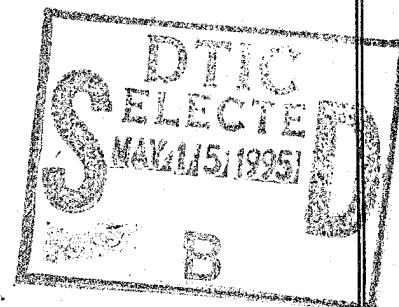


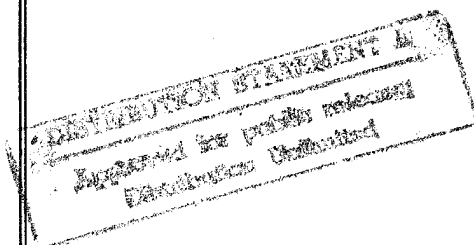
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**The Brooks Act:
An 8-Bit Act in a 64-Bit World?
An Investigation of the Brooks Act and Its
Implications to the Department of Defense
Information Technology Acquisition Process**

Commander
Timothy S. Traaen
Supply Corps
United States Navy



Faculty Research Advisor
Colonel Stephen L. Thacher, USA



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The Industrial College of the Armed Forces
National Defense University
Fort McNair, Washington, D.C. 20319-6000

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Abstract

Throughout the sixties and seventies, the Federal Government was the largest single buyer and IBM the largest seller of automated data processing equipment in the world. No natural set of interfaces among central processing units (CPUs), peripheral equipment, data, or programs existed. Lack of standardization resulted in thousands of hours of unused computer time within the government. In March 1965, the president approved and sent to Congress an OMB report on the management of ADP in Government. The report cited the government's serious ADP management problems. These matters were considered by Congress as the Brooks Act was enacted.

The Brooks Act sought improvement in ADPE acquisition processes that would enhance the Government's bargaining position of *hardware* through volume acquisitions, base rental-versus-purchase evaluations on the value of equipment to the Government as a whole rather than the equipment's useful life to the initial user, and select equipment which offered the greatest purchase advantage on a Government-wide basis.

The ADPE environment has changed dramatically since 1965. Today, market economic power in the ADPE industry is diffused. The government no longer is the major buyer. IBM is no longer the major supplier. Market forces in large part determine the standards that will be accepted and rejected. The major costs of acquisition today are in software development and maintenance- *not hardware*. Furthermore, several amendments to the Act since 1965 broadened its scope and altered its focus. GSA's oversight performance under the Act has been subject to much criticism- a conclusion that they provide little or no value to the acquisition process has been made.

DOD leadership has recognized the need to replace non-interactive systems and focus future systems development with an eye toward interoperability. The ADPE industry has advanced to the point where we must establish a new acquisition paradigm. Evolutionary acquisition methodologies and other elements exist now that, when properly garnered and organized into a new acquisition construct, provide solid justification to repeal the Brooks Act.

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Introduction

In March 1983, I was ordered as the Stock Control Officer to the largest, newest and most powerful warship ever conceived, built and deployed in the history of mankind. I "managed" an operation that consisted of a 110,000 line item inventory worth over \$250 million, a \$21 million/year operating budget and processed over 15,000 inventory and financial related transactions per month.

As large as my operation was, my computer system was no more capable than the system my father had used in 1962 aboard his ship. Batch-post updates took twelve hours to complete and the output provided the status of my operation ten - fourteen days before. "Real time" was "reel time," referring to the huge library of tapes we had to maintain.

That ship was the USS Carl Vinson (CVN-70). In the science fiction movie "The Final Countdown," her sister ship, USS Nimitz (CVN-68), found herself off Pearl Harbor on December 7, 1941. The firepower that NIMITZ held could have singlehandedly stood off the attack that day and possibly demolished the whole enemy fleet in short order. While the movie was typical Hollywood fantasy, it did display the ship's amazing power projection capabilities. However, neither that ship's supply officer, nor I on the CARL VINSON, could tell the aviation maintenance officer the up-to-date status of his budget or his high priority outstanding requisitions. The lack of real time information complicated my ability to help the maintenance effort and ultimately degraded the ship's capability to perform its mission. The maintenance computer did not talk to the supply computer either, although they were located in the same compartment. I could not even transmit a stock reorder (usually 2,000 requisitions) automatically because the tapes my computer produced were incompatible with our communications system.

I held the perception and preconceived notions that most laymen had of the computer industry and government's role in it. I wondered how the military, once an apparent driving force in the ADPE industry, could have taken such an abrupt "electronic off-ramp" somewhere along the line.

Surely, a large part of military information technology "pushed the envelope", but those projects were related to specific tactical (or mission critical) applications that directly supported the warfighters. Supply, logistics, or other administrative type programs/systems were frequently relegated to low priority for some reason. The nagging question was- Why? Why could we be so progressive in some areas, and so apparently weak and impotent in others?

An explanation given to me was--- THE BROOKS ACT. If it just weren't for Congress and that Act we could really do well! If we didn't have our hands tied by that law! Thank God for the Warner Amendment! I jumped immediately on the bandwagon. Yes! The Brooks Act is our problem! Was/is the Brooks Act the problem? I couldn't honestly say. I didn't know what the Brooks Act was or what it did. I didn't know how long it had been around or understand the circumstances that existed that caused its enactment. I didn't know enough to form an intelligent opinion. It was convenient to cast blame on something that I did not understand. I figured it was time I found out.

HISTORY- THE BIRTH OF THE ACT

The Government was The Industry's Customer

Throughout the sixties and seventies, the Federal Government was the largest single user of automated data processing equipment in the world. From June 30, 1960 to June 30, 1970, the number of systems in the Government's inventory increased from 531 to 5,277. Of the 5,277 systems, 3372 were owned wholly or partially and 1905 were rented. On June 30, 1970, the Government owned ADP equipment that cost \$1.9 billion and rented ADP equipment that would have cost another \$1.2 billion to purchase.¹

The federal government was also the world's largest computer equipment buyer. It was the only customer that possessed enough economic power to force substantial changes in contract terms or market conduct by threatening to "boycott" a particular manufacturer's product. Government's influence as a major buyer went beyond the actual computers it purchased for its own use. Private

users followed government buying patterns because they perceived the government had much more expertise in computer acquisition.²

Problems Due to Lack of Standardization

Even as near as ten years ago, the high cost of processing power and random access memory drove computer system design. Software programs were written to make machine and communications resources more efficient. When changes to users' processes or requirements occurred, modifications needed to accommodate the changes were expensive and often difficult to accomplish. System development philosophy then specifically optimized the use of the system's key critical computational elements. Developers were fully cognizant that when these changed, the information system itself would have to be redesigned.

