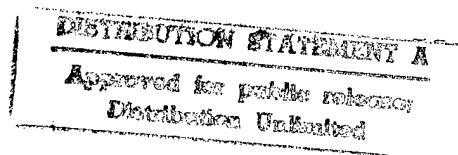


Contractor Evaluation Program

**Final Report for the
Contractor Past Performance
Systems Evaluation Study
to the
Deputy Under Secretary of
Defense (Acquisition Reform)**



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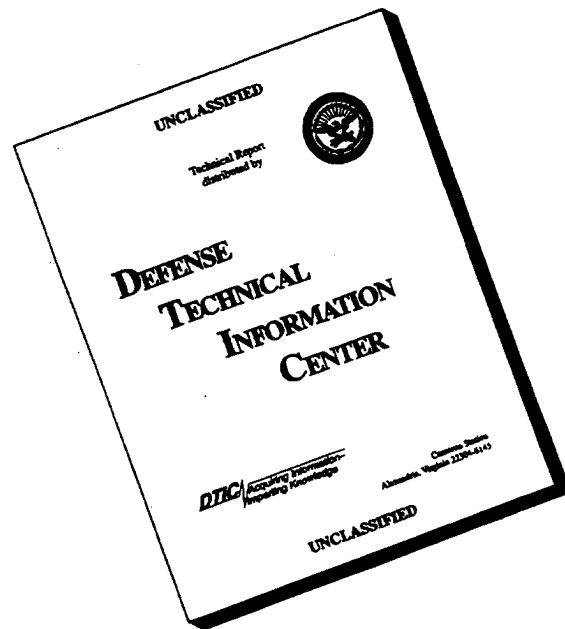
June 17, 1996

Arthur D. Little, Inc.

Contract No. DASW01-95-F-2182

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SECTION I. Executive Overview

A. Background

Policy, legislation, and regulations have been issued on contractor past performance as it relates to Government contracting over the past three and one half years.

Methods and approaches to implement this direction within the Department of Defense (DOD) have been studied, discussed, and evaluated by officials in the Office of the Secretary of Defense (OSD) and in the DOD components. The Past Performance Coordinating Council (PPCC) has also been active in developing a DOD-wide position on contractor past performance.

The implications of these actions has caused some concern within the DOD as to the best approach for implementing the contractor past performance initiative. Because of these concerns, the Deputy Under Secretary of Defense (Acquisition Reform) determined that an independent study was needed before implementing a department-wide policy dealing with matters related to contractor past performance.

The current plan within the DOD is to issue a change to the Department of Defense FAR Supplement (DFARS) to clarify how contractor past performance will be handled within the Department of Defense. A position on the specific content of the DFARS change is in the final stages of coordination.

There continues to be some concern and reservation by officials within the DOD about issues that surround the implementation of actions currently directed by the existing policy and regulations. Policy and regulations state that implementing action can be tailored to the particular circumstances and nature of a procurement program, yet, there has been no consensus on the extent of the tailoring that can and should be done, nor on who should be empowered to do the tailoring.

The Deputy Under Secretary of Defense (Acquisition Reform) has concluded that further study is needed before implementing a department-wide policy dealing with matters related to contractor past performance.

B. Objective and Scope

The principal objective of the study was to provide information and independent evaluations that will assist in the formulation of a DOD-wide policy on the collection and use of information on the past performance of contractors. The scope of the study was focused in two broad areas:

The first area addressed the following items:

- All existing past performance processes and systems used within the DOD, and a sample of comparable processes and systems used by other federal agencies and by commercial firms;
- The manner in which past performance information is collected and validated;
- The past performance data elements prescribed by the functional users;
- Customer satisfaction with past performance information and the systems that provide this information;
- Customer views on the difference that past performance information makes in the source selection process;
- An economic analysis to determine whether the use of past performance information makes good business sense;
- The appropriate use of contractor past performance information;
- The current use of past performance information within DOD; and
- The administrative burden associated with collecting the information.

The second broad area in which the study focused involved the development of a model program to assist in the implementation of past performance policy within DOD. This model was developed using the results from an assessment of the items listed above, under the first focus area.

C. Summary of Results.

Section II of the report provides a detailed discussion of the study. The Executive Overview summarizes these results in the following areas:

- Government perspective for dealing with contractor past performance,
- Industry perspective for dealing with contractor past performance,
- A proposed model for dealing with contractor past performance in DOD, and
- A business case analysis that evaluates some of the major alternatives for dealing with contractor past performance in DOD.

1. Government Perspective

This study area evaluated existing contractor past performance processes and systems. A prerequisite to this evaluation was a definition of terms and a structure for organizing the information that is currently available and relevant to the past performance of contractors. The definitions that were used made a distinction between the following types of information that pertains to the past performance of contractors:

- Performance information gathered at the time of a specific procurement decision on an ad hoc basis and for the exclusive use in that decision, and
- Performance information gathered on a routine basis as contract work is performed, is further divided into:

- Information gathered for purposes of managing the active contracts, and
- Information gathered with the intention that it will be made available for use in acquisition decisions at some future date.

When identifying and evaluating existing past performance information systems, focus was placed on the information available for use in acquisition decisions at some future date. The following criteria were also used to precisely identify the existing processes and systems:

- Information is collected, validated and filed to support future source selection decisions
- Opportunity is provided for review, comment and rebuttal of information by the contractor
- Provisions are established to resolve disputes between the contractor and the government
- Information is subject to the same controls and safeguards as other information used in source selection decisions
- The system is in operation and currently supporting source selection decisions.

DOD Past Performance Processes and Systems

The application of these definitions and criteria revealed a very limited coverage for past performance information systems that are currently in use in DOD relative to the requirements envisioned by the proposed FAR and DFARS implementation.

The analysis revealed two basically different types of systems. One type relied on an *appraisal* of the contractor's performance by an official, or officials, in a position to make a judgment on how well the contractor had performed his task. This is the system envisioned by the new Part 42.15 of the FAR. The other system relied on quality and delivery information gathered and recorded for the purpose of *tracking* the specific line items delivered under the terms of an existing contract. A third system involved the *certification* of contractors based on their past performance and used information taken from the systems noted above.

Using this definition structure, the following contractor past performance systems were identified:

- Performance *appraisal* systems included:
 - Contractor Performance Assessment Reporting System (CPARS). Developed and used within the Air Force primarily for major systems acquisition programs.
 - A&E Contract Administration Support System (ACASS). Developed and used by the Army Corps of Engineers.
 - Construction Contract Appraisal Support System (CCASS). Developed and used by the Army Corps of Engineers.

- Performance *tracking* systems included:
 - Red/Yellow/Green (RYG) system. Developed by the Navy Supply Systems Command and used by some procurement organizations within the Navy when procuring commodities with an assigned Federal Supply Classification code.
 - Automated Best Value Model (ABVM). Developed and used within DLA, also when procuring commodities with an assigned Federal Supply Classification code.
 - Contractor Profile System (CPS). Developed by DLA and which has seen some limited use.

Section II. A. of the report discusses and evaluates these existing systems based on experience to date.

Other Government Departments and Agencies

Past performance policy implementation was also a matter of concern within the other Government agencies. The GSA Federal Supply Service was found to have an existing system. Most other Government agencies were focused on collecting and validating past performance information for future use in procurement decisions (i.e., the requirements contained in the new Part 42.15 of the FAR).

One of the most noteworthy findings was a NASA decision not to collect past performance information before their contracts were signed. This decision was based on the fact that award fee contracts cover 80% of NASA's procurement dollars. These contracts already provide for a periodic evaluation of the contractor's performance. Another factor in this decision was a recent experience with a contractor evaluation system that proved to be an administrative burden and that did not provide the expected benefits. NASA will, continue to use past performance as a standard evaluation factor in source selection.

Principal Results

From a Government perspective, the study revealed the following:

- The DOD acquisition program is mammoth, covers multiple business areas, and dwarfs industrial conglomerates in the range of products and services procured, the number of procurement organizations, and the dollar amount of the program.
- When used as an evaluation factor in source selection, past performance information is typically gathered when needed and on an ad hoc basis
- There are currently very few instances where past performance information is collected and validated on a continuing basis for future use in contractor selection decisions (as now required by Part 42.15 of the FAR);
- In all cases where past performance information is collected and validated for future use, the process and related system were tailored to a specific business area
- There are two principal approaches for collecting past performance information on a continuing basis --

- Performance appraisals (i.e., a "report card" at the contract or delivery order level), and
 - Performance tracking (quality and delivery data at the contract line item level)
- The routine collection of past performance information has been tried periodically over the past thirty years. These initiatives have typically been abandoned because the value of the information in contracting decisions was not found to offset the cost and administrative burden of collecting validating, and maintaining the information.

2. Industry Perspective

The use of contractor past performance information was generally found to be an integral element in broader programs designed to improve the purchased goods component of the cost of goods sold. The motivation for these supplier evaluation programs was provided by a need to achieve and sustain a competitive position in the market place. The material purchased by the average U.S. manufacturing firm typically ranges from about 40% to 65% of sales, thus, attention to these cost elements, to supplier evaluation programs, and to supplier relationships, was found to be of major importance to the continued viability of the industrial operations.

Another trend that was evident in many industries, was a move to establish more profitable, longer-term relationships with fewer suppliers. An important factor in this process was the demonstrated performance of particular suppliers based on a number of criteria, including the past performance of the suppliers.

Although the industry programs varied in many of their details, one of the common elements was a recognition that successful programs needed to be tailored to discrete business areas. An initial step in this process was a thorough analysis of the specific business area with regard to company requirements, past and projected, as well as to industry trends and the specific contractors and suppliers that represented current and potential sources of supply. This step was designed to lead to a sensible program depending upon the specific business area.

In summary, the following were the principal results from an industry perspective:

- There is no acquisition program anywhere in industry that is comparable to DOD's program in size, scope and complexity
- All past performance initiatives were focused on discrete business areas or strategic business units
- The motivation for past performance programs in industry is to improve or maintain the competitive position of the operation
- All programs are integrated with overall strategic and planning considerations

- Industry programs tend to exhibit common characteristics which include:
 - Business area strategy and management
 - Supplier approval
 - Quality system assessment
 - Performance assessment
 - Performance measurement feedback
 - Supplier development and improvement initiatives
 - Total cost assessments
 - Item and part-level certification
 - Recognition programs

A discussion of industry initiatives and each of the program characteristics listed above is contained in Section II B of this report.

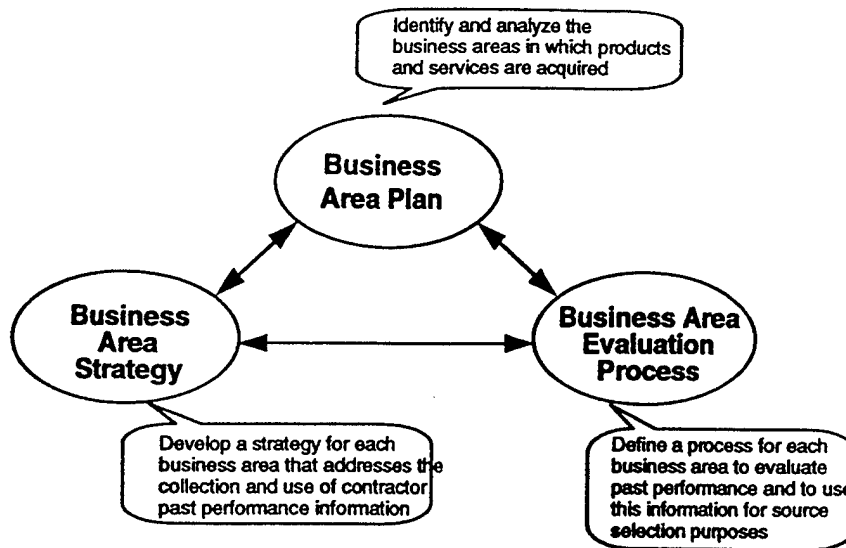
3. Contractor Evaluation Program Model

One of the principal challenges in conducting the study was to find ways to discuss and explore alternatives for dealing with contractor past performance and related issues such as business area analyses, strategic planning, contracting for best value, improving contractor performance levels, and gathering past performance information. A Contractor Evaluation Program model was developed to serve as a frame of reference for evolving a consensus on a viable approach. This model was also developed to address the related issues identified above.

The diagram, on the next page, portrays the major elements of the model functions that are typically involved in the acquisition of products and services. In the center of the diagram are the three principal elements of the model. The left side of the diagram identifies the major functions that deal with the collection, validation, and retention of past performance information for future use and which are affected by the outcome of the business analysis, the business area strategy, and the business area evaluation plan. The right side of the diagram depicts the major functions typically performed during contractor selection.

This model was developed from the Arthur D. Little case histories and discussions with Government and industry officials who represented a cross-section of the functions and disciplines involved in the acquisition of products and services. In addition, two workshops were held with representatives of Acquisition Reform Senior Steering Group (ARSSG) members.

A description of the model is contained in Section II C of the report. To some extent, the model may be viewed as a "straw man" at this stage, nevertheless it is believed to be an important step in achieving the objectives of the study. The Contractor Evaluation Program model has three principal elements, as depicted below.



These principal elements are:

- *Business Area Plan* -- provides an analysis of the business areas in which contracts are awarded,
- *Business Area Strategy* -- establishes goals and objectives for use of contractor past performance information and related issues in the business area, and
- *Business Area Evaluation Process* -- defines the process for executing the plan and strategy in the business area.

The principles used in designing and developing the model included the following:

- A cost-effective approach to the collection and use of contractor past performance information depends on, and is sensitive to factors related to the business areas in which products and services are procured and used (as opposed to a universal approach that can be applied to the full range of products and services procured by DOD in all areas).
- A business area consists of a homogeneous group of products or services which share similar characteristics and for which a forward-looking plan and a coherent and congruous strategy and evaluation process can be developed.
- Business areas can be local or extended in application, and in their most robust form, they constitute the horizontal integration of products and services.
- The process for implementing contractor past performance issues in a particular business area is developed from business area plans and strategies for the specific business area and typically involves a cross-functional team effort.
- The initial and vital step in developing plans and strategy for a business area is an analysis that covers the requirements for the product or service, past and projected; the industry composition and basis of competition, and the market trends and performance of leading companies in the industry.
- The business area plan and strategy will provide the basis for developing a tailored approach to the collection and use of contractor past performance information in the particular business area as well as the foundation for a total

program designed to incorporate best value practices into the procurement process and to attract contractors and suppliers committed to high levels of performance.

- Information technology will be utilized to facilitate communication between Government managers in separate organizations with a need to share information about business area strategies and plans and the past performance of contractors in those business areas.

A description of the Contractor Evaluation Program is contained in Section II C of the report.

4. Business Case Analysis

Because this study is designed to primarily assist in the implementation of past performance policy, and not in systems development, the business case analysis is therefore focused on three alternative policy implementation approaches to past performance. The three alternative models used in the analysis were the "As-is" model, which is structured from the information in Section II A; the DFARS model developed from information in the FAR and the proposed changes to the DFARS; and the Contractor Evaluation Program model, developed from information in Section II C.

The business case analysis focused on the following areas:

- Economic, process and automated data information systems analyses of current past performance systems.
- Analysis of recent changes to the FAR and proposed changes to the DFARS contractor past performance relative to the As-Is model.
- A comparison between the Contractor Evaluation Program and the FAR/DFARS model programs.

The objective of the *economic analyses* aspects of the business case analysis was to provide information and insight that would help determine whether the use of past performance information in the procurement process makes good business sense.

We first reviewed and diagrammed the *processes* for the systems that are currently in use, and identified the principal activities that are involved in the collection and use of past performance information.

In examining the existing systems, the major cost elements were found to be related to the collection and validation of performance information for possible future use in source selection decisions. The major steps in that process are:

- Evaluate and record performance of contractors on active contracts,
- Provide opportunity for contractor to review performance information,
- Receive response from contractors in the form of comments, rebuttal, or additional information relative to their performance,
- Review any response from contractors and resolve contractor evaluation, and

- File all information as "Source Selection Information" for possible future use within the next three-year period.

Attributing specific and quantifiable benefits to the existing systems was extremely difficult. Factors that complicated these determinations included the following:

- Some of the information systems were in the early stages of implementation and specific, tangible benefits were yet to be demonstrated;
- The value of specific information was difficult to isolate because of the multiple sources and types of information that are available for use in a procurement process, and because the ultimate award decision typically involves a range of information from many sources
- The existing systems were tailored to specific business areas and used information and evaluation factors unique to business areas (which did not necessarily have relevance outside of that business area).

Whereas these systems seem to be operating well and for the purpose intended, there was concern that an attempt to design a system to cover all active contracts, in all product and service codes, will prove to be extremely costly with very limited benefits that can be supported by analysis.

Because of the design features of the Contractor Evaluation Program model, as previously enumerated, the cost/benefit ratio appears to be very favorable. This is largely because the specific contractor past performance information issues will be addressed and resolved at the business area level.

The automated data information system portions reviewed and documented the information technology currently used, or planned for use, in two of the existing information systems. The ultimate resolution of issues related to the collection and use of contractor past performance information will clearly benefit from the application and use of information technology. The objective of this task area was to explore some of the possible applications for this technology and to describe the potential system development options that appear reasonable and feasible at this point.

The comparison of existing programs, proposed DFARS, and the Contractor Evaluation Program was the final aspect of the business case analysis. This analysis determined that there were criteria that could be used to evaluate the overall performance of contractors and that these criteria could be reduced to common data elements for all types of products and services. We also found that the evaluation criteria must be tailored to the type of work being performed in order for the information to be useful in making contractor selection decisions at some future date. We concluded that it is not practical to strive for a single DOD-wide past performance information system that prescribes the same detailed evaluation criteria and common data elements for use in evaluating contractor performance in all acquisition cases. We propose collecting that information in one system.

The business case analysis is in Section II D of the report.

D. Conclusions

One of the principal questions that the study addressed was, should DOD use information on the past performance of contractors in contractor selection decisions? Clearly, the answer here is yes, primarily because:

- It makes good business sense as proven by overwhelming industry acceptance
- It is being used successfully in DOD now, although on a very limited scale
- It can be tailored to fit specific circumstances, although proposed DFARS policy has the effect of limiting tailoring.

Other related and more detailed questions that are dealt with in the study include, what information should be collected?, what type of approach should be used?, and what direction and guidance should be provided? In dealing with these question, we believe that the following general principles have relevance to formulating a sensible contractor past performance policy within the DOD:

- Decentralize --The range of products and services, and the variance in the size, scope, type, and complexity of contracts makes a standard, DOD-wide system impractical. Government and industry experience support a decentralized approach, supplemented with general guidelines, decision rules, best practices, and information technology support.
- Business Areas Focus --The implementation of past performance should focus on individual business areas at the operating level. These encompass similar products or services for which a coherent and congruous strategy can be developed by organizations with procurement authority and technical responsibility.
- Total Program Context --Past performance needs to be viewed in the context of a total program that goes beyond the collection and use of past performance information, and covers:
 - the analysis of individual business areas (both internal and external factors)
 - development of a sensible strategy for contractor past performance at the business area level
 - processes designed to implement the strategy for business areas in which the organization is active
- Horizontal Integration --The business area concept starts at the local level, where it is integrated with the overall acquisition strategy and procurement planning for the business areas. As business area alliances are formed, it can exert a horizontal integration effect by joining similar business areas across the services and DLA. The implementing direction needs to emphasize the need for this integration and coordination.
- User-Driven --The users of past performance information need to have the principal role in defining what information to collect, when to collect it, and how to make it available for their use in selecting contractors. And the users should include the technical, management, and procurement officials who are involved in, and responsible for making contractor selection decisions. In this regard, the DFARS policy for collection is separate from considerations of future use.

in, and responsible for making contractor selection decisions. In this regard, the DFARS policy for collection is separate from considerations of future use.

- Simple --To be effective, the past performance approach has to be easy to understand and explain, without being simplistic, or it runs the risk of being misunderstood, ignored, or both.
- Share Information --Systems and processes for sharing past performance information among organizations depend on all of the above and should be dealt with after performing the steps above.

Section III of the report expands upon these conclusions.

SECTION II. A. Government Perspective

1. Establish Past Performance Information Definition

Past performance information is relevant information regarding a contractor's actions under previously awarded contracts. It includes:

- The contractor's record of conforming to specifications and to standards of good workmanship
- The contractor's record of containing and forecasting costs on any previously performed cost reimbursable contracts
- The contractor's adherence to contract schedules, including the administrative aspects of performance
- The contractor's history for reasonable and cooperative behavior and commitment to customer satisfaction
- The contractor's business-like concern for the interest of the customer

2. Develop Past Performance Information Structure

The 35 systems and processes, listed in Appendix A, that we examined contained or in some way dealt with past performance information but did not have comparable information system structures. To add to the challenge, most of the databases contained the information in multiple categories, e.g. company, contract performance, administrative. We found it useful to devise a scheme to classify all past performance information within the context of all government information. This information structure is shown below:

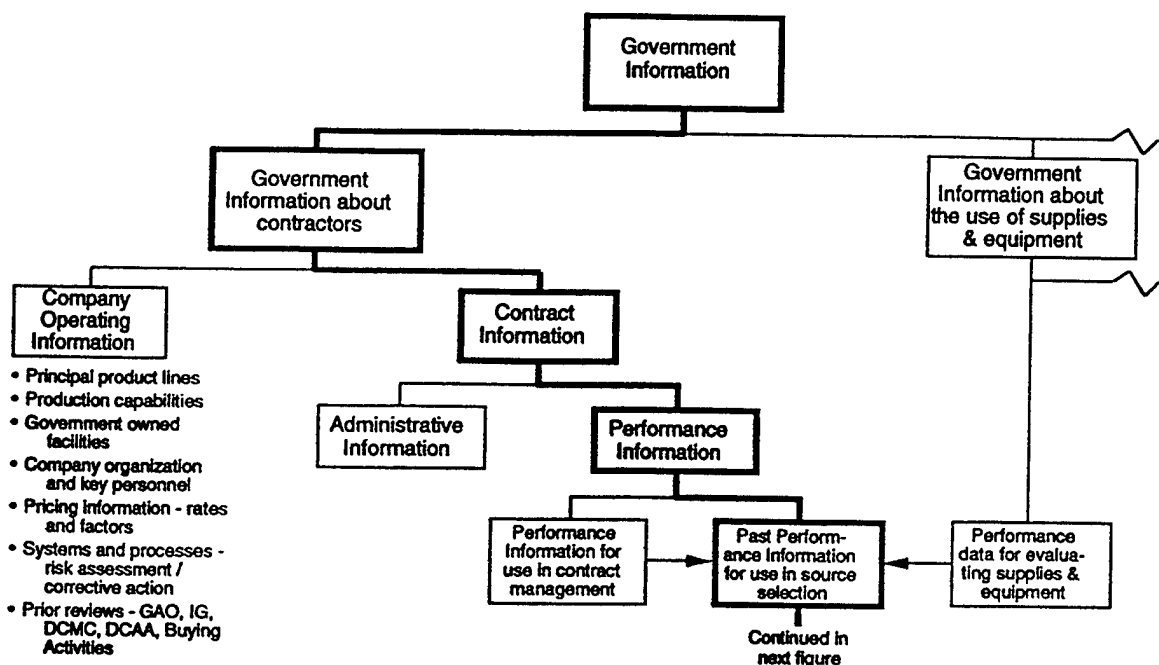


Figure IIA.1: Government Information

Once the chain leading to past performance information for use in contractor selection was established, we distinguished between past performance information collected, validated, and filed for use in future contractor selections, and past performance information collected and used--possibly validated--during an on-going selection. This distinction is depicted in the diagram below:

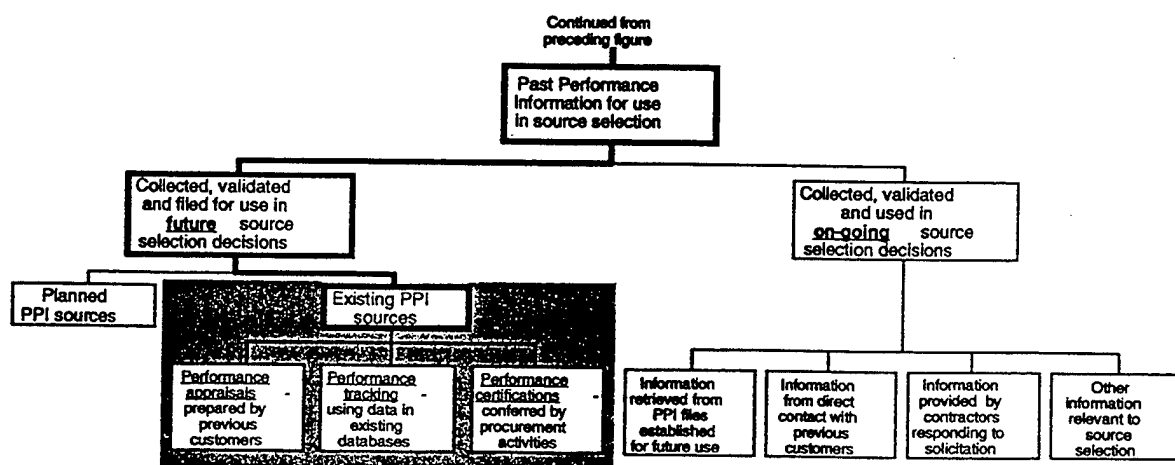


Figure IIA.2: Past Performance Information

3. Identify Existing Systems and Processes

Existing Government past performance information systems were identified using criteria derived from OFPP Policy Letter No. 92-5, FAR (FAC 90-26), OFPP "A Guide to Best Practices for Past Performance," and interviews with Government users, system managers, and process owners. A specific distinction was made between past performance information systems and systems that just had past performance information elements.

The following criteria was used to specifically identify existing past performance information systems:

- Information is collected, validated, filed, and disseminated for the specific purpose of supporting future contractor selection decisions
- Opportunity is provided for review, comment and rebuttal of the information by the contractor
- Provisions are established to resolve disputes between the contractor and the government
- Information is subjected to the same controls and safeguards as other information used in contractor selection decisions
- System is in operation and currently supporting contractor selection decisions

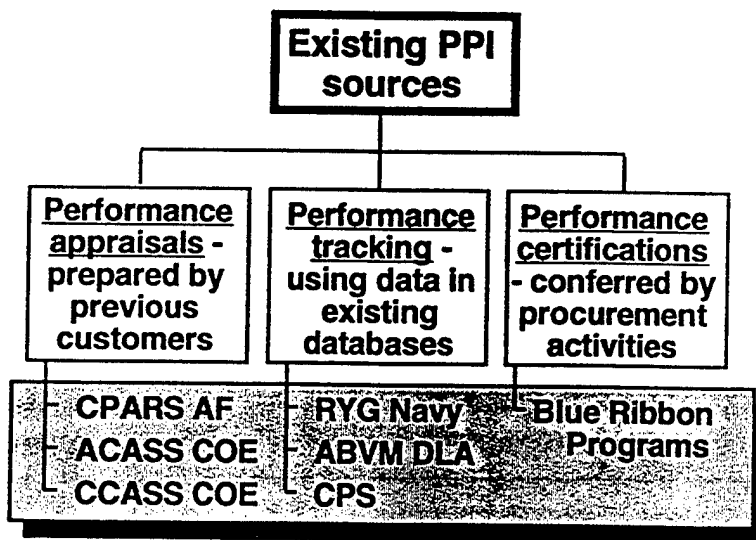
A past performance information system is an ongoing effort to collect and record past performance information for subsequent use in determining contractor eligibility and selection.

Using this definition, we identified three types of past performance information systems- which include six distinct systems from the list of 35 systems we reviewed. The three types of past performance information systems are:

- Performance appraisal systems containing contractor evaluations prepared by cognizant government officials
- Performance tracking systems which draw on quality and delivery data from existing databases
- Performance certification systems which establish specific criteria which are applied for purposes of identifying high levels of performance exhibited by certain contractors

Using this structure, the following past performance information systems were identified:

- Performance appraisal systems
 - Contractor Performance Assessment Reporting System (CPARS) developed and used within the Air Force
 - A&E Contract Administration Support System (ACASS) developed and used by the Army Corps of Engineers
 - Construction Contract Appraisal Support System (CCASS), also developed and used by the Army Corps of Engineers
- Performance tracking systems
 - Red/Yellow/Green (RYG) system developed by the Navy Supply Systems Command and used by certain procurement organizations within the Navy
 - Automated Best Value Model (ABVM) developed and used within DLA
 - Contractor Profile System (CPS), also developed by DLA
- Performance certification systems which include Blue Ribbon Programs which have been implemented by some procurement organizations



Performance appraisal systems, such as CPARS and ACASS, generally cover a wide range of evaluation factors—CPARS addresses 14; ACASS rates 11. Performance tracking systems generally focus on two or three factors. The difference in the number of factors is generally due to two reasons: tracking systems are associated with higher volume, relatively small dollar acquisitions (\$25-\$500K), and evaluations may be conducted on less than the whole contract requirements. The performance appraisal

systems differ from tracking systems in both respects in that the evaluation is for the whole contract and it is used in low volume, relatively high-dollar value contractor selections. CPARS uses interim reports so in one sense is also based on less than the whole contract, but the final CPARS report card for a contractor is accomplished for the whole contract requirement. The existing systems focus on a specific segment of the DOD acquisition program in terms of contractor dollar value and product/service.

Performance certification systems are generally for the same level of complexity and dollar value as tracking systems. They build upon the data in tracking systems but go a step beyond rating and ranking contractors. Performance certification systems actually offer pre-established evaluation standing in the contractor selection process. Certifying contractor performance requires a broader level of information than is obtained in tracking systems.

4. Coverage of DOD Acquisition Program by Existing Government Past Performance Information Systems

By 1997 the proposed DFARS policy provides that past performance information must be collected for all active contracts over \$100,000. *The challenge to cost-effectively collect that information is the major issue DOD is facing in implementing past performance policy.* That is why it is important to understand the very limited coverage that existing past performance information systems provide relative to the total DOD acquisition program. This table shows the limited coverage that is available from current systems from dollar value and product/service perspective.

Contract Dollar Values	Research & Development	Services and Construction	Supplies and Equipment
> \$ 5 M			CPARS ¹
> \$ 100 K		ACASS CCASS	
< \$ 100 K			RYG ² ABVM ³ BRCP

¹ CPARS is also used on major R&D programs

² The contractor performance data only from RYG can be used for transactions above \$100K

³ ABVM can be used for higher dollar transactions where the higher dollar value is due to greater quantities

An approach to filling the extensive gaps in coverage in research&development, services, and most of the supplies and equipment contracts is presented in Section II C.

5. Systems Assessments and Key Characteristics Evaluation

The results of system assessments and key characteristics of existing government past performance information systems follow.

System Assessment--Red/Yellow/Green (RYG) This is a Navy system designed to help reduce the risk of receiving non conforming products and late shipments. RYG classifies the degree of risk by assigning a color code to a contractor's historical quality and delivery performance in individual Federal Supply Classifications (FSCs). Red is high risk, yellow is moderate risk, and green is low risk. The system provides procedures and an automated system for incorporating these classifications into contractor selection decisions.

In addition to the color indicators, the system provides price adjustment factors that reflects the additional cost to the government for actions needed to reduce the risk of receiving non conforming products and late deliveries. When added to a red or yellow offeror's price, the adjustment factor may displace the low offeror in favor of an offeror with a better product quality and delivery history. The price adjustment feature of the system generally has relevance to the smaller contracts because the adjustment factors represent a fixed amount and this amount tends to lose significance as the contract value approaches \$100,000.

The RYG system tracks the quality of items delivered under specific line items and does so by relating discrepancy information observed and reported by government personnel. This information is used to calculate a rating for the contractor's specific plant location and for the specific FSC. An opportunity is provided to each contractor to review its ratings, and to challenge the basis upon which the ratings were determined. Differences are resolved between the government and the contractor.

The ratings and the related price adjustment factors are then available for use by government officials as a factor in contractor award decision, if the solicitation informed the contractors that this past performance information would be used for making the award. The system does not currently cover delivery information, although activity is underway to include this information. The system does not have the capability to track the in-service quality and reliability of items after delivery and acceptance, although this type of information can be retrieved from the database upon which the RYG system draws its data.

The RYG system has been in operational use for over five years and implementation and enhancements are continuing. The following was determined during the course of the study:

- The RYG system was available at 17 of the planned 41 sites, but some are closing

- Plans for expanded use at more sites are unclear and unscheduled
- Use to this point has largely been by advertising the system's value versus directing its use

The RYG system includes quality data and is currently adding delivery performance, which is not yet operational. It combines the data with an algorithm that produces a color indicator (red, yellow, or green) and a Technical Evaluation Adjustment (TEA), a price adjustment added to the bid price of contractors with a yellow or red rating. As the dollar value of the contract increases, the effect of the TEA in an award decision decreases. For example, contract awards over \$100K do not use the TEA feature. Color code ratings can provide a past performance indicator for any contract value. When delivery performance is incorporated in the system, two sets of past performance indicators will be provided for each FSC in which a contractor does business - one for quality and one for delivery. RYG Data is downloaded monthly to the using acquisition offices. Contractors have electronic access to and can read their ratings. The RYG system gives indications that design objectives for quality related issues are being met, but its experience with delivery related issues is too limited to judge its ultimate success throughout the Navy with any certainty.

System Assessment - ABVM: This DLA system was also designed to cover specific equipment and supplies with FSC's and other specifications. In this respect, coverage of the system is similar to the RYG system. It includes information on the reported quality and on-time delivery of specific contract line items and uses this information to calculate a score for each contractor's site and for each FSC. An opportunity is provided to each contractor to review their scores, and to challenge the basis upon which they were determined. The scores are then made available to buyers for use in making award decisions. The ABVM has the capability to include the results of random testing for items accepted and maintained in stock.

The ABVM is a module in the DLA Pre-Award Contracting System (DPACS), which is the migration system being used in the development of the Standard Procurement System (SPS). Initial implementation of ABVM started in 1995 and is currently underway at DLA sites. Consequently, it was not practicable to conduct an objective assessment of the system from the perspective of users. A user survey is currently being planned by DLA to assess the performance of the system and to solicit ideas for system enhancements.

The ABVM system is in the early stages of operational use. For example:

- Defense General Supply Center started ABVM operation in July 1995
- Training programs are currently underway

- Other DLA Centers will have installed the system in 1996

The ABVM system includes quality and delivery performance data which are combined with an algorithm to produce a score for each contractor in each FSC. Past performance scores are used as a tool in making a comparative assessment of price and performance risk. ABVM information is provided to buyers through DPACS. Contractors can read their ratings through an electronic bulletin board. ABVM replaces the Quality Vendor Program (QVP) as the principal system used by DLA. QVP is a performance certification type system rather than a performance tracking system. DLA shifted to the ABVM because QVP was:

- Too burdensome to administer
- Covered only a small portion of the supplier base
- Ended up with two ratings--certified and non-certified rather than a more comprehensive ranking of the suppliers

QVP is still authorized for use for specific FSCs or selected service requirements by individual contracting offices.

ABVM gives indications that design objectives are being met, but it is too soon to judge ultimate success throughout the DLA with any certainty.

System Assessment - CPARS: This is an Air Force system for major acquisition programs above \$5 million. that was designed for a low volume of transactions and extensive performance measurement categories. It is a manual system kept in files at Air Force Product Centers which provides strong support to the source selection process by communicating contractor strengths and weaknesses. It involves a periodic assessment by government officials responsible for the overall program; uses contractor data; and is updated every 12 months. It may also provide out-of-cycle reports. It provides relative performance feedback to contractors across all measurements.

The measurement factors include:

- Product / system performance, including system engineering and software development
- Schedule
- Cost performance
- Product assurance
- Test and evaluation
- ILS program
- Management responsiveness
- Subcontract management

Each report includes a description of the program, a statement describing the contractor's effort, a narrative that addresses the performance of the contractor during the period, and a rating for each of the evaluation areas listed above using four color codes--red, yellow, green and blue. Performance appraisals are provided to contractors for their review and comment, and then reviewed by the Government evaluator who may adjust the initial appraisal. Completed reports are identified as "Source Selection Information" and filed in libraries maintained at AFMC organizations that initiate the assessment report. Information is retrieved for use in source selection decisions by contacting the cognizant CPARS focal point.

Some initial action has been taken to automate the CPARS process utilizing Lotus Notes as well as to extend coverage to small systems, services, science and technology, and operational contracting.

CPARS very consistently performs its intended purpose as reports are based on first-hand data, validated by contractors, and controlled by program offices.

System Assessment - ACASS & CCASS: ACASS is a system used by the Army Corps of Engineers which covers architect and engineering services related to construction (Code C in the coding structure used by the Federal Procurement Data System (FPDS)). Evaluations are prepared by professionals who review and accept the work. Principal evaluation areas include:

- Thoroughness of site investigations
- Quality control procedures and execution
- Accuracy of plans and specification
- Clarity and completeness of the plans
- Overall management and adherence to schedule
- Compliance with cost limitations
- Suitability of design or study results
- Environmental suitability of proposed solution
- Cooperativeness and responsiveness of contractor
- Quality of briefings and presentations

Evaluations are prepared at the completion of contract efforts. Ratings are assigned in three categories -- outstanding, satisfactory, and unsatisfactory. Contractors have the opportunity to review and challenge the evaluations. Completed assessments are maintained in a central database which can be accessed by officials who are involved in contracting for A&E services.

