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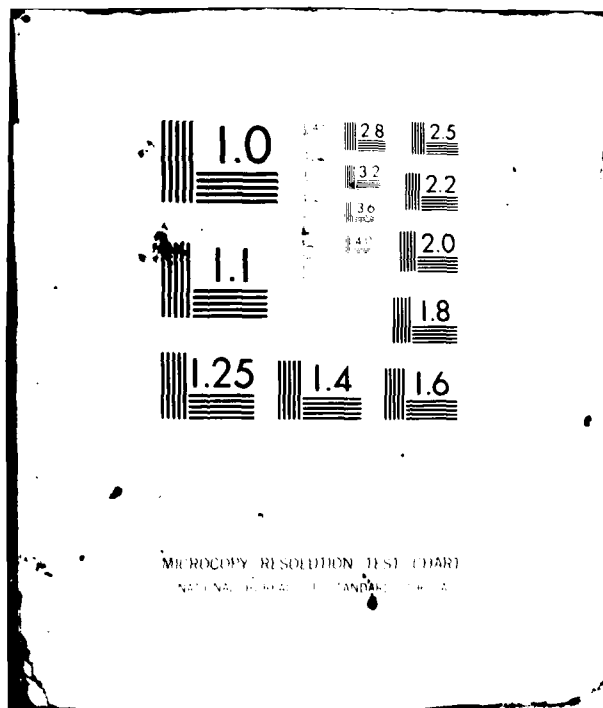
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NAVAL POSTGRADUATE SCHOOL

Monterey, California



THESIS

ADPE ACQUISITION: THE ACQUISITION OF THE
NAVAL POSTGRADUATE SCHOOL COMPUTER, A CASE STUDY

by

John Earl Boyle

September 1981

Thesis Advisor:

M.L. Sneiderman

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ADPE Acquisition: The Acquisition of the
Naval Postgraduate School Computer, A Case Study

by

John Earl Boyle
Lieutenant Commander, United States Navy
B.S., United States Naval Academy, 1972

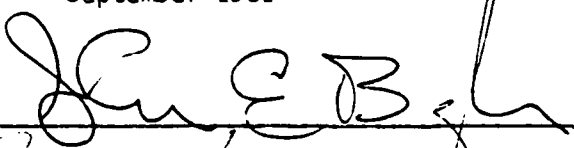
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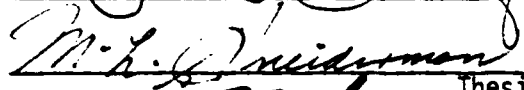
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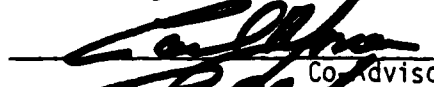
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ABSTRACT

The federal computer acquisition process is examined by studying one particular major computer system acquisition. The manner in which the principals involved conducted the acquisition in relation to the political and regulatory environment is examined and displayed in a case study format. Although the situational facts involve a computer acquisition for the Naval Postgraduate School, broad issues are developed which apply universally to public and private sector computer systems acquisition. The case exposes the reader to the issues of specification development, conversion costs, benchmark testing, and the role of competition in computer acquisition. Attention is focused on the environment in which a computer system need is developed and how that need is "marketed" through the review and support process of a large organizational buying system.

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I. INTRODUCTION

Recent studies by the General Accounting Office (GAO) have shown that many federal agencies are operating outmoded automatic data processing equipment. Over half the 1,366 medium and large scale computers in use at federal agencies are over ten years old and two or more computer generations behind current technology [1:1]. Investigations for GAO cite the current acquisition cycle, which is long, complicated and frustrating as a major contributor to the obsolescence of federal computers.

The federal procurement process has historically favored free and open competition to ensure the Government receives required supplies and services at fair and reasonable prices. This policy presents problems for federal agencies who wish to replace an inadequate computer system. If the agency acquires a larger, compatible computer from the same manufacturer on a sole source basis, other manufacturers are denied an opportunity to compete. On the other hand, if competition is held, the agency may face substantial effort, high costs, and operational disruption to convert its software programs to run on the new equipment [2:1]. Conversion costs of operating programs include:

- 1) labor costs for rewriting the program code
- 2) changing the programs supporting documentation
- 3) converting the data files
- 4) conducting program and system testing
- 5) costs of dual equipment operation during conversion
- 6) opportunity costs associated with applying resources to conversion rather than to new tasks
- 7) retraining personnel on new computer
- 8) costs of any necessary site modification

In this thesis the federal computer acquisition process is examined by studying one particular major computer system acquisition. The manner in which the principals involved conducted the acquisition in relation to the political and regulatory environment is examined and displayed in a case study format. Insightful conclusions about the process in general can be drawn from the facts presented in this single point research exercise.

The case study was developed from retained contract files and personal interviews with individuals actively involved in the acquisition of a replacement computer system for the Naval Postgraduate School. This acquisition was chosen for study because it was a major system acquisition (total costs 9.9 million dollars) still small enough to be studied in depth. The process of replacing the obsolete computer involved several important and controversial issues which ultimately led to a protest of the procurement to the General Accounting Office.

It is intended that the case study which is presented in chapter two, along with the teaching note presented in chapter three, be utilized in graduate or undergraduate level courses in computer systems management, acquisition contract management, marketing management and management policy. The case introduces the student to the Federal Government's computer acquisition process, and should provide insight to marketing strategies involved in the procurement of new equipment. Students analyzing the case should gain a new perspective into the difficult issues which are encountered when an organization wishes to replace an aging, inadequate major computer system.

II. A CASE STUDY

This chapter contains a case study intended for use in classroom discussion. It is illustrative of important aspects of computer acquisition strategy and procedures.

THE NAVAL POSTGRADUATE SCHOOL COMPUTER ACQUISITION

In June 1980, Mr. Robert Johnson, the Assistant Commissioner For Policy and Planning at the General Services Administration (GSA), was reviewing his decision on whether or not to revoke the Navy's Delegation of Procurement Authority (DPA) for the acquisition of a computer system at the Naval Postgraduate School. He would have to announce his decision immediately because the acquisition process was in its late stages and the Navy was about to award a contract. He had at most two days to take action.

