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THESIS

ANALYSIS OF CONSOLIDATING DEFENSE
ACQUISITION INFORMATION ON THE INTERNET

by

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June 1997

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       The Internet began over 30 years ago as a method of providing vital military communications following a nuclear attack. Today, due to the introduction of the World Wide Web and recent commercial interests, the Internet has grown into a multimedia source of information, and has become overloaded with information. Acquisition professionals in both the government and civilian defense acquisition sectors are attempting to use the Internet as an efficient and effective communications tool. However, due to the overloaded nature of the Internet, they are having difficulty finding relevant information in a timely manner.

       This thesis provides an overview of the current Internet tools available to acquisition professionals. It also demonstrates why these tools are not effective in providing timely acquisition information. This thesis proposes the development of a defense acquisition information center that would consolidate all acquisition information into one user-friendly location on the Internet. By organizing and consolidating information, the Internet can be transformed into a highly efficient and effective communications tool for the acquisition community.

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ANALYSIS OF CONSOLIDATING DEFENSE ACQUISITION INFORMATION ON THE INTERNET

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ABSTRACT

The Internet began over 30 years ago as a method of providing vital military communications following a nuclear attack. Today, due to the introduction of the World Wide Web and recent commercial interests, the Internet has grown into a multimedia source of information, and has become overloaded with information. Acquisition professionals in both the government and civilian defense acquisition sectors are attempting to use the Internet as an efficient and effective communications tool. However, due to the overloaded nature of the Internet, they are having difficulty finding relevant information in a timely manner.

This thesis provides an overview of the current Internet tools available to acquisition professionals. It also demonstrates why these tools are not effective in providing timely acquisition information. This thesis proposes the development of a defense acquisition information center that would consolidate all acquisition information into one user-friendly location on the Internet. By organizing and consolidating information, the Internet can be transformed into a highly efficient and effective communications tool for the acquisition community.

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A.   BACKGROUND

The Internet originated over 30 years ago as a Department of Defense (DoD) research project. The desired outcome of the project was to allow DoD to pass vital military information through computers and telephone lines. DoD was particularly interested in being able to pass military information immediately following a nuclear attack where numerous telephone lines had been destroyed. The research project resulted in a new type of communications technology and established the beginning of what is now commonly referred to as the Internet. [Ref. 2:p.14]

Although the Internet has been around for over 30 years, it has gained an incredible amount of public and media interest within the past few years.   The Internet, as a worldwide system of interconnected computer networks, provides local, national and international access to vast amounts of information. However, as a result of recent public interest, the Internet has become overloaded with information.   This information overload is making it difficult for users to find desired information in a timely manner.

In response to this information overload, several companies have developed information centers on the Internet. These information centers allow users to find relevant information faster, thus enhancing the power of information sharing. An information center provides information on a home page according to categories, and has a user-friendly point and click interface that enhances the users ability to find desired information.   These information centers have been growing in popularity over the past few years because they are easy to use and they provide timely access to information.

Acquisition information is currently available on the Internet from civilian defense contractors and government organizations. However, this information is not consolidated into an information center, resulting in difficult and lengthy searches for information. In today's high tech, fast paced environment, timely access to relevant information is paramount. For the acquisition community, timely access to information means that program managers, defense contractors, DoD agencies, as well as other acquisition professionals are able to quickly receive the most up to date acquisition information which can assist them in their daily decision making.

B.   OBJECTIVES

This thesis explores the current presentation of acquisition information on the Internet and the difficulty associated with finding relevant acquisition information in a timely manner. This thesis then analyzes the options available to the Department of Defense in the development of an acquisition information center to enhance the ability of acquisition professionals to find relevant acquisition information on the Internet.

C.   RESEARCH QUESTIONS

What options are available for the Department of Defense in the development of an acquisition information center to enhance the ability of acquisition professionals to find relevant acquisition information on the Internet?

Subsidiary Research Questions are:

a.   What is the Internet, how was it formed, and how is it used to enhance communications?

b.   What is the future of the Internet and its potential for enhanced

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communications?

c.　　What is an information center, what are the personnel/equipment requirements necessary to maintain an information center, what types of information centers are available, and what benefits do information centers provide?

d.　　Does the establishment of a defense acquisition information center support acquisition reform?

e.　　How accessible is acquisition information on the Internet?

f.　　What are the advantages and disadvantages of the different types of information centers?

D.　SCOPE AND LIMITATIONS

The scope of this thesis is limited to providing the Department of Defense with options available for the development of an acquisition information center. The thesis initially describes the attributes of the Internet and information centers, their resource requirements, as well as their benefits. Next, a basic overview of how acquisition information is currently presented on the Internet and the difficulty associated with finding this information is provided. Finally, an analysis is conducted to distinguish the advantages and disadvantages of the different options available to DoD in the development of an acquisition information center. This thesis does not provide a quantitative analysis of the costs and benefits associated with each option, because costs and benefits are variable items, and the parameters for these items must be defined by DoD before an accurate estimate can be provided.

E.   METHODOLOGY

A large portion of the research for this thesis was conducted on the Internet to demonstrate its capability to share information. The research initially began with a search through the Internet as well as literature on the history of the Internet. Personal interviews were then conducted with computer consultants, the Defense Technical Information Center (DTIC), the Yahoo! information center, and the FedCenter information center to determine the requirements and benefits of information centers. Finally, personal interviews were conducted with a developer of an acquisition information center and the Management Information Systems Executive for the Office of the Under Secretary of Defense for Acquisition and Technology to determine if an information center is beneficial to the acquisition community.

F.   ORGANIZATION OF THESIS

Chapter I (Introduction):   This chapter provides the background information, thesis objectives, the primary and secondary research questions, the research scope and limitations, and the methodology used in obtaining research data.

Chapter II (Background): This chapter provides a brief overview of the development of the Internet from its early inception over 30 years ago, to its present day use. It describes the formation of the Internet and the World Wide Web as well as the use of this medium as a means of communication and information sharing. This chapter also describes the types of hardware, software, and popular commercial providers necessary to access the Internet. Finally, this chapter addresses the rapid growth of the Internet and its potential for enhanced communications in the future.

Chapter III (Information Centers and Search Engines): This chapter provides an overview of the Internet tools available to help users navigate the overloaded Internet. It describes two different types of search engines as well as two different types of information centers currently used on the Internet, their capabilities, and the requirements to maintain them.

Chapter IV (Acquisition Information on the Internet): This chapter focuses specifically on acquisition information on the Internet. It explores five options available for finding acquisition information on the Internet and the advantages and disadvantages of these various options. This chapter also explores the Government Information Locator System (GILS) and the advantages and disadvantages associated with this new system on the Internet.

Chapter V (Establishing an Acquisition Information Center): This chapter explores the need for consolidating acquisition information into an acquisition information center on the Internet. Additionally, this chapter conducts an analysis of the alternatives available to the Department of Defense in establishing an acquisition information center.

Chapter VI (Summary, Findings, and Recommendations): This chapter provides a summary of findings as well as recommendations to the Department of Defense (DoD) for developing an information center. Finally, this chapter provides areas for follow-on research to enhance the Department of Defense acquisition community's ability to disseminate information and increase workforce productivity.

II. BACKGROUND

A. INTRODUCTION

This chapter provides a brief overview of the development of the Internet from it's early inception over 30 years ago, to its present day use. It describes the formation of the Internet and the World Wide Web as well as the usefulness of this medium as a means of communication and information sharing. This chapter also describes the types of hardware, software, and popular commercial providers necessary to access the Internet. Finally, this chapter addresses the rapid growth of the Internet and its potential for enhanced communications in the future.

B. WHAT IS THE INTERNET

The Internet, often referred to as the "net" or "information superhighway", is a world wide system of over 50,000 interconnected computer networks linking over 20 million computers world wide. [Ref. 4:p.13] This interconnected infrastructure, referred to as a "network of networks", allows computer systems to communicate with one another to share information. Figure 2.1 is an example of how the "network of networks" is used to share information between computers.
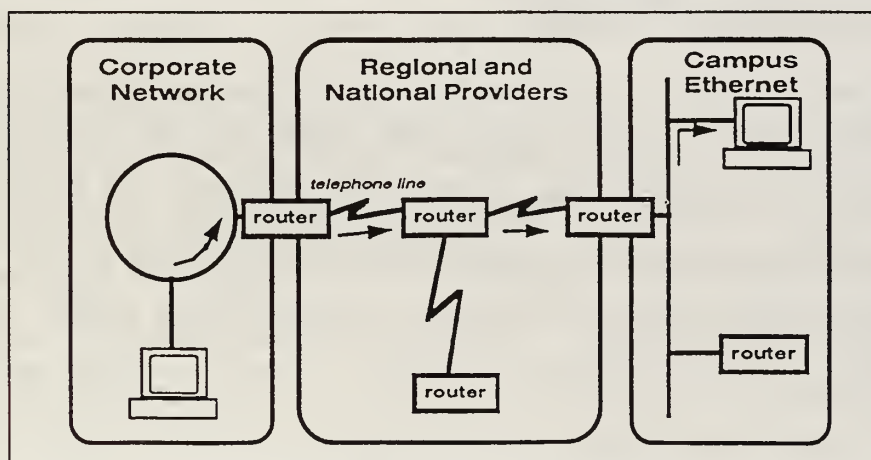
Figure 2.1. Internet Information Flow

As seen in Figure 2.1, information is sent from the corporate computer network through regional and national providers to a campus network. Once the information reaches the campus computer network, it is then terminated at the requesting computer. [Ref. 1:p.4] Through the use of fiber optics and satellite communications, this same type of process is used to share information between computers around the world.

Information that is requested over the Internet is requested from a personal computer or workstation (CLIENT) and the requested information is then retrieved from a distant computer database (SERVER). The CLIENT provides the user interface to the computer, translates the requested information into the syntax required by the SERVER, and then transmits the data. The SERVER is the supplying machine. It maintains the databases, processes requests from the CLIENT and returns the results to the CLIENT's screen. Through the use of fiberoptics, satellite communications and high-speed computer networks, a CLIENT can request information from an overseas SERVER and receive the information within a few seconds. [Ref. 1:p.11] This ability to rapidly share information has dramatically increased the public's interest in the Internet over the past few years.

C.   HISTORY OF THE INTERNET

The Internet got its start over 30 years ago during the Cold War with the former Soviet Union. During that time, computer scientists from the Pentagon's Defense Advanced Research Projects Agency (DARPA) were trying to develop a way to protect their vital military communication networks from a nuclear attack. DARPA scientists, looking for assistance, turned to a packet-switched network experiment that was being conducted by Paul Baran, a researcher for the Rand Corporation in California. Mr. Baran was experimenting with a new

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communications technology called packet switching, which broke data down into blocks that could be transmitted separately and then reassembled at the other end. The advantage of this new technology was that the data blocks did not have to travel over the same line to reach their final destination. DARPA scientists began to work with Mr. Baran to further develop this new communications technology that would allow an unlimited number of computers to communicate, when most of the telephone lines connected to the network were down. [Ref. 2:p.14] As a result of their research, the scientists developed the Defense Advanced Research Projects Agency (DARPA) network, which later changed its name to the Advanced Research Projects Agency (ARPA) network, and in 1984, changed its name again to what is now commonly referred to as the Internet.

The ARPA network (ARPANet) began to grow in the late 1960's as more universities and corporations began to use it as a means of communicating and accessing information from computers at distant sites. Although the original community of users consisted of scientific and technical researchers, the expansion of ARPANet created a distinctive culture and group of individuals that were encouraged to both contribute and disseminate information. As the ARPANet community grew, many refinements were made, including the development of a communication specification known as the Internet Protocol (IP). [Ref. 2:p.15] The Internet Protocol is a formal specification that controls the meaning of different messages passing between the sending and receiving computers. The development of a common computer language allowed for commonality among users of ARPANet, thus increasing the demand for access to the network.