CCASS is also a system used by the Army Corps of Engineers which covers the construction of structures and facilities (Code Y in the coding structure used by the

FPDS). Evaluations are also prepared by professionals who review and accept the work. Principal evaluation areas include:

- Quality of work (including eleven sub-factors)
- Timeliness (including seven sub-factors)
- Effectiveness of management (including nine sub-factors)
- Compliance with labor standards (including three sub-factors)
- Compliance with safety standards (including three sub-factors)

Evaluations are prepared at the completion of contract efforts. Ratings are assigned in five categories--outstanding, above average, satisfactory, marginal and unsatisfactory. Contractors have the opportunity to review and challenge the evaluations. Completed assessments are maintained in a central database which can be accessed by officials who are involved in contracting construction work.

These systems were originally designed to facilitate selection of "qualified" A&E and construction contractors. The systems were recently expanded to incorporate past performance information into contract award decisions. Evaluations are performed by government professionals responsible for reviewing and accepting work:

- Administrative Contracting Officers
- Contracting Officer's Representative
- Other Receiving Officials
- Resident Engineers

Reports are reviewed with contractors and entered into a central database via computer or mail. Access to the data is provided to COE elements; contractors do not have read access to the rating information.

System Assessment--Contractor Profile System (CPS): The Contractor Profile System, a DLA system that is currently available for use, did not fully meet the other criteria for past performance information systems. Work is underway by DCMC to enhance MOCAS data extraction. DCMC's Contractor Information Service (CIS) which is currently under development will encompass CPS and its system enhancements which are in progress. The CIS is discussed later in this report under planned past performance information systems.

Key Characteristics Evaluation: The results of comparing the five existing DOD Past Performance Information Systems to the 16 key characteristics provided in the Statement of Work is shown below.

System Evaluation Factors	Existing Past Performance Information Systems				
	RYG Navy	ABVM DLA	CPARS Air Force	ACASS CCASS	CPS DLA
Data system design - centralized or non-centralized	Centralized	Non-centralized	Centralized	Centralized	Centralized
Kinds of data used - Government, private	Quality and delivery	Quality and delivery	Cost, schedule, tech. perform.	Cost, schedule, tech. perform.	Access to existing databases.
Integrity of data - identity of sources	Drawn from existing databases	Drawn from existing databases	Eval. by responsible officials	Eval. by responsible officials	MOCAS, PASS, and DPACS
Accuracy	Ensured by contractor review	Ensured by contractor review	Ensured by contractor review	Ensured by contractor review	Limited to accuracy of data input
Currency - frequency of update	Monthly	Monthly	Annually & contract completion	At contract completion	Based on source databases
Remedial process by contractors	Yes	Yes	Yes	Yes	No routine process in place
Availability of information for source selection	Via computer terminal	Via computer terminal	From CPARS focal point	Via computer terminal	Via computer terminal
Confidentiality	Yes	Yes	Yes	Yes	Yes
Subcontractor involvement	No	No	Yes	No	No
Maintaining identity of contractors that are acquired	Yes	Yes	Yes	No	No
Fairness	Yes	Yes	Yes	Yes	Fairness ensured by user
Due process	Yes	Yes	Yes	Yes	Due process ensured by user
Lack of past performance	Neutral rating used	Average score used	NA	Not included in database	Not addressed in system
Threshold of applicability	Primarily below \$100K	Primarily below \$100K	\$5M and above	Over \$25K	DLA contracts & admin. by DCMC
Capability of attribution	Protected	Protected	Protected	Protected	No performance evaluation info.
Penalty	Info. used in source selection	Info. used in source selection	Info. used in source selection	Info. used in source selection	Info. used in source selection

Figure IIA.3: Key Characteristics of Existing Past Performance Information Systems

Detailed evaluations for each system were briefed to DUSD(AR) on January 24, 1996 and included in that deliverable.

6. Systems Under Development

Each of the DOD components have initiatives underway to implement DFARS that are aimed at expanding the past performance information available for use in contractor selection decisions.

The Air Force is examining an automated version of CPARS. The Navy is exploring a Contractor Evaluation System. The Army is developing a Performance Information Management System. DLA is developing the Contractor Information Service.

The CPARS approach, used for major acquisitions, has been tailored to be suitable for small systems, services, and R&D. The tailoring is primarily in the evaluation factors that are addressed in each case. Some initial work has been done in automating the

records that would facilitate communication with contractors and the filing and retrieval of information.

The Contractor Information Service design goal is to make DCMC's knowledge and experience more accessible to its customers. Goals include:

- Near term - enhance MOCAS data extraction capability and develop past performance input screens
- Mid term - merge three existing systems (CPS, PASS, DSIS) into a single information system over the next two to three years

Information will be organized on a company-wide basis with a capability to "drill down" to divisions and plant facilities. Coverage envisioned includes:

- Principal product lines and unique production capabilities
- Company organization and key personnel
- Sales, earning and financial health
- Past performance history - trends, data, and commentary
- Pricing information - rates and factors
- Systems and processes status - risk assessments and corrective actions
- Prior reviews - GAO, IG, DCMC, DCAA, buying activities
- Acquisition strategy "lessons learned"

7. Experience of Other Government Agencies

A total of 15 other non-DOD Federal Agencies were reviewed in terms of their approach to past performance information systems. The diversity of agencies provided extensive coverage in terms of the nature of products and services contracted for as well as missions performed.

Our observations are based on contacts with officials in several agencies and on a review of documentation on past performance implementation. Most agencies are implementing past performance by passing the OFPP Guide along with minimal guidance. Some exceptions to this include:

- Energy--which issued a 10-page Acquisition Letter to accompany the OFPP Guide
- GSA--which issued an Acquisition Letter in March 1993 (which is being updated) and Federal Supply Service specific guidance in a separate Acquisition Letter issued in October 1995

- Transportation-- guidance issued in the "Transportation Acquisition Manual"

Generally, the evaluation form in the OFPP Guide is provided for guidance purposes. No guidance is provided on how to tailor the evaluation to size, content, and complexity of the contractual requirements. No automated databases exist, but some agencies are planning to investigate. Specific concerns include:

- Protests and ruling by appeals boards and courts
- Number of open, active contracts that will need to be evaluated
- Workload impact

NASA will use past performance in source selection, but will not evaluate on-going contracts except as required for award fee determinations. NASA implemented a Contractor Performance Summary (CPS) in January 1992 which was based on the Air Force CPARS. CPS features included:

- An evaluation on all award fee contracts above \$25M
- Evaluation of non-award fee contracts was discretionary (by the Centers)

The CPS system was abandoned in March 1994 because the value added to the contracting process could not justify continuation of the system. In response to OFPP on the recent FAR changes, NASA will continue to use past performance as a standard evaluation factor in source selections (NASA has been doing this for at least 6 years). NASA will not create an Agency-wide system to require performance reports on active contracts.

NASA elected not to require performance reports because:

- Award fee evaluations capture approximately 80% of NASA's procurement dollars (and these are exempt from the FAR)
- Implementing an Agency-wide system would significantly burden the workforce without significant benefits

At the \$100K threshold, 80% of contracts would be non-award fee contracts and would account for about 20% of the procurement dollars. NASA estimates that a ten-fold increase in evaluations would be needed to evaluate the non-award fee contracts (from 224 to 2404). OFPP requested that NASA reconsider their decision. This seems unlikely.

The Federal Supply Service in GSA has issued policy on use of past performance information and on a system for routinely recording this information. Guidance was

provided by the FSS Acquisition Letter FC-95-7 of October 19, 1995, "Use of Past Performance as an Award Evaluation Factor - Routine Stock and Special Order Programs." The guidelines allow a contracting officer to efficiently use the quality of an offeror's past performance as a factor in a contract award decision. Past performance is to be considered along with price and applies to negotiated acquisitions in excess of \$1 million.

The process provides for:

- *Supplier Rating Reports*, that are used to evaluate contractor performance by the cognizant Office of Quality and Contracts.
- *The Administrative Contracting Officer opinion* supported by a summary of the Supplier Rating Report, that is provided to a Procuring Contracting Officer upon request.
- *The Contracting Officer's judgment* for the ultimate award decision.

The existence of well-developed policy was very limited. Taken as a whole, these 15 agencies' systems, with the exception of the GSA Federal Supply Service, appear to represent less structured and more ad hoc past performance evaluation programs. While represented in this report at a summary level, most of these agencies' programs appear to represent immature, unstructured approaches to evaluation.

SECTION II. B. Industry Perspective

This section presents the results of industry benchmarking and our review of industry supplier evaluation programs.

1. Benchmarking

The benchmarking phase of the study was accomplished by conducting on-site visits and by reviewing information in the Arthur D. Little Supply Chain Management practice database.

The names of companies we visited during the course of the study and the industries they represent are listed below. Notice that while manufacturing is heavily represented, industries dealing with electronics, process industries and companies performing logistics-like activities were included in our research to provide both breadth and depth to our review.

Companies Included in the Supplier Evaluation Database

Company Name	Industry Type
Allen-Bradley	Process Controls Equipment Manufacturing
Baxter	Pharmaceutical Manufacturing/Distrib.
Black and Decker	Consumer Goods Manufacturing
Boeing Defense & Space Group	Aerospace/Defense Manufacturing
British rail	Transportation
Fisher Scientific	Industrial Distribution
Ford Motor Co.	Automotive Manufacturing
McCormick & Co.	Consumer Goods Manufacturing
McDonnell Douglas	Aerospace/Defense Manufacturing
Mobil Corporation	Process Manufacturing
National Semiconductor	Electronics Manufacturing
Rockwell Defense Electronics	Aerospace/Defense Manufacturing
W.W. Grainger	Industrial Distribution
U.S. Postal Service	Transportation

Companies researched for benchmarking purposes included those producing consumer items as well as those in the defense contracting community. In addition, companies manufacturing component parts were also included since supplier certification is often performed down to the part level in a system.

A key finding of our industry research is that, in best-of-class supplier evaluation programs, there is a distinct supplier approval process keyed to associated risks. Also, the supplier approval process outcome results in a consolidation of suppliers, which is a necessary condition before a business relationship can take place.

2. Industry Supplier Evaluation Programs

The information in this section is organized according to the key features we found in industry supplier evaluation programs. The nine key features, which were identified in companies that are recognized as "best of class" among supplier evaluation programs along with their purpose, scope, and selected implementation features are summarized in the following table:

Evaluation Program Component	Purpose	Scope	Selected Implementation Features
Supply Base Management Process/ Supply Base Strategy	- Align supply base strategy to corporate strategy - Manage the supply base to achieve corporate strategy - Manage the supply base to create leverage, achieve least total cost, gain competitive advantage - Improve continuously	Company-wide All materials, services, equipment	- Size of supply base, overall and within commodity segments - Commodities Management Strategy - Identification of key suppliers - Long-term partnership strategies - Just-in-time - ISO 9000, Baldrige, other certification requirements - Process control focus
Supplier Performance Measurement	- Evaluate supplier performance on an ongoing basis - Use supplier performance data for continuous improvement, total cost reduction	Typically minimum measurements Quality of product materials/services provided Service performance Delivery performance Cost performance Overall commitment	Measurement can apply to all suppliers
Supplier Performance Measurement Feedback (Evaluation)	To feedback supplier performance results for the purposes of improving supplier performance	Strategic and Alliance Suppliers	- Cross-functional data sources - Feedback in an annual meeting - Development of corrective action plans
Supplier Quality System Assessment	Assure that the suppliers' quality systems and processes are documented and in use	Comprehensive assessment of quality systems, often based on ISO 9000 or other systems	Quality Process Self-Assessment Questionnaire
Item or Part Level Certification	- Identify parts or items that consistently meet statistical process control requirements - Identify parts or items based on conformance to process that will not be subjected to incoming inspection	All suppliers, but especially critical suppliers	100% conformance to requirements
Total Cost Assessments	Determine the total cost of doing business in a supplier relationship	All suppliers but especially critical suppliers	- Published guidelines and standards - Formal new supplier education program
Supplier Evaluation and Development	- Communicate supplier performance standards and requirements - Educate suppliers on the supplier improvement process	All suppliers, but especially critical suppliers	- Published guidelines and standards - Formal new supplier education program
Supplier Approval	Identify the suppliers that are approved to buy from before orders are placed	Company-wide Suppliers quality system Supplier's conformance to regulatory requirements Supplier's general business standing	Depth of evaluation varies with risk
Supplier Recognition Programs	- Honor the best performing suppliers - Recognize outstanding contributions by a supplier employee	Strategic and critical suppliers	Plaques, certificates of appreciation, thank you notes

Figure IIB.1 : Key Features: Supplier Evaluation Program

Supply Based Management Process/Supply-Based Strategy

In terms of "best-of-class" benchmarking findings, the following three principles, derived from the first key feature listed above, stand out:

- World class supply chain orientation
- Supply base improvement strategy
- Explicit supply base management process

The emphasis on a world-class orientation moves organizations from a prescriptive "meet the spec" environment to a fully collaborative internal and external team environment which emphasizes process rather than specifications..The emphasis on developing an explicit supply base improvement strategy and management process raises the level of supplier performance, reduces supply chain costs, and moves staff and suppliers into new roles which change over time from a largely reactive to a proactive orientation that reinforces continued improvements. Conspicuous in this new perspective is a systems approach to delivery of world-class products and services.

Supplier Performance Measurement

Ongoing supplier performance measurement is a central feature of supplier evaluation programs. The scope of application ranges from all suppliers to critical suppliers. Supplier performance measurement is generally performed for a small number of critical data elements, such as quality, service, delivery, and cost. Each business unit defines what constitutes product quality, service, and delivery performance, as well as the appropriate measures for each of these.

Prior to beginning supplier performance measurements, the customer's performance standards and requirements are communicated to suppliers. Standards include how a supplier will be rated and how ratings will be used and communicated.

Detailed profiles of ratings are generally available on-line. A supplier's data is never shared with another supplier. Examples of these profiles are shown in the two following figures:

SRIP			
File Select Position Reports Help			
Supplier			
SUPPLIER	WORLD WIDE WIDGET	CODE	012345
CAT NAME	ELECTRO MECHANICAL	SLAR	DOWNEY
CAT NUMB	03	PQE	KIRSANOFF
PQA LEVEL	1	CE	BARTLEY
TIER	1	AVG LOT VALUE	\$7382.75
OPEN PO'S	57	OPEN PO AMT	\$1772141.00
		MVP	N
		QP	N
		For Week Ending... 06/09/1993	
Delivery		Rating	
LOTS RECEIVED	03	SUPPLIER SPI	1.013
NOT RECEIVED	1	CAT RED LINE	1.150
LOTS LATE	1	AVG CAT SPI	1.026
DAYS LATE	57	ON-TIME %	98.600
AVG DAYS LATE	03	REJECTION %	1.400
OVERSHIPS	1	Ranking	
EARLY SHIPS	1	Category	30 of 82
NON PROD DELV		On Time	34 of 82
		Defect	48 of 82
1 of 1		0 k	
		Quality	
		SOURCE REJECTS	1
		RTV	0
		M.R. ACTIONS	0
		RESUBM VENDOR	0
		CARLS	0
		STOPS	0
		SHOP FLOOR DEF	0
		NON PROD QLTY	
		RESUBM ROK	0
		TOTAL REJECTIONS	1

Figure IIB.2 : Supplier Performance Measurement Profile (Manufacturer)

In Figure IIB.2, a supplier's performance index (SPI) and an average for the commodity group are calculated. Each commodity group has a cutoff or "redline." Suppliers with an SPI above the redline are not eligible for awards.

A sample supplier performance report used by a national distributor, shown in Figure IIB.3, has four categories. Three categories pertain exclusively to the supplier's performance in terms of quality, cost and delivery (timeliness or schedule). The last category, sales, pertains to the buying company's performance associated with a product line involving a particular supplier.

Category	Criteria		Current Month Results	Current Quarter Results	Current YTD Results
QUALITY	Total Units Sold		1,106	15,702	15,702
	Warranty Returns:	Units	5	48	48
		% of Total Units Sold	0.45%	0.31%	0.31%
		Cost \$	\$508	\$4,012	\$4,012
DELIVERY	Purchase Order Lines Delivered: (%)	Early	51.4%	42.4%	42.4%
		Late	14.3%	18.7%	18.7%
		On-Time	34.3%	38.9%	38.9%
	Shipments:	Total	27	294	294
		Shipping Errors	0	1	1
		Error Rate	0.0%	0.3%	0.3%
	Lead Time:	Prior Year End	2.5	12	12
		Current	3.5	0.08%	0.08%
		% Change	1.40	\$170	\$170
	Past Due Open Orders:	Total Open Order \$	\$38,375	\$369,653	\$369,653
		Total Past Due \$	\$1,900	\$16,698	\$16,698
		Past Due %	5.0%	4.5%	4.5%
COST	Invoices:	Total	34	333	333
		Invoice Errors	0	4	4
		Error Rate	0.0%	1.2%	1.2%
	Average Cost Change vs. Prior Year:				-0.87%
SALES	Our Cost		\$38,108	\$461,734	\$461,734
	Prior Year Cost		\$36,506	\$440,194	\$440,194
	% Change		4.4%	4.9%	4.9%

Figure IIB.3: Supplier Performance Measurement Profile (Distribution)

Measures in the "criteria" column of the report are accompanied by data in a format which has the capability to indicate existing trends. In addition to using measures applicable to operating units, the report also includes data in dollars--suitable for use by upper management.

Suppliers Performance Measurement Feedback

Another key feature of a supplier evaluation program is focused on feedback processes and improvements in communication. Feedback to suppliers is a very important ingredient in an effective supplier evaluation program. This provides needed information on quality to suppliers for their own improvement processes. Best-in-class companies provide feedback to their suppliers on their performance results for the purpose of improving future performance. An effective supplier evaluation program will have to contend with both the nature of specific feedback as well as the frequency. Many organizations utilize a formal "report card" process to provide suppliers with feedback in a structured fashion. Many companies meet with their suppliers at least once a year to inform them of their evaluation results, identify areas of improvement, and in more advanced situations, develop an action plan for improvement. Companies also notify their suppliers more frequently by on-line services, telephone, or letter about

their performance. This feedback is critical since it gives both parties the opportunity to improve the product, reduce costs, and improve service

Supplier Quality System Assessment

The foundation for a supplier evaluation program lies in an active, thorough, on-site evaluation of a supplier's approach to the installation and use of an effective quality system. Supplier quality systems assessments are often based on rigorous standards such as the ISO 9000 series of standards. A key feature of the ISO series is registration of a company or production element with a third party organization which monitors compliance to the registered standard. Purchasers of products and services from ISO registered companies are assured that the registered company has a documented quality system in place. Some approaches to assessment are developed in-house using ISO 9000 (or other applicable standards for the industry) or the Malcolm Baldrige National Quality Award criteria. The most objective approaches at this time rely on third-party certification including on-site evaluation, subsequent registration, and periodic re-evaluation.

Part-level Certification

Part-level certification requires accurate historical data on supplier past performance. An important outcome, often not explicitly stated, is the change in the relationship which occurs as a result of becoming a certified supplier. Generally, companies requiring supplier certification often experience a decrease in the number of qualified suppliers. The remaining suppliers, have an opportunity to develop a more stable business relationship.

Supplier certification tends to bring increased benefits for both the certified supplier and the customer. For the supplier, it can mean additional business, single or lead source within a commodity area. For the customer, it can mean significant cost savings by using parts received from certified suppliers because certification can eliminate costly incoming inspection and associated costs. The best-in-class supplier evaluation programs usually certify to the item/part or family of parts level. Most companies have the goal of certifying all of their key parts and products. However, they typically start with a manageable number of critical parts and then expand the program to include all of the critical items as well as those that have the potential to reduce operating costs. Some companies interviewed during the course of the study had certified virtually all of their products or were on their way to certifying all critical parts.

Total Cost Assessment

An emerging trend in the supplier evaluation arena is the use of a "total cost assessment" approach which attempts to capture all of the acquisition and consumption costs associated with doing business with a particular supplier. Acquisition costs are the costs of a supplier's activities to process and deliver an order and supplier's material and profit. Consumption costs are the costs of the customer activities—labor and overhead—to process a supplier's shipment through the customer's system. Effective total costs assessment processes usually rely on activity-based costing principles. Activity based costing techniques are used to acquire the best value by estimating the total costs of doing business with different suppliers. The "true" lowest bidder is sought—and bids account for all costs including quality, cost, and delivery. Customers identify historical non-productive costs resulting from supplier non-compliance with customer's mode of operations. Some supplier non-productive events that are "charged" to the supplier are:

Quality Events	Scheduled Events
• Source rejection • Inspection resubmittal • Return to supplier • Material review • Shop floor rejection (latent defect) • Corrective action request letter • Supplier stop notice	• Early delivery • Overshipment • Late receipt

One important use of a total cost assessment is the adjustment of bid prices from suppliers using a Supplier Performance Index (SPI). The index is developed from a ratio that estimates the true cost of supplier bids. An example application of the Supplier Performance Index concept is illustrated in Figure IIB.4.

$$SPI^1 = \frac{\text{Material Cost} + \text{Nonproductive Cost}}{\text{Material Cost}}$$

Supplier	Supplier A	Supplier B	Supplier C
Quoted Price	\$1,000.00	\$1050.00	\$1025.00
X SPI	1.450	X 1.230	X 1.086
Evaluated Bid	\$1,450.00	\$1,291.50	\$1,113.15



¹ A lot normalization factor (Q factor) is used to eliminate any lot value bias (Not shown)

² For this company, suppliers with insufficient data for a valid SPI are weighted at the commodity group average.

Figure IIB.4: Total Cost Assessment Ratio

Supplier Evaluation and Development

There are two primary purposes to supplier evaluation and development initiatives:

- Communicate supplier performance standards and requirements; and,
- Educate suppliers on the supplier improvement process.

The scope generally covers all suppliers, but especially critical suppliers. Companies typically communicate their guidelines and standards through published documents and formal supplier education programs. This is a highly proactive process in which companies view their suppliers “as their customers.”

Supplier Approval

A robust supplier approval process incorporates multiple data sources, focuses on quality, is documented, and is shared with suppliers. Supplier information gathered during the evaluation may include general business standing, service levels, distribution/logistic capabilities, supplier specifications/product brochures, company networking, and existing like-product data.

An example of the scope and depth of supplier approval programs is presented in Figure IIB.5:

Supplier Approval Requirements	Raw Materials, Components & Services											
	DISTRIBUTED PRODUCT			Contract Finished Goods & Services								
	Low	Med	High	Low	Med	High	Low	Med	High	Low	Med	High
Facility Assessment--Process & Control Systems			*					*	*	*	*	*
Questionnaire (e.g., general business, regulatory, environmental, diversity)	*	*	*				*	*	*	*	*	*
Regulatory Standing										*	*	*
Supplier Change Approval Commitment			*				*	*	*	*	*	*
Business Standing		*	*							*	*	*
Service Levels, distribution/logistics capability/networking		*	*				*	*	*	*	*	*
Approved NDA (if applicable)	*	*	*	*	*	*	*	*	*	*	*	*
Labeling approved							*	*	*	*	*	*
Legal contracts: Pricing, volumes, indemnification, liability insurance, recall responsibilities, quality, distribution, design responsibility /regulatory ownership labeling					*	*	*	*	*	*	*	*

Note: Example from manufacturer/distributor operating under Current Good Manufacturing Practices (CGMP).

Figure IIB.5: Supplier Approval Elements

Approval is formally documented to cover approved locations; any required reports or data; a list of processes approved; additional relevant quality information; and sign-off by business area teams.

Supplier Recognition Programs

Many commercial firms acknowledge supplier performance with a recognition program. Recognition programs vary, but an important outcome is the strengthening of customer-supplier relationships. Many companies present their best performing suppliers with an award, while others less formally send thank you letters. Most suppliers strive for such recognition--it brings publicity as well as more business from the customer giving the award.

Section II. C. Contractor Evaluation Program

1. Introduction

To develop a "To-be" vision for past performance policy implementation, we proceeded through several phases. The first phase involved analysis of government and industry information including document reviews, research results, system assessments, benchmarking, and interviews. The analysis led to the development of concepts within a tentative model. The second phase involved designing a workshop approach with ARSSG representatives and preparing materials to facilitate the workshops. The third phase involved scheduling/conducting the actual workshops, and collecting perspectives and insights concerning "To-be" concepts and issues from the workshop participants. The final phase involved integration of information, perspectives and concepts into the actual "To-be" model--the Contractor Evaluation Program.

Information essential to developing the Contractor Evaluation Program model was collected over the course of the study and described in the preceding sections of this report. The workshops, with ARSSG representatives, added value to the process by providing a broader, functional participation than had been present in previous past performance forums. The ARSSG workshops included representatives from Major Programs (API), Logistics, Economic Security, Systems Engineering, Quality, Inspector General, Procurement, General Counsel, Defense Contract Management Command (DCMC), and Defense Contract Audit Agency in the workshops. We were eventually able to test and explore the implications of the vision of a "To-be" model on surrogates for the DOD acquisition management and user communities. The workshop format also provided a forum for identification of milestones supporting the vision and discussion of actions to be taken.

The workshop approach provided an opportunity to demonstrate the status of current activity in both the government and industry arenas and led to the identification of many important factors for the Contractor Evaluation Program model, including the following:

- A key objective for industry in adopting supplier evaluation programs is to increase competitiveness. Characteristics associated with increased competitiveness include:
 - Reduced costs
 - Reduced cycle and response times
 - Improved operational efficiencies
 - Increased customer satisfaction and loyalty

- Reduced inventory (improved inventory turnover)
- Increased revenues
- Three key factors are inherent in the buyer-supplier relationship. These are *collaboration, competency, and continuous improvement*. Characteristics associated with these include:
 - Willingness to invest resources
 - Quality products
 - Service
 - Responsiveness
 - Technology
 - Corporate culture
- Industry uses supplier evaluation programs to meet specific objectives. Components of industry supplier evaluation programs are:
 - Business area and management strategy
 - Qualification Assessment (single quality system)
 - Performance measurement
 - Performance feedback
 - Item certification
 - Total cost assessment
 - Supplier recognition
 - Supplier evaluation and development
 - Supplier approval
- The uses for past performance in DOD are:
 - *Evaluate risk of performance.* Provide information which can be used in making trade-off decisions for what is the best value in the source selection process. This information can be used in the award of the initial contract, exercise of options, and the issuance of task and delivery orders.
 - *Develop acquisition strategy.* Help in the decision as to contract type and source selection factors, e.g., the mid-1980s overuse of FP development contracts led to many cost overruns.
 - *Manage contractor performance.* Provide information to identify variances from established tolerances in the existing program.
 - *Improve contractor performance.* Provide feedback to the contractor about performance to allow the contractor an opportunity to improve its performance.

- *Allocate oversight and review resources* . Identify those contracts or aspects of contracts in which experience dictates there have been problems, and employing oversight resources in those areas.
- *Streamline the source selection process*. Reduce reliance on voluminous contractor technical or management proposals that may not lead to expected contract performance.

2. Contractor Evaluation Program

The breadth, depth, and complexity of requirements is a major challenge to those involved in DOD acquisition programs and to those proposing solutions to issues (such as the past performance policy implementation issues being considered in this study). The Contractor Evaluation Program we designed is aimed at simplifying the past performance implementation effort facing the DOD as well as to improve the effectiveness of this effort. The program is conducted by cross-functional Business Area Teams that start locally and, as business area alliances are formed, may extend across the DOD components, as appropriate.

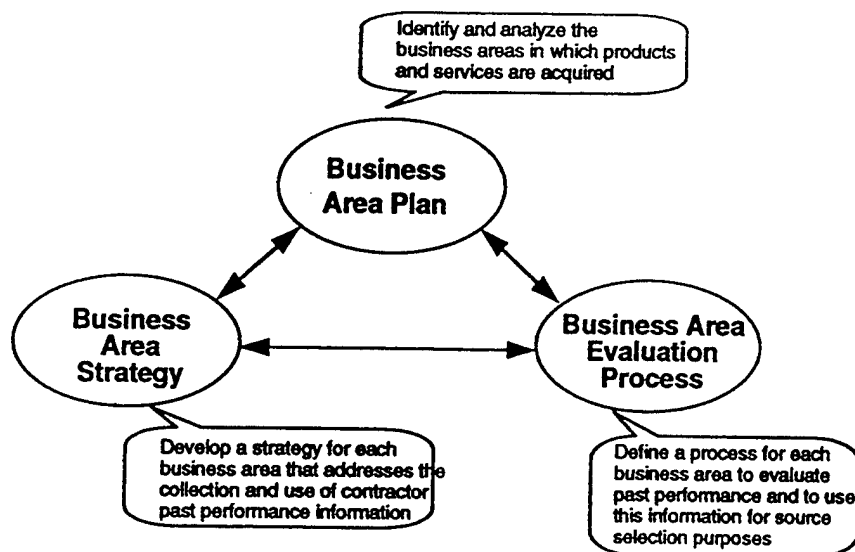
Overview

Implementation of the recent policy on contractor past performance requires a recognition of the business environment and existing acquisition systems, to include:

- The *total size* of the defense business
- The *wide range of products and services* for which contracts are issued
- The large *number of procurement organizations* that issue contracts
- The *existing procurement process*

In the aggregate these factors define a conglomerate that is engaged in an extensive number of business areas. In recognition of these factors, and with the overall goal of reducing the cost of doing business, the Contractor Evaluation Program is designed to:

- Develop a Business Area Plan, including defining common business areas
- Develop a Business Area Strategy that makes sense for the particular business area
- Develop a Business Area Evaluation Process that implements the business area strategy.



The Contractor Evaluation Program is designed to ensure the business area is getting the information to select world-class suppliers with a best-value outcome. The scope includes the products and services acquired by all the services and agencies.

Business Area Plan

There are four aspects to the business area plan

Define your business area
Develop a business area resource center
Conduct business area analyses
Form business area alliances.

Define Your Business Area: Defining your business area is the step designed to take an organization from a vertical hierarchical focus to a horizontal view of acquisition programs, products, and services in its local, inter-Command, inter-Service/Agency, and inter-Service/Agency acquisition environment. An example to illustrate the process for defining your business area follows.

The wide range of products and services purchased in DOD is the basis for starting this example of defining a business area.

FY94 funds in \$M		Money Spent	%
Research & Development		21,824	100
AB	Community Service	1.7	0.0
AC	Defense Systems	14,750.5	67.6
AD	Defense - Other	4,034.9	18.5
AE	Economic Growth and Productivity	158.7	0.7
AF	Education	2.9	0.0
AG	Energy	2.1	0.0
AH	Environmental Protection	63.6	0.3
AJ	General Science & Technology	163.1	0.7
AN	Medical	444.5	2.0
AP	Natural Resources	4.4	0.0
AR	Space	497.4	2.3
AS	Transportation - Modal	8.3	0.0
AT	Transportation - General	.9	0.0
AV	Mining	.3	0.0
AZ	Other R&D	1,690.3	7.7
Other Services & Construction		43,948	100
B	Special Studies and Analyses - Not R&D	343.6	0.8
C	Architect & Engineering Servi. - Construction	2,629.6	6.0
D	Auto. Data Processing & Telecom. Services	3,090.6	7.0
E	Purchase of Structures and Facilities	2	0.0
F	Natural Resources Management	667.3	1.5
G	Social Services	361.4	0.8
H	Quality Control, Testing and Inspect. Services	340.6	0.8
J	Maintenance, Repair, and Rebuilding of Equip.	5,839.0	13.3
K	Modification of Equipment	1,135.9	2.6
L	Technical Representation Services	890.4	2.0
M	Operation of Government-Owned Facility	2,423.8	5.5
N	Installation of Equipment	338.1	0.8
P	Salvage Services	72.2	0.2
Q	Medical Services	471.8	1.1
R	Professional, Admin. & Mgmt. Support Serv.	7,304.9	16.6
S	Utilities and Housekeeping Services	3,194.7	7.3
T	Photo., Mapping, Printing, & Pub. Services	157.6	0.4
U	Training Services	692.7	1.6
V	Transportation and Travel	2,144.1	4.9
W	Lease or Rental of Equipment	432.9	1.0
X	Lease or Rental of Facilities	118.1	0.3
Y	Construction of Structures and Facilities	6,607.7	15.0
Z	Maint. Repair or Alteration of Real Property	4,690.6	10.7
Supplies and Equipment		52,342	100
10	Weapons	701.0	1.3
11	Nuclear Ordnance	2.2	0.0
12	Fire Control Equipment	553.1	1.1
13	Ammunition and Explosives	1,068.5	2.0
14	Guided Missiles	4,598.0	8.8
15	Aircraft and Airframe Structural Components	13,078.5	25.0
16	Aircraft Components and Accessories	1,170.1	2.2
17	Aircraft Launch, Landing, and Ground Equip	82.3	0.2
18	Space Vehicles	166.1	0.3
19	Ships, Small Craft, Pontoons / Floating Docks	3,480.3	6.6
20	Ship and Marine Equipment	137.1	0.3
22	Railway Equipment	19.3	0.0
23	Motor Vehicles, Trailers, & Cycles	2,006.5	3.8
24	Tractors	26.7	0.1
25	Vehicular Equipment Components	355.4	0.7
26	Tires and Tubes	33.9	0.1
28	Engines, Turbines, and Components	2,832.3	5.4
29	Engine Accessories	176.8	0.3
Supplies & Equipment (cont)			
30	Mechanical Power Transmission Equipment	60.1	0.1
31	Bearings	51.9	0.1
32	Woodworking Machinery and Equipment	1.1	0.0
34	Metalworking Machinery	53.8	0.1
35	Service and Trade Equipment	7.4	0.0
36	Spectal Industry Machinery	173.1	0.3
37	Agricultural Machinery and Equipment	3.8	0.0
38	Const., Mining, Excavating, Highway Equip.	107.4	0.2
39	Materials Handling Equipment	220.2	0.4
40	Rope, Cable, Chain and Fittings	12.1	0.0
41	Refrig., Air Conditioning & Circulating Equip.	72.3	0.1
42	Fire Fighting, Rescue, and Safety Equipment	121.8	0.2
43	Pumps and Compressors	72.9	0.1
44	Furnace / Steam Equip. & Nuclear Reactors	270.1	0.5
45	Plumbing, Heating, and Sanitation Equipment	16.5	0.0
46	Water Purification and Sewage Treat. Equip.	16.3	0.0
47	Pipe, Tubing, Hose and Fittings	47.9	0.1
48	Valves	76.2	0.1
49	Maintenance and Repair Shop Equipment	353.0	0.7
51	Hand Tools	19.8	0.0
52	Measuring Tools	7.4	0.0
53	Hardware and Abrasives	73.9	0.1
54	Prefabricated Structures and Scaffolding	96.5	0.2
55	Lumber, Millwork, Plywood and Veneer	13.2	0.0
56	Construction and Building Materials	51.1	0.1
58	Com., Detection, & Coherent Radiation Equip.	4,600.1	9.2
59	Electrical and Electronic Equip. Components	1,016.9	1.9
60	Fiber Optics Materials, Comp., Assy., Access.	58.6	0.1
61	Electric Wire, and Power and Distrib. Equip.	534.1	1.0
62	Lighting Fixtures and Lamps	33.9	0.1
63	Alarm, Signal, and Security Detect. Systems	31.2	0.1
65	Med. Dental, & Veterinary Equip. & Supplies	348.6	0.7
66	Instruments and Laboratory Equipment	769.2	1.5
67	Photographic Equipment	35.4	0.1
68	Chemicals and Chemical Products	240.8	0.5
69	Training Aids and Devices	646.9	1.2
70	Gen. Purpose Auto. Data Processing Equip.	2,213.5	4.2
71	Furniture	269.6	0.5
72	Household & Com. Furnishings & Appliances	41.9	0.1
73	Food Preparation and Serving Equipment	25.6	0.0
74	Office Equip., Text Process. / Visible Records	18.7	0.0
75	Office Supplies and Devices	7.0	0.0
76	Books, Maps, and Other Publications	160.3	0.3
77	Musical Instruments, Phonographs & Radios	1.6	0.0
78	Recreational and Athletic Equipment	10.5	0.0
79	Cleaning Equipment and Supplies	21.3	0.0
80	Brushes, Paints, Sealers and Adhesives	3.7	0.0
81	Containers, packaging and Packing Supplies	136.6	0.3
83	Textiles, Leather, Furs, Apparel, Tents / Flags	134.0	0.3
84	Clothings, Individual Equipment, and Insignia	511.7	1.0
85	Toiletries	35.7	0.1
87	Agricultural Supplies	6.7	0.0
88	Live Animals	.1	0.0
89	Subsistence	1,577.9	3.0
91	Fuels, Lubricants, Oils, and Waxes	4,549.9	8.7
93	Nonmetallic Fabricated Materials	12.3	0.0
94	Nonmetallic Crude Materials	17.3	0.0
95	Metal Bars, Sheets and Shapes	31.2	0.1
96	Ores, Minerals and Their Primary Products	4.0	0.0
99	Miscellaneous	1,547.4	3.0