He knew that revoking the DPA would surely bring forth a wave of criticism that GSA's "second guessing" was making it impossible for federal agencies to maintain an up to date computer inventory. The uproar resulting from his most recent DPA revocation, a non-competitive procurement being carried out by the Environmental Protection Agency, was still sharp in his mind. However, he knew that allowing the Navy acquisition to continue would be criticized as a further example of GSA's "rubber stamping" an agency's non-competitive practices. Worse

This case was prepared by LCDR J. E. Boyle, S.C., USN under the supervision of CMDR M.L. Sneiderman, S.C., USN, and Professor C.R. Jones. It is based on personal interviews and materials made available by the U.S. Navy Automatic Data Processing Selection Office. It is intended for use as a basis for class discussion rather than to illustrate either effective or ineffective handling of an administrative situation.

yet, he might very well be summoned to explain his decision to the House of Representatives Committee on Government Operations, a long time advocate of maximum competition in federal computer acquisitions.

Johnson had spent a great deal of time in the past few days becoming familiar with the facts surrounding this acquisition. His staff had compiled a case history of the acquisition which traced its progress over the last three years. He had found this history very revealing and wanted to review it one last time before announcing his decision.

RECOGNIZING THE NEED

In the Spring of 1977 the Naval Postgraduate school formed an ad hoc future planning committee to begin the process of replacing the existing IBM 369/67 system. The committee evolved from the school's formal Computer Resources Board in recognition of the growing inadequacy of the installed system. The committee was tasked with determining the needs and requirements for computer support for the future.

The Postgraduate School was proud of the degree of computer involvement by its students and faculty. Curricula programs were purposely developed around extensive use of the computer facilities, and student thesis research was heavily computer dependent. One member of the ad hoc committee stated:

"It became obvious to us that the computer had so permeated the the educational fabric of the school that whatever option we decided upon it had to be that option which provided the best system with minimum disruption of the ongoing educational process. A serious degradation of the quality of education would result if the computer facilities were to be unavailable for any extended time."

The committee's review showed that the increasing present and projected workload far exceeded the capabilities of the current system. The School had bought this system in 1967. At that time it was considered a landmark machine for it had special hardware and software to facilitate general-purpose, time sharing operation. Ten years later the machine was far behind the 'state of art' distributed network systems.

Upgrading the IBM 360/67 was deemed inadvisable because it was outmoded both technologically and operationally. It was a third generation computer with early-sixties technology and IBM would shortly be dropping all support of the major operating system software. It was aging and increasingly difficult and expensive to maintain. The eleven years of continuous operation was finally wearing out key components and cables. Maintenance costs were rapidly increasing and computer down time was becoming a major problem.

Complicating the maintenance problem was the wide mix of vendor's equipment utilized to make up the complete system. In many instances it was difficult to determine which vendor's equipment was causing a problem. Professor Doug Williams, the director of the computer center, complained, "Maintenance and equipment troubleshooting were becoming a major drain on my two group supervisor's time. We were not staffed to support any maintenance functions and we could not afford to pay service call charges to several different vendors. It was therefore necessary for us to narrow the possible problem areas before contacting a vendor. An unfortunate cost of this procedure was that my supervisors had less time available to assist the student and faculty users."

The IBM 360/67 was also inadequate in computing power and processor storage capacity. The increasingly complex research techniques common to many educational and research institutions which were pioneered on newer generation machines could not be effectively or efficiently run on the 360/67. The system also had an unbalanced configuration due to saturation of existing input/output channels and was restricted in its telecommunications support because of its requirement for hardwired controllers.

In the late Fall of 1977 the committee summarized its findings in a report to the school's Board of Advisors. The Board in turn recommended quick action to begin required work to effect major changes to the NPS computing system. Key among the boards comments was,

"Whether an upgrading of the current hardware system is made, or a computer replacement purchased, software conversion requirements must be recognized. The Board notes that the current NPS software system is a unique resource, and every attempt should be made to maintain its usability on the new system without incurring extraordinary conversion costs."

THE ROLE OF THE GSA

On 14 October 1977 Professor Williams was formally designated by the School's Provost as the individual in charge of procuring the future computer system. Doug was uniquely qualified not only because of his technical expertise but also because of his intimate involvement in the acquisition of the IBM 360/67 ten years earlier. This experience had left him with an understanding of the complicated relationships that existed not only within the Navy but also between the Navy and the General Services Administration.

The Brooks Bill (P.L. 89-306) had consolidated authority for the acquisition of automatic data processing equipment (ADPE) under the General Services Administration (GSA). The bill gave GSA the authority to acquire, operate, fund, and dispose of ADPE for the entire Federal Government. However, GSA was not to "impair or interfere with the determination by agencies of their individual requirements." Over the years, close review of ADPE acquisitions by the House Government Operations Committee chaired by Congressman Jack Brooks (D. Texas) had forced GSA to carefully review all ADPE actions to insure maximum competition was possible, given the agency's requirement. The overriding requirement for maximum competition had effectively eliminated the consideration of software conversion costs when evaluating a vendor whose equipment was not able to run existing software.

Although charged with acquiring all general purpose ADPE for the Federal Government, GSA had never been provided with sufficient personnel to accomplish this task. As a result, over ninety percent of ADPE acquisitions were accomplished by the requiring agency through a Delegation of Procurement Authority (DPA) from GSA. The wording of this DPA was critical as to what type of systems and what costs could be considered in proposal evaluation by the requesting agency. GSA maintained control of the procurement process by closely monitoring agency compliance with the DPA. Violation of any terms of the DPA could result in GSA recinding it.