Although ARPANet was continuing to grow, it still was not a user-friendly environment for inexperienced computer users. Codes, characters and language structure all prevented easy use of the network. Information was sent and received as American Standard Code for Information Interchange (ASCII) text, which could

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be typed and read without a special computer application, however, it was not pretty to look at or easy to use. Information was also sent and received as an attached binary file, however, the file had to be downloaded and viewed off line, requiring a special computer application or protocol to decipher the information. The immense amount of work that it took to write applications capable of viewing all the different types of data was a deterrent to distributing information in a timely and efficient manner. As more people joined the ARPANet community, the desire for efficient distribution and presentation of information increased. [Ref. 3:p.2]

D.   THE WORLD WIDE WEB (WWW)

As a result of the difficult, arcane codes necessary to send and receive information, two physics researchers, Tim Berners-Lee and Robert Cailliau, working at the European Particle Physics Laboratory (known as CERN) in Geneva, Switzerland in 1990 developed a user-friendly interface that allowed for easier access and distribution of information on the Internet. The principal notion of the two researchers was that information should be accessible to any (authorized) user with a simple, intuitive interface, on any type of computer, in any country of the world. Their idea and research resulted in the development of the World Wide Web (WWW, W3 or simply the Web). Once the basic outline of the WWW was complete, CERN made the source code for its software publicly available encouraging collaboration by both academic and commercial parties, to continue the development of the Web.

The introduction of the World Wide Web had a dramatic impact on the growth of the Internet. People with limited computer resources and skills could easily and efficiently find information on the Internet. Those who wanted to publish information on the Net could do so through still images, film or video clips, sound clips, as well as text in a single location referred to as a "home page".

The Web also allowed distribution of all types of data across all different types of computers and operating systems (Macintosh, IBM, UNIX, etc.) in a unified format. With the advent of the Web came an increased ability to share information between computer users and subsequently, a stronger desire for access to the Internet. [Ref. 3:p.1]

E.   USEFULNESS OF THE WEB

Currently, the Web is one of the fastest growing areas on the Internet primarily because it promises to revolutionize the ways in which people publish and retrieve information. The Web is allowing Federal agencies to make text, graphics, audio and video information available to the public 24 hours a day, seven days a week. It enables these agencies to "conduct procurements, issue permits, process grant applications, offer employment and training services and automatically collect and disseminate information. Net surfers can electronically file their taxes, check on the status of their Social Security benefits, order coins from the U.S. Mint, retrieve Supreme Court decisions, and search Postal Service databases for ZIP codes." [Ref. 4:p.13]

The Web can help individuals and companies save time and money in solving what might appear to be a complicated problem. Jim Glenn, the Navy's Internet manager, who works at the Naval Computer and Telecommunications Station in Pensacola, Fla., found out the usefulness of the Web when he assigned a job to an associate that he estimated would take six to nine months to complete. It was a tricky technical assignment: developing software to help manage a computer network that he believed would require plenty of research, many phone calls, some failed experiments and a lot of waiting around for answers and parts. Twenty-four hours later, Glenn had his new network management software, and it was free. As it turned out, Glenn's associate got on the Internet and sent electronic mail to

vendors asking them if they could help in his development process. Within hours, they replied with names of users who had developed similar software in the past. He then contacted a few of these users, who told him that the software code he needed could be downloaded directly from the Internet for no charge. [Ref. 5:p.8] As Jim Glenn found out, the Internet can be used to help save time and money in solving many complicated problems.

The Web is providing a number of companies with the ability to tailor their home pages to provide information to specific clientele. AT&T and Hewlett-Packard have recently debuted a home page devoted to government activities. Although the home page is directed at Federal employees, it also offers comprehensive corporate information and convenient links to other government Internet sites, including those set up by the Federal, state, local, and international governments. Jim Maloney, director of new business development for electronic government at AT&T Government Markets believes that "Government employees have more to do, less time to do it in, and are under increasing pressure to do it in less expensive ways. We want to make it easier for government to not only put its information out there for citizens, but also to have easy access to related information that other agencies might be able to offer them." [Ref. 5:p.12]

F.   CAPABILITY OF THE INTERNET

Although the Internet was first established over 30 years ago as a means of sending text messages between Department of Defense agencies and a few educational institutions, it has now developed into a multimedia means of communicating. To access the Internet certain computer hardware and software requirements are necessary: primarily a personal computer, a modem (preferably a 28,800 kbps modem), Internet software and an Internet account. The Internet

software and account can be established through an educational institution that has access to the Internet, or through a commercial provider.

Commercial providers have their own computer software programs that, when installed on a personal computer, will allow access to the Internet. Commercial providers charge a fee (usually a monthly fee) for the use of their software and to maintain the individual Internet account. Although there are currently over 3,000 commercial providers available, some of the more prominent providers include, America On Line, CompuServe, and Prodigy.

Once established on the Internet, there are a number of things that an individual can do, such as sending electronic mail (e-mail) to a distant computer user. E-mail can be used to send a short text message as well as to exchange large documents, files, and graphics. This enables e-mail to be used as a highly cost-effective and efficient business tool, eliminating the need to wait overnight for vital information. Animation is another new area that is beginning to gain interest on the Internet. Users can now access computer animation, such as video clips from a movie, through home pages on the Internet. Another new capability gaining interest on the Internet is referred to as Internet Telephone, which allows the Internet users to talk to each other using only their existing multimedia computer and a microphone. Users of Internet Telephone are able to talk to each other for no costs, other that the monthly charges they would normally pay for their Internet use. [Ref. 5:p.6] As the public interest in the Internet continues to grow, so will the desire to provide new and innovative ways to share information.

G. FUTURE OF THE INTERNET

Due to government and private sector involvement, the future of the Internet appears to be very promising. The Clinton Administration has voiced strong support for all efforts to broaden access to the Internet. In 1995, the White

House called for the construction of a National Information Infrastructure (NII) as an expansion of the Internet. The NII was envisioned to be a web of high-speed communications networks capable of simultaneously delivery voice, data, and video anywhere, anytime. Such an infrastructure would be capable of providing instant electronic access to shopping networks, hospitals, schools, science labs, banks, libraries, movies, airline reservations, as well as countless other services. The administration proposed that all homes and businesses be wired so that they would have the capability of sending and receiving information on the NII.
[Ref. 2:p.24]

The development and construction of the NII is estimated to cost up to $1 trillion over the next 20 years. The bulk of this cost will come from the private sector as they attempt to gain a competitive edge in this fast moving field. However, the Federal Government has also agreed to provide support to stimulate investments by deregulating certain segments of the telephone, cable, utility, television, and satellite industries. Through both government and private sector involvement, future use of the Internet appears to have unlimited potential.
[Ref. 2:p.25]

H.   CHAPTER SUMMARY

This chapter introduced the Internet as a system of over 50,000 interconnected computer networks linking millions of computers world wide. The Internet was started over 30 years ago as a Department of Defense research project designed to protect vital military communications networks from a nuclear attack. Although the Internet was initially used by scientists and technical researchers to pass information, over time the Internet community grew to include non-technical users. In 1990, two physics researchers developed a software program (referred to as the World Wide Web) that provided a user-friendly interface to the Internet.

The development of the World Wide Web marked the beginning of a revolution of information sharing on the Internet.

As a result of the introduction of the World Wide Web, access to and use of the Internet has grown exponentially. Increased user interest and commercial involvement has resulted in the development of millions of home pages currently on the Internet. To assist users in navigating through these home pages, commercial companies have developed information centers and search engines as tools to help provide timely access to relevant Internet information. The next chapter discusses several different types of search engines and information centers currently available on the Internet.

III. INFORMATION CENTERS AND SEARCH ENGINES

A. INTRODUCTION

The Internet was developed as a method of sharing information between distant computer users. However, it has evolved into a system fast becoming overloaded with information. As a result of the information overload, several alternatives have been developed to help users find relevant information in a timely manner. One alternative is to use a computer search program, referred to as a search engine, to search the Internet for information related to key words submitted by the user. This chapter describes two types of search engines currently used on the Internet and their capabilities. A second alternative to help users navigate the Internet is referred to as an information center. This chapter also describes two different types of information centers currently on the Internet and the requirements to maintain them.

B. INTERNET MEANS INFORMATION OVERLOAD

As a result of the recent media attention and the development of the World Wide Web, access to and use of the Internet continues to grow by leaps and bounds. According to Newspage, an Internet news and information guide, "what we're seeing is that Internet access and use are becoming increasingly mainstream...it's clear that exposure to the Internet has increased dramatically" [Ref. 6:p.2]. CommerceNet, in conjunction with Nielsen Media Research, recently conducted an Internet Demographics Survey and concluded that access to the Internet in the United States and Canada was up by 50% from September 1995 to April 1996. [Ref. 6:p.1]

As user interest in the Internet continues to grow, so does commercial interest as an alternative means of providing corporate or sales information. Newspage reports that "this type of broadening, exponential growth (in the Internet) is unprecedented. Clearly a huge market exists for electronic commerce, enabling corporations to select the Internet as a viable alternative channel for exchanging information and delivering products and services" [Ref. 6:p.1]. However, increased user involvement coupled with increased commercial involvement produces large quantities of available data, subsequently resulting in information overload on the Internet.

Although the Internet and the World Wide Web were developed as a means to share information, that potential has been greatly diminished due to the shear volume of information available on the Internet. According to an Army Times Newspaper article, "the Internet has revolutionized information as a commodity, providing access to seemingly endless quantities of it. But like the story with no beginning, no middle, and no end, organization is a serious problem. To be useful, information must be accessible when it is needed, and too often on the Internet it is not. It is possible to spend hours searching the World Wide Web and find only frustration" [Ref. 7:p.30].

It is currently estimated that there are over 50 million home pages on the Internet. Although these home pages can provide a wealth of knowledge, they can also require vast amounts of time to search for useful information. If an individual were to spend only one minute per home page, and devote ten hours a day, it would take four and a half years to explore one million home pages; and an entire lifetime to explore the estimated 50 million home pages currently on the Internet. Lycos, a developer of an Internet search engine, claims that "the Internet has clearly caught on with Americans, though most feel right now that they spend

more time navigating the complex computer network in search of what they want rather than finding anything useful" [Ref. 8:p.1].

C.   SEARCH ENGINES

As a result of the information overload on the Internet, some commercial companies have developed search programs (commonly referred to as "search engines") that search the Internet and retrieve requested information.   As an example, if an individual wanted to find out information about Gray Whales, he could begin his search on the Internet by randomly exploring the estimated 50 million home pages with the hopes of finding the desired information, or he could allow a search engine to do the work for him.   To use a search engine, the individual would type in key words, such as "Gray Whales", and let the search program navigate the Web.   Within a few seconds, the search program would return a list of home pages that contained information on Gray Whales.   By using a search engine, the individual's search for relevant information would now be reduced from 50 million home pages to possibly a dozen home pages.