Figure IIC.1: DOD Products and Services

These are some of the major acquisition organizations within the DOD components

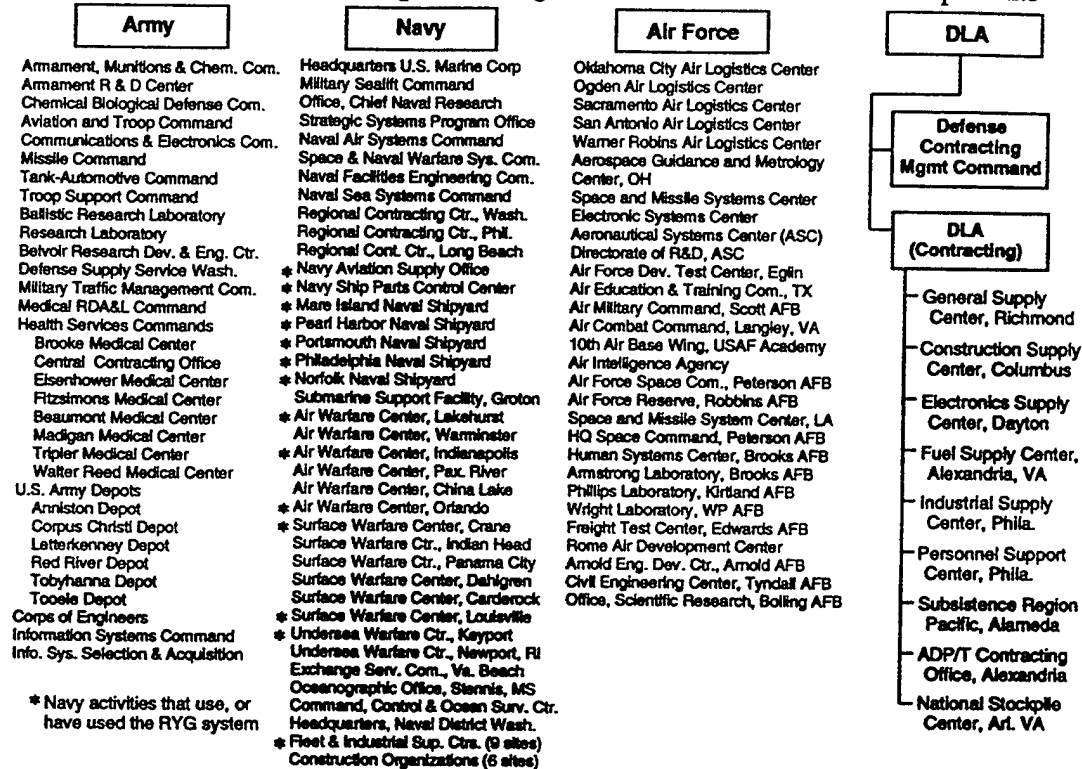
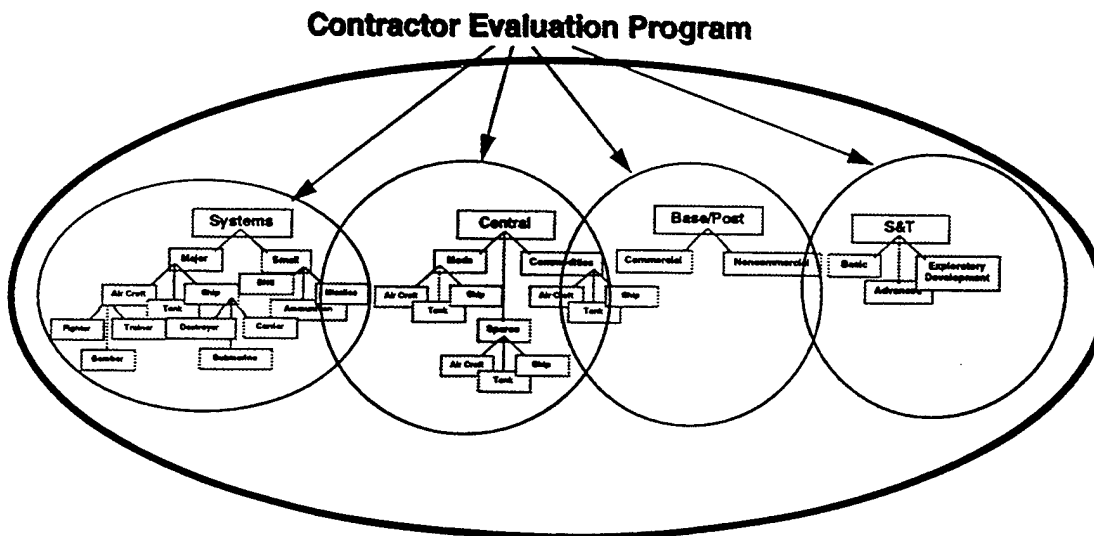
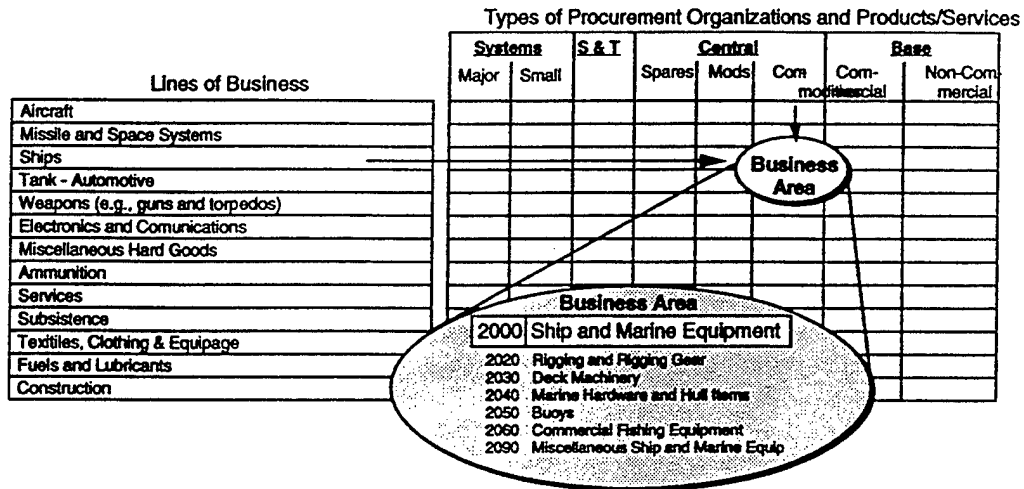


Figure IIC.2: DOD Acquisition Organizations

In the business area definition process, these acquisition organizations are initially categorized by *System*, *Central*, *Base/Post/Camp*, and *Science and Technology*.



This is a business area depicted at a commodity level:



Develop a Business Area Resource Center: Extensive information is required to keep the business area teams supplied with internal, industry, and contractor information they will need to conduct their analyses. Each business area should have an on-line or other of resource center to keep its implementation up-to-date and to support its business area analysis.

Examples of the data elements that may be needed for industry analysis are: information on competitors, market size/growth, market forecasts, profitability, cost structure, and technology. Examples of contractor analysis data elements: market share, balance sheet, facilities, profitability, and size/growth information.

The sources for such data are internal documents and external references such as Duns Business Rankings, S&P's Industry Surveys, Ward's Directories, U.S. Industrial Outlook, Producers Prices, and Prices Index.

Conduct Business Area Analyses: The objective of the business area analysis is to develop an understanding of the internal and external aspects of the business area, and evaluate and improve the performance of contractors. The Business Area Analyses can help evaluate:

- What is the past experience and future requirements of the government in this area?

- What are the relevant characteristics of the industry in terms of size, growth, and competitive forces?
- What is the current position of the key contractors in the industry?

Some of the factors that are typically involved in this analyses include:

Internal analysis

- Current contractor/supplier base
- Government's past experience
- Expenditures over time
- Internal acquisition costs
- Projected requirements

External analysis (industry)

- Market size and growth
- Capacity and utilization
- Market share of principal contractors
- Industry profitability
- Cost structure and drivers

External analysis (contractor)

- Customer base
- Position in the industry
- Commitment to industry
- Quality and service performance

Form Business Area Alliances: Business areas may start as a local construct, but regarding the business area as only a local construct limits the synergy that exists from the horizontal integration of DOD-wide resources. At its fullest expression, a business area will bring together the expertise in the DOD components, accelerate the elimination of waste and inefficiency, and promote the growth of world-class quality and best-value in the DOD contractor base.

Once operating at the local level, business area teams may look outside their organization to form wider alliances. The real benefits of this program are only realized

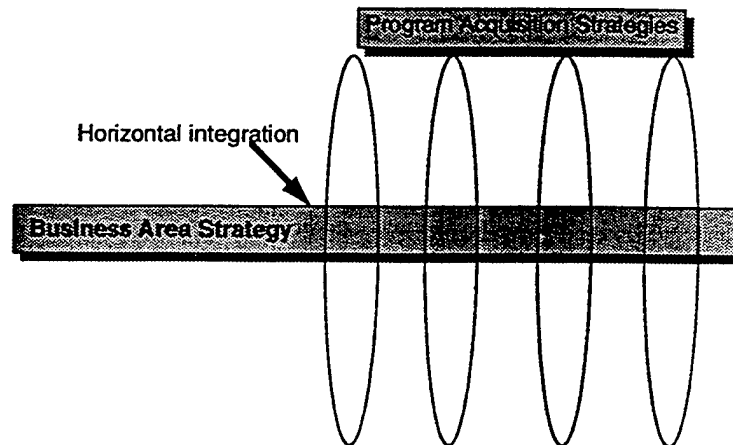
if business area teams are formed to coordinate their business processes across the DOD components and present “one face” to their industry segment.

Business Area Strategy

Each business area should develop a Business Area Strategy. This includes integrating the business area in a coherent strategy, developing goals for the business area, and determining uses for past performance information.

Integrating the Business Area
Developing Business Area Goals
Determining Uses for Past Performance Information

Integrating the Business Area: The business area strategy is the product of a cross-cutting, horizontal integration perspective. It starts at the local level but as business area alliances are formed, it becomes more robust and richer and exerts a DOD-wide influence. At the peak of horizontal integration, it becomes the backbone for a “one-face” to industry for a DOD-wide business are, e.g., fighter aircraft, engines, a commodity group, medical services.



Through its unique horizontal integration perspective, the business area strategy will help DOD organizations determine how to meet the challenges of the changing acquisition environment today and in the future. Developing a business area strategy is a means of making the fundamental departure from the narrow procurement perspective of the use of past performance information for source selection decisions to a broader business-like viewpoint expressed below:

Developing Business Area Goals: From our analysis, we identified goals that an effective strategy might include:

- Develop a world-class orientation
- Maintain total quality with focus on continuous improvements
- Increase the number of high-quality suppliers
- Improve contributions to corporate profitability/operations
- Implement a team approach internally and externally--new suppliers as an integral part of the team
- Accredite key, critical suppliers
- Develop, coordinate, communicate and integrate pricing strategies in all critical commodities
- Recognize highly reliable sources of supply

The strategy should address the evaluation of contractor performance in the context of a total program tailored to the particular business area. Implementation may be directed into one or all of the three areas of the Business Area Evaluation Process: measurement, certification, and improvement. The results of the strategy process may be that only measurement is appropriate for some products/services whereas more aggressive certification or improvement approaches are required for other products/services.

Determining Uses for Past Performance Information: The strategy elements that relate to the use of contractor past performance information in contractor selection decisions introduce the need for a tailored approach. Uses for contractor past performance information may include any or all of the following:

Tailor solicitation/award approach to selecting contractors

Make secondary decisions once long-term contract relationships are established (option exercised and IDIQ decisions)

Manage key, critical, strategic suppliers and track their impact on organization's performance goals

Recognize superior performance

Build long-term relationship/partnerships

Achieve specific performance improvements objectives

- Avoid incoming quality inspection
- Improvement in on-time deliveries
- Enhanced logistics support

Allocate government oversight resources commensurate with risk

The uses of past performance information can be different for different programs and business areas and should be addressed in the strategy at the business area level.

Business Area Evaluation Process

Each business area should develop an evaluation process that implements the Business Area Plan and Business Area Strategy. The Business Area Evaluation process establishes the methods, steps, and procedures for collecting and evaluating past performance information in the business area. The business area evaluation is designed to ensure the business area is getting the information to select world-class suppliers with a best-value outcome with the goal of reducing the total cost of doing business.

These are major outcomes of a business area evaluation process:

Measurement
Certification
Improvement

There are other outcomes that may be more appropriate for a business area. These are not meant to be mandated, but are used as examples generally found in most industry situations.

The business area evaluation process effort is a challenge to adopt the elements of the measurement, certification, and improvement outcomes that are appropriate for your business area—Base/Camp/Post, Central, Systems, or Science and Technology.

		MEASUREMENT	CERTIFICATION	IMPROVEMENT
Base/Camp/ Post	Commercial			
	Non-commercial			
Central	Mods			
	Spares			
	Commodities			
Systems	Major			
	Small			
S & T	Basic			
	Advanced			
	Exploratory Development			

Adopt the elements that are appropriate for the business area

Measurement: Ongoing performance measurement is a central aspect of the business area evaluation process. The benefits of performance measurement include:

- Systematic collection of accurate, relevant data for contractor selections
- Consistent approach to measurement across major business areas
- Consistent feedback to contractors
- Focus for supplier improvement
- A tool for item level certification
- A means to facilitate benchmarking

The major process elements for developing a measurement approach are:

Develop Measurement Criteria
Develop Approach for Data Validation by Contractors
Develop Performance Feedback Process

Develop Measurement Criteria: Each business area's business area evaluation process defines the system that best meets its business requirements, while incorporating common criteria for measuring supplier performance. Common requirements for each business unit include:

- Development of a procedure detailing (1) rating frequency; and (2) rating communication and use
- Supplier Performance Report with ratings
- Minimum reporting frequency of quarterly

- Distribution policy for rating results

Incorporating common criteria for measuring supplier performance, suppliers are rated on:

- Quality of the products and services they provide
- Delivery performance
- Ability to provide service, including pertinent information

Each business area must define what constitutes product quality, delivery performance, and service requirements. Measures appropriate to the business area then need to be defined for the three rating areas. Quality, delivery, and service are not equally weighted in every situation, thus there is a need for each business area to devise the appropriate weights. Each business area may weigh the three categories as it desires.

Performance measurement is used to select contractors to do business with and to allocate increased or decreased business to a contractor based on performance during the current contract relationship. This could occur through the exercise of contract options or the placement of contract orders.

Develop Approach for Data Validation by Contractors: The objective of this process is to ensure that contractors are given the opportunity to review, comment on, and, if appropriate, rebut information that bears on their performance in the execution of existing contracts. This process has the potential to be used in awarding future contracts.

The validation process will typically provide contractors with access to information that pertains to their performance. In the past, this has been accomplished by mailing the performance information to the respective contractors; however, the performance tracking systems are now using direct electronic access for this purpose.

As information moves through the validation process, provisions must be made for distinguishing between validated and non-validated data. In all cases, provisions need to be established for retaining any comments or rebuttal information from contractors relating to their performance.

Develop Performance Feedback Process: Feedback is provided to suppliers on their performance results to improve future performance. The feedback may occur in any number of forms, including:

- In-person meetings with suppliers at least annually to inform them of their evaluation results, identify areas of improvement and develop an action plan for improvement
- More frequent notification by telephone or letter
- Notification to suppliers of their performance, and their performance relative to other suppliers for their product or service, and for the business area in general

Feedback gives both parties the opportunity to improve the product, reduce costs, and improve service. Maintaining open communication helps keep contractors informed of their performance relative to all contractors within their commodity groups. Specific information pertaining to a single, identified supplier is never shared with other suppliers.

Certification: Certification to the item/part or family of parts level is a key feature of a contractor evaluation process. Certified items are purchased items that will not routinely be subjected to incoming inspection. The supplier is responsible for complying to form, fit and function criteria previously evaluated at incoming inspection. Certification is performed on an item-by-item basis. When certifying a component, the specific supplier manufacturing location that is producing the item will be the only site approved to provide the certified product.

Develop Certification Process Procedures
Identify Key Strategic Critical Parts, Materials, Assemblies
Conduct Quality System Assessment
Develop Total Cost Assessment

Develop Certification Process Procedures: The following should be given due consideration in the development of procedures for a certification process:

- Item quality level
- Financial requirements
- Risk analysis of using a certified product
- Supplier quality systems
- Supplier process capability
- Item stability

Procedures should also address: the sharing of information with all pertinent parties, i.e., business area management, other user locations; a recognition process for suppliers of

certified items; review changes to certified items or the process in which they are manufactured to ensure the change(s) will not invalidate the original qualification for certification; and periodic audits or reviews to determine continuing certification, de-certification, or re-certification.

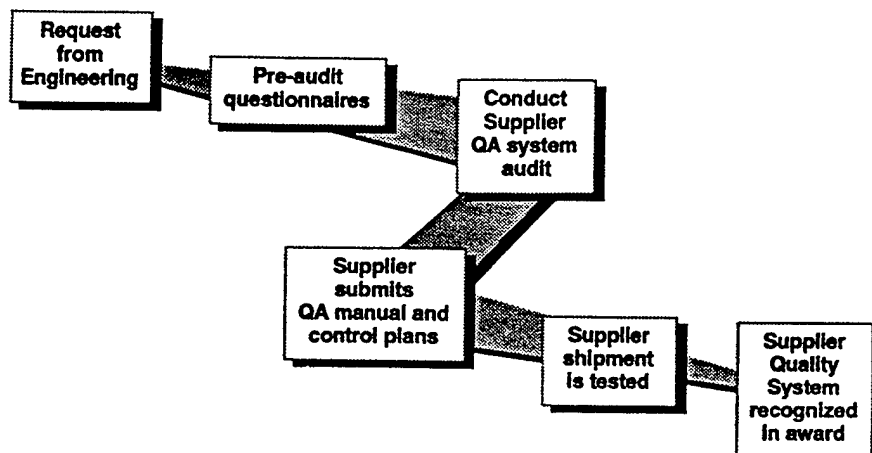
The criteria for and risks of certification will be determined at the immediate business area level. Each business area will determine the minimum amount of time and number of defect-free receipts that are acceptable before an item is eligible for certification. Each business area should determine a suitable threshold risk level on an item-by-item basis. The risk factor will vary depending on the supplier plant and item being certified.

A quality history must be established for the supplier facility producing the item being considered for certification. Historical compliance data, i.e., supplier delivery and incoming quality performance, quality history for the same or similar item produced for another facility, and supplier's product complaint levels for other similar products, will help validate supplier performance.

Certification of items involves site visits and the evaluation of processes. To provide a thorough understanding of the supplier's process, an on-site assessment prior to item certification is essential. Any issues found during the assessment must be resolved prior to certification of the item.

Identify Key Strategic Critical Parts, Materials, Assemblies: Start with a manageable number of critical parts and expand the program to include all of the critical items as well as those that have the potential to reduce operating cost. Part-level certification is vital for base/camp port and central commodities business areas.

Conduct Quality System Assessment: The foundation for a contractor evaluation process is a quality systems assessment. Assessment of a supplier's quality system can be viewed as a 6-step process.



This is a sample "Supplier Quality Process Evaluation Report" resulting from a quality system assessment.

Supplier Quality Process Evaluation Report

Supplier Address	Date	
	Product	
Telephone		
Facsimile		
Persons	SQA	
Evaluation	Rating	Max
•	7	10
•	9	10
• Quality	23	40
• Document	1	15
• Purchased	14	20
• Statistical	22	40
• Gage	12	15
• Material Control	12	15
• Final	6	10
• Continuous /Customer		
Total Rating	132	200
Quality Improvement		
Significant improvement has been made in material control. Increasing emphasis on employee training was Need to focus on real time statistical process control.		

This particular example includes both a quantitative rating and a narrative section to record identified improvement actions and other related remarks.

Eligibility for classification as a certified item should also include:

- Responsibility for quality lies solely with the supplier of an item
- Regulatory risk requirements must be reviewed to understand impact on the certification process
- Financial risk consideration must be given to balancing the potential risks of not routinely inspecting items against total system cost

Develop Total Cost Assessment: Effective total cost assessments, based on *Activity Based Costing* principles, are part of a contractor evaluation program.

Total cost encompasses the “all in” cost of doing business with a supplier. Examples are: acquisition cost, the cost of supplier’s activities to process a customer order and supplier’s materials plus profit, and consumption cost, the cost of a customer’s activities—labor and overhead—to process a supplier’s shipment through the customer’s system.

The objective of a total cost assessment, using Activity Based Costing principles, is to award contracts to the true lowest cost bidder. These are the issues to be addressed:

- the historical nonproductive costs resulting from supplier noncompliance
- the estimate of the true cost or value of bids
- the Suppliers’ nonproductive events that are “charged”

Quality Costs	Schedule Costs	Costs of Communications
• Source rejection • Inspection resubmittal • Return to supplier • Material review • Shop floor rejection (latent defect) • Corrective action request letter • Supplier stop notice • CECA action	• Early • Overshipment • Late receipt	• Paper based or EDI
	Stockless Production Cost	Cost Containment
	• Inventory carrying	• Stability of pricing

Improvement: The improvement aspects of a business area evaluation process are aimed at evaluating contractor's progress in achieving the highest levels of performance. There are four major elements in the improvement process.

Conduct Process Approvals
Formulate Projects to Reduce Cost/Improve Quality
Develop On-Going Cycle of Continuous Improvement
Develop Improvement Recognition Programs

Conduct Process Approvals: The scope of processes that are involved in improvement-related activities is more extensive than the certification process considers. Here the focus can extend to most of the following:

- Quality/Service History
- Cost Management
- Environmental Initiatives
- Quality Systems
- Risk Management

Additionally, management and technology factors are considered:

- Management commitment of the business area
- Industry position
- Technology position
- Resource commitments to continuous improvement

The Contractor Processes approval is contingent upon the success of ongoing measurement and certification efforts. Those processes that meet minimum requirements for approval will be approved.

Three possible scenarios for approving processes are: rely on either third-party certifications, commercial certifications, or both (e.g., ISO 9000, Malcolm Baldrige National Quality Award criteria, or other commercial certifications); second, grant DOD

certification; or third, either include third party, commercial, DOD, or all of these at the time of each acquisition--not in advance as implied above. This would potentially include ISO 9000, Baldrige, or other commercial certifications in addition to DOD.

For items used in private industry for which DOD has a need, third party or commercial certifications may be appropriate. The administrative burden of certification would be minimal in this scenario. In other situations, where the item is unique to DOD, DOD certification may be appropriate. This scenario may require a greater burden--and thus cost--to administer.

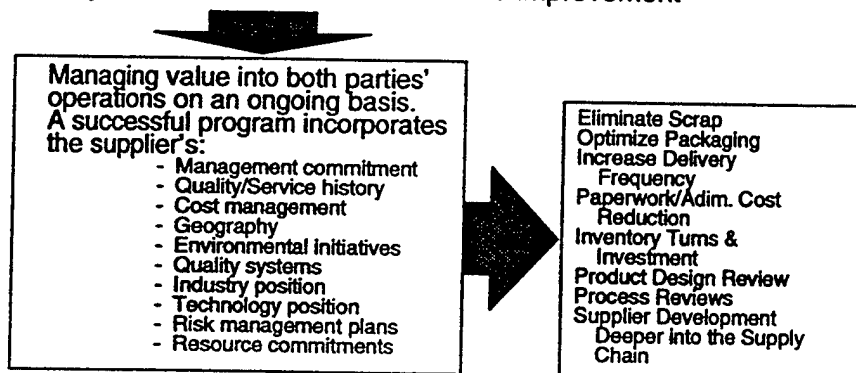
Formulate Projects to Reduce Cost/Improve Quality: Notwithstanding previous approvals for processes, projects to raise the contractor's level of performance can be mutually and/or singly identified. In this role, DOD is working with its contractors to aid in their efforts to achieve world-class performance.

Working with strategic, critical, and other key contractors on projects to upgrade their performance is a follow-on activity to initial certification. The goal is for contractors to achieve Government approval of processes in addition to any parts certification previously achieved.

Develop an On-going Cycle of Continuous Evaluation and Improvement: Self-assessments and performance measurement form the basis for the continuous improvement. Process evaluation is the focus of continuous improvement. The progress contractors make in exceeding their initial process approval levels is the focus of the on-going cycle of continuous improvement. As higher performance levels are achieved, new targets are formed and progress tracked and evaluated.

The best cost reduction and quality improvement results will be obtained from steady, focused continuous improvement.

- Invest time and resources to target projects that significantly reduce cost therefore benefit both buyer/seller
 - Cycle of continuous evaluation and improvement



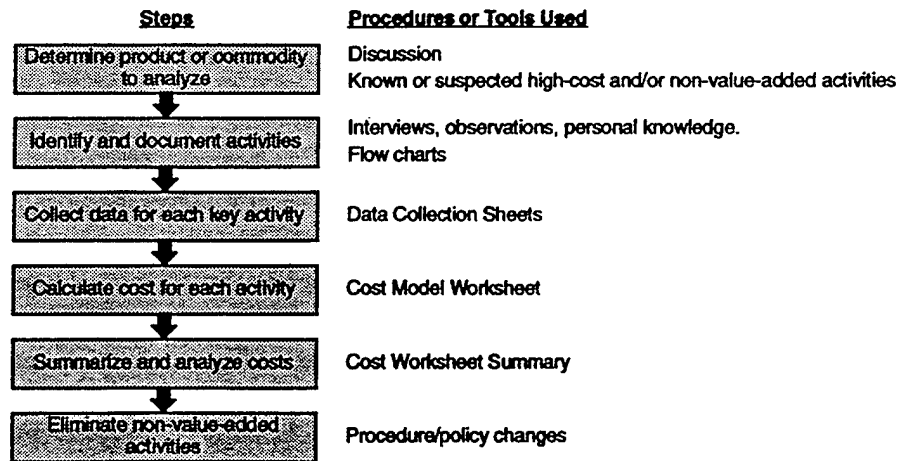
The respective DOD business areas should be proactive in all aspects of the business area evaluation process, but particularly when undertaking continuous improvement objectives. The “partnering” model is the posture that should be used to guide contractor interfaces in the improvement environment.

Develop Improvement Recognition Programs: A program should be developed to provide feedback and to recognize accomplishments. Documentation describing the business area’s evaluation process and objectives should be available for all interested contractors. Periodic meetings and reports should be a part of the program.

Cost: The cost aspects of the business area evaluation process track the level of contractor evaluation the business area has adopted.

- Measurement--Cost Assessment
 - The minimum needed to support best value
- Certification--Total Cost Assessment
 - Encompasses the “all in” cost of doing business with a supplier
- Improvement--Cost Reduction
 - Focuses on specific target opportunities to reduce cost using activity based costing

Activity Based Costing Process Flow



Comparison of Contractor Evaluation Program and Industry and Government programs: The Contractor Evaluation Program model is used in this diagram to array the type of program found in industry and DOD.

Ford - Xerox - Baxter Health Care - British Rail - Allen-Bradley - Texas Instruments - Boeing - Rockwell - McDonnell - Motorola - Allied Signal	Improvement
National Semiconductor - Lozier - Fisher Scientific	
Blue Ribbon Contractor Programs DLA Quality Suppliers	Certification
Grainger Distributors - Black&Decker Mobil Oil - R.J. Reynolds	
ABVM CPARS RYG	Measurement
Mature industry programs to a great extent. Other industry and government programs to a far lesser degree or not at all.	Business Area Plan and Business Area Evaluation Strategy

3. Functional Requirements for the Contractor Evaluation Program

A functional requirements document for the Contractor Evaluation Program was prepared during the course of this study. Documentation of functional requirements for the Contractor Evaluation Program was conducted in two parts:

Perform a functional requirements analysis. We analyzed the Contractor Evaluation Program model to identify specific functional requirements that must be satisfied by a potential information system, e.g., Standard Procurement System, Central Contractor Registry. We then identified the data and information requirements of the Contractor Evaluation Program model that must be satisfied by the information system.

Develop the functional requirements document. This is a statement of the functional requirements for information system support of the Contractor Evaluation Program model. We identified:

- Current system capabilities that need to be retained
- Deficiencies and limitations in the current system capabilities
- Additional functional and performance capabilities that will be required to satisfy new or changed past performance requirements from the Contractor Evaluation Program model
- Functional and performance capabilities that provide opportunities for increased economy and efficiency, from the Contractor Evaluation Program Model.

We implemented a *Use Case Approach* to analyze and document functional requirements for the Contractor Evaluation Program model. Through *Use Case Analysis*, we divided the Contractor Evaluation Program model into a collection of use cases. Next, textual descriptions of each use case were developed to describe the graphical information presented in each cases.

Once the functional requirements were documented, we analyzed the Standard Procurement System functional requirements related to *collection* of contractor past performance information. We then compared them to the functional requirements for the Standard Procurement System to the Contractor Evaluation Program. The requirements were found primarily in two areas: Administer Contract and Procurement Planning.

Under Administer Contract, it indicated that the system shall:

- Notify the user when previously-identified criteria for contractor performance have been breached
- Process material review board actions and corrective action requests/ notices/ plans
- Track contract performance reports
- Notify the user when performance parameters do not meet user-defined criteria
- Process shipment and performance data against the MILSTRIP requisition number and contract schedule.

Under the Procurement Planning functional requirements, it indicated that the system shall perform a Contractor Assessment. In doing so, the system shall automatically

- Aggregate contract performance information into contractor summary performance reports
- Use these summary reports along with other contractor information to create vendor rating summary reports.

We also analyzed the Standard Procurement System functional requirements related to use of contractor past performance information. They were found primarily in the Solicit Offers and Award Contracts area.

The Solicit Offers and Award Contracts section it indicated that to evaluate offers, the system shall provide the capability to:

- Evaluate offers based on the offer data and previously-defined criteria
- Integrate offer data and previously-established evaluation criteria to perform evaluation
- Integrate an offeror's past performance information into the evaluation process, and recommend a determination of responsibility based on user-defined criteria and algorithms applied to previously entered data
- Be able to create, request, receive, and dispose of pre-award survey requests.

Our analysis showed that the Contractor Evaluation Program model functional requirements are consistent with apparent Standard Procurement System contractor past performance functional requirements from the standpoint that use and collection criteria are user-defined to the Standard Procurement System.

4. System/ Process Issues for the Contractor Evaluation Program

The Contractor Evaluation Program *implementation* must consider several system/process issues. The general criteria for their application are defined by the three sections of the Contractor Evaluation Program and the relationship between the specific system/process i.e. the Business Area Plan, Business Area Strategy, and Business Area Evaluation Process. In two cases--Fairness and Due Process--the issues appeared to be related more to the Government's conduct of the contractor selection process and how the information would be used than to the attributes of the Contractor Evaluation Program.

GENERAL CRITERIA FOR APPLICATION

ISSUES	Business Area Plan	Business Area Strategy	Business Area Evaluation Process
<u>Centralized / Decentralized</u> The degree and level of centralization. Is data aggregated to the product center, major command or HQ level?		X	
<u>Automated / Manual</u> Is the system or process automated, semi-automated or manual in the manner in which past performance information is collected, maintained and disseminated?		X	
<u>Confidentiality</u> System's capability to protect, limit, and otherwise effectively control against unauthorized access to contractor past performance data.			X
<u>Data Availability</u> System's capability to rapidly disseminate the requested standard and tailored information on real-time or time delay basis.		X	
<u>Currency / Integrity / Accuracy / Validity</u>			X

GENERAL CRITERIA FOR APPLICATION

ISSUES	Business Area Plan	Business Area Strategy	Business Area Evaluation Process
<u>Source and Type of Data</u> Categories of data included in the system -- government, DOD only / commercial. Quantitative, qualitative data. Data trends. Comparison data.		X	
<u>Mergers and Acquisitions</u> System capability to report on company's past performance that occurred prior to a merger or acquisition.			X
<u>Subcontractor Involvement</u> The system's capability to discern between the prime contractor and its subcontractor's past performance on prior contracts			X
<u>Fairness</u> The system's capability to treat all offeror's equally and ensure past performance data is evaluated with the same impartiality as other evaluation data			Contractor Selection Issue
<u>Due Process</u> Opportunity for contractor to respond to weaknesses or deficiencies documented in the government's evaluation process			Contractor Selection Issue
<u>Lack of Past Performance History</u> The system's capability to overcome / handle the lack of past performance data for a particular contractor.		X	
<u>Threshold of Applicability</u> The system's capability to apply data according to cost, time, or other (dollar) thresholds.			X
<u>Capability of Attribution</u> The system's capability to shield data sources from unwarranted disclosure.			X

GENERAL CRITERIA FOR APPLICATION

	Business Area Plan	Business Area Strategy	Business Area Evaluation Process
<u>Consequences to the Contractor</u> The system's intended / untended penalties / rewards for poor / superior past performance data		X	
<u>Feedback</u>			X
<u>Recognition</u>		X	

The system/process issues to be considered under the Business Area Strategy aspects of the Contractor Evaluation Program are:

- Centralized/Decentralized
- Automated/Manual
- Data Availability
- Source and Type of Data
- Lack of Past Performance History
- Consequences to the Contractor
- Recognition

The system/process issues to be considered in the Business Area Evaluation Process aspects of the Contractor Evaluation Program are:

- Confidentiality
- Currency/Integrity/Accuracy/Validity
- Merges and Acquisitions
- Subcontractor Involvement
- Threshold of Applicability
- Capability of Attrition
- Feedback

Specific criteria for application of these issues should be developed as part of the respective Business Area Strategy or Business Area Evaluation Process considerations to which they relate.

SECTION II. D. Business Case Analysis

This study is designed to assist past performance policy implementation, not systems development, the business case analysis is therefore an analysis of three alternative policy implementation approaches to past performance policy implementation. The three alternatives that will be used for comparison purposes in the business case analysis are the "As-is" model, which is structured from the information in Section II. A. on existing Government past performance information systems; the DFARS model, developed from information in the FAR and the proposed changes to the DFARS; and the Contractor Evaluation Program (To-be model), developed from information in Section II. C. In each model a distinction is made between the "Collection of Past Performance Information for Future Use", and the "Collection and Use of Past Performance Information during Contractor Selection". The analysis of and comparison between models is from these two perspectives.

1. "As-is" Model

The "As-is" model for existing government past performance information systems, as depicted below, reflects the situation prior to recent changes to the FAR and the related DFARS case. The left side of the diagram covers the collection of contractor performance information for future use. The right-hand side depicts the principal activities performed for the collection and use of past performance information during contractor selection.

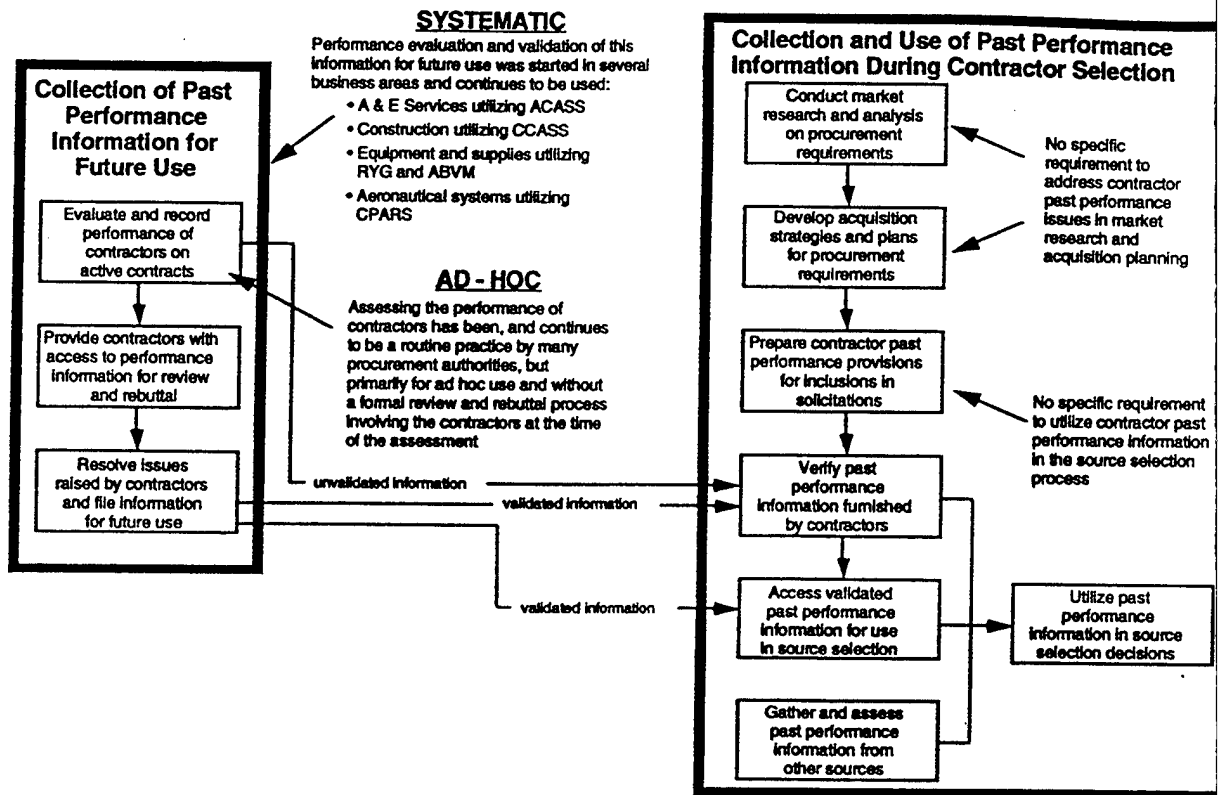


Figure IID.1: "As-is" Model

The two approaches to collecting past performance information for future use that are highlighted in the center of the diagram are *ad hoc* and *systematic*. The *ad hoc* collection of past performance information for future use has been, and continues to be a routine practice by some procurement authorities. The primary purpose has been to support local contractor selection decisions. In most cases the performance evaluations are not provided to contractors for review and possible rebuttal. The evaluations are not identified as "source selection information" or filed for possible use in the future. Information from these activities is used in contractor selection decisions together with other past performance information that may be gathered at the time of a contractor selection decision.