ADPE ACQUISITION IN THE NAVY

ADPE procurement in the Department of the Navy is accomplished under the auspices of the Assistant Secretary of the Navy for Financial Management. (ASN(FM)). Although he must ultimately approve all major ADPE acquisitions the ASN(FM) maintains only a small ADPE staff. The major portion of justification and acquisition is the responsibility of the Naval Data Automation Command. (NAVDAC). This command is tasked with administering and coordinating the Navy Non-Tactical Automatic Data Processing Program. This responsibility includes collaboration on ADP matters with all ADP users; development of policy and procedures; approval of systems development; sponsoring of ADP technology; and career development and training of ADP personnel.

The Automatic Data Processing Selection Office (ADPSO) is tasked with accomplishing the actual selection and acquisition of ADP resources. ADPSO predates NAVDAC as an organization being established in 1967 to provide the Navy a full time organization with expertise in the areas of specification development and ADP selection and acquisition.

GAINING APPROVAL OF NEEDS

In January 1978 Doug Williams made initial contact with personnel at NAVDAC to begin the formal process to replace the IBM 360/67. As a result of these contacts a systems analyst from NAVDAC conducted a fact finding trip to the Postgraduate School in early February 1978. The analyst concurred in the findings previously reported by the faculty future planning committee and recommended that these findings be formally submitted to the NAVDAC in the form of an Automated

Data System Plan. The ADS plan in turn would provide the basis for a request for a delegation of procurement authority from GSA.

Originally NAVDAC had proposed to send a team of personnel to assist the school in developing the ADS plan but this help was turned down. Doug Williams commented, "I had worked with those people for several years and just felt that we could do a better job ourselves. Besides I knew how overworked they were and they would just not be able to give us the priority I thought we needed."

Discussions with the analyst centered around justifying the requirement for a replacement system which allowed continued use of the Post-graduate School's extensive software resources. It was estimated at that time that the replacement system would cost 6.5 million dollars to purchase or 1.3 million dollars per year to lease if done on a plug to plug software compatible basis. This estimate of cost was necessary in order to provide a funding figure to enter the Navy's budgeting cycle for fiscal year 1980 which was nearing its final stages.

Getting funds for the NPS computer would require high level involvement due to its submission in such a late stage of the Five Year Planning and Budgeting System used in the Department of Defense. Obtaining this support required the dedicated involvement of the school's Provost. The Provost, as the key civilian spokesman for the school and as a member of many committees and study groups, had frequent interactions with high placed managers and educational sponsors within the Navy and Department of Defense. These managers/sponsors had vested interest in the quality of educational support provided by the school.

Sponsors provided the input to various curricula taught at the school and research efforts so that the graduate would have a practical payback to blend with the theoretical concepts. One such sponsor was the Commander of NAVDAC, who placed a guiding hand on the computer science curriculum and found officers with masters level skills ready for induction into NAVDAC. The Postgraduate School computer was also used by the Defense Manpower Data Center (DMDC). The personnel data base maintained by DMDC was essential to justify and analyze defense manpower costs. The relationship with DMDC provided a champion for the budget request in the person of the Assistant Secretary of Defense for Manpower, Reserve Affairs and Logistics. The Provost ensured that the school's computer requirement remained highly visible to these officials by taking every opportunity, during phone calls and meetings, to keep them aware of progress made.

In order to obtain a reliable planning figure for the Provost to work with the computer planning committee had designated suitable combinations of various manufacturers' systems and priced these using prices quoted in GSA ADPE catalogs. Each proposed system was required to have the following capabilities:

- 1) 10 times present CPU power
- 2) 4 times processor storage (6-8 MBYTES)
- 3) more I/O channels
- 4) large capacity disk storage (400 MBYTES/spindle)
- 5) one single, integrated operating system

In order to confirm that their estimates of costs were accurate the planning committee invited on 30 March 1978 interested vendors to submit informal estimates of what they thought would be a suitable

system given the stated requirements. Estimates later received from the vendors confirmed the budget planning figure.

Utilizing the information obtained from their own efforts and those of the vendors responding to the informal request for information, the computer planning committee began compiling the various economic analysis, workload analysis, and impact statements required for the postgraduate school's Automated Data System Plan. Finally in August 1978 the ADS plan was completed and forwarded on to NAVDAC for ultimate approval by the ASN(FM).

Upon receipt of the Postgraduate School's ADS plan NAVDAC began its review to ensure the analysis was proper and dependable. The Postgraduate School had been quite successful thus far in gaining funding approval for the computer acquisition. The school's Provost had established the legitimacy of the computer requirement and funding in Fiscal Year 1980 seemed assured. However, the funds were deleted in late December 1978 just prior to the submission of the DOD budget. The loss of funding support threatened to significantly delay processing of the Postgraduate School's request as it would now be put "on a back burner" at NAVDAC. The Provost quickly marshalled the school's supporters to reestablish funding credibility and, on 19 January 1979, the commander of NAVDAC issued a memo directing his people to "not hold up processing the PG School ADPE request."

In the Spring of 1979 Doug Williams was under great pressure from the Provost who was unhappy with the seemingly endless delay on the approval of the ADS plan. The Provost directed Doug to go to

Washington and get the process moving. At first it was difficult to determine what was causing the delay. Eventually the Provost interceded and was informed by the commander of NAVDAC that one key individual had misgivings about the validity of the projected workload. Once this problem was surfaced Doug was able to quickly develop additional justification for inclusion in the ADS plan. On 20 April 1979 final approval of the ADS plan was obtained from the ASN(FM) and a Delegation of Procurement Authority was requested from GSA.

THE DELEGATION OF PROCUREMENT AUTHORITY (DPA)

By the administrative guidelines GSA has twenty days in which to act upon an agency's request for a DPA. By custom GSA will often ask for additional information on a DPA request in order to extend the twenty day limit. The requirement to include software conversion costs in the NPS procurement ran into immediate resistance from GSA, who requested additional information and stopped the twenty day time clock.