Search engines are computer software programs (referred to as Webcrawler or spider programs) that wander through the World Wide Web searching for new home pages.   When a new home page is found, the computer program indexes the address (referred to as Uniform Resource Locator - URL) and stores the address in a databank for future reference.   Some of the most popular search programs continually update their databanks by searching the Web for new home pages, completing their search every seven to ten days.   When an individual enters a key search word, the database is accessed and returns the requested site addresses that match the key search word.   Two of the more popular search engines currently on the Internet are Alta Vista and HotBot. [Ref. 10:p.6b]

D.   ALTA VISTA SEARCH ENGINE

The Alta Vista search engine was developed by Digital Research Laboratories in Palo Alto, California as a research project in the summer of 1995. The project combined a fast Webcrawler with a scalable indexing software program, designed to provide the largest searchable database on the Internet. As a result of their research, on 15 December 1995, Digital Equipment Corporation launched Alta Vista as the largest search engine on the Internet capable of indexing 30 million home pages. Within three weeks of the debut of Alta Vista, the search engine was receiving two million requests a day for information. By May 1996, the search engine was receiving twelve million daily requests for information. [Ref. 9:p.4]

Alta Vista is similar to other search programs available on the Internet in that it uses a few, extremely large, fast, and expensive computers combined with Webcrawler and indexing software to search the Internet for information. For the individual users requesting information, Alta Vista provides timely access to a wealth of information. [Ref. 9:p.4]   Figure 3.1 is an example of the home page for Alta Vista where users can submit their request for information on the Internet.
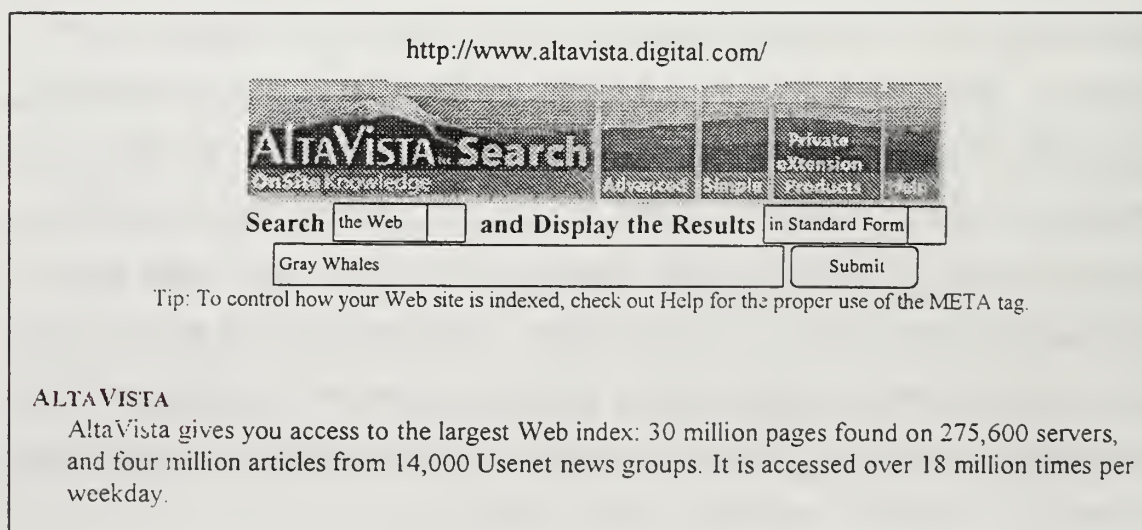

Figure 3.1. Alta Vista Home Page

E.   HOTBOT SEARCH ENGINE

As a result of the increasing demand for powerful search engines, on 20 May 1996, a new, even more powerful search engine named HotBot was debuted. The new search engine is a partnership agreement between Inktomi (pronounced "ink-to-me") Corporation of Berkeley, California and HotWired Ventures of San Francisco, California. [Ref. 10:p.6b]

HotBot is similar to the other search engines on the Internet in that it uses Webcrawler and indexing software to find and save information.   The main difference is that HotBot does not use a single, large, expensive computer to process data, but instead networks smaller computers together to perform the same function.   Eric Brewer, the company's co-founder and professor of computer science at the University of California at Berkeley stated that "by using a bunch of little machines instead of one big machine we get no limits on growth, better cost performance and better fault tolerance, because if one node fails the rest can cover for them" [Ref. 10:p.6b].   Figure 3.2 is the home page for HotBot where users can submit their request for information on the Internet.

http://www.hotbot.com/

Search the entire Web
With 54 million documents, HotBot is
the most complete Web index online.

Search the Web for   all the words
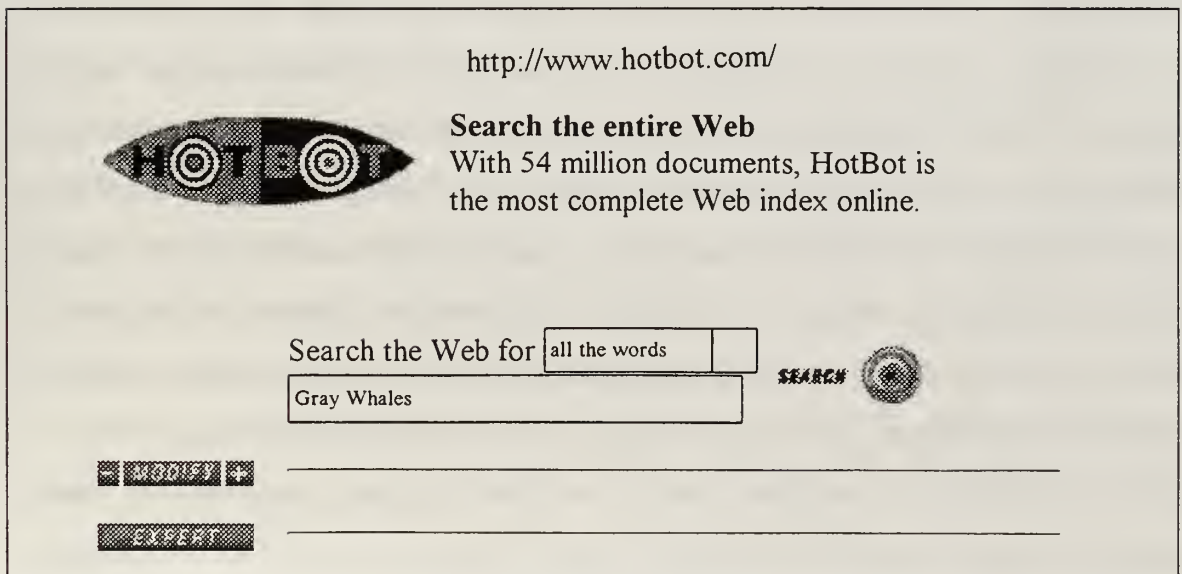
Gray Whales

SEARCH

Figure 3.2. HotBot Home Page

Because of the network capability of this search engine, HotBot purports to be able to search and index all of the estimated 54 million home pages on the Internet, and to complete the entire search weekly. Users who previously had access to information in 30 million home pages now have access to the entire World Wide Web and can receive information within a few seconds. [Ref. 10:p.6b]

F.   INFORMATION CENTERS

As an alternative to search engines such as Alta Vista and HotBot, some commercial companies have developed information centers on the Internet to help users find valuable information in a timely fashion. Information centers appear on the Internet as a single home page where information is categorized according to a topic area.

An example of an information center is a home page with categories of information such as business, government, news, sports, and travel. If an individual wanted to find out the most recent football scores, he would click on the sports category, which would then open up to a new home page. The new home page would have a listing of categories such as football, basketball, baseball, tennis, and golf. If the individual continued to click on the football categories he would arrive at a home page displaying the most recent football scores. As this example demonstrates, within a few minutes of accessing the Internet an individual using an information center could quickly find relevant Internet information. Because of the ease of use and categorization of subjects in an information center, users commonly refer to information centers as "one-stop shopping" pages. Two popular information centers that provide one-stop shopping currently on the Internet are "Yahoo!" and "FedCenter".

G.   YAHOO! INFORMATION CENTER

Yahoo! (which stands for Yet Another Hierarchical Officious Oracle) is an information center that was developed by David Filo and Jerry Yang, Ph.D. candidates in Electrical Engineering at Stanford University in April 1994. Filo and Yang began Yahoo! as a hobby to help themselves keep track of their favorite Web sites on the Internet. As their list grew, so did their database. During 1994, they decided to customize their database according to subject areas and to provide this information to the users of the Internet. In essence, they began the first information center on the Internet. In 1995, Yahoo! merged with Netscape Communications in Mountain View, California to provide an information center to users of the Netscape browser software on the Internet. [Ref. 11] As Jerry Yang stated, "Yahoo! is all about providing our users with the best ways to tap the Web as an information and entertainment source" [Ref. 12:p.1].

Yahoo! creates and updates its database of information by having Yahoo! employees search the Internet for new home pages and categorize them according to subject matter. "The Yahoo! hierarchical index or directory includes over 260,000 Web sites and is updated daily by a team of 'surfers' who review and catalog sites in a consistent, organized manner. This human interface sets Yahoo! apart from automated search engines, and provides high quality results with simple and intuitive site descriptions" [Ref. 13:p.1]. Currently Yahoo! Inc. employs just under 100 employees in several areas such as Graphic Design and User Interface; Advertising and Sales; Marketing and Brand Management; Engineering and System Administration, and Web Surfers. [Ref. 11]

To pay for the computers and personnel that are required to maintain Yahoo!, the company raises revenues by selling commercial advertisements on home page links that are maintained within the Yahoo! database. As the database and user access continues to grow, so does the desire to advertise on Yahoo! In

the second quarter of 1996, Yahoo!'s advertising base doubled from the previous quarter to 230 advertisers. Tim Koogle, president and chief executive officer of Yahoo! Inc. stated that "our client roster continues to broaden as more global and consumer-oriented marketers, including Disney, Hilton, Honda, Lexus, Proctor and Gamble, and Sears, recognize the effectiveness and power of interactive advertising" [Ref. 14:p1]. By raising revenues through advertising, Yahoo! allows Internet users to access their information center free of charge.

Figure 3.3 shows how the Yahoo! home page categorizes information for easy access. By providing information in subject areas, the Yahoo! information center functions like a telephone book for the Internet.
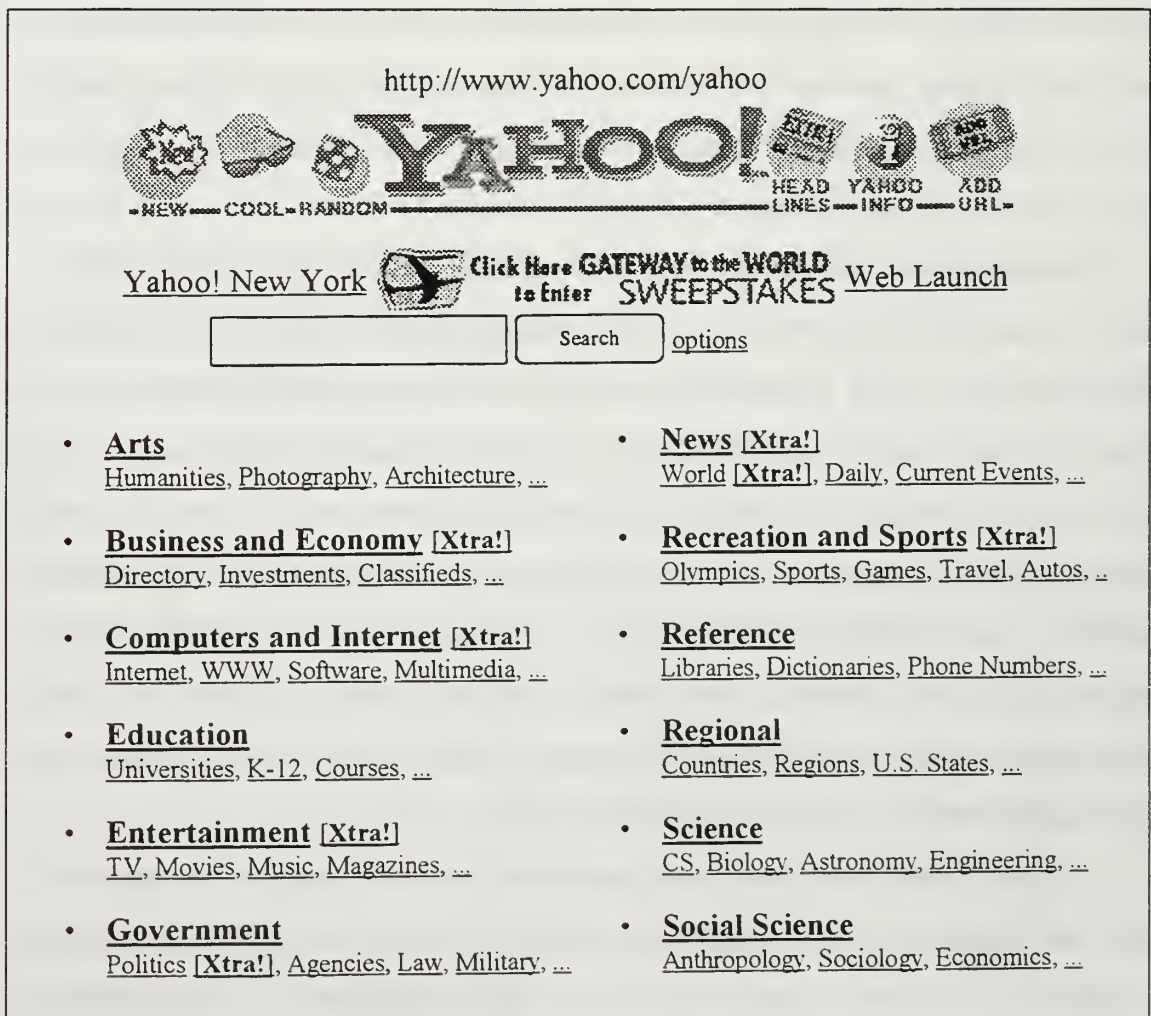