The *systematic* collection of past performance information for future use is used in the systems that are identified and described in Section II. A. of this report. These existing systems operate in essentially two different ways - *performance tracking* and *performance appraisal*. Under *performance tracking*, the system relies on the existence of performance tracking data at the contract line item level. Under this

system, these data are used to calculate performance ratings based on previously established decision rules. Typically these systems address attributes of supplies and equipment that are discernible and detected at the time of, or subsequent to, delivery by the contractor. The principal focus of these systems is on the quality of the supplies and equipment and the timeliness of the deliveries by the contractor. The data upon which these systems rely is essentially quantitative and objective -- for example, number of reported defects and number of days late in delivery. The Red/Yellow/Green and the Automated Best Value Model were the existing systems that used this approach. The process analyses and the automated data information system analyses for these two systems are included in Appendix B.

The *performance appraisal* systems rely on the appraisal of the entire contract. Appraisals cover the work performed on the total contract or contract order. Typically these systems address not only the quality and timeliness of products delivered by a contractor, but also additional factors dealing with the performance of work in-process and overall technical, cost and schedule performance of the contractor. These factors might include any one or all of the following, depending on the circumstances of the acquisition and the nature of the product or service that is being acquired:

- compliance with contract requirements
- overruns experienced on reimbursable contracts
- effectiveness in managing the provisions of the contract effectiveness in executing the program provisions in the contract (e.g.; systems, engineering management, design engineering, manufacturing, test and evaluation, logistics, subcontract management, quality assurance, continuous process improvement, etc.)
- the quality and thoroughness of research conducted under the contract

Our analysis identified CPARS, ACASS and CCASS as the existing systems that use this approach. The processes analyses and the automated data information systems analyses for these systems are included in Appendix C.

The right side of the diagram for the "As-is" Model, depicts the activities related to the collection and use of past performance information at the time of contractor selection and contracting decisions. Market research has been, and continues to be used to investigate commercial products and the use of commercial distribution systems. In addition, market analysis is also undertaken as a part of non-development item initiatives. There is no specific requirement to inquire into the past performance of potential sources as part of this analysis. Evaluation of an offeror's past performance is encouraged to be an important element of every evaluation and contract award for commercial items. Likewise, acquisition strategies and plans may be formulated in anticipation of a solicitation for certain products or services. There is no

stated requirement to address the approach for dealing with contractor past performance as a part of these strategies and plans.

The activities at the bottom right of the As-Is Model diagram are performed in connection with gathering, validating and using past performance information at the time of a contractor selection decision. These activities are:

- verify past performance information furnished by contractors in response to the requirements in the solicitation;
- access validated past performance information for use in source selection, to the extent that it may exist; and
- gather and assess past performance information from other sources, such as information available from risk assessments, process reviews, government maintained databases, performance award listings, and commercial survey services.
- utilization of past performance information in contractor selection decisions based on the ground rules established for the acquisition and consistent with the evaluation criteria and other information provided to the offerors.

2. DFARS Model

The DFARS model is depicted in the diagram on the next page. It is based on our interpretation of the DFARS Case at this time. With respect to the collection of past performance information on active contracts for future use performance evaluations will essentially be required on *all* contracts above \$100,000 with few exceptions and results of the evaluation will be provided to the contractors for their review, comment and possible rebuttal. Methods for handling the review process and resolving any differences between contractor and government officials are also covered in the model.

With respect to the collection and use of past performance information at the time of contractor selection, the DFARS includes the requirement to use contractor past performance information, except in those cases where its use is not found to be practical or useful. In those cases, the contracting officer must document in the contract file the reasons why past performance was not used.

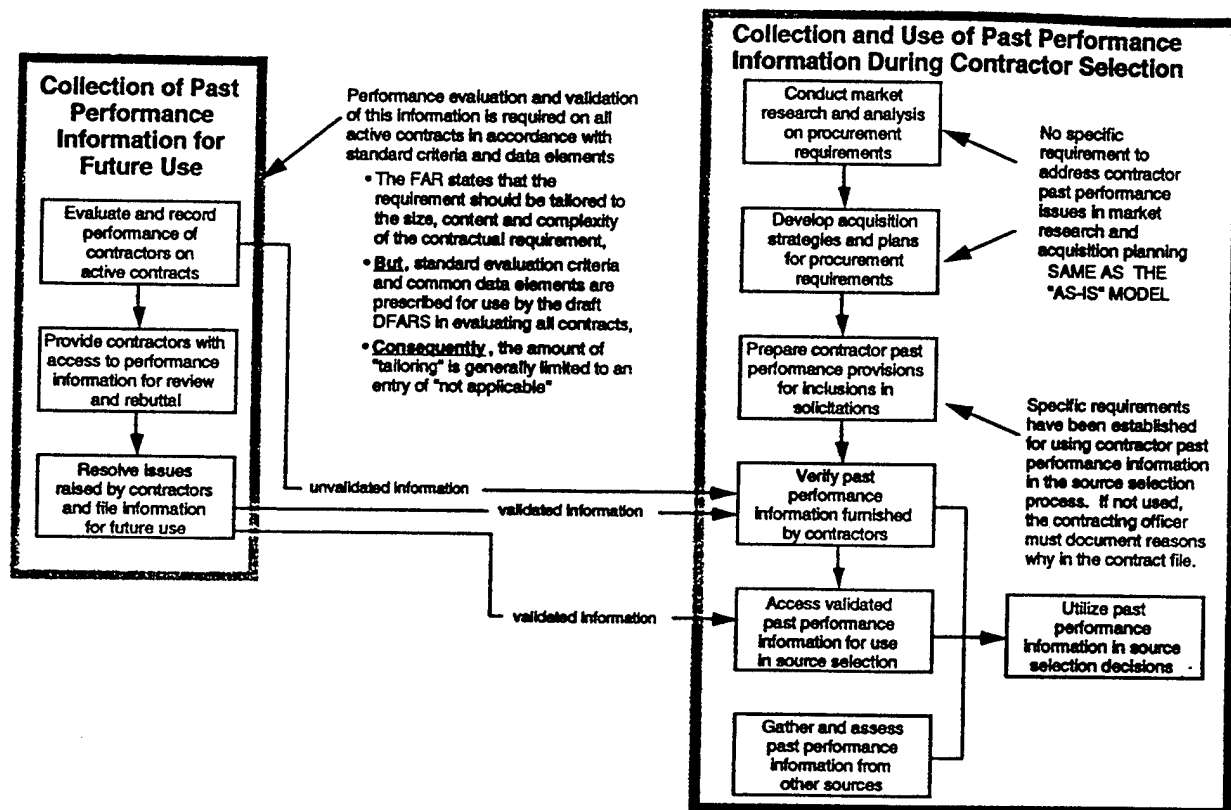


Figure IID.2: DFARS Model

A significant point concerning the DFARS model is that although the FAR states that the requirement for the evaluations should be *tailored* to the size, content and complexity of the contractual requirement, the DFARS (as of the current draft) establishes standard evaluation criteria and common data elements to be used in *all* cases. Consequently, the amount of "tailoring" could be constrained by the use of the standard criteria. The following table provides a summary of these provisions of the FAR that indicate that the collection and use of past performance information can be tailored to the particular circumstances of the procurement.

Collection of past performance information for future use (Ref. FAR, SUBPART 42.15)	Collection and use of past performance information at the time of source selection (Ref. FAR, PART 15)
The content and format of performance evaluations shall be established in accordance with agency procedures and should be tailored to the size, content and complexity of the contractual requirements. [Ref. 42.1502 (a)]	The cognizant technical official is responsible for the technical and past performance requirements related to the source selection process. [Ref. 15.604(b)] Past performance shall be evaluated . . . unless the contracting officer documents in the contract file the reasons why past performance should not be evaluated. [Ref. 15.605 (b) (1) (ii)] The source and type of past performance information to be included in the evaluation is within the broad discretion of agency acquisition officials and should be tailored to the circumstances of each acquisition. [Ref. 15.608 (a) (2) (ii)]

The FAR provisions provide government officials the latitude to develop and adopt a tailored approach that fits the specific circumstances of each acquisition. On the other hand, the proposed DFARS provides criteria and a rating scheme that shall be used in the evaluation of contractor performance. These prescriptions could be construed to limit the extent of tailoring that may be attempted.

The evaluation criteria and rating scheme in the DFARS is summarized on the next page.

EVALUATION AREAS AND FACTORS	RATINGS
Quality of Product or Service (a required element). This includes the following aspects of performance: 1. Compliance with contract requirements; 2. Accuracy of reports; 3. Appropriateness of contractor personnel assigned to the contract.	Unsatisfactory : Nonconformances compromise (or are compromising) the achievement of contract requirements, despite the use of Agency resources. Marginal : Nonconformances require major Agency resources to ensure achievement of contract requirements. Satisfactory : Nonconformances do not impact achievement of contract requirements. Excellent : There are no quality problems.
Cost Control (not required for firm-fixed-price and firm-fixed-price with economic price adjustment contracts). This includes the following aspects of performance: 1. Current, accurate, and complete billings; 2. The relationship of negotiated cost to actuals; 3. Cost containment initiatives; and 4. The number and cause of change orders issued.	Unsatisfactory : Cost issues are compromising performance of contract requirements. Marginal : Cost issues required (or require) Agency resources to ensure achievement of contract requirements. Satisfactory : Cost issues do not impact achievement of contract requirements. Excellent : There are no cost issues.
Timeliness of Performance (a required element). This includes the following aspects of performance: 1. Whether the contractor met interim milestones; 2. Contractor's responsiveness to technical direction; 3. Contractor's responsiveness to contract change orders and administrative requirements; 4. Whether the contract was completed on time, including contract close out and reporting responsibilities and contract administration; and 5. Whether liquidated damages were assessed.	Unsatisfactory : Delays are compromising the achievement of contract requirements, despite the use of Agency resources. Marginal : Delays require Agency resources to ensure achievement of contract requirements. Satisfactory : Delays do not impact achievement of contract requirements. Excellent : There are no delays.
Contracting / Business Relations (a discretionary element). This includes the following aspects of performance: 1. Whether the contractor effectively managed the contract effort; 2. How responsive the contractor was to contract requirements; 3. How promptly the contractor notified the Government of problems; 4. Whether the contractor was reasonable and cooperative; 5. How flexible the contractor was; 6. Was the contractor proactive; 7. How effective were contractor recommended solutions; and 8. Did the contractor effectively implement socioeconomic programs, including compliance with requirements of the clause of FAR 52.219-8, Utilization of Small Business Concerns and Small Disadvantaged Business Concerns, and 52.219-9, Small Business and Small Disadvantaged Business Subcontracting Plan.	Unsatisfactory : Response to inquiries, technical service, and administrative issues is not effective and responsive. Marginal : Response to inquiries, technical service, and administrative issues is marginally effective and responsive. Satisfactory : Response to inquiries, technical service, and administrative issues is usually effective and responsive. Excellent : Response to inquiries, technical service, and administrative issues is effective and responsive.

Figure IID.3: DFARS Past Performance Evaluation Criteria

There may appear to be some advantages in a single set of evaluation criteria for all contracts, just as there are apparent disadvantages that bring into question a "one size fits all" approach to evaluating contractor past performance. These questions are addressed later in this section.

3. Contractor Evaluation Program Model ("To-be" Model)

The diagram below incorporates the Contractor Evaluation Program described in Section II. C. The principal difference between the Contractor Evaluation Program and

the “As-Is” and DFARS models is the focus on business areas , shown in the shaded area in the center of the diagram. This emphasis on business areas includes: a business area plan, a business area strategy to guide the collection and use of past performance information; and a business area evaluation process, tailored to the specific requirements of the business area.

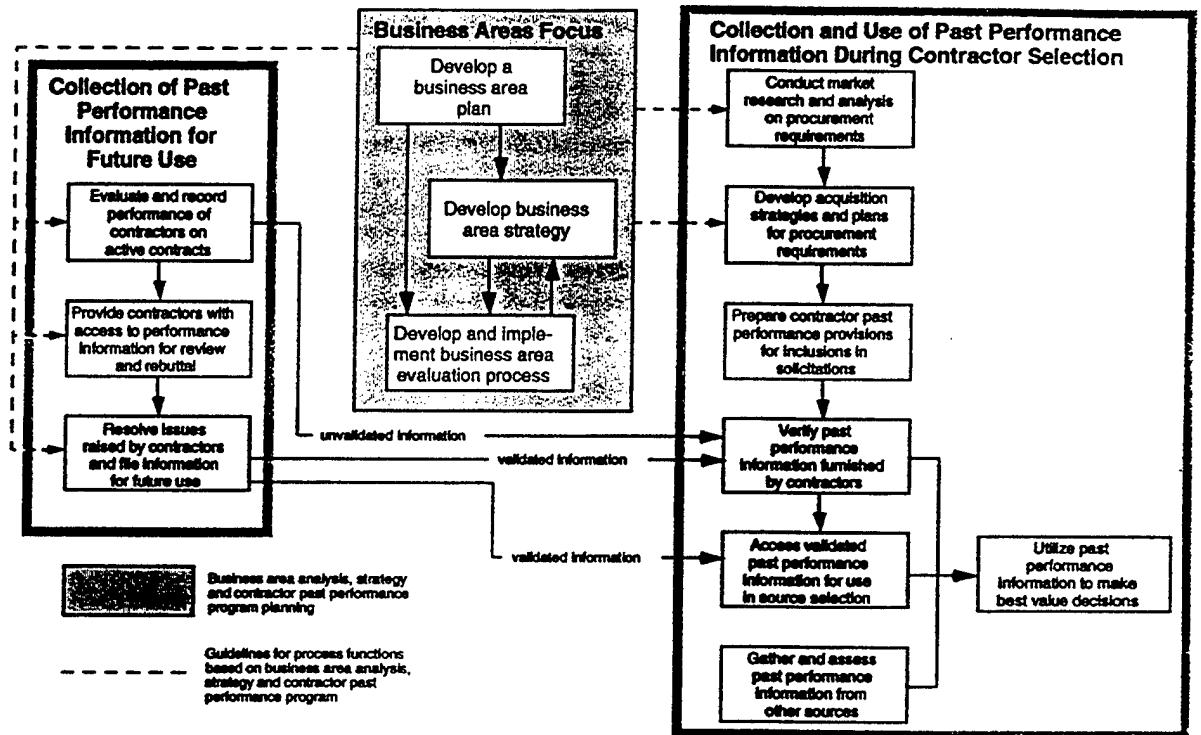


Figure IID.4: Contractor Evaluation Program Model

The principles that were used in designing the model were derived from an analysis of our previous research in this area and from the government and industry approaches to contractor past performance and supplier evaluation that we reviewed in this study. They included the following:

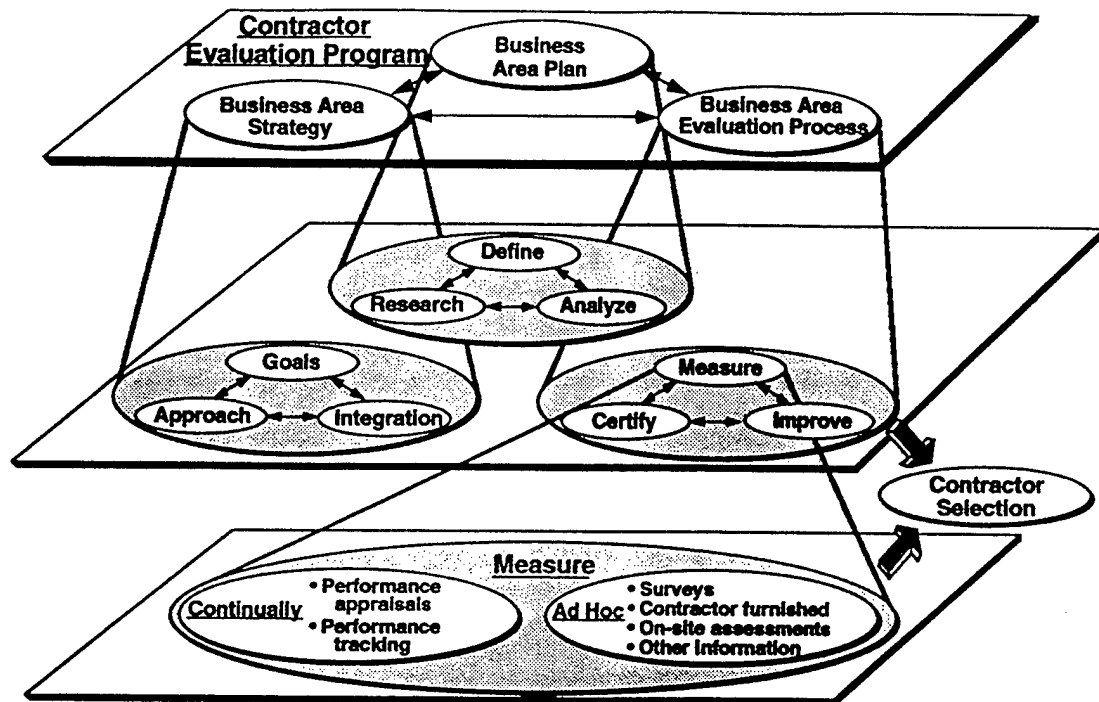
- A cost-effective approach to the collection and use of contractor past performance information depends on, and is sensitive to factors related to the business areas in which products and services are procured and used (as opposed to a universal approach that can be applied to the full range of products and services procured by DOD in all sectors of the industry).
- A business area consists of a homogeneous group of products or services which share similar characteristics and for which a forward-looking plan and a coherent and congruous strategy and evaluation process can be developed.

- Business areas can be local or extended in application. In their most robust form, they constitute the horizontal integration of products and services across organizational lines.
- The process for implementing contractor past performance issues in a particular business area is developed from business area plans and strategy for the specific business area and typically involves a cross-functional team effort.
- The initial and vital step in developing plans and strategy for a business area is an analysis that covers the requirements for the product or service, past and projected; the industry composition and basis of competition; and the market trends and specific performance of leading companies in the industry.
- The business area plan and strategy will provide the basis for developing a tailored approach to the collection and use of contractor past performance information in the particular business area as well as the foundation for a total program designed to incorporate best value practices into the procurement process and to attract contractors and suppliers committed to high levels of performance.
- Information technology will be utilized to facilitate communication between Government managers in separate organizations with a need to share information about business area strategies and plans as well as the past performance of individual contractors in those business areas.

The key elements of the Contractor Evaluation Program as shown on the top level of the accompanying diagram are:

- A Business Area Plan;
- A Business Area Strategy in the context of an overall acquisition strategy for the business area
- A Business Area Evaluation Process that can be used to tailor the contractor past performance provisions of the FAR and the DFARS to the particular business area.

Each of these elements is interrelated and are shown at three levels of detail in the diagram below.



The Business Area Plan at the second level of the diagram: *defines* the business area to be investigated; includes a *research* input using internal and industry data; and presents an *analysis* of all the internal and external factors related to the business area.

The Business Area Strategy at the second level of the diagram includes :

- *Integration* of contractor past performance issues with the broader issues related to the overall acquisition program for the business area, and with the cross-functional considerations that may be involved (e.g., engineering, test and evaluation, production, logistics, risk management, and quality)
- *Goals* for the contractor past performance program in the business area, including the desired level of performance sought from contractors with whom contracting relationships exist or are anticipated
- *Approach* for the use of past performance information designed to achieve the best value and world-class suppliers goals and objectives established for the business area, and to provide guidelines for developing a cost effective plan tailored to the particular business area.

The Business Area Evaluation Process is designed to lay out a plan for executing the Business Area Plan and Strategy. Three principal areas are identified for possible

coverage in the process, these may be changed or others may be added when warranted in a specific business area.

The three principal areas are:

- A process to *measure* the performance of contractors based on criteria tailored to the business area and consistent with the strategy for the business area;
- A process to *certify* the performance of contractors consistent with the strategy for the business area and that considers the certification of processes, products and services (e.g., "Blue Ribbon" Programs); and
- A process to *improve* the performance of contractors that constitute the supplier base, in a manner consistent with the strategy established for the business / program area (e.g., process improvement initiatives and recognition programs).

Whereas all processes should address the performance measurement aspects of the program, the other two areas will be covered to the extent that the agreed strategic approach provides guidance and direction in these areas.

The third level of the diagram addresses the methods that will be used to measure past performance information on contractors that participate in the business area. The following methods are candidates for use:

A *continuous* measurement program that typically may include provisions for review of the information by the contractor; a process for dealing with the resolution of contractor rebuttals; and the maintenance of the information for future use when needed for source selection purposes, or some other purpose consistent with the strategic plan. This approach is implemented in either of the two following ways:

- Periodic performance appraisals at the contract or contract order level based on an assessment by the responsible government official(s) for contract technical and management oversight; and
- Continuous performance tracking at the contract line item level based on quality and delivery data collected as a part of established contract management and oversight processes.

An *ad hoc* measurement program that is designed to provide past performance information when needed to support contractor selection decisions, or some other purpose established in the strategic plan. This type of program may include information from sources such as:

- Surveys of prior customers—e.g., reference checks;
- Requests for past performance information from contractors (e.g., in response to solicitations);

- On-site assessments of contractor operations to include their technical and management processes; and
- Information gathered from other available source (e.g., product performance and reliability data, C/SCS data, certifications and awards, etc.).

The Contractor Evaluation Program is a comprehensive approach for collecting and providing information on the past performance of contractors for contractor selection purposes. It is also an orderly approach to tailoring policy and requirements to specific business areas, and to achieving and sustaining improvements in the overall level of performance exhibited by contractors in the business area.

4. Difference Between Contractor Evaluation Program and DFARS Models

The following summarizes the principal differences between the Contractor Evaluation Program and the DFARS model in dealing with contractor past performance issues, policies and requirements. Each of the criteria indicated in the chart is discussed in the following paragraphs.

CRITERIA	DIFFERENCES	
	DFARS	Contractor Evaluation Program
FLEXIBILITY Organizations are provided latitude and empowered to tailor requirements and guidelines to fit particular characteristics of their business areas	Limited	Substantial
SCOPE Consideration of past performance information extends beyond its use in source selection decisions to include improvement initiatives	None	Significant
BUSINESS AREAS FOCUS An analysis of business areas is recognized as a key factor in developing effective strategies and plans for dealing with past performance issues	No	Yes
PROCESS INTEGRATION & TEAMWORK Past performance strategies and plans are developed consistent with overall acquisition strategies and utilizing cross-functional teamwork	Limited	Yes
VALUE TO THE USER Information on the past performance of contractors provides a valuable input to sources selection decisions and is shared with other organizations	Limited	Substantial
SHARING INFORMATION Provisions are made for sharing contractor past performance information among DOD organizations in a cost effective manner	Not addressed	Yes

Figure IID.5: Comparison of DFARS and Contractor Evaluation Program Models

Flexibility

The Flexibility criterion addresses the capability to deal with and adapt to the particular circumstances of an acquisition program. It is especially important in the implementation of past performance policy and requirements within the DOD because of the wide range of products and services that are acquired and the wide range of circumstances that may affect the acquisition process leading up to the selection of contractors and to the award of contracts. In addition, the post-award activities and the contract management approach used by DOD components is also subject to considerable variability depending on factors such as the size, scope, complexity, and nature of the contracted work.

Both models are designed to address the flexibility criterion. The extent of the flexibility in the Contractor Evaluation Program is considerably greater than the FAR / DFARS model, as summarized in the following table.

FLEXIBILITY	DIFFERENCES
CONTRACTOR EVALUATION	FAR / DFARS MODEL
Organizations with contracting authority and technical oversight responsibilities shall establish the content and format of performance evaluations based on analysis of their business areas and consistent with strategies and processes established by these organizations.	Content and format of performance evaluations shall be established in accordance with agency procedures and should be tailored to the size, content and complexity of the contractual requirements. (Ref. FAR 42.15)
Contractor evaluations will be tailored to the business areas in which the contracts are issued and to the requirements established in the contracts. This tailoring may extend to the thresholds used and to the provisions for review and rebuttal by the contractor.	Contractor evaluations will be prepared on all active contracts above the \$100,000 threshold, reviewed by contractors subsequent to the evaluation, and filed and protected as "source selection information" after resolution of any rebuttal by the contractor. (Ref. FAR 42.15)
Principal users of contractor past performance information include government officials involved in contracting decisions. Users of the information shall have a major role in determining the scope and content of contractor evaluations in specific business areas.	The evaluation of contractor performance shall include specific data elements and evaluation areas, factors and ratings (as delineated in the proposed DFARS 42.15)
Same as the FAR / DFARS model, except that cognizant technical officials will also ensure that their responsibilities are discharged in a manner consistent with the strategy and the plan established for the business area.	The cognizant technical official is responsible for the technical and past performance requirements related to the source selection process. [Ref. FAR 15.604 (b)]
Same as the FAR / DFARS model, except that the contractor past performance strategy and implementing process shall cover guidelines and provide decision rules for determining the inclusions of past performance factors in source selection and contracting decisions.	Past performance shall be evaluated (in contract award decisions) . . . unless the contracting officer documents in the contract file the reasons why past performance should not be evaluated. [Ref. FAR 15.605 (b)]
Same as the FAR / DFARS model, except the source and type of past performance information is first tailored to each business area and the approach is described in the strategy for the business area.	The source and type of past performance information to be included in the evaluation is within the broad discretion of agency acquisition officials and should be tailored to the circumstances of each acquisition. [Ref. FAR 15.608 (a)]

Figure IID.6: Contractor Evaluation Program and FARS/DFARS Flexibility Differences

A more rigid structure for the collection and use of contractor past performance information would very likely simplify the information processing functions and the automated systems that may be used to support these functions. Our analysis indicated that *the value of past performance information to the user for contractor selection purposes diminishes as the degree of standardization is increased in the evaluation process and in the collection of information.* The views of the government officials who were interviewed during the course of the project and who participated in the workshops tended to support this view.

Scope

The Scope criterion addresses the coverage each model provides for all types and

sources of contractor past performance information and for all potential uses of this information. Provisions in Subpart 15.8 and in Subpart 42.15 of the FAR, supplemented by the provisions in the proposed DFARS, address the types and sources of past performance information and one purpose served by this information (i.e., for source selection purposes). The statement in the FAR Subpart 15.8 states:

"... the solicitation shall afford offerors the opportunity to identify ... contracts performed by the offerors that were similar in nature to the contract being evaluated, so that the Government may verify the offerors' past performance on these contracts. ... Past performance information may also be obtained from other sources known to the Government. The source and type of past performance information to be included in the evaluation is within the broad discretion of agency acquisition officials and should be tailored to the circumstances of each acquisition. Evaluations of contractor performance prepared in accordance with Subpart 42.15 are one source of performance information which may be used."

Whereas supplemental FARS/DFARS guidance could be provided to address other types and sources of past performance information and the potential use of this information for other purposes, none is currently available. The OFPP guide on best practices for past performance, published in May 1995, is recognized to be an interim measure. Some of the guidance provided in this document does not appear to have relevance to DOD acquisition.

The Contractor Evaluation Program is intended to provide a broader perspective to contractor past performance and is designed to address a total systems approach to the collection and use of past performance information, to include:

- The type of analyses required to develop a tailored approach by business area
- A definitive strategy for dealing with the entire issue of contractor past performance in each business area in a manner consistent with the overall acquisition strategy and procurement planning for the business or program area; and
- A process focused on the actions necessary to execute the contractor past performance strategy in areas such as performance measurement, product and process certification, and performance improvement initiatives.

Coverage in the Contractor Evaluation Program is provided for the performance appraisal information that is addressed in Subpart 42.15 of the FAR, and performance tracking systems, such as the Navy's Red/Yellow/Green system and DLA's Automated Best Value Model. The proposed model also covers past performance information related to the certification of contractors for products and services as well as the processes employed by the contractors.

Business Area Focus

This criterion addresses the capability to effectively deal with the size, scope and diversity of the DOD acquisition program.

The proposed Contractor Evaluation Program recognizes that the products and services acquired by DOD span from sophisticated, multi-million dollar weapon systems to relatively simple, inexpensive commodities. Using FY '94 data, the following table illustrates the size of the DOD procurement program as well as the range of products and services that are acquired. Also shown is the breakdown of the total dollars into the various categories.

FY94 funds in \$M		Money Spent	%
Research & Development		21,824	100
AB Community Service		1.7	0.0
AC Defense Systems		14,750.5	67.6
AD Defense - Other		4,034.9	18.5
AE Economic Growth and Productivity		158.7	0.7
AF Education		2.9	0.0
AG Energy		2.1	0.0
AH Environmental Protection		63.6	0.3
AJ General Science & Technology		163.1	0.7
AN Medical		444.5	2.0
AP Natural Resources		4.4	0.0
AR Space		497.4	2.3
AS Transportation - Modal		8.3	0.0
AT Transportation - General		.9	0.0
AV Mining		.3	0.0
AZ Other R&D		1,690.3	7.7

Other Services & Construction		43,948	100
B Special Studies and Analyses - Not R&D		343.6	0.8
C Architect & Engineering Serv. - Construction		2,629.6	6.0
D Auto. Data Processing & Telecom. Services		3,090.6	7.0
E Purchase of Structures and Facilities		.2	0.0
F Natural Resources Management		667.3	1.5
G Social Services		361.4	0.8
H Quality Control, Testing and Inspect. Services		340.6	0.8
J Maintenance, Repair, and Rebuilding of Equip.		5,839.0	13.3
K Modification of Equipment		1,135.9	2.6
L Technical Representation Services		890.4	2.0
M Operation of Government-Owned Facility		2,423.8	5.5
N Installation of Equipment		338.1	0.8
P Salvage Services		72.2	0.2
Q Medical Services		471.8	1.1
R Professional, Admin. & Mgmt. Support Serv.		7,304.9	16.6
S Utilities and Housekeeping Services		3,194.7	7.3
T Photo., Mapping, Printing, & Pub. Services		157.6	0.4
U Training Services		692.7	1.6
V Transportation and Travel		2,144.1	4.9
W Lease or Rental of Equipment		432.9	1.0
X Lease or Rental of Facilities		118.1	0.3
Y Construction of Structures and Facilities		6,607.7	15.0
Z Maint. Repair or Alteration of Real Property		4,690.6	10.7

Supplies and Equipment		52,342	100
10 Weapons		701.0	1.3
11 Nuclear Ordnance		2.2	0.0
12 Fire Control Equipment		553.1	1.1
13 Ammunition and Explosives		1,068.5	2.0
14 Guided Missiles		4,598.0	8.8
15 Aircraft and Airframe Structural Components		13,078.5	25.0
16 Aircraft Components and Accessories		1,170.1	2.2
17 Aircraft Launch, Landing, and Ground Equip		82.3	0.2
18 Space Vehicles		166.1	0.3
19 Ships, Small Craft, Pontoons / Floating Docks		3,480.3	6.6
20 Ship and Marine Equipment		137.1	0.3
22 Railway Equipment		19.3	0.0
23 Motor Vehicles, Trailers, & Cycles		2,006.5	3.8
24 Tractors		26.7	0.1
25 Vehicular Equipment Components		355.4	0.7
26 Tires and Tubes		33.9	0.1
28 Engines, Turbines, and Components		2,832.3	5.4
29 Engine Accessories		176.8	0.3

Supplies & Equipment (cont)		Money Spent	%
30 Mechanical Power Transmission Equipment		60.1	0.1
31 Bearings		51.9	0.1
32 Woodworking Machinery and Equipment		1.1	0.0
34 Metalworking Machinery		53.8	0.1
35 Service and Trade Equipment		7.4	0.0
36 Special Industry Machinery		173.1	0.3
37 Agricultural Machinery and Equipment		3.8	0.0
38 Const., Mining, Excavating, Highway Equip.		107.4	0.2
39 Materials Handling Equipment		220.2	0.4
40 Rope, Cable, Chain and Fittings		12.1	0.0
41 Refrig., Air Conditioning & Circulating Equip.		72.3	0.1
42 Fire Fighting, Rescue, and Safety Equipment		121.8	0.2
43 Pumps and Compressors		72.9	0.1
44 Furnace / Steam Equip. & Nuclear Reactors		270.1	0.5
45 Plumbing, Heating, and Sanitation Equipment		16.5	0.0
46 Water Purification and Sewage Treat. Equip.		16.3	0.0
47 Pipe, Tubing, Hose and Fittings		47.9	0.1
48 Valves		76.2	0.1
49 Maintenance and Repair Shop Equipment		353.0	0.7
51 Hand Tools		19.8	0.0
52 Measuring Tools		7.4	0.0
53 Hardware and Abrasives		73.9	0.1
54 Prefabricated Structures and Scaffolding		96.5	0.2
55 Lumber, Millwork, Plywood and Veneer		13.2	0.0
56 Construction and Building Materials		51.1	0.1
58 Com., Detection, & Coherent Radiation Equip.		4,800.1	9.2
59 Electrical and Electronic Equip. Components		1,016.9	1.9
60 Fiber Optics Materials, Comp., Assy., Access.		58.6	0.1
61 Electric Wire, and Power and Distrib. Equip.		534.1	1.0
62 Lighting Fixtures and Lamps		33.9	0.1
63 Alarm, Signal, and Security Detect. Systems		31.2	0.1
65 Med. Dental, & Veterinary Equip. & Supplies		348.6	0.7
66 Instruments and Laboratory Equipment		769.2	1.5
67 Photographic Equipment		35.4	0.1
68 Chemicals and Chemical Products		240.8	0.5
69 Training Aids and Devices		646.9	1.2
70 Gen. Purpose Auto. Data Processing Equip.		2,213.5	4.2
71 Furniture		269.6	0.5
72 Household & Com. Furnishings & Appliances		41.9	0.1
73 Food Preparation and Serving Equipment		25.6	0.0
74 Office Equip., Text Process. / Visible Records		18.7	0.0
75 Office Supplies and Devices		7.0	0.0
76 Books, Maps, and Other Publications		160.3	0.3
77 Musical Instruments, Phonographs & Radios		1.6	0.0
78 Recreational and Athletic Equipment		10.5	0.0
79 Cleaning Equipment and Supplies		21.3	0.0
80 Brushes, Paints, Sealers and Adhesives		3.7	0.0
81 Containers, packaging and Packing Supplies		136.6	0.3
83 Textiles, Leather, Furs, Apparel, Tents / Flags		134.0	0.3
84 Clothings, Individual Equipment, and Insignia		511.7	1.0
85 Toiletries		35.7	0.1
87 Agricultural Supplies		6.7	0.0
88 Live Animals		.1	0.0
89 Subsistence		1,577.9	3.0
91 Fuels, Lubricants, Oils, and Waxes		4,549.9	8.7
93 Nonmetallic Fabricated Materials		12.3	0.0
94 Nonmetallic Crude Materials		17.3	0.0
95 Metal Bars, Sheets and Shapes		31.2	0.1
96 Ores, Minerals and Their Primary Products		4.0	0.0
99 Miscellaneous		1,547.4	3.0

Figure IID.7: FY1994 Product/Service Acquisitions (\$M)

Included in the tabulation shown in the table above are all contract actions above \$25,000. The total of these actions was about \$118 billion in FY '94, which was divided into about 19% for R&D, 37%

for services and construction, and 44% for supplies and equipment. The total DOD procurement program for FY 94 accounted for about 67% of all federal departments and agencies.

It is important to understand the size and scope of the DOD procurement program as well as the number of organizations that have procurement authority and technical oversight responsibilities for a portion of the total program. Some of the principal organizations in the major DOD components are listed below. In addition, contracts are awarded by the operational organizations in each service including bases, posts and camps.

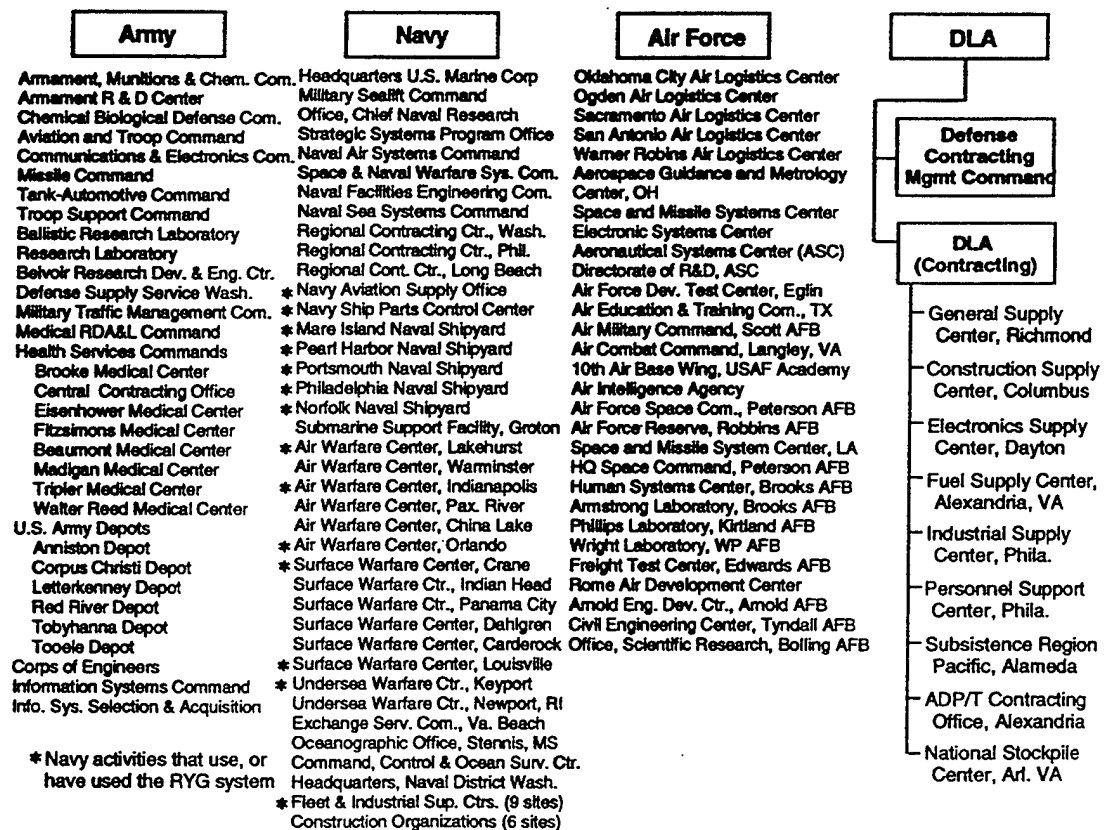


Figure IID.8: Principal Organizations That Acquire Products/Services

Under review, the DOD acquisition program dwarfs anything in the commercial world. Even the largest commercial operations are relatively small by comparison. And most of the major firms focus their business in a relatively few areas (e.g., automobiles, software, aircraft, etc.).