On 18 May 1979 representatives of the Navy and GSA met to review the positions developing in the respective procurement approaches. The GSA position favored a fully competitive procurement which allowed all vendors an opportunity to compete. The GSA proposed DPA would allow a fully competitive solicitation in which any required software conversion (estimated at 3.7 million dollars) would have to be absorbed by the vendor. The Navy had requested a DPA to enter into a competitive solicitation that would be capable of processing the current software without conversion. This, in effect, would limit the competition to IBM compatible computers. (i.e. IBM, AMDAHL, ITEL, CDC and others).

The Navy maintained that the GSA approach would be more costly to the government both in time and dollar costs due to the following factors:

a) software conversion costs

The cost to document the existing software library so that a new non-compatible vendor could consider a conversion bid was estimated at 250,000 dollars minimum and six months.

b) operational inefficiencies

The delay of one to one and a half years of the GSA approach would prove detrimental to the NPGS mission and to the customers supported by this computer system.

c) hardware requirements preparation

The Navy's cost and time required to develop a more definitive specification to spell out processing requirements and standards in order to accommodate new non-compatible vendors would be high.

Additionally the Navy felt that the GSA approach, while fully competitive on the surface, placed such unreasonable requirements on the vendor that few would respond. It was questionable whether responsible vendors would or could compete for a 6.5 million dollars total contract if they had to cover 3.7 million dollars in conversion cost. In order to provide substantive answers to some GSA concerns, the Navy agreed to have the Doug Williams brief the key GSA decision makers on the Navy's approach.

A Navy memorandum recording the issues discussed at the meeting added:

"After the meeting, at GSA's suggestion, we contacted the Federal Communications Commission as to their experience with the GSA approach recommended here. FCC had a similar situation and had requested an IBM compatible DPA to retain its present software. GSA insisted that FCC go fully competitive and require the vendors to absorb any conversion cost. It was implied in GSA that this had been a completely

successful effort. However, a FCC representative reports utter disaster. The FCC solicitation is now under protest by CDC to have the conversion package thrown out of the RFP. If that protest is successful, the contract will be based on equipment costs alone. After more than four years the representative said FCC is no closer to a computer than when they started."

Doug, now aware of the ongoing problem at the Federal Communications Commission, prepared his presentation. The presentation focused on obtaining maximum practical competition while striving for least total overall cost. It pointed out the magnitude of the actual costs of conversion which included:

- a) Rewriting of documentation and instructional materials generated over the previous twelve years.
- b) Contractor/user coordination problems.
- c) The requirement to establish a site for live parallel operations so that converted software was tested under live conditions.
- d) Recent experience at other government sites which had shown that conversion costs could be as much as six times greater than original estimates.
- e) Waste of student and faculty time while debugging "converted programs."

Many of these costs were not quantifiable and were not permissible considerations in contract awards and therefore could not be considered in evaluation of vendor proposals. They did however represent real costs to be borne by the Navy which would not be required under the more limited competitive approach requested. In light of the high costs described, Doug felt it was highly unlikely that the fully competitive approach would be the least cost alternative.

Professor Williams left the meeting feeling confident that he had provided a convincing presentation for the GSA representatives.

Subsequent discussions between the NPS Provost and the head of the General Services Administration pointed out GSA's doubts about the validity of the conversion costs cited by the Navy. GSA was reluctant to grant the requested DPA until they could verify these costs. The Provost was concerned that further delay would jeopardize the established budget support. He therefore directed Professor Williams to arrange for conversion costs to be estimated by a commercial consulting group recommended by GSA. The consulting group, after a two day study, determined that conversion could cost in excess of five million dollars. The Navy delighted that this estimate strengthened their case provided the study results to GSA in mid-July.

On 7 August 1979 the Navy was awarded a DPA for "the acquisition of a replacement system for an IBM 360/67 computer system located at the Navy Postgraduate School." The DPA went on to require competition "to the maximum extent practical" and recognized the requirement "that all proposed systems be software compatible with the existing systems and be capable of processing your existing inventory of software without change." This delegation required the acquisition to be consummated within twelve months. [See Exhibit 1] On 31 August 1979 the Automatic Data Processing Selection Office received direction from NAVDAC to proceed with the Postgraduate School acquisition.

DEFINING REQUIREMENTS

Although ADPSO exists to provide the Navy an organization with expertise in specification development, it does so only in an advisory capacity. The major responsibility for specification development rests with the user.

Anticipating approval of its acquisition strategy of maximum practical competition, the Postgraduate School had been finalizing required specifications and benchmark criteria during the summer of 1979. The Postgraduate School possessed unique resources in the area of specification and benchmark development in that it had a distinguished computer science and computer systems management faculty. The Provost was therefore able to call upon four professors, each holding a doctorate in the computer related fields, to serve with Professor Williams on the specifications committee. This group was fully aware of what was technically available in the marketplace and were intimately involved and knowledgeable of the basic requirements of the school. In fact, the technical knowledge available to this group far exceeded the capabilities of the personnel at ADPSO. ADPSO's role became one of questioning proposed specifications as being possibly too restrictive and matters of format.

The specifications as developed proposed to obtain from a single contractor a compatible large scale ADP system consisting of commercial or modified commercial items, to replace the IBM 360/67. Mandatory requirements included:

- a) central processing unit(s)
- b) local and remote terminal system
- c) software
- d) maintenance
- e) training
- f) manuals and documentation.

The general scope of the proposed system was described by functional specifications. Precise models or quantities of equipment required to meet the specifications and provide for expansion of the system as workload increased were to be determined by the contractor. The Benchmark Test¹ would determine the equipment configuration, size and quantities each offeror would need to meet the minimum specifications of the solicitation. Other items required for support (e.g. software, maintenance, training and documentation) would be determined by the hardware selected. The mandatory specifications² contained certain constraints in addition to the performance requirements set forth in the benchmark. These constraints dealt with mandatory Federal Information Processing Standards (FIPS), a requirement that the new system be capable of running all present applications and systems software without change, and be able to interface with existing Government owned equipment. In addition to the mandatory requirements,

¹The Benchmark test is a live test demonstration utilizing sample data to validate a proposed systems ability to accomplish a required processing exercise.