Figure 3.3. Yahoo! Home Page

Yahoo! was developed to assist users in gaining access to information that was available to the public over the Internet. As a result of this premise, Yahoo! decided not to censor or restrict information available in its database. It cautions users to exercise discretion when viewing home pages in Yahoo! as some users may find certain types of information to be offensive in nature. "The Yahoo! directory is designed to be comprehensive, and may direct you to sites containing information that some people may find offensive or inappropriate. Other than determining categorization of subject matter at time of listing, Yahoo makes no attempt to review the content of sites listed in the directory, and so Yahoo! is not responsible for the accuracy, copyright compliance, legality or decency of material contained in sites listed in the Yahoo! directory" [Ref. 15:p.1].

H.   FEDCENTER INFORMATION CENTER

FedCenter, which began operations in 1995, is another type of information center available on the Internet. Like Yahoo!, FedCenter is designed to provide one-stop shopping to users of the Internet that will allow them easy access to relevant information. FedCenter's founder, David Beers, developed the idea for FedCenter because of his frustration with trying to navigate the Internet to find useful information. "If you look at the Internet and the pop and sizzle that's going on it's very difficult to get around, and much of the information is for a mass general audience" [Ref. 5:p.12].

Mr. Beers felt that information should be easy to find on the Internet, but unlike Yahoo!, he developed a new concept of tailoring his information center towards a target audience. "We really do not believe in that information overload approach. We believe in redacting the data so you have useful information that's focused towards a target audience, and listening to them carefully to make sure that you deliver products they need" [Ref. 5:p.12]. Mr. Beer's target audience for

his FedCenter information center is the government Information Technology (IT) community, "especially those who decide which computers, printers, and other hardware and software government agencies will buy" [Ref. 7:p.30]. Mr. Beers chose the government IT community as the target audience because, as a former marketing executive for Sun Microsystems, he felt that the government was not aware of the full information technology market. To assist both the government and the commercial IT community, he decided to develop an information center that would allow both sides of the work force to provide or access timely and relevant information. [Ref. 16]

To develop an information center that was tailored around a target audience, Mr. Beers had to first find out what the target audience (in this case, federal government information technology specialists) was looking for and how they would like to have information presented on the Internet. To do this, Mr. Beers "pulled together an advisory council of more than 100 government employees to determine what kind of information was needed and how to present it" [Ref. 5:p.12]. Following their recommendations, Mr. Beers developed a standardized home page format for presentation of information. All companies that present their information in FedCenter must present it in the standardized format. The advantage of the standardized format is that it allows FedCenter viewers to find the information easily and to compare companies and products with one another. Each company's FedCenter entry also provides a "hyper-link" that can connect the viewer to the company's own home page. Mr. Beers states "that FedCenter provides value added information. The added values are clarity, simplicity, and uniformity of presentation. No one else in the world is doing anything like it" [Ref. 7:p.30]. Figure 3.4 shows how the FedCenter home page categorizes information for easy access.
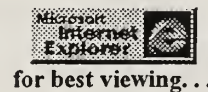
FedCenter

A Digital Commerce Corporation™ Network

VOTE! click here and vote for the '96 Webbies!

The First and Only Independent I.T. Resource for the Federal Government

What's New?   Hot Links   Search   Join   Help   Jobs

Check out our Windows 95 Resource Center and more! — — — — — → **What's Hot?**

25,000+ Training course/Seminar database. Register on-line! — — — — → **Events & Training**

IT company Fedpages in a common data architecture. — — — — — → **Companies & Products**

GSA Schedules on-line. Info on tens of thousands of products — — — — → **Contract Resources**

Free Membership, Special Offers. Federal Advisory Council — — — — → **Member Services**

NETSCAPE
for best viewing. . .

FedCenter Employment!
Jobs available now!

Microsoft Internet Explorer
for best viewing. . .

FedCenter
The First and Only Independent IT Resource for Federal Employees on the WWW!

Figure 3.4. FedCenter Home Page

To raise revenues for the development and maintenance of his information center, Mr. Beers charges non-government agencies a fee to post their information on home pages within FedCenter. The fee is $6,500 per year for five megabytes (about 50 pages) of data to be displayed in the standardized FedCenter format. These home pages are essentially marketing data that allows the viewer to see what is offered by the commercial company. If the viewer were interested in

purchasing a specific item, then he would click to another area within FedCenter that would display the price lists for the available products. FedCenter charges the commercial companies an additional $6,500 for displaying price list information as well as translating that information into an Electronic Commerce/Electronic Data Interface (EC/EDI) format. The end result is that a viewer can access FedCenter free of charge, select a company to do business with, jump to a product price list and purchase the product within a few minutes. Therefore, the total cost to the commercial company to have FedCenter provide this function is $13,000 a year. As is evident, FedCenter is truly providing "one-stop shopping". [Ref. 16]

The costs to develop and maintain an organization like FedCenter are high. Currently, FedCenter employs approximately 70 employees in its organization. The costs associated with developing a basic business home page (unlike an individual home page) run between $10,000 - $25,000 to set it up, and $1,000 to $2,500 a month to operate it. In addition to a basic business home page, FedCenter has developed a commerce-enabled home page (EC/EDI capable) allowing users to purchase products on-line. The costs to establish an EC/EDI capable home page run between $300,000 and $3.4 million. Because of these costs, most companies selling a product on the Internet will not spend the money to make their home page commerce-enabled. Mr. Beers feels that FedCenter provides an advantage in that aspect because FedCenter can assume the initial startup costs for a commerce-enabled home page, and then distribute those costs among all companies using that service. This reduces FedCenters overall cost of the operation as well as provides the service to companies at a greatly reduced cost. [Ref. 16]

FedCenter's philosophy on censorship of Internet information is different than Yahoos!. FedCenter exercises censorship or restrictions in two ways. First it takes the advertising agencies information and sanitizes it into a standardized

home page format. Second, the only agencies that are allowed to be displayed on a FedCenter home page are those companies that pay the annual fee to be placed into the FedCenter database. However, FedCenter does not allow companies to become part of their database solely on their ability to pay the annual fees. When an agency requests access into the FedCenter database, the agency is reviewed for good business practices. Mr. Beers stated that if a companies history or business practices were questionable, then he would hear from the panel of government advisors, (which is currently around 260 members) as well as from the company about the discrepancy, and then make a decision on access to the database. "I would obviously not want to have a producer who was doing a disservice to the (government IT) community by having low quality service or something like that" [Ref. 16].

I.   CHAPTER SUMMARY

Although the Internet and the World Wide Web were developed as a method of sharing information, that potential has been greatly diminished due to the volume of information available on the Internet. To help users navigate the complex and cumbersome Web, commercial agencies have developed search engines that search the Web for keywords and return lists of home pages that provide information on those key words. Two popular search engines are Alta Vista and HotBot. In addition to search engines, commercial agencies have developed information centers, which categorize information into subject areas. The advantage of an information center is that it is easy to use, and it allows the viewer to conduct "one-stop shopping" for information in one location on the Internet. Two different types of information centers are Yahoo! and FedCenter.

Currently, the government acquisition community as well as defense contractors are providing and accessing information on the Internet. Although

acquisition information is available on the Internet, it is often very difficult to find. The next chapter describes the current methods available to find acquisition information on the Internet and the advantages and disadvantages of each of these methods.

IV. ACQUISITION INFORMATION ON THE INTERNET

A. INTRODUCTION

Acquisition information is currently available on the Internet from both government and civilian acquisition organizations. Although this information is present on the Internet, it is often hard to find in a timely manner. This chapter explores the current options available for finding acquisition information on the Internet as well as the advantages and disadvantages of these various options. This chapter also presents the advantages and disadvantages of the Federal Government's attempt to provide a government information center on the Internet, referred to as the Government Information Locator System (GILS).

B. FINDING DEFENSE ACQUISITION INFORMATION ON THE INTERNET

As mentioned in Chapter III, the Internet has become overloaded with information. As a result, "it is possible to spend hours searching the World Wide Web and find only frustration" [Ref. 7:p.30]. Users of the Internet "feel right now that they spend more time navigating the complex computer network in search of what they want rather than finding anything useful" [Ref. 8:p.1]. Currently, users searching for defense acquisition information on the Internet suffer the same frustration and difficulty in trying to find useful acquisition information. A user searching for a specific acquisition topic may spend hours looking through numerous acquisition home pages and still not find the desired information. As an example, a test was conducted by the author to find the name and telephone number of the Army program manager for the Theater High Altitude Area Defense (THAAD) system.

The THAAD program manager was chosen as a test case because recently the THAAD weapon system has encountered some negative publicity in the press and from Congress. The THAAD weapon system is a new Theater Ballistic Missile defense system. It is currently conducting live fire tests to verify the capability of the system. However, the last three flight tests have resulted in failures, causing some to question the capability of the system and the program. A fellow program manager who was interested in discussing lessons learned from the flight tests, could use the Internet to find the name and telephone number of the THAAD program manager.

This test was conducted to determine how rapidly this acquisition information could be found on the Internet. The test was conducted with a personal computer and a 33,600 bits per second modem, connected to an educational institution that has a T-1 (1.5 megabytes per second) connection to the Internet. The author has experience in using the tools of the Internet (discussed later in this chapter) making it possible to find information faster than the novice Internet user. The test resulted in a total of 3 ½ hours being spent using five different Internet tools to search for the name and phone number of the THAAD program manager. During the test, the required information was found through only one of the five tools. The results of each search method are provided in the following sections of this chapter.

This test demonstrated that although acquisition information is available on the Internet, it is not presented in a manner that provides rapid access to desired information. Based upon this test, the fellow program manager would determine that finding acquisition information on the Internet is difficult and time consuming and would probably turn to other sources, such as telephone books or friends, in the future for desired information. The irony is that the Internet provides the

largest, most current source of information available to individuals. However, if the information is not user-friendly and easily accessible then it will not be used.

C.   INTERNET TOOLS AVAILABLE TO FIND ACQUISITION INFORMATION

Currently, to find acquisition information on the Internet, a user can explore five different options. One option is to try and guess the correct address of the desired home page (referred to as the Uniform Resource Locator - URL). A second option is to type a keyword into one of the available search engines currently on the Internet and hope that the search engine returns information that is relevant to the request. A third option is to search the multitude of independent, diverse acquisition home pages available from the Department of Defense and defense contractors, jumping through their sub-categories and related links hoping to find the desired information. A fourth option is to search the Government Information Locator Service (GILS) - an alphabetized index of Government information. The fifth option is to use an information center such as Yahoo! or FedCenter that provides categories of government information.