The tremendous size, scope and diversity of the DOD acquisition program, as indicated in the preceding discussion, represented a significant challenge during the course of conducting the study and examining the contractor past performance issue. It was found that any discussion or analysis of contractor past performance required a qualifying statement that established the particular segment of the total program being addressed. For example, a method that was reasonable and logical for one segment was found to be irrelevant or even counter productive in other areas. These observations provided the basis for one of the design characteristics that has been built into the Contractor Evaluation Program -- , the capability to deal with the inherent differences in the various segments of the DOD acquisition program.

The business area focus in the proposed model is achieved by addressing each business area as a separate entity, analyzing the factors relevant to the business area, and then devising a strategy that makes sense for dealing with contractor past performance at the business area level. This information is then used to develop ground rules and to devise a process, for considering past performance in contracting decisions, and improving the overall performance of contractors in a particular business area.

The FAR / DFARS model does provide for tailoring but does not address the idea of using the business area analysis as the basis for devising a sensible, cost effective approach to contractor past performance. The FAR gives some recognition to market research in Part 11 for determining the availability of commercial products in the marketplace for Government use. The Non-Developmental Item (NDI) handbook does address market investigations for NDI purposes. Neither, however, encompasses contractor past performance considerations, nor is it undertaken on a continuing basis.

Process Integration & Teamwork

This criterion deals with provisions for handling the integration of past performance considerations with other factors and analyses that may be pertinent to a particular business area, or to the acquisition program or programs that constitute the business area. The criterion also, encompasses the teamwork and coordination needed for dealing with the cross-functional interests and perspectives that may be a factor in the larger more complex business areas.

The process integration and teamwork provisions in the Contractor Evaluation Program are primarily addressed in the development of a business area strategy. This activity also contributes to the process by which the vertical, overall acquisition strategy is developed for a program area.

At the present time the DFARS model does not specifically address the integration nor the teamwork aspects for dealing with contractor past performance, either in the collection of information on contractor performance or in the use of this information for contractor selection purposes. Guidance in this area could be developed and provided in a separate document, *there does not appear to be recognition in the DFARS for an integrated and cross-functional teaming approach to the implementation of the contractor past performance policy.*

Value to the User

This criterion deals with the capability to focus on the needs of the ultimate user and to provide past performance information that has value to the users -- government officials involved in the acquisition of products and services.

The Contractor Evaluation Program is designed to ensure that it will provide useful information to users by incorporating the following features:

- *Users define the specific evaluation criteria to be used.* This feature is based on one of the underlying principles embedded in the Contractor Evaluation Program; namely, *use dictates collection*. The specific approach for handling the past performance contractors is developed at the business area level. Part of this process provides for developing specific criteria that will be used to evaluate the performance of contractors. The primary user of this information is the same organization that collects the information, or that oversees its collection.
- *Users maintain local files on contractor past performance.* When past performance information is gathered on a continuing basis for future use by a particular business area, it will typically consist of either performance appraisal information or performance tracking information. Performance appraisals are generated locally by government officials with contract management oversight responsibility. And tracking information is typically gathered from separate databases that cover quality and delivery performance. In either case, this information is available across the business area and continuously updated for future use in the selection of contractors to perform similar work.

By specifying top and second level criteria the DFARS model limits the extent to which the needs of the ultimate users of the information are considered.

Past Performance Information Sharing

This criterion deals with the capability to share past performance information among government organizations.

In the Contractor Evaluation Program, provisions are made for sharing two types of information within the business areas - *administrative and specific past performance for use by other organizations in a business area..* This information could be appended to a Central Contractor Registry or similar centralized system, through a lead site within the business area, or it could be provided separately. The following is a brief description of each type:

- The *administrative information* includes on-line access to the full range of data from the Federal Procurement Data System (FPDS) for any product or service code of interest. These data include the identity of contractors that provide various products and services to the government, including contract numbers, types, and dollar value. Additional information would also include: a synopsis of contract work statements; an indication if past performance information was available for a particular contractor at a certain location; the availability of planning information for the particular business area; and contact points for the purpose of obtaining additional information and coordinating with the other government organizations.
- The *past performance information* would include information available at other business area sites, based on criteria used by the business area. This information would be accessible by direct contact with the other organizations by whatever means are established by the organization that maintains the information (e.g., telephone, e-mail, FAX, and database access). Provisions would ensure that access is provided only to authorized users.

Section III. Conclusions

This section is organized into three parts. The first is designed to provide our responses to three fundamental questions DUSD (AR) needs to consider to implement past performance policy implementation. The second part states general lessons-learned that we believe should guide past performance policy implementation. The third presents additional associated conclusions.

A. Responses to DUSD (AR) Questions

Question: Should DOD collect and use the past performance information required by FAR Part 42?

Answer:

Yes, because:

- *It makes good business sense as proven by overwhelming industry acceptance*
- *It is being used successfully in DOD now, although on a very limited scale*
- *It can be tailored to fit specific circumstances, although proposed DFARS policy has the effect of limiting tailoring.*

Discussion:

We reviewed government and industry experience to answer the question of whether to implement FAR Part 42.

There is a very limited amount of Government experience available. The past performance information systems in use in DOD acquisition accounted for a very small percentage of DOD actions or dollars. They were not a valid resource for answering this question for all the different types of products/services. However, the commodity-based systems we observed were successfully meeting their intended purposes.

There is extensive industry supplier evaluation program experience (the industry parallel to our definition of a Government past performance information system), that supports the implementation of FAR Part 42 guidance by DOD. However, there is very little industry experience with services and major/small system acquisitions using supplier

evaluation program techniques. There is also an extensive amount of industry experience on approval of processes in addition to measuring contract performance.

The benefits of establishing ongoing performance measurement, certification, and/or approval programs support implementing FAR Part 42 requirements. These benefits include:

- Improved service
- Decreased costs (transportation, product/part, transaction (labor), payment terms, inventory, operations)
- Increased quality
- Improved development time to introduction of new technologies
- Increased customer satisfaction and loyalty
- Higher employee morale

The process essentially leverages the information that would otherwise be collected for contractor selections by using it for performance measurement/feedback, certification, and/or improvement programs.

Questions:

- (a) What information should be collected?
- (b) What type of approach should be used?
- (c) What direction and guidance should be provided?

Answer (a):

The information that is collected should be driven by its planned uses and tailored to the business area requirements. The business area planning and strategy steps will help define the planned uses for past performance information and top-level criteria, e.g., Quality, Cost, Delivery, and Service. The next level of definition should be accomplished in the business area evaluation process.

Answer (b):

The DOD approach should follow these general principles:

Decentralized, Focus on Business Areas, Total Program Context, Horizontally Integrated, User and Use-Driven, Simple, and Share Information.

Discussion:

An explanation of these principles follows:

- **Decentralized**--The range of products and services, and variance in size, scope, type, and complexity of contracts makes a standard, DOD-wide system impractical. Government and industry experience support a decentralized approach supported by general guidelines, decision rules, best practices, and information technology support.
- **Focus on Business Areas**--The implementation of past performance should focus on individual business areas at the operating level which encompass similar products or services from which a coherent and congruous strategy can be developed by organizations with procurement authority and technical responsibility.
- **Total Program Context**--Past performance needs to be viewed in the context of a total program that goes beyond the collection and use of past performance information, and covers:
 - Analysis of individual business areas including both internal and external factors
 - Development of a sensible strategy for contractor past performance at the business area level.
 - Processes designed to implement the strategy for business areas in which the organization is active
- **Horizontally Integrated**--The business area concept starts at the local level, where it is integrated with the acquisition strategy and procurement planning for the business areas. As business area alliances are formed, they exert a DOD-wide horizontal integration effect by joining similar business areas across the DOD components. The implementing direction needs to emphasize the need for integration and coordination.
- **User-Driven**--The users of past performance information need to have the principal role in defining what information to collect, when to collect it, and how to make it available for their use in selecting contractors. The users should include the technical, management, and procurement officials who are involved in and responsible for making contractor selection decisions.
- **Simple**--To be effective, the past performance approach has to be easy to understand and explain, without being simplistic, or it runs the risk of being misunderstood, ignored, or both.

- **Share Information**--Systems and processes for sharing past performance information among organizations depend on all of the above and should be dealt with after all of the above are dealt with.

Answer (c):

DUSD(AR) past performance implementation policy and guidance should consider the following specific conclusions:

- *Past performance policy implementation should follow the tenets, procedures, and techniques of the Contractor Evaluation Program or a similar program.*
- *The past performance information collection requirements of FAR Part 42 should be implemented for commodity acquisitions, except for commercial products.*
- *The past performance implementation requirements of FAR Part 42 should be tested on a pilot/prototype basis for the acquisition of services.*
- *The past performance informative requirements of FAR Part 42 should not be required for major/small systems. A pilot/prototype system should be tested for major/small systems, with emphasis on the evaluation of processes.*

Discussion:

Based on the industry and Government information available, it appears reasonable for DOD to implement FAR Part 42 collection requirements for commodity-type acquisitions.

There is very little data for service-type acquisitions other than A&E and construction. Although the Corps of Engineers systems appeared to be successful for their highly-tailored application, we do not feel comfortable endorsing that specialized experience for all the different services-types procurements.

For major systems, CPARS is a successful system. However, it was not clear there is a benefit to collecting vast amounts of contract-related past performance information over a six- to ten-year timeframe for a systems acquisition when it may not be used for a similar contractor selection until years later. The benefits may be more forthcoming from collecting process related past performance information.

Question: How should information be collected—Single system, Decentralized systems, Ad hoc only?

Answer:

There is no single answer. The response is sub-divided into three perspectives - single system, decentralized systems, or ad hoc.

Single System:

A single DOD-wide past performance information system would be effective only as a "red and/or blue flag" system and could not provide the detailed analyses to support best-value, world-class contractor selection.

Discussion:

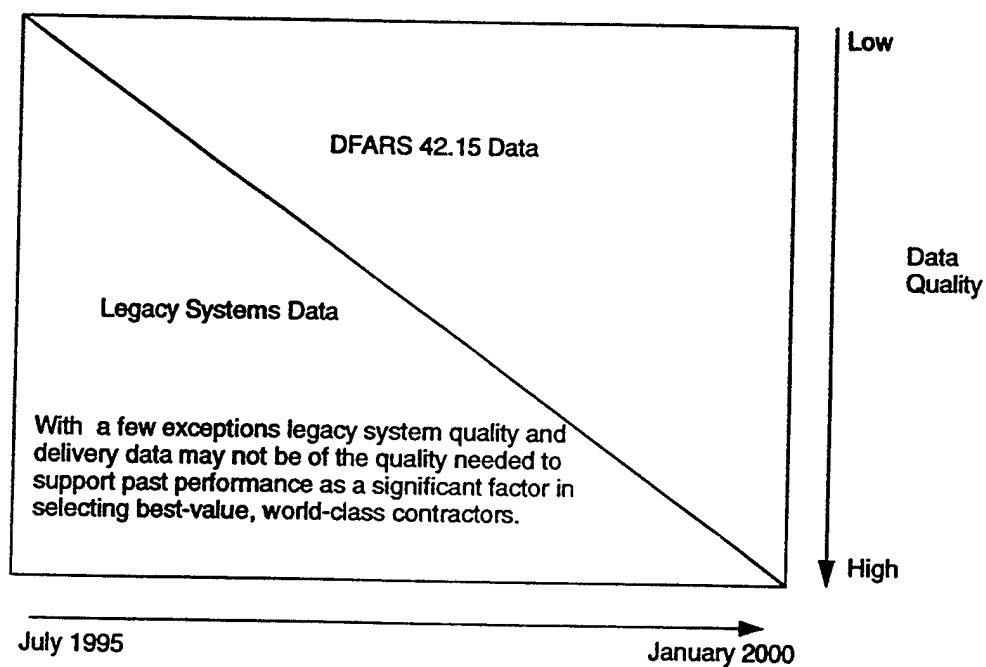
The weight accorded past performance information in contractor selections has considerably increased. Contractor past performance evaluation generally has been conducted in a very circumscribed manner, compared to what is envisioned in the new policies:

- Past performance has been a *minor factor* in source selection
 - Typically valued at 5-15%
 - Generally not a discriminator in the selection process.
- Past performance information collection generally has been *ad hoc and concurrent* with the source selection process
 - Forms/Calls to program managers and contracting officers are made on current and expired contracts
 - Contractor submissions are in response to RFPs, RFQs
- Contract management performance measurement data was not designed to be used in source selection

Because of the weight that is planned to be given past performance information, *the accuracy, detail, and relevance* of past performance information must be the highest level, in order to support the selection of world-class suppliers on a best value basis. *It is very doubtful that a single system for the hundreds of thousands of transactions that occur annually (and possibly millions over a three-year period for maintaining the data) could provide the relevant and detailed past performance information that is required.*

The problem of accuracy poses another considerable issue. With few exceptions, *the accuracy of quality and delivery source data in legacy systems is inadequate to support widespread use of past performance information systems.* Previous attempts by the Services have failed because of the lack of accurate data from source databases. Data of the highest reliability is needed for a credible past performance information system.

The Red/Yellow/Green system has been successful because of the reliability of the quality performance data in its source databases. It has been providing contractor quality performance ratings for over five years. However, its efforts to expand to include ratings for delivery performance were slowed by the lack of reliable delivery data. The introduction of new past performance systems is dependent on reliable source databases, without which new past performance information systems cannot be used. We see the process as one in which the data to be collected under FAR Part 42, should be designed to produce accurate, relevant, and detailed data needed for the new past performance information systems.



Decentralized System:

Decentralized systems organized on a business area basis are the most cost-effective approach to implementing FAR Part 42 collection requirements.

The reasons that led us to develop the Contractor Evaluation Program model are the same that support this conclusion. A decentralized system with a business area focus will provide the relevant, detailed data to support best-value, world-class contractor selection decisions. Over time accuracy will be improved, but procedures are required to insure quality data is collected and provided to selection officials.

Ad hoc Approach:

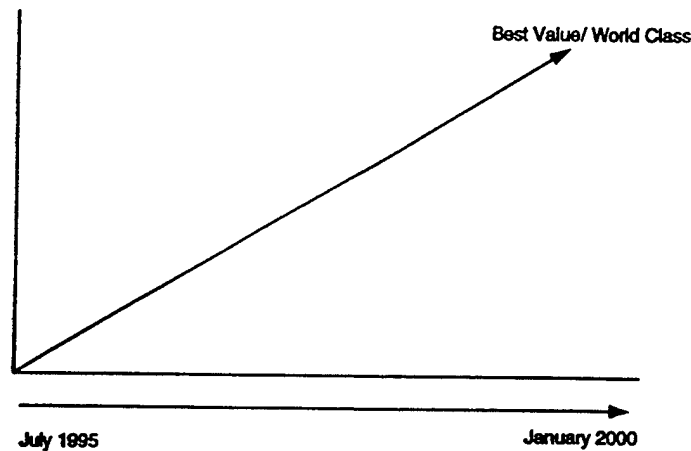
This approach may not provide the systematic, accurate, relevant data that is needed to support past performance as a major factor in contractor selection.

Systematic collection of past performance data is essential to supporting the increased weight being accorded past performance in contractor selection. Due to the distributed nature of the data that is collected *ad hoc*, it is highly unlikely that it will be entirely relevant, accurate, or detailed enough to support the prominent evaluation weight being accorded to past performance in contractor selections. This *ad hoc* approach is characteristic of the manner in which past performance data is collected today. Improvements being made by DOD and other Federal agencies in collection techniques are a step in the right direction. However, until procedures are added for contractors to validate the data, it is difficult to imagine the *ad hoc* approach as being fully capable of supporting weighty past performance-based contractor selection decisions.

B. Lessons Learned

The following lessons learned are provided for DUSD (AR) consideration:

- Achieving full implementation can take 5 to 7 years. Nonetheless, the perspective and its evolving development offers vision, a road map, and confirmation of direction for DOD.



- Linking past performance strategies to overall acquisition reform strategy and initiatives is critical.
- Partnering and multi-functional teamwork at all levels with internal customers and suppliers are essential.
- All stakeholders must be identified and explicitly considered in process improvements.
- Information systems and accurate data are critical to implementation.
- The challenge to improve the supplier base is difficult, but can be achieved by working with suppliers in a win-win relationship.

C. Associated Conclusions

There are a number of barriers in the DOD environment to widespread adoption of past performance as a major selection factor in a best-value context:

- Low bidder mindset/culture
- Risk avoidance culture

- Lack of experience with subjective decisionmaking
- Need to educate buyers that there is a choice
- Time to validate performance information
- Weak/inaccurate quality and delivery data processes
- Lack of tools to collect accurate data
- Impact on acquisition streamlining efforts to reduce procurement administrative lead time (PALT)
- Productivity Impact
- Administrative burden

Innovative change management training programs will be required to meet past performance policy implementation and its related world-class supplier and best-value objectives.

- Cultural change to support other-than-"low-cost" mentality is slow to take place without new learning, team environment, management commitment, and sound automation systems.
- Industry supplier evaluation, performance measurement, and recognition of successes and techniques may need to be introduced.
- Government initiatives may need to be expanded and emphasized.

DOD must work with contractors to develop:

- Common awareness of DOD business past performance vision/strategy
- Shared understanding of current reality/leverage points
- Align actions for redesigning processes and implementing resource, technology, and organizational features
- Collaborative review of progress throughout the cycle

Long-term contracts should be emphasized to:

- Provide contractors with the confidence to do necessary long-term planning and increase commitment.
- Provide contractors with tangible evidence that you are serious about partnership.
- Reduce cost by lengthening the period that contractors have to recover capital investments.
- Reduce administrative costs of annual contract award.

On-going process evaluation programs should be considered. DCMC's Risk Assessment Model and PROCAS programs and planned initiatives like JACG-CPARS Supplier Assessment are similar to industry programs.

- DCMC uses RAM and PROCAS programs to evaluate key contractors and to improve their processes.
 - Designed for contract management not to support source selection
 - Do not apply to most DOD suppliers
- JACG-CPARS focus on contractor capability to perform future contracts based on performance risk and assessment of key processes.

Process evaluation adds an important dimension to judging future performance.

APPENDIX A

Study Methodology

The principal steps in our methodology for this study were:

- Research
- Review
- Interviews
- Analysis
- Benchmarking
- Model Program Development
- Functional Requirements Development
- Business Case Analysis

A description of the major activities that occurred as these steps were applied and the results of these efforts are included in Section II of the report. A brief overview for each step follows.

Research

Government, industry, and Arthur D. Little research resources were used to provide a starting point for the study. Our research at the start of the study was focused in three areas:

- History of past performance information systems in DOD. We examined the history of other past performance efforts in DOD since the 1960s. The collection and use of past performance information in source selection decisions is not new--numerous approaches have been tried, and this historical perspective has proven useful in guiding the study as well as developing our recommendations.
- Policy, Legislation, Regulations, and Guidance.
- The principal documents reviewed included:
 - OFPP's Policy Letter 92-5, Past Performance Information, December 30, 1992
 - Section 1091 of the Federal Acquisition Streamlining Act of 1994 (FASA)
 - Federal Register, March 31, 1995, Federal Acquisition Regulation, Past Performance Information, Final Rule
 - OFPP's "A Guide to Best Practices for Past Performance," Interim Edition, May 1995
 - Proposed amendment to Defense Federal Acquisition Regulation Supplement (DFARS)
 - DUSD (AR) and Past Performance Coordinating Council information

- Arthur D. Little's Industry Supply Chain Management Database. Arthur D. Little maintains a database of Industry Supply Chain Management case histories which was reviewed.

Reviews of Past Performance Processes and Systems

A comprehensive review process was used to *identify* and *categorize existing* past performance information systems in the federal sector. The approach we followed was to first identify all systems and processes that contained, or in some way dealt with, past performance information. They are as follows:

	Acronym	System/Process Name	Owner
1	ABVM	Automated Best Value Model	DLA
2	ACASS	A&E Contract Administration Support System	COE
3	ACPS	Automated Contract Preparation System	Air Force
4	ACTS	Automated Configuration Tracking System	DCMC
5	AMIS	Acquisition Management Information System	Air Force
6	BCAS	Base Contracting Automation System	Air Force
7	BRP	Blue Ribbon Program	All DOD
8	C/SSR	Cost/Schedule Status Reports	DOD
9	CCASS	Construction Contract Appraisal Support System	COE
10	CCSS	Commodity Command Standard System	Army
11	CDCS	Customer Depot Complaint System	DLA
12	CIS	Contractor Information System	Army
13	CIS	Contractor Information Service	DCMC
14	CPARS	Contract Performance Assessment Reporting System	Air Force
15	CPR	Cost Performance Reports	DOD
16	CPS	Contractor Profile System	DCMC
17	DPACS	DLA Pre-award Contracting System	DLA
18	GIDEP Alerts	Government Industry Data Exchange Program Alerts/Safe Alerts	DOD
19	JO41	Acquisition and Due In System	Air Force
20	JACG-IPT	Joint Aeronautical Commanders Croup Integrated Product Team (study covers contractor past performance and supplier rating)	Joint Service/ DLA
21	MIR	Material Inspection Records	Navy
22	MOCAS	Mechanization of Contract Administrative Services	DCMC
23	PADDS	Procurement Automated Data and Document System	Army
24	PASS	Pre-award Survey System	DCMC
25	PDREP	Product Deficiency Reporting and Evaluation Program	Navy
26	PQDR	Product Quality Deficiency Reports	DCMC
27	PRAG	Performance Risk Assessment Groups	Army/ AF
28	PROCAS	Process Oriented Contract Administration Services	DCMC
29	QPL	Qualified Parts List	Navy
30	RAM	Risk Assessment Model	DCMC
31	RYG	Red Yellow Green	Navy
32	SAACS	Standard Army Automated Contracting System	Army
33	SALT	System Analysis and Lab Testing	DLA
34	SAMMS	Standard Automated Material Management System	DLA
35	VRS	Vendor Rating System	Air Force

Figure A-1.1: Systems and Processes Related to Past Performance

In the next step, we used the definition of past performance information to focus on the more relevant systems and processes. According to the OFPP Policy, *past performance information* regarding a contractor's actions under previously awarded contracts is relevant information. Past performance information includes the contractor's:

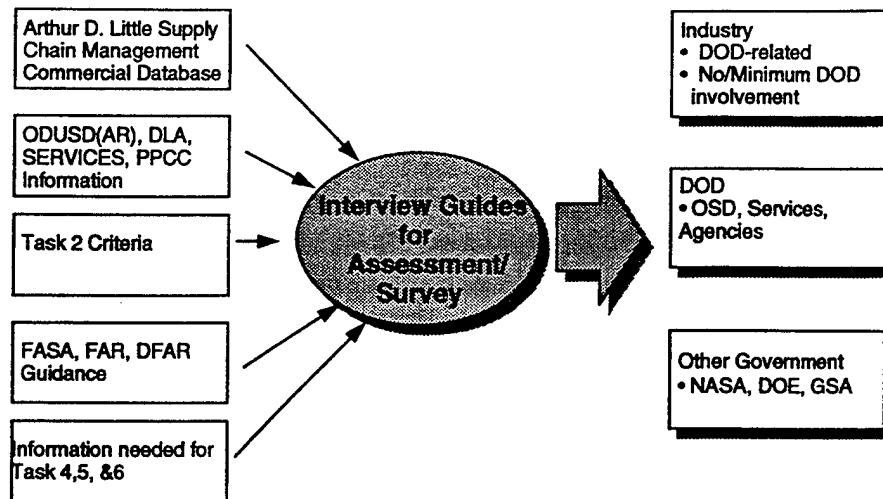
- Record of conforming to specifications and to standards of good workmanship
- The contractor's record of containing and forecasting costs on any previously performed cost reimbursable contracts
- Adherence to contract schedules, including the administrative aspects of performance
- History for reasonable and cooperative behavior and commitment to customer satisfaction
- Business-like concern for the interest of the customer

The next step involved further screening of the systems and processes using the definition for past performance information systems. This definition was derived from guidance and direction contained in OFPP Policy Letter No. 92.5, FAR changes (FAC 90-26), and OFPP "A Guide to Best Practices for Past Performance." The definition used for past performance information systems is as follows:

- Information is collected, validated and filed for the specific purpose of supporting future source selection decisions
- Opportunity is provided for review, comment and rebuttal of the information by the contractor
- Provisions are established to resolve disputes between the contractor and the government
- Information is subject to the same controls and safeguards as other information used in source selection decisions
- System is in operation and currently supporting source selection decisions

Interviews

We conducted interviews to obtain current information on existing past performance processes and systems. The chart below illustrates the approach we used to gather data on existing past performance process and systems.



Data to construct the interview guides was obtained from: Arthur D. Little supply chain management databases; information provided by DUSD (AR); the evaluation criteria contained in the statement of work for the study provided above; data from the relevant Federal Acquisition Streamlining Act, Federal Acquisition Regulation, and Office of Federal Procurement Policy documents; and questions for information we anticipated would be needed later in the study.

The interview guides and their application provided a consistent, structured approach to data collection. As indicated in the right-hand side of the above chart, interviews were conducted in three major sectors--DOD, including OSD, the DOD component; industry, including both defense and commercial contractors; and non-DOD Government agencies, including the National Aeronautics and Space Administration, Department of Energy, Department of Commerce, General Services Administration, and Department of Transportation.

An important outcome of this approach was the broad industry and government response we were able to obtain. Such response was significant in that it assured broad representation and helped mitigate potential bias. A wide range of DOD organizations was contacted for information relevant to this study. Interviews were conducted with representatives of: Defense Logistics Agency (DLA) at Headquarters and at the Defense General Supply Center; Defense Contract Management Command; Assistant Secretary of the Army/Research, Development, and Acquisition; Army Material Command; Army Corps of Engineers; Secretary of the Air Force/Acquisition Contracting; Air Force Material Command/Procurement and Wright Laboratories; Assistant Secretary of the Navy/Research Development and Acquisition; Naval Air Systems Command; and Naval Material Quality Assurance Office. Non-DOD Federal Agencies were also contacted. GSA in particular provided significant coverage in terms of contracting experience since GSA manages many contracts that serve other federal government agencies. NASA provided a technology perspective and DOE the perspective of complexity. Such wide

organizational representation also provided a diversity of experience in terms of the nature of the products and services that were acquired.

It is important to note that in conducting the interviews, information was gathered not only from users of past performance systems and processes, but also from the managers and owners of such systems and processes. This approach provided assessments and ideas from many individuals representing the different points of view in the process. Together, the DOD and non-DOD sources of information provided a relatively large experience base to draw upon. This base was a particular strength of this study. The interview guides are included in Appendix A.

Analysis

Analyses were conducted for each of the existing systems to determine the success of each system in meeting its past performance information system objectives. Other analyses examined the extent of coverage provided by the existing systems relative to contract dollar value, product or service areas, and the evaluation factors cited in the OFPP guide on Contractor Past Performance.

In addition, each of the systems and processes was compared to the evaluation factors contained in the Statement of Work. These factors covered the following:

- Data System Design--centralized or non-centralized
- Kinds of data used--government, private
- Integrity of data--identity of sources
- Accuracy
- Currency
- Remedial Process by Contractors
- Availability of Information for Source Selection
- Confidentiality
- Sub-contractor Involvement
- Maintaining Identity of Contractors That are Acquired
- Fairness
- Due Process
- Lack of Past Performance
- Threshold of Applicability
- Capability of Attribution
- Penalty

Each of the DOD components have initiatives underway which aim at expanding the past performance information available for use in contractor selection decisions. Planned past performance information sources were identified in the study along with the conceptual approach that will be applied and the depth of coverage.

Systems used by other government agencies were also analyzed, focusing on the following four areas:

- Published Policies
- Rating System
- Databases
- Known problems with existing approach to past performance evaluation

Benchmarking

The benchmarking phase of the study was developed through on-site visits and the review of information in the Arthur D. Little Supply Chain Management practice database and secondary research. For benchmarking purposes we interviewed companies which are considered to be best in class in terms of supplier past performance evaluation. These firms included:

- Allen-Bradley
- Baxter Health Care
- Black & Decker
- Boeing Defense and Space Group
- Fisher Scientific
- Ford Motor Co. (by telephone)
- McCormick & Co.
- McDonnell Douglas/C-17
- Mobile Corporation
- National Semiconductor
- Rockwell North American
- U.S. Postal Service
- W. W. Grainger

We compiled the results into a series of "best practices" that were briefed to DUSD(AR) on January 24, 1996.

Model Program Development

The Contractor Evaluation Program is the model program we developed to assist DUSD(AR) in past performance policy implementation. We approached the

development of the Contractor Evaluation Program by refining our benchmarking results and by conducting workshops for DOD officials who were involved in acquisition reform initiatives and who represented the functional areas that were affected in some way by contractor past performance processes and systems.

In so doing, several workshops were held with the following representatives from the Acquisition Reform Senior Steering Group (ARSSG) and the Past Performance Coordinating Committee (PPCC):

- Major Programs (API)
- Logistics
- Economic Security
- Systems Engineering
- Quality
- Inspector General
- Procurement
- General Counsel
- Defense Contract Management Command (DCMC)
- Defense Contract Audit Agency

Workshops were built around four inter-related modules, listed below:

- Review background information (address new policies; government and industry programs)
- Develop working definition of contractor past performance
- Assess selected contractor past performance evaluation practices
- Develop a working process for contractor past performance

Workshop participants were introduced to the goals, objectives, and desired outcome of the study. In order to provide a baseline for each workshop, information was provided to participants on DOD 5000 and FAR/DFARS, as well as on common elements associated with a contractor evaluation program. In addition, industry supplier evaluation programs and lessons learned from industry were shared with participants.

During the workshops, maximum opportunity was provided for participants to share their perspectives on past performance evaluation. Participants also addressed questions concerning a DOD contractor vision and implications of anticipated changes for the acquisition community.

Functional Requirements Development

The Contractor Evaluation Program was analyzed to develop a functional requirements document which was provided to DUSD(AR) as a separate deliverable.

Business Case Analysis

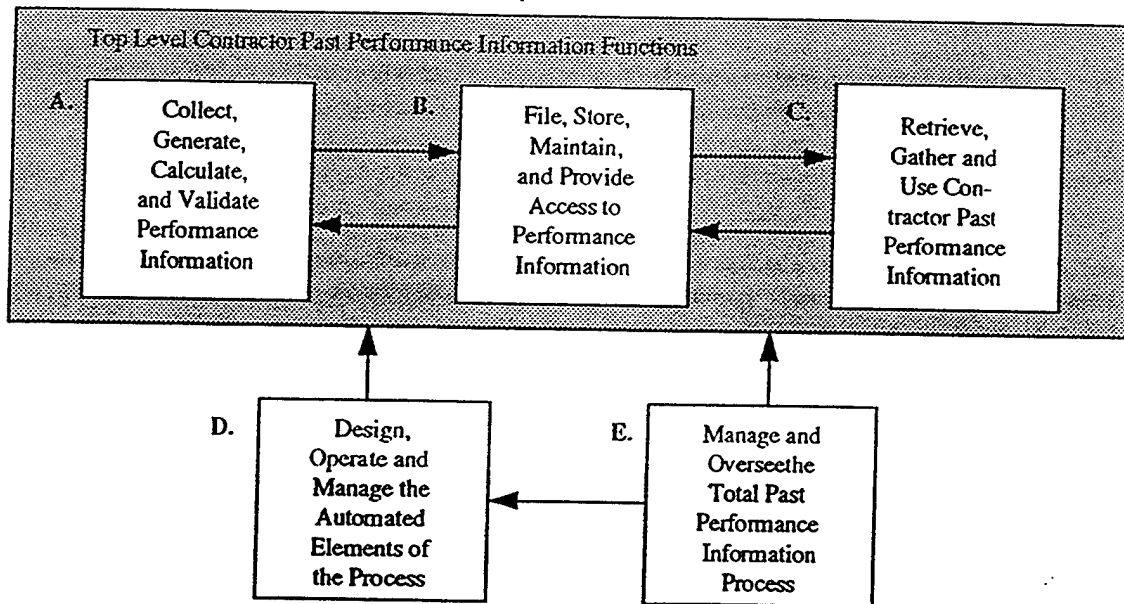
The business case analysis focused on an assessment of the alternate approaches for implementing Past Performance policy. Information was addressed in three areas:

- The current processes and systems that deal with contractor past performance;
- The recent changes in the processes and systems that are directed by the FAR and the proposed changes to the DFARS; and
- A proposed approach for dealing with contractor past performance issues, referred to as the Contractor Evaluation Program

The analysis covers process mapping, automated data information system analysis, and a comparison of the differences between the proposed Contractor Evaluation Program model and the FAR/DFARS approach.

Past Performance Process Analysis

Three contractor past performance systems were reviewed, Red/Yellow/Green (RYG), the Automated Best Value Method (ABVM), and the Architect-engineer Contract Administration Support System (ACASS). Process flows were developed for each system using a standard approach that was briefed on 24 January 1996.



Although all three systems are geared towards very different types of purchases, the functions required to operate all three systems is nearly identical. All three systems require the collection of data from various sources. All three systems use both manual and electronic inputs. Both ABVM and RYG use electronic inputs from other systems, whereas ACASS uses electronic performance evaluations from the U.S. Army Corps of Engineers Engineering Division. All three have a process in place to resolve contractor challenges. Both the RYG and ACASS systems include the negative ratings in the contractor information that is used by buyers with an annotation that the rating is being challenged. ABVM does not include ratings that are being challenged in the contractor information that is being disseminated. The RYG system tries to provide an automated adjustment to compensate for the higher risk of a contractor with a negative rating to help buyers in their selection choice. ABVM and ACASS provide the ratings, and require the buyers to use their judgment to make the Best Value procurement.

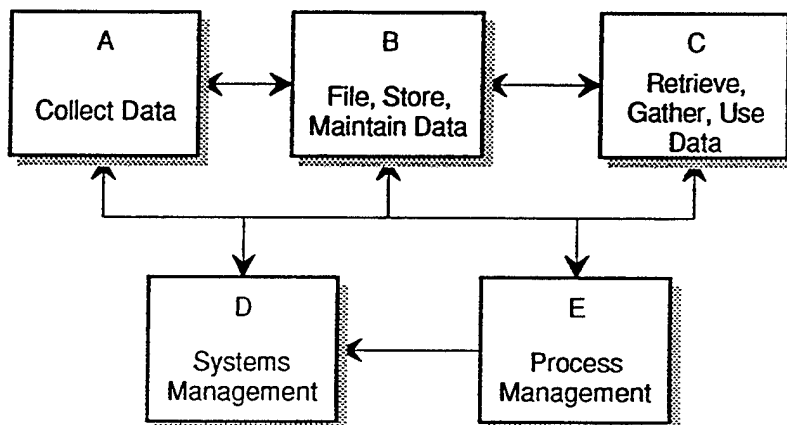
Each of the activities was desegregated and the processes that occur for each of the above major activities is documented in greater detail in the following pages.

Red/Yellow/Green System Process

The Red/Yellow/Green system is a Navy system that provides historical performance data to buyers. The system is currently being hosted on a mainframe computer at the Naval Sea Systems Command (NAVSEA) Detachment Naval Material Quality Assessment Office (NMQAO) at Portsmouth New Hampshire. The Product Deficiency Reporting and Evaluation (PDREP) system collects data from a variety of sources. RYG classifications are automatically assigned based on contractor performance data collected. PDREP updates the RYG tables, System Operators post vendor classifications on a Bulletin Board System, and buyers download this data via modem. Buyers download the most recent classifications onto their PC where the RYG software resides.

Buyers review the RYG tables, and for those vendors with Yellow or Red Classifications, they must decide to use the TEAs or the Greatest Value/Best Buy method. If they decide to use TEAs, almost all use the standard TEA which is automatically calculated by PDREP. Once all vendor data is assembled, the buyer compares the adjusted prices and makes an award.