²Mandatory specifications are established by the Government as being essential to meet the Government needs. When set forth in the solicitation, the mandatory specifications must be met by an offer in order for such an offer to be considered responsive to the solicitation.

three desirable features were described. It was not necessary for a contractor to bid the desirable features in order for his proposal to be responsive to the solicitation. However, if desirable features were not bid certain set dollar values corresponding to the Government's estimate of their worth would be added to the evaluated cost of the proposal, constituting a penalty to that offeror.

THE BENCHMARK TEST

The benchmark test was designed to measure the ability of the proposed equipment to process, at acceptable performance levels, the initial and projected workloads for the Postgraduate School's computer system. The test would be evaluated on a pass/fail basis.

The benchmark test was composed of three segments:

- a) BATCH, test of batch-processing performance;
- b) TEST 150, test of system performance under a mixed workload of batch-processing, and interactive computing at 150 simultaneous terminals;
and
- c) TEST 250, test under mixed load of batch-processing and 250 interactive terminals.

It was designed to be a representative sample of the Postgraduate School's workload. The first test, BATCH, would establish the performance of the system on batch-processing work and provide a base measurement for subsequent tests under mixed computing loads. To pass the batch test the elapsed time from the beginning of the first to the end of the last job must be less than thirty minutes. Also the CPU Improvement Ratio for each job (as computed by comparing

the stated IBM 360/67 CPU execution time to the CPU execution time for the system being tested) must be a minimum of ten with a median value for all ratios of twelve or more.

TEST 150 required that the system be able to execute the batch-processing jobs while simultaneously interacting with 150 remote terminals simulated by utilizing a Remote Terminal Emulator. The interactive terminals would cycle through a script of commands representative of normal NPS workload. To pass this portion of the benchmark the system must be able to execute the batch jobs in less than three times the original time determined in the BATCH test. Also response time at the terminals would be measured and must meet requirements set forth in the specifications. TEST 250 was included in the benchmark to demonstrate that the proposed initial system could grow to accommodate the expected increase in workload over time. The offeror was allowed to expand the initially proposed system if necessary to accomplish TEST 250. System additions were required to be field-installable on the system initially installed. TEST 250 was the same as TEST 150 except that 250 remote terminals are to be emulated.

The methodology used to evaluate the benchmark test was as follows:

- a) A Government team would verify that the offeror's hardware and software is that proposed in the offeror's response to the RFP.
- b) The Government would compare the results of the offeror's capability demonstration to results obtained earlier at a government computer site. This validation would be conducted for each phase of the demonstration and would be graded on a pass/fail basis.

- c) The Government team would review the inputs and outputs from the terminal emulation and make the required calculations to determine if the proposed equipment met the required response and turnaround times for time sharing terminals as specified in the RFP.

EVALUATING PROPOSALS

The proposal evaluation system to be used involved two separate review bodies, the Source Selection Evaluation Board (SSEB) and the Source Selection Advisory Committee (SSAC). The function of the SSEB was to review all proposals received in accordance with the evaluation factors section of the solicitation document. This evaluation would be conducted in four stages sequenced as follows:

- a) technical acceptability
- b) successful completion of benchmark
- c) agreement as to terms and conditions
- d) contract life cost

If it was determined by the SSEB that any offerors proposal was not technically acceptable that proposal could be eliminated from any further consideration. Only offerors whose proposals were technically acceptable and passed the benchmark would be considered in the competitive range and be asked for "best and Final"¹ offers. A contract life cost would then be developed for each remaining offeror based on costing information submitted and considering all additional necessary costs to the Government. Costs would be applied in the month they occur and would be evaluated on "present value" analysis. The offeror evaluated and

¹Best and final offer is that offer which the contractor is allowed to submit after negotiations which will be used as the basis of evaluation for contract award.

having the lowest contract life cost over the projected eight year life of the system would be recommended for award.

The function of SSAC was to review and approve the solicitation document and the evaluation plan and to recommend to the ASN(FM) which offeror to award the contract. The SSAC was composed of relatively senior personnel in comparison to the SSEB and in general acted to ensure the process remained unbiased.

The system's specifications for the solicitation document were finalized in October 1979. Letters of interest were mailed to 137 prospective contractors on 9 November 1979 and the announcement of the solicitation was placed in the Commerce Business Daily on 20 November 1979. Thirty-two requests for solicitation documents were received at ADPSO by 20 December 1979. Solicitation documents were issued to the thirty-two requestors on 22 January 1980 with a deadline for offers of 10 March 1980. On 29 January 1980 copies of the Benchmark Test package were available for all interested parties.

THE COMPETITION

IBM Corporation and Federal Data Corporation (FDC) were the only vendors to seriously pursue the NPS contract. FDC, a small firm located in Chevy Chase, Maryland, functioned as an integrator of various vendor products. In this case FDC proposed a system with the main equipment (processor nucleus) from AMDAHL. FDC/AMDAHL expressed many questions and concerns throughout the period from the receipt of the letters of interest to the proposal due date. The first of nine letters received at ADPSO from FDC/AMDAHL questioned the remote terminal emulation

requirement for two hundred fifty terminals. Specifically FDC/AMDAHL felt that this requirement would force them to be non-responsive to the solicitation as they could not provide two hundred fifty terminals at their benchmark test center. FDC/AMDAHL went on to provide various alternative methods of testing the systems terminal capacity. Implied in the letter was the thought that this requirement strongly favored IBM due to their pioneering work in remote terminal emulation and their extensive benchmark facilities.