No natural set of interfaces among central processing units (CPUs), peripheral equipment, data, or programs existed. Interfaces were chosen based upon design considerations and for convention and convenience. No producer undertook the effort to produce compatibility among machine types. Programs and data would only run on machines for which they were specifically designed.

Numerous conventions existed for magnetic tape widths and number of data tracks; coding schemes for assigning binary digits to numbers, letters and symbols proliferated faster than tape characteristics. Programming languages multiplied with no provision for or thought of transferring programs from one machine to another.³

Standards were one method of producing compatibility by insuring all manufacturers chose the same conventions. From a public policy point of view, the advantage of government imposed standards had to be weighed against the disadvantages:

Advantages

- freer competition
- increased flexibility- consumer choice
- reduced costs through equipment compatibility
- removal of product differentiation barriers to entry

Disadvantages

- possible reduction in technical progress
- reduced competitiveness in global market

In 1960, the International Standards Organization (ISO) assigned responsibility for standardization to the American Standards Association, renamed the American National Standards Institute (ANSI) in 1966. ANSI neither writes nor enforces standards, but provides a framework for the cooperative voluntary development of standards by industry groups.⁴

The Effects of Standards on Consumers.

A user's enthusiasm for standardization varies with the size of his ADPE investment. Very small scale users tied to a particular manufacturer and having only a minor stake in standardization would be relatively indifferent to switching suppliers. Since it would not cost them a lot to change out their systems, they'd rather switch than fight. In principle, they would like to see an environment that expanded their choices, but if, for example, they were relatively happy IBM users, they would exhibit little fervor for standardization as a major goal. Conversely, large users with large investments would realize greater benefit from industry standardization. If compatibility with their current systems did not exist, costs of taking advantage of technological advancements would be quite high.⁵

As the largest computer user, the federal government was the one most concerned with standardization. Its selection procedures theoretically ensured it a selection of equipment from many different sources. The government was aware of its losses due to computer incompatibility, but was reluctant to use its market power to force standardization.

Historically, Congress mandates standardization when it decides there is "no real alternative". In 1965, Congress decided there was no real alternative. A report revealed that 500,000 hours of computer time went unused because data and program incompatibility prevented workload transfer from overloaded machines to underutilized ones.⁶

The Effects of Standards on Suppliers.

The success of voluntary standardization efforts depends upon the effect that standardization will have on manufacturers. Suppliers react differently to standardization. If standardization affects all in the market equally, then it has a greater chance of success than if it gives a competitive advantage to one firm at the expense of another. In the computer industry, standards have traditionally helped those firms trying to enter the market or expand market share, and hurts those trying to defend their share. Depending on one's position in the marketplace, standardization can represent either a threat to one's market share or an opportunity to enter the market as barriers to entry are reduced. Consequently, in the embryonic ADPE industry, voluntary standards had been largely unsuccessful.⁷

IBM, then the largest supplier in the world, generally opposed the development of standards in the computer industry. IBM knew that standardization would result in increased computer compatibility and serve to limit its ability to fend off competition in the marketplace. Since it held such a dominant economic power in the marketplace, IBM controlled the market simply by its largesse. Smaller companies were forced to follow IBM's lead in order to compete for any modicum of ADPE market share. Furthermore, because of the concentration of market power IBM had, it could change the standards at will to protect or improve its competitive position.⁸

Because of IBM opposition, very little progress came from the ANSI. ANSI required a consensus among those affected by standards for them to become official. Only when users became involved in standardization did progress occur. With the exception of the federal government, individual users were so small relative to the market that organizational difficulties and self-interest precluded them from exercising a strong voice in the standardization effort. The federal government had enough market power either to force standards on its own or to organize other users into an effective pressure group.⁹

The government's position as a large user gave it the opportunity to increase useful

standardization without putting unwieldy legal constraints on the industry. The Brooks Act established the legal framework for the National Bureau of Standards (NBS) to set standards for the federal inventory of computers. This power was used to establish standards for Government purchases rather than waiting for industry to set voluntary standards; the fact that the standards were only required for government computers did not preclude the industry from pursuing technological progress. If a major innovation was developed that did not fit the established standards framework, the manufacturer could petition NBS for an exception or a change in standards.

Although the standards would not be required except on federal computers, the government buys such a volume of computers that the federal standards would probably become generally accepted throughout the industry. The government's buying power and the Brooks bill allow the government to set semirequired standards without the inflexible legal restraints that would be required to establish standards by law.¹⁰

ADP Acquisition prior to Brooks Act

The government's ADPE was acquired in essentially the same manner as other types of material or property. Each agency was responsible for the acquisition of its own ADPE subject to existing statutory, regulatory, and budgetary restrictions. Acquisition decisions were made on a decentralized basis-- that is, without regard for any other agency's needs or without regard for any other capability that another agency could provide from its already owned or rented ADPE.

Three central type agencies were involved, within their own spheres of interest, with the acquisition of the government's ADP equipment-- the Office of Management and Budget (OMB), the General Services Activity (GSA) and the Department of Commerce (DOC).

OMB issued policies and guidelines, inquired into ADP activities during its annual budget reviews, and sponsored interagency groups for the resolution of ADP management problems. GSA's role in acquiring ADP equipment was consonant with its general procurement and contracting responsibilities under the Federal Property and Administrative Services Act of 1949, as amended (40 U.S.C. 471). ¹¹

The Brooks Bill becomes Law

Several years before the enactment of the Brooks Bill, a need was recognized within the legislative and executive branches of government for specialized and dynamic leadership in the management of ADP activities. The need focused specifically on the acquisition of *equipment*. In 1961, OMB issued circular A-54, entitled "Policies on Selection and Acquisition of Automatic Data Processing Equipment (ADPE)," which discussed:

- desirability of selecting equipment on the basis of system specifications and overall costs,
- need for equal opportunity and appropriate consideration of all equipment manufacturers, and
- need for evaluations of acquisition alternatives, such as rent versus purchase.¹²

Later, in March 1965, the president approved and sent to Congress an OMB report on the management of ADP in Government. The report cited some of the government's more serious ADP management problems (which were neither surprising nor unexpected). It also provided recommendations for their solution. These matters were considered by the Congress in enacting the Brooks Act, Public Law 89-306.¹³

In enacting the Brooks Bill, the Congress tried to provide for a coordinated, Government-wide approach to the acquisition of ADP equipment. The ordinance placed Government-wide authorities and responsibilities on OMB, DOC, and GSA that were consistent with their traditional functions.