D.   GUESSING THE CORRECT NAME OF A HOME PAGE

In an attempt to find acquisition information on the Internet, one option is to try and guess the correct URL (address) of the desired home page. The development of the World Wide Web (WWW) provided a standardized format for addressing resources on the Internet. The standardized format is referred to as the Uniform Resource Locator (URL). The URL provides an address, similar to the address on a piece of mail, which instructs the browser to obtain information from a specific server. Once the address is found, the corresponding home page is

displayed on the requesting computer. [Ref. 1:p.6] The standardized format of the URL makes it easier to find a home page by simply guessing the address of the home page.

Finding the Hughes Electronics Corporation home page is an example of guessing the correct URL of a home page. Hughes is a well known, large, defense contractor. If an individual is interested in finding out information about Hughes or the products that they provide, the individual could try to guess the correct URL for the corporation's home page. The URL would be typed into the box labeled "address" on the Web browser, the request would be sent, and if the URL were correct, a response would be returned. In this particular case the URL (address) typed in for Hughes - http://www.hughes.com - was the correct guess, and the Hughes Electronic Corporation home page was returned to the requesting computer. Figure 4.1 displays the Hughes home page and the URL of the home page.

Figure 4.1. Hughes Electronic Corporation URL and Home Page

The advantage of using this method to find acquisition information on the Internet is that it is simple to use and it provides an immediate response as to whether or not the URL was correct. The disadvantage of this method is that the probability of finding the correct URL out of the estimated 50 million home pages on the Internet is very small.

Figure 4.2 is an example of the difficulty associated with guessing the correct URL. In this figure, the home page for another large defense contractor, Lockheed Martin, is displayed. A guess of the correct URL for this home page might consist of "http://www.lockheed.com" or "http://www.martin.com" or "http://www.lockheedmartin.com". However, the probability of guessing the correct URL "http://www.lmco.com" (Lockheed Martin Corporation) is probably very small.
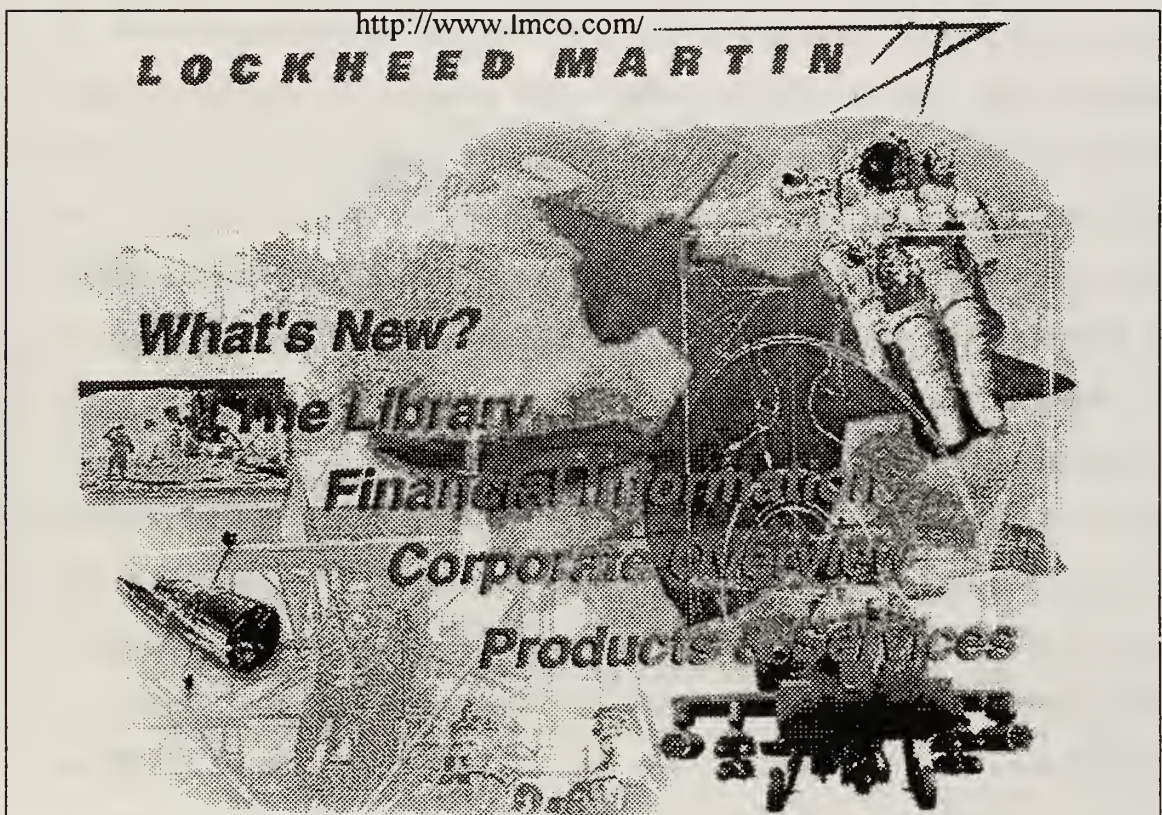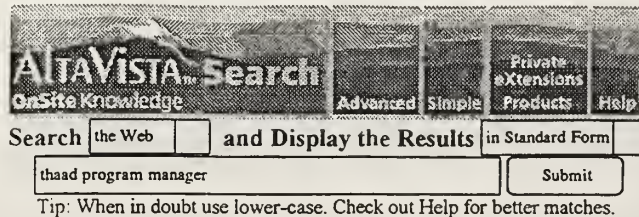

Figure 4.2. Lockheed Martin Corporation URL and Home Page

In the test conducted by the author numerous guesses were made, such as http://www.thaadprogram.mil, http://www.thaad.com, http://www.thaadorg.com, in an attempt to find the THAAD system program manager's name and phone number. The guesses were all incorrect and after approximately 20 minutes another Internet tool, the search engine, was chosen to try and find the desired information. The correct URL that was later found to contain the requested information was http://www.sarda.army.mil/. As is evident, the probability of guessing this correct address was very low.

E. USE A SEARCH ENGINE TO FIND INTERNET INFORMATION

A second option available to find acquisition information on the Internet is to use a search engine. Examples of two popular search engines currently on the Internet are Alta Vista and HotBot, which were discussed in Chapter III. The advantage of the search engine is that the computer software has searched and indexed the entire Internet and can return responses to the user within a few seconds, whereas it would take a lifetime for the user to individually search the entire Internet. The disadvantage of the search engine is that it often returns a large number of home pages that contain the requested key search words. This results in an excess amount of time required to review all of the home pages. Figure 4.3 is an example of the numerous home page responses that were returned based upon the keyword "THAAD program manager". The response to the keyword search was returned within a few seconds, but the response provided 10,000 matching home pages that contain the words "THAAD" or "program" or "manager" in them. In this case, the user does not have to navigate all 50 million home pages to find information about the THAAD program manager, however, a search of the 10,000 home pages will still be time consuming.

AltaVista Search
OnSite Knowledge   Advanced Simple   Private eXtensions Products   Help

Search the Web   and Display the Results in Standard Form

thaad program manager   Submit

Tip: When in doubt use lower-case. Check out Help for better matches.

```
Word count: thaad:2224; manager:1937585
Ignored :    program: 8668181
```

Documents 1-10 of about 10000 matching the query, best matches first.

THAAD Test Flight
Second THAAD Flight Achieves Many Objectives; Data Analysis Continues. Army, BMDO
Conduct Test. The Ballistic Missile Defense Organization (BMDO) and the..
http://juggler.lmsc.lockheed.com/star/950811star/stories/01athaad.html - size 2K - 11 Aug 95

BMDO, U.S. Army Conduct First THAAD Flight Test
BMDO, U.S. ARMY CONDUCT FIRST THAAD FLIGHT TEST The Ballistic Missile Defense
Organization (BMDO) and the U. S. Army conducted the first flight of the new.
http://www.lmsc.lockheed.com/newsbureau/pressreleases/9545.html - size 2K - 28 Jan 96

THAAD Home Page
Welcome to the THAAD Home Page. The Theater High Altitude Area Defense (THAAD)
program is an aggressive initiative to field the first endo/exoatmospheric..
http://juggler.lmsc.lockheed.com/thaad/ - size 2K - 6 Apr 96

First THAAD Test Launch a Success!
First THAAD Test Launch a Success! The first test flight of the Theater High Altitude Area
Defense (THAAD) missile was conducted at White Sands Missile...
http://juggler.lmsc.lockheed.com/star/950505star/stories/01athaad.html - size 2K - 13 Jul 95

THAAD Team
THAAD Team Map. Lockheed leads a nationwide team of industrial experts. This map shows the
locations of most members of the THAAD Team. Below, you'll find.
http://www.lmsc.lockheed.com/thaad/team.html - size 5K - 21 Dec 95

Figure 4.3. Alta Vista Search for THAAD Program Manager

Some search engines provide an advanced search capability that is helpful
for more advanced users on the Internet. The advanced search feature further
defines the search parameters and may return less ambiguous responses. Figure
4.4 displays the responses received after an advance search was conducted for the
THAAD program manager.

AltaVista Search: Advanced Query thaad progra...

http://www.altavista.digital.com/cgi-bin/query?pg=aq&what=web&fmt=.&q=thaad+program+m


```
Word count: thaad:2224; manager:1937585
Ignored :    program: 8668181
```

Documents 1-3 of 3 matching the query, best matches first.

BMDO, U.S. Army Conduct First THAAD Flight Test

BMDO, U.S. ARMY CONDUCT FIRST THAAD FLIGHT TEST The Ballistic Missile Defense
Organization (BMDO) and the U. S. Army conducted the first flight of the new.
http://www.lmsc.lockheed.com/newsbureau/pressreleases/9545.html - size 2K - 28 Jan 96

First THAAD Test Launch a Success!

First THAAD Test Launch a Success! The first test flight of the Theater High Altitude Area
Defense (THAAD) missile was conducted at White Sands Missile...
http://juggler.lmsc.lockheed.com/star/950505star/stories/01athaad.html - size 2K - 13 Jul 95

Chapter 255c

1 July 1994 CHAPTER 255 DA PAM 37-100-95 STANDARD ARMY ACCOUNTING
CLASSIFICATION. MANAGEMENT DECISION PACKAGE MDEPS VALID FOR USE IN
FY 1995 OR LATER....
http://134.11.192.15/pubs/37_100/95_255c.htm - size 20K - 1 Feb 95

Figure 4.4. Alta Vista Advanced Search for THAAD Program Manager

In this figure, only 3 responses were returned that contained the keywords
"THAAD program manager". However, although these three responses returned
home pages that contained the words "THAAD program manager", they did not
find the correct home page that contained the name or phone number of the
THAAD program manager. In this portion of the test conducted by the author,
numerous variations were made to the keywords in an attempt to find the required
information. The keyword requests returned thousands of responses, however,
after searching 14 different home pages in 42 minutes with no results the author
switched to another Internet tool, acquisition home pages, to try to find the desired
information.

F.   SEARCH THROUGH ACQUISITION HOME PAGES

A third option available to find acquisition information on the Internet is to search through the multitude of independent, diverse acquisition home pages currently on the Internet. Acquisition information is available from defense contractors as well as Department of Defense agencies. Currently, due to the design of the Internet, this information is provided in a "decentralized" format. It is decentralized because there is not a consolidated, organized approach to finding all acquisition information on the Internet.

This current situation is analogous to taking a Yellow Pages telephone book, dividing it into hundreds of sections, mixing up the sections so that there is no organization to the telephone book, and then asking a user to find the telephone number for a Chinese restaurant. If the Yellow Page telephone book company had not provided an organized approach to finding this information, then the book would be of little value. Currently, users searching for acquisition information suffer from the unorganized, telephone book approach because there is not a consolidated, organized approach to finding all acquisition information on the Internet.