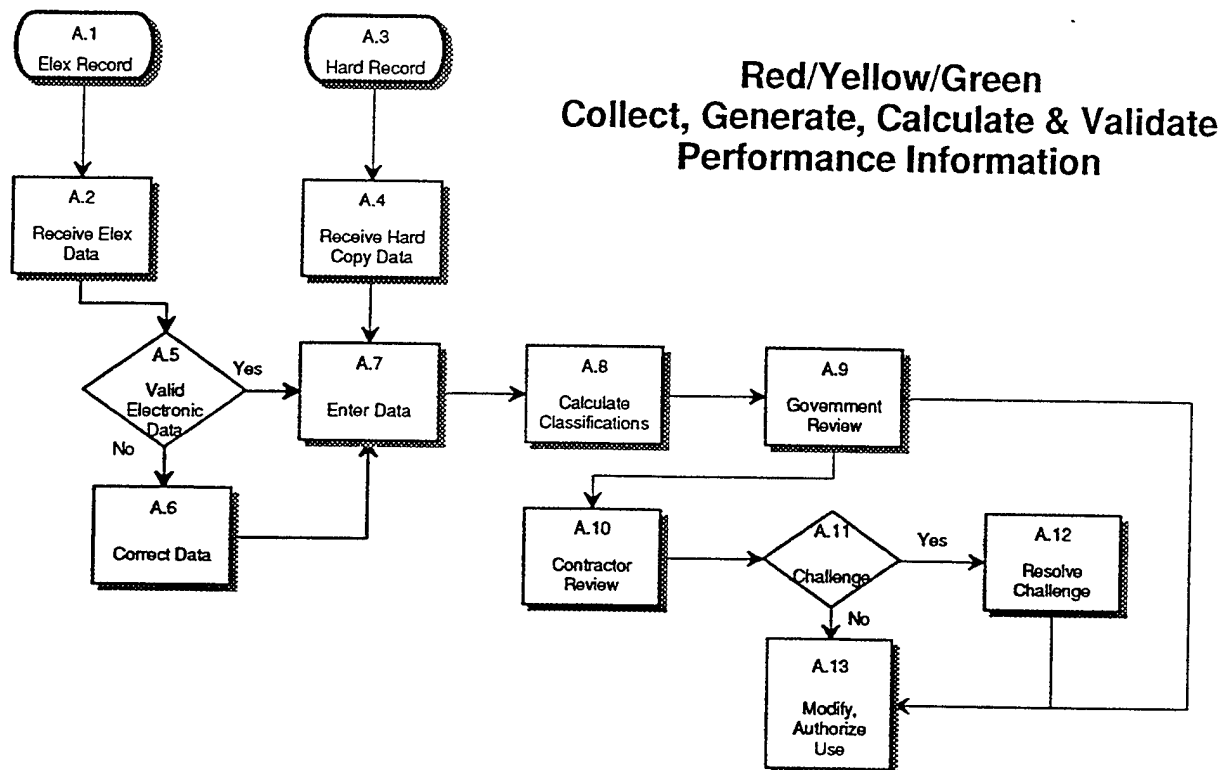
Red/Yellow/Green Major Processes



Each of the major process activities has been disaggregated into subcomponent processes:

A. Collect, Generate, Calculate, and Validate Performance Information

Activity A of the major ABVM process has been disaggregated here. This activity pertains to the collection of contractor performance data; verifying that the data is correct; automatically generating contractor classifications - either a Red, a Yellow, or a Green; satisfying contractor challenges; and releasing the classifications for use by buyers.

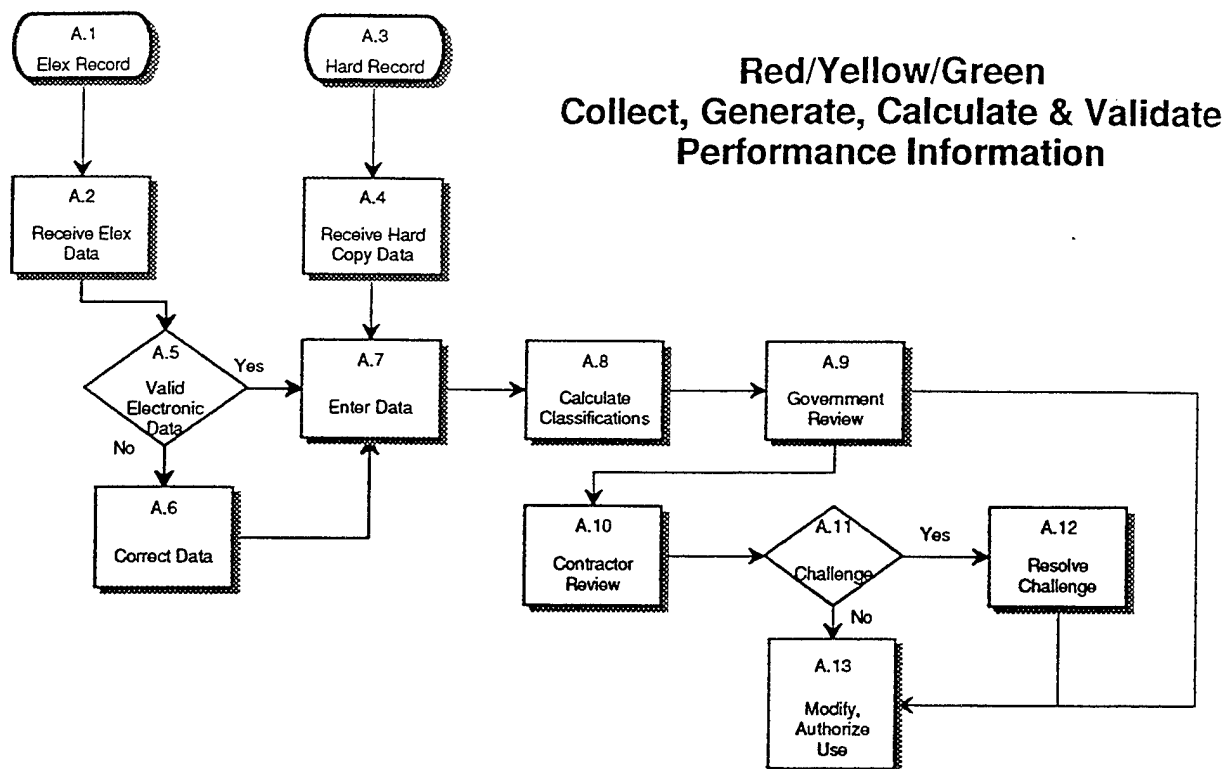


A.1 Elex Record - Electronic records to be input into PDREP. This activity is included here as a starting place for this process.

A.2 Receive Elex Data - Maintain interactive input programs, batch import programs, and error checking algorithms. This activity is explored in D.3 "Maintain Interfaces," but included here because it is a part of this process. On the average for any given month:

1. 7,500 individual reports are electronically transferred for import into PDREP.
2. These transfers are made via Bulletin Board, various PDREP applications, hard diskettes, and CEDES.
3. Two full-time programmers are required to maintaining these data links.

A.3 Hard Record - paper record input into PDREP. This activity is included here as the other starting place for this process.



A.4 Receive Hard Copy Data - Receive, review, validate and correct paper reports. On the average for any given month:

1. 750 individual hard copy reports are received for input into PDREP.
2. It takes data input personnel from one to twenty days calendar days and forty labor hours to validate the hard copy data.
3. Once data errors are discovered, it can take one to twenty days calendar days and forty hours of labor to correct the hard copy data?

A.5 Valid Electronic Data - review data and determine its validity. On the average for any given month:

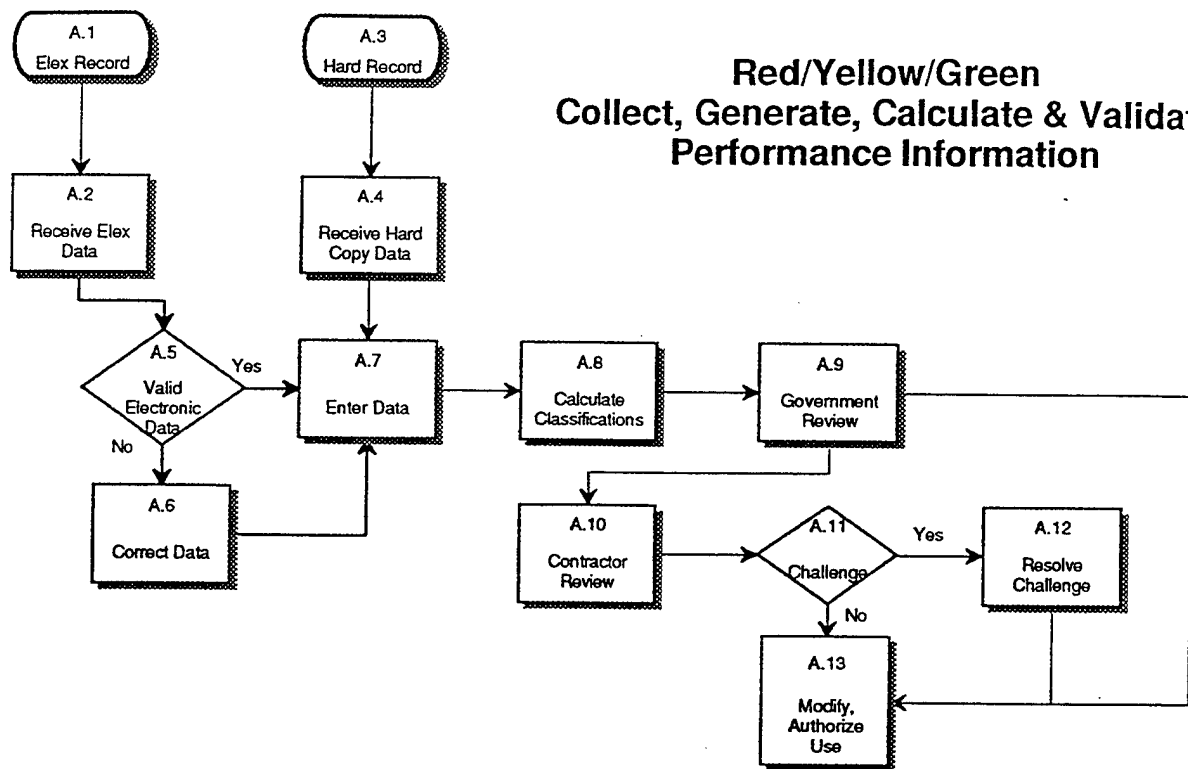
1. It takes programmers from one to twenty days calendar days and eight labor hours to validate the electronic data.

A.6 Correct Data - re-import data, reject & return to data source, manually correct data. On the average for any given month:

1. It takes data processing personnel from one to twenty days calendar days and eight labor hours to correct the electronic data.

A.7 Enter Data - import electronic data and key in hardcopy data into PDREP database. On the average for any given month:

1. It takes data processing personnel from one to twenty days calendar days and ten labor hours to maintain the import programs and import electronic data.
2. It takes data entry personnel forty mandays to key in the data from hard copy reports.



A.8 Calculate Classifications - assign RYG classification to contractors. These calculations are provided automatically by the PDREP software to the RYG system.

A.9 Government Review - government personnel review RYG classifications for accuracy & concurrence. On the average for any given month:

1. Government personnel take 1-7 workdays and 56 labor hours to review RYG records.

A.10 Contractor Review - provide classification report to contractors. On the average for any given month:

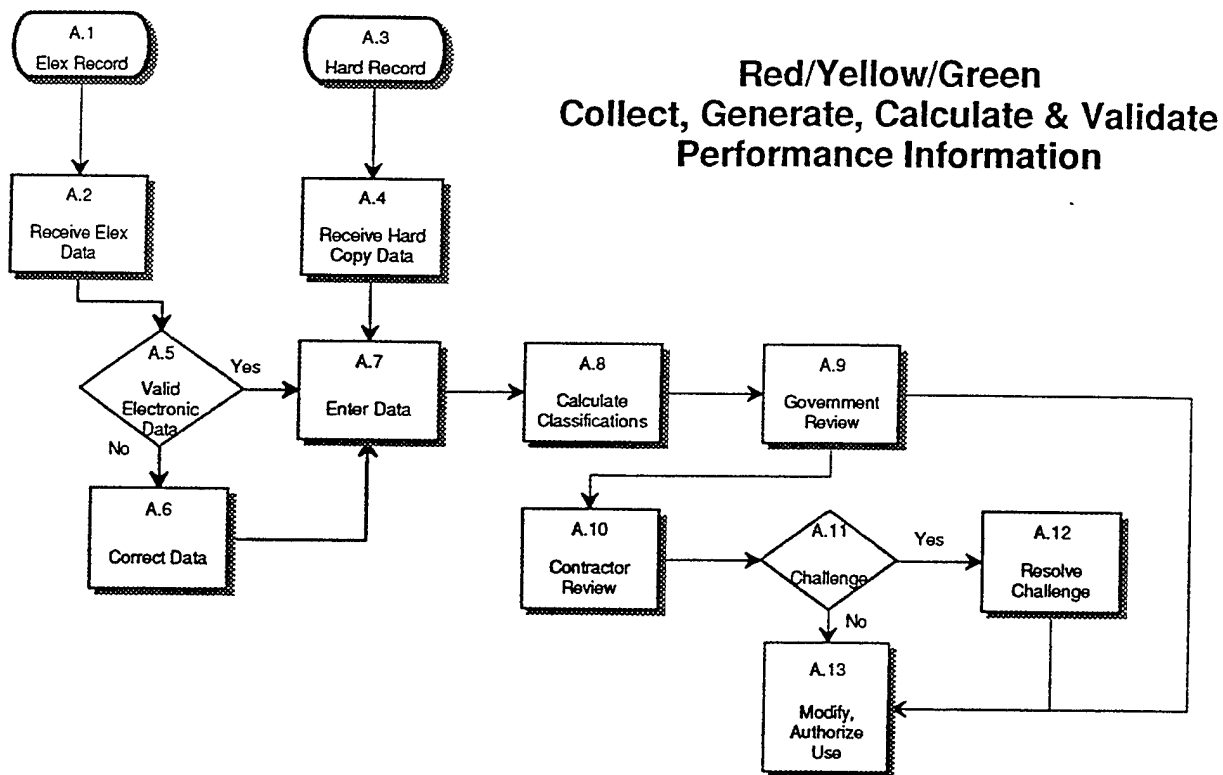
1. 5000 reports are provided to contractors.
2. It takes coordinator personnel from one to seven days calendar days and 4 labor hours to provide these reports to contractors.

A.11 Challenge - does the contractor challenge the rating?

1. The contractor has twenty work days to issue a challenge.

A.12 Resolve challenge - work with contractor and users to resolve any rating challenges. On the average for any given month:

1. Fifty challenges are received and resolved.
2. This takes program managers from 1-20 days and 15 mandays of labor to complete.



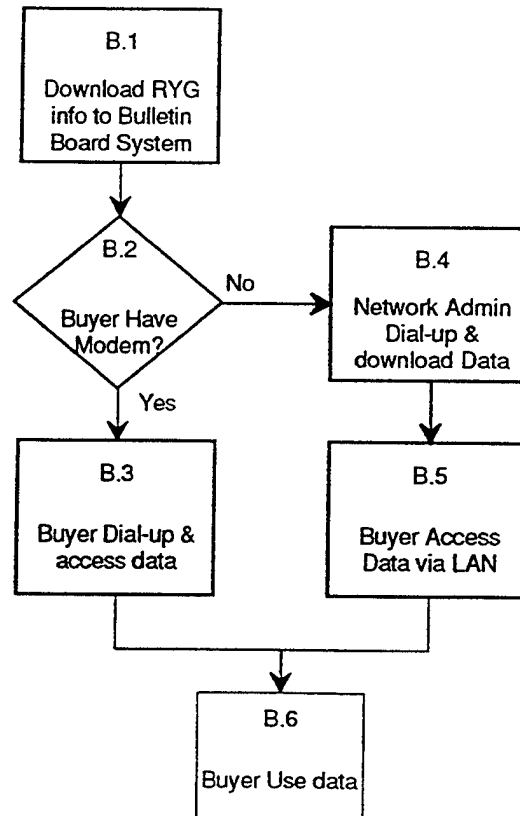
A.13 Modify, Authorize Use - Update PDREP classifications as a result of challenge resolution and authorize use of the data for contractor evaluation purposes. On the average for any given month:

1. 10 records are modified as a result of challenge resolution.
2. Coordinators take form 1-20 days and four labor hours to make the necessary changes.

B. File, Store, Maintain, and Provide Access to Performance Information

Activity B pertains to storing the contractor information electronically such that buyers can access contractor historical performance information. Buyers can access RYG data directly by dialing-up to the database via modem. If buyers don't have access to a modem, their network administrator dials-up, download the data to a bulletin board on the local area network (LAN) where buyers can then access the information.

Red/Yellow/Green File, Store, Maintain Data



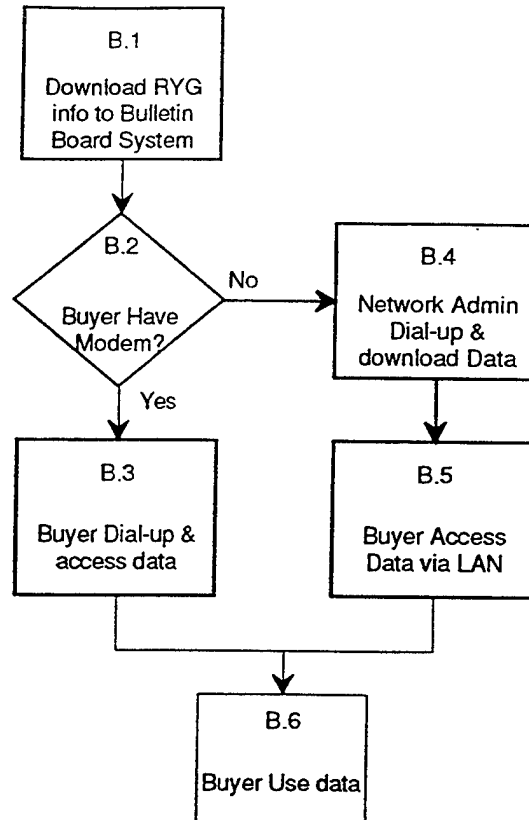
B.1 Download RYG info into Bulletin Board System - extract RYG classification info from PDREP database into Bulletin Board System. This activity is explored in D.3 "Maintain Interfaces."

B.2 Buyer have Modem - determine whether the buyer has a modem.

B.3 Buyer dial-up and access data - if the buyer has a modem, RYG classifications can be electronically downloaded from the RYG Bulletin Board System and used in contractor evaluation. On the average for any given month:

1. One buyer for each buying activity (22) access the RYG classifications via modem. This occurs once a month, and the download takes twenty minutes.

Red/Yellow/Green File, Store, Maintain Data



B.4 Network Admin Dial-up & download data - if the buyer does not have a modem, the local area network (LAN) administrator will dial-up and download the RYG classification information. On the average for any given month:

1. The LAN administrator for each buying activity (22) downloads the RYG data onto RYG bulletin boards on their LANs. This occurs once a month, and the download takes twenty minutes.
2. The LAN administrators each take four hours to maintain the bulletin board on their LAN.

B.5 Buyer access data via LAN - buyers access RYG classifications downloaded by their LAN administrators via their LAN. On the average for any given month:

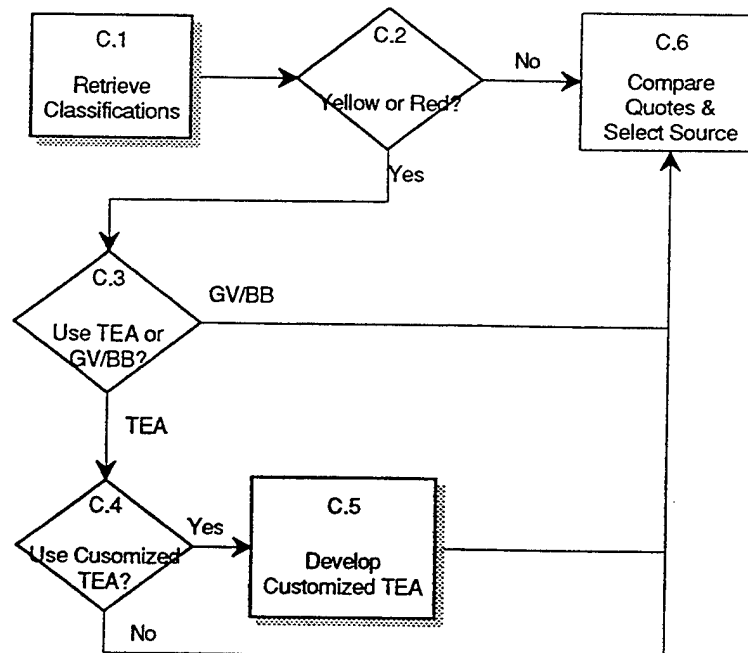
1. Two thousand buyers access RYG classifications via their LANs on a daily basis, taking only seconds.

B.6 Buyer Use Data - buyers use this data to make source selections. This is discussed in Activity C. Retrieve, Gather, and Use Contractor Past Performance Information.

C. Retrieve, Gather and Use Contractor Past Performance Information

Activity C pertains to the use of contractor performance information by buyers as part of the buying process. If a vendor has a yellow or red classification, the buyer must use a Technical Evaluation Adjustment (TEA). A Standard TEA is automatically calculated by the RYG software. A site with a Quality Assurance (QA) Department can develop their own TEA based on their experience with the contractor. The TEA adjusts the bid for risk such that the lowest adjusted bid can be awarded the job.

Retrieve, Gather and Use Contractor Past Performance Information



C.1 Retrieve Classifications - buyer will retrieve classifications for contractors who have provided a bid from the current RYG classifications loaded onto their PCs in B. "File, Store, Maintain, and Provide Access to Performance Information." On the average for any given month:

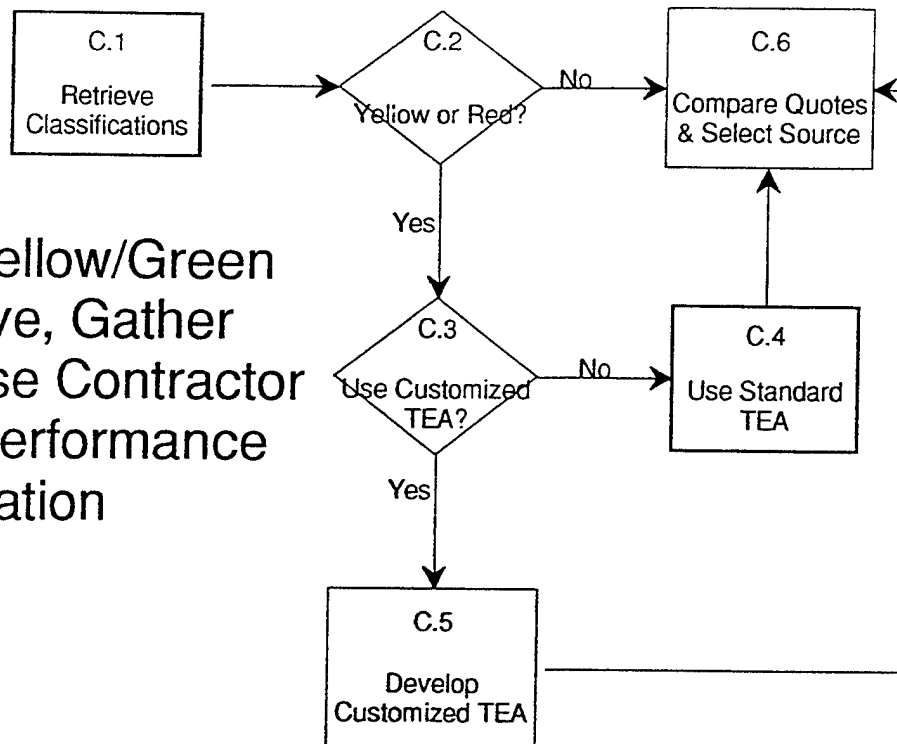
1. Buyers process ten buys, reviewing 3 contractors for each buy.
2. Buyers do not review the RYG classifications for every buy.

C.2 Yellow or Red? - does the contractor have a Red or Yellow classification? On the average for any given month

1. Only 2% of Contractors reviewed have a Yellow or Red Classification.

C.3 Use TEA or GV/BB? - the buyer decides whether to use the TEA factors or the Greatest Value / Best Buy method. The GV/BB is more appropriately used in high dollar value/large purchases where differences in vendor's prices are so large, that the TEA comparisons cannot be made.

Red/Yellow/Green Retrieve, Gather and Use Contractor Past Performance Information



C.4 Use Customized TEA? - the buyer decides whether to use a customized TEA or the standard TEA provided by the RYG software.

Even though approximately 500 buyers have access to QA departments and could develop customized TEAs.

C.5 Use Standard TEA - buyers use the standard TEAs automatically developed in the RYG software based on contractor performance. On the average for any given month:

1. 99% of all TEAs used are based on the standard values produced automatically.

C.6 Develop Customized TEA - for those buying sites equipped with quality assurance departments, on the average for any given month:

1. Virtually no customized TEAs are developed.

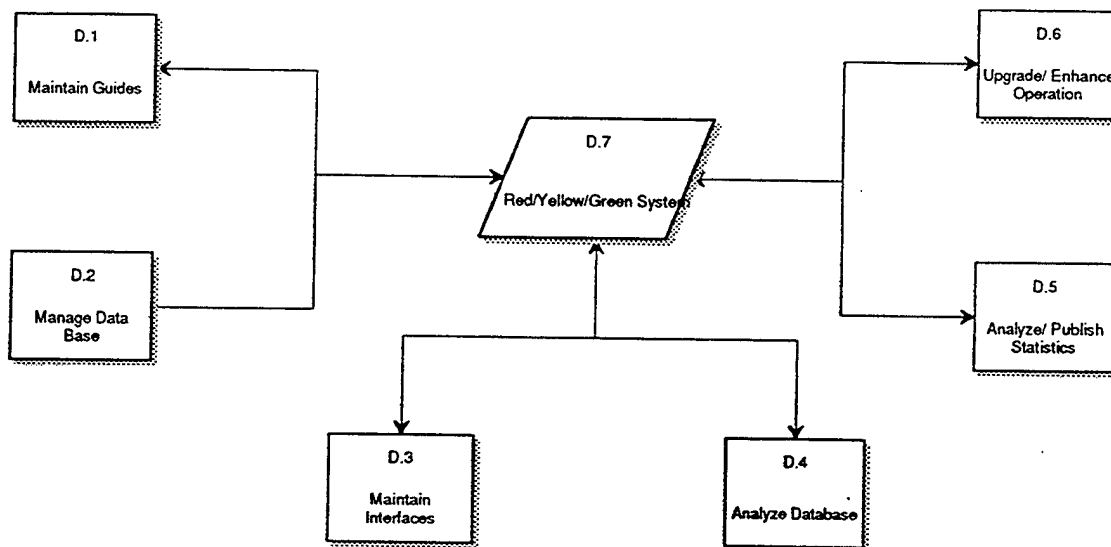
C.7 Compare Quotes & Select Source - buyers using either the TEA or GV/BB method will compare quotes and make an award. On the average for any given month:

1. Four hundred contracts are awarded.

D. Design, Operate and Manage the Automated Elements of the Process

Activity D pertains to the computer and communication system management. System operators maintain the databases, update documentation, upgrade SW & HW as new versions are released, maintain and upgrade user interfaces, and ensure that import and export functions operate properly.

Red/Yellow/Green Design, Operate and Manage the Automated Elements of the Process



D.1 Maintain guides - guides, procedures, handbooks for the Red/Yellow/Green system must be kept up to date and current, documenting any changes in procedure, responsibility, and data elements.

1. Documentation for the RYG system is updated once per year, requiring ten mandays of labor.

D.2 Manage Database - Maintaining the RYG database requires 2 manyears of labor annually.

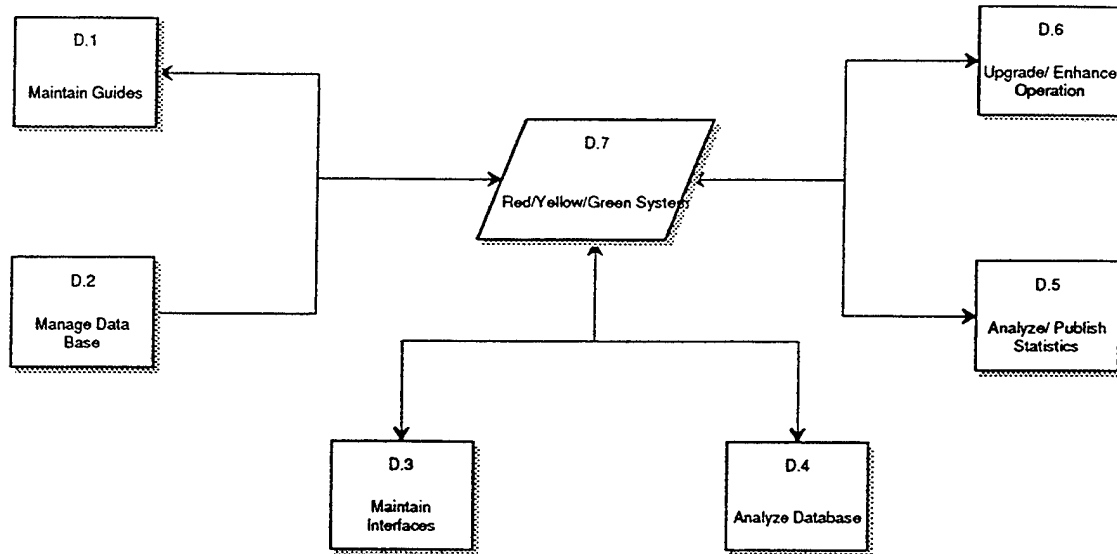
D.3 Maintain Interfaces - Maintaining the automated interfaces and bulletin boards requires 2 manyears of labor annually.

D.4 Analyze Database - Analyzing the data, data elements, normalizing the data, etc. requires 2 manyears of labor annually.

D.5 Analyze/Publish Statistics - requires 1 manyear of labor annually.

D.6 Upgrade/Enhance Operation - upgrading HW & SW requires 2 manyears of labor annually.

Red/Yellow/Green
Design, Operate and Manage the Automated
Elements of the Process

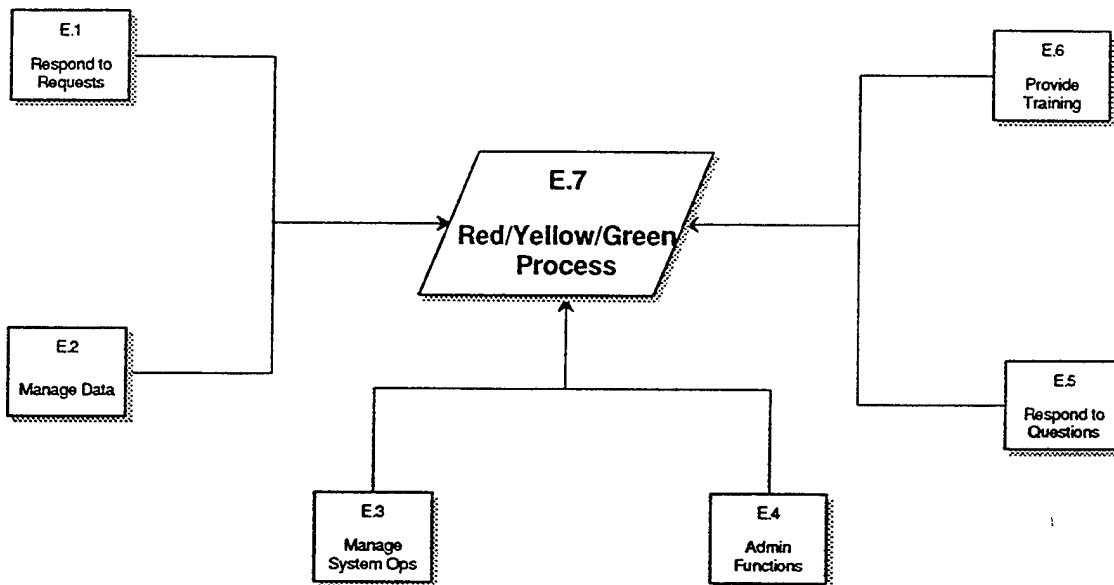


D.7 Red/Yellow/Green System - this encompasses the entire system that provides the RYG classifications and their use (A,B, & C).

E. Manage and Oversee the Total Past Performance Information Process

Activity E refers to the administration and overall management of the Red/Yellow/Green system. Administrative personnel provide information about the system, provide training, oversee system operations, and perform administrative tasks.

Red/Yellow/Green Manage and Oversee the Total Past Performance Information Process



E.1 Respond to Requests - it requires 1 full time equivalent employee to respond to routine and special requests for information.

E.2 Manage Data - it requires 1 full time equivalent employee to manage the information produced for and by the RYG system.

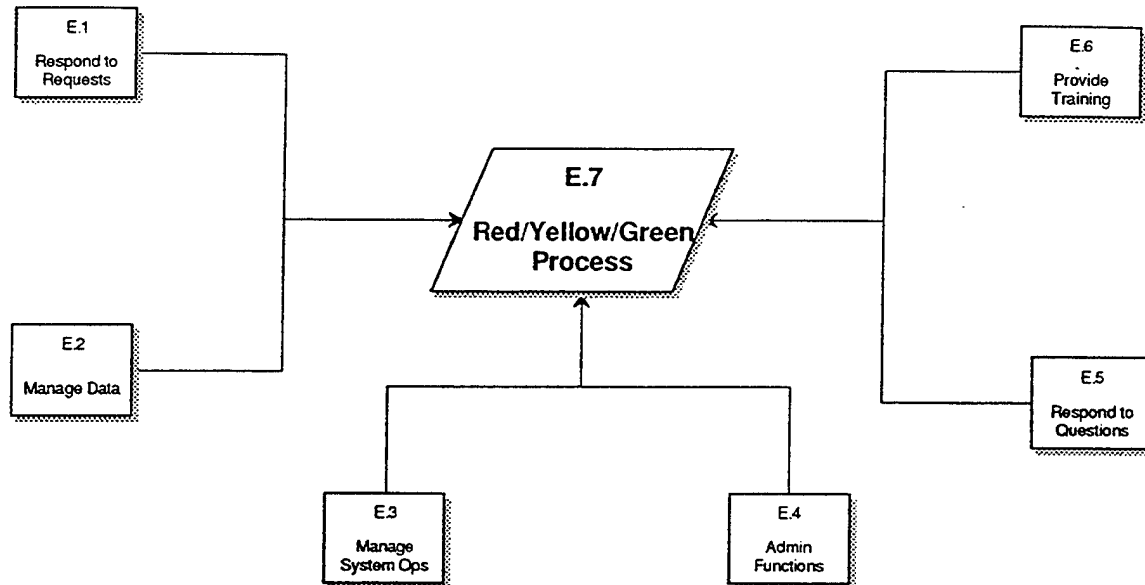
E.3 Manage System Ops - it requires 1 full time equivalent employee to manage the day to day operational activities.

E.4 Admin Functions - it requires one fourth of a full time equivalent employee to take care of administrative activities.

E.5 Respond to Questions - it requires one half of a full time equivalent employee to respond to questions about the system, its operation, and personnel.

E.6 Provide Training - it requires one fourth of a full time equivalent employee to provide training to RYG users.

**Red/Yellow/Green
Manage and Oversee the Total Past
Performance Information Process**



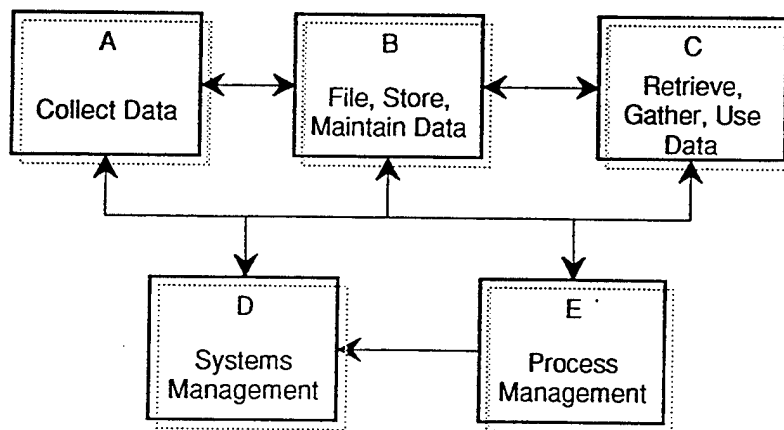
E.7 Red/Yellow/Green Process - this encompasses the entire system that provides the RYG classifications, their use, and the information systems used (A,B,C, & D).

Automated Best Value Model System Process

The Automated Best Value Model (ABVM) System is a Defense Logistics Agency (DLA) system that provides historical performance data to buyers. The system is currently being hosted on a mainframe computer at the Information Processing Center at Columbus Ohio. Contractor rating information is transferred to the Defense Electronics Supply Center (DESC), the Defense Supply Center Columbus (DSCC), the Defense Supply Center Richmond, and the Defense Industrial Supply Center via a Wide Area Network (WAN). Access by buyers is provided via a local area network (LAN).

ABVM automatically calculates a rating using inputs such as product quality nonconformances, packaging nonconformances, laboratory test results, delinquencies, and order rejections where the company has demonstrated an intent to perform. Buyers must trade-off a price for past performance when the contractor with the highest ABVM score does not have the lowest price. Other factors that buyers consider are item designation as weapons system or personnel support item, inventory supply status and required delivery schedule, limited sources of supply and industrial base concerns, dollar difference between low technically acceptable offeror and a higher priced, higher scored offeror, and the presence of new offerors.