The National Bureau of Standards of the Department of Commerce provided advisory services to agencies regarding technical aspects of the selection and acquisition of ADP equipment. The Bureau also conducted research to improve equipment compatibility and recommended uniform Federal Standards for equipment, techniques for use and computer languages... The technical aspects of ADP management remained with the Department of Commerce which was to represent the Government in its standardization effort and to coordinate the Government's ADP research efforts.

OMB was to retain fiscal and policy control over all aspects of ADP management to the extent that any action of any agency under the authority of the law is subject to OMB's review and approval.

The law gave GSA the operational responsibility for coordinating a Government-wide ADP management program.. Thus GSA was given exclusive authority to acquire all general purpose ADP equipment for use by other agencies.¹⁴

GSA's responsibility for acquiring ADPE, as defined by OMB, was limited to providing annual Schedule contracts for rental, purchase, and maintenance of equipment. GSA was to

"coordinate and provide for the economic and efficient purchase, lease, and maintenance of equipment by Federal agencies"¹⁵. An ADP fund for the acquisition of agencies' equipment requirements was to be administered by GSA. Agencies were to obtain annual appropriations from the Congress to reimburse the ADP fund.¹⁶

The law also established a management information system of inventory and fiscal data. Congress and OMB needed current and reliable information to maintain policy and budgetary control over ADP expenditures. This information was considered to be essential for GSA, in its Government-wide coordination effort, to achieve optimum use and reuse of ADP resources and to ensure that the Government evaluated *all* ADPE acquisition alternatives completely. OMB assigned the responsibility for operating the information system to GSA.¹⁷

The acquisition program coordinated by GSA required that rental/purchase decisions be made on a Government-wide basis to ensure that available funds were used in the most efficient and economical manner. The law was clear that the authority conferred upon GSA *should not be construed so as to interfere with agencies' determinations of their equipment requirements and uses*. Cases of disagreement between GSA and agencies were to be arbitrated by OMB.¹⁸ The implication of this caveat to GSA's mandate will be more fully explored later.

Since the program was to be implemented gradually, Congress gave GSA the authority to delegate its procurement authority to agencies. GSA could implement effective ADP management on an orderly, step-by-step basis by prudently using this delegation of authority. Once an effective management program was in place and the ADP fund was operational, GSA would then begin to coordinate Government equipment acquisitions to achieve substantial savings.¹⁹

In Summary:

The Act's objectives were threefold: (1) to improve information management; (2) to optimize the utilization of government ADPE through sharing of assets, and (3) to provide more economical ADPE acquisition... The Brooks Act ultimately made the GSA the sole, directly-authorized procurer of all government automatic data processing equipment... Assigning the responsibility to GSA also

provided that agency with the opportunity to develop contracting and technical expertise in sufficient depth to keep pace with technological change and to avoid some of the worst problems of the past.²⁰

THAT WAS THEN, THIS IS NOW

Broadening the Scope: Amendments to the Act

Since it was enacted, several amendments have had substantial impact on the Brooks Bill.

These were, in chronological order:

The Paperwork Reduction Act of 1980

The Warner Amendment of 1981

The Competition in Contracting Act of 1984

The Paperwork Reduction Reauthorization Act of 1986

The Paperwork Reduction Act of 1980

This legislation did not directly amend the Brooks Act. Congress passed this act to promote greater efficiency and economy in federal agencies' information management activities. It complemented the Brooks Act by requiring an agency head to designate a senior individual to review its information management policies, procedures and practices. The Paperwork Reduction Act further required that the designated individual also be responsible for the conduct of acquisitions made under auspices of the Brooks Act.

... the legislation required the Director of the newly established Office of Information and Regulatory Affairs to develop, in consultation with the Administrator of GSA, a five year plan for meeting the ADPE needs of the federal government under the Brooks Act.

This Act was based in part upon the congressional perception that federal procurement of ADPE was inefficient and overly time-consuming. However, four members of the Senate Government Affairs committee expressly and vehemently opposed any legislation that would ... constitute an expansion of the Brooks Act by broadening GSA's managerial role... numerous studies...noted that implementation of the Brooks Act had resulted in unforeseen impacts on timely and efficient procurement of ADPE... the deficiencies of ADPE procurement under Brooks Act procedures were particularly evident in ADPE procurement by national defense and intelligence agencies... significant delays had been demonstrated by Brooks Act mandated procedures, and that these procedures, if expanded by current legislation, could seriously undermine national defense.²¹

This opposition would become manifest in the Warner Amendment.

The Warner Amendment of 1981

This amendment exempts certain DOD ADPE procurements from the restrictions of the Brooks Act if their functions or operational use involves: intelligence/cryptologic activities, command and control of military forces, equipment that is embedded or an integral part of a weapons system, or uses that are critical to military or intelligence operational missions. The arguments against the Brooks Act procedures were:

Beyond encouraging the acquisition of obsolescent equipment...(1) They induce monetary inefficiencies by making it difficult for the armed forces to obtain fewer and less costly ADPE services...(2) Federal regulations remove the ADP decision making process from the Service level where knowledge and understanding of the operational equipment resides, and place it within ADP bureaucracies of the GSA and OMB not familiar with these requirements...(3) Significant and unnecessary time and personnel costs are incurred in the course of most ADP procurements.²²

Equipment used for "routine" administrative/business applications (described as payroll, finance, logistics and personnel management) were conspicuously and specifically excluded from Warner Amendment coverage. Consequently,

...the Warner Amendment removes the procurement of all "militarily operational" ADPE resources from the jurisdiction of GSA and places the authority to procure directly with the DOD. No delegation is required, nor are these procurements subject to the protest resolution provisions of the Brooks Act.²³

The Competition in Contracting Act of 1984

This Act authorizes the GSA Board of Contract Appeals to review any decision by a contracting officer alleged to violate a statute or regulation upon the request of an interested party.²⁴

The Paperwork Reduction Reauthorization Act of 1986

This Act revised the definition of ADPE by recognizing the merging nature of equipment and communications technology. The new definition included software, ADP support services and communications. The act

...also authorized the "Agency Designated Senior IRM Officials" as individuals responsible for conduct of acquisitions under the Brooks Act delegation... this designation was intended to encourage the GSA Administrator to delegate procurement authority to officials with sufficient experience, resources and ability to conduct such procurements soundly. It was contemplated that the Administrator would grant such authority for all procurement for a period of time rather than on a case-by-case basis...This legislation is thus the statutory basis for establishment of the Management Reviews Division within the GSA, responsible for on-site reviews of the agencies' information

*resources programs under the Brooks Act.*²⁵

However, while the Act encouraged GSA to delegate procurement authority to an agency, GSA still retained the *responsibility* to provide oversight of the procurement process. This is not a trivial point.