Users looking for specific acquisition information must initially begin their search by using a search engine or an information center. The results of the initial search will take the user to an acquisition-related home page. If the user does not find the desired acquisition information, he can then use a "hyper-link" on that home page to transfer to a related home page. The user can continue this process until the desired information is found. With hundreds of acquisition related home pages currently on the Internet, this process could result in a lengthy search for the desired acquisition information. The following is a brief listing, and an example, of the diversity of acquisition related home pages currently on the Internet:

1. Department of Defense

a. Under Secretary of Defense (Acquisition & Technology).

b. Deputy Under Secretary of Defense (Acquisition Reform).

c. DoD Acquisition Workforce.

d. Defense Acquisition Workforce Improvement Act.

e. Defense Technical Information Center.

g. Defense Advanced Research Projects Agency.

h. Defense Acquisition University.

i. Army Acquisition Corps.

j. Army Acquisition Corps Website.

k. Air Force Acquisition.

l. Navy Acquisition Reform.

m. Coast Guard.

2. Contracting

a. Air Force Contracting.

b. National Contract Management Association.

c. National Association of Purchasing Management.

d. Defense Contract Management Command.

e. Commerce Business Daily.

3. Federal Agencies

a. Federal Acquisition Institute.

b. General Accounting Office.

c. General Services Administration.

d. Small Business Administration.

e. Federal Acquisition Jumpstation.

[Ref. 17:p.57]

Additionally, while searching through different acquisition related home pages, the user must often spend additional time and effort navigating through the

different categories of information in each new home page. Department of Defense agencies and defense contractors categorize information on their home page in the method most advantageous to their organization. This means the user must try to understand and navigate each new home page in an attempt to find the desired acquisition information. Figures 4.5, 4.6, and 4.7 are three different acquisition related home pages demonstrating the diversity in presentation of information. Figure 4.5 is Lockheed Martin's product and services home page. Figure 4.6 is the home page for the Army Acquisition Corps. Figure 4.7 is the home page for the Defense Contract Management Command.

In the test conducted by the author, numerous acquisition home pages were searched in an attempt to find information on the THAAD program manager. After searching 41 different home pages in 1-½ hours, the correct home page was found. Figure 4.8 displays the correct home page URL and the desired information on the THAAD program manager. After the information was found, the author continued the test with the final two Internet tools (GILS and Information Centers) to see if they would return the same response.

LOCKHEED MARTIN
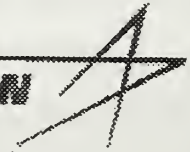
Lockheed Martin Products and Services

- Access Graphics Products and Services
- Acoustic Test Facility (RV Paganelli)
- Advanced Concepts Center
- Advanced Gunnery Training System (AGTS)
- AEGIS Technical Support Training
- Application Specific Integrated Circuit/Multi-Chip Module Center of Excellence
- Astronautics Product Fact Sheets
- C-54 Flight Test Aircraft Flying Laboratory
- C-130 Video Animated Systems Trainer
- CASS Support Office
- Chemical Management Information Services
- Commercial Systems Integration Services
- CYPRIS Encryption Processor
- Defense Enterprise Integration Services
- Defense Message System
- Domestic Business Development Trade Show Kit (Password required)
- Domestic Business Development Trade Show Kit Application Form
- Ecological Risk Analysis Tools and Applications
- Electroceramics Development & Production Services
- Electronics & Missiles LANTIRN Program
- FORMTEK Products and Services
- HAZWRAP, The Hazardous Waste Remedial Actions Program
- Helium Tanks for the A2100 Satellite
- Hybrid Propulsion Demonstration Program
- JetClean Circuit Board Cleaning System
- Lockheed Martin Joint Strike Fighter (JSF) Program
- Lockheed Martin Information Systems & Technologies (IS&T)
- Manassas Telecommuting Center
- Minotaur™ Family of Information Security Products
- NIH Image World
- Oak Ridge Centers for Manufacturing Technology
- OR&SS Antenna Development & Test Site
- PMTool: Program Management Solutions
- PrePass

Figure 4.5. Lockheed Martin's Products and Services Home Page

Figure 4.6. Army Acquisition Corps Home Page

Figure 4.7. Defense Contract Management Command Home Page

THEATER HIGH ALTITUDE AREA DEFENSE (THAAD) (Project Manager, PEO, Air and Missile Defense, P.O. Box 1500, Huntsville, AL 35807-3801) - Provide a high altitude, long range, hit-to-kill defense for critical military assets, troops and civilian population centers against Tactical/Theater Ballistic Missiles (TBM). The THAAD system consists of missiles, launcher, radars, and BMC3I operation centers. The THAAD program is currently in the Demonstration/Validation Phase.

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DATAFAX: DSN 788-3455

Figure 4.8. Requested Information on the THAAD Program Manager

G. USING THE GOVERNMENT INFORMATION LOCATOR SYSTEM

A fourth option available to find acquisition information on the Internet is to use the Government Information Locator System (GILS). The Office of Management and Budget (OMB) published OMB Bulletin 95-01 on December 7, 1994, directing the development of the GILS system. The development of the system was in response to a report by a Commission on Federal Paperwork that charged the government with not knowing "what information it collects, with what frequency, from whom, and for what uses" [Ref. 4:p.18]. The bulletin directed the Defense Technical Information Center (DTIC) to be the head agency responsible for the development and maintenance of the GILS system. It additionally required the heads of executive departments to provide public agency information to DTIC to be cataloged in the GILS system.

GILS is an electronic card catalog of government information. It identifies resources throughout the Executive Branch, describes the information available, and provides assistance in how to obtain the information. The intent of the GILS system is to "provide information to the public…and to help the public locate government information" [Ref. 18:p.2]. If a government agency has electronic information that it wishes to share with the public (such as a home page, electronic documents or publications), then that agency provides a reference to that information through the GILS system. User access to the GILS system and database is gained through various home pages on the Internet such as the Defense Link home page at http://www.dtic.dla.mil/defenselink/.

As an example use of GILS, if a user were interested in finding information about the Ballistic Missile Defense Organization (BMDO) and did not know that the BMDO office was maintaining a Web site on the Internet, they could query the GILS system through the Internet for information. If the GILS system had information about the BMDO office it would provide a response to the user. Figure 4.9 is the response received upon requesting information about the BMDO office. On page two of this response (not shown) the Internet address of the BMDO home page is provided for the user. The format for each GILS response has been standardized by DTIC. In other words, each response to a GILS request will look like Figure 4.9. Therefore, each government agency that submits information into the GILS system must follow the GILS standardized format.

An advantage of using the GILS system to find acquisition information on the Internet is that the system provides a central location to query for government information and a large database for responding to queries. The system also provides responses to queries in a standardized format, making it easier to find information without having to navigate through each new document. Each response to a GILS request provides an array of information such as an Internet

address, a mailing address, phone numbers and fax numbers for requesting further information.

Ballistic Missile Defense Organization LINK : BMDOLINK

Originator:

- Department of Defense
- Office of the Secretary of Defense
- Under Secretary of Defense for Acquisition and Technology
- Ballistic Missile Defense Organization

Access Constraints: None. Approved for Public Release

Use Constraints: None

Abstract: The BMD program's objective is to: first, develop and deploy increasingly capable to meet the existing missile threat to deployed U.S. and allied forces; second, as a hedge against the emergence of long-range ballistic missile threats, develop options to deploy a National Missile Defense (NMD)for the United States; and third, continue to support research on more to keep pace with the threat and improve the performance of theater and NMD systems.

Purpose: BMDOLINK serves as the official computer-based forum for releasing public information concerning ballistic missile defense (BMD). BMDOLINK provides a quick, easy, and cost effective means to provide information to the BMD commmunity.

Agency Program: Within the Department of Defense, the Ballistic Missile Defense Organization (BMDO) is responsible for managing, directing, and executing the Ballistic Missile Defense Program.

Local Subject Terms:

- ballistic missile
- ballistic missile defense
- US Federal GILS

Distributor Name: BMDO Strategic Relations Deputate
Distributor Organization: Ballistic Missile Defense Organization
Distributor Street Address: The Pentagon
Distributor City: Washington
Distributor Telephone: 703-695-8743
Distributor Fax: 703-614-7059

Figure 4.9. GILS Information on the BMDO Office

A disadvantage of using the GILS system to find acquisition information on the Internet is that the system database only consists of government organizations. Non-government organizations, such as civilian defense contractors, are not allowed to be in the database. Additionally, the database only consists of government agencies that have provided input into the system. Then, even after an agency has provided input into the system, changes made by the agency, (such as a

new home page address, a new phone number or organizational address), must be re-submitted by the agency to DTIC to be updated in the GILS system. DTIC is trying to reduce this problem by sending annual notices to agencies in the database asking them to revalidate their information.

An additional disadvantage of the GILS system is that the information contained in the database consists of agencies throughout the entire federal government. The target audience is not simply the acquisition community but anyone interested in searching for government information. This results in searches that are not defined for just the acquisition community, and often returns information that is not desired by the acquisition user.

In the test conducted by the author, numerous keywords such as "THAAD program manager", "Army program manager", and "Program Managers" were submitted to search the GILS database in an attempt to find the THAAD program manager information. Each GILS search returned 40 responses to the keywords submitted. After searching 16 different document references in 36 minutes with no results the author switched to the fifth Internet tool, information centers.

H. USING AN EXISTING INFORMATION CENTER

A fifth option available to find acquisition information on the Internet is to use an existing Internet information center. As mentioned in Chapter III, information centers categorize information according to subject areas. An advantage of the information center is that it provides a visual, friendly interface for the user to see different categories of information. The user can then search for desired information by pointing and clicking on categories related to the desired topic. A disadvantage of the current information centers is that they are not tailored to the acquisition community. This means that a user interested in finding acquisition information must first begin searching through a large categorization of

general government information, and continue jumping through home pages until an acquisition related topic is found. This can often result in a lengthy search for desired acquisition information.

In the test conducted by the author, the Yahoo! and FedCenter information centers were searched in an attempt to find information on the THAAD program manager. After searching 19 different home pages throughout both information centers in 33 minutes with no results, the test was concluded.

I.   CHAPTER SUMMARY

Currently, to find acquisition information on the Internet, a user can explore five different options. One option is to try to guess the correct address of the desired home page (referred to as the Uniform Resource Locator - URL). A second option is to type a keyword into one of the available search engines currently on the Internet and hope that the search engine returns information that is relevant to the request. A third option is to search the multitude of independent, diverse acquisition home pages available from the Department of Defense and defense contractors, jumping through their sub-categories hoping to find the desired information. A fourth option is to search the Government Information Locator Service (GILS) - an alphabetized index of government information - in an attempt to find the required information. The fifth option is to use an existing information center that provides categories of general government information.

Although these options have advantages and disadvantages associated with each of them, there is not one option that provides timely access to relevant information for the acquisition community. Acquisition information is displayed on home pages in various formats and is often difficult to find. A test was conducted by the author to find the name and phone number for the THAAD program manager. All five Internet tools available to users were explored to try

and find this desired information. A total of 3 ½ hours was spent using the five different Internet tools to search for the desired information. The information was found through only one of the five tools, and in the one tool where it was found, it took 1½ hours to find. This test demonstrates that although acquisition information is present on the Internet, it is not easy to find. The next chapter explores the need for consolidating acquisition information as well as the alternatives available to the Department of Defense in establishing an acquisition information center on the Internet.

V. ESTABLISHING AN ACQUISITION INFORMATION CENTER

A. INTRODUCTION

Acquisition information is present on the Internet, however, it can be hard to find. This often results in frustration for the user and wasted time trying to find the information. Currently, users must explore one or more of the five Internet tools discussed in Chapter IV to find acquisition information. However, there is an alternative option available to help the acquisition community retrieve and present acquisition information on the Internet in a more effective and efficient manner. The alternative is to develop an acquisition information center that is used as a central starting point for all acquisition users, and that provides links to all acquisition information on the Internet. This chapter explores the need for consolidating acquisition information into an acquisition information center on the Internet. Additionally, this chapter conducts an analysis of the alternatives available to the Department of Defense in establishing an acquisition information center.

