving as a cost/price analyst?

34. What do you feel are major problem areas in the pricing/cost analysis conducted on contract proposals?

35. What do you feel was the overall success of the cost/pricing team on the recent Source Selection?

Low						High
1	2	3	4	5	6	7

36. How effective in terms of mission was the cost/pricing team on the recent source selection?

Low						High
1	2	3	4	5	6	7

37. How efficient in terms of time was the cost/pricing team on the recent source selection?

Low						High
1	2	3	4	5	6	7

38. How would you rate the quality of the products of the recent cost/pricing source selection team?

Low						High
1	2	3	4	5	6	7

39. What individual characteristics are necessary in order to be an effective member of the source selection cost/price analysis team?

40. Please rank order (low 1, medium 2, high 3) the following in order of *relative* importance during the source selection process:

    Education level
    Experience level
    Job Training

Please identify any issues or add comments you feel necessary to include in the questionnaire.

This completes the questionnaire. Thank you for your participation.

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Vita

Captain Anthony L. Smith was born in Vicenza, Italy. After graduating from Wurzburg American High School, Wurzburg, Germany in 1991, he attended Fayetteville State University in Fayetteville, North Carolina, where he received a Bachelors of Science degree in Accounting. Upon graduating in May 1997, he received his commission in the United States Air Force. Following his assignment at Fairchild AFB, Washington, he entered the Graduate School of Engineering and Management, Air Force Institute of Technology, in August 2000.

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5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)

Smith, Anthony L., Captain, USAF

5d. PROJECT NUMBER

5e. TASK NUMBER

5f. WORK UNIT NUMBER

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WPAFB OH 45433-7765

8. PERFORMING ORGANIZATION REPORT NUMBER

AFIT/GAQ/ENV/02M-15

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)

SAF/AQX
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Arlington, VA 20301

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13. SUPPLEMENTARY NOTES

14. ABSTRACT This research effort intends on identifying the knowledge and skills necessary for cost and price analyst to be effective members of cost panel evaluation teams during source selections. The purpose of this research is to determine what levels of education, experience, and training (the three factors studied under this research) the participants of source selection evaluation team members, specifically the cost panel members, have when conducting a source selection.

It also assesses whether the cost panel members and senior Air Force acquisition military and civilian personnel associate the levels of education, experience, and training as being key factors in fulfilling cost analyst duties and supporting the selection of a source in the government procurement process. From this analysis, a suggested education level, training requirement, and experience level that will form knowledge parameters that provide for future source selection or training that may be needed before members are assigned to fulfill a cost or price analyst role on a source selection.

To accomplish this objective a literature review, personal interviews, and questionnaires were conducted and utilized. The recommendations of this study are intended to assist cost and price analysts in attaining the knowledge and skill necessary in contributing and supporting a source selection.

15. SUBJECT TERMS

Cost Analysis, Cost Analysts, Source Selections, Knowledge, Skills

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