Technology Builds Technology

There can be no disagreement that technological change during the last decade has fundamentally altered the information systems landscape. Technology has built more technology and the rate of technological change continues to exceed anything thought ten years ago. In fact, it was only in 1982 that the personal computer was introduced!

The current generation of personal computers and workstations are sufficiently inexpensive that both processing power and storage capacity have essentially become *commodities*. Connectivity, local and international, has become a utility service that is both seamless and widespread. Telecommunication bandwidths have increased by orders of magnitude for local and long distance use with the introduction of inexpensive fiber optics and other transmission media. Standards of exchange of image, video, and audio data are emerging quickly and fundamentally expand concepts of digital data. The tremendous processing power, storage capacity, and communications bandwidths available today free developers and users to focus on using information effectively, rather than using internal computational elements of the system platform. Today's information systems architectures depend heavily on off-the-shelf software packages and permit the developer or user to upgrade systems rapidly and inexpensively by intelligently leveraging the product marketplace. Users can economically acquire and enhance their individual systems, incorporating only the feature and function sets that are desired while using connectivity that was unthinkable 10 years ago.

Today's technology enables the speedy implementation of prototypes as a feasible and routine practice. The process remains economical even if those prototypes are discarded. Systems development processes have shifted to the effective presentation of information rather than the efficient

processing of data.

CPU and memory upgrades are available with total compatibility, and commercial hardware has evolved with astonishing reliability and environmental resiliency. Ruggedization to meet military specifications is often now unnecessary or available with low risk and cost. Mean time to failure (MTTF) and mean time between failures (MTBFs) existing today were unthinkable in equipment even five years ago. While information security remains a large concern, encryption methods have advanced. Removable storage devices are widely available and support for multi-level secure operations in both operating systems and database systems is increasing. Commercial equipment, software products, and secure operations and information security are not mutually exclusive domains.²⁶

Current GSA Responsibilities and DOD Procurement

Before reading, please fasten your seat belt. The Federal Information Resource Management Regulation (FIRMR) governs what GSA terms Federal Information Processing (FIP- the reference GSA makes to ADPE) resources. Part 39 of the Federal Acquisition Regulation (FAR) deals with the acquisition of Information Technology (IT) within the government. The FIRMR specifies that *it relies on the FAR for general policies and procedures*²⁷. But- an appendix to part 39 of the FAR contains a republication of the complete FIRMR acquisition procedures that apply to FIP resources. The FAR mandates that acquisition personnel *shall follow the FAR, except where the FIRMR prescribes special policies, procedures, provisions or clauses*²⁸. Furthermore, the *Defense Federal Acquisition Regulation Supplement* (DFARS) supplements the FAR for DOD. It stipulates that in cases where the FIRMR applies, the FIRMR takes precedence and must be followed when acquisitions are subject to the Brooks Act. Thus, GSA controls the process.²⁹

As previously described, the Administrator of GSA delegates, either on a case basis or by blanket delegation, authority to an agency to procure ADPE competitively or in certain cases, sole

source. If any part of a procurement exceeds delegation limits, or if the procurement materially deviates from its original delegation terms, an amendment must be obtained from GSA. If a request has not been acted upon within 30 days, the delegation is considered approved. GSA also performs oversight by performing Information Resources Management (IRM) reviews. The reviews include assessments of all phases of the acquisition process, but not any determination of the validity of the requirement.

The Section 800 Panel identified that "the current statutory and regulatory framework for ADPE procurement is complex and makes it difficult for the DOD procure what it needs."³⁰ It provides several examples of service agencies' travails in procuring ADPE and being thwarted by GSA's bureaucracy.

*Currently, GSA reports that the average time for review of all agency procurement requests is 18.4 days. However, GSA also reports that the figure is considerably longer-- up to six to eight weeks-- in more complex ADPE procurements. And that figure may extend even further if a procurement involves a DPA amendment or additional technical review... the equipment at time of purchase may not be state of the art because it is based on specifications written considerably earlier.*³¹

Given what I've discovered from my research and related to you, it is no wonder that we have to have a group of highly trained acquisition specialists. Not necessarily for any specific acquisition, but to cut through the bureaucratic morass!

Bottom Line

Market economic power in the ADPE industry has shifted. The government no longer is the major buyer... IBM is no longer the major supplier... market forces in large part determine the standards that will be accepted and rejected... Today, commercial technology has far surpassed what the government has an ability to impact. Hardware costs are down, manufacturing costs are down... the major costs today are in software development and maintenance- *not hardware*. 10 years ago, technology that we have today did not exist; architectures for future exploitation then were based on proprietary hardware, operating systems, and custom-built applications software. Today's enabling

technologies seemed visionary and in the distant future. Hence, systems developed by the use of evolutionary architecture were feasible but expensive. Currently, practical and inexpensive architectures are readily available.

IS THE BROOKS ACT ON LIFE SUPPORT?

There Are Advocates- Arguments for the Brooks Act

GSA's Position

GSA opposes any alteration of its current oversight role in ADPE procurement. GSA maintains that its extensive experience with all federal agencies and programs gives it a Government-wide perspective on issues relating to the business and administrative use of federal information processing resources. GSA contends that this experience provides an advantage over a single agency focus, and that it uses this advantage to share information with DOD agencies, and to formulate recommendations for improvement. GSA also promotes the establishment and use of government-wide standards for systems and hardware.

GSA's involvement in the pre-acquisition process...ensures that the acquisition planning process promotes competition and efficiency. An agency's efforts and ability to promote and obtain competition will be a determining factor in GSA's decision to grant or deny authority to acquire information resources.