The analysis focuses on the theoretical options available, and does not focus on a quantitative analysis. A quantitative analysis, such as how many computers and personnel are needed to develop and maintain a specific type of information center, is not conducted because these numbers are directly related to the size and intent of the information center. The variables that encompass a quantitative analysis include the number of personnel necessary, the number of computer servers required, the costs of basic computer hardware, the costs of software to index the Internet, the costs of software to maintain the database, and the cost to access the Internet. These costs all vary with the type of option chosen, such as a personnel intensive or computer intensive information center, therefore a quantitative analysis will be left for future thesis research.

B.   THE NEED FOR AN ACQUISITION INFORMATION CENTER

The Internet often intimidates novice and average computer users because it is seen as a time consuming and technologically difficult source of information. These individuals would feel more comfortable referring to other familiar sources for desired acquisition information. However, the Internet is the largest, most current source of information available to these individuals. If they could be convinced that the Internet is neither time consuming nor technologically difficult, but is instead an easy, efficient means of sharing information, they could potentially increase their workforce productivity.

One method of overcoming this fear of the Internet is through the use of an acquisition information center. As a central starting point for all acquisition information on the Internet, users could avoid lengthy, time consuming, searches through search engines or acquisition home pages in an attempt to find their desired information. Reducing lengthy searches of the Internet means that acquisition workforce employees are able to quickly locate the desired information, spending less time on the Internet and more time on their assigned task. Another benefit of the information center is its ability to reduce the novice or average users technological fear of the Internet. By presenting information in a user-friendly, categorized environment users can point and click on topics of interest and avoid trying to navigate the overloaded Internet. An additional benefit of an acquisition information center is that it could be used as a central location for the rapid dissemination of acquisition information.

The Office of the Under Secretary of Defense for Acquisition and Technology (USDA&T) realized that the Web could be used as a tool to assist in the dissemination of acquisition information. As a result, the USDA&T had a home page developed (titled ACQWEB) as an information center for acquisition information. The ACQWEB home page is displayed in Figure 5.1.
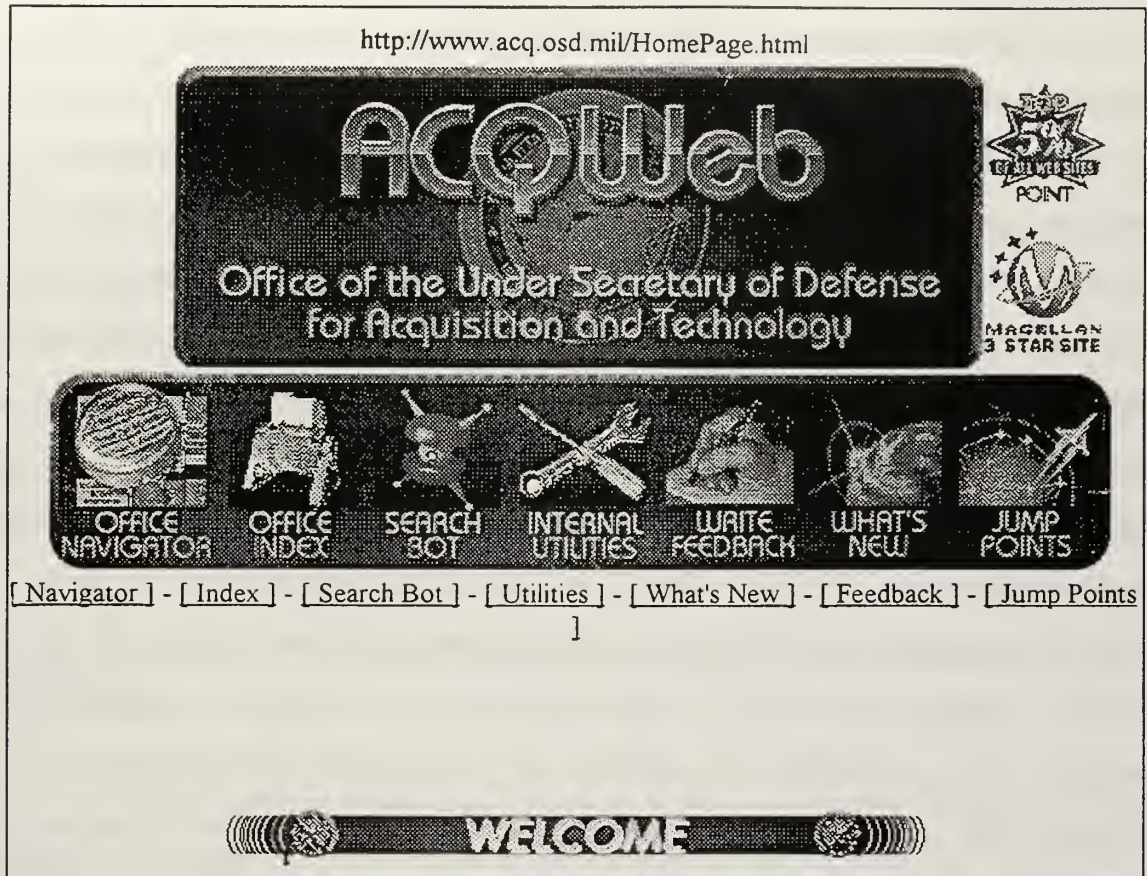
Figure 5.1. ACQWEB Homepage

The USDA&T determined that by providing acquisition policies, programs, and current initiatives in a central location, they were able to rapidly disseminate information to the acquisition community as well as receive responses to information through user e-mail. [Ref. 20] In an interview with Mr. John Downey, a Senior Executive Service (SES) officer in charge of the Management Information Systems for USDA&T he stated that, "(the USDA&T home page) is a very, very popular source of information. When decisions are made, the first thing (higher management) says is get it on the home page" [Ref. 20]. This ability to rapidly disseminate information to a large audience on the Internet reduces administrative costs (such as reproducing documents) and it reduces the time delay of packaging and shipping documents to the acquisition community. Reducing

layers of acquisition bureaucracy while speeding up information flow and decision making is what acquisition reform is all about.

As can be seen in Figure 5.1, the ACQWEB home page is an acquisition information center that categorizes information for easy use by the acquisition community. The development of the acquisition information center began over 2 ½ years ago, as an experiment to see if users of the Internet would find the consolidation of acquisition information useful. Today the information center is visited over 60,000 times a day, and is continuing to grow. ACQWEB is unofficially the most frequented site out of all of the Department of Defense home pages on the Internet. [Ref. 19] Clearly, the Internet community finds the user-friendly environment, timely access, and consolidation of information to be beneficial. Although ACQWEB is currently the most comprehensive acquisition information center, it is unable to consolidate all of the acquisition information on the Internet due to its limited staff and computer resources. Specifics on the limitations of the ACQWEB information center are discussed later in this chapter. Suffice it to say that although the ACQWEB home page is attempting to help the acquisition community, it is not currently a fully capable acquisition information center.

C.   DEPARTMENT OF DEFENSE OPTIONS

The popularity of the ACQWEB home page has demonstrated a desire for the consolidation of acquisition information. The Department of Defense (DoD) can satisfy this desire through one of four options in the development of an acquisition information center. The first option is for DoD to develop a FedCenter style information center. The second option is for DoD to develop a Yahoo! style information center. The third option is for DoD to enter into a contract with an existing information center, such as Yahoo! or FedCenter, to provide an

acquisition information center. The fourth option is for DoD to use the current ACQWEB information center, but to expand its current capability to include all acquisition information on the Internet. DoD's choice of the best option will be dependent upon the preferences for five factors: the costs of development and maintenance of the information center, the desired method of raising revenues, the desire to censor information, the preference for standardize home page formats, and the preference for Electronic Commerce/Electronic Data Interchange (EC/EDI) capable home pages. These five factors are presented in each of the four options available to DoD.

D.   OPTION #1 - DEVELOP A FEDCENTER STYLE INFORMATION CENTER

The first option available to DoD is to develop an information center based upon the philosophy of the FedCenter information center described in Chapter III. The costs of development and maintenance of this information center were high, primarily because of the computer hardware and software required to produce (EC/EDI) capable home pages. Revenues were raised to support this operation by requiring organizations to pay either $6,500 or $13,000 per year to be a part of the database. Information within the database was censored through the development of standardized home pages, and by only allowing organizations into the database that had a good business reputation. And finally, EC/EDI capable home pages were provided to allow organizations to sell their products directly off of their home page.

An acquisition information center developed utilizing this approach would be costly to operate and maintain. To pay for development and maintenance, the information center could charge both government and civilian defense acquisition organizations a fee to be in the database. An alternative approach would be to

allow government organizations free access into the database while charging civilian organizations a fee for entrance. This type of information center would allow DoD to censor information being put into the database, and would provide a standardized format for every home page. It would also allow for EC/EDI capable home pages for those government or civilian organization wanting to sell products or services off of their home page.

The advantages of this type of information center are: the ability to censor information within the database, a standardized format for presentation of information on home pages, and the capability of EC/EDI. The disadvantages of this approach are the high costs to develop and maintain the information center, and the ability to raise revenues to cover those costs. If the fee for entrance into the database is large, then both government and civilian acquisition organization may not want to be in the database, therefore defeating the purpose of consolidating all acquisition information in one location. Additionally, DoD could encounter some problems while trying to implement censorship of information. If DoD were to censor information within its database by including some organizations and excluding others, then a legal or public perception problem might develop. An additional disadvantage could result from EC/EDI capable home pages. If an organization were to sell a product off of a home page within the database, and the item was found to be defective or to cause a safety accident, then DoD might be held liable.

The FedCenter style of information center gives DoD a lot of flexibility in developing an acquisition information center. It provides a user-friendly interface for acquisition information, and a standardized home page format allowing for faster review of information in home pages. It also allows users to purchase items directly from their computer, eliminating the time associated with locating a telephone number or point of contact to purchasing the item. However, the

development and maintenance costs as well as the legal ramifications associated with this type of information center may cause this option to be too prohibitive for DoD.

E. OPTION #2 - DEVELOP A YAHOO! STYLE INFORMATION CENTER

The second option available to DoD is to develop an information center based upon the philosophy of the Yahoo! information center described in Chapter III. Applying the five factors here results in a different type of information center. The costs of development and maintenance of the information center were moderately high as a result of the computer hardware and personnel requirements necessary to run this operation. The Yahoo! information center was more personnel intensive than hardware intensive because it used employees of the company to search and index home pages on the Internet. Raising revenues for this operation was accomplished through allowing commercial companies to advertise on home pages within the Yahoo! database. Censorship of information was not controlled by this information center because the home pages were currently available to the public on the Internet. Home pages were not presented in a standardized format and were not developed by Yahoo! Finally, this information center did not provide EC/EDI capable home pages.

An acquisition information center developed utilizing this approach could potentially be costly to operate and maintain. The initial hardware and software start-up costs could be high, but the costs to maintain the information center would probably be moderate, depending on the size of the personnel staff required to search and index information. To pay for operations and maintenance, this information center could sell advertising space on home pages to civilian and government agencies. This type of acquisition information center would not

provide censorship of information within its database, unless DoD set censorship restriction on the employees that were finding and indexing home pages on the Internet. Additionally, this type of acquisition information center would not provide for a standardized home page format or EC/EDI capable home pages because this organization is not developing the home pages within the database.

The advantage of this type of information center is that it provides a central location for all acquisition information on the Internet. Since membership into the database is not dependent upon a fee, but is instead based upon presence on the Internet, there are no limitations to access to the database. An additional advantage is that this type of an information center could cost less because expensive EC/EDI capable computer equipment is not needed. A disadvantage of this type of information center is that it does not allow EC/EDI capability, nor does it present each home page in a standardized format. A non-standardized home page format increases the time that a user must spend navigating each new home page in search of their desired information. An additional disadvantage of this type of information center is that it is not designed to censor information within the database. This could offend some users of the database and create a public perception problem for DoD.

