COST EFFECTIVENESS IN DATA MANAGEMENT
OR
WHY BUY MORE THAN YOU NEED

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ABSTRACT

This paper suggests that data management acquisition procedures used by Government are often not cost effective. All sorts of military standards are deemed "the thing" when contractors' formats would suffice at a substantial savings. Data management acquisition procedures need an overhaul. The Naval Training Equipment Center (NAVTRAEQUIPCEN) has developed a Recommended List of Approved Data Item Descriptions (DID's) and DID numbers for a major weapon buy. This list must be tailored to the requirement. In addition, Data Management, Technical (DAMTEC), an automated system for tracking the Contract Data Requirements List (CDRL) items in contracts, has been developed to monitor the progress of the deliverable data and to serve as a data bank for use by project team members. This data bank provides cost comparison information based upon cost of data previously bought for various training equipment.

INTRODUCTION

During the 1960's the National Aeronautics Space Administration (NASA) bought trainloads of data, and developed a slide rule for assessing its cost. Just as NASA was concerned by the mounting cost of documentation, we at NAVTRAEQUIPCEN are also concerned. Sometimes it appears that all Government wants, or is looking for, is more and more technical data. "Not so," says NAVTRAEQUIPCEN. In 1979 the Center sharpened its data management pencil and "managed" to delete 31 items from an 81-item list of data for larger procurements without weakening support to the related training equipment. Cost savings have been dramatic.

Definition of Technical Data

According to DOD, technical data are "recorded information used to define a design and to produce, support, maintain, or operate items of defense material." These data may be recorded as graphic or pictorial delineations in media such as drawings or photographs; text in specifications or related performance or design-type documents; in machine forms such as punched cards, magnetic tape, computer memory printouts; or may be retained in computer memory. Examples of recorded information include engineering drawings and associated lists, specifications, standards, process sheets, manuals, technical reports, catalog item identifications, and related information. These technical data are identified on a DD Form 1423, Contract Data Requirements List (CDRL), if the contract requires delivery of the data.

Data Cost Factors

The contractor has to prepare certain data to satisfy the design, development, testing, and production aspects of the contract regardless of the deliverable data requirements placed on the contract by the government. Knowing that much of the data required by the government are basically the same as that prepared by the contractor for his own use in satisfying the contract, DOD, in conjunction with Aerospace Industry Association, developed what is known as the "over-and-above" concept.

This concept in action requires the contractor to include in his estimated selling price on each specified data item, that portion of the development/preparation data effort expended by him to solely satisfy the government requirement for a deliverable data item.

This estimated selling price to the government also includes General and Administrative (G&A) costs, overhead, and profit. Under the "over-and-above" concept the estimated selling price is contingent upon whether or not the contractor had to prepare the data for his own use or solely to meet the government requirements.

Current DOD policy identifies four pricing conditions, known as "Price Groups," which the contractor utilizes under the "over-and-above" concept. They are summarized as follows and then defined in the narrative.

Group	Essential to Performance of Contract	Added Effort Required	Price
I	NO	YES (100%)	YES
II	YES	YES	YES
III	SOME	SOME	YES
IV	NONE	NONE	NO

Group I - Data which the contractor prepares to satisfy the Government. The contractor does not need this type of data to perform the rest of the contract. Price would be based on identifiable direct costs, overhead, and profit. Technical manuals prepared for government use are an example. (Engineering drawings generally are the source material for technical manuals. The cost of developing these drawings is not a cost of producing the manuals.)

Group II - Data essential to contract performance which must be reworked or amended to conform to government requirements. The price for data in this group would be based on the direct cost to conform the original data to government needs and to deliver it, plus allocable overhead and profit. Much of the data purchased is from this group.

Group III - Data which the contractor must develop *for his own use and which require no substantial* change to conform to government requirements regarding depth of content, format, frequency of submittal, preparation, and quality of data. Only the cost of reproducing, handling, and delivery, plus overhead and profit, are considered in pricing data in this group. An example of the kind of data to be categorized as Group III would be DOD-D-1000 Level 1 drawings used in the manufacturer's normal plant functions. Level 1 drawings are those drawn to company standards.

Group IV - Data which the contractor has developed as part of his commercial business. Not much of these data are required and the cost is insignificant. The item is coded "no charge." Example: A brochure or brief manual developed for commercial application which will be acquired in small quantities, the added cost is too small to justify the expense of computing the charge that otherwise would go with the acquisition.