*GSA maintains that exemption of DOD from its oversight role will have a significant negative impact on federal ADPE procurement, both in DOD and within the government in general. As the largest single federal purchaser, DOD would be able to set a de facto standard, thus splitting the aggregated buying power of the Federal Government. This split would result in increased costs for both the civilian agencies and DOD. Because GSA also contends that the Office of Secretary of Defense does not provide sufficient oversight of information resources management by its components, any DOD exemption from the Brooks Act would therefore require the creation of a duplicate oversight bureaucracy within DOD.*³²

Much of GSA's contention was established in the original premise of the Brooks Act. I feel they are overstating their position by tying their arguments to an era that no longer exists. A recent annual review by GSA of the impact the Brooks Act has had on ADPE acquisition stated it has saved the government more than \$26 billion since its enactment in 1965.³³ But at what expense? There has been no real evaluation of the opportunity cost imposed on the taxpayer because of government personnel having to use outdated, cumbersome, incompatible systems which have become unsuitable for their intended tasks-- I cannot help but recall my own experiences. I have seen little of their

argument translate to actual success in the field. I shall show later how GSA's position further falls apart under scrutiny.

Other Arguments in Favor of the Act:

Without the Act, we will be faced with decreased competition- Japan as an example.

Bob Dorman, in defending the need for the Brooks Act, intimates that without the Act, competition in the marketplace would dwindle and consumers would be forced to a market dominated by few suppliers.

Federal vendors and employees may complain about the effects of the Brooks Act, but I have had my eyes opened to what a world without it would be like.

-Three companies dominate the Japanese government services industry with more than 90 percent of the market.

-Three-quarters of Japanese government procurements are done on a sole-source basis, without any hint of competition.

-The acquisition and application of information and application of information technology is well behind ours...

The lack of automation may be a cultural peculiarity of even a budgetary matter. I believe, however, that if Japan were subject to a Brooks-like act, competition would not be as limited.³⁴

Rebuttal: It may be true that Japan has fallen behind in using information technology, but a cure is not regulation. It can be argued that it is because of excessive regulation and government micromanagement that the Japanese market has evolved to its present state.

The relationship that the Japanese government has with commercial industry historically has been much different than that which the United States has had with its domestic producers. Cultural differences are apparent, Japanese place great value on consensual decision making. A much greater degree of government/industry cooperation exists in Japan. Furthermore, the Japanese know better than anyone else what their problems are and why competition is lacking:

In Japan... the information-technology industry is bound by red tape, lacking in creativity and dominated by such slow moving companies such as Fujitsu, Hitachi, and NEC... Japanese companies "are still trying to catch up with IBM", says a senior official at the Ministry of International Trade and Industry (MITI). "But IBM isn't dominant anymore. It is the smaller companies that are setting the rules of the game."³⁵

The rapid change in the uses of information technology doesn't lend itself to the kind of deliberate,

*consensus-oriented planning that served Japan's bureaucrats well when they developed the nation's manufacturing strategy... Tokyo has smothered the information-technology industry under a blanket of licensing requirements, rules and regulations and informal guidance... this protective attitude raises costs and stifles innovation.*³⁶

Hence, Brooks Act like legislation is probably something the Japanese can continue live without. In contrast with the early United States ADPE experience, Japan does not have to struggle with establishing protocols and standards. Thanks in large part to the U.S., commercial standards have been set globally. Therefore, competition would conceivably explode and thrive in Japan, as in the U.S., if the government approached the IT industry in a more laissez-faire manner.

Being exempt from the Brooks Act does not allow faster IT material acquisition.

There has been no empirical evidence that proves that procurements accomplished under Warner Exemption have been done faster than those procured under the Brooks Act. GAO, during a study in 1986, found that the time required for ADPE procurements that were exempt from the Brooks Act did not differ significantly from the time required for procurements that required a DPA:

*...found that there is little difference between Warner Amendment and Brooks Act procurements in the acquisition procedures followed and total time needed to complete procurements... the Defense's implementation of the Warner Amendment has not resulted in more expeditious acquisition of computer resources for critical military missions...*³⁷

Rebuttal: This finding notwithstanding, there can be no argument against the fact that the Act has had to be *executed* by agencies. A bureaucracy will interpret any legislation and incorporate those interpretations *within* regulations for execution. The Brooks Act is the root of the "great oak" of non-tactical IT acquisition policy. Without the root, a tree withers and dies. Thus, if the Brooks Act were repealed, the voluminous and myriad bureaucratic regulations which emanate from it would have *no basis for existence*. True streamlining and overhaul of the process could then proceed.

Opposing Viewpoints- Those Against the Act

The Section 800 Panel Finds Brooks Act Lacks Relevance

In review, the Brooks Act was intended to give the Administrator of GSA operational

responsibility to provide the federal government with: (1) optimum utilization of ADPE, (2) more economic acquisition of government ADPE, and (3) better management information. The Section 800 Panel, established to do a complete review of the legislative and regulatory environment in which government does its procurement, determined that the foundation of the Brooks Act was questionable.

For the following reasons, the Section 800 Panel determined that the Brook's Act lacks relevance in today's ADPE environment.

ADPE Service Centers: As has been described, in 1965, Congress felt that there was "widespread waste in available but unused Government ADPE time". GSA was required to establish multi-agency service centers to furnish ADPE support to multiple users.

Large processing centers have become dinosaurs of the computer age. Personal computers today have far greater computing power than the large mainframe computers of the 1960s. Hence, decentralized and distributed data processing is becoming more common than centralized processing.³⁸ The capital investment associated with large processing centers can promote waste rather than save money. This investment can induce a reluctance to convert to more efficient distributed processing centers. Large processing centers also foster noncompetitive sole source relationships with vendors.³⁹

Reutilization of ADPE Resources: In the 1960's and 1970's, some savings were obtained by reutilizing ADPE resources. Hardware for large computer systems represented the major cost component of a computer system. In theory, savings could be achieved by reutilizing equipment that had not become obsolete.

In practice, reuse of old hardware often resulted in a lack of compatibility when newer systems were introduced. Reuse also perpetuated sole-source dependence upon the original manufacturer for support. Maintenance of older equipment also became very expensive when the manufacturer stopped supporting the equipment.⁴⁰

The federal government today receives little, if any, benefit today from reutilization of ADPE.