The Yahoo! style information center allows DoD to develop a fully capable information center. It provides a user-friendly interface for all acquisition information on the Internet. However, the start-up costs and development of this type of information center, in this era of declining defense budgets, may cause this option to be too prohibitive for DoD.

F. OPTION #3 - CONTRACT WITH AN EXISTING INFORMATION CENTER

The third option is to avoid the cost of development and maintenance of the acquisition information center, and to contract with an existing information center such as Yahoo! or FedCenter for that support. The target audience would be the acquisition community. In the development of the contract, the five factors of cost, raising revenues, censorship of information, standardized home page formats, and EC/EDI capabilities, would have to be defined. The ability of DoD to implement its acquisition information center would depend upon the capabilities of the existing information center.

An advantage of this option is that DoD would not have to invest money in computer equipment or personnel. DoD could use this option to test the idea of consolidating all acquisition information into a user-friendly home page, and if the idea did not prove to be of substantial benefit, then DoD could dissolve the operation without substantial hardware and personnel investments.

A disadvantage to this option is that DoD would have to define the parameters of the information center. Who would be allowed into the database and why? What would DoD's liability be on censorship and defective products, compared to that of the contractor? How would information be categorized within the existing information center to achieve the most benefit for the acquisition community?

This option gives DoD a lot of flexibility in choosing an information center provider, and in the development of an information center. It takes advantage of another organizations investment in computer equipment, and their expertise in developing an information center. It reduces the risk to DoD associated with developing an acquisition information center. However, all of these benefits are associated with a cost of doing business with a contractor. Depending upon the

contractor and DoD's acquisition information requirements, these costs could be too prohibitive for DoD.

G. OPTION #4 - USE THE CURRENT ACQWEB INFORMATION CENTER

The fourth option available is to use the current ACQWEB information center, but to expand the input of information into ACQWEB to include all acquisition information on the Internet. Currently, input into the ACQWEB home page is confined to agencies within the USDA&T. If the army program manager for the Comanche helicopter program developed a home page with information about the Comanche program, he would not be allowed to provide that information on the ACQWEB home page. The reasoning behind this decision is that the USDA&T does not currently have the staff or the computer resources to support the maintenance of an enlarged information center. [Ref. 19]

Two approaches could be used to expand the input of information into ACQWEB. The first approach would require the purchase of web searching software that could find acquisition information. Then a small staff could categorize that information into the ACQWEB home page. A second option is to advertise to the acquisition community for them to enter the ACQWEB home page. This could be done by providing a point and click button on the ACQWEB home page such as "add your acquisition related home page to ACQWEB". Then the ACQWEB staff would determine where the new home page should be categorized in the ACQWEB home page. Either approach would require additional costs to purchase hardware and software to support a larger acquisition information center.

An advantage of this option is that ACQWEB is currently up and running, providing limited acquisition information to the acquisition community. Based

upon its growth, it is becoming recognized as a central starting point for acquisition information research. By allowing more input into the database, ACQWEB could easily become the acquisition community's starting point for all acquisition information. Additionally, since the USDA&T is the senior acquisition organization within DoD, they could set a precedent for increasing productivity, reducing bureaucracy, and contributing to acquisition reform by establishing ACQWEB as the focal point for all acquisition information.

The disadvantage of this option is that additional costs for personnel and computer equipment may be required as the size of the database grows. Additionally, DoD would need to ensure that the home pages within the database were kept current and clean (e.g. no pornography, etc.). This means that censorship of information would be conducted. An additional disadvantage is that the home pages would not be presented in a standardized format, nor would they be EC/EDI capable.

H. RECOMMENDATION

With the cold war over, and the political environment shifting towards smaller government and deficit reduction, the Department of Defense is faced with a declining budget. Reduced dollars means finding innovative ways to accomplish an objective while maintaining low costs. With this in mind, the fourth option - expanding the ACQWEB information center capability - appears to provide the lowest cost option available to DoD.

The ACQWEB information center is currently up and running, and is growing in popularity among the acquisition community. The ACQWEB site could very easily solicit the acquisition community to join the site. Additionally, since ACQWEB is already functioning as an acquisition information center, it would take the least amount of effort to initiate into a fully capable information

center. With minimal effort and minimal costs, the ACQWEB site could be the initial starting point for all acquisition information on the Internet. Its current user-friendly environment, ease of access to information, and popularity has demonstrated its effectiveness to the acquisition community.

I. CHAPTER SUMMARY

Acquisition information is present on the Internet, however, this information can be hard to find, and often results in frustration for the user trying to find the information. Currently, users must explore one or more of the five Internet tools described in Chapter IV to find acquisition information. However, there is an alternative option available to help the acquisition community retrieve and present acquisition information on the Internet. The alternative is to develop an acquisition information center that is used as a central starting point for all acquisition users, and that provides links to all acquisition information on the Internet.

An information center is both a benefit for the user and the provider of the information. The user-friendly interface allows users to simply point and click on topics of interest. Additionally, the availability of current information in one central location makes the information center popular, as is evident through Yahoo! and ACQWEB. The information center is also a benefit to the provider of information, such as the USDA&T, because it provides a central location to pass on immediate information, as well as receive responses to information through e-mail.

This chapter presented four options available to the Department of Defense for the development of an acquisition information center on the Internet. Although each option has advantages and disadvantages, the last option appears to be the best option for DoD. Expansion of the current ACQWEB information center

could be accomplished with minimal effort and minimal costs, and could provide a substantial benefit to the acquisition community. The next chapter concludes this thesis and makes recommendations for further research.

VI. SUMMARY, FINDINGS, AND RECOMMENDATIONS

A. SUMMARY

The Internet originated over 30 years ago as a Department of Defense research project. The desired outcome of the project was to allow DoD to pass vital military information through computers and telephone lines. DoD was particularly interested in being able to pass military information immediately following a nuclear attack where numerous telephone lines had been destroyed. The research project resulted in a new type of communications technology and established the beginning of what is now commonly referred to as the Internet. [Ref. 2:p.14]

Although the Internet has been around for over 30 years, it has gained an incredible amount of public and media interest within the past few years. The Internet, as a worldwide system of interconnected computer networks, provides local, national and international access to vast amounts of information. However, as a result of recent public interest, the Internet has become overloaded with information. This information overload is making it difficult for users to find desired information in a timely manner.

In response to this information overload, several companies have developed information centers on the Internet. These information centers provide a user-friendly interface allowing users to find relevant information faster, thus enhancing the power of information sharing. An information center provides information on a home page according to categories, and has a point and click interface that enhances the user's ability to find desired information. These information centers have been growing in popularity over the past few years because they are easy to use and they provide timely access to information.

Acquisition information is currently available on the Internet from civilian defense contractors and government organizations. However, this information is not consolidated into an information center, resulting in difficult and lengthy searches for information. In today's high tech, fast paced environment, timely access to relevant information is paramount. For the acquisition community, timely access to information means that program managers, defense contractors, DoD agencies, as well as other acquisition professionals are able to quickly receive the most up to date acquisition information which can assist them in their daily decision making.

B. FINDINGS

Currently, to find acquisition information on the Internet, a user can explore five different options. One option is to try and guess the correct address of the desired home page (referred to as the Uniform Resource Locator - URL). A second option is to type a keyword into one of the available search engines currently on the Internet and hope that the search engine returns information that is relevant to the request. A third option is to search the multitude of independent, diverse acquisition home pages available from the Department of Defense and defense contractors, jumping through their sub-categories hoping to find the desired information. A fourth option is to search the Government Information Locator Service (GILS) - an alphabetized index of government information - in an attempt to find the required information. The fifth option is to use an existing information center that provides categories of general government information.

Although these options have advantages and disadvantages associated with each of them, there is not one option that provides timely access to relevant information for the acquisition community. Acquisition information is displayed on home pages in various formats and is often difficult to find. A test was

conducted by the author to find the name and phone number for the THAAD program manager. All five Internet tools available to users were explored to try and find this desired information. A total of 3 ½ hours was spent using the five different Internet tools to search for the desired information. The information was found through only one of the five tools, and in the one tool where it was found, it took 1 ½ hours to find. This test demonstrates that although acquisition information is present on the Internet, it is not easy to find.

Based upon this test, a fellow program manager would determine that finding acquisition information on the Internet is difficult and time consuming and would probably turn to other sources, such as telephone books or friends. The irony is that the Internet provides the largest, most current source of information available to individuals. However, if the information is not user-friendly and easily accessible, then it will not be used

C.   RECOMMENDATIONS

There is an alternative solution to the time consuming, unorganized process of finding acquisition information on the Internet. The alternative solution is to develop an acquisition information center that is used as a central starting point for all acquisition users, and that provides links to all acquisition information on the Internet. An acquisition information center allows users to avoid lengthy, time consuming, searches through search engines or acquisition home pages in an attempt to find their desired information. Reducing lengthy searches of the Internet means that acquisition workforce employees are able to quickly locate the desired information, spending less time on the Internet and more time on their assigned task. An acquisition information center can also to reduce the novice or average users technological fear of the Internet. By presenting information in a user-friendly, categorized, environment users can point and click on topics of

interest and avoid trying to navigate the overloaded Internet. Additionally, an acquisition information center could be used as a central location for the rapid dissemination of acquisition information.

The primary research question of this thesis was to address the options available for DoD in the development of an acquisition information center to enhance the ability of acquisition professionals to find relevant acquisition information on the Internet. This thesis presented four viable options. Of the four options, the best option is the expansion of the existing ACQWEB information center. This information center is currently up and running, and is growing in popularity among the acquisition community. The ACQWEB site could very easily solicit the acquisition community to join the site. Additionally, the ACQWEB information center would take the least amount of effort to initiate. With minimal effort and minimal costs, the ACQWEB site could be the initial starting point for all acquisition information on the Internet. Its current user-friendly environment, ease of access to information, and popularity has demonstrated its effectiveness to the acquisition community.

D.   RECOMMENDATIONS FOR FURTHER STUDY

Two areas of further study that would be beneficial for the acquisition community are the development of an Internet acquisition directory book and a cost benefit analysis on the development of an acquisition information center. The development of an acquisition directory book is based upon the premise that some users may feel more comfortable looking for acquisition information (URL's) in a paper copy Internet directory book, much like our yellow pages telephone book, rather than searching through the overloaded Internet. Some commercial companies have developed and are selling these Internet directories, however these current directories are not targeted for the acquisition community. The second

area for follow-on research is to conduct a cost-benefit analysis of the different options presented in this thesis. Based upon a cost-benefit analysis, DoD might be persuaded to develop an acquisition information center that could enhance the productivity and efficiency of the acquisition community.

The defense acquisition community is growing in presence on the Internet. However, the ability to effectively share and distribute this information is currently limited. The development of an acquisition information center would enhance the ability to disseminate information, increase productivity in the workforce, and support acquisition reform initiatives.

APPENDIX - ACRONYMS AND ABBREVIATIONS

ARPA   Advanced Research Projects Agency
ARPANet   Advanced Research Projects Agency Network
ASCII   American Standard Code for Information Interchange

BMDO   Ballistic Missile Defense Organization

DARPA   Defense Advanced Research Projects Agency
DoD   Department of Defense
DTIC   Defense Technical Information Center

EC/EDI   Electronic Commerce/Electronic Data Interface
E-mail   Electronic Mail

GILS   Government Information Locator System

IP   Internet Protocol
IT   Information Technology

NII   National Information Infrastructure

OMB   Office of Management and Budget

SES   Senior Executive Service

THAAD   Theater High Altitude Area Defense

URL   Uniform Resource Locator
USDA&T   Under Secretary of Defense for Acquisition and Technology

WWW   World Wide Web

YAHOO!   Yet Another Hierarchical Officious Oracle

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20. Interview with John Downey, Senior Executive Level officer in charge of the Management Information Systems (MIS) for USDA&T, November 25, 1996.

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