Data, Data, Everywhere? -- What to Buy?

Prior to 1979, NAVTRAEQUIPCEN was being inundated with data. On a typical major procurement, "minimum" data requirements totalled 81 items. The Center's Data Management Officer chaired a data review board which screened and rewrote all Data Item Descriptions (DID's) to reduce cost-driving requirements, and encouraged use of contractor's format. The list was reduced to 50 items. The immediate impact was to cut the cost of data on a single procurement from $436,223 to $309,709.83 for a savings of $137,513.17. The new "Recommended Data List" is shown in figure 1. It is a maximum requirement list for a major training equipment procurement, and only selected DID's are expected to be used to acquire necessary data; tailoring should take place throughout the system/equipment life cycle.

Exhibit A - Engineering Data (Hardware)

1.	Trainer Engineering Design Report	UDI-S-25591A
2.	Trainer Test Procedures	UDI-T-25594A
3.	Trainer Facilities Report	UDI-P-25579
4.	Trainer Photographs	UDI-E-25559
5.	Trainer Slides	UDI-E-25560
6.	Trainer Mockup Report	UDI-E-25565
7.	Trainer GFE Report	UDI-P-25581
8.	Trainer Artist Sketch	UDI-E-25562

Exhibit A - Engineering Data (Software)

9.	Software Development Plan (SDP)	DI-A-2176/MOD
10.	Specification, Program Performance (PPS)	DI-E-2136/MOD
11.	Interface Design Specification (IDS)	DI-E-2135/MOD
12.	Computer Program Test Plan	DI-T-2142/MOD
13.	Computer Program Test Procedures/Reports	DI-T-2144/MOD
14.	Program Design Specification (PDS)	DI-E-2138/MOD
15.	Data Base Design Document (DBDD)	DI-S-2140/MOD
16.	Program Package Document (PPD)	DI-S-2141/MOD
17.	Program Description Document (PDD)	DI-S-2139/MOD
18.	Operator's Manual	DI-M-2145/MOD
19.	Computer Software Trouble Report (STR)	DI-E-2178/MOD
20.	Software Quality Assurance Plan	DI-R-2174/MOD
21.	Software Configuration Management Plan	DI-E-2175/MOD
22.	Software Change Proposal (SCP) and Software Enhancement Proposal (SEP)	DI-E-2177/MOD

Exhibit B - Administrative Data

23.	Trainer Technical Progress Report	UDI-A-25602A
24.	Cost Schedule Status Report	DI-F-6010

Exhibit C - Provisioning Data

25.	Provisioning Parts List (PPL)	DI-V-7002
26.	Provisioning Forms	
27.	Provisioning Parts List Index (PPLI)	DI-V-2022/MOD
28.	Supplementary Provisioning Technical Documentation (SPTD)	DI-V-7000
29.	Provisioning and other Procurement Screening Data	DI-V-7016B
30.	Repairable Item List (RIL)	DI-V-7005
31.	Post Conference Provisioning List (PCPL)	DI-V-2172
32.	Interim Support Item List (ISIL)	DI-V-7006
33.	Recommended List of Maintenance, Test and Support Equipment (MT&SE)	DI-V-5275/MOD
34.	Design Change Notice (DCN)	DI-V-7009
35.	Inventory/Utilization Data Report (IUDR)*	UDI-V-25513

Exhibit D - Maintenance Data

36.	Reliability/Maintainability Status Reports	UDI-R-255844/ UDI-L-25572A
37.	Nonstandard Part Approval Requests	DI-E-7028
38.	Integrated Logistic Support Plan (ILSP)	UDI-L-25622B
39.	Training Equipment Summary	UDI-L-25510
40.	Contractor Field Service Reports	UDI-L-25514C
41.	Drawings, Engineering and Associated Lists	DI-E-7031/MOD
42.	Trainer ECP Summary	UDI-E-25603
43.	Training Device Inventory Record	UDI-L-25578A

Exhibit E - Publications Data

44.	(a) Manual, Technical, Functionally Oriented Technical Manual (FOTM) For Training Devices**	UDI-M-25597B
	(b) Manual, Technical, Operation and Maintenance Instructions**	UDI-M-25575
45.	PMS Documentation	UDI-L-20304A
46.	Manual, Technical, Commercial Standard	UDI-M-25576
47.	Vendor Equipment Data Updates	UDI-M-25700A