While reusing hardware and software should be encouraged within an agency where it makes sense, the limited economic benefits of reutilization no longer justify perpetuation of a large government wide bureaucracy. Changes in technology and system architecture, the reduced cost of new equipment, and the high cost of maintaining old equipment generally favor the acquisition of new equipment.⁴¹

More Economic ADPE Acquisition: Congress believed that the federal government was not receiving special advantages, such as volume discounts from volume purchases.

With the Brooks Act they attempted to achieve such advantages through GSA oversight. In practice, however, agencies awarding large Indefinite Delivery/Indefinite Quantity (IDIQ) or requirements type contracts have often been more successful than GSA in achieving significant cost savings. These agencies have attained the volume discounts that are still elusive for GSA, particularly on multiple award schedule contracts.⁴²

There is also growing pressure to compete each ADPE procurement without imposing "compatibility limited" requirements. This pressure has reduced the Government's ability to consolidate requirements and obtain volume discounts.⁴³

Better Management Information: Congress intended GSA to collect and consolidate information needed for ADPE management in the federal government. Today, GSA only plays a limited role in actually collecting or consolidating data on ADPE within the federal government.⁴⁴

In practice, GSA basically collects and collates limited information (the estimated value of the project, etc) about pending procurements as part of the process by which it grants a delegation of purchase authority (DPA). GSA also monitors and reports on protests before the General Services Board of Contract Appeals (GSBCA). GSA then attempts to make correlations between GSBCA decisions and the overall ADPE procurement process. While GSA has complied with its statutory mandate, this collection of information arguably has added very little value to the overall process.

Congress itself has raised questions regarding the adequacy of GSA's management information role.⁴⁵

Perhaps most importantly, the government-wide management role for GSA that was envisioned under the Brooks Act for information resources is no longer needed. Virtually every federal agency has an information management organization that defines requirements, conducts procurements, and fields information systems. Within DOD, this role is being assumed by the DISA. Further, there is an increasing tendency for the government to adopt *open systems architecture that depends on industry standards*.⁴⁶

The 800 panel also described three additional problems caused by the Brooks Act:

Delays in ADPE procurement caused by GSA oversight: The Senate Report to the Paperwork Reduction Act of 1980 expressed this concern, particularly as it applied to computer systems embedded in weapons systems. This particular problem was resolved by the Warner Amendment, but there still is an expressed concern by DOD over the additional time that is required to obtain a DPA from GSA during the procurement of non-tactical systems.

*GSA's current policies concerning approvals of DPA's are perhaps the best evidence that this process has no substantive value. Once a DPA has been requested by an agency within DOD, the delegation is deemed approved after 30 days if it has not been specifically disapproved. Thus, a delegation can occur whether GSA reviews or approves the request. GSA adopted this policy in response to criticism that the delegation process delayed the DOD procurements.*⁴⁷

Overly Broad definitions of ADPE: Originally, the Brooks Act applied to the acquisition of general purpose ADPE systems and components. However, as has been described in the Paperwork Reduction Reauthorization Act of 1986 (above), and in part of

*...a jurisdictional issue that arose during the protest of an award on an Army printing and publishing contract, the Congress amended the Brooks Act and expanded the definition of ADPE. The term Automatic Data Processing Equipment was redefined to mean 'any equipment or interconnected system or subsystems of equipment that are used in the automatic acquisition, storage manipulation, management, movement, control, display, switching, interchange, transmission, or reception of data or information, including communications'. This definitional change has enormously broadened the scope of the Brook Act.*⁴⁸

Unnecessary Bureaucracy: Another serious consequence of the Brooks Act has been the

propagation of numerous separate entities that are involved in the acquisition of ADPE. Agencies have compartmentalized enterprises within their organizations to acquire different types information technology. Activities have had to train and develop contracting specialists for acquisition of tactical systems under the 5000 series procedures and specialists for acquisition of non-tactical systems under 8000 series procedures.

A separate culture has been spawned in which requirements are defined and approved in different channels, while separate procuring agencies have been established in each DOD agency to acquire general purpose ADPE. In some procurements, the approving official and the procuring activity are determined by how the item will be used rather than the nature of the item itself.⁴⁹

Congress Itself Sees Problems With the Act

An investigation was initiated by Senator William S. Cohen (then ranking minority member on the Subcommittee on Oversight of Government Management of the Senate Governmental Affairs Committee) to examine the federal government's practices for purchasing computers. It also found several deficiencies in those procedures:

- 1. Antiquated and inefficient computer systems cost the Government billions;*
 - 2. Computer modernization efforts have failed;*
 - 3. Government planning efforts are inadequate, and;*
 - 4. The computer buying process condemns the Government to pay more for less.⁵⁰*
- A computer buy takes two years, on average, though technology changes every 18 months;*
 - The current acquisition process is inflexible, bureaucratic and over-regulated;*
 - The process is inundated with protests; and,*
 - GSA has neither the staff nor other resources to do its job as described under the Act.⁵¹*

Three decades after the passage of the act, the Brooks Act appears anachronistic in an era of small low-cost desktop computers, rapidly changing technology, numerous suppliers, easy access to the computer market, the emergence of multimedia technology and the dawn of the information highway.⁵²

To resolve these deficiencies, Senator Cohen's report recommends the following:

- 1. Emphasize early oversight and planning;*
- 2. Reduce bureaucratic barriers to purchase;*
- 3. Avoid reinventing existing technology;*
- 4. Size projects to meaningful levels;*
- 5. Encourage Innovation;*
- 6. Create incentives for the government and contractors to perform;*
- 7. Communicate lessons learned, and;*

8. *Reevaluate existing procurements and halt new procurements until the computer acquisition process is improved.*⁵³

DMRD 918 Establishes DISA

Defense Management Review Directive (DMRD) 918 designated the Defense Information Systems Agency (DISA) as the central manager of the defense information infrastructure. The role DISA plays consists of:

- *implementing systems security,*
- *developing, specifying, certifying, and endorsing information technology standards,*
- *network management, engineering, design and control of long haul and regional communications and technical management of base level communications,*
- *management and workload control of data processing installations,*
- *central design activities for support systems activities, and*
- *acquisition of information technology components and services that require integration.*

*...DISA will assume responsibility for centrally acquiring information technology hardware, software, and services requiring systems integration. DISA will acquire commodity goods and services and will function as the IT reuse organization. DISA is delegated authority to procure IT assets and services..*⁵⁴

Now Secretary of Defense, William Perry, has forced the Department of Defense (while kicking and screaming) to the realization that standardization is expected, will continue to be a priority, and is here to stay. As a means to ensure the concepts of standardization and integration are fully embraced, DISA was established.