On 14 February 1980 FDC/AMDAHL's second letter pointed out additional issues which they felt were too restrictive. Most important among these was the requirement for the system to present a single system image to the user and operate with a single copy of the operating system software. The letter requested a thirty day delay in the bid submission date and suggested that FDC/AMDAHL and ADPSO conduct a technical conference to discuss the issues raised. The technical conference was held on 25 February 1980 and tentative agreement was reached on the single system image issue. The next day FDC/AMDAHL sent an additional letter to ADPSO summarizing their comments as a result of the 25 February meeting. FDC/AMDAHL went on to pose four specific questions as to the possible degree of involvement of IBM in the development of the minimum performance requirements. FDC/AMDAHL's analysis of the benchmark had shown that a single AMDAHL 470V/8 CPU could not meet the requirement even though it would increase NPS's computing power in excess of ten times the power of the IBM 360/57. It was therefore FDC/AMDAHL's position that the benchmark was excessively

restrictive. They went on further to state that they estimate costs of 3.1 million dollars to expand AMDAHL's benchmark center to accommodate the NPS benchmark. Additionally they were totally dependent on IBM to provide some key equipment for which IBM quoted delivery lead times of fourteen months. FDC/AMDAHL stated that "It is a well documented fact that our principal competitor teaches its marketing representatives to attempt to influence benchmarks into an area of complexity and size which allows them to use their resources of computer equipment, number of staff, and benchmarking expertise to create an environment where no other vendor can succeed. This allows the disqualification of all other vendors at the benchmark and prevents the Government from taking advantage of the cost benefits associated with competitive procurement." FDC/AMDAHL offered five alternative methods of benchmarking the NPS requirement which FDC/AMDAHL felt would allow them to compete.

In March, FDC/AMDAHL wrote several additional letters to ADPSO questioning and challenging different aspects of the solicitation document. In a letter dated 27 March 1980 FDC/AMDAHL stated that, "We have still outstanding, a number of problems, which if uncorrected will result in Federal Data submitting a bid which is unresponsive." FDC/AMDAHL went on to request a delay in closing of the solicitation. The Navy, concerned that a further delay past the already amended 31 March 1980 closing date, would not allow time for contract completion prior to the expiration of the DPA and refused to change the closing date.

THE CONTROVERSY

On March 31, 1980 two proposals were received, one from IBM and one from FDC/AMDAHL. FDC/AMDAHL also submitted a protest to the General Accounting Office protesting certain terms and conditions of the solicitation.¹

The detailed technical review of the proposals received was performed by the director of the NPS computer center and the NPS systems support group supervisor, both members of the SSEB. The technical review team was unable to validate the FDC proposal. The proposal was judged to contain sufficient deficiencies that only a complete rewrite would allow the review team to validate and evaluate it. The IBM proposal was evaluated as containing no technical deficiencies although a number of issues remained unresolved. The unresolved issues were in the form of clarifications or in the context of the relationship between the specifications and the special provisions. It was judged that the unresolved issues could be pursued during negotiations. By letter dated 15 April 1980, Federal Data was informed that their proposal had been determined unacceptable.

FDC/AMDAHL attempted to have ADPSO's determination, that their proposal was unsuitable, overruled. It was unlikely that FDC/AMDAHL's

¹Under the Budget and Accounting Act of 1921 the Comptroller General of the General Accounting Office (GAO) has the power to settle and adjust government accounts. Since procurement involves the expenditure of federally appropriated funds, GAO has asserted an extensive role in the field of bid protests under which he may review in detail the administrative procedures of federal agencies to determine whether or not (in its procurement process) the agency has complied with the statutes, policies, and regulations which govern federal procurement procedures.

formal protest to the General Accounting Office would result in a ruling in their favor. In fact several Comptroller General decisions supported proposal rejection when a proposal, such as the one submitted by FDC/AMDAHL, provided a repetition of the requirement as stated in the solicitation without a technical description of how the vendor would fulfill those requirements. FDC/AMDAHL therefore attempted to convince Navy and GSA officials in the ADPE approval chain that ADPSO had conducted the procurement unfairly and should be directed to re-open the solicitation. Their case suggested that ADPSO's administration of the procurement was flawed by three fundamental errors which violated the Delegation of Procurement Authority, Defense Acquisition Regulations and General Accounting Office precedent. FDC/AMDAHL set forth these errors in a letter to the Office of the Assistant Secretary of the Navy (Financial Management) as follows:

"First, ADPSO arbitrarily excluded Federal Data Corporation/AMDAHL from the procurement, thereby eliminating IBM's only known competitor. This action violated the Delegation of Procurement Authority ("DPA") which explicitly recognized that the Navy's requirements would adversely impact the scope of competition and therefore mandated that the Navy conduct the Procurement so as to achieve the maximum competition practical.

Despite the DPA's directive to achieve maximum competition, ADPSO structured its original solicitation so as to exclude all offerors but IBM. By its letters of February 14 and March 7, 1980, Amdahl advised ADPSO that the stated requirement for a central processing system prevented any offeror from bidding Amdahl units, the only non-IBM equipment compatible with the mandated software and of adequate size. This was because the combination of Amdahl machines required to fulfill the Postgraduate School's stated eight-year workload would be loosely rather than tightly coupled and therefore unable to run on one copy of the operating software.

Thus, the only machine available to satisfy both the stated workload and the single operating system requirement was an IBM 3033 attached processor or multiprocessor.

Despite the fact that ADPSO was notified as early as February 14, 1980, that its specifications totally eliminated competition, it failed to remedy the situation until March 25, 1980, just days before the closing date for the receipt of proposals, and it refused to extend the closing date to allow Amdahl or Federal Data to prepare a bid. Thus, prior to March 25, 1980, neither Amdahl nor Federal Data could have prepared a proposal capable of being deemed responsive to the mandatory requirements, and they therefore did not expend the substantial and costly (and obviously futile) effort necessary to do so. After March 25, 1980, Amdahl and Federal Data were, at last, able to bid, but they were arbitrarily denied sufficient time to prepare a thorough proposal for this complex procurement. IBM had more than two and one-half months to complete its proposal; Federal Data/Amdahl had only days to do so before the March 31 closing date. ADPSO had every opportunity to amend the offending restrictive specifications well in advance of the closing date for proposals. In light of the fact that ADPSO knew that no competition existed without such an amendment, it acted irresponsibly by failing to make the necessary modifications in a timely manner. ADPSO compounded its error when it ignored Federal Data's request for an extension and then rejected as "unacceptable" Federal Data's timely but hastily prepared submission.