Exhibit F - Training Data

48.	Outlines, Training Course Curriculum (Option 1 only)	DI-H-2026
49.	Guides, Instructor/Lesson-Training Courses	DI-H-2073
50.	Audiovisual, Aids, Master Reproducibles and Review Copies Training Equipment and Training Courses	DI-H-2122
51.	Test, Measurement of Student Achievement	DI-H-2033A
52.	Forms Evaluation - Student & Training Course	DI-H-2165
53.	Handbook, Instructor's Utilization Simulation Equipment	DI-H-2028A
54.	Guides, Students - Training Courses	DI-H-2102A

*Not required if 3M reporting invoked.
**Only one of these items is used.

Figure 1. Recommended Data List

DAMTEC

To monitor the progress status of these DID's, DAMTEC, an automated data processing (ADP) system was developed. This unique ADP application monitors the progress of the deliverable data items identified on DD Form 1423's in the contract. DAMTEC serves as a data bank for use of project team members making them aware of the total picture. In addition, DAMTEC alerts the team when the delivery of a CDRL item is due, or when the delivery of a CDRL item is overdue. This system provides up-to-date and accurate access to all information related to contract technical data. On a weekly basis, one report automatically flags those contract/item numbers that have potential slippage of milestone dates. The DAMTEC Element Dictionary consists of 33 data elements, nine of which are automatically extracted from two other NAVTRAEQUIPCEN computerized systems, the Technical Program Control System and the Contract Status System. In this way, the Data Specialist need not duplicate effort by inputting like data which is already stored in the computer.

DATA ELEMENT DICTIONARY

ACCEPTANCE DATE
APPROVAL CODE
ACTUAL RESPONSE DATE
CANCEL DATE
COMPLETION DATE
CONTRACT AWARD VALUE
CONTRACT NUMBER
CONTRACTOR NAME
CONTRACT STATUS
CONTRACTOR RESPONSE DUE
DATE RECEIVED
DUE DATE
DEVICE NOMENCLATURE
DEVICE NUMBER
DID TITLE
ELEMENT MANAGER
EXHIBIT IDENTIFIER
FREQUENCY
FINAL

GOVERNMENT RESPONSE DUE
IF ITEM WAS ACCEPTED/
 REJECTED
ITEM DATA COST
ITEM NUMBER
LATEST MILESTONE DATE
NATIONAL STOCK NUMBER/
 LOCAL STOCK NUMBER
OBLIGATION ACTUAL DATE
PRELIMINARY
RECORD CHANGE DATE
PROGRAM CODE
REMARKS
TASK NUMBER
TECHNICAL DATA SPECIALIST
TECHNICAL OFFICE

From the Data Element Dictionary comes the "DAMTEC Data Item Status Report by Contract Number". This report selects all records on the DAMTEC Data Base, except those coded "C" (closed) in Contract Status data element. Another report, "Milestones Due/ Overdue," selects all records with the latest milestone past due or due within seven days of the "as of" date on the report. One of the most used reports is the "Data Item Status Report by Technical Office and Element Manager". The element manager has a composite of what line items he is responsible for reviewing and, if it has already been received, the response/review date he must meet. AD HOC reports, selecting any imaginable combination from the Random Select Report Module, can be requested by properly querying the data bank and asking for contract number sequence, device number sequence, DID sequence, etc. As indicated above, the primary purpose of DAMTEC is to serve as a progress monitoring tool. However, this data bank, because it can store and report data item costs, also serves as an excellent guide in determining item "should costs", and otherwise aid in tailoring requirements for new procurements. Although DAMTEC has been in operation for less than a year, it has been praised by project team members and element managers. New uses for DAMTEC are constantly being discovered, and NAVTRAEQUIPCEN sees it growing into a bigger and better project management tool.

CONCLUSIONS

Guidelines should be developed for selecting tailoring, and applying specifications and standards, data requirements, and management systems to assist personnel.

Cost-driving requirements of specifications should be identified and tailored prior to requesting proposals.

Data banks should be established and used in modifying requirements for new procurements.

Industry should assist the Government in identifying the cost-driving requirements of present DID's and standards imposed on Government procurements.

Industry should automatically provide alternate proposals on all RFP's to indicate how contractor format or other alternatives can be used to reduce proposal cost with no loss in technical information being provided.

REFERENCES

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