RECOMMENDATIONS

An Appeal to Sanity

Why does the procurement system exist, if not to acquire the goods and services that help that soldier, sailor, airman and marine do the job that he or she is tasked to do without getting killed. We can argue about the political, socio-beneficial, or economic aspects of government procurement policy all day long, but the bottom-line, I would argue, is that it serves to ultimately get rounds on target!

We are in the "information age" as many have said:

As new technologies tumble into use by U.S. soldiers... the point that all gee whiz gadgetry and digital displays amounts to more than incremental advances in the way America fights... the United States is in one of those rare historical periods when revolutions happen in how wars are fought... The revolution derives not from any single invention or idea...but from a range of rapidly developing technologies...(a)dvantage on future battlefield, it is said, will fall to smaller more mobile military units that rely on stealth technology and electronic warfare to evade enemies. In this vision, soldiers will be able to draw intelligence about their adversaries quickly and directly from continually updated electronic displays, then fire weapons from over the horizon... Joint task forces will blur present-day distinctions among the Army, Navy, Air Force and Marines and will survive on much leaner logistical support systems.⁵⁵

We want to digitize the battlefield. We want seamless information processing. We emphasize joint operations between DOD services, between governmental agencies, between our allies. We want to have lean and mean logistics systems.

The Joint Requirements Oversight Committee (JROC) serves now to ensure that weapons systems will meet joint warfighting capabilities needed in the future...

...A Joint Staff study found individual service information systems are more interconnected than officials had expected. Still, one complaint commonly heard among Pentagon Strategists is the absence of a firm integrating vision from the top.⁵⁶

Fiscal constraint has forced fiscal restraint. I feel that a large part of the "J" equation still has been left out. The JROC reviews IT related weapons system or "tactical" (e.g. 5000 series) procurements- but why not "non-tactical" (which are governed by 8000 series)? The simple answer is that acquisition of non-tactical systems are governed by the Brooks Act. But--- information systems will not become truly and totally integrated without a single vision emanating from the top.

We have created and perpetuated a myth that there is something different between black boxes for the fighters and the black boxes that the logistician uses to support the warfighter. We have allowed parochial thought and political agenda to displace imagination, innovation and creativity that is necessary to solve this problem. But do we have the *will* to dispense with arcane acquisition policies.

Is it so far fetched that medical, pay, and logistic information is not just as important to the warfighter as the bullets he puts in his rifle? Battlefield commanders have instant access to personnel and materiel gains or losses and can describe immediately and directly to higher command what his

specific needs are to sustain the fight. They can burn through the fog of war and instantaneously inform the supply and logistic system of what immediate needs are. Theater commanders can, in turn, more effectively and quickly respond to changing circumstances.

Because of total asset visibility, supporting logisticians can redirect or divert material in transit to where it is more critically needed. Because *information*, and not just data, is available to decision makers, "JITLOG" (just in time logistics) becomes reality. The warfighter can be sustained much more effectively with less money. Therefore, the logistics tail can be reduced and resources spent in maintaining a long logistics pipeline can be reapplied to getting the things the operator needs NOW. Since it is now visible *and accessible*, material in-transit is part of total system inventory. Less money must be devoted to inventory safety levels and can now be given to the operator.

The corpsman in the field can input directly from the battlefield the status of wounded soldiers, and link directly to the field hospital. The field hospital can immediately provide casualty information. Special medical needs are immediately known by those who can respond-- even though they may be thousands of miles away. More lives and limbs can be spared. Appropriate actions for servicemen killed in the line of duty- survivors benefits, insurance disbursements, etc. can be automatically, and thus more efficiently, handled.

The difference between tactical and non-tactical becomes fuzzier as we realize that a fighting force is only as effective as it can be sustained, and sustainability is tantamount to responsive logistics. A logistics system is effective only as long as it gets the **right material** to the **right place** at the **right time**-- and that takes information from the people to whom the support is being provided. But systems that fall under the realm of logistics are not "weapons systems" or "tactical" or "mission critical" and therefore must be procured under different rules and procedures; even though we are coming to require (desire?) them to operate seamlessly with the warfighter.

Brooks, GSA, GAO Don't Have the Answer

Has the Brooks Act done its job? Is it even needed anymore? Will any expanded blanket delegation of procurement authority (DPA) provide fundamental improvement? GSA has always had the ability to delegate its procurement authority. GSA habitually focused on initial procurement issues and did not provide follow-on oversight. History is full of GAO reports citing GSA with what amounted to rubber stamp delegations of procurement authority and not providing effective oversight.

Why hasn't the federal government been able to effectively modernize its computer systems? A main reason often offered is that the government does not do a good job in defining their requirements or planning their purchases. If so, where was GSA oversight in the failed modernization projects? If DPA's were provided, where was GSA to step in with the red light when the projects began to fail? A delegation of procurement authority does not mean relinquishing *oversight responsibility*. GSA never properly did its job under the law.

An increase in blanket DPA threshold increases GSA's responsibility in oversight. GSA would be required to expend more effort to ensure that the delegated procurement projects would come to positive closure. It will not free up resources for them to concentrate on the "really big ones" because they still have responsibility to provide oversight to the "little ones". A increased blanket DPA may also increase the tendency for the requiring agency to manipulate the system in order to justify a blanket DPA. Again, how will GSA apply the resources to do a better oversight job than they did in the past? Where will they get the resources, especially during this period of rightsizing? The following, from Senator Cohen's investigation, is revealing and very important to the case made against perpetuation of the Brooks Act:

Last year GSA approved 716 delegations totalling almost \$20 billion, and denied 84 with a value of \$1.4 billion..., in general most denials are not for substantive reasons... In almost all cases, procurements are not stopped-- just delayed for filing the wrong form... under provisions of the Brooks Act, GSA cannot impair or interfere with individual agency determinations of their computer system requirements... Many computer systems acquisition problems ultimately derive from inadequate requirements definition. If GSA cannot impact on these requirements and system planning, the Brooks

Act is irrelevant to successful computer system procurements.... the present debate focuses on changing delegation levels than on questioning the adequacy of the process...GSA will 'delegate, but not abdicate', implying that GSA will hold back DPA authority based on agency past performance in buying computer technology...⁵⁷