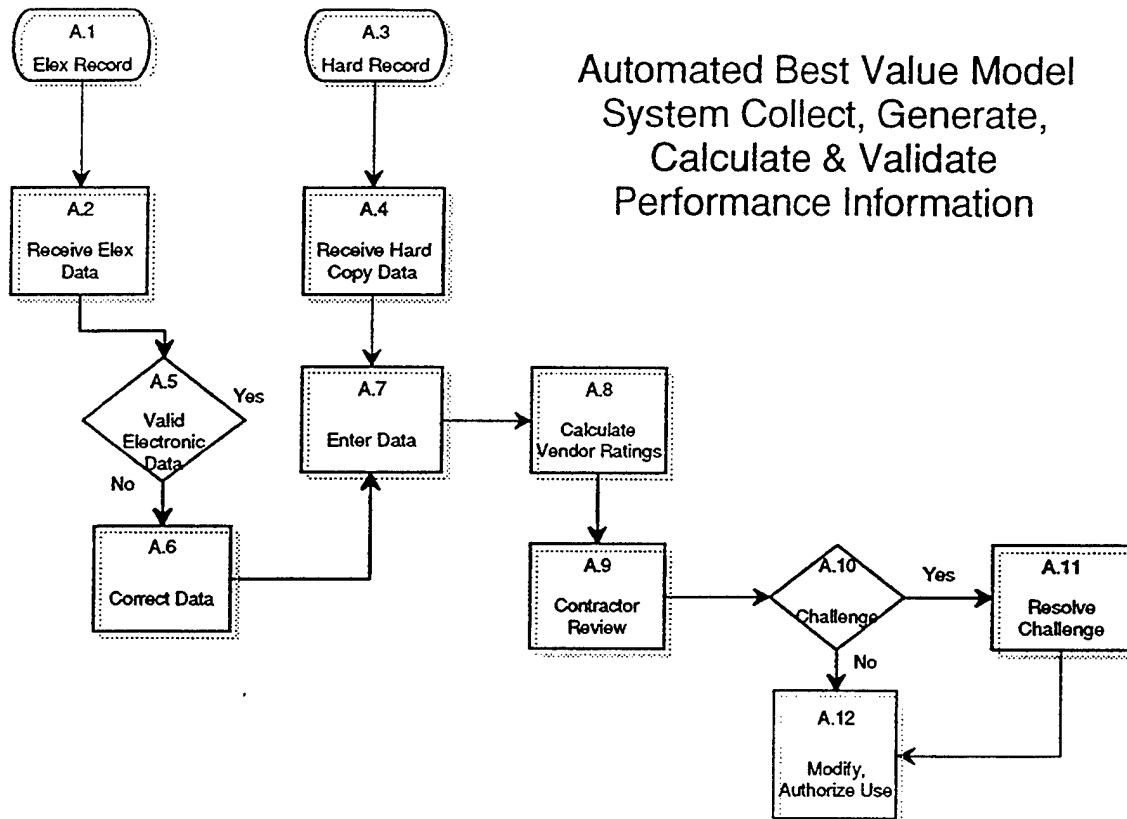
Automated Best Value Model System Major Processes



Each of the major process activities has been disaggregated into subcomponent processes:

A. Collect, Generate, Calculate, and Validate Performance Information

Activity A of the major ABVM process has been disaggregated here. This activity pertains to the collection of contractor performance data; verifying that the data is correct; automatically generating contractor ratings; satisfying contractor challenges; and releasing the classifications for use by buyers.



A.1 Elex Record - Electronic records to be input into ABVM database. This activity is included here as a starting place for this process.

A.2 Receive Elex Data - Maintain interactive input programs, batch import programs, and error checking algorithms. This activity is explored in D.3 "Maintain Interfaces," but included here because it is a part of this process.

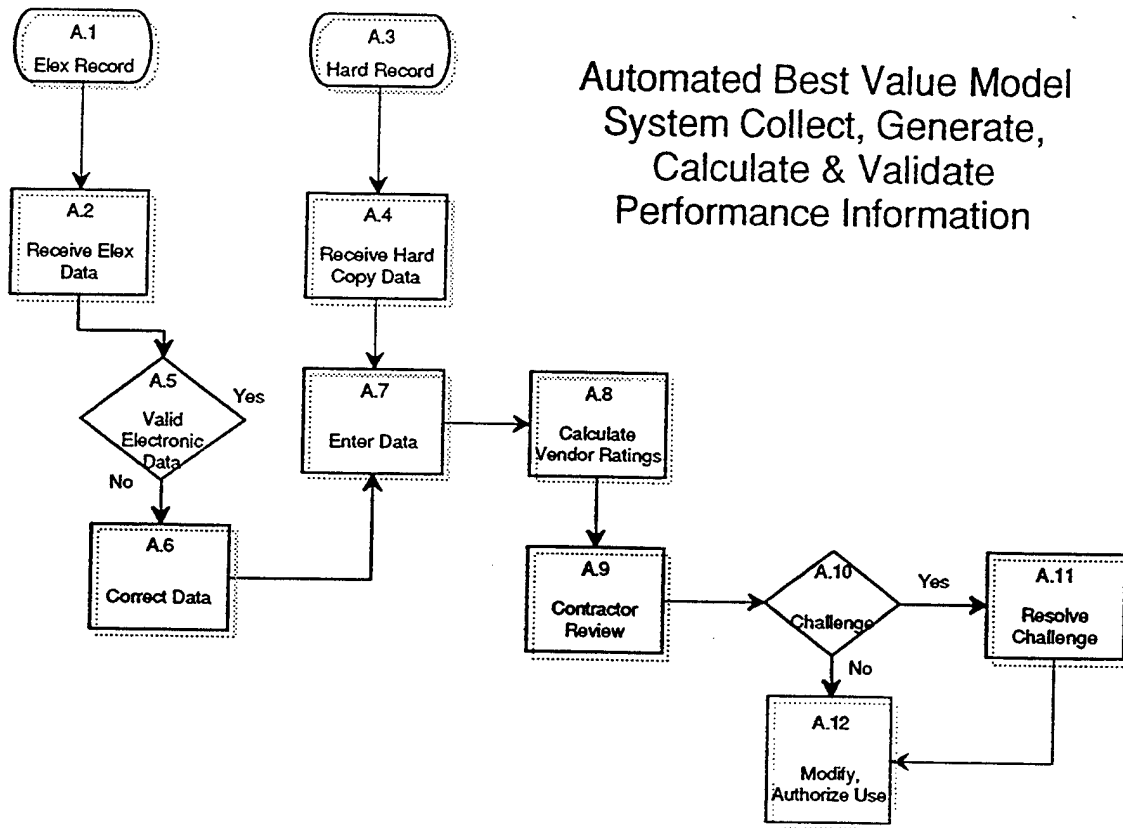
A.3 Hard Record - paper record input into ABVM database. This activity is included here as the other starting place for this process.

A.4 Receive Hard Copy Data - Receive, review, validate and correct paper reports.

A.5 Valid Electronic Data - review data and determine its validity.

A.6 Correct Data - reimport data, reject & return to data source, manually correct data.

A.7 Enter Data - import electronic data and key in hardcopy data into ABVM database.



A.8 Calculate Classifications - assign ABVM classification to contractors. These calculations are provided automatically by the ABVM database software to the ABVM system.

A.9 Contractor Review - computed ratings and detailed negative performance data via a PC based bulletin board system.

A.10 Challenge - does the contractor challenge the rating?

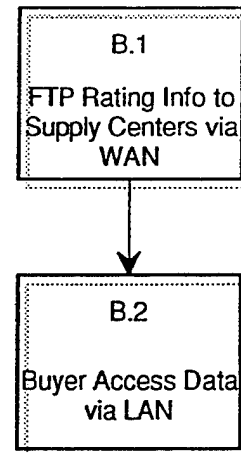
A.11 Resolve challenge - work with contractor and users to resolve any rating challenges.

A.12 Modify, Authorize Use - Update ABVM database ratings as a result of challenge resolution and authorize use of the data for contractor evaluation purposes.

B. File, Store, Maintain, and Provide Access to Performance Information

Activity B pertains to storing the contractor information electronically such that buyers can access contractor historical performance information. ABVM data is transferred using a file transfer protocol (FTP) via a Wide Area Network (WAN) to each buyer's site and is accessed by the buyers via their local area network (LAN).

Automated Best Value Model File, Store, Maintain and Provide Access to Performance Information

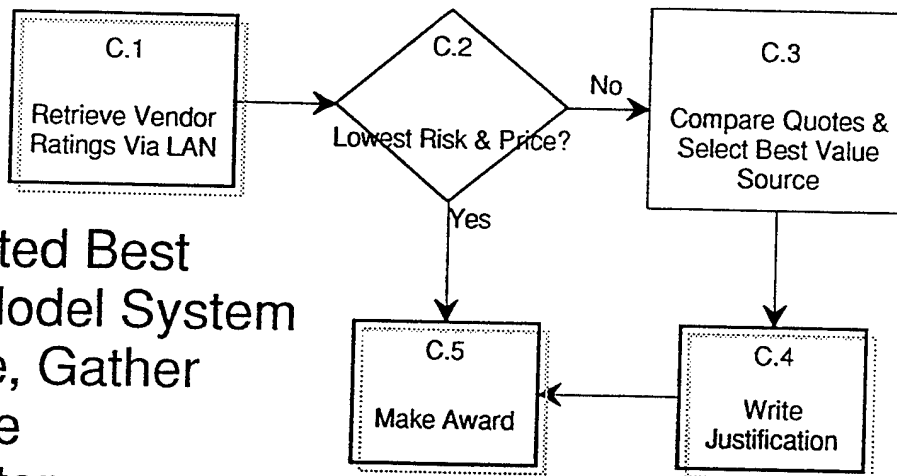


B.1 FTP Rating Info to Supply Centers via WAN - ABVM system administrators electronically transfer ABVM Rating information to Supply Center network administrators who then make this information available to buyers on the local area network (LAN). This activity is explored in D.3 "Maintain Interfaces."

B.2 Buyer Access Data via LAN - LAN administrators download the FTP transfer of ABVM information into the local installation of DLA PreAward Contracting System (DPACS). Buyers access contractor rating information through DPACS when making buys on their local area network.

C. Retrieve, Gather and Use Contractor Past Performance Information

Activity C pertains to the use of contractor performance information by buyers as part of the buying process. As the name of the system suggests, buyers determine the best value by weighing cost and risk. If a contractor submits the lowest bid and the contractor also conveys the lowest associated risk, the buyer simply makes an award to that contractor. If the buyer makes an award to the contractor who represents the overall best value, but did not submit the lowest bid, the buyer must write an award justification.



Automated Best Value Model System Retrieve, Gather and Use Contractor Past Performance Information

C.1 Retrieve Vendor Ratings via LAN - buyers will retrieve contractor ratings when making a buy via DPACS which is accessed on their LAN.

C.2 Lowest Risk and Price? - does any bidding contractor provide the lowest risk based on the ABVM rating and offer the lowest price? If one does, the buyer may make the award, if no one bidder offers the lowest risk and price, the buyer must compare all the bids.

C.3 Compare Quotes and Select Best Value Source - the buyer makes a vendor selection based on the price of the bid, and the risk associated with the vendor based on past performance as reflecting the assigned vendor rating.

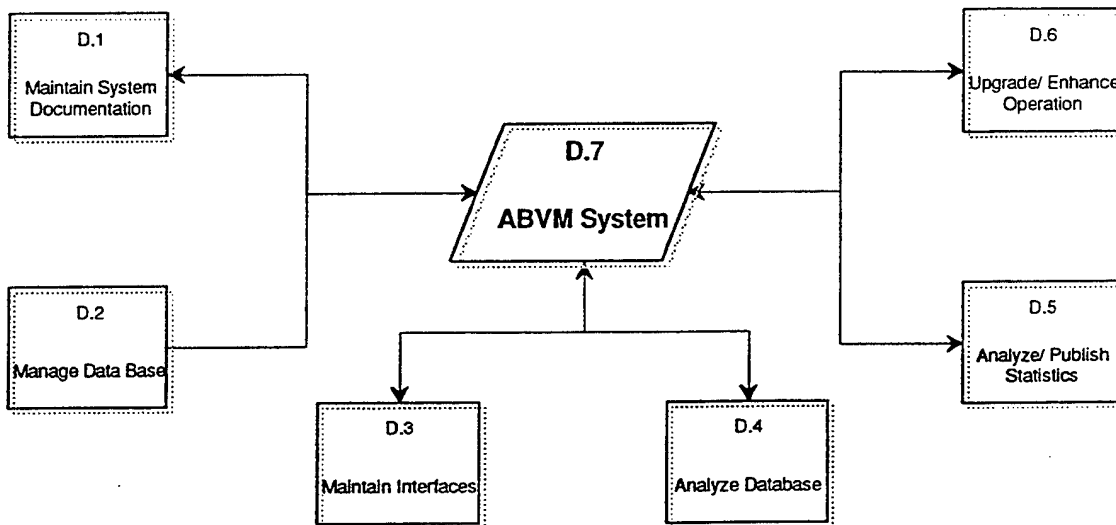
C.4 Write Justification - the buyer must write a justification of source selections whenever the lowest bidder is not selected.

C.5 Make Award - the buyer issues an award to the selected vendor.

D. Design, Operate and Manage the Automated Elements of the Process

Activity D pertains to the computer and communication system management. System operators maintain the databases, update documentation, upgrade SW & HW as new versions are released, maintain and upgrade user interfaces, and ensure that import and export functions operate properly.

Automated Best Value Model System Design, Operate and Manage the Automated Elements of the Process



D.1 Maintain guides - guides, procedures, handbooks for the Automated Best Value Model system must be kept up to date and current, documenting any changes in procedure, responsibility, and data elements.

D.2 Manage Database - system operators must manage the database to ensure that is properly updated and used.

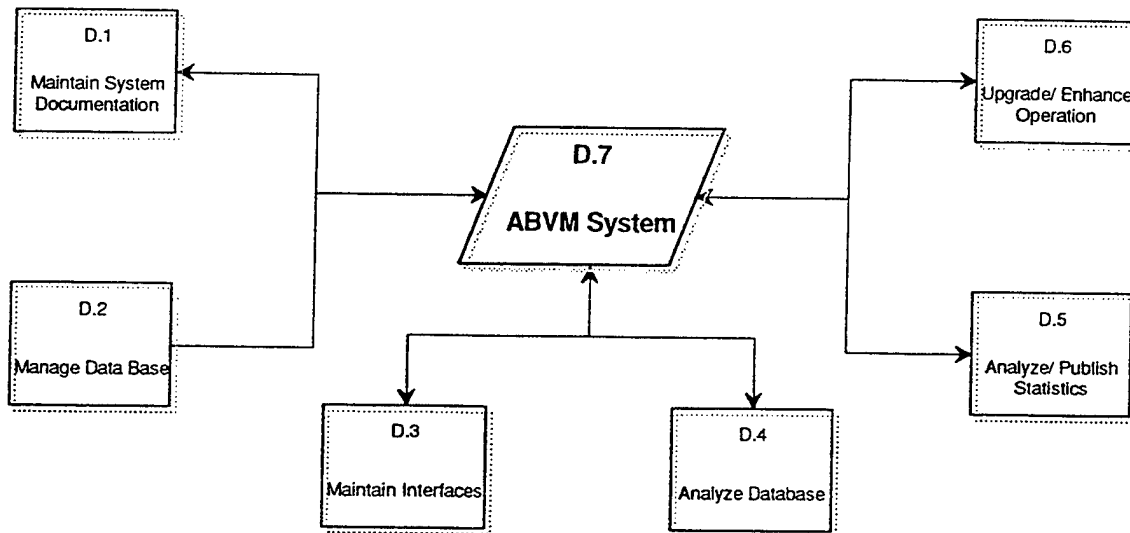
D.3 Maintain Interfaces - system administrators must maintain the automated interfaces for both incoming data and transfers to DPACS.

D.4 Analyze Database - system operators must analyze the database to ensure data elements are not corrupted, and the data remains normalized.

D.5 Analyze/Publish Statistics - operating reports and statistics are kept up to date and are published periodically and on an adhoc basis.

D.6 Upgrade/Enhance Operation - system operators must upgrade HW & SW ensuring that only up to date versions of both Commercial-Off-The-Shelf (COTS) HW & SW and any internally developed code is being used.

Automated Best Value Model System Design, Operate and Manage the Automated Elements of the Process

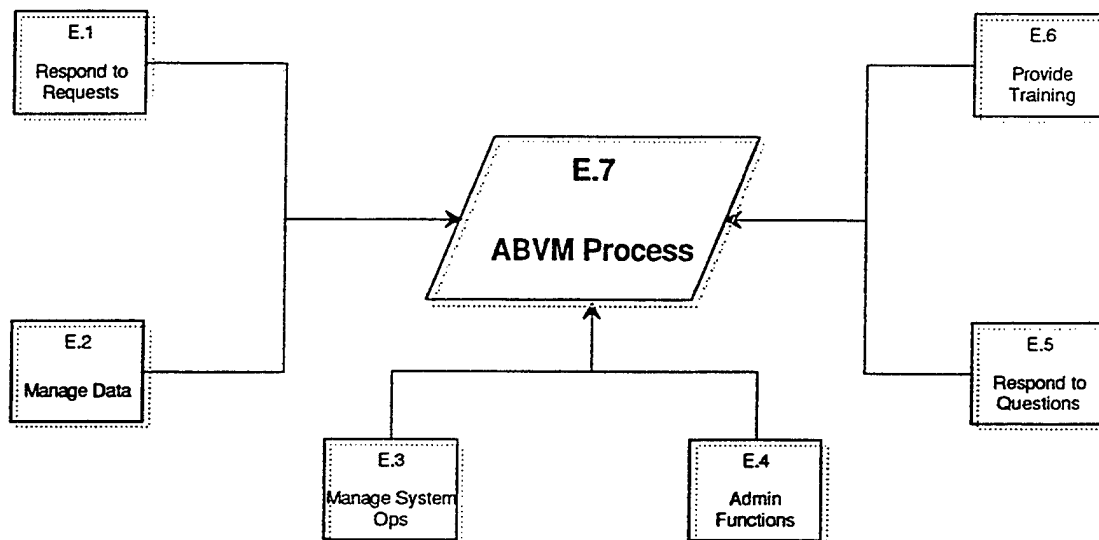


D.7 Automated Best Value Model System - this encompasses the entire system that provides the ABVM classifications and their use (A,B, & C).

E. Manage and Oversee the Total Past Performance Information Process

Activity E refers to the administration and overall management of the Automated Best Value Model System. Administrative personnel provide information about the system, provide training, oversee system operations, and perform administrative tasks.

Automated Best Value Model System Manage and Oversee the Total Past Performance Information Process



E.1 Respond to Requests - system administrators respond to routine and special requests for information.

E.2 Manage Data - system administrators manage the information produced for and by the ABVM system.

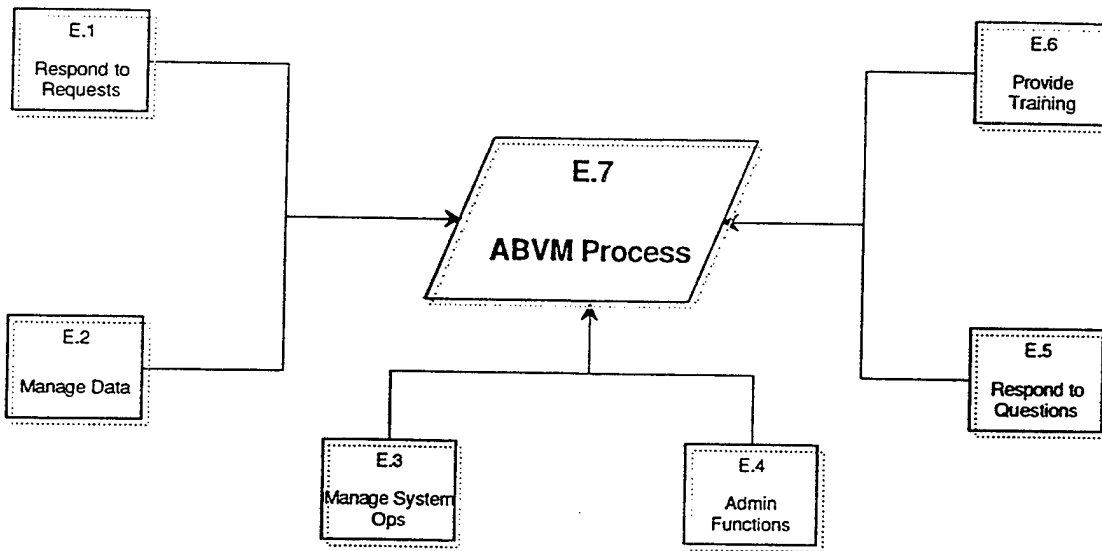
E.3 Manage System Ops - system administrators manage the day-to-day operational activities.

E.4 Admin Functions - system administrators perform necessary administrative activities.

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Automated Best Value Model System Manage and Oversee the Total Past Performance Information Process



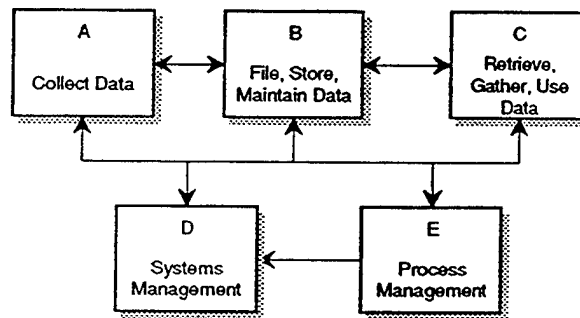
E.7 Automated Best Value Model Process - this encompasses the entire system that provides the ABVM classifications, their use, and the information systems used (A,B,C, & D).

Architect-engineer Contract Administration Support System (ACASS) Process

The Architect-engineer Contract Administration Support System (ACASS) is sponsored by the Engineering Division, Directorate of Military Programs (CEMP-ES) at Headquarters, U.S. Army Corps of Engineers. The North Pacific Division, U.S. Army Corps of Engineers (CENPD-CT) is responsible for the day-to day management of ACASS. ACASS provides performance history and is used for only architect and engineering service contractors. The portion of the ACASS system that this report refers to is the portion used to provide one of five classifications to vendors based on their performance. The possible classifications are Excellent, Above Average, Average, Below Average, and Poor. The ACASS database itself resides on a mainframe computer located at the CENPD-CT command in Portland. Access to the database is provided via a menu driven interface that buyers and other ACASS data users connect with via a modem.

All firms that desire to perform Architect-engineering services for the U.S. Army Corps of Engineers (USACE) are required to register themselves by completion of SF 254 Architect-Engineer and Related Services Questionnaire. This Questionnaire allows contractors to describe the type of firm they are, their technical expertise, and their specific experience. The SF 254 must be updated on an annual basis. Contractors are notified in writing whenever a classification of Below Average or Poor is assigned and may challenge the classification.

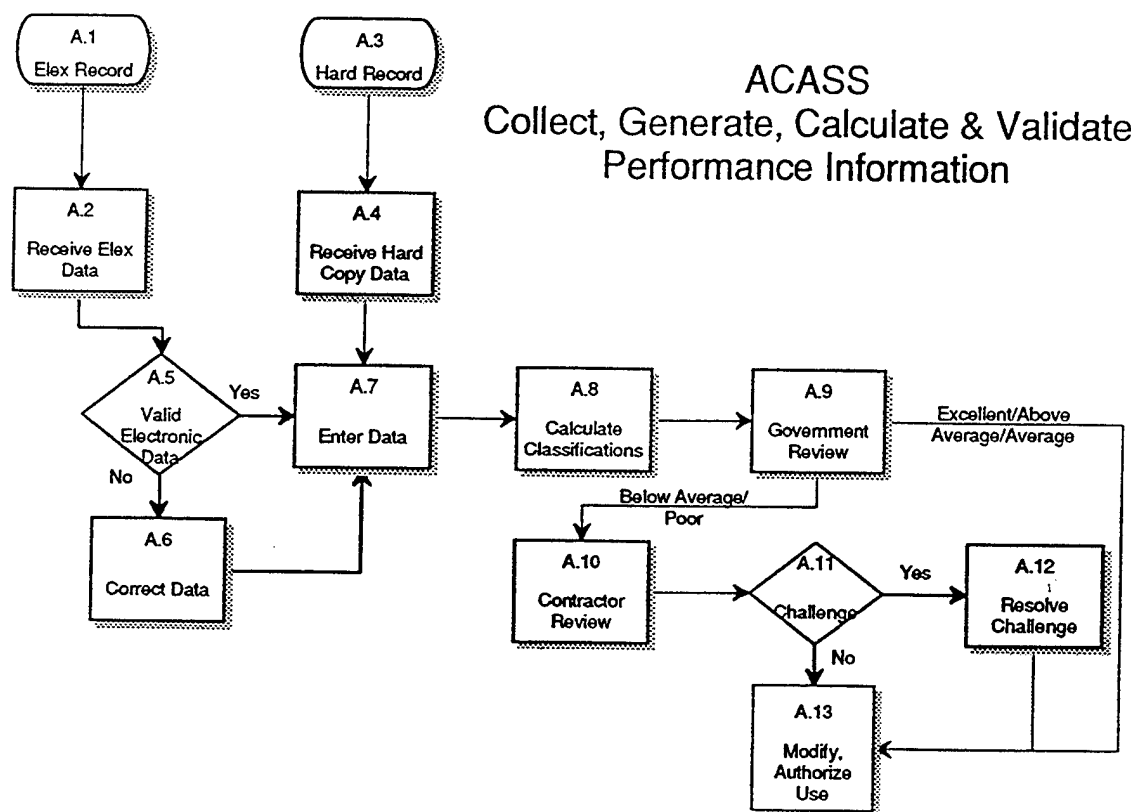
Architect-engineer Contract Administration Support System Major Processes



Each of the major process activities has been disaggregated into subcomponent processes:

A. Collect, Generate, Calculate, and Validate Performance Information

Activity A of the major ACASS process has been disaggregated here. This activity pertains to the collection of contractor performance data; verifying that the data is correct; classifying contractor performance as either Excellent, Above Average, Average, Below Average, or Poor; satisfying contractor challenges; and releasing the classifications for use by buyers.



A.1 Elex Record - Electronic records to be input into ACASS database. This activity is included here as a starting place for this process.

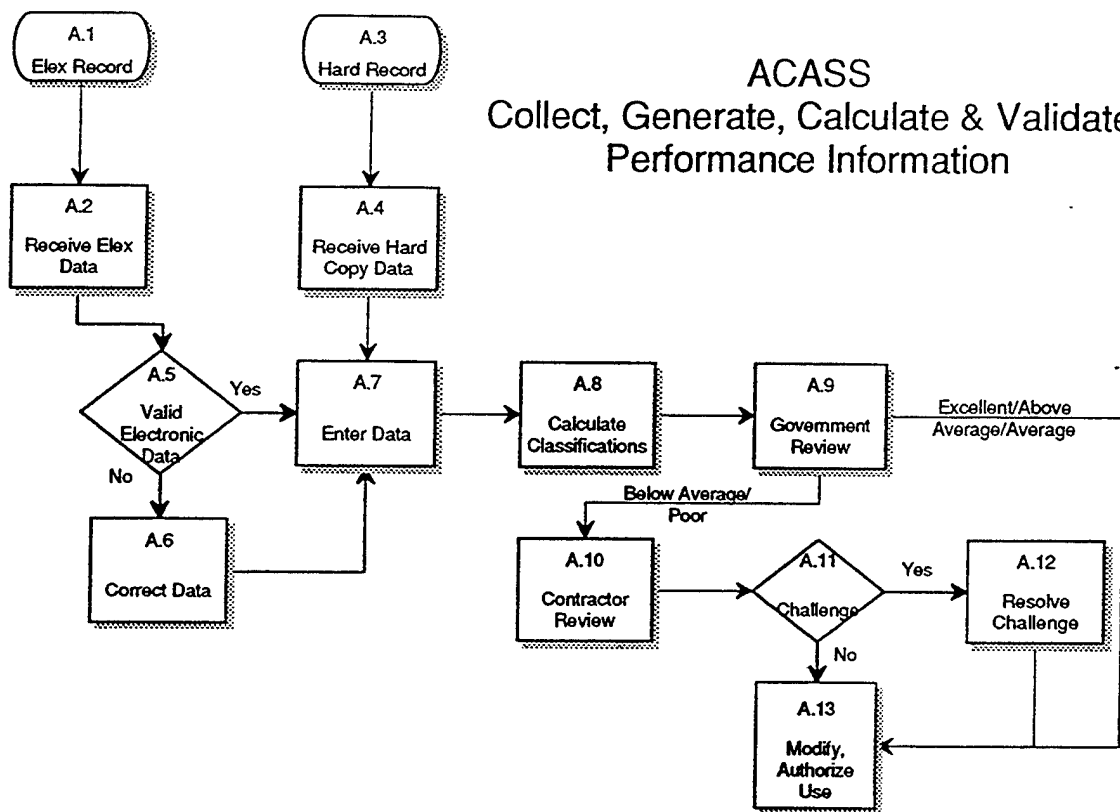
A.2 Receive Elex Data - Maintain interactive input programs, batch import programs, and error checking algorithms. This activity is explored in D.3 "Maintain Interfaces," but included here because it is a part of this process.

A.3 Hard Record - paper record input into ACASS database. This activity is included here as the other starting place for this process.

A.4 Receive Hard Copy Data - Receive, review, validate and correct paper reports.

A.5 Valid Electronic Data - review data and determine its validity.

A.6 Correct Data - reimport data, reject & return to data source, manually correct data.



A.7 Enter Data - import electronic data and key in hardcopy data into ACASS database.

A.8 Calculate Classifications - assign ACASS classification to contractors. These calculations are provided automatically by the ACASS database software to the ACASS system.

A.9 Government Review - government personnel review classification, if classification is **Below Average** or **Poor**, information is provided to contractors for their review and included in the ACASS database. If **Excellent**, **Above Average**, or **Average**, the data is included in the ACASS database, and not provided to contractors.

A.10 Contractor Review - computed negative performance classifications is provided to Contractors, contractors may challenge the classification. Contractors may also request positive classification information.

A.11 Challenge - does the contractor challenge the rating?

A.12 Resolve challenge - work with contractor and users to resolve any rating challenges.

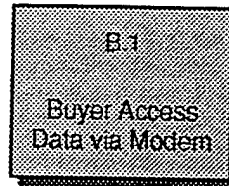
A.13 Modify, Authorize Use - Update ACASS database ratings as a result of challenge resolution and authorize use of the data for contractor evaluation purposes.

B. File, Store, Maintain, and Provide Access to Performance Information

This activity pertains to storing the contractor information electronically such that buyers can access contractor historical performance information. ACASS provides interactive access when users dial up through their modems and then ACASS provides a menu driven interface so that buyers can navigate the system to get the information they require.

ACASS

File, Store, Maintain and Provide Access to Performance Information

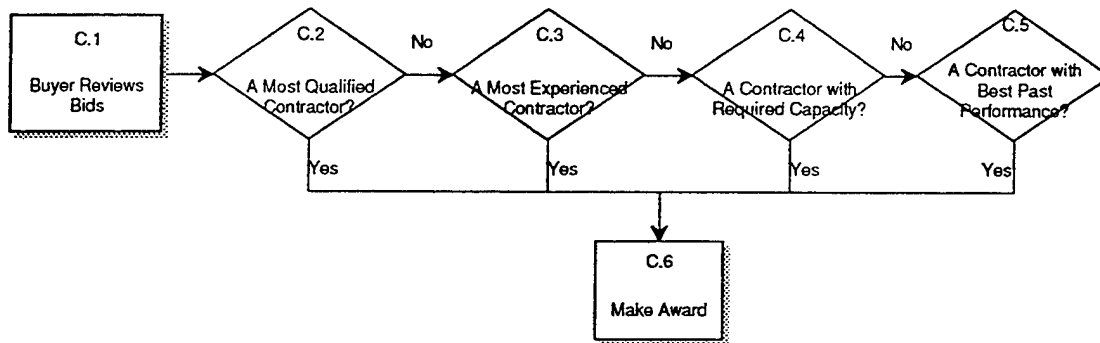


B.1 Buyer Access Data via LAN - system operators update the ACASS database monthly. Buyers access contractor classification information interactively by dialing up via modem when making buys.

C. Retrieve, Gather and Use Contractor Past Performance Information

Activity C pertains to the use of contractor performance information by buyers as part of the buying process. Generally for the ACASS process, performance information is used as the fourth criterion after technical qualification, experience, and available capacity.

ACASS Retrieve, Gather and Use Contractor Past Performance Information



C.1 Buyer Reviews Bids. The standard criteria in order of importance is technically qualified, experienced, possesses the required capacity to do the work, has the best past performance, geographic proximity, participation in Small Business and/or Small Disadvantaged Business, and volume of DoD contract awards. The later two evaluation criteria are not mentioned in the above diagram because they are criterion that are generally used after the Past Performance criterion has been applied.

C.2 A Most Qualified Contractor? - if the buyer determines that one bidding contractor is the most technically qualified, an award is made to that contractor.

C.3 A Most Experienced Contractor? - if two or more contractors are equally qualified, and the buyer determines that one bidding contractor is the most experienced, an award is made to that contractor.

C.4 A Contractor with Required Capacity? - if two or more contractors are equally experienced, and the buyer determines that one bidding contractor has the required capacity, an award is made to that contractor.

C.5 A Contractor with the Best Past Performance? - if two or more contractors possess the required capacity, and the buyer determines that one bidding contractor has the best past performance, an award is made to that contractor.

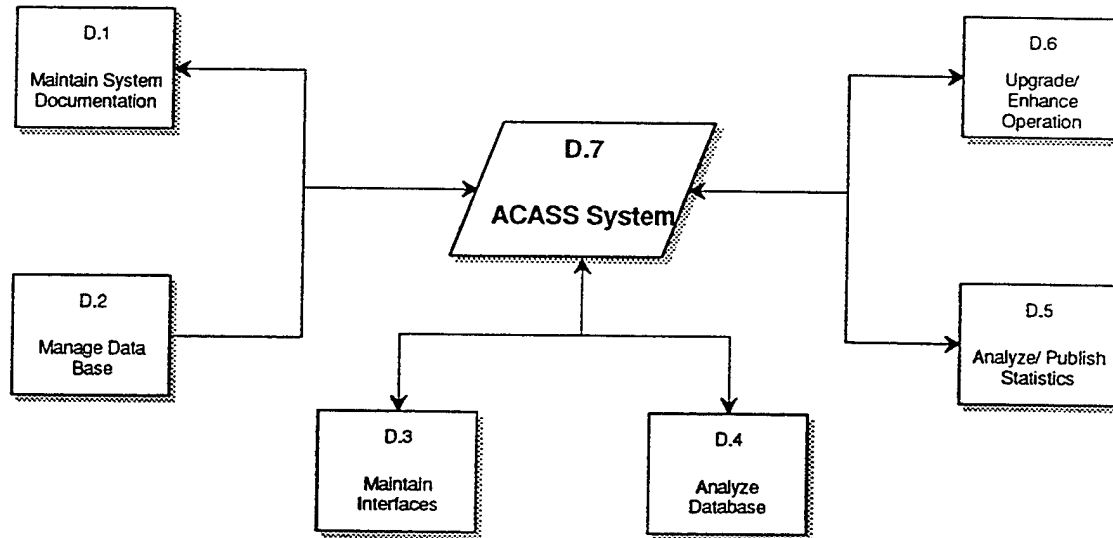
C.6 Make Award - the buyer issues an award to the selected vendor.

D. Design, Operate and Manage the Automated Elements of the Process

Activity D pertains to the computer and communication system management. System operators maintain the databases, update documentation, upgrade SW & HW as new versions are released, maintain and upgrade user interfaces, and ensure that import and export functions properly.

ACASS

Design, Operate and Manage the Automated Elements of the Process



D.1 Maintain guides - guides, procedures, handbooks for the Architect-engineer Contract Administration Support System must be kept up to date and current, documenting any changes in procedure, responsibility, and data elements.

D.2 Manage Database - system operators must manage the database to ensure that is properly updated and used.

D.3 Maintain Interfaces - system administrators must maintain the automated interfaces for both incoming and outgoing data.

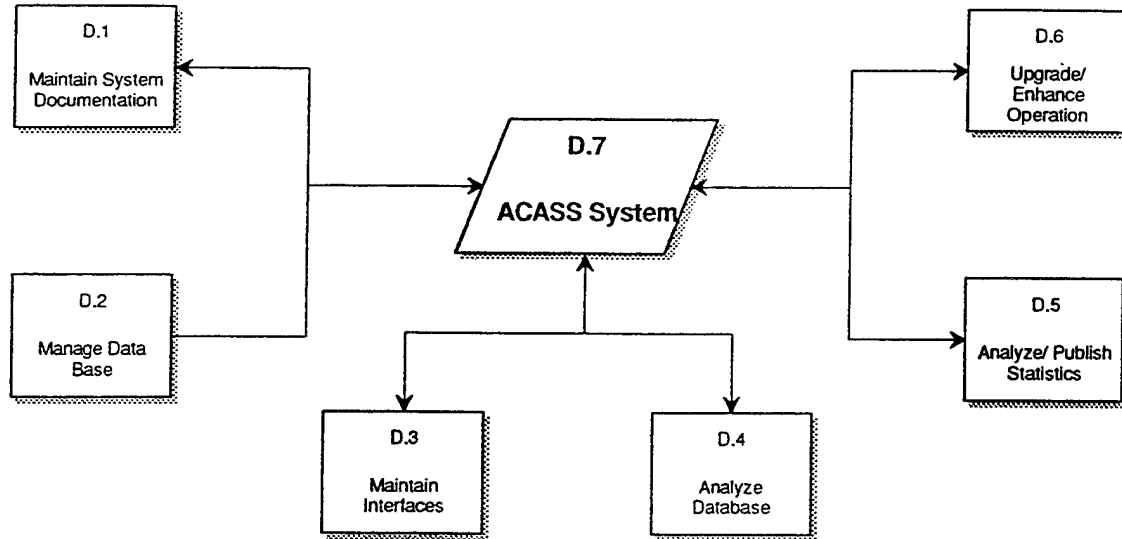
D.4 Analyze Database - system operators must analyze the database to ensure data elements are not corrupted, and the data remains normalized.