Thus, ADPSO not only failed to conduct this procurement on a competitive basis, but it completely eliminated the only available competition from the outset.

Second, ADPSO failed to cancel the RFP and resolicit all potential offerors after Amendment 0005 substantially eliminated onerous and costly terms and conditions which had precluded Amdahl and others from submitting proposals initially as prime contractors. ADPSO's failure to resolicit violated Defense Acquisition Regulation 3-805.4(b) and General Accounting Office precedent. Furthermore, ADPSO's decision not to restore competition by circulating Amendment 0005 to all potential offerors was in derogation of the DPA's requirement that maximum competition be achieved.

Third, ADPSO failed to cancel the RFP and resolicit all potential offerors after Amendment 0006 vastly expanded

the scope of this procurement. Again, ADPSO's decision to share Amendment 0006 only with IBM, the sole remaining offeror, constituted a violation of procurement regulations and case law and revealed its unwillingness to abide by the terms of the DPA."

The Navy's position in rebuttal of FDC/AMDAHL's allegations was that the Navy had gone to extreme lengths to revise both the mandatory specifications and the benchmark test to avoid any possible restrictions on competition. Amendments 0001-0004 were all generated in response to concerns expressed by FDC/AMDAHL. Many concessions and revisions were made to the benchmark test procedure to accommodate logistical and other difficulties at the AMDAHL test center. A special testing procedure was developed expressly for FDC/AMDAHL to permit the testing of their loosely coupled multi-processor configuration as two separate systems. These accommodations were made despite their undesirability and the fact that they made performance comparison with other offerors difficult. In a letter to the General Accounting Office the Navy stated, "FDC/AMDAHL had received unmistakable indications from the Navy by 26 February 1980 that they would not be prevented from responding in this procurement. The requirement for a single-system image was dropped in the meeting of 25 Feb. and confirmed by FDC/AMDAHL in their letter of 26 Feb... In light of this, any FDC/AMDAHL argument that they didn't have enough time to prepare a proposal is specious. They had at least 30 days after resolution of the 'single-system image' issue."

In response to the Assistant Commissioner of the Automated Data and Telecommunications Service, the Navy stated, "You have raised the

question of whether in view of the limited competition if it would be desirable/proper to have the contracting officer reconsider and allow the company to repair its proposal.

Our comments are:

- a) Appropriate GAO cases state that when a technical proposal is so deficient as to require a "rewrite", the company should not be given a second "bite at the apple".
- b) Any attempt to change what is a correct decision will to a considerable extent dilute the integrity of the procurement process.
- c) Although a single source is not the most desirable situation to be in, it was arrived at properly and must be accepted.

The only way to increase competition on this acquisition would be to cancel the solicitation and readvertise. This is not acceptable to the Navy. It would most likely expose the Navy to a substantial claim for proposal costs."

The Navy later stated that changes made by amendment 0005 were a consequence of negotiations with the sole remaining contractor which after cost benefit analysis represented the best value to the Government. Amendment 0006 established an estimated maximum ordering quantity to limit the contractor's liability on this fixed price requirements type contract. Only the initial configuration buy is approved and funded. Any additional acquisitions under this contract would come after the necessary funding and ADP review approvals have been obtained for each proposed action.

AUG 1 1979

Mr. G. A. Peapples
Assistant Secretary of the Navy
(Financial Management)
Department of the Navy
Washington, DC 20350

Dear Mr. Peapples:

Based on the justification appearing in your letter of April 20, 1979, subsequent documentation and discussions between members of our respective agencies, we are granting you a Delegation of Procurement Authority (DPA) in respect to the acquisition of a replacement system for an IBM 360/67 computer system located at the Navy Postgraduate School, Monterey, California.

This procurement shall be conducted on a competitive basis to the maximum extent practical. We understand that your mandatory specifications will require that all proposed systems be software compatible with the existing systems and be capable of processing your existing inventory of software without change.

Recognizing that this type of specification will have a severe impact on the scope of competition, you are requested to insure that definite steps are taken by the Navy Postgraduate School to avoid such procurements in the future.

This DPA is subject to those limitations set forth in Enclosure 1 as are validated by initials. Failure to operate within the established limitations renders this DPA voidable. In particular, your attention is invited to paragraph 10 of the referenced limitations which pertains to statutory socio-economic procurement programs.

The acquisition action authorized by this DPA must be consummated within 12 months of the date of this letter.

(EXHIBIT 1)

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Any future reference to this DPA should cite Case Number CDS-9-240.

Questions about this procurement or requests for assistance may be addressed to Mr. James L. Arrington of our staff at (202) 566-1566.

Sincerely,

FRANK J. CARR
Commissioner

Enclosures

(EXHIBIT 1)

APPENDIX A

On 5 January 1981 the General Services Administration announced a complete revision to the procurement regulations governing automatic data processing equipment acquisition. The revision provided (for the first time since passage of the Brooks Act in 1965) for inclusion of software conversion costs. The revision stated,

"Full and open competition is a basic procurement objective of the Government. The maximum practicable competition among offerors who are capable of meeting the user's needs will ensure that the Government's ADP needs are satisfied at the lowest overall cost, price and other factors considered, over the system life."

It went on to state,

"Software conversion studies shall be performed for all procurements to ensure that the user's needs are met at the lowest overall cost, price and other factors considered, including the cost and other factors associated with conversion activities."

The GSA revisions were greeted warmly by agency ADP procurement officials who felt that they signaled a long overdue reduction of influence on the procurement process by Congressman Brook's House Government Operations Committee.

III. TEACHING NOTE

This chapter contains a teaching note to be utilized in guiding student discussion of the case study presented in Chapter II.