Surprisingly, since this report emanates from a member of Congress, the Section 800 panel contradicts this finding and states in its report that Congress has found "no compelling justification to change the law". It has been argued that the amendments to date (as described earlier) serve as testimony to Congress' perception of the Brooks Act's relevance. However, when the last amendment was enacted in 1986, *personal computers were just catching on*. Mainframe systems were still in vogue. Concepts of full interoperability, client/servers, open-systems architecture, battlefield digitization, et cetera were not yet developed and embraced by IT pundits. What can be a more compelling reason for true reform than the recognition that we must create an environment that is capable of producing an integrated Information Technology package that supports those who must answer the call to arms? True interoperability and compatibility, "common operating environments" and "common engines" cannot be attained if artificial distinctions are made based on IT application. Computers don't make any distinction between the different types of information they process- it ALL consists of 0's and 1's! There is little argument that proliferation of duplicative or redundant systems DOD wide has to stop; continued development and maintenance of non-interactive, stovepipe systems cost too much money. DOD today is moving to a single system in each "non-tactical" functional area. While the wisdom of the requirement to pick a functional "winner" before standardized processes are established is heatedly debated, I feel it can be argued that it is a step in the right direction.

Evolutionary Acquisition for Evolving Technology

Evolutionary Acquisition should become the favored approach for acquiring information technology systems, as it is now quickly becoming a commercial-world standard. A problem cited by many procurement specialists involves the current procurement criteria to fully describe and define life

cycle costs of systems being procured. This is quite an onerous and futile task- especially during times of rapid technological development.

Under Evolutionary acquisition philosophy, once a requirement is identified, and for sake of example, 80% of the functional requirements are defined, production should be allowed to commence using available technology. An understanding that as users become conversant with the capabilities and discover inadequacies of the fielded system, user feedback and participation can guide further development of the product. Therefore, user friendliness and true operator needs can be continuously incorporated in the design. The user gets a product he can use *now* rather than two or three years down the stretch, and also attains a particular ownership by participating directly in its further refinement.

Conclusion

The Brooks Act has done its job, but like my old Commodore 128 8-bit computer, it just does not handle the load in today's information based world. We must recognize that the acquisition of Information Technology today serves to support the *user*. We cannot continue to force our warfighters, logisticians, and knowledge workers to be the beneficiaries of the sour harvest reaped from seeds sown by bureaucratic infighting and political knee-jerk reactionism. The focus must be on the information **processes** that need to be developed and not on the physical product; *form follows function*. A **system of standards** rather than **standard systems** needs to be developed.

The Section 800 panel, GSA, GAO, and Senator Cohen all fritter around the edges of reform. In each group, there is a continuing reluctance to dispense with an almost neurotic need to legislate what should be imbued in all IT acquisition managers-- *good sound business practices*. Senator Cohen's investigation, I believe, provides sound recommendations, but still falls short in its demonstrated reluctance to release a certain amount of oversight requirement. A *new* paradigm must be established where responsibility is laid on the services for the execution of their information

technology acquisitions. Oversight becomes intrinsic if an environment is created that dispenses with the threat of the "stick" and rewards good planning and performance. That sounds utopian, and maybe a bit hard to accept when reality is brought to bear. There must be oversight, but the questions remain-- How much? and Who will do it?

The challenge to government is designing a system that can achieve the objectives of the Brooks Act-- effective oversight, competition, and fairness-- within the constraints of technology that require procurements to be made in less than eighteen months.⁵⁸

Does this mean that we must build another new structure to accomplish this? No. In many respects there is too much oversight being provided by numerous separate entities. GAO, Defense Contract Audit Agency (DCAA), Systems Command audit teams and Service Inspectors General (to mention a few) all play a part in providing "oversight". Inspectors leaving offices pass by other inspectors arriving- to review what has just been reviewed. Elements exist today that, when properly garnered and organized into a new IT acquisition construct, would provide justification to repeal the Brooks Act. These are:

Existing

- * Continued and enduring leadership at the SecDef and CJCS levels to husband the goals of "jointness" and interoperability.
- * Establishment of DISA as the "central IT clearinghouse" for DOD.
- * The recognition that stovepipes and redundant systems are too expensive and costly to maintain.
- * A greater realization that the commercial marketplace can provide via commercial-off-the-shelf or non-developmental items to satisfy government's needs.
- * GSA's ability to perform service as "commodity broker" for general purpose and commercially available IT hardware and software as they do with other commodities.
- * Maintain GSA's ability to serve as oversight provider for non-DOD IT acquisitions.

Need to Develop/ Refine and Institutionalize

- * Tie DISA in with JROC to engender seamless Operator/Logistician interface.
- * Development and refinement of Evolutionary Acquisition methodologies for IT procurements.
- * Establish firm and non-redundant responsibilities for DOD and service Inspectors General to

provide oversight of IT acquisitions (in conjunction with GAO).

- * Dispense with 8000 series IT acquisition requirements; IT procurements should be handled as any other agency procurement subject to FAR.

- * Establish clear link between GSA and DISA for the maintenance of "system of standards" to ensure interoperability between DOD and non-DOD.

The future?

I am convinced that we can "change the world." The electronic "third wave" is upon us and enlightened leadership now realizes the benefits that can occur through deliberate "battlefield digitization." Today, operators and logisticians, as well as those involved with IT acquisition, realize that stovepipe systems and their inherent lack of interoperability cannot proliferate. We must, however, take the next step to commit to the idea continued incarceration of tactical support system acquisitions by dogmatic adherence to the Brooks Act must not be allowed. Operators must commit to the concept that development of logistics related systems must be done in tandem with tactical systems.

There is no crystal ball which can fully describe all functional requirements and life cycle costs of any ADP system at program inception. We must use commercially available hardware and software where it makes sense. We must be willing to establish a new paradigm which allows us to exploit rapidly expanding technological capabilities at the risk of a loss of some oversight control. Evolutionary acquisition methodologies admittedly present risk (an acceptable one) to conventional oversight, but will allow for more rapid fielding of improved systems and advantageous implementation of new technologies. When a proper system of standards is developed, by definition it would seem, all systems developed would be interoperable. The proper role of GSA is in its strength as a large volume procurement agent for general purpose IT equipment. Organizations exist today that, when properly empowered, can give the precise level of oversight necessary.

Onward and Upward. Repeal the Brooks Act!

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