D.5 Analyze/Publish Statistics - operating reports and statistics are kept up to date and are published periodically and on an adhoc basis.

D.6 Upgrade/Enhance Operation - system operators must upgrade HW & SW ensuring that only up to date versions of both Commercial-Off-The-Shelf (COTS) HW & SW and any internally developed code is being used.

ACASS

Design, Operate and Manage the Automated
Elements of the Process



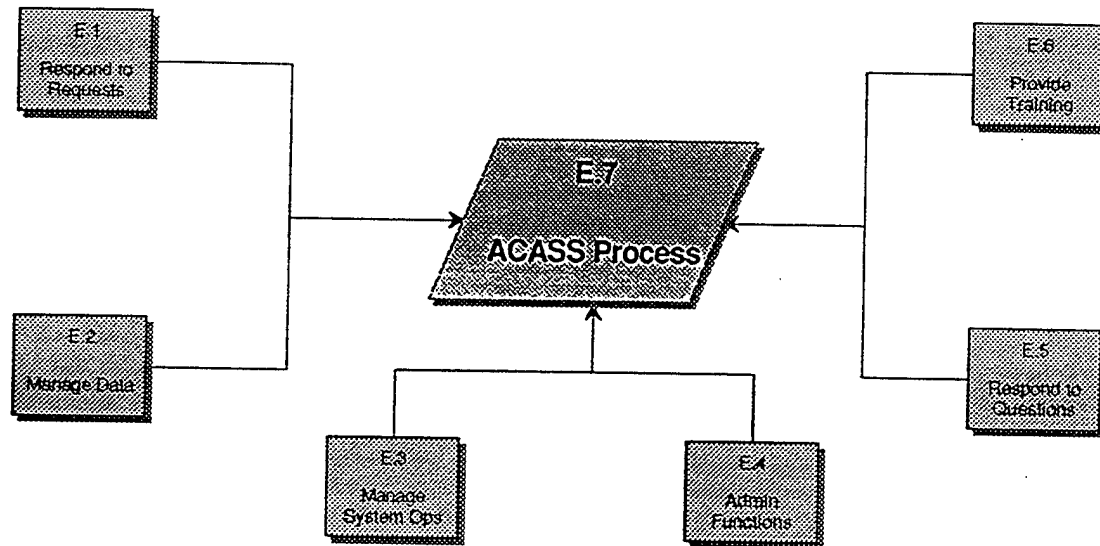
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ACASS

Manage and Oversee the Total Past Performance Information Process



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RED/YELLOW/GREEN

Presentation to

Date

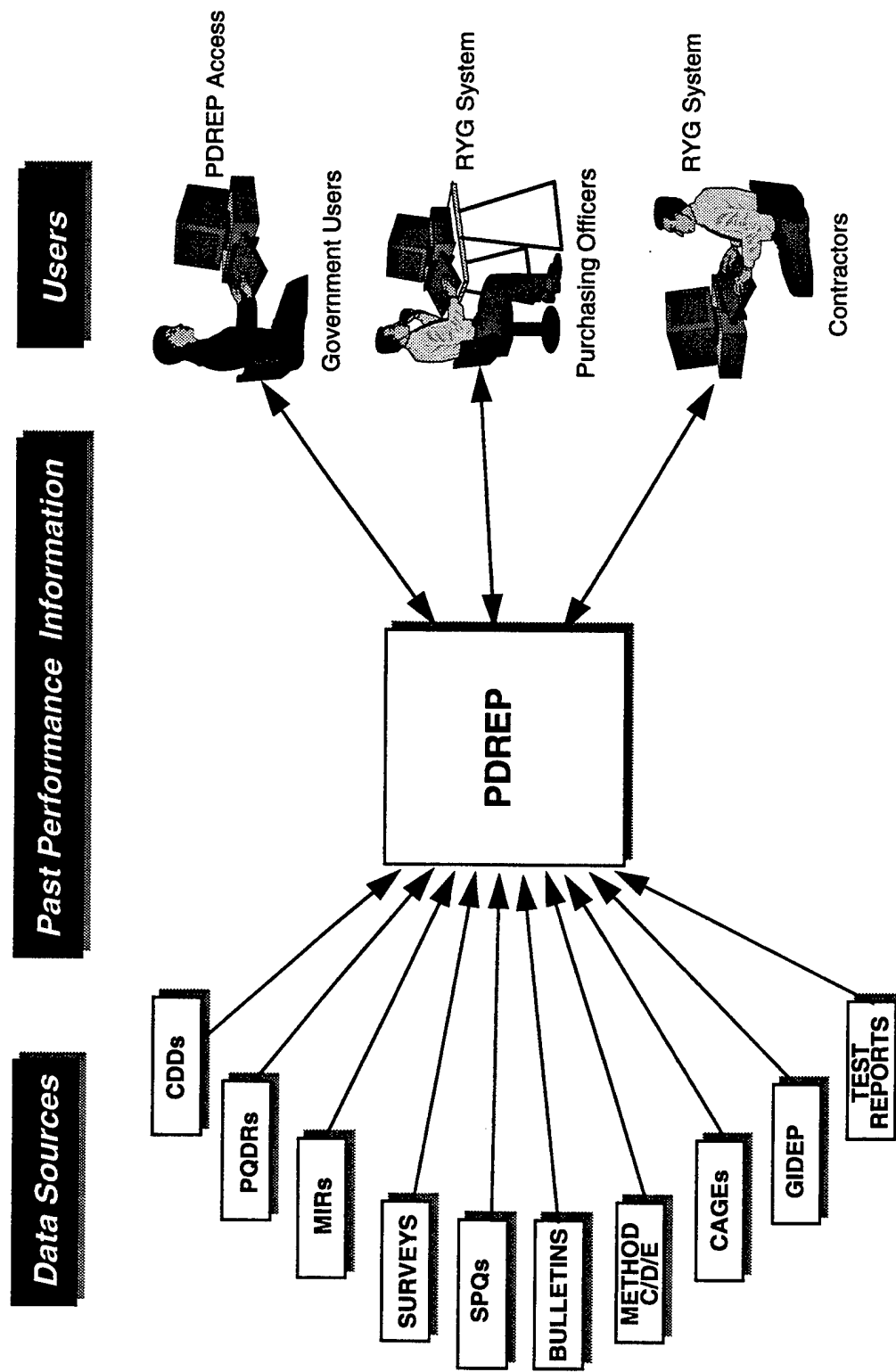
Arthur D. Little, Inc.
Acorn Park
Cambridge, Massachusetts
02140-2390
(617) 498-5000

Reference

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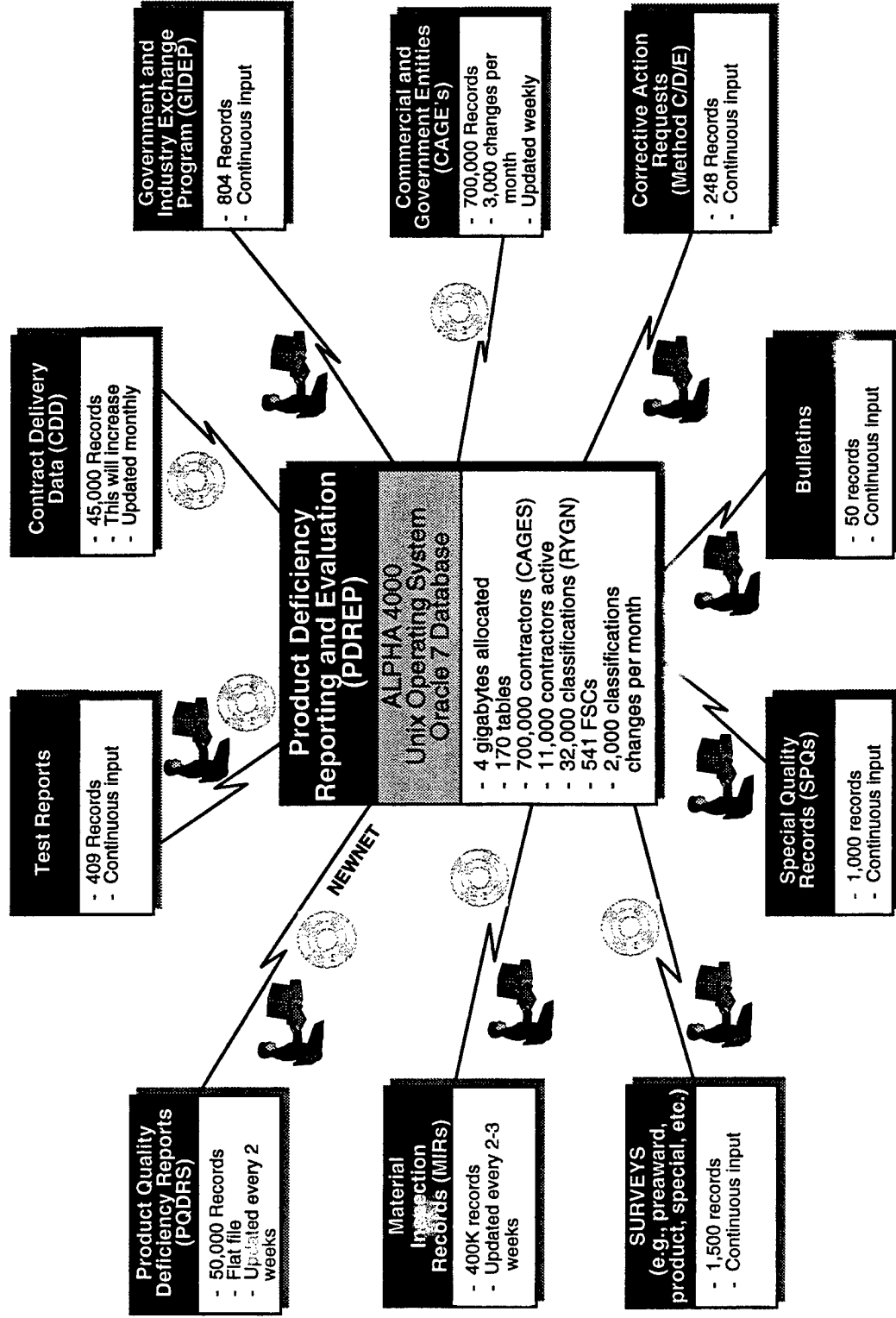
Red/Yellow/Green System Overview

PDREP is updated with past performance data from a variety of sources and accessed remotely by users via PCs.



Red/Yellow/Green System Past Performance Data Acquisition

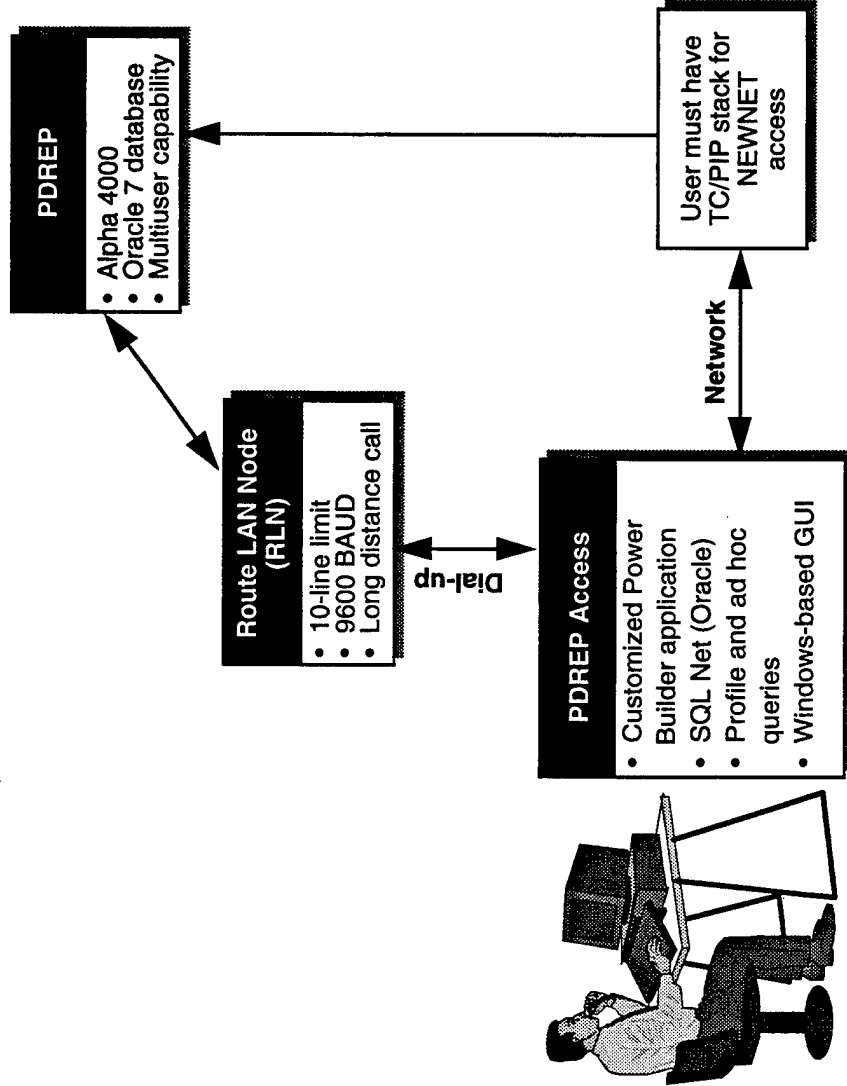
PDREP is the central repository for contractor past performance information.



Although some data are entered electronically, via NEWNET or magnetic tape, one full-time data entry analyst is required to support the database.

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Government users can access the PDREP database directly through dial-up or network connection.

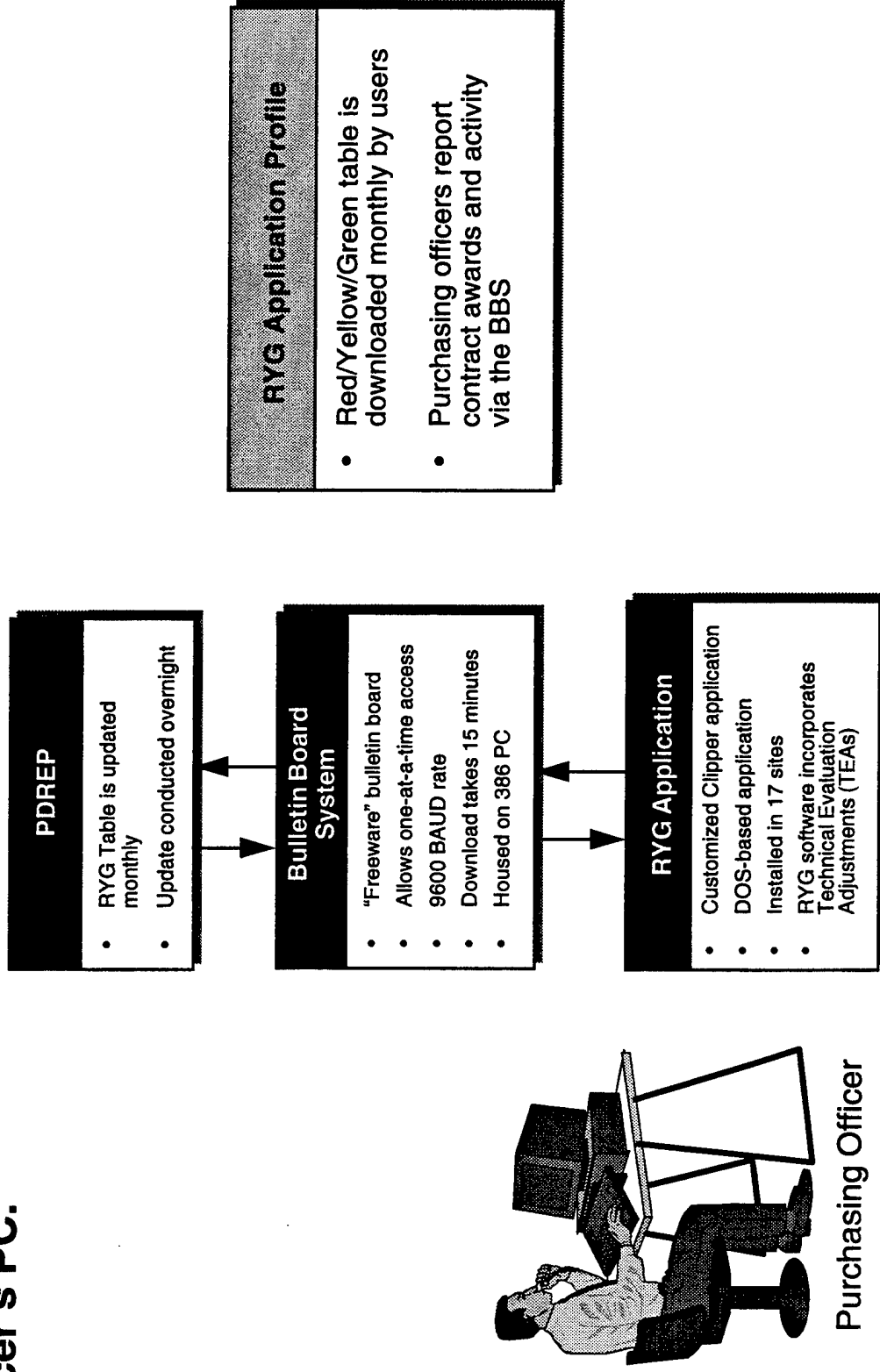


- Purchasing Officers
- Inspectors
- Quality Assurance Personnel

PDREP Access Profile
• Currently 184 users – Purchasing officers – Inspectors – Quality Assurance Personnel • Low volume usage (one access per day) primarily due to dial-up – Cannot run other applications – Must typically reboot system • NEWNET provides instant access • Response rate is in the area of 5 seconds or less

Red/Yellow/Green System RYG Application

The Red/Yellow/Green database and system reside on the Purchasing Officer's PC.



Purchasing Officer

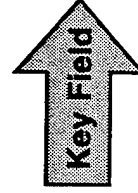
Users update the RYG database monthly via an electronic bulletin board.

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The RYG evaluation table could be easily imported and appended to external past performance databases.

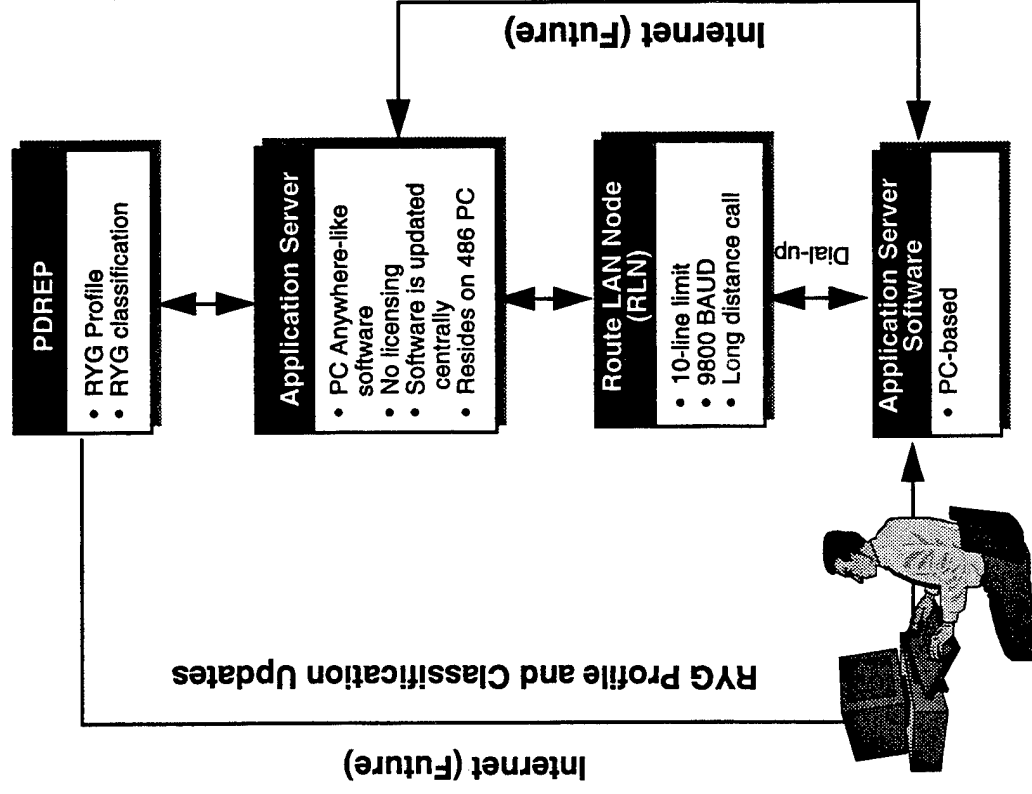
RYG Record Layout

<i>Data Element</i>	<i>Description</i>	<i>Data Type</i>	<i>Record Length</i>
CAGE Code			
Change Indication			
Classification Date			
Color Code			
Company Name			
Evaluation Indicator			
Evaluation Ending Date			
Federal Supply Class (FSC)			
FSC material Description			
Nuclear Material Indicator			
Reason Code			



Red/Yellow/Green System Contractor Access

The PDREP system is being enhanced to provide contractors with “push” and “pull” access to their profiles and RYG classifications.



Contractor Access
• Currently 3 contractor users • This system will obviate the need for monthly mailings

Contractor

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Significant expansion of the PYG past performance evaluation system would require more streamlined data acquisition, improved network access capabilities, and greater standardization in PC-based software

System Expansion Issues

- Retrieval of past performance information from multiple sources for storage in PDREP relies heavily on manual input.
- Dial-in access to PDREP and bulletin board access to FYG data inhibits ease of use.
- Multiple modes of data access and transfer (e.g., dial-up, manual input, tape, NEWNET) complicate management of the overall system.
- Multiple PC software packages (e.g., PDREP Access, [PowerBuilder], RYG [Clipper and BBS], contractor access [Application Server]) complicate management and maintenance of the overall system.

An extrapolation of the PDREP system from the current number of active contractors (11,000) to the potential number of contractors (700,000) yields the following:

- 11,000 contractors to 700,000 contractors
- 32,000 RYG classifications to 2,036,300 RYG classifications
- 2000 RYG classification updates each month to 127,269 RYG classification updates
- PDREP data tables
 - From 50,000 to 3,181,500 Product Quality Deficiency Reports (PDQR's)
 - From 400 to 25,452 Material Inspection Records (MIR's)
 - From 1,500 to 95,455 Surveys (e.g., preaward, product, special, etc.)
 - From 1000 to 63,630 Special Quality Records (SPQ's)
 - From 50 to 3,182 Bulletins
 - From 248 to 15,782 Corrective Action Requests (Method C/D/E)
 - From 804 to 51,164 Government and Industry Exchange Program (GIDEP) records

An extrapolation of the PDREP system from the current number of active contractors (11,000) to the potential number of contractors (700,000) yields the following (continued):

- PDREP data tables
 - From 45,000 to 2,863,636 Contract Delivery Data (CDD) records
 - From 409 to 26,027 Test Reports

ABVM

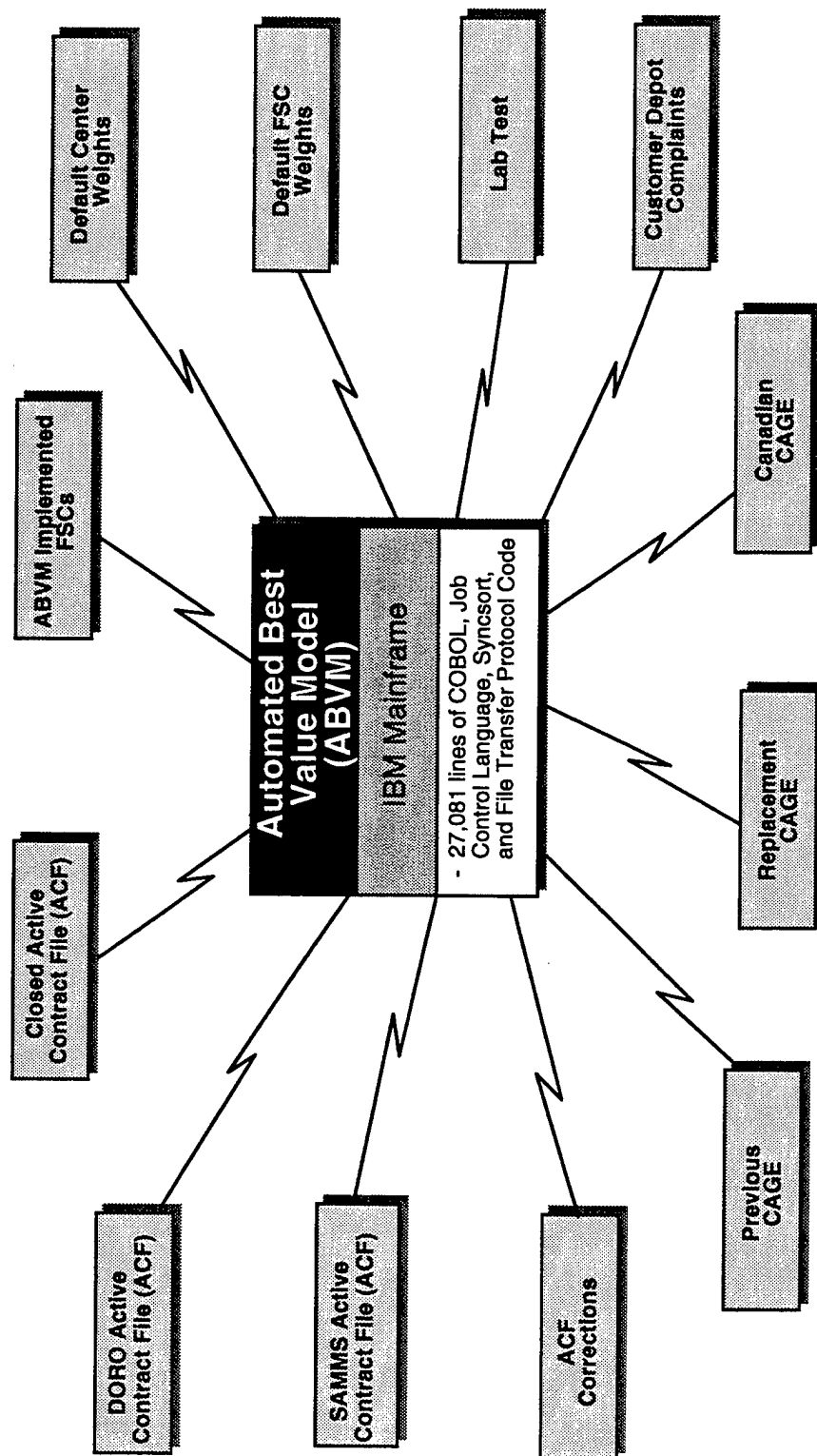
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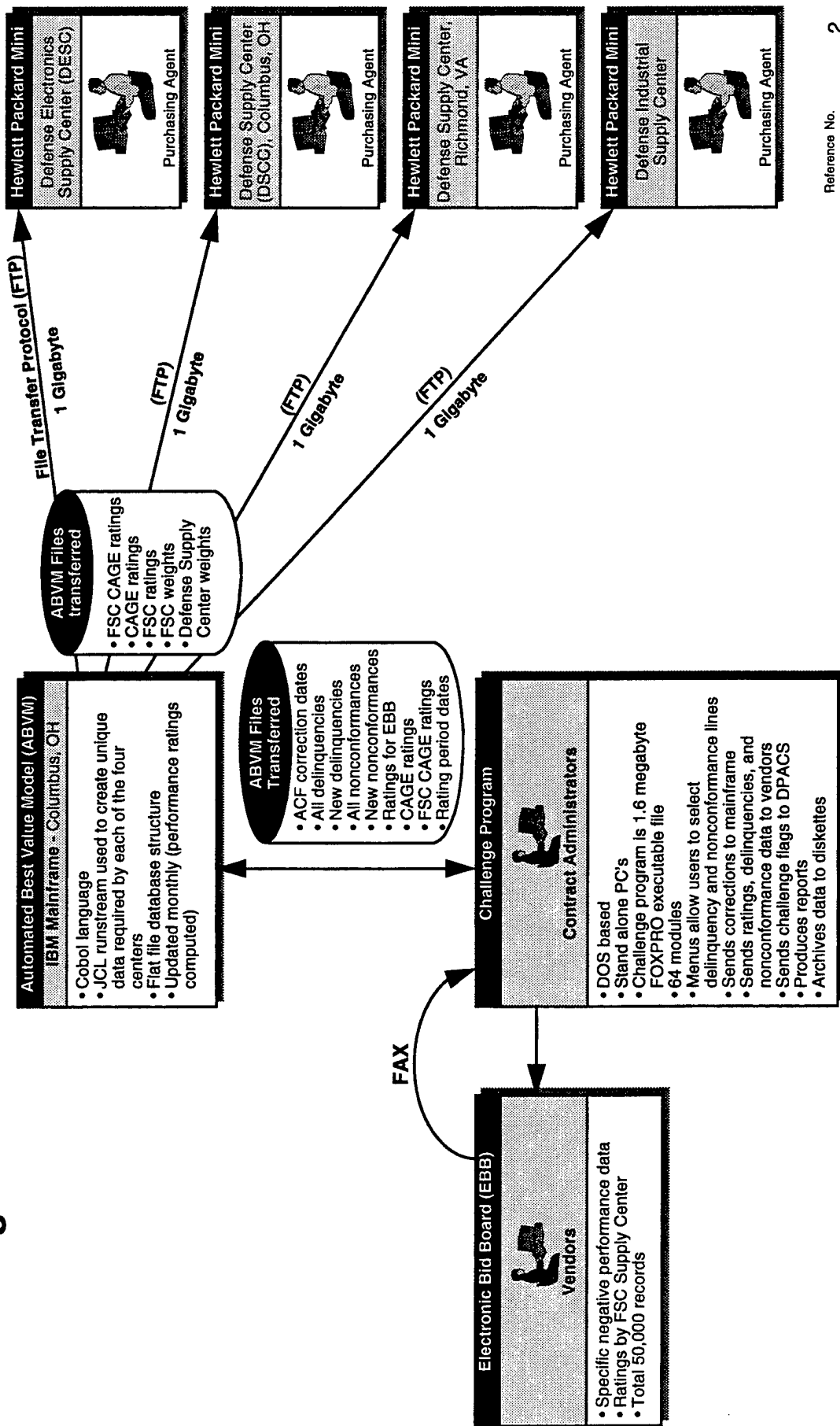
Automated Best Value Model (ABVM) System Past Performance Data Acquisition

Past performance data for ABVM is collected from a variety of sources.

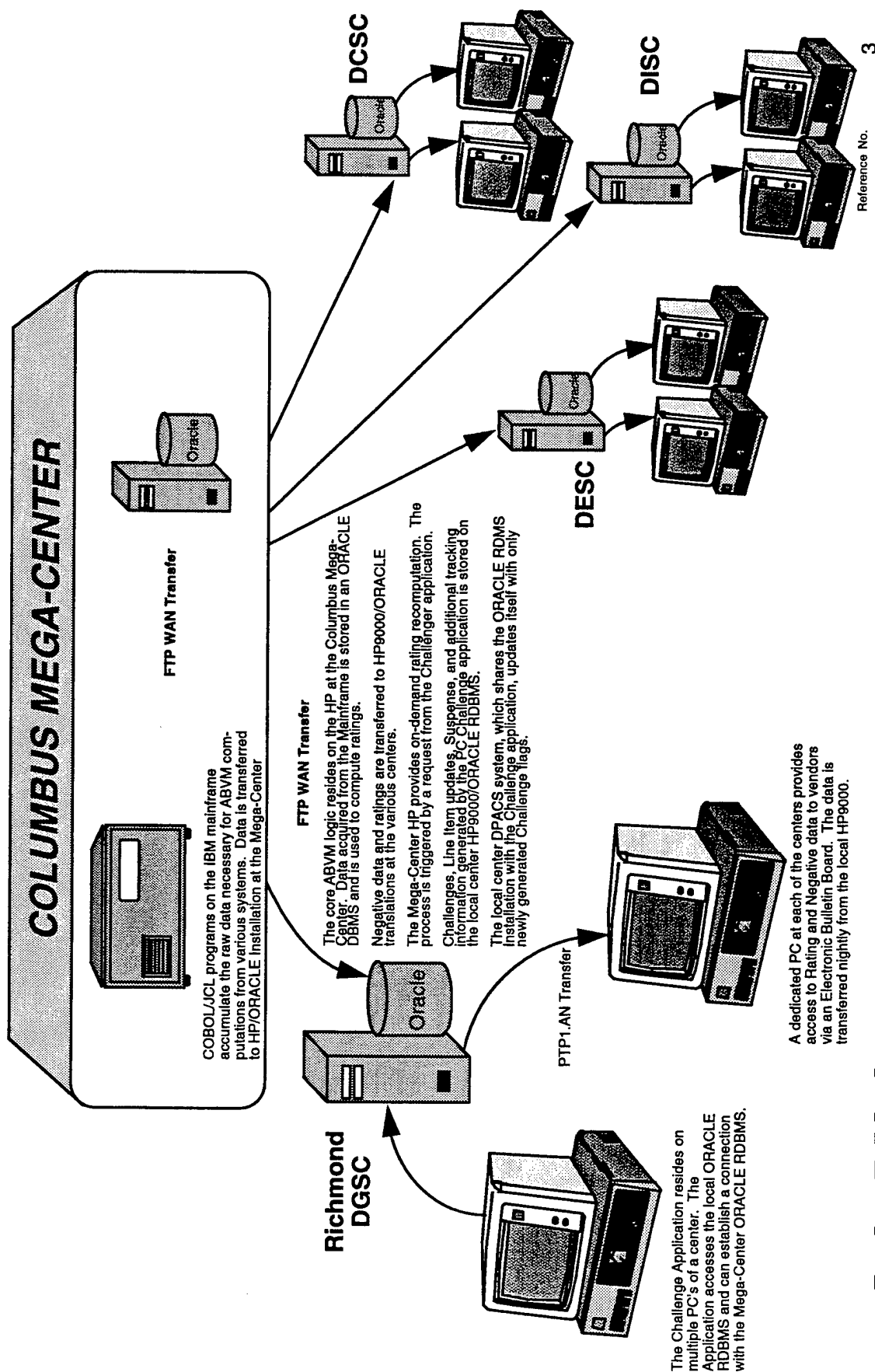


Automated Best Value Model (ABVM) System System Components

The ABVM system is composed of three interrelated components, the Automated Best Value Model, Electronic Bid Board, and Challenge Program.



A new system architecture for ABVM is planned.



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Automated Best Value Model (ABVM) System Upgrade Advantages

The proposed ABVM system upgrades will yield multiple benefits and advantages over the existing system configuration.

Update Area	Current	Proposed Upgrade	Advantages
ABVM Rating Computation Component	Mainframe - based flat file application. Data and ratings processed on mainframe and sent to each DSC via FTP. Ratings are completely rebuilt and calculated each month. Data is underutilized because of its flat file structure and lack of automated interfaces.	Computation component moved to a mid-tier HP 9000 minicomputer UNIX/Oracle environment.	Improved data access. Out of cycle rating recomputations can be made as vendor data is changed by the Challenge process.
ABVM Application Program	Four versions of the rating program are maintained, one for each Supply Center. Center unique rating parameters are hard coded in programs and can only be changed by programmer.	A single Oracle program is used to process ratings for all Supply Centers. Supply Center differences are accommodated through the use of parameter tables. Parameter tables can be changed by system administrator.	Only one versus four programs to maintain. Rating parameters can be adjusted within policy limits by Center level system administrators.
ABVM Program Operating System/Code	MVS/COBOL	UNIX/PL/SQL (4GL) and C Data Extraction in MVS/COBOL	Less code - faster, easier to maintain and extend.
Challenge Application Program	Single user PC application using local flat file structures.	Multi-user PC application using Oracle RDBMS residing on HP server.	More than one Challenge Monitor can work in system at the same time. Simplified user interface reduces key strokes and provides improved visibility over process. Improved data access and challenge tracking. Daily updates of challenge data.
Challenge Program Operating System/Code	DOS/FoxPro	Windows/Visual Basic	Better looking and easier to use interface. Faster and easier to make changes and extend functionality of program.
DPACS Challenge Flag Setting	Flag files produced by Challenge Program are sent to DSDC computer for consolidation and forwarded to DPACS twice daily.	Flag files produced by Challenge Program are sent directly to DPACS.	Removes unnecessary processing leg. challenge flag updates can be processed faster. Sets the stage for more direct interface.
EBB Program	PC Bulletin Boards - Two different systems in use.	Rating and deficient/delinquent line data can be updated daily.	Rating and deficient/delinquent line updates more frequent.

Reference No.

4

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