THE NAVAL POSTGRADUATE SCHOOL COMPUTER ACQUISITION

TEACHING NOTE

This case is an examination of an acquisition of a major computer system. Although the situational facts relate to the Naval Postgraduate School, broad issues are developed which apply universally to public and private sector computer systems acquisition. The case exposes the student to the issues of specification development, conversion costs, benchmark testing, and the role of competition in computer acquisition. Attention is focused on the environment in which a computer system need is developed and how that need is "marketed" through the review and support process of a large organizational buying system.

TEACHING OBJECTIVES

This case is intended for either graduate or advanced undergraduate level courses in computer systems management or acquisition management. The case illustrates the process utilized by the United States Government in obtaining general purpose computer systems. In analyzing the case the student must evaluate the contributions made by the numerous organizations involved in overseeing federal computer acquisitions. Underlying the acquisition process is the basic philosophy that federal procurements should rely on full and open competition to obtain required goods and services at fair and reasonable prices. This

This teaching note was prepared by LCDR J. E. Boyle of the Naval Postgraduate School, Monterey, California.

philosophy is shown to be in conflict with the best interest of the government when replacing major computer systems. The costs of converting application programs from one manufacturer's machine to another are so high that they must be considered and, once recognized they effectively eliminate free and open competition.

DISCUSSION QUESTIONS

- 1) What effect does the one year term of the DPA have on the acquisition process?
- 2) Is it possible to have true competition in a computer replacement? What are the longterm implications of conversion costs for an organization buying its initial computer?
- 3) What is the role of top management in a computer acquisition?
- 4) What advantages does an incumbent vendor have in obtaining a follow-on contract?

ANALYSIS AND EVALUATION

The computer acquisition process can be viewed as being comprised of five distinct phases:

- 1) the need for the ADP capability must be documented and approved
- 2) detailed specifications and an evaluation plan must be prepared
- 3) vendor proposals to meet stated specifications must be solicited
- 4) vendor proposals must be evaluated in accordance with the evaluation plan
- 5) the most advantageous proposal to the buyer is selected and contract awarded

Each of these phases is interrelated and interdependent. The manner in which the needs are stated in phase one can have profound impact on specification development, what the vendor can propose in response to those specifications and ultimately which vendor will be selected.

The following key terms/responses apply to the above discussion questions. -Chalkboard terms for discussion. Question One;

- false deadline
- inflexible milestones

Utilization of a specific time period in which the acquisition must be completed causes the buying agency to be inflexible when asked to extend an established milestone. The process provides for numerous levels of review which in themselves cause a considerable delay prior to DPA approval. Fear of running out of time on the DPA, and the inherent danger of having to "revisit" the approval chain, can cause the buying agency to refuse milestone extensions on factors other than what is best for the instant procurement.

Question Two;

- conversion costs
- longterm relationship
- dependence on vendor

Modern complex organizations have become dependent on computer systems to process an enormous volume of information. As the complexity of the organization increases so does its dependence on the computer. Factors to consider before converting application programs (software) include high labor/material costs, significant operational disruption

and the possibility that the new system might not work. Fear of a new vendor not being able to provide a fully capable system can cause the buyer to establish specifications which limit or eliminate competition in hope of retaining an incumbent vendor. By restricting the competition in this manner the buyer may not receive the price lowering benefits of full competition.

In cases where full competition is desired, inclusion of extensive conversion costs can effectively eliminate non-compatible vendors from consideration. Buyers of computer systems should recognize that their selection of an initial vendor will effect any future upgrading or replacement actions.

Question Three;

- establish momentum
- break deadlocks

In a large undertaking, of such importance to an organization as replacing its central computer system, two levels of management are required. First, a daily operating level must exist with sufficient authority and technical expertise to accomplish the routine requirements of the process. Second, the top manager must, by his active interest, show that the requirement has sufficient priority to compete successfully with other organizations requirements for resources. Invariably hurdles are encountered by lower level managers which stop progress and require intervention by the top manager. In these cases top level assistance can result in expeditious resolution of what otherwise could be a long delay.

Question Four;

- early knowledge of requirement
- known commodity
- possibility to influence customer requirements

Clearly, IBM was able to take advantage of its position as the incumbent contractor, and its extensive marketing organization to be active in the impending NPS computer acquisition long before its competitors. FDC/AMDAHL, with limited marketing resources, was not aware of the acquisition until it was formally announced just four months prior to the proposal date. FDC/AMDAHL had to expend considerable effort during the relatively short proposal preparation time to become familiar with the requirements and attempt to obtain changes in the solicitation which would favor its system.

TEACHING PLAN

Discussion can be started with questions about the contributions of the various agencies involved in the acquisition process. This is primarily for eliciting the students' feelings as to the complicated nature of the process utilized in replacing government computers. One may ask, for example, whether the General Services Administration (GSA) is accomplishing its responsibilities under the Brooks Act? Does GSA contribute to the economic and efficient procurement of ADPE in the Federal Government?

The discussion should continue to examine the impact of conversion costs. Useful questions would include, what costs should be considered when estimating conversion? What would be the impact of ignoring these costs? What impact does including these costs have on potential contractors?

Having established the complicated nature of the process and the substantial impact of conversion costs, discussion should be focused on how each of the principals involved with the Postgraduate School computer acquisition acted within the process to achieve their objectives. The students should be asked to offer their opinions as to what each principal (Postgraduate School, GSA, NAVDAC, ADPSO, FDC/AMDAHL, IEM) had as its objective, and how successful it was in attaining that objective.

The students can then offer their decision on whether or not the DPA should be revoked, giving their justification for the chosen action. Finally discussion should focus on what factors in the acquisition process could be improved, and what actions can be taken by management to avoid or reduce the problems encountered.

LIST OF REFERENCES

1. U. S. General Accounting Office Report, "Continued Use of Costly, Outmoded Computers in Federal Agencies Can Be Avoided," AFMD-81-9, 15 December 1980.
2. U. S. General Accounting Office Report, "Conversion: A Costly, Disruptive Process That Must Be Considered When Buying Computers," FGMSD-80-35, 3 June 1980.

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